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

| PROCEDURE | PROCEDURE TITLE | REVISION NUMBER |
|---|---|---|
| 000 Series | Organization | |
| A.2-001 | Emergency Organization | 2 |
| 100 Series | Activation | |
| A.2-101 | Classification of Emergencies | 1 |
| A.2-102 | Notification of an Unusual Event | 1 |
| A.2-103 | Alert | 2 |
| A.2-104 | Site Area Emergency | 1 |
| A.2-105 | General Emergency | 1 |
| A.2-106 | Activation of Technical Support Center | 2 |
| A.2-107 | Activation of Operations Support Center | 1 |
| 200 Series | Assessment | |
| A.2-201 | On-Site Monitoring During an Emergency | 0 |
| A.2-202 | Off-Site Monitoring Durng an Emergency | 0 |
| A.2-203 | Evacuation Criteria for On-Site Personnel | 0 |
| A.2-204 | Off-Site Protective Action Recommendations | 0 |
| A.2-205 | Personnel Accountability-Control Room/TSC | 0 |
| A.2-206 | Personnel Accountability-Assembly Points | 0 |
| 300 Series | Protective Actions | |
| A.2-301 | Emergency Evacuation | 1 |
| A.2-302 | Assembly Point Activation | 0 |
| A.2-303 | Search and Rescue | 1 |
| A.2-304 | Thyroid Prophylaxis | 0 |
| 400 Series | Radiological Surveillance and Control | |
| A.2-401 | Emergency Exposure Control | 0 |
| A.2-402 | Contamination Control | 0 |
| A.2-403 | Emergency Surveys | 1 |
| A.2-404 | Emergency Sampling and Analysis | 0 |
| A.2-405 | Release Rate Determination | 0 |
| A.2-406 | Off-Site Dose Projection | 2 |
| A.2-407 | Personnel and Vehicle Monitoring | 0 |
| A.2-408 | Sample Coordination During an Emergency | 0 |
| A.2-409 | Self-Contained Breathing Apparatus (SCBA) Use During An Emergency | 0 |
| A.2-410 | Out-of-Plant Surveys | 0 |
| A.2-412 | Mobile Lab Counting Procedure | 0 |
| 500 Series | Communications and Documentation | |
| A.2-501 | Communication During an Emergency | 0 |
| A.2-502 | Recordkeeping During an Emergency | 0 |
| A.2-503 | Emergency Reports and Documentation | 0 |
| 600 Series | Re-Entry and Recovery | |
| A.2-601 | Re-Entry | 0 |
| A.2-602 | Transition to Recovery Plan | DELETED-11/19/81 |
| A.2-603 | Repair and Corrective Action | 1 |
| 700 Series | | |
| A.2-702 | Response to an Emergency at Prairie Island | 1 |

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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

# EMERGENCY ORGANIZATION
A.2-001

Prepared by: GD Mathiasen ALARA Review: G. D. Mathiasen Date 11/17/81
Reviewed by: F L Fey Q.A. Review: R. L. Scheinost Date 11/17/81
Operations Committee Final Review: Meeting Number 1056 Date 1/22/82
Approved by: Wayne A Shamla Date 1/29/82
Op. Com. Results Review: not required Mtg. 1027 Date 11/20/81

## PURPOSE

The purpose of this procedure is to specify the onsite emergency organization and to establish personnel assignments, orders of succession, and individual and group responsibilities.

## PRECAUTIONS

No Monticello Nuclear Generating Plant personnel shall make any information releases to members of the news media or the general public during an emergency unless cleared through the Emergency Manager, if established, or Emergency Director. Direct all inquiries to the Communications Department at NSP Headquarters or at the EOF.

## DISCUSSION

A. Although it is not practical to develop detailed procedures encompassing every conceivable emergency situation, advance planning should create a high order of preparedness and ensure an orderly and timely decision-making body. Advance planning of the Emergency Organization ensures that during an emergency the duties of the plant staff members, who are required to direct the emergency effort, are defined. (See Figure 1)

B. The Emergency Organization is herein described. The duties and responsibilities of the individual Emergency Organization members are defined. Assignments to Emergency Organization positions are made and the alternates that may fill positions, in case of absence of the assigned individual, are listed. In some cases, personnel are listed in more than one group. To avoid conflicts, the Emergency Director is determined first and he will then make the other assignments.

C. It is the Emergency Director's responsibility to ensure 24 hour coverage of key positions in the emergency organization. He must consider that the emergency may continue for some time and "pace" the utilization of personnel resources (e.g., ensure rotation of personnel to allow time for eating and sleeping).

D. While the qualification criteria listed in this procedure will be used to determine who may be qualified to fill a given emergency organization position, it is not intended that a person who is not qualified may not be assigned to that position. The goal should be to have several people qualified to fill each position, but if there is no one available from the qualified list, the most qualified person available should be selected.

Requalification, when applicable, will be required on an annual (± 3 months) basis. This procedure will be reviewed quarterly, and revised if necessary.

E. This organization is updated at least quarterly. Between updates, personnel who become qualified may be used to staff these positions.

QUALIFICATION, ORDER OF SUCCESSION AND DUTIES

I. Coordination and Direction Group

A. Emergency Director

1. Qualifications

a. Five years experience at Monticello Nuclear Generating Plant

NOTE: This requirement does not apply during initial phase of emergency when the Duty Shift Supervisor is Emergency Director.

b. Experience as Plant Manager Designee

NOTE: This requirement does not apply during initial phase of emergency when the Duty Shift Supervisor is Emergency Director.

c. Knowledgeable or qualified in following areas:

- Corporate Emergency Plan
- Monticello Emergency Plan
- Emergency Implementing Procedures:

| | |
|---|---|
| A.2 - 101 | A.2 - 303 |
| A.2 - 102 | A.2 - 304 |
| A.2 - 103 | A.2 - 401 |
| A.2 - 104 | A.2 - 501 |
| A.2 - 105 | A.2 - 502 |
| A.2 - 204 | A.2 - 503 |
| A.2 - 205 | A.2 - 601 |
| A.2 - 301 | A.2 - 603 |

- Safeguards Contingency Plan Implementing Procedures

| | |
|---|---|
| SCPIP - 1 | SCPIP - 8 |
| SCPIP - 2 | SCPIP - 12 |
| SCPIP - 4 | |

2. Qualified Personnel in Order of Succession

   a.
   b.
   c.
   d.
   e. Duty Shift Supervisor

3. Duties

   a. Coordinates the response of the plant emergency organization;

   b. Evaluates plant and radiological conditions;

   c. Ensures assessment of offsite radioactivity releases;

   d. Recommends offsite protective actions;

   e. Determines emergency classification;

   f. Calls in additional plant personnel;

   g. Assumes control of Technical Support Center personnel and activities;

   h. Makes decisions regarding habitability of emergency response centers and location of assembly areas;

   i. Approves radiation exposures in excess of normal limits;

   j. Ensures all injured personnel receive medical assistance; and

   k. Ensures 24-hour coverage for key positions of plant emergency organization.

B. Shift Technical Advisor

1. Qualifications

   Qualified per 4 AWI-4.7.1

2. Qualified Personnel

3. Responsibility

Provide technical operational advice to the Shift Supervisor.

C. Shift Emergency Communicator

1. Qualifications

a. Six months experience at Monticello

b. Ability to communicate verbally in clear, concise manner

c. Knowledgeable or qualified in following areas:

- Emergency Implementing Procedures:

| | |
|---|---|
| A.2 - 101 | A.2 - 105 |
| A.2 - 102 | A.2 - 106 |
| A.2 - 103 | A.2 - 501 |
| A.2 - 104 | A.2 - 502 |

- Emergency Plan (Knowledgeable to degree necessary to be able to direct others in use of procedures)

d. Other administrative qualifications as determined by Plant Management.

2. Qualified Personnel

3. Duties

a. Assists Emergency Director in emergency classification;

b. Conducts initial and followup notification in accordance with procedures;

c. Coordinates all incoming and outgoing communications;

d. Ensures proper logging and recording of communications.

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e. Assist Emergency Organization in use of procedures.

II. Operations Group

A. Operations Group Leader

1. Qualifications

a. Current SRO License for Monticello

b. Demonstrated ability in supervisory skills.

c. Five years experience in plant operations at Monticello

d. Knowledgeable or qualified in following areas:

- Monticello Emergency Plan
- Emergency Implementing Procedures:

| | |
|---|---|
| A.2 - 101 | A.2 - 205 |
| A.2 - 102 | A.2 - 301 |
| A.2 - 103 | A.2 - 303 |
| A.2 - 104 | A.2 - 401 |
| A.2 - 105 | A.2 - 501 |
| A.2 - 204 | A.2 - 502 |

2. Qualified Personnel in Order of Succession

a.
b. Duty Shift Supervisor
c. Most senior Shift Supervisor present
d. Most senior Lead Plant Equipment & Reactor Operator present

3. Duties

a. Coordinates response of Operations Group;

b. Evaluates plant and radiological conditions;

c. Ensures Emergency Director is informed of plant status;

d. Directs operation of the plant in compliance with all normal plant procedures, directives, technical specifications and emergency procedures;

e. Monitors plant parameters and conditions.

B. Fire Brigade

1. Qualifications

a. Currently qualified in accordance with 4 AWI-3.13.2, including SCBA training and qualification.

b. Currently qualified in accordance with Appendix R, 10CFR50:

1.) The Team Leader and #2 & #3 Team Members shall have sufficient training in or knowledge of plant safety-related systems to understand the effects of fire and fire suppressants on safe shutdown capability.

2.) The Team Leader shall be competent to assess the potential safety consequences of a fire and advise control room personnel.

c. Qualified physically in accordance with Tab 7 of the NSP Medical Policy and Procedure Manual (annual requirement).

2. Qualified Personnel

a. Team Leader

If designated Team Leader is not on duty, the alternate Team Leader will be the operator assigned to fill the regular Team Leader's classification.

b. Team Members #2 & #3

c. Team Members #4 & #5

III. Maintenance Group

The Maintenance Group consists of the Plant Superintendent, Operations and Maintenance; the Superintendent, Maintenance; the Maintenance Supervisors; all maintenance crew people; the plant electricians; plant helpers and the Instrument & Control Group including supervisors and coordinators.

A. Maintenance Group Leader

1. Qualifications

a. Five years experience at Monticello Nuclear Generating Plant

b. Demonstrated ability in supervisory skills

c. Knowledgeable or qualified in following areas:

- Emergency Plan
- Emergency Implementing Procedures:

A.2 - 106
A.2 - 107
A.2 - 603

2. Order of Succession

a.
b.
c.
d.
e.
f.

B. Group Responsibilities

The group shall have the primary responsibility for emergency repairs and corrective actions.

IV. Engineering Group

The Engineering Group consists of the Superintendent, Technical Engineering and the Technical Engineering Group, plus the Superintendent, Operations Engineering and the Operations Engineering Group.

A. Engineering Group Leader

1. Qualifications

a. Five years experience at Monticello Nuclear Generating Plant

b. Demonstrated ability in supervisory skills

c. Knowledgeable or qualified in following areas:

- Emergency Plan
- Emergency Implementing Procedures:

A.2 - 106
A.2 - 502

2. Order of Succession

a.
b.
c.
d.
e.

B. Group Responsibilities

The group shall have the responsibilities for providing technical support for emergency repairs and corrective actions.

V. Health Physics Group

The Health Physics Group consists of the Supt., Radiation Protection and all Members of the Radiation Protection Group.

The group is divided into two sections: The Offsite Dose Assessment and Chemistry Section and the Monitoring Section. The group leader is the Radiological Emergency Coordinator (See Figure 2).

A. Radiological Emergency Coordinator

1. Qualifications

a. Five years experience at Monticello Nuclear Plant;

b. Demonstrated ability in supervisory skills;

c. Knowledgeable or qualified in following areas:

- Health Physics
- Emergency Plan
- Emergency Plan Implementing Procedures:

| | | |
|---|---|---|
| A.2 - 101 | A.2 - 301 | A.2 - 405 |
| A.2 - 106 | A.2 - 302 | A.2 - 406 |
| A.2 - 201 | A.2 - 303 | A.2 - 407 |
| A.2 - 202 | A.2 - 304 | A.2 - 408 |
| A.2 - 203 | A.2 - 401 | A.2 - 409 |
| A.2 - 204 | A.2 - 402 | A.2 - 502 |

A.2 - 205    A.2 - 403    A.2 - 702
A.2 - 206    A.2 - 404

2. Order of Succession

a.
b.
c.
d.
e.

3. Duties

a. Coordinate assessment of radiological aspects of accident, including offsite surveys prior to EOF activation.

b. Formulate protective action recommendations

c. Ensure radiological surveillance and control measures are implemented.

d. Advise Emergency Director on health physics matters

B. Offsite Dose Assessment and Chemistry Section Leaders

1. Qualifications

a. One year experience at Monticello Nuclear Generating Plant

b. Knowledgeable or qualified in following areas:

- Chemistry and radiochemistry, including Monticello Chemistry Manual
- Emergency Plan Implementing Procdures:

A.2 - 404
A.2 - 405
A.2 - 406
A.2 - 408
A.2 - 502

2. Order of Succession

a.
b.
c.
d.
e.

3. Duties

a. Offsite dose projection

b. Release rate determination

c. Sampling and analysis of reactor coolant, containment atmosphere and plant effluents

d. Sample coordination and recording

C. Monitoring Section Leader

1. Qualifications

a. One year experience at Monticello Nuclear Generating Plant

b. Knowledgeable or qualified in following areas:

- Health Physics, including Monticello Radiation Safety Procedures (E.1)

- Emergency Plan Implementing Procedures:

| | |
|---|---|
| A.2 - 301 | A.2 - 403 |
| A.2 - 302 | A.2 - 404 |
| A.2 - 303 | A.2 - 407 |
| A.2 - 304 | A.2 - 501 |
| A.2 - 401 | A.2 - 502 |
| A.2 - 402 | A.2 - 601 |

2. Order of Succession

a.
b.
c.
d.
e.

3. Duties

a. Emergency exposure control

b. Contamination Control

c. Emergency surveys

d. Personnel and vehicle monitoring

e. Personnel and equipment decontamination

VI. Support Group

The Support Group consists of all plant office personnel and all plant QA personnel.

A. Support Group Leader

1. Qualifications

a. Two years experience at Monticello Nuclear Generating Plant;

b. Demonstrated ability in supervisory skills;

c. Knowledgeable or qualified in following areas:

| | |
|---|---|
| A.2 - 501 | A.2 - 503 |
| A.2 - 502 | A.2 - 106 |

2. Order of Succession

a.
b.
c.
d.
e.

3. Duties

a. Assign group personnel to provide administrative support, document control and document retrieval;

b. Assure that TSC is staffed adequately.

c. Coordinate and provide personnel for logistics functions

d. Act as TSC Coordinator and be responsible for conduct of Procedure A.2-106, Activation of the Technical Support Center.

B. Emergency Document Control Coordinator

1. Qualifications

a. Thorough understanding of Monticello document and record control system;

b. Knowledge of physical storage locations of plant documents and records;

c. Knowledgeable or qualified in following areas:

A.2 - 502
A.2 - 503

2. Order of Succession

a.
b.
c.
d.
e.

3. Duties

a. Provide document retrieval support for TSC;

b. Assist Support Group Leader with records control in TSC area

VII. Security Group

The Security Group consists of all plant Security and Services personnel and the contract security force.

A. Security Group Leader

1. Qualifications

a. Two years experience at Monticello Nuclear Generating Plant

b. Knowledgeable or qualified in following areas:

- Monticello Security Plan

- Safeguards Contingency Plan & Implementing Procedures

- Emergency Plan Implementing Procedures:

A.2 - 206
A.2 - 301
A.2 - 302

2. Order of Succession

a.
b.
c.
d.

3. Duties

a. Carry out plant security and access control functions

b. Maintain strict personnel accountability onsite.

VIII. Emergency Team Personnel

If required by procedure or for other purposes, an Emergency Team will be selected from the list of available candidates. (In special cases, however, exceptions to this procedure may be authorized by the Emergency Director.)

A. Qualifications

1. Current Red Cross Multi-Media First Aid training (i.e. within last three years).

2. Currently qualified under respiratory protection program, including training for use of SCBA equipment.

3. One year experience in current general work classification.

B. Qualified Personnel

Personnel who are qualified for emergency team are identified with an asterisk on form 5790-102-5, 'Monticello Emergency Augmentation List' (see attachment 1).

IX. Miscellaneous Positions

A. Emergency Planning Coordinator

1. Qualifications

a. Health physics background or health physics expertise on staff.

b. Five years experience at nuclear power plant.

c. Two years experience at Monticello.

2. Designated Emergency Planning Coordinator

Mathiasen, G.

B. Emergency Preparedness Instructors

1. Qualifications

a. Knowledgeable in Plant and Corporate Plans and Implementing Procedures.

b. Demonstrated ability in instructing methods.

c. Thoroughly familiar with subject matter of instruction.

2. Qualified Personnel

Personnel approved by Monticello Training Superintendent

C. Assembly Point Coordinator

1. Qualifications

See Qualifications for Shift Emergency Communicator

2. Qualified Personnel

See Qualified Personnel for Shift Emergency Communicator

3. Duties

   a. Assume control of operational Assembly Point

   b. Ensure proper radiological surveys are conducted

   c. Conduct accountability procedure as required

   d. Maintain communications between Assembly Point and TSC

D. TSC Coordinator (See Support Group Leader)

E. OSC Coordinator

1. Qualifications - Experience as Radiation Protection Coordinator

2. Qualified Personnel

   a.
   b.
   c.
   d.
   e.

3. Duties

   a. Be responsible for conduct of procedure A.2 - 107, Activation of the Operational Support Center.

   b. Supervise OSC personnel assigned to standby duty.

F. Technical Communicator

1. Qualifications

   a. Experience at Monticello
   b. Systems expertise

2. Qualified Personnel

   This position will be filled by designating the most qualified person from among available candidates. The Emergency Director will be responsible for assuring that this position is adequately staffed.

3. Duties

   a. Continuously maintains an open telephone communications link between the Control Room, TSC, and EOF.

   b. Communicate technical information between response centers.

   c. If located in TSC, post information on Status board.

X. Response Center Staffing

A. TSC Staffing

1. Emergency Director - In charge

2. Group Leaders

a. Radiological Emergency Coordinator
b. Engineering Group Leader
c. Operations Group Leader *
d. Maintenance Group Leader
e. Support Group Leader (TSC Coordinator)
f. Security Group Leader

* If primary designate is not available, this individual may be required to stay in Control Room.

3. Communicators

a. Lead TSC Communicator
b. Assistant TSC Communicator (offsite notification)
c. Technical Communicator (3-way to EOF and CR)
d. Assistant REC Communicators (2)
e. Assistant TSC Communicator

4. Auxiliary Staff

a. Monitoring Section Leader
b. Offsite Dose Assessment and Chemistry Section Leader
c. Engineering Assistant
d. Security Assistant
e. Emergency Document Control Coordinator
f. Recorder

B. OSC Staffing

1. OSC Coordinator - In Charge

2. Standby Personnel

a. All unassigned RPS

b. Extra Operators (i.e., not assigned to Control Room)

c. I&CS Supervisor, Coordinator and Specialists

d. Maintenance Supervisors, Chief Electrician, Station Electricians, Machinists, Welders, Repairmen, and Riggers.

3. Communicator (To be designated by OSC Coordinator if needed)

C. Control Room Staffing

1. Site Superintendent - In Charge

2. Assistance

a. Shift Supervisor
b. Shift Operators
c. Additional operators assigned to Control Room
d. STA

3. Technical Communicator (CR to TSC)

4. Technical Support Center personnel as directed by Emergency Director

REFERENCES

1. Monticello Nuclear Generating Palnt Emergency Plan

2. Monticello Nuclear Generating Plant Operations Manuals

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

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FIGURE 1

ON-SITE EMERGENCY ORGANIZATION

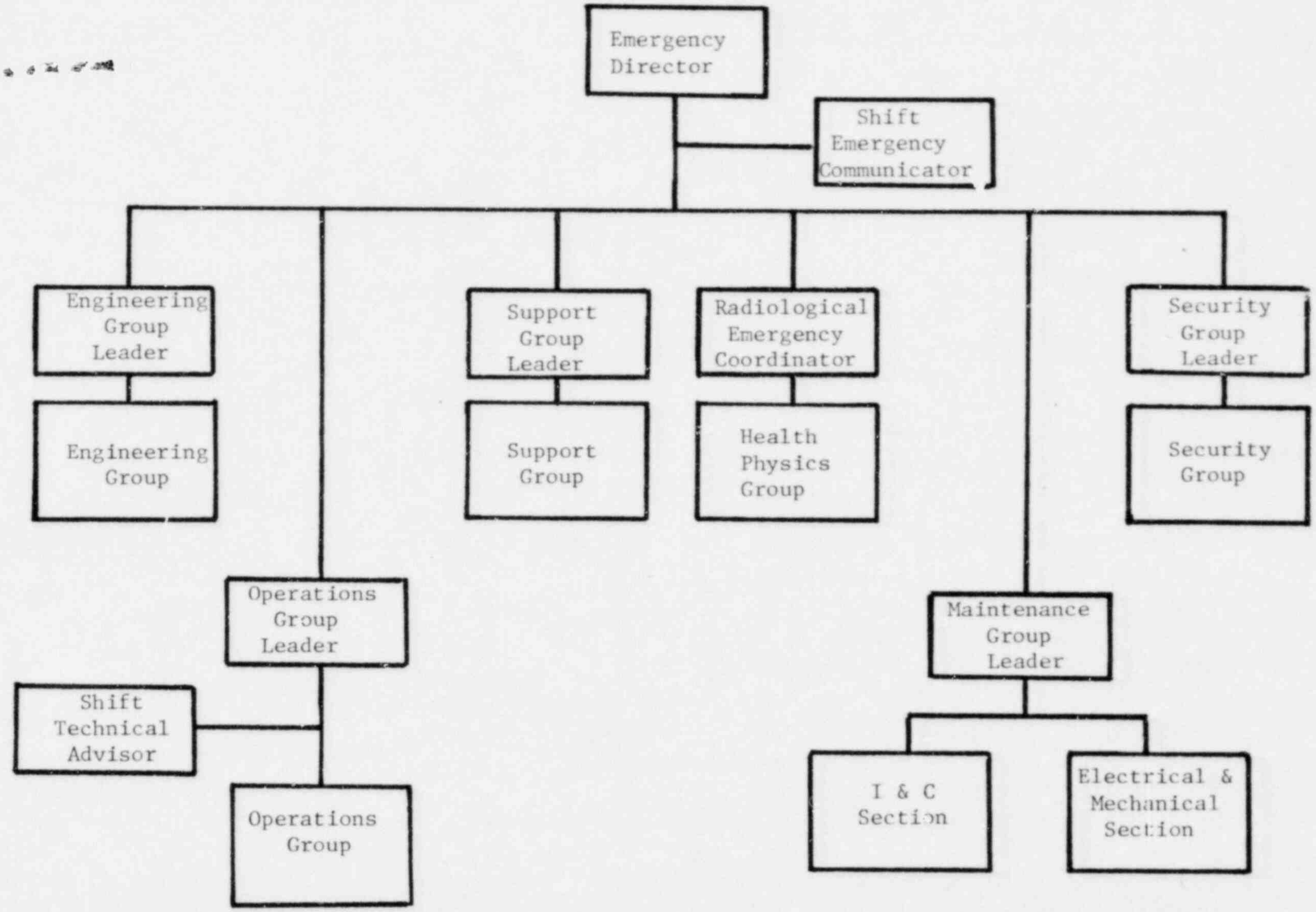
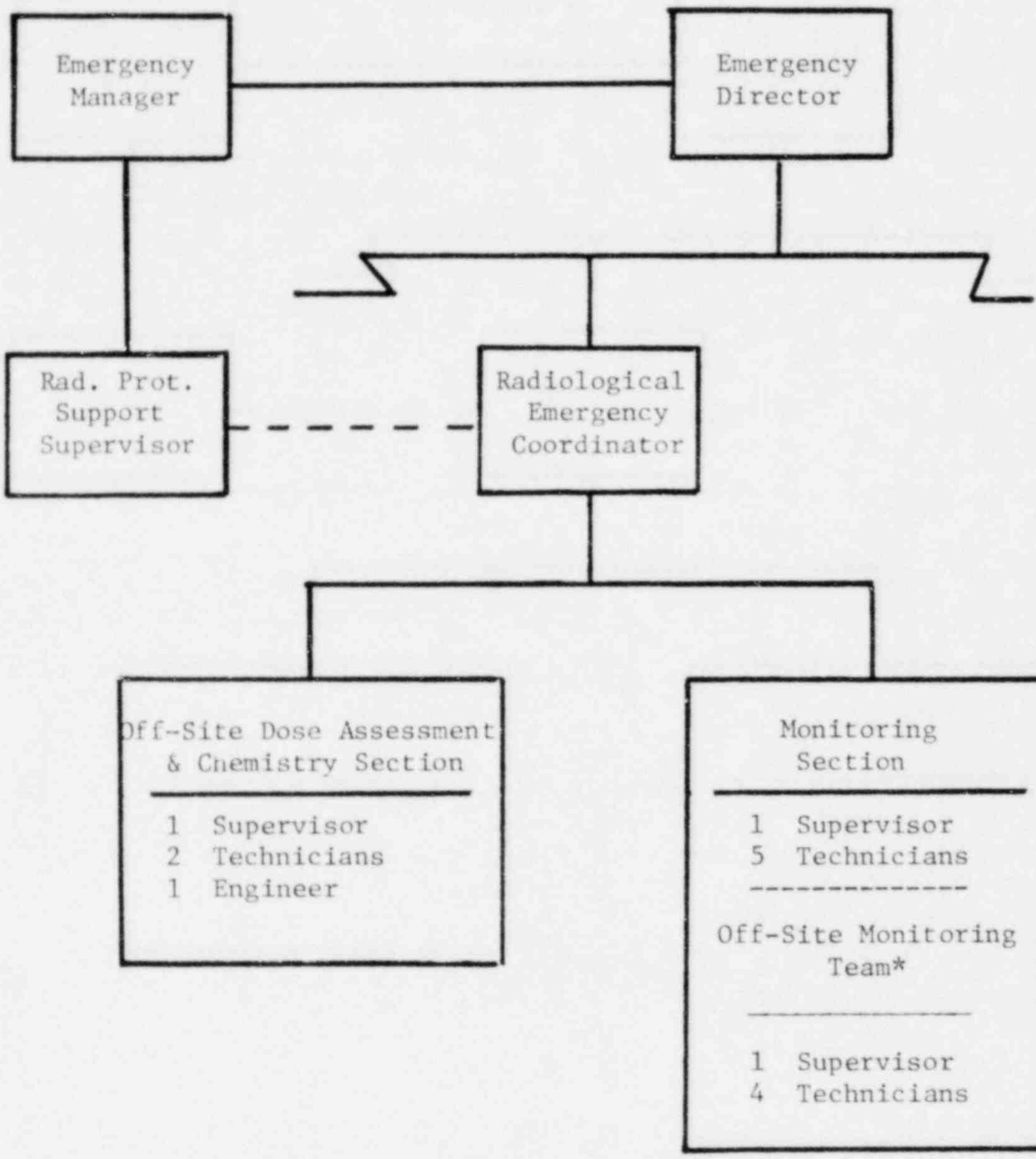


FIGURE 2

HEALTH PHYSICS GROUP (SHIFT) ORGANIZATION




* Staffed during initial hours of emergency. After EOF activation, Off-Site Monitoring Team dissolves into Monitoring Section.

ATTACHMENT 1

Form 5790-102-5
Revision 3, 02/13/82
Page 1 of 8

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

COORDINATION AND DIRECTION GROUP

| | | Pager | Home |
|---|---|---|---|
| * ( ) | Plant Manager | | |
| ( ) | Plt. Supt., Engr. & Rad. Prot. | | |
| * ( ) | Plt. Supt., Oper. & Maint. | | |
| * ( ) | Supt., Security & Services | | |
| * ( ) | Supt., Quality Engineering | | |

SECURITY GROUP

| | | |
|---|---|---|
| * ( ) | Supt., Security & Services | |
| ( ) | Supervisor, Security & Services | |
| ( ) | Plant Scheduling Administrator | |
| ( ) | Scheduling Coordinator | |
| ( ) | Duty Security Force Supervisor (For Additional Guards) | Ext. |

* Emergency Team Candidates

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Form 5790-102-5
Revision 3, 2/13/82
Page 2 of 8

ATTACHMENT 1 (Cont'd.)

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

MAINTENANCE GROUP

| | | Pager | Home |
|---|---|---|---|
| * ( | Plt. Supt., Oper. & Maint. | | |
| * ( | Superintendent, Maintenance | | |
| * ( | Maintenance Supervisor | | |
| * ( | Maintenance Supervisor | | |
| * ( | Lead Machinist | | |
| * ( | Lead Machinist | | |
| ( | Machinist | | |
| * ( | Machinist | | |
| * ( | Machinist | | |
| * ( | Appr. Machinist | | |
| * ( | Appr. Machinist | | |
| * ( | Appr. Machinist | | |
| * ( | Steam Fitter Welder | | |
| * ( | Steam Fitter Welder | | |
| * ( | Steam Fitter Welder | | |
| * ( | Appr. Steam Fitter Welder | | |
| ( | Lead Rigger | | |
| * ( | Rigger | | |
| * ( | Appr. Rigger | | |
| * ( | Appr. Rigger | | |
| * ( | Appr. Repairman | | |
| * ( | Appr. Repairman | | |
| * ( | Chief Electrician | | |
| * ( | Appr. Electrician | | |
| ( | Appr. Electrician | | |
| * ( | Sta. Electrician | | |
| * ( | Sta. Electrician | | |
| * ( | Nuclear Plant Helper | | |

* Emergency Team Candidates

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Form 5790-102-5
Revision 3, 02/13/82
Page 3 of 8

ATTACHMENT 1 (Cont'd.)

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

MAINTENANCE GROUP (Cont'd)

| | | Pager | Home |
|---|---|---|---|
| * ( | Nuclear Plant Helper (Lead) | | |
| * ( | Nuclear Plant Helper | | |
| * ( | Nuclear Plant Helper | | |
| * ( | Nuclear Plant Helper | | |
| * ( | Nuclear Plant Helper | | |
| ( | Lead, Instruments & Controls Engineer | | |
| * ( | I&C Coordinator | | |
| ( | I&C Specialist | | |
| * ( | I&C Specialist | | |
| * ( | I&C Specialist | | |
| ( | I&C Specialist | | |
| * ( | I&C Specialist | | |
| ( | I&C Specialist | | |

* Emergency Team Candidates

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Form 5790-102-5
Revision [illegible], 02/13/82
Page 4 of 8

## ATTACHMENT 1 (Cont'd.)

### Example of
### MONTICELLO EMERGENCY AUGMENTATION LIST

### OPERATIONS GROUP

| | | Pager | Home |
|---|---|---|---|
| * ( ) | Superintendent, Operations | | |
| * ( ) | Relief Shift Supervisor | | |
| ( ) | Shift Supervisor | | |
| * ( ) | Shift Supervisor | | |
| ( ) | Shift Supervisor | | |
| ( ) | Shift Supervisor | | |
| * ( ) | Site Superintendent | | |
| ( ) | Site Superintendent | | |
| ( ) | Site Superintendent | | |
| * ( ) | Site Superintendent | | |
| * ( ) | Site Superintendent | | |
| ( ) | Site Superintendent | | |
| ( ) | Lead Plt. Equip. & Reac. Operator | | |
| * ( ) | Lead Plt. Equip. & Reac. Operator | | |
| ( ) | Lead Plt. Equip. & Reac. Operator | | |
| * ( ) | Lead Plt. Equip. & Reac. Operator | | |
| * ( ) | Lead Plt. Equip. & Reac. Operator | | |
| * ( ) | Plt. Equip. & Reac. Operator | | |
| * ( ) | Plt. Equip. & Reac. Operator | | |
| ( ) | Plt. Equip. & Reac. Operator | | |
| * ( ) | Plt. Equip. & Reac. Operator | | |
| * ( ) | Plt. Equip. & Reac. Operator | | |
| * ( ) | Plt. Equip. & Reac. Operator | | |
| * ( ) | Plt. Equip. & Reac. Operator | | |
| * ( ) | Plt. Equip. & Reac. Operator | | |
| ( ) | Asst. Plt. Equip. Operator | | |
| ( ) | Asst. Plt. Equip. Operator | | |
| * ( ) | Asst. Plt. Equip. Operator | | |

* Emergency Team Candidates

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Form 5790-102-5
Revision 3, 02/13/82
Page 5 of 8

ATTACHMENT 1 (Cont'd.)

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

OPERATIONS GROUP (Cont'd.)

| | | | Pager | Home |
|---|---|---|---|---|
| * | ( | Asst. Plt. Equip. Operator | | |
| * | ( | Asst. Plt. Equip. Operator | | |
| * | ( | Asst. Plt. Equip. Operator | | |
| | ( | Asst. Plt. Equip. Operator | | |
| * | ( | Asst. Plt. Equip. Operator | | |
| * | ( | Asst. Plt. Equip. Operator | | |
| * | | Asst. Plt. Equip. Operator | | |
| * | | Plant Attendant | | |
| * | | Plant Attendant | | |
| | | Plant Attendant | | |
| * | | Plant Attendant | | |
| * | | Plant Attendant | | |
| | | Plant Attendant | | |
| * | | Plant Attendant | | |
| * | | Plant Attendant | | |
| * | | Appr. Plant Attendant | | |
| * | | Appr. Plant Attendant | | |
| * | | Appr. Plant Attendant | | |
| * | ( | Appr. Plant Attendant | | |
| * | ( | Appr. Plant Attendant | | |

* Emergency Team Candidates

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Form 5790-102-5
Revision 3, 02/13/82
Page 6 of 8

ATTACHMENT 1 (Cont'd.)

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

HEALTH PHYSICS GROUP

| | | Pager | Home |
|---|---|---|---|
| ( ) | Superintendent, Radiation Protection | | |
| * ( ) | Health Physics | | |
| ( ) | Senior Chemist | | |
| * ( ) | Chemist | | |
| * ( ) | Radiation Protection Associate | | |
| * ( ) | Radiation Protection Coordinator | | |
| * ( ) | Radiation Protection Specialist | | |
| ( ) | Radiation Protection Specialist | | |
| * ( ) | Radiation Protection Specialist | | |
| * ( ) | Radiation Protection Specialist | | |
| * ( | Radiation Protection Specialist | | |
| * ( | Radiation Protection Specialist | | |
| ( | Radiation Protection Specialist | | |
| * ( | Radiation Protection Specialist | | |
| * ( | Radiation Protection Specialist | | |
| * ( | Chemistry Coordinator | | |
| ( | Radiation Protection Specialist | | |
| * ( | Radiation Protection Specialist | | |
| ( ) | Radiation Protection Specialist | | |

* Emergency Team Candidates

WP/dw

Form 5790-102-5
Revision 3, 02/13/82
Page 7 of 8

ATTACHMENT 1 (Cont'd.)

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

ENGINEERING GROUP

| | | | Pager | Home |
|---|---|---|---|---|
| | ( | Superintendent, Technical Engineering | | |
| * | ( | Superintendent, Operations Engineering | | |
| * | ( | Lead Chemical Engineer | | |
| * | ( | Asst. Chemical Engineer | | |
| | ( | Engineer | | |
| * | ( | Lead Protection Engineer | | |
| | ( | Production Engineer | | |
| * | ( | Engineer | | |
| * | ( | Engineer | | |
| * | ( | Lead Production Engineer | | |
| * | ( | Asst. Production Engineer | | |
| * | ( | Engineer | | |
| * | ( | Engineer | | |
| * | ( | Engineer Associate | | |
| * | ( | Engineer Associate | | |
| * | ( | Engineer Associate | | |
| * | ( | Associate Production Engineer (Lead) | | |
| * | ( | Asst. Production Engineer | | |
| * | | Asst. Production Engineer | | |
| * | | Assoc. Production Engineer | | |
| * | | Engineer | | |
| * | | Nuclear Engineer | | |
| | | Lead Nuclear Engineer | | |
| | | Lead Computer Engineer | | |
| | | Computer Engineer | | |
| | | Assoc. Engineer Instr. | | |
| | ( | Asst. Instr. Engineer | | |
| | ( | Asst. Instr. Engineer | | |

* Emergency Team Candidates

WP/dw

Form 5790-102-5
Revision 3, 02/13/82
Page 8 of 8

ATTACHMENT 1 (Cont'd.)

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

SUPPORT GROUP

| | | Pager | Home |
|---|---|---|---|
| * ( ) | Superintendent, Quality Engineer | | |
| ( ) | Plant Office Manager | | |
| ( ) | Quality Engineer (Lead) | | |
| * ( ) | Quality Specialist | | |
| * ( ) | Quality Specialist | | |
| * ( ) | Quality Specialist | | |
| ( ) | Quality Specialist | | |
| ( ) | Document Control Supervisor | | |
| ( ) | Plant Administrative Specialist | | |
| ( ) | Administrative Aid | | |
| ( ) | Plant Administrative Specialist | | |
| ( ) | Administrative Aid | | |
| ( ) | Administrative Aid | | |
| ( ) | Purchasing/Inventory Control Supv. | | |
| ( ) | Plant Administrative Specialist | | |
| ( ) | Plant Administrative Specialist | | |
| ( ) | Administrative Services Supervisor | | |
| ( ) | Plant Administrative Specialist | | |
| ( ) | Administrative Aid | | |
| ( ) | Plant Administrative Specialist | | |
| ( ) | Administrative Aid | | |
| ( ) | Plant Administrative Specialist | | |
| ( ) | Quality Engineer | | |

* Emergency Team Candidates

WP/dw

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: C D Mathiasen ALARA Review: Revision 0 Date 3/27/81
Reviewed by: RL Scheinost Q.A. Review: Revision 0 Date 3/28/81
Operations Committee Final Review: Meeting Number 1059 Date 2-1-82
Approved by: F L Fey Date 2-2-82
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 and 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 on 3rd floor of Administration Building, move to TSC if required.)

2. The current Plant Technical Specifications.

3. Plant Operating Procedures

4. Plant Emergency Procedures

5. Final Safety Analysis Report (FSAR)

6. Complete set of essential technical manuals

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. Operational Support Center-Intercom
6. State EOC to EOF to TSC-Hotline Telephone
7. TSC to EOF to City Hall-Hotline Telephone
8. TSC to General Office Hotline
9. State DES Radio Hotline
10. Commercial Telephones (4)
11. Plant Extensions (7)

E. Equipment and Facilities

The TSC contains the following:

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

E. Equipment and Facilities (Cont'd.)

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

PROCEDURE

PART I - ACTIVATION

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

STEP 2 Activate Meteorological Computer Terminal (power switch on and on line).

STEP 3 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 4 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 5 Check the intercoms to OSC and Control Room.

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

STEP 6 If habitability is of concern, request radiological survey of the TSC.

NOTE: Habitability Criteria

| | |
|---|---|
| Smearable Contamination | 500 dpm/100 $cm^2$; |
| Airborne MPC Ratio | 1; |
| Whole Body Exposure | 25 mR/hr |

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.

WP/kk

STEP 7 Activate the CAM used to monitor the air in the TSC. (The CAM is located on a cart in the hallway north of the TSC.) The system is activated by plugging the electrical cord into a wall outlet. Mark the chart with date, time and initials.

STEP 8 Clear the TSC of interferring equipment, personnel or furniture.

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 EOF and OSC. 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 whe... 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"

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 OPERATIONAL SUPPORT CENTER (OSC)

A.2-107

## REVIEW AND APPROVAL

Prepared by: M.R. Offerdahl ALARA Review Revision 0 Date 3/28/81
Reviewed by: G.A. Mathison Q. A. Review Revision 0 Date 3/28/81
Operations Committee Final Review: Meeting Number 1056 Date 1/22/82
Approved by: J.L. Fey Date 1-26-82
Op. Com. Results Review: not required Mtg.# 1056 Date 1/22/82

## COMMENTS

WORK REQUEST AUTHORIZATION(S) ISSUED Yes ___ No ___ Number(s) ___

## PURPOSE AND REQUIREMENTS

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

## 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 OSC 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 OSC or the continuing OSC operations in the event of an accident. OSC facility use during normal operation shall be limited to activities that will not degrade the level of OSC preparedness to react to accident situations and will not reduce OSC reliability.

ORGANIZATION AND RESPONSIBILITIES

A. Emergency Director - Overall In-Charge

B. Radiological Emergency Coordinator - Assist Emergency Director by providing supervision for OSC Coordinator.

C. Operational Support Center Coordinator - Responsible for implementation of this procedure.

DISCUSSION

A. OSC Function

The OSC will function as a staging area for personnel and equipment necessary to respond to an emergency. It will provide an access control function and will be the primary information source to the TSC on plant radiological conditions.

B. Location

The Primary OSC location will be at Access Control. The alternate location will be on the second floor of the Administation Build'ng. (See Attachment 1 for OSC Floor Plan.)

C. Data and Information Resources

The OSC area contains the following:

1. A complete set of up-to-date radiological survey maps.
2. Plant Operating Procedures
3. Plant Emergency Procedures

D. Communications

1. OSC to TSC intercom
2. Plant Emergency Radios (2)
3. Plant Extensions (2)

E. Equipment and Facilities (Primary Location)

1. GDE Terminal for exposure control
2. BBA System
3. Count Room equipment
   a. Automatic Smear Counter
   b. GeLi Counting System
4. Status Board
5. Radiological Survey Maps
6. Procedure Forms
7. Portable CAM
8. Portal Monitor
9. First Aid Kits and Stretcher
10. Decon Facilities
11. Friskers

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12. Respiratory Protection Equipment
13. Fire Fighting Equipment
14. Protective Clothing

PROCEDURE

PART I - Activation

STEP 1 Initiate an OSC sign-in-sheet (form #5790-107-1) for personnel reporting to the OSC. (This list will be needed if personnel accountability is required)

STEP 2 Direct or perform radiological survey in the OSC and SAS. Forward result to REC. The REC will be responsible for ensuring routine surveys of the OSC and for evaluation of the results.

STEP 3 Place portable CAM in operation.

STEP 4 Verify Automatic Smear Counter and GeLi Detector systems in operation.

STEP 5 Move the portable radios and charger from the RP Office to the OSC Control area. Establish communications with the REC.

STEP 6 Direct the removal of non-essential personnel, interferring equipment, etc. from the OSC.

STEP 7 Initiate the OSC log in accordance with A.2-502.

STEP 8 Obtain a copy of the most current exposure information for active personnel. If personnel are available, process any dosimeter cards and update the master exposure file.

PART II - OPERATION

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

STEP 1 Continually update survey floor plans. This will require review of incoming survey results.

STEP 2 Continually maintain OSC status board.

STEP 3 Obtain the services of a Shift Emergency Communicator, if needed. Ensure that communications are continuously attended.

STEP 4 Keep the REC apprised of OSC events and activities.

STEP 5 Supervise personnel assigned to the OSC for standby status. All personnel should have dosimetry and current exposure information.

STEP 6 Determine the need for special supplies, equipment, etc. to support OSC operation. Any requests should be forwarded to Support Group Leader.

STEP 7 Support emergency rescue, first aid, maintenance and survey teams by verifying their preparedness to initiate their activities and by coordinating their movements in and out of the controlled area with the Control Room and TSC.

STEP 8 Maintain strict access control procedures and keep the TSC and Control Room advised of personnel entering and leaving controlled areas. Request Security Personnel assistance in maintaining access control if required.

STEP 9 Coordinate the arrival and departure of offsite support services and coordinate their standby status while on site.

STEP 10 Make necessary preparations to relocate access control (Procedure A.2-411) in the event that the primary access control point becomes uninhabitable.

STEP 11 Continually maintain the OSC log.

STEP 12 Assume responsibilities of RP Coordinator and ensure that Radiation Protection Procedures are followed.

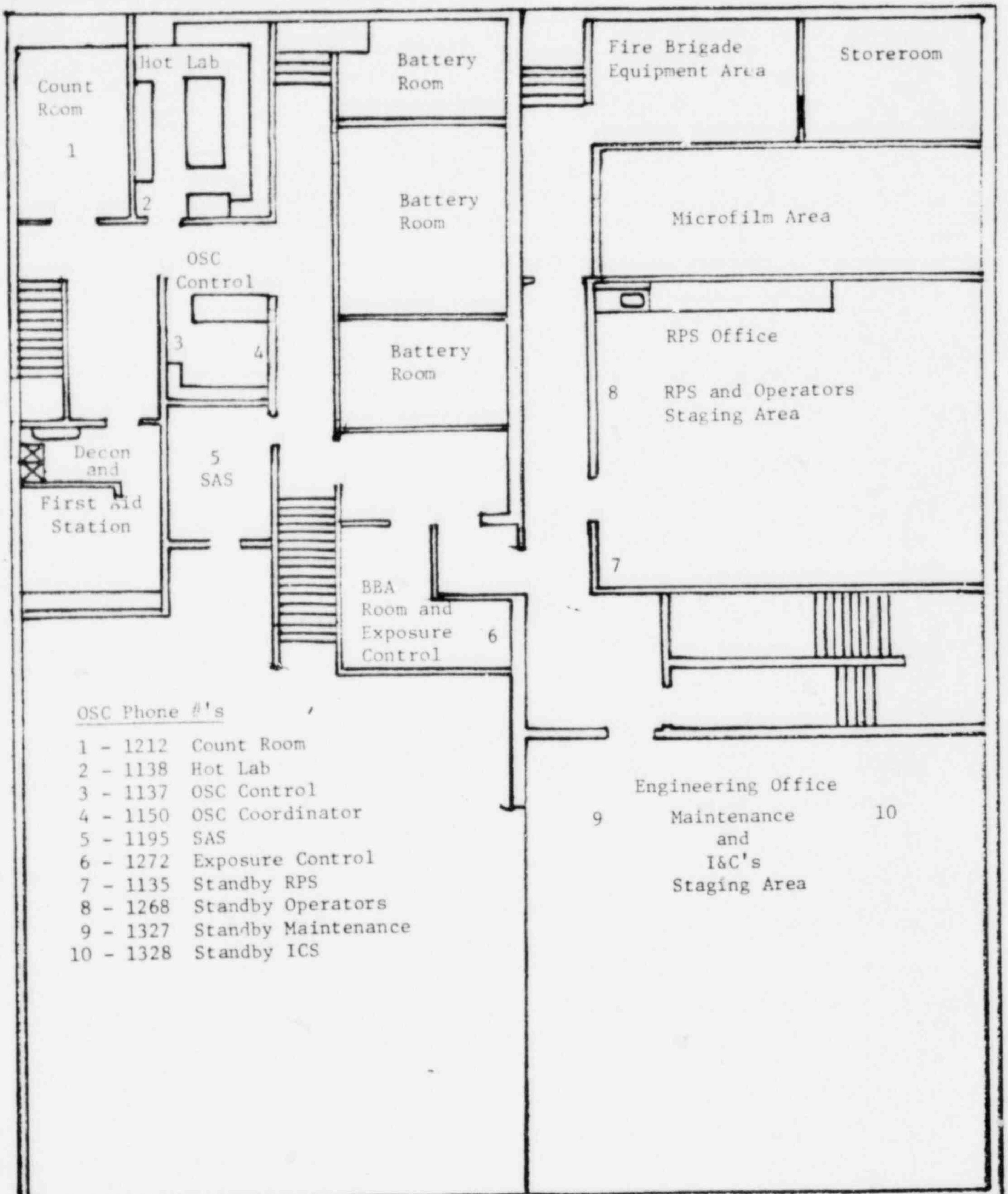
REFERENCES

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."

ATTACHMENT 1




WP/dw

| | | | | |
|---|---|---|---|---|
| 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: | CdMathan | ALARA Review: | CdMathan | Date | 2/1/82 |
| Reviewed by: | FL Fey | Q.A. Review: | Revision 0 | Date | 3/28/81 |
| Operations Committee Final Review: Meeting Number | | | 1059 | Date | 2/1/82 |
| Approved by: | JR Pask | | | Date | 2/8/82 |
| 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. "Evacuation Criteria for Onsite Personnel", Procedure A.2-203, has been implemented and some level of evacuation has been authorized by the Emergency Director (Shift Supervisor until relieved).

or

C. "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.

WP/kk

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: Assign an Assembly Point Coordinator. (See Procedure A.2-001 for qualified personnel listing.) Direct Coordinator to take a portable radio from the TSC, proceed to the designated assembly point, and implement procedure A.2-302, ASSEMBLY POINT ACTIVATION.

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).

NOTE: When conditions stabilize, direct a re-entry to affected areas of the plant as required. Re-entry shall be made in accordance with Procedure A.2-601, RE-ENTRY.

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 DURING AN EMERGENCY.

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 DURING AN EMERGENCY. 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"

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)

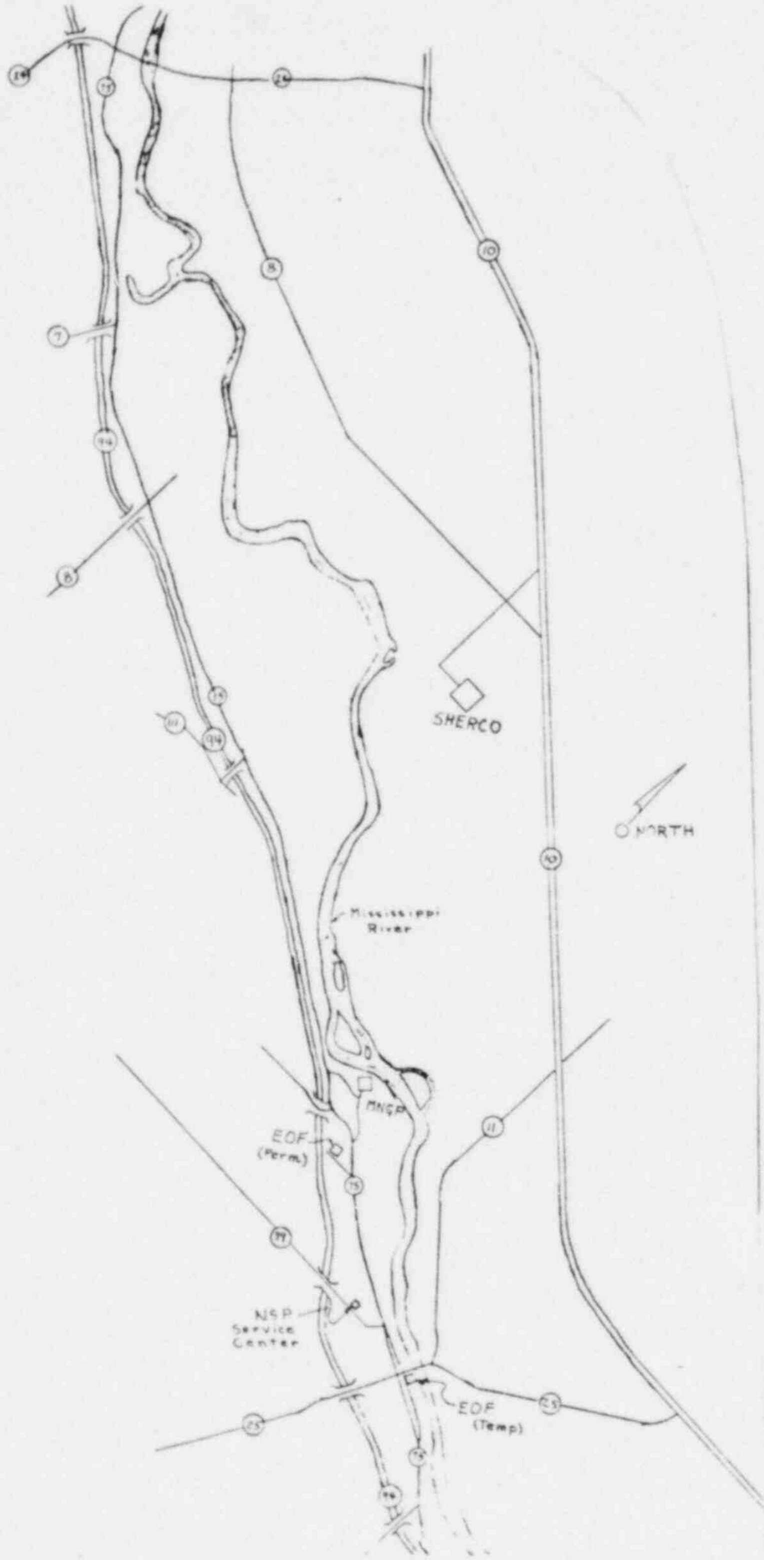
| Item | ED Initials | Time | Date |
|---|---|---|---|
| 1. Monitoring station established. | | | |
| 2. Traffic control established. | | | |
| 3. Evacuation and Assembly Point announced. | | | |
| 4. Accountability procedure implemented. | | | |
| 5. Access Control assigned to RP Group and monitoring procedures implemented. | | | |
| 6. Owner Controlled Area evacuated. | | | |
| 7. Unnecessary personnel evacuated from plant. | | | |
| 8. Personnel at Assembly Point released or given further instructions. | | | |

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 Point

 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 X No

# IN-PLANT EMERGENCY SURVEYS

A.2-403

| | | | | | |
|---|---|---|---|---|---|
| Prepared by: | M. Offerdahl | ALARA Review: | Revision 0 | Date | 3/28/81 |
| Reviewed by: | C.S. Mathews | Q.A. Review: | Revision 0 | Date | 3/28/81 |
| Operations Committee Final Review: Meeting Number | | | 1056 | Date | 1/22/82 |
| Approved by: | | | | Date | 1-26-82 |
| 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 approve RWP and perform ALARA review.
Radiological Emergency Coordinator (REC) - in charge; survey shall not proceed without final approval of REC.
Operational Support Center Coordinator (OSCC) - 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.

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, principally 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. Survey preparations and methods are basically the same as those described in the MNGP Operations Manual, Section E.1.4.

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.

PROCEDURE

STEP 1 Plan the survey. Considering the objective of the survey, expected radiological conditions and any other pertinent circumstances, prepare a RWP for the survey. Specify the equipment to be used, protective clothing requirements, and the particulars of the survey. Submit RWP to REC or Monitoring Section Leader for approval and ALARA review.

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 the OSC and maintain communications throughout the conduct of the survey. Request REC to notify the Control Room of survey commencement.

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 the OSCC. 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. (Refer to Operations Manual Section E.1.4 for detailed survey and sampling procedures. Sample volumes, filter media, etc. should be modified for situation.) Record data as required. Refer to Attachment 3 for Gaseous Sampling Procedure.

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

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

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.

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.

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

   Formula assumes 95% filter efficiency.

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

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

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

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

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

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

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

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

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

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

Attachment 3

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.

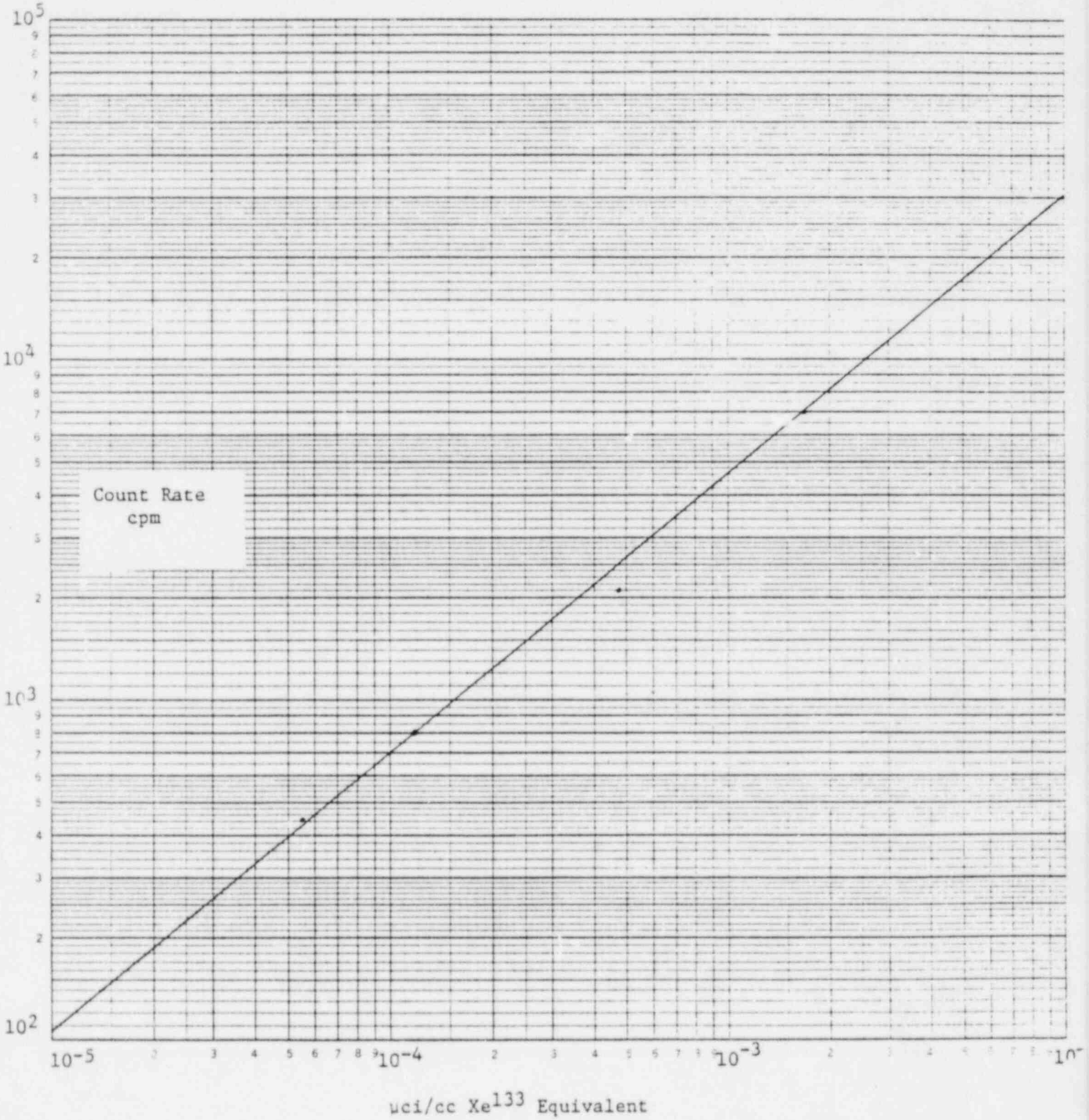
STEP 7 Count the gas chamber with an RM-14. If the count rate is $<$ 50,000 cpm refer to Table 1 for method of analysis. If the count rate is too high to be determined with an RM-14, measure the dose rate with a Radector III and refer to Table 1 for method of analysis.

WP/kk

FIGURE 1

GAS CHAMBER CALIBRATION CURVE

(100 cc S.S.)



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: MR Offerdahl ALARA Review: CD Mathiesen Date 1/25/82
Reviewed by: CD Mathiesen Q.A. Review: RL Scheinost Date 1/25/82
Operations Committee Final Review: Meeting Number 1056 Date 1/22/82
Approved by: FL Fey Date 1-26-82
Op. Com. Results Review: Not Required Mtg. # 1056 Date 1/22/82

## 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

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.

This procedure is essentially identical to the corporate procedure for off-site surveys (EPIP 1.1.10), which sister plant personnel will use when the EOF is activated.

WP/dw

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.

The extent and degree of radiological monitoring following a release of radioactive material will depend on the nature, the physical or chemical form, and the radioisotopic composition of the release. The affected plant's personnel will provide information to the Radiological Emergency Coordinator concerning the areas to be monitored and the protective actions required for monitoring teams.

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 protection 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 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 perform an air sample survey and/or a stationary dose rate survey at each selected location. 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.

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 OSC 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.

   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.

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

5. At each designated survey point perform surveys in accordance with applicable procedures as directed by the Radiological Emergency Coordinator or Monitoring Section Leader.

6. 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.

7. Identify survey locations using predesignated survey location numbers, as shown on the applicable Radiological Sampling Points map. Map coordinates and/or locations should also be identified as per the mobile sampling locations list.

8. Frequently check personal dosimeters and request relief if cumulative exposure approaches administrative control levels.

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.

B. Equipping of Off-Site Survey Teams

1. Obtain an NSP vehicle, if available. 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.

2. 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.

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

E. Sampling Procedures

1. 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 5790-403-2)
11) Stainless Steel Gas Chamber

b) <u>Particulate and Radioiodine Procedure</u>

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.

<u>NOTE</u>: 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, ($7.07 \times 10^5$ 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

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:

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

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

cf = Correction factor for sample size is .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:

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

Where µCi's on absorber = activity on absorber determined from Figure 2 using the corrected count rate.

NOTE: 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.

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 assemb

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.

2. Stationary Survey

a) Equipment Required

1) Radiation Survey Instrument (RO-2 or equivalent, with Beta Correction Factor)
2) Sample Results Log (Form 5790-403-2)
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 second 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

3. 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 Figure 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

## Attachment 1

Example of
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) | |
| | | | | | | | | | | | | | |
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1. Formulas listed on back
2. Remarks: ____________________

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

____________________
TECHNICIAN SIGNATURE

WP/dw

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 $2.83 \times 10^4$ = cubic centimeters.

   $Ft^3 \times 2.83E4 = cc$

3. $\mu Ci/cc$ = (particulate)

$$\frac{(\text{CPM (net)})\ (4.5E\text{-}7\ \mu Ci/dpm)}{(\text{instrument efficiency})(\text{sx time} \times \text{cfm} \times 2.83 \times 10^4)(\text{CF})}$$

(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.

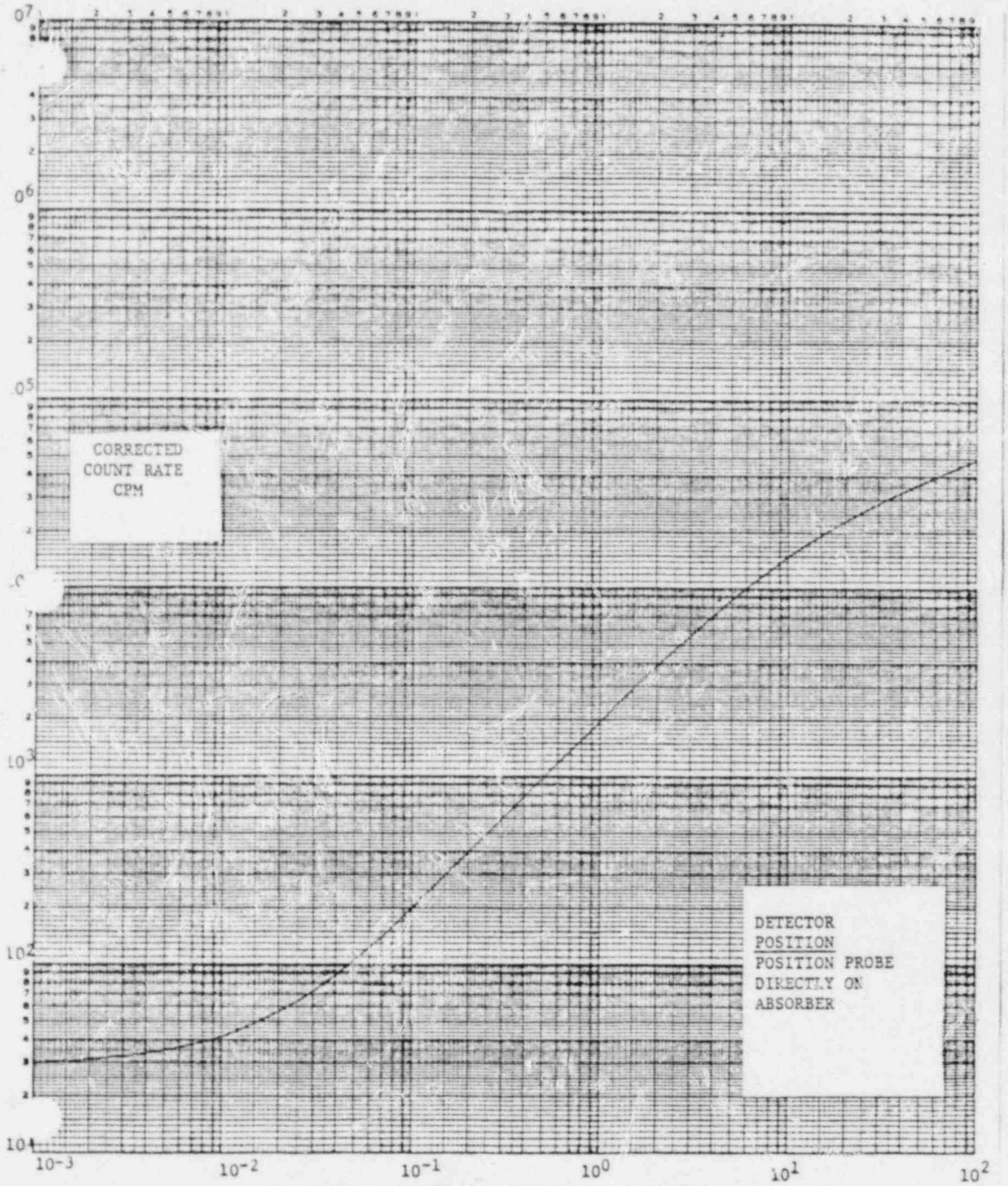
3. List factors affecting reading; height of probe, reading inside vehicle, etc.

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/dw

Attachment 2

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

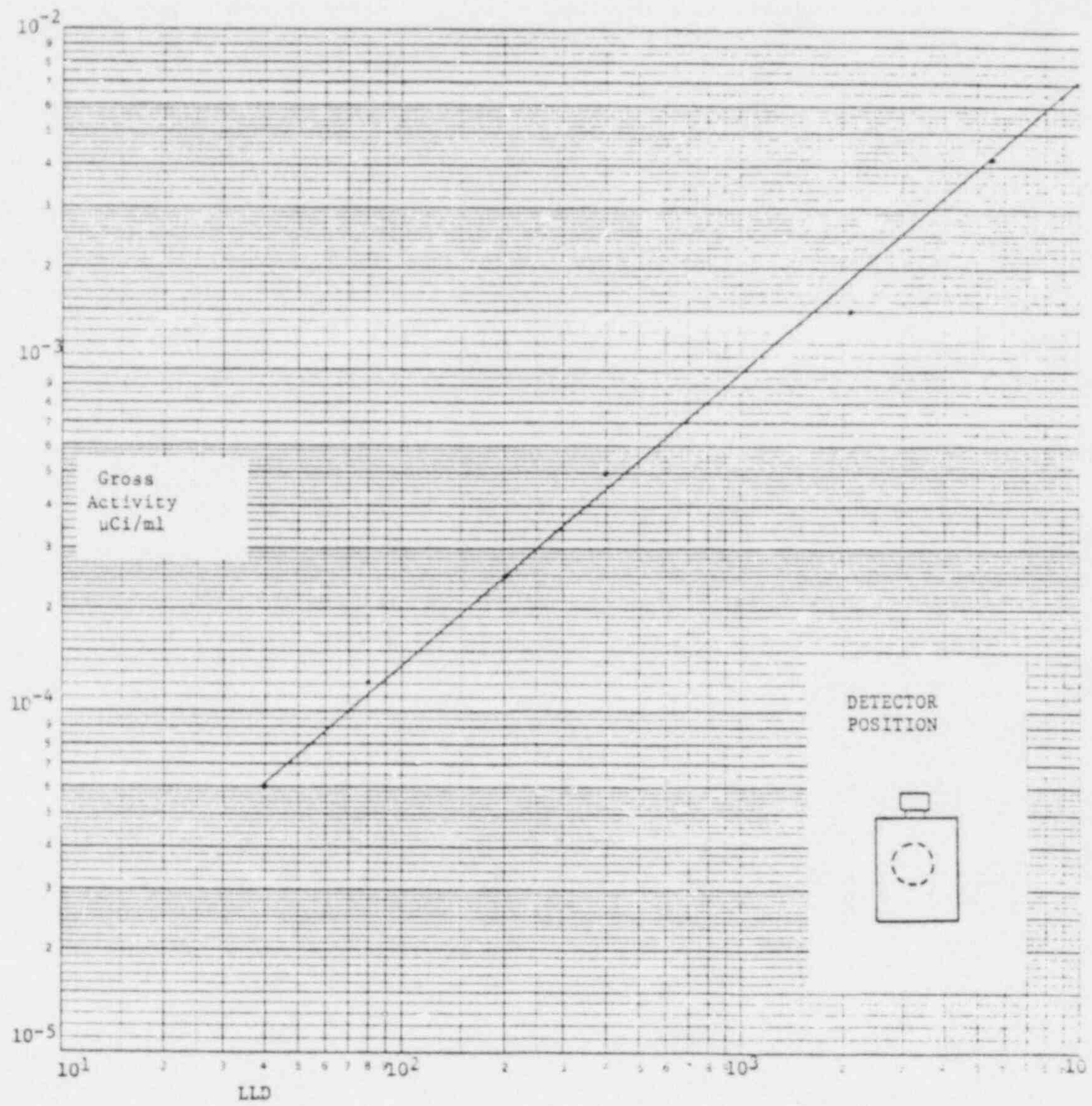





WP/dw

Attachment 3

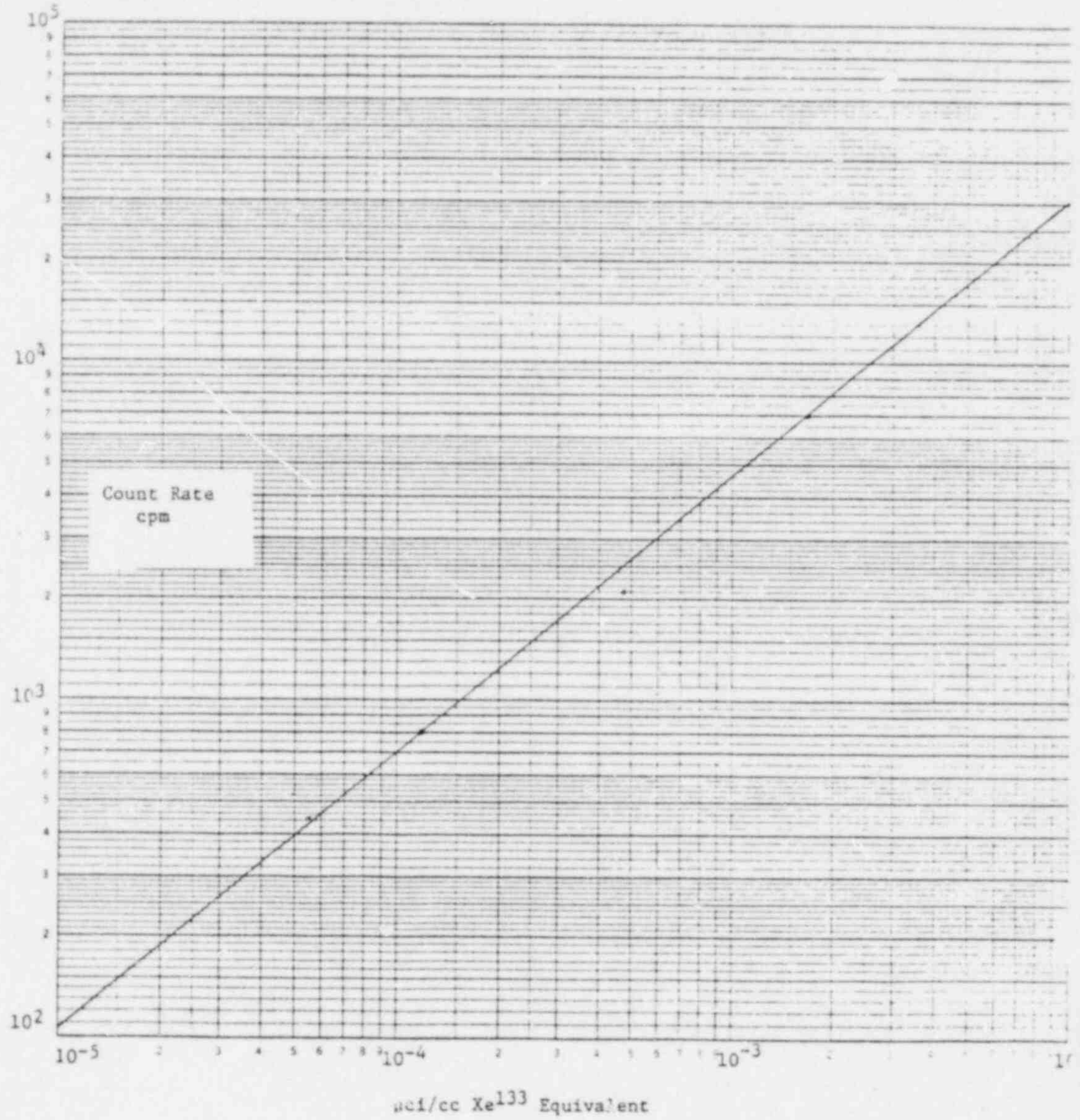
GROSS LIQUID ACTIVITY CURVE
USING RM-14 WITH HP-210 PROBE



Attachment 4

GAS CHAMBER CALIBRATION CURVE

(100 cc S.S.)



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 |
| 1 | 2" GM Pancake Probes |
| 1 | Battery Powered Air Sampler |
| 2 | Personnel Self-Reading Dosimeters (Low Range) |
| 2 | Personnel Self-Reading Dosimeters (High Range) |
| 2 | TLDs (if individuals have a normally assigned TLD they should wear those assigned) |
| 1 (Package) | Plastic Sample Bags (Approximately 100) |
| 1 (Box) | Garbage Bags (Approximately 10) |
| 1 (Package) | Paper Towels or Handiwipes |
| 2 (Roll) | Masking Tape |
| 20 | Silver Zeolite Cartridges |
| 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 | Umbrella |
| 1 | Watch or Clock |
| 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, etc.) |

* Not stored in footlocker

WP/dw

Attachment 5 (Cont'd.)

SURVEY TEAM EQUIPMENT PACKAGE

2. The Procedures Binder shall contain:

1 Package of the following maps:

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

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

1 Copy of EPIP 1.1.10, "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/dw

## 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/dw

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

# Mobile LAB Counting Procedure

A.2-412

## REVIEW AND APPROVAL

Prepared by: E L [signature] ALARA Review C D Mathiasen Date 1/26/82
Reviewed by: MR Offerdahl Q. A. Review R L Scheinost Date 1/27/82
Operations Committee Final Review: Meeting Number 1062 Date 2-11-82
Approved by: J L Fey Date 2-11-82
Op. Com. Results Review: Not Required Mtg.# 1062 Date 2-11-82

## PURPOSE

This procedure provides information and instructions for the proper operation of the counting systems that are located in the Emergency Counting Trailer. The trailer is set up to provide systems to count environmental samples. In the case that the in plant counting room becomes uninhabitable, the trailer will also provide a back up counting system for samples taken within the plant.

## CONDITIONS & PREREQUISITES

The Emergency Counting Trailer must have available a 220 volt power source. However, in the case that a 220 volt power source is not available, the trailer is equipped with a 15 KW Emergency Generator. The generator is installed in the rear of the trailer. When setting up the trailer insure the trailer is level. This is accomplished with trailer jacks that are furnished with the trailer.

## DISCUSSION

The samples obtained in the post-accident condition may be extremely radioactive. This creates some unique problems in order to count them. It is of the utmost concern that the technician doing the counting avoid either contaminating the mobile counting trailer or over ranging the counting equipment with a too hot sample. There are some basic rules to follow regarding use of the trailer.

a) Always check a sample with a dose rate indicating device prior to entering trailer. If the sample is hot enough to have measurable dose rate, then special counting measures shall be used. If sample activity is too high to allow counting the sample should be diluted in the Hot Lab Area.

b) Post-accident samples waiting to be counted should be kept in shielded storage to reduce technician exposure and to eliminate contributions to other samples that are being counted. If the sample is no longer required, it should be disposed of.

WP/dw

c) Any post-accident sample to be counted or taken into the trailer shall be rewrapped in uncontaminated wrapping or placed in a clean poly bag before introducing into trailer.

A. FC-2/MS-2 Scaler

STEP 1 Ensure trailer electrical power is available.

STEP 2 Check following switch locations:

| | |
|---|---|
| TEST SWITCH - | Off |
| WINDOW IN/OUT - | Out |
| THRESHOLD - | 2.50 |
| H.V. ADJUST - | Set for current plateau value |
| FUNCTION - | Timed |

STEP 3 Set count time in minutes for desired value.

STEP 4 Set P10 gas supply at 3 psig.

STEP 5 Place sample to be counted in the loading position of the sample charger.

STEP 6 Adjust the gas flow to approximately six bubbles per second using the adjustment knob by the detector on the side of the sample changer.

STEP 7 Rotate the lower plate of the sample changer clockwise until the next sample well is in the loading position. This places the first sample in the purge position and it should remain there for about 15 seconds before introducing it into the counting position.

STEP 8 While the first sample is being purged, a second sample may be introduced into the loading position.

STEP 9 Rotate the lower plate clockwise, as before, to bring the first sample into the counting position. Decrease the gas flow rate to approximately one or two bubbles per second. A third sample may now be introduced into the loading position.

STEP 10 Depress the RESET/START button to start the count.

STEP 11 Once sample count is complete, increase the purge gas flow to six bubbles per second while rotating the sample changer. Then recommence counting as per STEP 9.

B. Determination of Plateau Voltage

STEP 1 Place a 2" Cs-137 calibration source in a planchet.

STEP 2 Turn the high voltage potentiometer to the minimum voltage position.

STEP 3 Count the source for one minute.

STEP 4 When the counting sequence begins, increase the high voltage until counts begin to appear in the Count Storage. Record this value as threshold voltage.

STEP 5 Obtain one minute counts at 50 volt increments. The count rate will increase sharply, level off and then increase again. Be careful not to enter the continuous discharge region.

STEP 6 Record the count rates at the various voltages and plot a plateau curve on semi-log graph paper. Plot the count rate on the log scale versus the applied voltage on the linear scale.

STEP 7 Select an operating voltage for the counter at about the midpoint of the flat plateau region.

STEP 8 Record the plateau data on graph paper and the operating voltage on the FC-2/MS-2 Calibration Data Plaque.

C. Determination of Background Count Rate

STEP 1 Place a clean planchet in the load position of the sample changer.

STEP 2 Count the "background" planchet for 20 minutes.

STEP 3 Record background count rate on the FC-2/MS-2 Calibration Data Plaque.

D. Determination of Counting Efficiency

STEP 1 Place a 2" Cs-137 calibration source in a planchet in the load position of the sample changer.

STEP 2 Count the source for 10 minutes.

STEP 3 Calculate counting efficiency using the following equation:

$$\text{Eff} = \frac{(\text{cpm}) - (\text{bkgd})}{(\text{dpm})}$$

Where: $\text{cpm} = \frac{\text{Total counts from scaler}}{\text{count time (minutes)}}$

bkgd = current background count rate
dpm = disintegrations per minute of source

STEP 4 Record the counting efficiency on the FC-2/MS-2 Calibration Data Plaque.

E. Sample Counting

STEP 1 Before introducing post accident samples into the trailer for counting, check them with a Frisker or dose rate instrument to determine if they might cause radiological or contamination problems when introduced into the trailer. Use good radiological practices when handling samples.

STEP 2 Transfer sample information from the Sample Label to the Accident Airborne Sample Record.

STEP 3 Count samples in accordance with the general counting procedure (A).

STEP 4 Log the sample count results on the Accident Airborne Sample Record, along with Iodine charcoal and/or gas spectrum analysis reports.

STEP 5 Log all sample results on the Air Sample Data Log and report sample results to the TSC or EOF as directed by the Radiological Emergency Coordinator.

F. Trailer Based 11/05 Ge(Li) Counting System

Preparing the Unit for Travel

STEP 1 Press LOAD buttons on RK05 disc packs to spin down the discs. When discs have stopped, LOAD lights will light.

STEP 2 Open the RK05 bins and remove the discs from the bins.

STEP 3 Reduce the high voltage supply on the GeLi detector to zero. Turn high voltage switch "off", on high voltage power bin.

STEP 4 Pull out liquid nitrogen level monitor and place the use/ship switch to "ship". (Located on the side of the bin).

STEP 5 Turn the key on control panel of PDP 11/05 to off.

STEP 6 Turn off the master power switch for system bin, located on top of cabinet.

STEP 7 Tape all the bins in the computer cabinet and ensure the restraint straps are tight and in place.

STEP 8 Ensure no loose equipment inside the trailer that might cause damage or be damaged during transit.

STEP 9 Turn off main power supply by placing large double throw switch in the mid-position.

STEP 10 If trailer is on shore power, disconnect cable. Also, disconnect phone cables and trailer ground strap.

STEP 11 Connect towing vehicle, brakes and lights.

STEP 12 Raise trailer jacks and secure to trailer.

STEP 13 Transport trailer to desired location.

G. Trailer Setup

STEP 1 Ensure trailer is level and jacks are in position.

STEP 2 Connect power cable to 220 VAC source or start 15 KW set.

STEP 3 Close double throw switch direction of incoming power source. (See start-up of Emergency Generator, if necessary).

STEP 4 Check all circuit breakers reset.

STEP 5 Turn on power to the master power bin on top of system cabinet.

STEP 6 Turn key on PDP 11/05 control panel to the POWER position.

STEP 7 Pull out the liquid nitrogen level monitor and place the use/ship switch in the "use" position. Push the bin back in place.

STEP 8 Turn on the H.V. power supply bin and adjust detector high voltage to proper voltage for detector. Refer to sign on H.V. power supply bin.

STEP 9 Place the RK05 discs in the RK05 disc drives. The system master disc goes in the upper RK05 unit, close the bin doors.

STEP 10 Press the load button on the face of the RK05 bins. The LOAD light will go out and the READY light will illuminate when the discs are up to speed.

STEP 11 Ensure the RK05 WRITE PROTECT lights are off.

STEP 12 System is ready to boot up.

H. Trailer Based Computer System Bootstrapping Procedure

STEP 1 There is an Auto-Boot Board in the Expansion Chassis. For it to function you must turn off the Power Bin Master Switch and then back on; the terminal will print:

```
000000 000000 025276 112442
$
```

Proceed to step (7)

STEP 2 For a Manual-Boot place the following address on the 11/05 switch register 173000.

STEP 3 Press "CONTROL" and "HALT" down simultaneously and then release.

NOTE: You must place the HALT switch to mid position.

STEP 4 Press LOAD "ADDRESS".

STEP 5 Press "START".

STEP 6 Computer will print:

000000 000000 025276 112442
$

STEP 7 Type "DK" and then do a carriage return.

STEP 8 Computer will print:

RT-11SJ (S) V03B-00D

STEP 9 After "." enter date ie "DAT DAY-MON-YR" and do a carriage return.

STEP 10 After "." enter TIME ie "TIM 10:45" and do a carriage return.

STEP 11 Type "R-CLASS" and do a carriage return.

STEP 12 The system at this point is ready to run the Spectran III GAMMA SPECTRUM ANALYSIS PROGRAMS.

I. System Energy Calibration

STEP 1 Ensure Ge(Li) detector has been filled with liquid nitrogen.

STEP 2 Ensure proper high voltage supply to detector.

STEP 3 Ensure MCA has function switch selected to PHA, vertical range switch selected to LOG and preset count switch set to OFF.

STEP 4 Place a mixed isotope calibration source (preferably the source used during SP 1553 test) in the sample holder. Make certain the sample holder is tight against the detector end cap and that the red dot on the source bottle is toward the detector. Also, ensure the lead cave plug is installed.

STEP 5 Count the source for 3000 seconds using the 8100 Multi-channel Analyzer and Count Room Manual procedures. Return the source to the shielded holder in the trailer.

STEP 6 Once the spectrum has been collected, place the 8100 in Remote and use the RT-11 Spectran 3 program "Run PUTMCA" to store the spectrum into mass storage. Use a spectrum index number between 1 and 10.

STEP 7 Next, use the "RUN AUTOCA" program to adjust the energy calibration. When interrogated by the program, use the same index number used when storing the spectrum.

NOTE: The AUTOCA program expects to find calibration peaks within five channels of the locations indicated by the current calibration. If all peaks are not found AUTOCA will not attempt a recalibration. If this occurs, a manual energy calibration using the program RUN CALIB must be performed as per steps 6 through 18. If the recalibration was performed satisfactorily, then refer to STEP 19 to complete the detector check.

STEP 8 Select the "Run Calib" program to initiate a manual energy calibration. Answer the program interrogations in the following manner:

| | |
|---|---|
| Region: | Full |
| Detector: | 3 |
| Number of Smooths: | 1 |
| Energy Calibration: | Yes |
| Calibration Date: | Today's date (day-month-year) |
| Number of Channels: | 4096 |

STEP 9 The program will now type "Intensify calibration peaks (and only calibration peaks). When done, verify that the cursor is off, and press Return." To do this, go to the 8100 Multi-channel Analyzer and complete the following steps:

STEP 10 Press the "Intensify" button. The light should illuminate and the intensified regions will become brighter on the screen.

STEP 11 Press the "Cursor" button to activate the cursor and then move the cursor to the right side of the screen.

STEP 12 Press "Clear Band" button three times to clear all previously intensified regions.

STEP 13 Move the cursor to the left side of the lowest energy calibration peak (including approximately 5 background channels). Press "Enter Band". The light should illuminate. Move the cursor to the right through the peak to a position approximately 5 background channels right of the peak. Again, press "Enter Band" and the light should extinguish.

STEP 14 Repeat STEP 13 for each peak you wish to use in the energy calibration. Refer to the printout from the most recent energy calibration for assistance with selecting the peaks to be used and their approximate locations.

STEP 15 Once all peaks to be used in the calibration have been properly intensified, verify that the cursor is "OFF", intensify is "ON" and press return on the terminal.

STEP 16 The computer will examine the spectrum and respond with statistical data for the first peak and then type "Energy:". Enter the corresponding energy for that peak in Kev (87.7 for Cd-109, etc.) and press return. Continue to enter the energy levels for all peaks intensified.

STEP 17 Upon completion of the calibration the calibration coefficients will be typed across the bottom of the page. The top line of coefficients will begin "Energy =" and the center number will be written in the format of 4.823E-01*CH (Example) indicating the 8100 multichannel analyzer is calibrated to .4823 Kev/Channel.

STEP 18 The Calibration program will now question if you wish to complete an Efficiency Calibration. Answer No.

STEP 19 Upon completion of either the Automatic or Manual energy calibration, analyze the spectrum with the "Run GammaK" program. Use Geometry #23 and refer to SP 1553 Appendix B decay correction information and assay comparison.

STEP 20 If the values fall off of the acceptable band, verify that the standard deviation of the measured versus theoretical energy is $<$ 0.8 Kev. If it is $>$ 0.8 Kev, recalibrate the detector by running a manual energy calibration. If the standard deviation is $<$ 0.8 and the values fall out of the acceptable band, verify the correct decay time and geometry were used. If discrepancies still exist, notify the Chemistry Section Leader.

J. System Operation and Sample Counting

STEP 1 Prerequisites to operation:

a) Trailer ambient temperature $<$ 85°F
b) Computer system warmed up and running with all switches in normal positions

Vertical Range - LOG
Function - PHA
I/O Device - REMOTE
Data - ADD
I/O Cycle - Manual
Memory Control Transfer - 1/1
ADC IN/AMP IN - ADC IN
COINC/ANTI - ANTI

c) GeLi detector energy and efficiency calibrations completed and the detector checked satisfactorily with regard to SP 1553. Appendix B.

d) Trailer located in area unaffected by high radiation backgrounds.

STEP 2 Before bringing possible high level samples into the trailer, they shall be checked with a dose indicating device. Based on this measurement, the technician shall determine the appropriate counting distance from the following:

| Shelf Position | 3' Rad Levels |
|---|---|
| a) 2cm | < 1 mr/hr |
| b) 36" | 1-3 mr/hr |
| c) 144" | 3-50 mr/hr |

STEP 3 Once status of sample has been determined, place the sample in the appropriate location with respect to the crystal.

Ensure the sample mounting platform is level with the detector port.

STEP 4 Place the 8100 MCA in EXT. Initiate a ten second count and check the dead time. Do not exceed 20% dead time!

STEP 5 Set the desired counting time on the time set thumbwheels.

STEP 6 Press the two reset switches simultaneously to clear the MCA.

STEP 7 Press the COLLECT button to start the count.

STEP 8 When count has been completed, place the 8100 MCA in REMOTE.

STEP 9 Remove the sample from the detector and store in a shielded area if radiation levels will interfere with subsequent counting.

STEP 10 Analyze the spectrum with SPECTRAN III software using the 'GAMMAK' program. Results will be printed by the computer on the terminal. Attach the spectrum printout to the sample coversheet or label.

STEP 11 Once the sample has been analyzed successfully, either store for later counting or discard.

K. Using the 8100 MCA Without Computer

STEP 1 Procedure assumes a loss of computer to the trailer Ge(Li) system.

STEP 2 Collect spectrum of Ge(Li) in accordance with 5.3.5 STEPS 1 through 7.

STEP 3 Go to last system energy calibration posted on trailer bulletin board. Use the coefficient of the middle term of the first calibration equation to determine term of the first calibration equation to determine Kev/channel. Divide channel number of peak by the coefficient to get energy of the peak or peaks in question.

STEP 4 Move the cursor to the beginning of the peak.

STEP 5 Push INTENSIFY button.

STEP 6 Push ENTER BAND button.

STEP 7 Move cursor through peak, stopping at the lower limit of the peaks other side.

STEP 8 Turn ENTER BAND off.

STEP 9 Press EXPAND to check if peak is adequately intensified.

STEP 10 Turn EXPAND off.

STEP 11 Push INTEGRATE.

STEP 12 Integral of area of peak will appear at bottom center of the CRT.

STEP 13 Calculate the activity as follows:

$$\text{Activity ci/volume} = \frac{(\text{Area})(60)\ (4.51 \times 10^{-7})}{(\text{A/C})(C_T)(\text{Y})(\text{Eff})(\text{Vol})(e^{-.693\ t/T})(\text{Ef})}$$

Where: Area = counts from step 4.7.12

$C_T$ = counting time in seconds

Y = Yield of the nuclide (obtained from Chart of Nuclides)

Eff = Ge(HP) efficiency for the energy of the peak defined. Use calibration graph for the particular detector for the particular geometry counted.

Vol = sample volume

t = time from sampling to counting

T = half life of nuclide

$E_f$ = filter retention efficiency (if appropriate)

A/C = filter area correction factor (if appropriate)

STEP 14 Repeat steps 4 through 13 until spectrum has been identified and analyzed.

L. Operating Trailer Based Emergency Generator

Start-Up of Emergency Generator

STEP 1 Once the trailer is located and it is determined that the emergency electrical generator is required to provide electrical power for operation of the counting systems, the following checks should be made before attempting to run the generator:

a) Check level in fuel tank to ensure it contains sufficient fuel for duration of intended operation. Refill with regular gasoline, as necessary.

NOTE: The generator will run ~ 9 Hrs on a full fuel tank (24 gal).

b) Check engine oil at dip stick located inside hinged panel at rear of generator. If oil is below add mark, add 10W40 weight oil until the oil level indicates full.

c) Before starting engine, check the main power switch box inside the trailer to insure the double throw safety switch is not in the "down" position. This way the engine will not be carrying an electrical load on start-up and the trailer systems will not be subjected to the fluctuating voltages.

d) Start the emergency generator:

1) Place the Run/Stop switch in the "Run" position.

2) Hold down the "Start" switch until the engine starts and then release.

3) The engine is on an automatic governor and will come up to speed automatically.

4) Allow 5 minute warmup time before attempting to load the generator.

e) Before placing trailer load on the emergency generator, secure all power switches associated with the Canberra Counting System, to prevent the fluctuating voltages from damaging the system.

f) Place the double throw safety switch in the "Down" position. This places all trailer associated electrical loads on the generator.

g) Place the trailer counting systems in operation in accordance with the Count Room Manual.

M. Shutdown of Emergency Generator

STEP 1 Once an outside power supply has been attained or prior to moving the trailer, the emergency generator is to be secured.

STEP 2 Secure the power to the Canberra Counting System. If the trailer is to be relocated, power should be secured in accordance with the "Trailer Moving Procedure" to allow proper care of the computer system disc packs.

WP/dw

STEP 3 If all power to the trailer is to be secured, place the double throw safety switch in the center or "OFF" position.

STEP 4 If another outside power supply has been arranged, place the double throw safety switch in the "UP" position.

STEP 5 Place the Run/Stop switch in the "STOP" position to secure the emergency generator.

WP/dw

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

# REPAIR AND CORRECTIVE ACTION

Procedure A.2-603

## REVIEW AND APPROVAL

Prepared by: MR Offerdahl ALARA Review: CD Mathison Date 1/18/82
Reviewed by: CD Mathison Q.A. Review: Revision 0 Date 11/23/81
Operations Committee Final Review: Meeting Number 1056 Date 1/22/82
Approved by: [signature] Date 1-26-82
Op. Com. Results Re iew: Not Required Mtg. # 1026 Date 11/19/81

## PURPOSE

This procedure provides instructions pertaining to plant repair and corrective action if required to correct the cause of an emergency or stop further damage during or following an emergency.

## CONDITIONS AND PREREQUISITES

A. Conditions exists that requires action to correct an emergency situation.

B. The Emergency Director has decided that Emergency Teams will perform this action.

## PRECAUTIONS

Permissible exposure incurred during repair and corrective action 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. Engineering Group
3. Radiation Protection Group

RESPONSIBILITIES

A. Emergency Director
   1. Implement appropriate Emergency Plan Implementing Procedures.
   2. Assure establishment of Emergency Team

B. Emergency Team Leader
   1. Select Emergency Team Members.
   2. Instruct Team Members on type of repair or corrective action.
   3. Ensure that proper equipment and parts are obtained to perform necessary action.

C. Emergency Team Members
   Perform repair or corrective action.

D. Engineering Group
   Provide technical assistance for damage control and corrective action.

E. Radiation Protection Group
   Provide radiological information, emergency exposure control and lead Emergency Team into effected area.

DISCUSSION

A. If the repair or corrective action must be performed in an area of the plant affected by a radiological emergency, the operation must be performed as expeditiously as possible to minimize the dose to the emergency team.

B. Rescue of a victim should take precedence over repair or corrective action, unless such actions are necessary to effect rescue.

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

D. Equipment available for repair and corrective action may be obtained or is located in various areas on the Plant site and off-site facilities.

   1. Locations and Equipment

      a. Hot Shop: Lathe, Drill Press, Welder and Hand Tools

      b. Cold Shop: Lathes, Milling Machine, Power Saws, Welders and Hand Tools.

      c. Warehouse 1, 2 and 3: Pumps and parts for repair of plant equipment.

      d. Fire Brigade Room (Basement North of New Administration): Equipment and Clothing for Fire Control.

      e. SherCo Plant (about 15 miles away): Complete inventory of equipment and tools used in power plants.

      f. Fab Shops: Welders and various tools used by Construction. (These items may not always be available, depending on current level of construction activity on site.)

WP/kk

PROCEDURE

STEP 1 Upon notification of a situation requiring repair or corrective action, organize a team with the neces.ary skills or training for the job, one of the team members will be an RPS. Form 5790-102-5 (Attachment 1) contains a listing of Plant Personnel with candidates for Emergency Team duty identified.

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

STEP 3 Proceed to the designated repair area, lead by an RPS, as authorized by the Emergency Director or his designee. If appropriate maintain communication with the Control Room.

STEP 4 Notify Control Room before initiating repair or corrective action.

STEP 5 Perform repair or corrective action as expeditiously as possible.

STEP 6 Return to access control according to plan.

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, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants

ATTACHMENTS

1. Example of Monticello Emergency Augmentation List (Form 5790-102-5)

Form 5790-102-5
Revision 3, 02/13/82
Page 1 of 8

ATTACHMENT 1

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

## COORDINATION AND DIRECTION GROUP

| | | Pager | Home |
|---|---|---|---|
| *( ) | Plant Manager | | |
| ( ) | Plt. Supt., Engr. & Rad. Prot. | | |
| *( ) | Plt. Supt., Oper. & Maint. | | |
| *( ) | Supt., Security & Services | | |
| *( ) | Supt., Quality Engineering | | |

## SECURITY GROUP

| | | |
|---|---|---|
| *( ) | Superintendent, Security & Services | |
| ( ) | Supervisor, Security & Services | |
| ( ) | Plant Scheduling Administrator | |
| ( ) | Scheduling Coordinator | |
| ( ) | Duty Security Force Supervisor (For Additional Guards) | Ext. |

* Emergency Team Candidates

WP/kk

Form 5790-102-5
Revision 3, 02/13/82
Page 2 of 8

ATTACHMENT 1 (Cont'd.)

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

MAINTENANCE GROUP

| | | Pager | Home |
|---|---|---|---|
| *( ) | Plt. Supt., Operations & Maintenance | | |
| *( ) | Superintendent, Maintenance | | |
| *( ) | Maintenance Supervisor | | |
| *( | Maintenance Supervisor | | |
| *( | Lead Machinist | | |
| *( | Lead Machinist | | |
| ( | Machinist | | |
| *( | Machinist | | |
| *( | Appr. Machinist | | |
| *( | Appr. Machinist | | |
| *( | Appr. Machinist | | |
| *( | Appr. Machinist | | |
| *( | Steam Fitter Welder | | |
| *( | Steam Fitter Welder | | |
| *( | Steam Fitter Welder | | |
| *( | Appr. Steam Fitter Welder | | |
| ( | Lead Rigger | | |
| *( | Rigger | | |
| *( | Appr. Rigger | | |
| *( | Appr. Rigger | | |
| *( | Appr. Repairman | | |
| *( | Appr. Repairman | | |
| *( | Chief Electrician | | |
| *( | Appr. Electrician | | |
| ( | Appr. Electrician | | |
| *( | Sta. Electrician | | |
| *( | Sta. Electrician | | |
| *( | Nuclear Plant Helper | | |

* Emergency Team Candidates

WP/kk

Form 5790-102-5
Revision 2, 02/13/82
Page 3 of 8

ATTACHMENT 1 (Cont'd.)

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

MAINTENANCE GROUP (Cont'd.)

| | | Pager | Home |
|---|---|---|---|
| *( | Nuclear Plant Helper (Lead) | | |
| *( | Nuclear Plant Helper | | |
| *( | Nuclear Plant Helper | | |
| *( | Nuclear Plant Helper | | |
| *( | Nuclear Plant Helper | | |
| ( | Lead, Instruments & Controls Engineer | | |
| *( | I&C Coordinator | | |
| ( | I&C Specialist | | |
| *( | I&C Specialist | | |
| *( | I&C Specialist | | |
| ( | I&C Specialist | | |
| *( | I&C Specialist | | |
| ( | I&C Specialist | | |

* Emergency Team Candidates

WP/kk

Form 5790-102-5
Revision 3, 02/13/82
Page 4 of 8

ATTACHMENT 1 (Cont'd.)

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

OPERATIONS GROUP

| | | Pager | Home |
|---|---|---|---|
| *( | Superintendent, Operations | | |
| *( | Relief Shift Supervisor | | |
| ( | Shift Supervisor | | |
| *( | Shift Supervisor | | |
| ( | Shift Supervisor | | |
| ( | Shift Supervisor | | |
| *( | Site Superintendent | | |
| ( | Site Superintendent | | |
| ( | Site Superintendent | | |
| *( | Site Superintendent | | |
| *( | Site Superintendent | | |
| ( | Site Superintendent | | |
| ( | Lead Plt. Equip. & Reac. Oper. | | |
| *( | Lead Plt. Equip. & Reac. Oper. | | |
| ( | Lead Plt. Equip. & Reac. Oper. | | |
| *( | Lead Plt. Equip. & Reac. Oper. | | |
| *( | Lead Plt. Equip. & Reac. Oper. | | |
| *( | Plt. Equip. & Reac. Operator | | |
| *( | Plt. Equip. & Reac. Operator | | |
| ( | Plt. Equip. & Reac. Operator | | |
| *( | Plt. Equip. & Reac. Operator | | |
| *( | Plt. Equip. & Reac. Operator | | |
| *( | Plt. Equip. & Reac. Operator | | |
| *( | Plt. Equip. & Reac. Operator | | |
| *( | Plt. Equip. & Reac. Operator | | |
| ( | Asst. Plt. Equip. Operator | | |
| ( | Asst. Plt. Equip. Operator | | |
| *( | Asst. Plt. Equip. Operator | | |

* Emergency Team Candidates

WP/kk

Form 5790-102-5
Revision 3, 02/13/82
Page 5 of 8

ATTACHMENT 1 (Cont'd.)

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

OPERATIONS GROUP (Cont'd.)

| | | Pager | Home |
|---|---|---|---|
| *( | Asst. Plt. Equip. Operator | | |
| *( | Asst. Plt. Equip. Operator | | |
| *( | Asst. Plt. Equip. Operator | | |
| ( | Asst. Plt. Equip. Operator | | |
| *( | Asst. Plt. Equip. Operator | | |
| *( | Asst. Plt. Equip. Operator | | |
| *( | Asst. Plt. Equip. Operator | | |
| *( | Plant Attendant | | |
| *( | Plant Attendant | | |
| ( | Plant Attendant | | |
| *( | Plant Attendant | | |
| *( | Plant Attendant | | |
| ( | Plant Attendant | | |
| *( | Plant Attendant | | |
| *( | Plant Attendant | | |
| *( | Appr. Plant Attendant | | |
| *( | Appr. Plant Attendant | | |
| *( | Appr. Plant Attendant | | |
| *( | Appr. Plant Attendant | | |
| *( | Appr. Plant Attendant | | |

* Emergency Team Candidates

WP/kk

Form 5790-102-5
Revision 3, 02/13/82
Page 6 of 8

ATTACHMENT 1 (Cont'd.)

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

HEALTH PHYSICS GROUPS

| | | Pager | Home |
|---|---|---|---|
| ( | Superintendent, Radiation Protection | | |
| *( | Health Physicist | | |
| ( | Senior Chemist | | |
| *( | Chemist | | |
| *( | Radiation Protection Associate | | |
| *( | Radiation Protection Coordinator | | |
| *( | Radiation Protection Specialist | | |
| ( | Radiation Protection Specialist | | |
| *( | Radiation Protection Specialist | | |
| *( | Radiation Protection Specialist | | |
| *( | Radiation Protection Specialist | | |
| *( | Radiation Protection Specialist | | |
| *( | Radiation Protection Specialist | | |
| *( | Radiation Protection Specialist | | |
| *( | Radiation Protection Specialist | | |
| *( | Chemistry Coordinator | | |
| ( | Radiation Protection Specialist | | |
| *( | Radiation Protection Specialist | | |
| ( | Radiation Protection Specialist | | |

* Emergency Team Candidate

WP/kk

Form 5790-102-5
Revision 3, 02/13/82
Page 7 of 8

ATTACHMENT 1 (Cont'd.)

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

ENGINEERING GROUP

| | | Pager | Home |
|---|---|---|---|
| ( | Superintendent, Technical Engineering | | |
| *( | Superintendent, Operations Engineering | | |
| *( | Lead Chemical Engineer | | |
| *( | Asst. Chemical Engineer | | |
| ( | Engineer | | |
| *( | Lead Production Engineer | | |
| ( | Production Engineer | | |
| *( | Engineer | | |
| *( | Engineer | | |
| *( | Lead Production Engineer | | |
| *( | Asst. Production Engineer | | |
| *( | Engineer | | |
| *( | Engineer | | |
| *( | Engineer Associate | | |
| *( | Engineer Associate | | |
| *( | Engineer Associate | | |
| *( | Associate Production Engineer (Lead) | | |
| *( | Asst. Production Engineer | | |
| *( | Asst. Production Engineer | | |
| *( | Assoc. Production Engineer | | |
| *( | Engineer | | |
| *( | Nuclear Engineer | | |
| ( | Lead Nuclear Engineer | | |
| ( | Lead Computer Engineer | | |
| ( | Computer Engineer | | |
| ( | Assoc. Engineer Instr. | | |
| ( | Asst. Instr. Engineer | | |
| ( | Asst. Instr. Engineer | | |

* Emergency Team Candidates

WP/kk

Form 5790-102-5
Revision 3, 02/13/82
Page 8 of 8

ATTACHMENT 1 (Cont'd.)

Example of
MONTICELLO EMERGENCY AUGMENTATION LIST

SUPPORT GROUP

| | | Pager | Home |
|---|---|---|---|
| *( ) | Superintendent, Quality Engineering | | |
| ( | Plant Office Manager | | |
| ( | Quality Engineer (Lead) | | |
| *( | Quality Specialist | | |
| *( | Quality Specialist | | |
| *( | Quality Specialist | | |
| ( | Quality Specialist | | |
| ( | Document Control Supervisor | | |
| ( | Plant Administrative Specialist | | |
| ( | Administrative Aid | | |
| ( | Plant Administrative Specialist | | |
| ( | Administrative Aid | | |
| ( | Administrative Aid | | |
| ( ) | Purchasing/Inventory Control Supv. | | |
| ( ) | Plant Administrative Specialist | | |
| ( ) | Plant Administrative Specialist | | |
| ( ) | Administrative Services Supervisor | | |
| ( ) | Plant Administrative Specialist | | |
| ( ) | Administrative Aid | | |
| ( ) | Plant Administrative Specialist | | |
| ( | Administrative Aid | | |
| ( | Plant Administrative Specialist | | |
| ( | Quality Engineer | | |

* Emergency Team Candidates

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

| PROCEDURE | PROCEDURE TITLE | REVISION NUMBER |
|---|---|---|
| 000 Series | Organization | |
| A.2-001 | Emergency Organization | 2 |
| 100 Series | Activation | |
| A.2-101 | Classification of Emergencies | 1 |
| A.2-102 | Notification of an Unusual Event | 1 |
| A.2-103 | Alert | 2 |
| A.2-104 | Site Area Emergency | 1 |
| A.2-105 | General Emergency | 1 |
| A.2-106 | Activation of Technical Support Center | 2 |
| A.2-107 | Activation of Operations Support Center | 2 |
| 200 Series | Assessment | |
| A.2-201 | On-Site Monitoring During an Emergency | 0 |
| A.2-202 | Off-Site Monitoring Durng an Emergency | 0 |
| A.2-203 | Evacuation Criteria for On-Site Personnel | 0 |
| A.2-204 | Off-Site Protective Action Recommendations | 1 |
| A.2-205 | Personnel Accountability-Control Room/TSC | 1 |
| A.2-206 | Personnel Accountability-Assembly Points | 0 |
| A.2-207 | Sampling Priorities During an Emergency | 0 |
| A.2-208 | Core Damage Assessment | 0 |
| 300 Series | Protective Actions | |
| A.2-301 | Emergency Evacuation | 1 |
| A.2-302 | Assembly Point Activation | 1 |
| A.2-303 | Search and Rescue | 1 |
| A.2-304 | Thyroid Prophylaxis | 0 |
| 400 Series | Radiological Surveillance and Control | |
| A.2-401 | Emergency Exposure Control | 1 |
| A.2-402 | Contamination Control | 0 |
| A.2-403 | Emergency Surveys | 2 |
| A.2-404 | Emergency Sampling and Analysis | 0 |
| A.2-405 | Release Rate Determination | 0 |
| A.2-406 | Off-Site Dose Projection | 2 |
| A.2-407 | Personnel and Vehicle Monitoring | 0 |
| A.2-408 | Sample Coordination During an Emergency | 1 |
| A.2-409 | Self-Contained Breathing Apparatus (SCBA) Use During An Emergency | 0 |
| A.2-410 | Out-of-Plant Surveys | 1 |
| A.2-411 | Establishment of Secondary Access Control | 0 |
| A.2-412 | Mobile Lab Counting Procedure | 0 |
| 500 Series | Communications and Documentation | |
| A.2-501 | Communication During an Emergency | 0 |
| A.2-502 | Recordkeeping During an Emergency | 0 |
| A.2-503 | Emergency Reports and Documentation | 0 |



AAA056

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

| PROCEDURE | PROCEDURE TITLE | REVISION NUMBER |
|---|---|---|
| 600 Series | Re-Entry and Recovery | |
| A.2-601 | Re-Entry | 0 |
| A.2-603 | Repair and Corrective Action | 1 |
| 700 Series | | |
| A.2-702 | Response to an Emergency at Prairie Island | 1 |

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 OPERATIONAL SUPPORT CENTER (OSC)

A.2-107

## REVIEW AND APPROVAL

Prepared by: JWinchell ALARA Review Revision 0 Date 3/28/81
Reviewed by: GDMathison Q. A. Review Revision 0 Date 3/28/81
Operations Committee Final Review: Meeting Number 1067 Date 2/25/82
Approved by: ___ Date 2·26·82
Op. Com. Results Review: Not Required Mtg.# 1056 Date 1/22/82

## COMMENTS

WORK REQUEST AUTHORIZATION(S) ISSUED Yes ___ No ___ Number(s) ___

## PURPOSE AND REQUIREMENTS

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

## 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 OSC 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 OSC or the continuing OSC operations in the event of an accident. OSC facility use during normal operation shall be limited to activities that will not degrade the level of OSC preparedness to react to accident situations and will not reduce OSC reliability.

WP/dw

ORGANIZATION AND RESPONSIBILITIES

A. Emergency Director - Overall In-Charge

B. Radiological Emergency Coordinator - Assist Emergency Director by providing supervision for OSC Coordinator.

C. Operational Support Center Coordinator - Responsible for implementation of this procedure.

DISCUSSION

A. OSC Function

The OSC will function as a staging area for personnel and equipment necessary to respond to an emergency. It will provide an access control function and will be the primary information source to the TSC on plant radiological conditions.

B. Location

The Primary OSC location will be at Access Control. The alternate location will be on the second floor of the Administation Building. (See Attachment 1 for OSC Floor Plan.)

C. Data and Information Resources

The OSC area contains the following:

1. A complete set of up-to-date radiological survey maps.
2. Plant Operating Procedures
3. Plant Emergency Procedures
4. Bechtel Accident Dose Rate Maps

D. Communications

1. OSC to TSC intercom
2. Plant Emergency Radios (2)
3. Plant Extensions (2)

E. Equipment and Facilities (Primary Location)

1. GDE Terminal for exposure control
2. BBA System
3. Count Room equipment
   a. Automatic Smear Counter
   b. GeLi Counting System
4. Status Board
5. Radiological Survey Maps
6. Procedure Forms
7. Portable CAM
8. Portal Monitor
9. First Aid Kits and Stretcher
10. Decon Facilities
11. Friskers

12. Respiratory Protection Equipment
13. Fire Fighting Equipment
14. Protective Clothing
15. Signs and chains for use in positively maintaining plant access control

PROCEDURE

PART I - Activation

STEP 1 Direct or perform radiological survey in the OSC and SAS. Forward result to REC. The REC will be responsible for ensuring routine surveys of the OSC and for evaluation of the results.

STEP 2 Place portable CAM in operation.

STEP 3 Verify Automatic Smear Counter and GeLi Detector systems in operation.

STEP 4 Obtain 4 portable radios on the OPERATIONS net, plus a gang charger, for use at the OSC. Establish radio contact with the REC.

STEP 5 Direct the removal of non-essential personnel, interferring equipment, etc. from the OSC.

STEP 6 Initiate the OSC log in accordance with A.2-502.

STEP 7 Obtain a copy of the most current exposure information for active personnel. If personnel are available, process any dosimeter cards and update the master exposure file.

PART II - OPERATION

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

STEP 1 Continually update survey floor plans. This will require review of incoming survey results, and also review of ARM data (Form No. 5790-107-3, Emergency ARM Log (Attachment 4) may be used to record ARM data.).

STEP 2 Continually maintain OSC status board.

STEP 3 Obtain the services of a Shift Emergency Communicator, if needed. Ensure that communications are continuously attended.

STEP 4 Keep the REC apprised of OSC events and activities.

STEP 5 Supervise personnel assigned to the OSC for standby status. All personnel should have dosimetry and current exposure information.

STEP 6 Determine the need for special supplies, equipment, etc. to support OSC operation. Any requests should be forwarded to Support Group Leader.

STEP 7 Support emergency rescue, first aid, maintenance and survey teams by verifying their preparedness to initiate their activities and by coordinating their movements in and out of the controlled area with the Control Room and TSC. Prepare emergency RWP's i.a.w. Attachment 2, to ensure that adequate precautions have been taken.

STEP 8 Maintain strict access control (signs should be used to aid in this process) and keep the TSC and Control Room advised of personnel entering and leaving controlled areas. Request Security Personnel assistance in maintaining access control if required.

STEP 9 Coordinate the arrival and departure of offsite support services and coordinate their standby status while on site.

STEP 10 Make necessary preparations to relocate access control (Procedure A.2-411) in the event that the primary access control point becomes uninhabitable.

STEP 11 Continually maintain the OSC log.

STEP 12 Assume responsibilities of RP Coordinator and ensure that Radiation Protection Procedures are followed.

STEP 13 If and when directed to do so, ensure that all personnel in the OSC (including the SAS) insert their security badges into the accountability reader located near the portal monitor. Caution personnel to make sure they get a red light after inserting cards. As part of the accounting process, prepare a list of names, initials and TLD numbers of any personnel who are in the Controlled Area and not available to use card reader. Forward the list to the TSC.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan.

2. Monticello Nuclear Generating Plant Operations Manual.

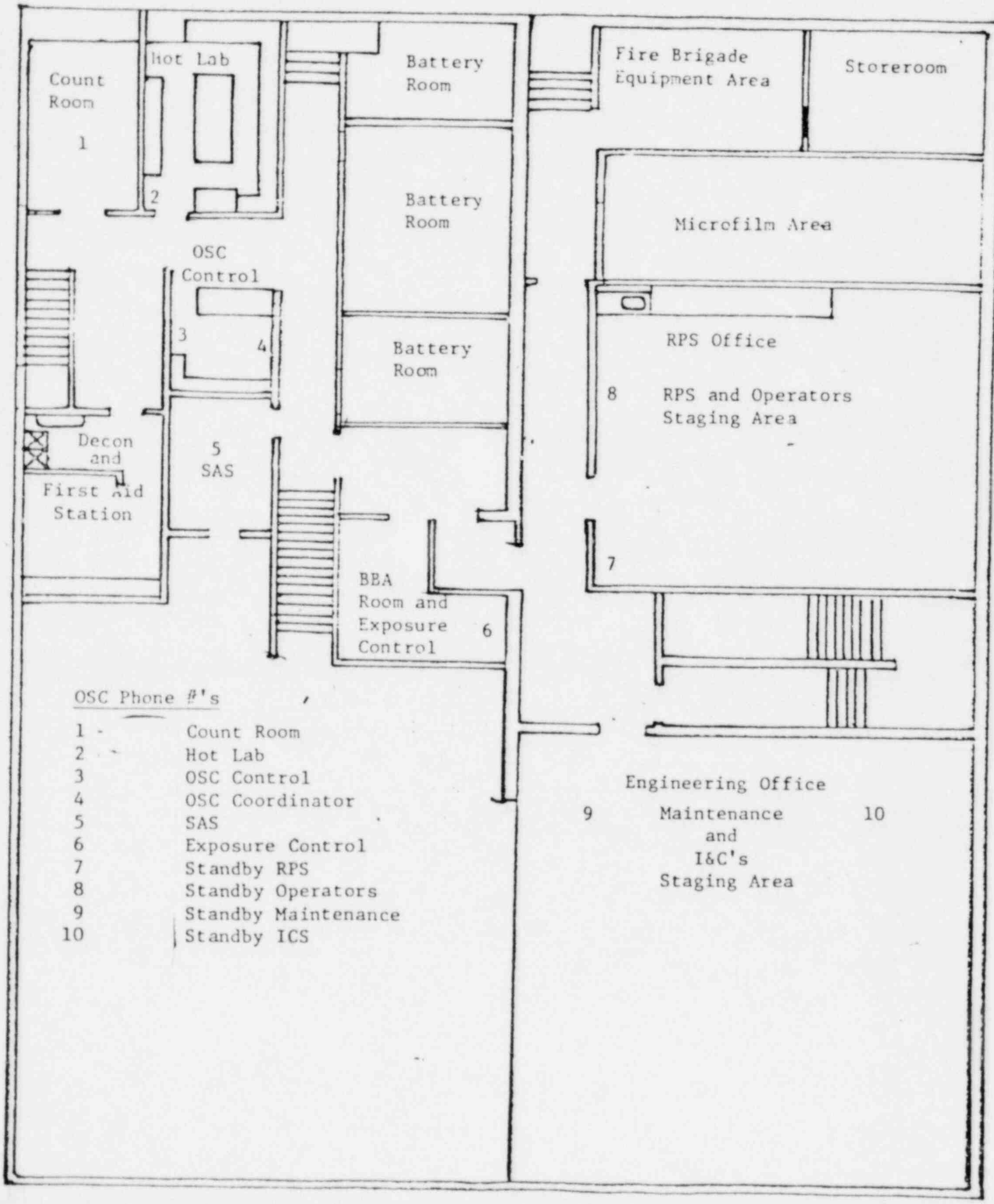
3. NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in support of Nuclear Power Plants."

ATTACHMENTS

1. Floor Plan of OSC
2. Guidelines for Use of Emergency RWP Checklist
3. Example of Emergency RWP Checklist
4. Example of Emergency ARM Log

WP/dw

ATTACHMENT 1



## ATTACHMENT 2

## Guildelines for Use of Emergency RWP Checklist

### PURPOSE

The purpose of this attachment is to detail the process of how emergency RWP's will be used to govern emergency work.

### DEFINITIONS

An emergency RWP is defined as the process which ensures certain radiological precautions for emergency work are considered, and appropriate actions are taken. The emergency RWP checklist (Form No. 5790-107-2, Attachment 3) is the instrument that documents which actions were taken.

### DISCUSSION

In general, the entire process as outlined below should be completed each time an emergency RWP is needed. However, in urgent situations, completing the whole process may hamper the timely execution of certain corrective actions. On the other hand, hazardous radiological conditions that could be present during an accident may increase the importance of ensuring the necessary precautions are taken. Therefore, each circumstance will dictate the extent to which an emergency RWP will be completed, and this procedure is intended to outline the philosophy which will be used to ensure the degree of control required by the emergency RWP is appropriate for the task at hand.

### EMERGENCY RWP ISSUANCE PROCESS

To the extent that is practical, the entire emergency RWP process as outlined below should be completed. One should be able to readily determine from the urgency of the situation how much job preplanning should be done and to what extent the emergency RWP process should be completed. For all emergency RWP's, an emergency RWP checklist shall be completed, post job completion, if necessary, for items a, b, c, e, g, h, & j.

a. Determine the urgency and verify the validity of the proposed emergency work. Normally, this information will be supplied through normal channels from the TSC (e.g. phone call from MSL or approved WRA). If it has not been supplied, contact the ED, REC, or MSL to obtain this information before allowing the work to commence. The only exception to this may be if it is learned that immediate actions are necessary to save a life. If the work has been ordered to begin immediately, do not spend time completing the checklist if it will hold up the start of the job. Prescribe appropriate precautions, and ensure job begins ASAP. However, complete as much of checklist as possible while waiting for necessary precautionary steps to be taken (e.g. donning P.C.'s etc.).

b. Assess the radiological conditions to be encountered during the job. Determine if the precautions contained in the existing extended RWP's are adequate, and

ATTACHMENT 2

if they are, use the extended RWP, while still completing sections c, e, and j of the process. If the extended RWP's are not adequate, complete the rest of the process.

c. For all jobs, an accurate and complete description of work, work site location and the protective equipment and dosimetry to be used shall be determined. If there is doubt as to the exact nature of the work to be performed, or the location of the work, the workers supervisor should be consulted.

d. If at all possible, ensure an RPS is in attendance for the job.

e. Log personnel in and out by completing page 2 of the emergency RWP checklist.

f. The Bechtel accident dose rate maps should be used to determine the best route to the work site in order to keep doses ALARA.

g. Emergency workers should have completed form-4's and procedure A.2-401 shall be completed for exposures which are expected to result in the individuals quarterly accumulated dose to exceed plant administrative limits.

h. For areas in which the dose rate is expected to be $>$ 1R/hr, the expected time at the work site and the authorized individual doses for the job shall be determined (assume the current quarterly allowable, unless told otherwise). From this information, determine the highest working area dose rate which would result in the limiting individual authorized dose being received, while also taking into account any significant doses that may be received in route. In addition, an absolute dose rate ~ 4 times higher than any expected, up to 1000 R/hr for the worst case, should be determined. Perform timekeeping during the job to ensure planned exposures are not exceeded. Continual radio contact should be available between emergency workers and the OSC to aid in such timekeeping. While the job is in progress, if it is determined that planned exposures will be exceeded, contact the ED immediatley for further instructions.

i. To increase personal safety, the buddy system should be employed in the following conditions:

   1) If the equipment needed for the job is too much for one person, slowing the job down and resulting in non ALARA exposures.

   2) If radiological conditions could change abruptly and drastically during the job, and one person is not available to watch a dose rate meter continuously.

   3) If radio contact cannot be maintained between the OSC and the emergency workers.

j. Prior to dispatching personnel to perform emergency work, ensure adequate job planning has been performed and that emergency workers have been adequately briefed regarding the proper precautions which should be exercised to maintain worker risk to an acceptable level. Since the OSC may be a very busy place, extra effort will have to be exercised to ensure this is effectively done. The higher the expected hazards, the more important this becomes.

WP/dw

Form 5790-107-2
Rev. 0, 02/23/82
Page 1 of 2

ATTACHMENT 3

Example of
Emergency RWP Checklist

Date ________

WRA No. ________

Time ________

a. Job must begin immediately. Yes No

b. Existing extended RWP used. Yes No. ________ No.

c. Work location ________

Work description ________

Protective equipment and dosimetry used

| | | | |
|---|---|---|---|
| ☐ Hood | ☐ Rubber gloves | ☐ TLD | ☐ Front & Back |
| ☐ Coveralls | ☐ Canvas gloves | ☐ 200 mR SRD | |
| ☐ Waterproof Outer Layer | ☐ Rubbers | ☐ 1 R SRD | |
| ☐ Full Face Part Resp | ☐ SCBA | ☐ 10 R SRD | |
| | | ☐ 200 R SRD | |
| | | ☐ Extremity TLD | |

d. RPS in attendance Yes No

e. Personnel logged in ________ (Complete the backside of this form)
Initial

f. ALARA routes specified Yes No

If yes, record route ________

g. A.2-401 completed Yes No

h. Expected time to be spent at work site ________
Limiting Authorized individual dose for job ________
Highest allowable working area dose rate ________
Highest allowable absolute dose rate ________
Timekeeping ready Yes No
Radio contact available Yes No

i. Buddy system employed Yes No

j. Briefing conducted Yes No

Completed by ________
RPS

WP/dw

Form 5790-107-2
Rev. 0, 2/23/82
Page 2 of 2

ATTACHMENT 3

Example of Emergency RWP Checklist

| Name | Authorized Dose | Time | | Dosimeters | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In | Out | 0-200 | | 1R | | 10R | | 200R | |
| | | | | In | Out | In | Out | In | Out | In | Out |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
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| | | | | | | | | | | | |

NOTE: After this form is completed and is not required for immediate use, it shall be placed in the appropriate container provided for emergency records.

WP/dw

Form #5790-107-3
Revision 0, 2/25/82
Page 1 of 2

ATTACHMENT 4

Example of
EMERGENCY ARM LOG

Date ____________

| ARM No. | Area Description | Normal Reading | Current Reading (record time in top box) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| A-1 | Refuel Floor Low Range | 2 | | | | | | | | | | |
| A-2 | Refuel Floor High Range | 5 | | | | | | | | | | |
| A-3 | Refuel Floor Stairway | 1 | | | | | | | | | | |
| A-4 | New Fuel Vault (1001 North) | 7 | | | | | | | | | | |
| A-5 | Fuel Pool Pump Room | 9 | | | | | | | | | | |
| A-6 | Contaminated Storage Area (1001 South) | 2 | | | | | | | | | | |
| A-7 | 985 Sx Hood | 5 | | | | | | | | | | |
| A-8 | 962 N.W. | 0.25 | | | | | | | | | | |
| A-9 | 962 Tool Crib | 0.65 | | | | | | | | | | |
| A-10 | East CRD Mod Area | 7 | | | | | | | | | | |
| A-11 | West CRD Mod Area | 5 | | | | | | | | | | |
| A-12 | TIP Drive Area | 2 | | | | | | | | | | |
| A-13 | TIP Cubicle | 30 | | | | | | | | | | |
| A-14 | HPCI Turbine Area | 0.25 | | | | | | | | | | |
| A-15 | 896 Radwaste Drain Tk Room | 6 | | | | | | | | | | |
| A-16 | RCIC Pump Area | 1 | | | | | | | | | | |
| A-17 | A-RHR Room (East) | 10 | | | | | | | | | | |
| A-18 | B-RHR Room (West) | 10 | | | | | | | | | | |
| A-19 | Chemistry Hot Lab | 0.26 | | | | | | | | | | |
| A-20 | Control Room Low Range | 0.02 | | | | | | | | | | |
| A-21 | Control Room High Range | 3 | | | | | | | | | | |

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ATTACHMENT 4

Example of
EMERGENCY ARM LOG

| ARM No. | Area Description | Normal Reading | Current Reading (record time in top box) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| B-1 | Operating Floor - 951 | 20 | | | | | | | | | | |
| B-2 | T. G. Front Standard | 10 | | | | | | | | | | |
| B-3 | Cond Demin Operating Area | 1 | | | | | | | | | | |
| B-4 | MVP Room | 9 | | | | | | | | | | |
| B-5 | FW Pump Area | 1 | | | | | | | | | | |
| C-1 | R.W. Control Area | 0.2 | | | | | | | | | | |
| C-2 | Sample Tank Area - 947 | 3 | | | | | | | | | | |
| C-3 | Conveyor Operating Aisle | 0.2 | | | | | | | | | | |
| D-1 | Machine Shop (Hot) | 0.2 | | | | | | | | | | |

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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 | |

EMERGENCY EXPOSURE CONTROL

A.2-401

| | | | | | |
|---|---|---|---|---|---|
| Prepared by: | JWindschill | ALARA Review: | JWindschill | Date | 2/25/82 |
| Reviewed by: | CDMathiasen | Q.A. Review: | Revision 0 | Date | 3/28/81 |
| Operations Committee Final Review: Meeting Number | | | 1067 | Date | 2/25/82 |
| Approved by: | | | | Date | 2-26-82 |
| Op. Com. Results Review: | Not Required | Mtg. # | 949 | Date | 3/26/81 |

## PURPOSE

This procedure provides guidance and criteria for the authorization of personnel exposure to radiation in excess of legal or administrative limits during an emergency.

## CONDITIONS AND PREREQUISITES

A. An emergency condition at the Monticello Nuclear Generating Plant has resulted in radiation levels within the plant greatly in excess of normal levels and special considerations are required for exposure control.

B. It has been determined that individual doses for a job are expected to result in an individual exceeding his/her plant administrative limit.

## PRECAUTIONS

A. The provisions of this procedure are applicable only during a declared emergency, and are applicable to personnel performing emergency functions.

B. Personnel shall not enter any area where dose rates are unknown and unmeasurable or when dosimetry is not immediately available.

C. Appropriate dosimetry equipment, which is capable of measuring the anticipated maximum exposure and type of radiations, shall be worn.

D. Extremity dosimeters shall be worn if anticipated that extremity exposure is greater than about five (5) times that of the whole body.

## PERSONNEL REQUIREMENTS

Radiation Protection Specialist - procedure implementation
Radiological Emergency Coordinator - review
Emergency Director - approval

DISCUSSION

A. General

1. The exposure of personnel during emergency operation shall be maintained as low as reasonably achievable, and should be maintained less than the administrative guides established in the MNGP Operations Manual Section E.1.2, and/or less than the Federal radiation exposure standards established in 10CFR20 if practicable.

2. In order to accomplish this objective, administrative means used during normal operations to minimize personnel exposure (such as radiation work permits and ALARA measures) should remain in force to the extent consistent with timely implementation of emergency measures.

3. If necessary operations require personnel exposures in excess of the normal limits, or if normal access control and radiological work practices will result in unacceptable delays, the Radiological Emergency Coordinator may, at his discretion, waive or modify the established exposure control criteria and methods in accordance with the provisions of this procedure. In making such decisions, the Radiological Emergency Coordinator should call upon the expertise of the radiation protection staff onsite, if readily available.

B. Authority

The Emergency Director has the authority to perform appropriate protective and corrective measures necessary to mitigate the consequences of an accident and place the facility in a safe condition. If necessary to affect these measures, the Emergency Director may direct the Radiological Emergency Coordinator to approve personnel exposures in excess of normal guides/limits, but not greater than the planned radiation exposure criteria established in this procedure, provided the pre-conditions of such exposure are met. The Radiological Emergency Coordinator shall be the only individual besides the Emergency Director authorized to permit emergency exposure.

C. Emergency Exposure Criteria

The exposure received pursuant to the performance of emergency measures should be commensurate with the significance of the action to be performed and should be maintained at a level which is as low as reasonably achievable (ALARA) that the emergency condition permits. Criteria for emergency exposures are established in Attachment 1. The basis for these criteria are as follows:

1. In order to avoid restricting actions that may be necessary to save lives, it shall be the discretion of the Emergency Director that determines the amount of exposure that will be permitted in order to perform the emergency mission. However, in no case will the exposure be permitted to exceed 75 rem. Volunteers will be advised as to the effects of large doses.

2. In situations where the bodies of accident victims are in areas inaccessible because of high radiation field, special planning and remote recovery devices should be used to retrieve the bodies. Exposure of recovery personnel should not exceed 25 rems.

3. If it is necessary to secure or retrieve equipment, personnel may be allowed to receive up to 3 rem. When the risk is such that life would be in jeopardy or there would be severe effects on the health and safety of the public, volunteers may receive up to 75 rem exposure. Volunteers will be advised as to the effects of large doses.

4. Medical treatment, first aid, ambulance service and decontamination personnel should not exceed 3 rem.

D. Considerations and Conditions

1. Personnel receiving increased exposure should be volunteers or professional rescue personnel (eg.: firemen who "volunteer" by choice of employment).

2. Personnel should be broadly familiar with the consequences of any exposures received under emergency conditions as per Attachment 2.

3. Women in their reproductive years should not take part in these actions.

4. Exposures under these conditions should be limited to once in a lifetime.

5. Internal exposure should be minimized by the use of appropriate respiratory equipment, and contamination should be controlled by the use of appropriate protective clothing.

E. Post-Exposure Evaluations

Personnel receiving exposures under emergency conditions should be restricted from further occupational exposure pending the outcome of exposure evaluations and, if necessary, medical surveillance.

PROCEDURE

In the event a planned emergency exposure is necessary, the following actions should be performed. Although it is preferable to perform and document these steps prior to the exposure, if necessary, the Emergency Director may verbally authorize the increased exposure and complete the documentation at a later time.

STEP 1: Complete Section A of the Emergency Exposure Authorization Form, #5790-401-1, (Attachment 3).

STEP 2: Brief the individual on the radiological and other conditions in the area (or expected in the area), the tasks to be performed, ALARA measures applicable to the tasks, contingency measures and effects of acute exposures (if applicable), prior to entry to the affected area.

STEP 3: Ensure that the individual to receive the increased exposure completes Section B of the Emergency Exposure Authorization form.

STEP 4: Submit the form to the Radiological Emergency Coordinator for review and the Emergency Director for approval. Completed form should go to Radiological Emergency Coordinator for recording and filing.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Monticello Nuclear Generating Plant Operations Manual

3. Title 10, Code of Federal Regulations, Part 20

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

5. EPA-520/1-75-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents"

ATTACHMENTS

1. Example of Emergency Exposure Guidelines

2. Example of Effects of Acute Exposures

3. Example of Emergency Exposure Authorization Form

ATTACHMENT 1



EMERGENCY EXPOSURE GUIDELINES

| | Lifesaving/Protecton Of Public Health And Safety Activities | | Emergency (Non-Lifesaving) Activities | |
|---|---|---|---|---|
| | Whole Body Dose (Rem) | Thyroid Dose (Rem) | Whole Body Dose (Rem) | Thyroid Dose (Rem) |
| Undertaking Corrective Actions | 75 | * | 25 | 125 |
| Performing Assessment Actions | -- | -- | 25 | 125 |
| Providing First Aid | 75 | * | 25 | 125 |
| Performing Personnel Decontamination | ** | ** | 3 | 15 |
| Providing Ambulance Services | ** | ** | 3 | 15 |
| Providing Medical Treatment | ** | ** | 3 | 15 |
| Performing Search and Rescue Operations | 75 | * | 25 | 125 |
| Removal of Injured Persons | 75 | * | 25 | 125 |
| Recovery of Dead | -- | -- | 25 | 125 |

* No specific upper limit is given for thyroid exposure since in the extreme case complete thyroid lost might be an acceptable penalty for a life saved. However, this should not be necessary as respirators and/or thyroid protection for rescue personnel are available.

** It is unlikely that lifesaving guidelines will be necessary if exposures are maintained as low as practicable; however, should they be necessary, guidelines shall be consistent with other "Lifesaving/Protection of Public Health and Safety Activities".

WP/kk

ATTACHMENT 2



EFFECTS OF ACUTE EXPOSURES

| Acute Dose (Rem) | Probable Effect |
|---|---|
| 0-50 | No obvious effect, except possibly minor blood changes. |
| 80-120 | Vomiting and nausea for about 1 day in 5 to 10 percent of exposed personnel. Fatigue but no serious disability. |
| 130-170 | Vomiting and nausea for about 1 day, followed by other symptoms of radiation sickness in about 25 percent of personnel. No deaths anticipated. |
| 180-220 | Vomiting and nausea for about 1 day, followed by other symptoms of radiation sickness in about 50 percent of personnel. Rarely death may occur. |
| 270-330 | Vomiting and nausea in nearly all personnel on first day, followed by other symptoms of radiation sickness. About 20 percent deaths within 2 to 6 weeks after exposure; survivors convalescent for about 3 months. |
| 400-500 | Vomiting and nausea in all personnel on first day, followed by other symptoms of radiation sickness. About 50 percent deaths within 1 month; survivors convalescent for about 6 months. |
| 550-750 | Vomiting and nausea in all personnel within 4 hours from exposure, followed by other symptoms of radiation sickness. Up to 100 percent deaths; few survivors convalescent for about 6 months. |
| 1000 | Vomiting and nausea in all personnel within 1 to 2 hours. Probably no survivors from radiation sickness. |
| 5000 | Incapacitation almost immediately. All personnel will be fatalities within 1 week. |

WP/kk

ATTACHMENT 3

Form 5790-401-1
Revision 2, 02/26/82
Page 1 of 2

Example of
EMERGENCY EXPOSURE AUTHORIZATION FORM

SECTION A

CAUTION: If the ED has verbally authorized the emergency exposure, complete the documentation at a later time.

1. Name of Individual to Receive Exposure: ______________________

   Social Security Number: ______________

2. Individual Badge Number: ______________

   Employer/NSP Department: ______________

3. Task(s) to be Performed: ______________________

   ______________________________________________

4. Date of Authorization: __________ Authorized Limit: __________

5. Conditions:

   _____ Individual is a volunteer or professional rescue-person.

   _____ Individual is broadly familiar with radiological consequences of exposure.

   _____ Woman capable of reproduction has been advised not to take part (Reg. Guide 8.13).

   _____ Individual has not received an emergency exposure before.

   _____ Dose rates in area known/measurable.

   _____ Undertaking corrective actions

   _____ Performing assessment actions

   _____ Providing first aid

   _____ Performing personnel decontamination

   _____ Providing ambulance services

   _____ Providing medical treatment

   _____ Performing search and rescue operations

   _____ Removal of injured persons

   _____ Recovery of dead

   Individual has been briefed per STEP 2 of Procedure A.2-401.

6. Radiation Protection Specialist: ______________ Date: __________
   Signature

WP/kk

ATTACHMENT 3

Form 5790-401-1
Revision 2, 02/26/82
Page 2 of 2

Example of
EMERGENCY EXPOSURE AUTHORIZATION FORM (Cont'd.)

SECTION B

I have been briefed in the radiological consequences of the proposed emergency exposure, and I have volunteered to performed the emergency measures during which I will receive the emergency exposure.

7. Signature: ______________________ Date: __________

SECTION C

8. Reviewed: ______________________ __________
Radiological Emergency Coordinator Date

9. Approved: ______________________ __________
Emergency Director Date

NOTE: After this form is completed and is not required for immediate use, it shall be placed in the appropriate container provided for emergency records.

WP/kk

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

| PROCEDURE | PROCEDURE TITLE | REVISION NUMBER |
|---|---|---|
| 000 Series | Organization | |
| A.2-001 | Emergency Organization | 2 |
| 100 Series | Activation | |
| A.2-101 | Classification of Emergencies | 1 |
| A.2-102 | Notification of an Unusual Event | 1 |
| A.2-103 | Alert | 2 |
| A.2-104 | Site Area Emergency | 1 |
| A.2-105 | General Emergency | 1 |
| A.2-106 | Activation of Technical Support Center | 2 |
| A.2-107 | Activation of Operations Support Center | 1 |
| 200 Series | Assessment | |
| A.2-201 | On-Site Monitoring During an Emergency | 0 |
| A.2-202 | Off-Site Monitoring Durng an Emergency | 0 |
| A.2-203 | Evacuation Criteria for On-Site Personnel | 0 |
| A.2-204 | Off-Site Protective Action Recommendations | 1 |
| A.2-205 | Personnel Accountability-Control Room/TSC | 1 |
| A.2-206 | Personnel Accountability-Assembly Points | 0 |
| A.2-207 | Sampling Priorities During an Emergency | 0 |
| A.2-208 | Core Damage Assessment | 0 |
| 300 Series | Protective Actions | |
| A.2-301 | Emergency Evacuation | 1 |
| A.2-302 | Assembly Point Activation | 1 |
| A.2-303 | Search and Rescue | 1 |
| A.2-304 | Thyroid Prophylaxis | 0 |
| 400 Series | Radiological Surveillance and Control | |
| A.2-401 | Emergency Exposure Control | 0 |
| A.2-402 | Contamination Control | 0 |
| A.2-403 | Emergency Surveys | 2 |
| A.2-404 | Emergency Sampling and Analysis | 0 |
| A.2-405 | Release Rate Determination | 0 |
| A.2-406 | Off-Site Dose Projection | 2 |
| A.2-407 | Personnel and Vehicle Monitoring | 0 |
| A.2-408 | Sample Coordination During an Emergency | 1 |
| A.2-409 | Self-Contained Breathing Apparatus (SCBA) Use During An Emergency | 0 |
| A.2-410 | Out-of-Plant Surveys | 1 |
| A.2-411 | Establishment of Secondary Access Control | 0 |
| A.2-412 | Mobile Lab Counting Procedure | 0 |
| 500 Series | Communications and Documentation | |
| A.2-501 | Communication During an Emergency | 0 |
| A.2-502 | Recordkeeping During an Emergency | 0 |
| A.2-503 | Emergency Reports and Documentation | 0 |

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

| PROCEDURE | PROCEDURE TITLE | REVISION NUMBER |
|---|---|---|
| 600 Series | Re-Entry and Recovery | |
| A.2-601 | Re-Entry | 0 |
| A.2-603 | Repair and Corrective Action | 1 |
| 700 Series | | |
| A.2-702 | Response to an Emergency at Prairie Island | 1 |

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

# OFFSITE PROTECTIVE ACTION RECOMMENDATIONS

A.2-204

| | | | |
|---|---|---|---|
| Prepared by: GDMathews | ALARA Review: Revision 0 | Date 03/29/81 |
| Reviewed by: JWinkelbill | Q.A. Review: Revision 0 | Date 03/29/81 |
| Operations Committee Final Review: Meeting Number 1066 | | Date 2/23/82 |
| Approved by: | | Date 2-24-82 |
| Op. Com. Results Review: Not Required | Mtg. # 948 | Date 03/25/81 |

## PURPOSE

This procedure provides the guidelines to be used in formulating off-site protective action recommendations. The purpose of this procedure is to provide recommendations for off-site protective actions to the Emergency Director.

## CONDITIONS AND PREREQUISITES

A. An emergency condition has been declared.

B. A release of radioactive maerial has occurred, is occurring or is likely.

## ORGANIZATION AND RESPONSIBILITIES

A. Overall Responsibility - Emergency Director

B. In Charge - Radiological Emergency Coordinator

C. Assistance - Off-Site Dose Assessment Section
- Monitoring Section

## PRECAUTIONS

A. Prior to EOF activation, the Emergency Director has the non-delegatable authority for the decision to make off-site protective action recommendations. During this period, all recommendations for protective actions shall be made to the Emergency Director.

B. With the activation of the EOF, the Emergency Manager assumes the authority and responsibility for making off-site protective action recommendations. The Radiological Emergency Coordinator will continue to provide protective action recommendations until relieved by the Emergency Manager. Recommendations formulated during this time will be submitted to the Emergency Manager and should be channeled through the Emergency Director.

## DISCUSSION

### A. Protective Action Guides

Protective actions are measures taken to avoid or reduce the projected dose when the benefits derived from such action are sufficient to offset any undesirable features of the protective actions.

The protective actions in this procedure are limited to protective actions for minimizing the exposure of the public to external and internal radiation exposure from passage or inhalation of the radioactive plume; and from internal exposure from drinking water. Other protective actions for minimizing public exposure via the ingestion pathway will be determined and implemented by the appropriate State authorities.

### B. Protective Action Options

#### 1. No Recommendation

No protective actions for members of the general public should be recommended for incidents involving radioactive releases which are projected to result in doses less than 1 REM whole body and/or 5 REM thyroid (child).

#### 2. Sheltering

Sheltering is a protective action which involves members of the general public taking cover in a building that can be made relatively air tight. Although sheltering, particularly in masonry buildings, will also reduce the exposure of personnel to external radiation as the plume passes, this effect is less significant than the corresponding reduction in internal exposure. Generally, any building suitable for winter habitation, with windows and doors closed and ventilation turned off, would provide reasonably good protection for about two hours; but would be ineffective after that period due to natural ventilation of the structure. Sheltering is an appropriate protective action for:

a. Severe incidents in which an evacuation cannot be implemented because of inadequate lead time to the rapid passage of the plume ("puff" release).

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

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

#### 3. Evacuation

Timely evacuation of members of the population is the most effective protective action. There are, however, disadvantages and constraints that may make evacuation inappropriate. Estimates of the time necessary to effect an evacuation are tabulated in Attachment 9. Evacuation is an appropriate protective action for:

a. An incident involving a release, or potential release, which is projected to result in an offsite dose greater than 1 rem whole body, and/or 5 rem** to the child thyroid in situations where the lead time between declaration of the emergency and population relocation is compatible with plume involvement.

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

** A thyroid dose of 5 rem to the child thyroid corresponds to a dose of about 2 rem to the adult thyroid.

4. Thyroid Prophylaxis

The effect of thyroid blocking agents, normally potassium iodide (KI), is to saturate the thyroid with stable iodine and significantly reduce the probability of thyroid uptake of radioiodine. Since some individuals may have allergic reactions to KI, it is administered only under medical surveillance. For this reason, offsite thyroid prophylaxis will not be recommended by MNGP personnel.

5. Secure Water Treatment Intakes

Recommendations shall be made to downstream water treatment plants to secure taking water from the Mississippi River for liquid releases when concentrations at the intake are projected to exceed 10CFR20, Appendix B limits for unrestricted areas. St. Paul is the first intake of concern. The assumed dilution factor from Monticello to the St. Paul intake is 7:1.

C. Designation of Affected Areas

1. The designation of the area requiring protective actions will depend on several variables, each of which will have to be evaluated at the time of the incident. Major variables, include the nature and extent of the incident, local geography, and existing meteorological conditions. Generally, the affected area will resemble a keyhole consisting of a circle with a 90° (or larger) wedge shaped sector attached in the downwind direction.

2. Affected areas will be defined by MNGP personnel on the basis of circles of various diameters, and if wind patterns permit, particular sectors beyond the initial circle. County and State authorities have been provided with maps having sector designations identical to those on maps in use at the plant.

PROCEDURE

FOR LIQUID RELEASE:

STEP 1: If there has been a release to the Mississippi River, estimate the volume and amount of radioactivity released. Initiate Form 5790-204-1 OFF-SITE PROTECTIVE ACTION RECOMMENDATION CHECKLIST, Attachment 8.

STEP 2: Determine the MPC Ratio for the release (Refer to 10CFR20, Appendix B).

STEP 3: Using Attachments 1 and 2 of this procedure, estimate the time the release will arrive in the vicinity of the Minneapolis and St. Paul intake.

STEP 4 Complete the checklist. If the MPC ratio exceeds 5.0, advise Emergency Director to recommend closing the water intakes.

FOR GASEOUS AIRBORNE RELEASE:

NOTE: Do not delay recommending protective actions while waiting for off-site monitoring team results, or completion of checklist.

STEP 1: Obtain projected dose data generated by Procedure A.2-406 (Off-Site Dose Projection). Initiate Form 5790-204-1, OFF-SITE PROTECTIVE ACTION RECOMMENDATION CHECKLIST, Attachment 8.

NOTE: If actual field data on radioiodine concentrations is available, attachments 10 and 11 may be used to estimate thyroid inhalation doses and exposure times which would result in a 5 Rem child thyroid dose.

STEP 2: Using meteorological data, determine the plume direction and wind speed. Evaluate the potential for wind direction shifting as part of the determination. (Either call National Weather Service @ 725-3401 (725-3400 if no answer) or refer to weather information service reports.)

STEP 3: Determine how long the release is likely to continue (at greater than tech spec limits) using a conservative or worst case estimate. Calculate the expected integrated doses for the affected sectors by combining the dose projections for releases which have already occurred and the exposure which would result from the current exposure rates over the period the release is expected to continue.

STEP 4: Determine the affected area.

STEP 5: Using the data accumulated in the foregoing steps, determine the appropriate protective action recommendation by utilizing Attachments 3, 4, 5 and 12. In addition, recommend activation of the Public Alert & Notification System at the General Emergency level and at the site Area level if sheltering or evacuation measures are being recommended.

NOTE: Attachments 6 and 7 may be used to determine the effectiveness of sheltering. Attachment 9 has the estimated evacuation times.

WP/kk

STEP 6: Use Form 5790-204-1, to record recommendations and to convey information to Emergency Director.

STEP 7: Advise the Emergency Director to make the recommendation for appropriate off-site protective action.

STEP 8: If, as a result of continuing assessment, dose projection results or meteorological conditions change significantly, re-evaluate the recommended protective action and, if necessary, update the initial recommendation. Complete checklist.

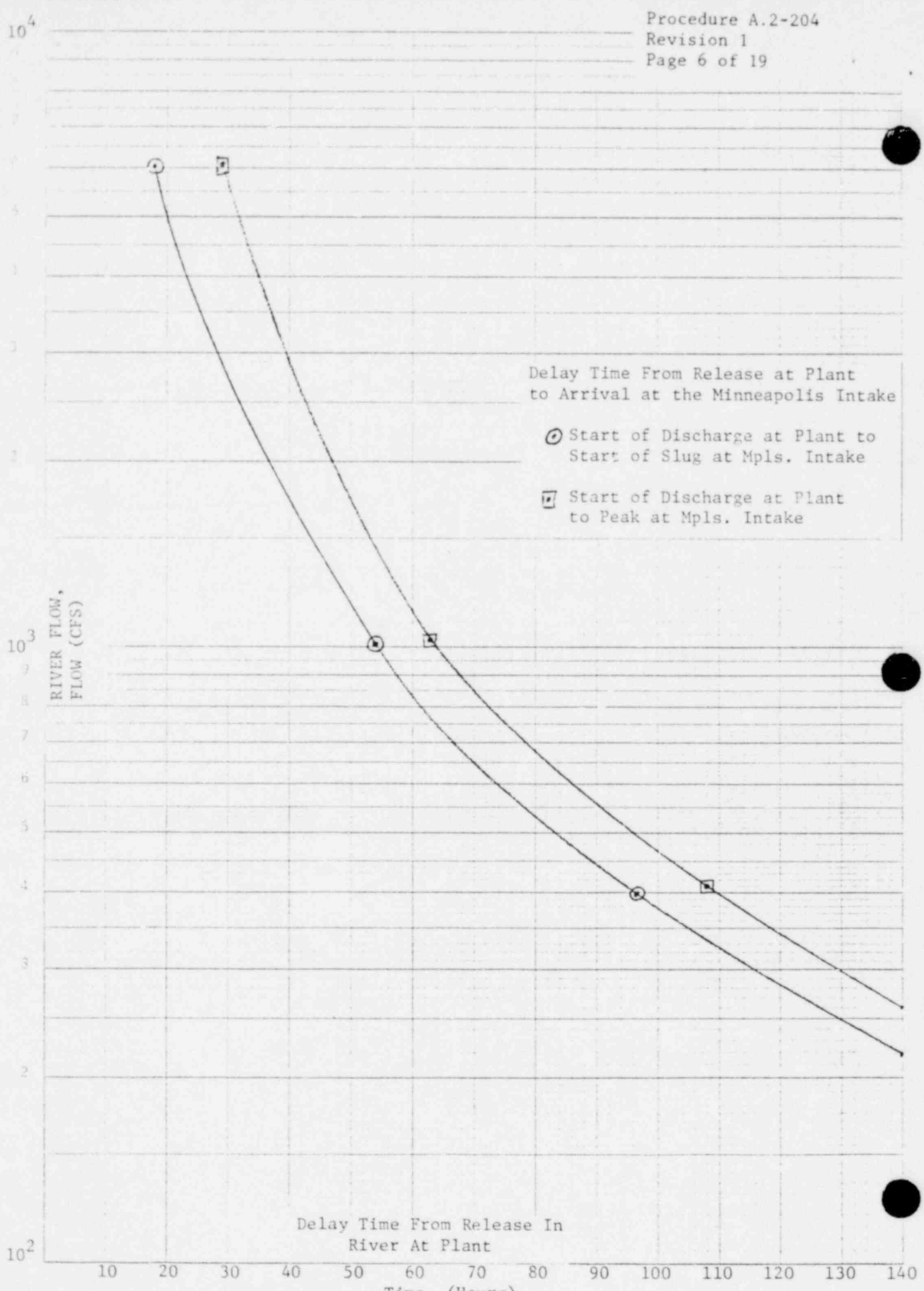
## REFERENCES

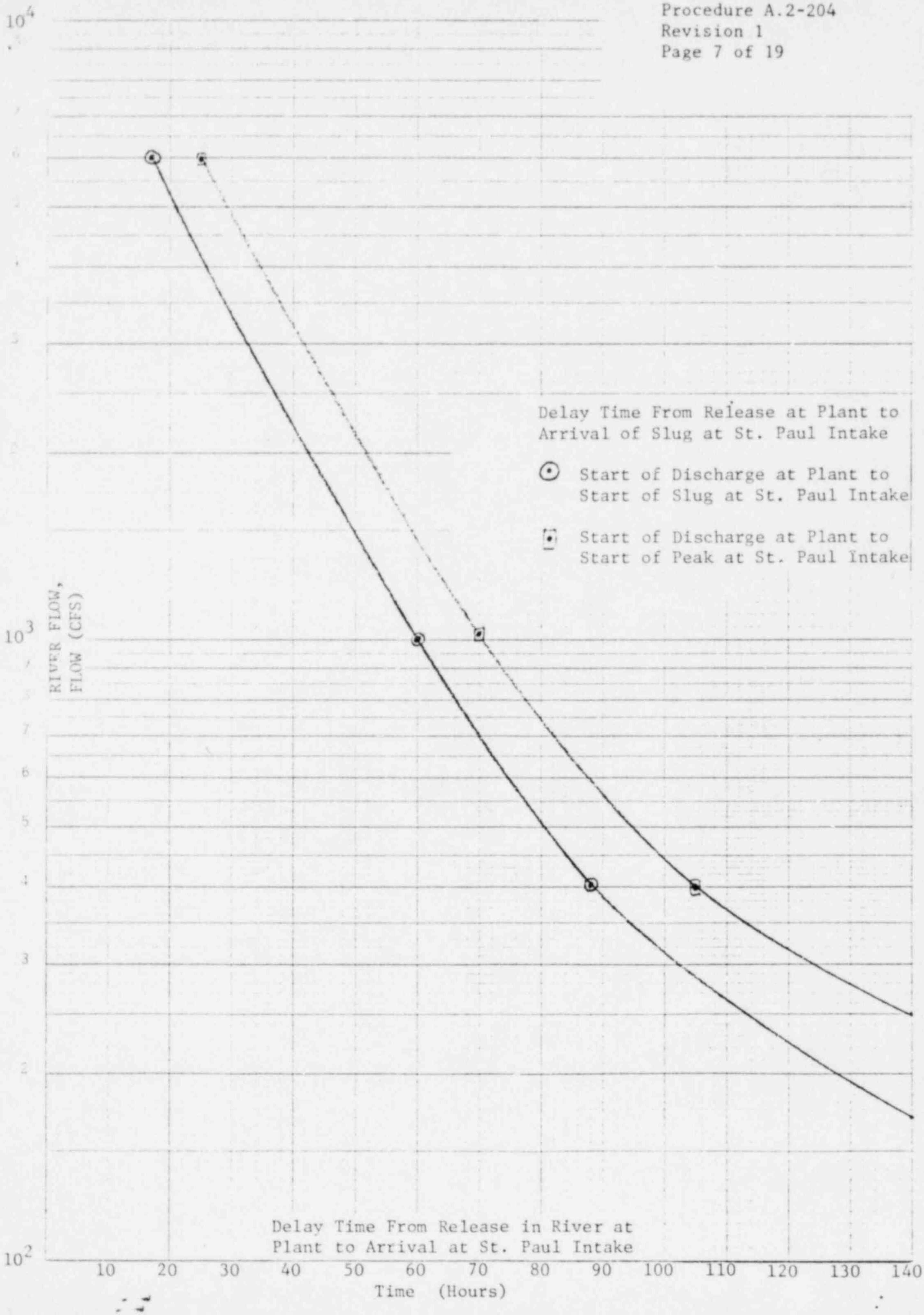
1. Monticello Nuclear Generating Plant Emergency Plan
2. Monticello Nuclear Generating Plant Operations Manual
3. NUREG-0654/FEMA-REP-1 "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"
4. USEPA 520/1-75-001 (and subsequent revisions) "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents"
5. Title 10 Code of Federal Regulations Part 50, Appendix E

## ATTACHMENTS

1. Delay Time from Release in River at Plant to Arrival at Minneapolis Intake
2. Delay Time from Release in River at Plant to Arrival at St. Paul Intake
3. Recommended Protective Actions to Avoid Whole Body and Thyroid Dose From Exposure to Gaseous Plume
4. Guidelines for Protection Against Ingestion of Contamination
5. Recommended Protective Actions (by Accident Phase)
6. Representative Shielding Factors from Gamma Cloud Source, and Selected Shielding Factors for Airborne Radionuclides
7. Representative Shielding Factors for Surface Deposited Radionuclides
8. Example of Off-Site Protective Action Recommendation Checklist, Form 5790-204-1.
9. Evacuation Time Estimates
10. Thyroid Dose Conversion Factors
11. Radioiodine Concentrations Resulting in 5 Rem Thyroid Dose
12. Recommended Protective Actions for Potential Release Situations
13. Percent of Fuel Inventory in Containment

WP/kk


10^4
10^3
10^2
RIVER FLOW, FLOW (CFS)
Delay Time From Release at Plant to Arrival at the Minneapolis Intake
Start of Discharge at Plant to Start of Slug at Mpls. Intake
Start of Discharge at Plant to Peak at Mpls. Intake
Delay Time From Release In River At Plant
10 20 30 40 50 60 70 80 90 100 110 120 130 140
Time (Hours)


$10^4$
$10^3$
$10^2$
7
6
5
4
3
2
RIVER FLOW,
FLOW (CFS)
Delay Time From Release at Plant to
Arrival of Slug at St. Paul Intake
Start of Discharge at Plant to
Start of Slug at St. Paul Intake
Start of Discharge at Plant to
Start of Peak at St. Paul Intake
Delay Time From Release in River at
Plant to Arrival at St. Paul Intake
10 20 30 40 50 60 70 80 90 100 110 120 130 140
Time (Hours)

ATTACHMENT 3

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

| Projected Dose (Rem) to The Population | Recommended Actions [a] | Comments |
|---|---|---|
| Whole Body < 1<br><br>Thyroid < 5 (child) | No planned protective actions. [b]<br>Issue an advisory to seek shelter and await further instructions.<br>Monitor environmental radiation levels. | Previously recommended protective actions may be reconsidered or terminated. |
| Whole Body 1 to < 5<br><br>Thyroid 5 to < 25 (child) | Seek shelter as a minimum.<br>Consider evacuation. Evacuate unless constraints make it impractical.<br>Monitor environmental radiation levels.<br>Control access. | If constraints exists, special consideration should be given for evacuation of children and and pregnant women. |
| Whole Body 5 and above<br><br>Thyroid 25 and above (child) | Conduct mandatory evacuation.<br>Monitor environmental radiation levels and adjust area for mandatory evacuation based on these levels.<br>Control access. | Seeking shelter would be an alternative if evacuation were not immediately possible. |

Projected Dose (Rem) To Emergency Workers

| | | |
|---|---|---|
| Whole Body 25<br><br>Thyroid 125 | Control exposure of emergency team members to these levels except for lifesaving missions. (Appropriate controls include time limitations, respirators and thyroid prophylaxis.) | Although respirators and thyroid prophylaxis should be used where effective to control dose to emergency workers, Thyroid dose should not be the limiting factor for lifesaving missions. |
| Whole Body 75 | Control exposure of emergency team members performing a lifesaving mission to this level. (Control of exposure time will be most effective.) | |

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

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

WP/kk

Attachment 4

GUIDELINES FOR PROTECTION AGAINST INGESTION OF CONTAMINATION+

I. Ground Contamination
  A. Action Levels
    1. Projected whole body dose above the ground 1 Rem.
    2. Ground Contamination levels 200 uci/$m^2$ at t = 1 hr post-accident.
    3. Exposure rate 12 mRem/hr at 1 meter above ground at t = 1 hr post-accide
  B. Recommended Protective Actions
    1. Evacuation of affected areas.
    2. Restriction of entry to contaminated offsite areas until radiation level has decreased to State approved levels.

II. Food and Water Contamination
  A. Action Levels

| | Concentration in Milk or Water (0.5 rem WB or bone: 1.5 Rem Thyroid) | Concentration in Milk or Water (5 rem WB or bone: 15 Rem Thyroid) | Total Intake via all Food & Water Pathways | | Pasture Grass (Fresh Weight | |
|---|---|---|---|---|---|---|
| | Preventive Level (μCi/l) | Emergency Level (μCi/l) | Preventive (μCi) | Emergency (μCi) | Preventive (μCi/kg) | Emergenc (μCi/kg |
| Nuclide* | | | | | | |
| I-131 (Thyroid) | 0.012 | 0.12 | 0.09 | 0.9 | 0.27 | 2.7 |
| -137 Whole Body) | 0.34 | 3.4 | 7 | 70 | 3.5 | 35 |
| Sr-90 (Bone) | 0.007 | 0.08 | 0.02 | 0.2 | 0.7 | 7 |
| Sr-89 (Bone) | 0.13 | 1.3 | 2.6 | 26 | 13 | 130 |

  B. Recommended Protective Actions

Preventive
1. Removal of lactating dairy cows from contaminated pasture and substitution of uncontaminated stored feed.
2. Substitute source of uncontaminated water.
3. Withhold contaminated milk from market to allow radioactive decay.
4. Divert fluid milk to production of dry whole milk, butter, etc.

Emergency
Isolate food and water from its introduction into commerce after considering:
a. availability of other possible actions;
b. importance of particular food in nutrition;
c. time and effort to take action;
d. availability of other foods.

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

\+ References: U.S. Food and Drug Administration, Federal Register, Vol. 43, No. 242, December 15, 1978.

WP/kk

Attachment 5

## RECOMMENDED PROTECTIVE ACTIONS

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

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

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

3 Long Term Phase - Recovery period.

* "Typical" Post-Accident time periods.

WP/kk

Attachment 6

## REPRESENTATIVE SHIELDING FACTORS FROM GAMMA CLOUD SOURCE

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

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

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

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

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

## SELECTED SHIELDING FACTORS FOR AIRBORNE RADIONUCLIDES

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

* Taken from SAND 77-1725 (Unlimited Release)

Attachment 7

REPRESENTATIVE SHIELDING FACTORS FOR SURFACE DEPOSITED RADIONUCLIDES

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

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

(b) Away from doors and windows.

* Taken from SAND 77-1725 (Unlimited Release)

WP/kk

ATTACHMENT 8

Form 5790-204-1
Revision 2, 12/20/81
Page 1 of 2

Example of
OFF-SITE PROTECTIVE ACTION RECOMMENDATION CHECKLIST

FOR LIQUID RELEASE:

1. Release volume: __________; Release activity: __________

   Delay times: Minneapolis ________ hrs; St. Paul ________ hrs.

   Date/Time of Release: ______________

   Protective Action Recommendation: ☐ None ☐ Secure intakes

   ____________ REC Initials ____________ Time ____________ Date

2. Communicated release information to Emergency Director.

   ____________ REC Initials ____________ Time ____________ Date

FOR AIRBORNE RELEASES

1. Review latest off-site dose projections.

   ____________ REC Initials ____________ Time ____________ Date

2. Record plume direction and speed, plus associated date and time on Page 2 of this form.

   ____________ REC Initials ____________ Time ____________ Date

3. Indicate recommendations on Page 2 of this form.

   ____________ REC Initials ____________ Time ____________ Date

4. Detach Page 2 and forward to Emergency Director. Review recommendation with same.

   ____________ REC 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.

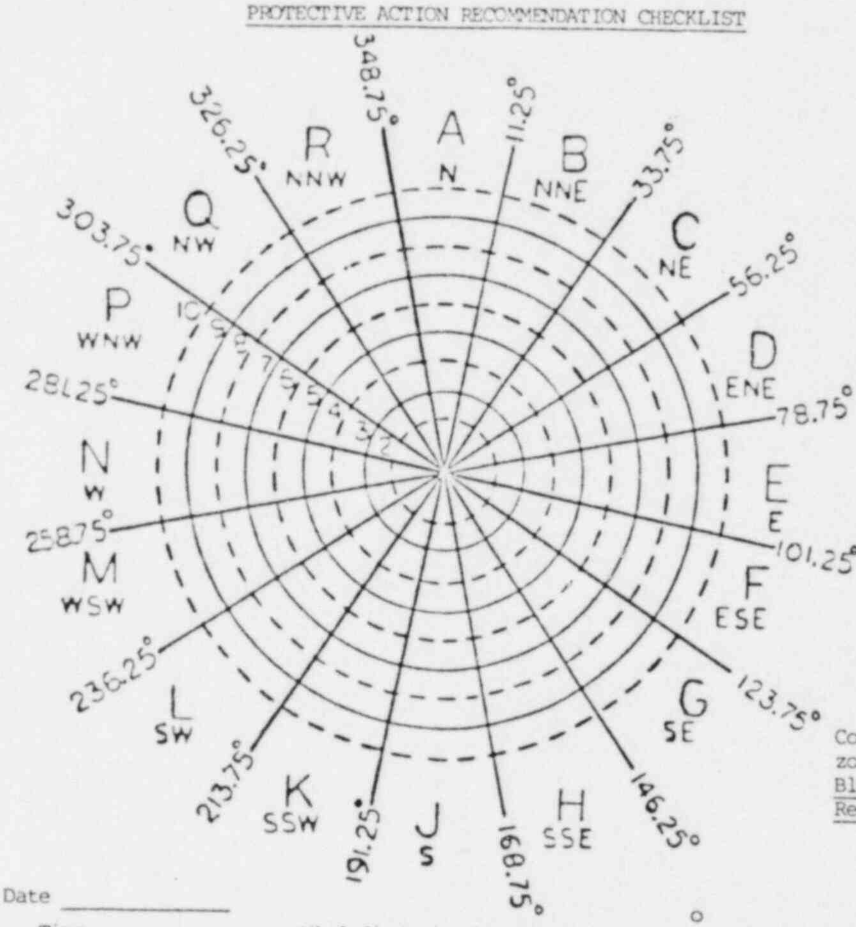
WP/kk

ATTACHMENT 8 (Cont'd.)

Form 5790-204-1
Revision 2, 12/20/81
Page 2 of 2

Example of

PROTECTIVE ACTION RECOMMENDATION CHECKLIST




Color in affected zones as follows:
Blue for sheltering
Red for evacuation

Date ______________

Time ______________ Wind direction/speed ____________ ° At __________
From (mph)

PROTECTIVE ACTION:

This form may be used in conjunction with an Emergency Notification Followup Message

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

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

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

☐ ACTIVATE PUBLIC ALERT & NOTIFICATION SYSTEM

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

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

WP/kk

## ATTACHMENT 9

## EVACUATION TIME ESTIMATES*

| ZONE | SECTORS | DISTANCE (MILES) | POPULATION | EVACUATION TIME (MIN) BEST/ADVERSE/CONFIRM |
|---|---|---|---|---|
| M-1 | Q - F | 0 - 2 | 266 | 10/13/26 |
| M-2 | G - P | 0 - 2 | 509 | 10/13/26 |
| M-3 | Q - B | 0 - 5 | 1099 | 22/29/58 |
| M-4 | C - F | 0 - 5 | 1766 | 22/29/58 |
| M-5 | G - K | 0 - 5 | 4573 | 22/29/58 |
| M-6 | L - P | 0 - 5 | 1133 | 22/29/58 |
| M-7 | Q - B | 0 - 10 | 2855 | 42/55/110 |
| M-8 | C - F | 0 - 10 | 6609 | 42/55/110 |
| M-9 | G - K | 0 - 10 | 8890 | 56/73/146 |
| M-10 | L - P | 0 - 10 | 3620 | 42/55/110 |

* Taken from Minnesota Radiological Emergency Response Plan

WP/kk

## ATTACHMENT 1C

### Thyroid Dose Conversion Factors

Ratio of a child thyroid inhalation dose to radioiodine concentration, RIC, as a function of time after reactor shutdown at which exposure begins and the inhalation exposure duration $\left(\frac{rem}{Ci/m^3}\right)$

| Time after shutdown at which exposure starts (hr) | RIC, $\left(\frac{rem}{Ci/m^3}\right)$ for inhalation periods ranging from 1 to 12 hours | | | | | |
|---|---|---|---|---|---|---|
| | 1.0/hr | 2.0/hr | 3.0/hr | 4.0/hr | 6.0/hr | 12.0/hr |
| 1.0 | 5.0E+05 | 9.8E+05 | 1.4E+06 | 1.9E+06 | 2.8E+06 | 5.2E+06 |
| 2.0 | 5.6E+05 | 1.1E+06 | 1.6E+06 | 2.1E+06 | 3.2E+06 | 5.9E+06 |
| 3.0 | 6.1E+05 | 1.2E+06 | 1.8E+06 | 2.3E+06 | 3.4E+06 | 6.5E+06 |
| 4.0 | 6.5E+05 | 1.3E+06 | 1.9E+06 | 2.5E+06 | 3.7E+06 | 7.0E+0[illegible] |
| 6.0 | 7.1E+05 | 1.4E+06 | 2.1E+06 | 2.8E+06 | 4.1E+06 | 7.7E+06 |
| 12.0 | 8.4E+05 | 1.7E+06 | 2.5E+06 | 3.3E+06 | 4.9E+06 | 9.3E+06 |

NOTE: Adult thyroid doses are approximately 50% of child thyroid doses.

WP/kk

ATTACHMENT 11

Radioiodine Concentrations Resulting in 5 Rem Thyroid Dose

Radioiodine concentration in air which would result in a 5 rem thyroid inhalation dose to a child as a function of time after reactor shutdown, $t_a$, at which exposure begins and the inhalation time ($Ci/m^3$)

| Time after Shutdown, $t_a$ (hr) | Inhalation Time | | | | | |
|---|---|---|---|---|---|---|
| | 1.0/hr | 2.0/hr | 3.0/hr | 4.0/hr | 6.0/hr | 12.0/hr |
| | Radioiodine concentration yielding 5 rem thyroid dose to child ($Ci/m^3$) | | | | | |
| 1.0 | 1.0E-05 | 5.1E-06 | 3.5E-06 | 2.6E-06 | 1.8E-06 | 9.5E-07 |
| 2.0 | 8.9E-06 | 4.5E-06 | 3.1E-06 | 2.3E-06 | 1.6E-06 | 8.4E-07 |
| 3.0 | 8.2E-06 | 4.2E-06 | 2.8E-06 | 2.1E-06 | 1.5E-06 | 7.7E-07 |
| 4.0 | 7.7E-06 | 3.9E-06 | 2.6E-06 | 2.0E-06 | 1.4E-06 | 7.2E-07 |
| 6.0 | 7.1E-06 | 3.6E-06 | 2.4E-06 | 1.8E-06 | 1.2E-06 | 6.5E-07 |
| 12.0 | 5.9E-06 | 3.0E-06 | 2.0E-06 | 1.5E-06 | 1.0E-06 | 5.4E-07 |

NOTE: Adult thyroid doses are approximately 50% of child thyroid doses.

WP/kk

ATTACHMENT 12

Recommended Protective Actions For Potential Release Situations

NOTE: Situation is presented in progressively degrading sequence.

- Core melt sequence with no significant releases taking place from containment

- Large amounts of fission products not yet in containment atmosphere

  PROTECTIVE ACTION: 2 mile precautionary evacuation

- If large amounts of fission products (> gap activity*) are in containment atmosphere

  PROTECTIVE ACTION: 5 mile precautionary evacuation in 45° - 90° sector downwind and sheltering in other parts of EPZ

- If containment failure leading to direct atmospheric release is likely in the sequence but not imminent

  PROTECTIVE ACTION: precautionary evacuation 5 miles in all directions and 10 miles downwind (45° - 90° sector)

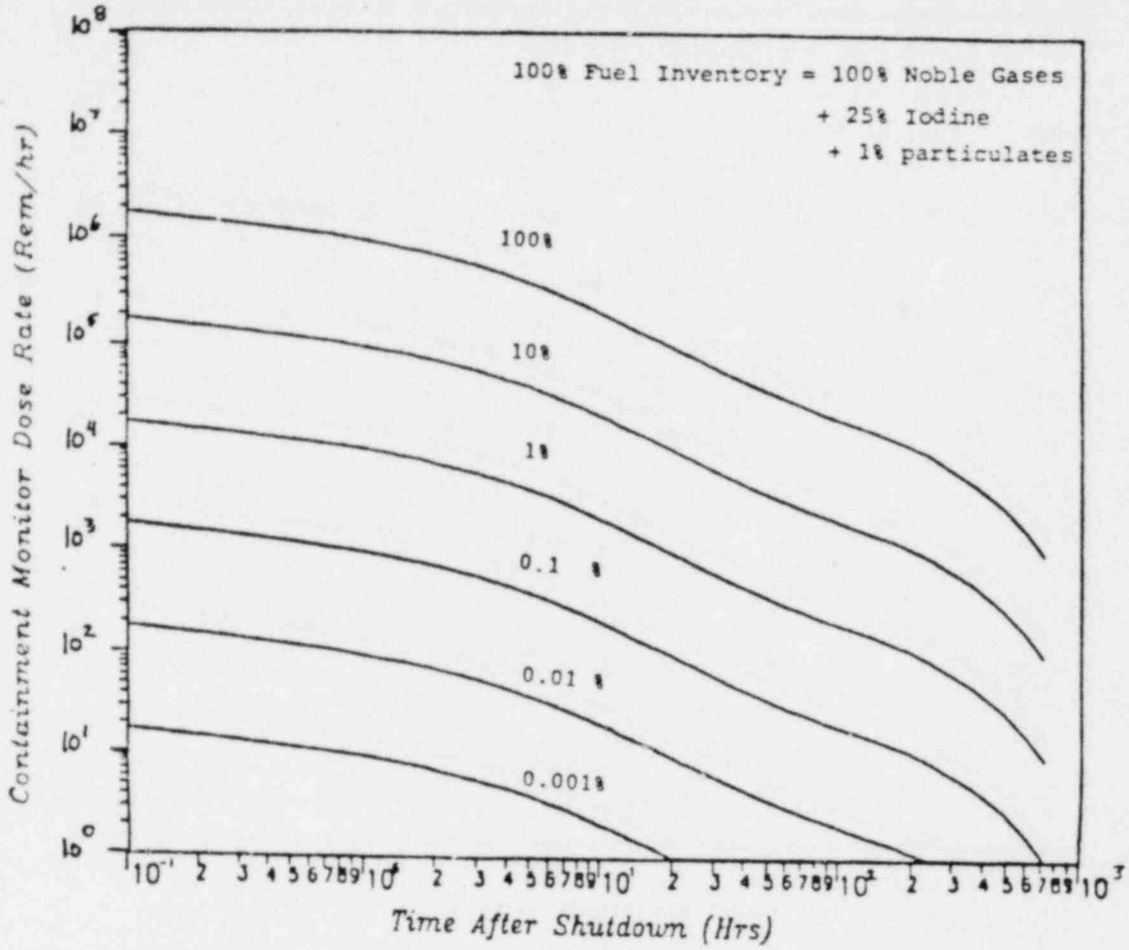
- If containment failure leading to direct atmospheric release is judged imminent

  PROTECTIVE ACTION: recommend sheltering in areas where evacuation cannot be completed before transport of activity to that location

* Containment activity may be determined by referring to Attachment 13, PERCENT OF FUEL INVENTORY IN THE CONTAINMENT. The 10% curve represents the gap activity. Plot the point corresponding to the containment monitor reading versus time after shutdown. If the point is above the 10% curve, the containment activity exceeds the gap activity. An alternative method is to sample containment activity concentration and calculate total activity. The gap activity at shutdown is approximately 100 megacuries. The free air volumes of the drywell and torus are 3800 $m^3$ and 3000 $m^3$ respectively.

WP/kk

**Percent of Fuel Inventory Airborne in the Containment**




| % Fuel Inventory Released | Approximate Source and Damage Estimate |
|---|---|
| 100. | 100% TID-14844, 100% fuel damage, potential core melt. |
| 50. | 50% TID noble gases, TMI source. |
| 10. | 10% TID, 100% NRC gap activity, total clad failure, partial core uncovered. |
| 3. | 3% TID, 100% WASH-1400 gap activity, major clad failure. |
| 1. | 1% TID, 10% NRC gap, Max. 10% clad failure. |
| .1 | .1% TID, 1% NRC gap, 1% clad failure, local heating of 5-10 fuel assemblies. |
| .01 | .01% TID, .1% NRC gap, clad failure of 3/4 fuel element (36 rods). |
| $10^{-3}$ | .01% NRC gap, clad failure of a few rods. |
| $10^{-4}$ | 100% coolant release with spiking. |
| $5 \times 10^{-6}$ | 100% coolant inventory release. |
| $10^{-6}$ | Upper range of normal airborne noble gas activity in containment. |

| | | | | |
|---|---|---|---|---|
| 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: | C.O'Muthiauer | ALARA Review: | Revision 0 | Date | 3/27/81 |
| Reviewed by: | G R Post | Q.A. Review: | Revision 0 | Date | 3/28/81 |
| Operations Committee Final Review: Meeting Number | | | 1065 | Date | 2/22/82 |
| Approved by: | | | FL Fey | Date | 2-24-82 |
| 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 -
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.

B. This procedure provides both a primary and a backup method of doing the accounting in the event of a plant or site evacuation. The primary method depends on 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 (X-1150)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.

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 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).

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 (X-1150), TSC Coordinator, Site Superintendent (in Control Room) and Guard House. Direct that a list of names, initials, & 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 hon
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.

ATTACHMENT 2

Form 5790-205-2
Revision 2, 2/13/82
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 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 [redacted] 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

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

# SAMPLING PRIORITIES DURING AN EMERGENCY

A.2-207

REVIEW AND APPROVAL

| | | | | | |
|---|---|---|---|---|---|
| Prepared by: | [signature] | ALARA Review | GDMathiasen | Date | 2-23-82 |
| Reviewed by: | [signature] | Q. A. Review | R L Schmit | Date | 2-23-82 |
| Operations Committee Final Review: | | Meeting Number | 1066 | Date | 2/23/82 |
| Approved by: | [signature] | | | Date | 2-24-82 |
| Op. Com. Results Review: | NA | Mtg.# | 1066 | Date | 2/23/82 |

## PURPOSE

The purpose of this procedure is to establish priorities for obtaining and analyzing plant samples in varying emergency situations.

## CONDITIONS AND PREREQUISITES

A. An emergency condition has been declared.

B. Sampling and analysis options are limited by time, personnel, or facility resources.

C. The Radiological Emergency Coordinator (REC) and/or the Chemistry Section Leader (CSL) shall allocate personnel and equipment resources to the most important tasks based on the situation at hand.

## 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

## DISCUSSION

The highest priority has been assigned to any tasks which directly impact the public health and safety or NSP's ability to protect the health and safety of public.

The sample frequencies will be dependent on the situation and the resources available. With sufficient resources, the frequencies should be often enough to provide current information for decision making and also allow for trend analysis.

## PROCEDURE

STEP 1 Refer to the situation statements in Attachments 1-4 and determine which one applies to the current plant status.

WP/dw

STEP 2 Direct the sampling in accordance with the applicable guideline for priorities. Assign samples on a frequency which is consistent with the situation.

STEP 3 Review sample analyses and be aware of plant status. If conditions change, shift sampling priorities to the appropriate guideline.

REFERENCES

A. Monticello Nuclear Generating Plant Emergency Plan

B. Operations Manual Sections A.2-404 and A.2-408

C. Plant Chemistry Manual - Volume One

ATTACHMENTS

1. Sampling Priority Guideline #1 - High Effluents
2. Sampling Priority Guideline #2 - Potential for High Effluents
3. Sampling Priority Guideline #3 - Containment Barriers Intact
4. Sampling Priority Guideline #4 - Recovery

WP/dw

ATTACHMENT 1

Sampling Priority Guideline #1 - High Effluents

Situation

Liquid or gaseous effluents have exceeded instantaneous Technical Specification limits.

| Parameter | Primary Coolant | Rx Bldg Vent | Plant Stack | Primary Containment | Other (Canal) |
|---|---|---|---|---|---|
| (L) A. Liquid release | 2 | | | | 1 |
| (G) B. Gaseous release | 4 | 2* | 1 | 3 | |

| | | | | | |
|---|---|---|---|---|---|
| I. Analyses (Radiochemical) | | | | | |
| A. Isotopic | L/G | | | | L |
| B. Noble Gas | | G | G | G | |
| C. Charcoal (Iodine) | | G | G | G | |
| D. Particulate | | G | G | G | |

* - Sample RBV first if projected offsite doses are higher than the stack.

| | | | | | |
|---|---|---|---|---|---|
| II. Analysis (Chemical) | | | | | |
| A. Conductivity | L/G | | | | |
| B. pH | L/G | | | | |
| C. Chloride | L/G | | | | |
| D. $H_2/O_2$ | L/G | | | L/G | |
| E. Boron | L/G | | | | |

Priority Code

1 - Highest Priority
5 - Lowest Priority

L - Perform analysis for liquid releases
G - Perform analysis for gaseous releases

Sample Procedures

A.2-404
Attachment 1 - Primary Coolant
Attachment 2 - RBV
Attachment 3 - Stack
Attachment 4 - Primary Containment

WP/dw

ATTACHMENT 2

Sampling Priority Guideline #2 - Potential for High Effluents

Situation

Gaseous effluents are less than instantaneous Technical Specification limits. Core damage has occured and the potential for offsite releases exceeding Technical Specification limits is high.

| Parameter | Primary Coolant | Rx Bldg Vent | Plant Stack | Primary Containment |
|---|---|---|---|---|
| (G) Gaseous releases | 2 | 4 | 3 | 1 |
| I. Analyses (Radiochemical) | | | | |
| A. Isotopic | * | | | |
| B. Noble Gas | | * | * | * |
| C. Charcoal (Iodine) | | * | * | * |
| D. Particulate | | * | * | * |
| II. Analysis (Chemical) | | | | |
| A. Conductivity | * | | | |
| B. pH | * | | | |
| C. Chloride | * | | | |
| D. $H_2/O_2$ | * | | | * |
| E. Boron | * | | | |

Priority Code

1 - Highest Priority
4 - Lowest Priority

* - Perform indicated analysis

Sample Procedures

A.2-404
Attachment 1 - Primary Coolant
Attachment 2 - RBV
Attachment 3 - Stack
Attachment 4 - Primary Containment

WP/dw

ATTACHMENT 3

Sampling Priority Guideline #3 - Containment Barriers Intact

Situation

Possible core damage has occurred with primary coolant and the primary containment barrier still intact.

| Parameter | Primary Coolant | Rx Bldg Vent | Plant Stack | Primary Containment |
|---|---|---|---|---|
| Gaseous releases possible | 1 | 4 | 3 | 2 |
| I. Analyses (Radiochemical) | | | | |
| A. Isotopic | * | | | |
| B. Noble Gas | | * | * | * |
| C. Charcoal (Iodine) | | * | * | * |
| D. Particulate | | * | * | * |
| II. Analysis (Chemical) | | | | |
| A. Conductivity | * | | | |
| B. pH | * | | | |
| C. Chloride | * | | | |
| D. $H_2/O_2$ | * | | | * |
| E. Boron | * | | | |

Priority Code

1 - Highest Priority
4 - Lowest Priority

* - Perform indicated analysis

Sample Procedures

A.2-404
Attachment 1 - Primary Coolant
Attachment 2 - RBV
Attachment 3 - Stack
Attachment 4 - Primary Containment

WP/dw

ATTACHMENT 4

## Sampling Priority Guideline #4 - Recovery

### Situation

Plant is stabilized and liquid/gaseous effluent releases are less than Technical Specification limits. The plant is in a recovery status.

| Parameter | Primary Coolant | Drywell Sump Radwaste | Rx Bldg Vent | Plant Stack | Primary Containment | Other (Canal) |
|---|---|---|---|---|---|---|
| General Recovery | 1 | 3 | 5/6 | 4 | 2 | 5/6 |
| I. Analyses (Radiochemical) | | | | | | |
| A. Isotopic | * | * | | | | * |
| B. Noble Gas | | | * | * | * | |
| C. Charcoal (Iodine) | | | * | * | * | |
| D. Particulate | | | * | * | * | |
| II. Analysis (Chemical) | | | | | | |
| A. Conductivity | * | * | | | | |
| B. pH | * | * | | | | |
| C. Chloride | * | | | | | |
| D. $H_2/O_2$ | * | | | | * | |
| E. Boron | * | | | | | |

Priority Code

* - Perform indicated analysis

1 - Highest Priority
6 - Lowest Priority

Sample Procedures

A.2-404
Attachment 1 - Primary Coolant
Attachment 2 - RBV
Attachment 3 - Stack
Attachment 4 - Primary Containment

WP/dw

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

# CORE DAMAGE ASSESSMENT

Procedure A.2-208

## REVIEW AND APPROVAL

Prepared by: KH Jepson ALARA Review CA Mathison Date 2-24-82
Reviewed by: KH Jacobson Q. A. Review RL Scheinost Date 2-24-82
Operations Committee Final Review: Meeting Number 1066 Date 2/23/82
Approved by: FL Fey Date 2-24-82
Op. Com. Results Review: Not Required Mtg.# 1066 Date 2/23/82

## PURPOSE

The purpose of this procedure is to determine the degree of reactor core damage from the measured fission product concentrations in water and gas samples taken from the primary system under accident conditions. The degree of core damage can also be determined from the containment radiation monitor dose rates under accident conditions.

## CONDITIONS AND PREREQUISITES

A. An emergency condition has occurred at Monticello Nuclear Generating Plant which has resulted in possible core damage.

B. The Emergency Director has requested assessment of possible core damage.

C. A radiochemcial analysis has been performed on either or both a reactor coolant sample and containment atmosphere sample.

D. Containment radiation monitor is operable although this is not a necessary requirement.

## PERSONNEL REQUIREMENTS

Radiological Emergency Coordinator - procedure implementation
Chemistry Section Personnel - procedure completion

## DISCUSSION

This procedure is based on methods from PROCEDURES FOR THE DETERMINATION OF THE EXTENT OF CORE DAMAGE UNDER ACCIDENT CONDITIONS a (GE document written for plants with a Post Accident Sampling System.) This procedure involves calculations of fission product inventories in the core and the release of inventories into the primary system under postulated loss-of-coolant accident (LOCA) conditions. The fuel gap fission products are assumed to be released upon the rupture of fuel cladding, and the majority of fission product inventories in the core will be released when the fuel is melted at higher temperatures. The graphs (Attachments 2 and 3) used in this procedure were developed by G.E. for a 3579 MWt rated BWR-6/238 with a Mark III containment reference plant having operated 3 years at steady state (3651 MWt) power. Because of this Monticello isotopic concentrations obtained by sampling and analysis must be normalized prior to determination of core damage using the G.E. prepared graphs. It is the function of the computer program "CORDAM" to normalize the Monticello isotopic concentrations. To obtain additional verification of core damage assessment or as a backup method of assessing possible core damage the containment monitor dose rate can be plotted on the attached graph (Attachment 4) from a Bechtel study relating the percent of fuel inventory airborne in containment, approximate source and damage estimate and containment monitor does rates (Rem/hr).

PRECAUTIONS

It is recommended that both the water and gas phase samples be measured in order to reduce the uncertainty in core damage estimations. (The two phases should corroborate each other.)

PROCEDURE

NOTE 1: Obtain either or both I-131 concentrations from reactor coolant and Xe-133 concentrations from containment atmosphere per emergency procedure A.2-404 prior to proceeding with the following steps.

STEP 1 Access the chemistry group computer from a terminal.

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

PLEASE ENTER SAMPLE DECAY TIME (HRS)

STEP 3 Respond by typing the number of hours between reactor shutdown and sampling.

STEP 4 The computer will respond with:

ARE THE FISSION PRODUCT CONCENTRATIONS MEASURED SEPARATELY FOR THE RX WATER AND SUPPRESSION POOL OR THE DRYWELL GAS AND THE TORUS GAS? (YES OR NO)

Type either "YES" or "NO" as appropriate.

STEP 5 The computer will respond with either

PLEASE ENTER THE CONCS. (UCI/CC) OF THE FOLLOWING ISOTOPE(S) BEING CONSIDERED. ENTER 0 IF NOT CONSIDERED.

I-131:
XE-133:

or

ENTER SAMPLE CONCENTRATIONS IN UCI/CC

I-131 IN RX WATER:
I-131 IN SUPPRESSION POOL:

XE-133 IN DRYWELL:
XE-133 IN TORUS GAS:

Type in the appropriate concentrations as obtained by radiochemical analysis of the samples.

STEP 6 The computer will respond with:

IN ORDER TO PROPERLY CALCULATE A CORE INVENTORY CORRECTION FACTOR THE PERIODS OF PLANT SHUTDOWN AND OPERATION MUST BE KNOWN DATING BACK AT LEAST 50 DAYS.

ENTER THE TOTAL NUMBER OF SHUTDOWN AND OPERATION PERIODS.

Type in the total number of both operating and shutdown periods. The total number of days of all the periods shall be greater than 50 days.

NOTE 2: Operating and Shutdown period information may be obtained from Chemistry Section Leader. (See file entitled Outages A.2-208 located in Chemistry Department office file cabinet.)

STEP 7 The computer will respond with:

ENTER DAYS OF OPERATION OR OUTAGE AND POWER LEVEL (MWT) FOR EACH PERIOD BEGINNING AT THE TIME OF RX SHUTDOWN AND WORKING BACKWARDS.
PERIOD NO. 1.0 (DAYS, POWER):
PERIOD NO. 2.0 (DAYS, POWER):
PERIOD NO. 3.0 (DAYS, POWER):

Type in the days and power (MWt) in the indicated format. For example a first entry of "40,1670" tells the computer that during period one the reactor was operating at 1670 MWt for 40 days.

STEP 8 The computer will respond with either or both of the following statements:

THE REF. CONC. OF I-131 IN PRIMARY COOLANT IS (VALUE)

THE REF. CONC. OR XE-133 IN CONT. ATMOS. IS (VALUE)

On the best estimate lines plot the reference concentration of I-131 on ATTACHMENT 2, Relationship between I-131 Concentration in the Primary Coolant (Reactor Water and Pool Water) and the Extent of Core Damage in Reference Plant and plot the reference concentration of Xe-133 on ATTACHMENT 3, Relationship between Xe-133 Concentration in the Containment Gas (Drywell and Torus Gas) and the Extent of Core Damage in Reference Plant.

WP/dw

STEP 9 Determine the extent of core damage using the best estimate lines on ATTACHMENTS 2 and 3 and record on ATTACHMENT 1, Core Damage Assessment Report.

STEP 10 Compare reactor water isotopic analysis with those performed during normal operation. Note especially Sr, Ba, La and Ru (either soluble or insoluble). Record noticeable increases on Attachment 1, Core Damage Assessment Report.

NOTE 3: If unusually high concentrations of less volatile fission products, such as isotopes Sr, Ba, La and Ru (either soluble or insoluble) are found in the water sample a fuel meltdown may be assumed.

STEP 11 If the containment radiation monitor is operable obtain the radiation monitor does rate (Rem/hr) and plot the value on Attachment 4, Percent of Fuel Inventory Airborne in the Containment. From Attachment 4 determine the approximate % Fuel Inventory Released and approximate source and damage estimate and record on Attachment 1, Core Damage Assessment Report.

REFERENCES

1. Procedures for the Determination of the Extent of Core Damage Under Accident Conditions, by Chien Lin, General Electric (RPE 81CCL01)

2. Monticello Nuclear Generating Plant Emergency Plan.

ATTACHMENTS

1. Core Damage Assessment Report

2. Relationship Between I-131 Concentration In the Primary Coolant and the Extent of Core Damage In Reference Plant.

3. Relationship Between Xe-133 Concentration In the Containment Gas and the Extent of Core Damage In Reference Plant.

4. Percent of Fuel Inventory Airborne in the Containment.

ATTACHMENT 1

Form 5790-208-1
Rev. 0, 02/01/82
Page 1 of 1

Example of
CORE DAMAGE ASSESSMENT REPORT

Ref. conc. of I-131 in primary coolant (from CORDAM) ____________μCi/cc

Ref. conc. of Xe-133 in cont. atmos (from CORDAM) ____________μCi/cc

% Cladding Failure based on I-131 ____________%
% Fuel Meltdown based on I-131 ____________%
(from Attachment 2)

% Cladding Failure based on Xe-133 ____________%
% Fuel Meltdown based on Xe-133 ____________%
(from Attachment 3)

Containment Monitor Dose Rate ____________R/hr
% Fuel Inventory Released ____________%
Source ard Damage Estimate ____________%
(from Attachment 4)

Are less volatile fission product concentrations, for isotopes Sr, Ba, La and Ru unusually higher than during the last normal operating period? If yes, how much higher. (Unusually high concentrations of these isotopes in coolant further substantiate fuel meltdown.)

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________

Performed by: ______________________________Time ________ Date ____________

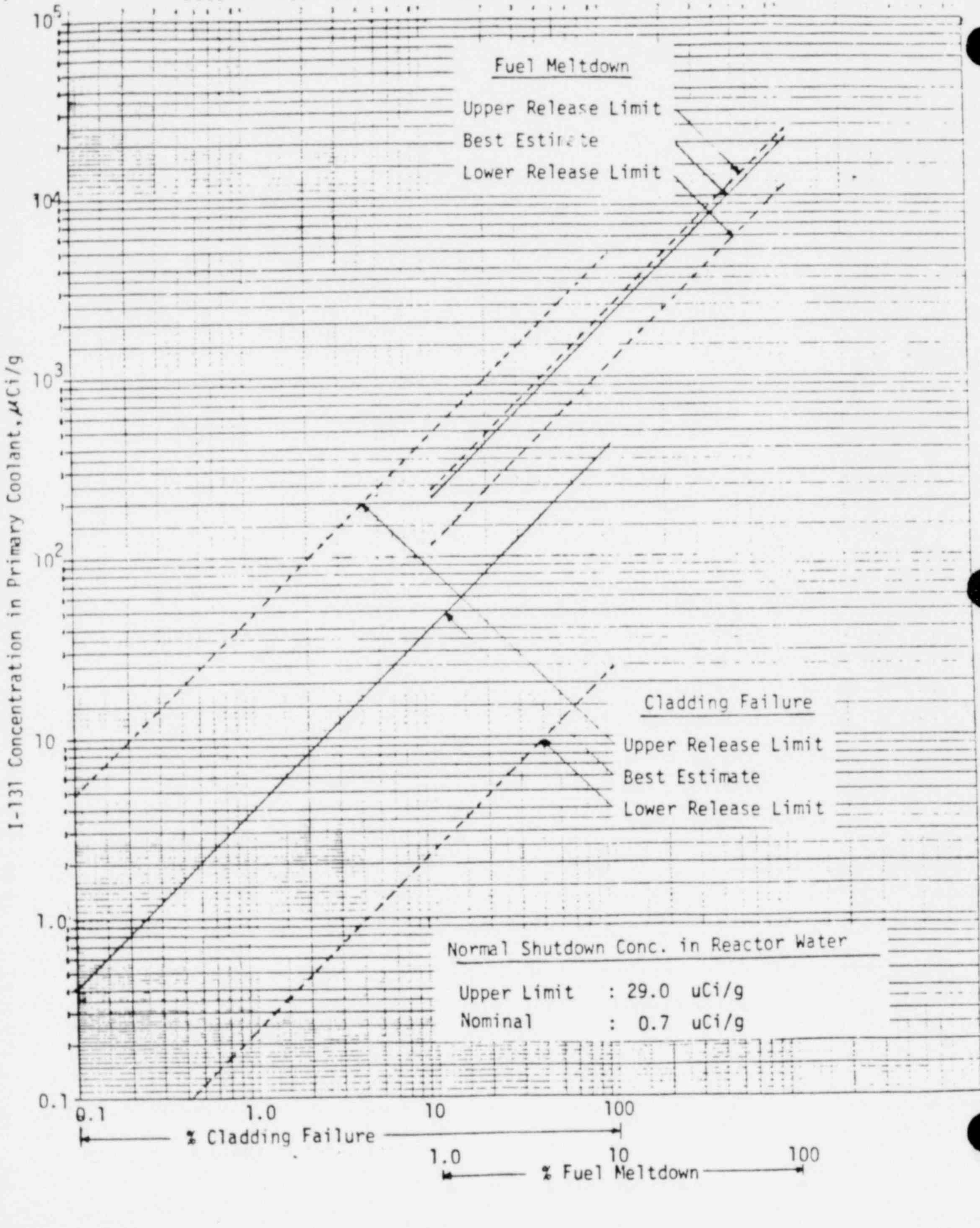
Reviewed by Chemistry Section Leader ____________________ Date ____________

Reviewed by Rad. Emerg. Coord. ________________________ Date ____________

Reviewed by Emergency Director ________________________ Date ____________

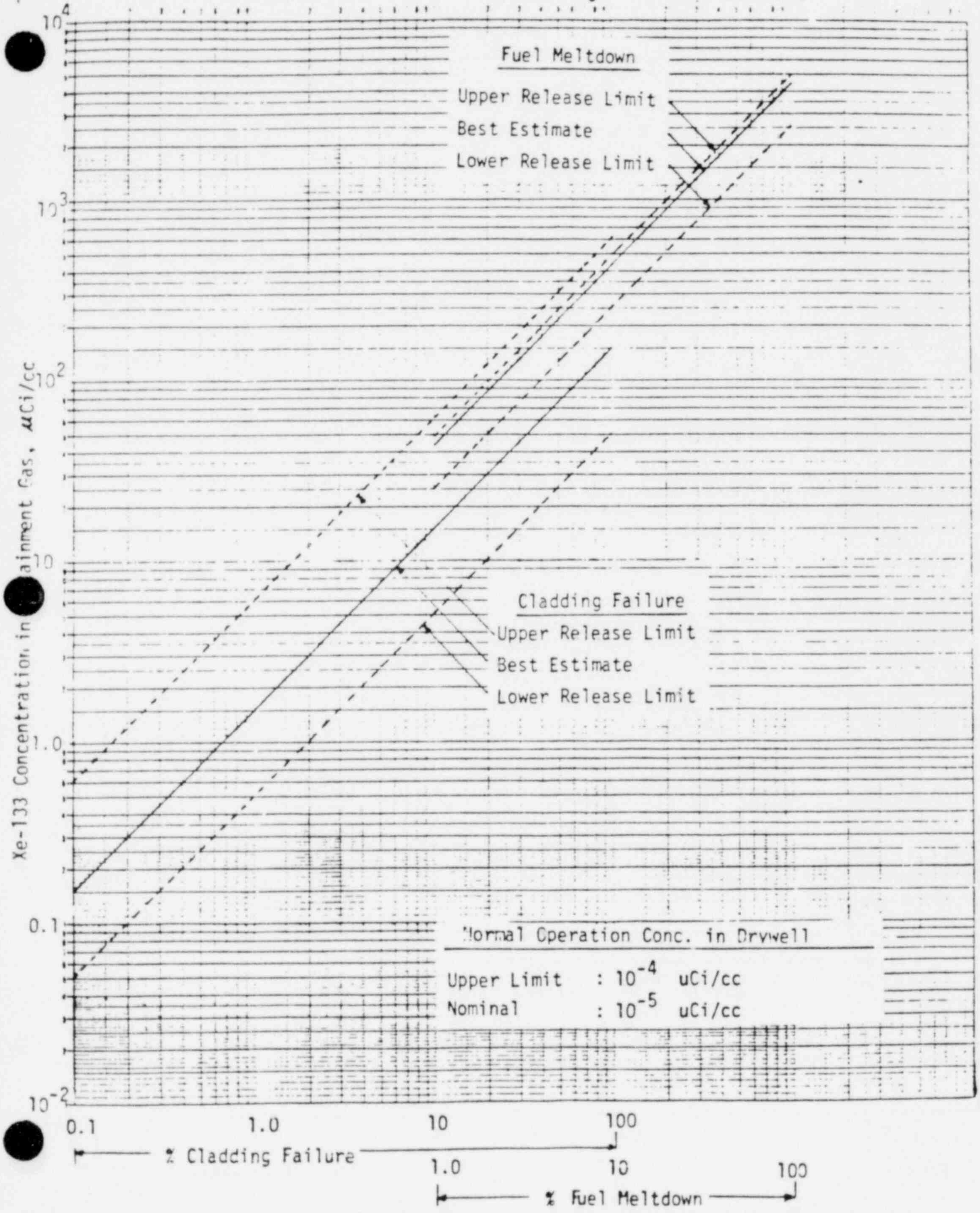
NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

Relationship between I-131 Concentration in the Primary Coolant (Reactor Water + Pool Water) and the Extent of Core Damage in Reference Plant

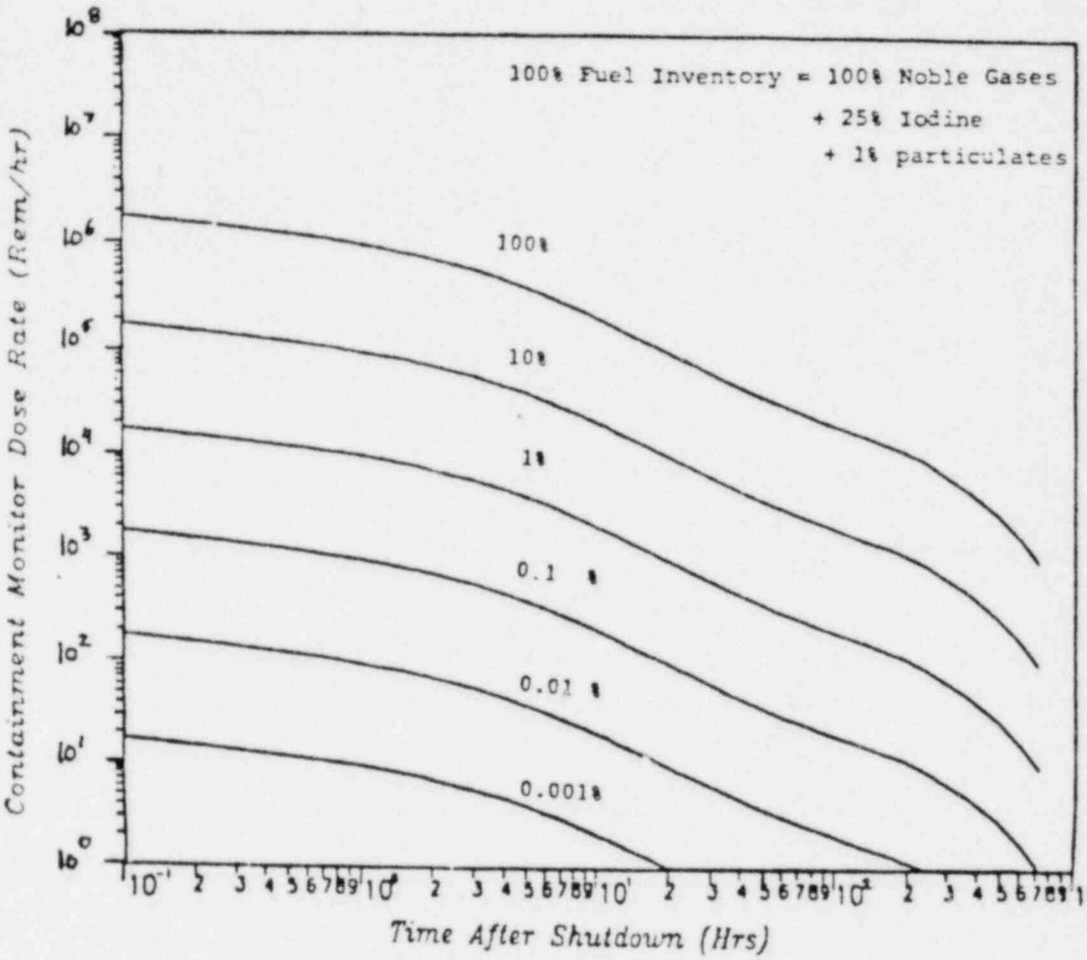


ATTACHMENT 3

Relationship between Xe-133 Concentration in the Containment Gas (Drywell + Torus Gas) and the Extent of Core Damage in Reference Plant



Percent of Fuel Inventory Airborne in the Containment




| % Fuel Inventory Released | Approximate Source and Damage Estimate |
|---|---|
| 100. | 100% TID-14844, 100% fuel damage, potential core melt. |
| 50. | 50% TID noble gases, TMI source. |
| 10. | 10% TID, 100% NRC gap activity, total clad failure, partial core uncovered. |
| 3. | 3% TID, 100% WASH-1400 gap activity, major clad failure. |
| 1. | 1% TID, 10% NRC gap, Max. 10% clad failure. |
| .1 | .1% TID, 1% NRC gap, 1% clad failure, local heating of 5-10 fuel assemblies. |
| .01 | .01% TID, .1% NRC gap, clad failure of 3/4 fuel element (36 rods). |
| $10^{-3}$ | .01% NRC gap, clad failure of a few rods. |
| $10^{-4}$ | 100% coolant release with spiking. |
| $5x10^{-6}$ | 100% coolant inventory release. |
| $10^{-6}$ | Upper range of normal airborne noble gas activity in containment. |

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

Procedure A.2-302

| | | | |
|---|---|---|---|
| Prepared by: MKOffhalel | ALARA Review: Revision 0 | Date | 3/27/81 |
| Reviewed by: CAMathews | Q.A. Review: Revision 0 | Date | 3/28/81 |
| Operations Committee Final Review: Meeting Number | 1065 | Date | 2/22/82 |
| Approved by: | J L Fey | Date | 2-24-82 |
| 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

A. An emergency condition requiring plant or site evacuation has been declared at the Monticello Nuclear Generating Plant.

B. Procedure A.2-301 (Emergency Evacuation) has been initiated.

## 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 and designation of Assembly Point Coordinator.

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 circumstances.

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. Site and Area Maps
2. Appropriate Emergency Plan Implementing Procedures
3. Employee Home Telephone Listings/Phone Book
4. Telephone Numbers of Assembly Areas (Attachment 3)

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. 2 Scott air packs
7. 2 full face respirators w/particulate filters
8. 1 decontamination kit
9. 10 sets of protective clothing
10. Radiation barrier tape/rope and radiation signs
11. 10 sets of building diagrams
12. First aid kit
13. Stationary supplies
14. Portable generator

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 Security Group Leader or Shift Supervisor)
b. Baseball cap with Assembly Point Coordinator designation

Initiate ASSEMBLY POINT CHECKLIST, 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 [redacted] 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

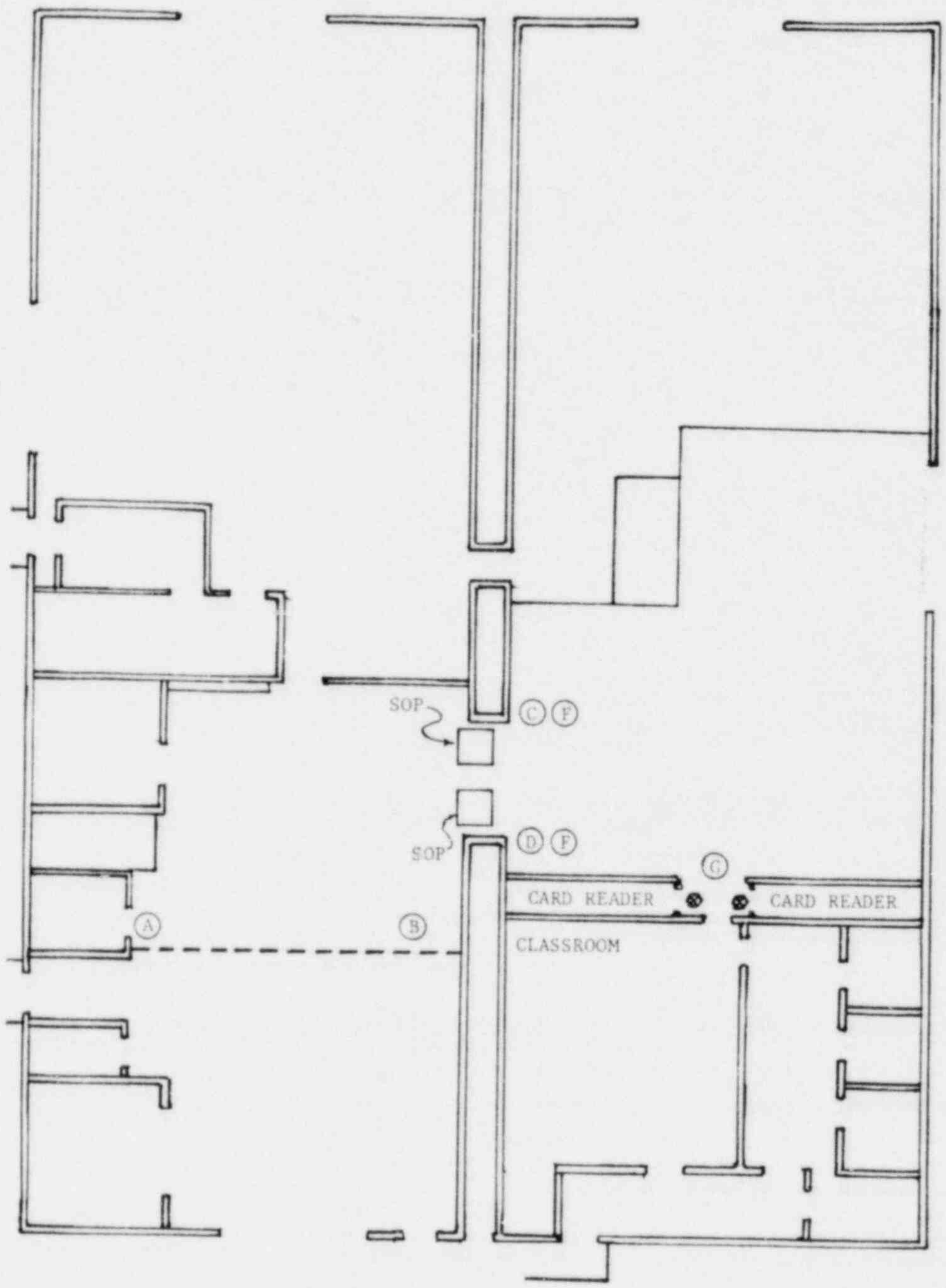
1. Monticello Nuclear Generating Plant Emergency Plan
2. Monticello Nuclear Generating Plant Operations Manual
3. NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

ATTACHMENTS

1. On-Site Assembly Point Diagrams
2. On-Site Assembly Point Diagrams
3. Telephone Listing For Assembly Areas
4. Example of Assembly Point Activation Checklist

WP/kk

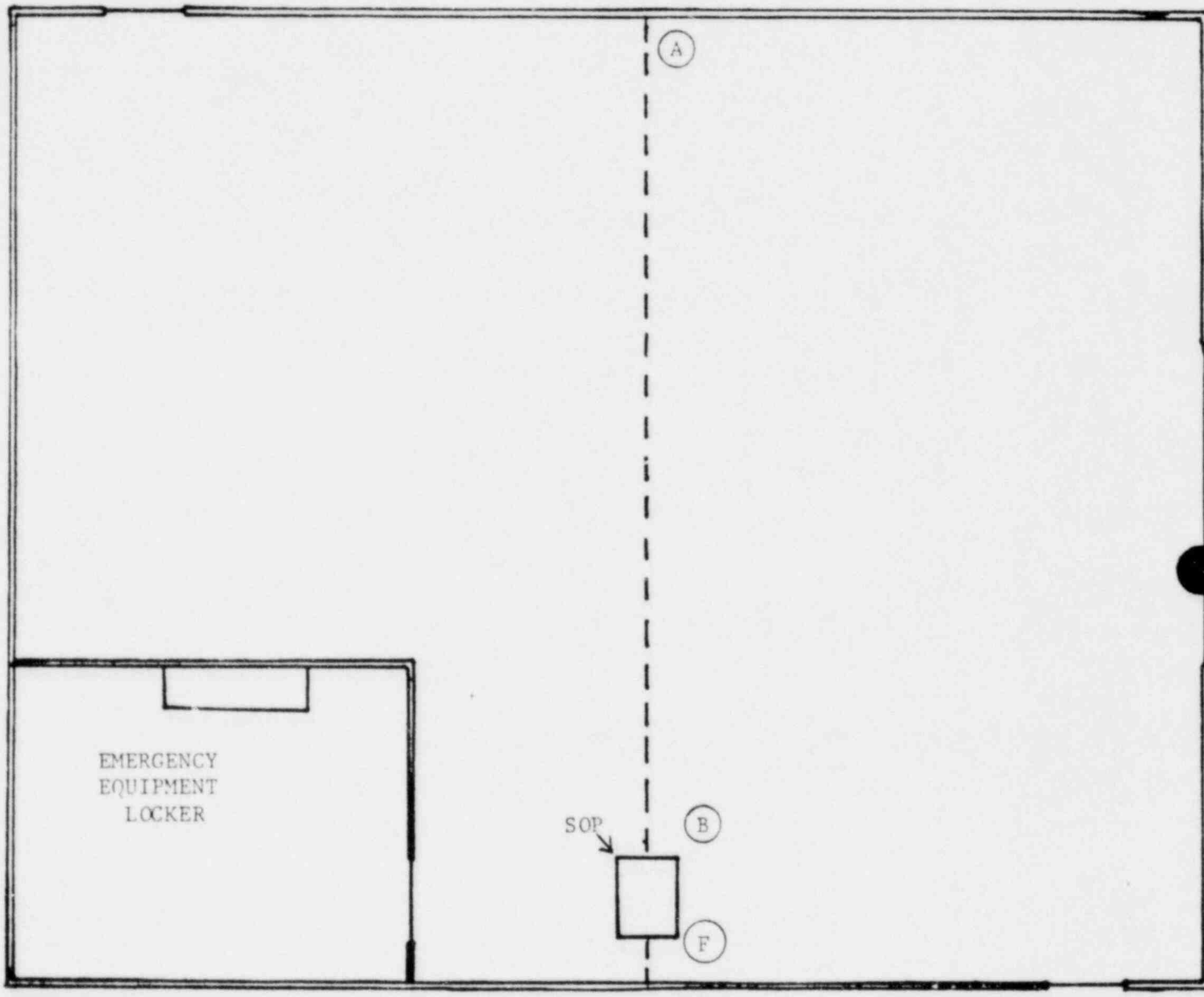
ATTACHMENT 1




WAREHOUSE ASSEMBLY POINT

WP/kk

ATTACHMENT 2




SUBSTATION ASSEMBLY POINT

WP/kk

## ATTACHMENT 3

Page 1 of 1

## TELEPHONE LISTINGS

Primary Assembly Area ------------------------------------

Alternate Assembly Area ----------------------------------

Emergency Operations Facility (EOF) ----------------------

Control Room ---------------------------------------------

Guard's Station ------------------------------------------

Technical Support Center

Emergency Director ---------------------------------

Security Group Leader ------------------------------

REC ------------------------------------------------

Operations Support Center

OSC Coordinator ------------------------------------

ATTACHMENT 4

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

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

1. Assumed the responsibilities of Assembly Point Coordinator.

   ______ APC Initials ______ Time ______ Date

2. Security computer ready for accountability.

   ______ APC Initials ______ Time ______ Date

3. Survey of Assembly Point Area initiated and radiological control point established.

   ______ APC Initials ______ Time ______ Date

4. Emergency Director notified that Assembly Point is prepared for evacuation.

   ______ APC Initials ______ Time ______ Date

5. If warehouse location is activated, notified Security Group Leader when all evacuees were processed.

   ______ APC Initials ______ Time ______ Date

6. Completed radiological screening and so notified REC.

   ______ APC Initials ______ Time ______ Date

7. Released Assembly Point personnel on order from Emergency Director.

   ______ APC 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 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 ___

# IN-PLANT EMERGENCY SURVEYS
A.2-403

| | | | |
|---|---|---|---|
| Prepared by: C.D. Mathiasen | ALARA Review: C.D. Mathiasen | Date | 2-22-81 |
| Reviewed by: [illegible] | Q.A. Review: Revision 0 | Date | 3/28/81 |
| Operations Committee Final Review: Meeting Number | 1066 | Date | 2/23/82 |
| Approved by: | [illegible] | Date | 2-24-82 |
| 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; survey shall not proceed without final approval of REC.
Operational Support Center Coordinator (OSCC) - 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 <u>shall</u> be given to the safety of the survey party, both radiological and physical. The "buddy" system <u>should</u> 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.

<u>DISCUSSION</u>

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. Survey preparations and methods are basically the same as those described in the MNGP Operations Manual, Section E.1.4.

WP/kk

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.

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 #5790-107-3) 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 the OSC and maintain communications throughout the conduct of the survey. Request REC to notify the Control Room of survey commencement.

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 the OSCC. 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. (Refer to Operations Manual Section E.1.4 for detailed survey and sampling procedures. Sample volumes, filter media, etc. should be modified for situation.) Record data as required. Refer to Attachment 3 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 OSCC 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.

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

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

   Formula assumes 95% filter efficiency.

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

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

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

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

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

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

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

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

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

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

Attachment 3

## 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.

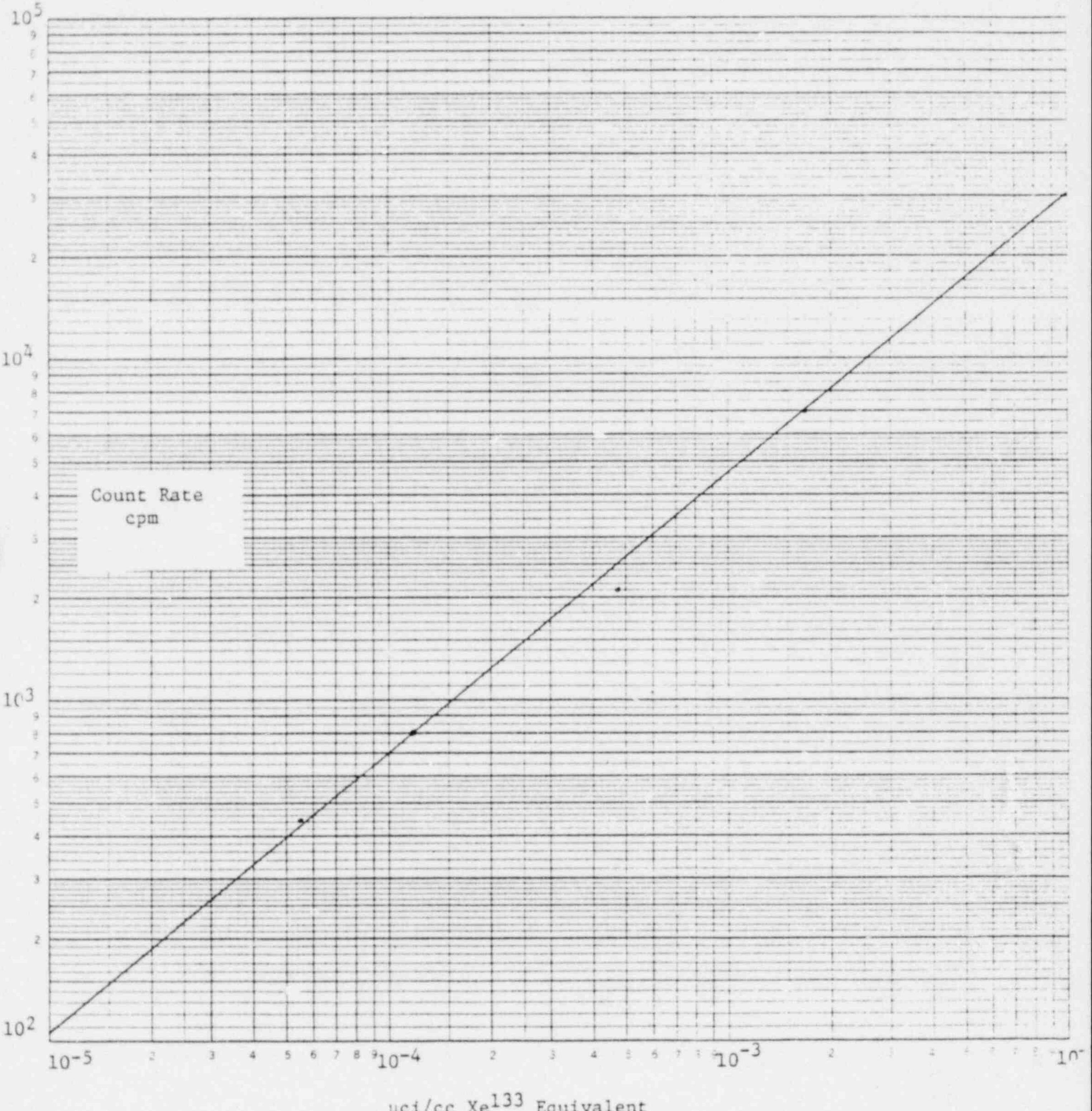
STEP 6 Shut the stop cocks on the gas chamber.

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.

FIGURE 1

GAS CHAMBER CALIBRATION CURVE

(100 cc S.S.)



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

# SAMPLE COORDINATION DURING AN EMERGENCY

A.2-408

Prepared by: [signature] ALARA Review: [signature] Date 2/16/82
Reviewed by: [signature] Q.A. Review: Rev. 0 Date 3/29/81
Operations Committee Final Review: Meeting Number 1066 Date 2/23/82
Approved by: [signature] Date 2-24-82
Op. Com. Results Review: Not Required Mtg. # 949 Date 3/26/81

## PURPOSE

The purpose of this procedure is to establish a contingency plan for coordinating and tracking samples during an emergency. This procedure allows for the appointment of a Sample Coordinator, establishes an Emergency Sample Log, and sets guidelines for sample priorities.

This procedure may be implemented entirely or in part, depending on the volume and priority of samples, and at the discretion of the Radiological Emergency Coordinator.

## CONDITIONS AND PREREQUISITES

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

B. Radiological conditions are such that a greater than normal volume of samples of differing priorities are being processed some of which may be sent to various offsite facilities for analysis.

C. The Radiological Emergency Coordinator implements this procedure in its entirety or in part.

D. The Radiological Emergency Coordinator or his representative has appointed a Sample Coordinator, if one was not predesignated. The Sample Coordinator should be familiar with this procedure and the normal chemistry and radiation protection sampling and analysis effort.

## PRECAUTIONS

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

B. Exposures to all personnel due to handling and transmitting samples should be maintained as low as is reasonably achievable.

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

PERSONNEL REQUIREMENTS

Sample Coordinator
Radiological Emergency Coordinator

DISCUSSION

The accident at Three Mile Island proved the necessity for a contingency plan for handling the many times greater than normal sample load which may result from a radiological emergency of significant consequence. The differing priorities of samples, the possible usage of offsite analysis facilities, and the potential for samples or sample results to be misplaced or misdirected in the post-accident confusion are additional considerations. This procedure provides for the establishment of a sample "clearing house" under such conditions. It is intended that this clearing house should (1) ensure the proper transmission and handling of samples, (2) ensure that samples are processed consistent with their assigned priorities, and (3) provide for tracking samples by means of documentation.

PROCEDURE

NOTE: The Radiological Emergency Coordinator may implement all or part of this procedure as conditions warrant.

STEP 1: (a) The Sample Coordinator shall initiate the Emergency Sample Log, Form 5790-408-1 (Attachment 3) and ensure that all samples are labeled with analysis priority and sample identification numbers

(b) The Sample Coordinator shall assign a sequential sample number. Attachment 1 of this procedure, "Guidelines for Assignment of Sample Identification Numbers", shall be consulted to accomplish this.

(c) The Sample Coordinator may request assignment of the appropriate quantities of the following resources as are necessary to carry out his/her duties:

1. Clerical support
2. Sample "runners"
3. Transportation as necessary and available

STEP 2: Sample Analysis Priority

The Sample Coordinator shall assign an analysis priority number to each sample if one has not already been assigned by the Radiological Emergency Coordinator or an appropriate member of the Technical Support Center (TSC) staff. Attachment 2 of this procedure, "Guidelines for Assignment of Sample Analysis Priority", shall be consulted to accomplish this.

NOTE: The priority number assigned a given sample shall govern the urgency with which the sample is logged and transmitted, analyzed and the results returned to the originator. Priority 1 samples should be logged, transmitted and analyzed immediately, and the results returned to the Chemistry Section Leader as expeditiously as possible.

STEP 3 The Sample Coordinator shall ensure that all sample and analysis data is properly logged on page 1 of the Emergency Sample Log Format, Attachment 3, and that the log is updated and completed as required.

STEP 4 The Sample Coordinator shall ensure that page 2 of the Emergency Sample Log Format, Attachment 3, is initiated, updated and completed with information of samples which are to be sent offsite for chemical or radiochemical analysis.

STEP 5: Sample Handling and Storage

The Sample Coordinator shall ensure that all samples are handled and stored in a manner consistent with ALARA considerations. Lead bricks should be used to construct a storage area for high activity samples.

CAUTION: Samples with high radiation levels shall be stored away from occupied areas.

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"

ATTACHMENTS

1. Guidelines for Assignment of Sample Identification Numbers

2. Guidelines for Assignment of Sample Analysis Priority

3. Example of Emergency Sample Log Format

## ATTACHMENT 1

## GUIDELINES FOR ASSIGNMENT OF SAMPLE IDENTIFICATION NUMBERS

The following prefixes shall be used along with a sequential number to identify each post-accident sample.

| PREFIX | DESCRIPTION |
|---|---|
| R | Rx Water/RHR |
| PC | Primary Containment |
| SC | Secondary Containment |
| S | Stack |
| V | Vent |
| E | Environmental (canal, river, sand, etc.) |

For example the first reactor water iodine sample obtained would be identified as "R-1". The following Rx water sample would be identified as "R-2". And if the next sample obtained was a vent particulate it would be identified as "V-1" if it were the first vent sample obtained.

ATTACHMENT 2

GUIDELINES FOR ASSIGNMENT OF SAMPLE ANALYSIS PRIORITY*

| PRIORITY | | EXAMPLE |
|---|---|---|
| 1 | a. | Post-accident assessment |
| | b. | Samples in support of accident mitigation operations or affecting personnel safety. |
| 2 | a. | Post-accident surveillance |
| | b. | Samples in support of recovery operations |
| 3 | a. | Routine surveillance |

* The Radiological Emergency Coordinator or his representative may assign analysis priority numbers as conditions dictate; however, the Sample Coordinator should attempt to follow these guidelines if the priority has not already been assigned.

WP/kk

ATTACHMENT 3

Form 5790-408-1
Revision 2, 01/22/82
Page 1 of 2

EMERGENCY SAMPLE LOG FORMAT

| SAMPLE NO. | SAMPLE ANALYSIS PRIORITY | SAMPLED TIME/DATE | SAMPLE DESCRIP. | ANALYSIS RESULTS | INITIALS |
|---|---|---|---|---|---|
| | | | | | |

NOTE: After ›is 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 5790-408-1
Revision 2, 01/22/82
Page 2 of 2

EMERGENCY SAMPLE LOG FORMAT (Cont'd.)

| SAMPLE NO. AND XMIT TO | XMIT TIME/DATE | INITIAL | RESULTS RECEIVED TIME/DATE | RESULTS XMIT TO | RESULTS XMIT TIME/DATE | INITIALS |
|---|---|---|---|---|---|---|
| | | | | | | |

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 | |

# OUT-OF-PLANT SURVEYS

Procedure A.2-410

## REVIEW AND APPROVAL

| | | | | | |
|---|---|---|---|---|---|
| Prepared by: | [signature] | ALARA Review: | CD Mathews | Date | 2/22/82 |
| Reviewed by: | CD Mathews | Q.A. Review: | Rev 0 | Date | 1-25-82 |
| Operations Committee Final Review: Meeting Number | | | 1065 | Date | 2/22/82 |
| Approved by: | | | [signature] | Date | 2-24-82 |
| Op. Com. Results Review: | Not Required | Mtg. # | 1056 | Date | 1-22-82 |

## 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

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.

This procedure is essentially identical to the corporate procedure for off-site surveys (EPIP 1.1.10), which sister plant personnel will use when the EOF is activated.

WP/dw

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.

The extent and degree of radiological monitoring following a release of radioactive material will depend on the nature, the physical or chemical form, and the radioisotopic composition of the release. The affected plant's personnel will provide information to the Radiological Emergency Coordinator concerning the areas to be monitored and the protective actions required for monitoring teams.

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.

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 OSC 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.

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. At area 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.

7. 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.

8. 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.

9. Frequently check personal dosimeters and request relief if cumulative exposure approaches administrative control levels.

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.

B. Equipping of Off-Site Survey Teams

1. Obtain an NSP vehicle, if available. 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.

2. 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.

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

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

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, ($7.07 \times 10^5$ 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

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:

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

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

cf = Correction factor for sample size is .3 for 4 inch paper counted with a 2 inch probe.

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

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

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

NOTE: 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.

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.

WP/dw

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

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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) | Model / Serial Number |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

1. Formulas listed on back
2. Remarks: ______________________________

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

______________________________
TECHNICIAN SIGNATURE

WP/dw

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 $2.83 \times 10^4$ = cubic centimeters.

   $Ft^3 \times 2.83E4 = cc$

3. $\mu Ci/cc$ = (particulate)

$$\frac{(\text{CPM (net)})\ (4.5\text{E-}7\ \mu\text{Ci/dpm})}{(\text{instrument efficiency})(\text{sx time} \times \text{cfm} \times 2.83 \times 10^4)(\text{CF})}$$

(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.

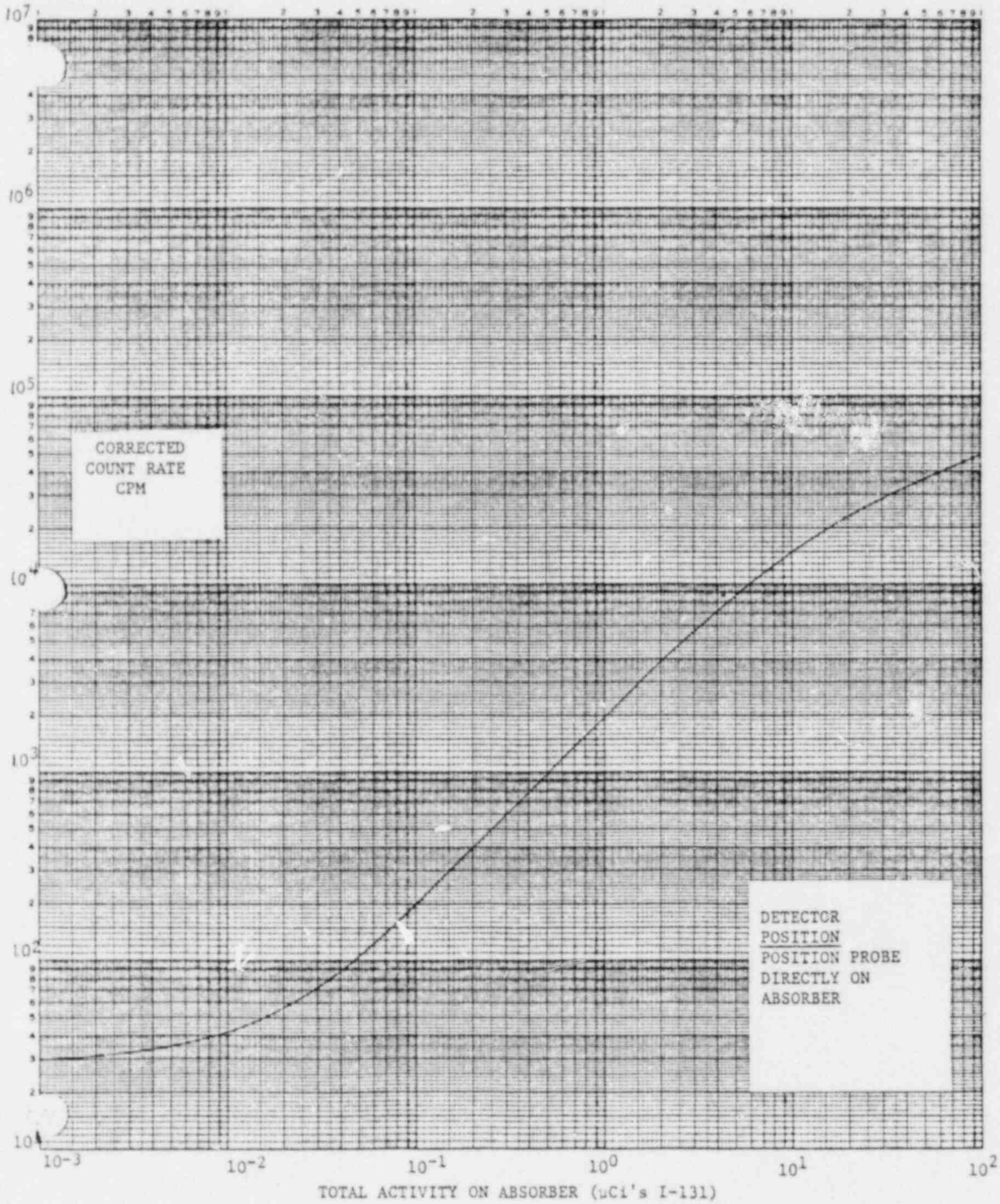
3. List factors affecting reading; height of probe, reading inside vehicle, etc.

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/dw

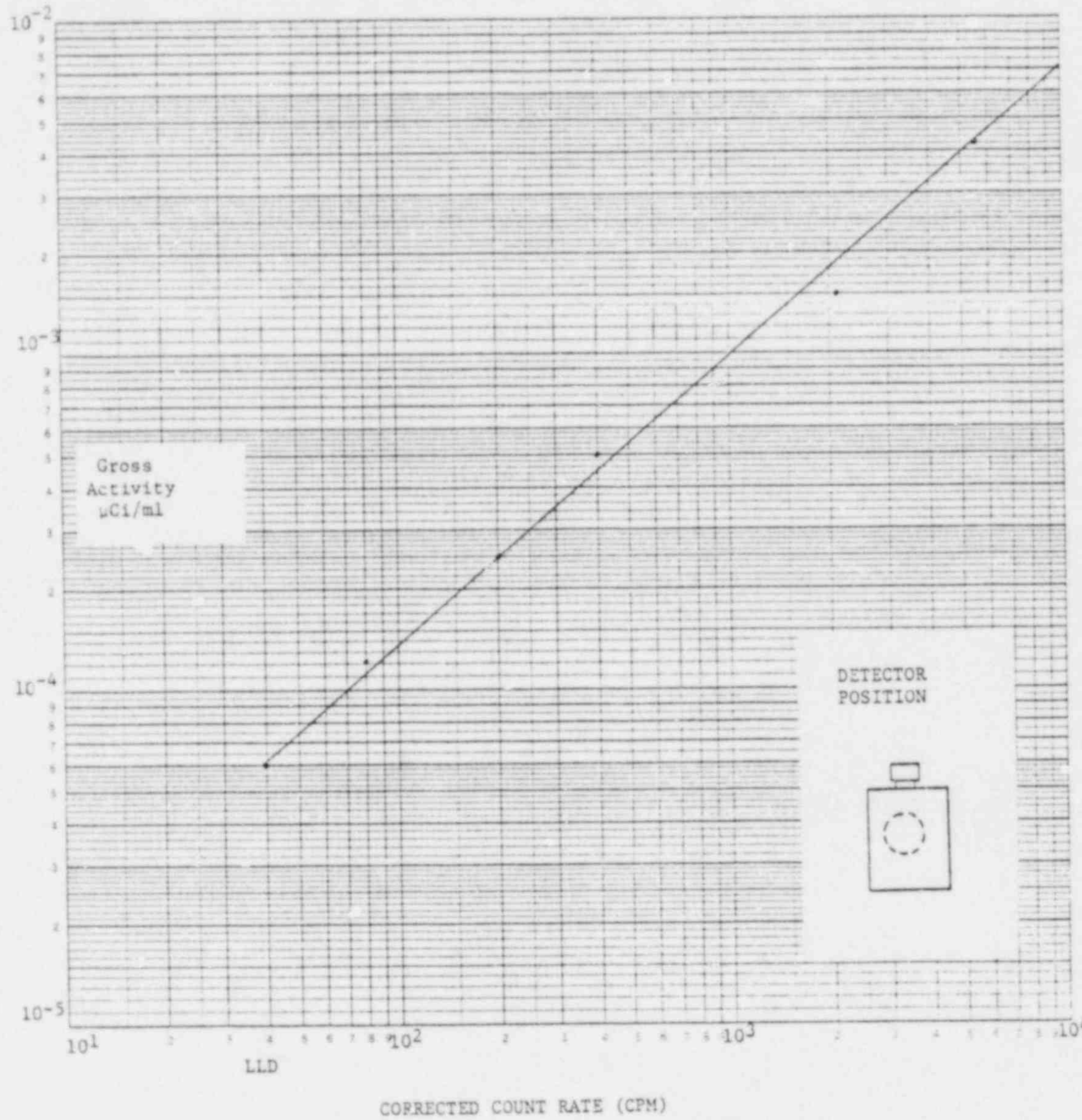
Attachment 2

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



Attachment 3

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

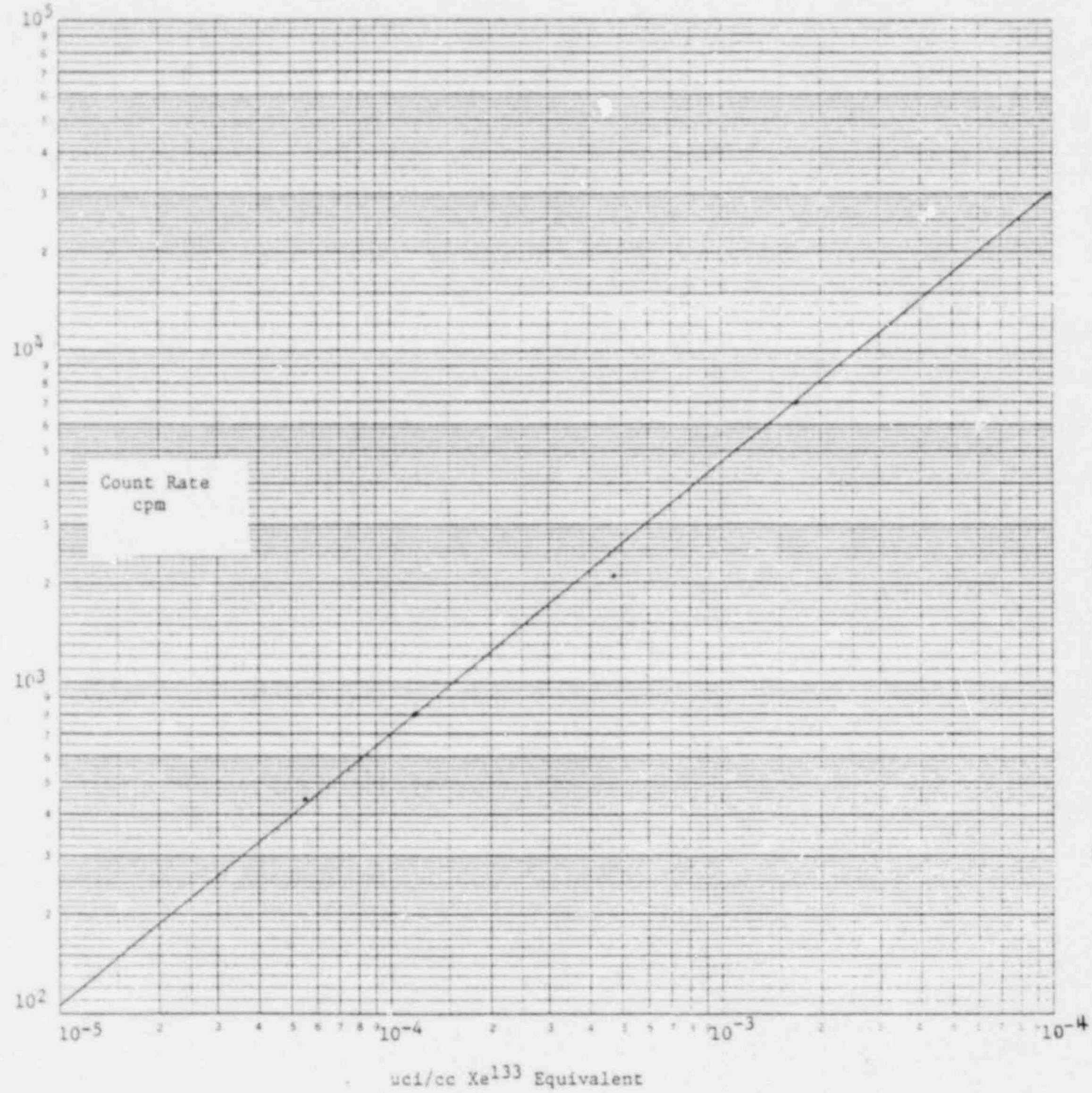



WP/dw

Attachment 4

## GAS CHAMBER CALIBRATION CURVE

(100 cc S.S.)




WP/dw

## 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 | 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 | 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

Attachment 5 (Cont'd.)

SURVEY TEAM EQUIPMENT PACKAGE

2. The Procedures Binder shall contain:

| | |
|---|---|
| 5 | Prairie Island Radiological Sampling Point Maps and related list of location descriptions. |
| 5 | Monticello Radiological Sampling Point Maps 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/dw

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/dw

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: MR Offerdahl ALARA Review: C. Mathews Date 1/20/82
Reviewed by: C. Mathews Q.A. Review: RL Scheinost Date 1/27/82
Operations Committee Final Review: Meeting Number 1064 Date 2/18/82
Approved by: FL Fey Date 2-22-82
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 and/or OSC 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.

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

B. OSC 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.

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 0, 02/19/82
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: __________ ______________________________
   RPC/OSC Coordinator

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

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

| PROCEDURE | PROCEDURE TITLE | REVISION NUMBER |
|---|---|---|
| 000 Series | Organization | |
| A.2-001 | Emergency Organization | 2 |
| 100 Series | Activation | |
| A.2-101 | Classification of Emergencies | 2 |
| A.2-102 | Notification of an Unusual Event | 2 |
| A.2-103 | Alert | 3 |
| A.2-104 | Site Area Emergency | 2 |
| A.2-105 | General Emergency | 2 |
| A.2-106 | Activation of Technical Support Center | 2 |
| A.2-107 | Activation of Operations Support Center | 2 |
| 200 Series | Assessment | |
| A.2-201 | On-Site Monitoring and Protective Action Criteria | 1 |
| A.2-202 | Off-Site Monitoring Durng an Emergency | 1 |
| A.2-204 | Off-Site Protective Action Recommendations | 1 |
| A.2-205 | Personnel Accountability-Control Room/TSC | 1 |
| A.2-207 | Sampling Priorities During an Emergency | 0 |
| A.2-208 | Core Damage Assessment | 0 |
| 300 Series | Protective Actions | |
| A.2-301 | Emergency Evacuation | 1 |
| A.2-302 | Assembly Point Activation | 1 |
| A.2-303 | Search and Rescue | 1 |
| A.2-304 | Thyroid Prophylaxis | 1 |
| 400 Series | Radiological Surveillance and Control | |
| A.2-401 | Emergency Exposure Control | 1 |
| A.2-402 | Contamination Control | 0 |
| A.2-403 | Emergency Surveys | 2 |
| A.2-404 | Emergency Sampling and Analysis | 1 |
| A.2-405 | Release Rate Determination | 1 |
| A.2-406 | Off-Site Dose Projection | 3 |
| A.2-407 | Personnel and Vehicle Monitoring | 1 |
| A.2-408 | Sample Coordination During an Emergency | 1 |
| A.2-409 | Self-Contained Breathing Apparatus (SCBA) Use During An Emergency | 0 |
| A.2-410 | Out-of-Plant Surveys | 1 |
| A.2-411 | Establishment of Secondary Access Control | 0 |
| A.2-412 | Mobile Lab Counting Procedure | 0 |
| 500 Series | Communications and Documentation | |
| A.2-501 | Communication During an Emergency | 0 |
| A.2-502 | Recordkeeping During an Emergency | 0 |
| A.2-503 | Emergency Reports and Documentation | 0 |

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

| PROCEDURE | PROCEDURE TITLE | REVISION NUMBER |
|---|---|---|
| 600 Series | Re-Entry and Recovery | |
| A.2-601 | Re-Entry | 0 |
| A.2-603 | Repair and Corrective Action | 1 |
| 700 Series | | |
| A.2-702 | Response to an Emergency at Prairie Island | 1 |

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

# CLASSIFICATION OF EMERGENCIES

A.2-101

| | | | | | |
|---|---|---|---|---|---|
| Prepared by: | CD Mathiasen | ALARA Review: | Revision 0 | Date | 03/31/81 |
| Reviewed by: | J Windschill | Q.A. Review: | Revision 0 | Date | 03/31/81 |
| Operations Committee Final Review: Meeting Number | | | 1068 | Date | 3/1/82 |
| Approved by: | | | F L Frey | Date | 3-1-82 |
| Op. Com. Results Review: | Not Required | Mtg. # | 946 | Date | 03/20/81 |

## PURPOSE

The purpose of this procedure is to specify conditions or groups of conditions that indicate an emergency exists and the actions to be taken by the Shift Supervisor or Control Room Operators to verify and classify the type of emergency condition.

## CONDITIONS AND PREREQUISITES

An off-normal condition corresponding to one of the initiating events described in the appendices of this procedure is occurring or has occurred.

## PRECAUTIONS

A. There are many indications of an emergency condition that may occur either individually, in group events or sequentially. The operator or Shift Supervisor must be careful not to rely on any one indication as being absolutely indicative of an emergency condition. Although the operator should believe indications and take action based on those indications, he shall attempt to verify indications by checking secondary or coincident indicators. Continued surveillance and assessment of plant conditions is necessary to ensure that the emergency classification is appropriately revised as conditions change, or as more definitive information is obtained.

B. None of the actions specified in the EPIP's shall take precedence over the actions that are necessary to comply with Technical Specifications.

## ORGANIZATION

A. Overall Responsibility - Emergency Director

B. In Charge

Control Room - Shift Supervisor

C. Assistance

Reactor Operator
Shift Technical Advisor when assigned
Shift Emergency Communicator

DISCUSSION

A. Definitions

1. Emergency Condition - An occurrence, or combination of events and indications that fall into one of the following classifications:

   a. Notification of Unusual Event

      Unusual events are in process or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring off-site response or monitoring are expected unless further degradation of safety systems occurs.

   b. ALERT

      Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety to the plant. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

   c. SITE AREA EMERGENCY

      Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to exceed EPA Protective Action Guideline exposure levels except near site boundary.

   d. GENERAL EMERGENCY

      Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels off-site for more than the immediate site area.

2. Emergency Action Levels (EAL) - Numerical or qualitative values for the operational or radiological parameters, (radiological dose rates; water borne or surface deposited concentrations of radioactivity; specific instrument indications or changes in indications) that may be used as threshholds for initiating procedures or actions to assess and verify plant conditions and may require initiating specific emergency procedures as designated by a particular class of emergency.

B. Recognition

Attached to this procedure is Attachment 2, Event Recognition Guidelines (1-28). These guidelines identify the four emergency classifications, the possible initiating event(s), emergency action levels for each classification, and, where applicable, specific instruments and indications to be used to detect and classify an emergency. The identified instruments and alarms are a representative listing of various instruments that may be used to verify an emergency condition. There are many process variables referred to in the guidelines.

The instruments, indications, or alarms listed for any particular event are not necessarily a complete list of all those that will show abnormal indications or be useful in classifying the event. There is typically more than one instrument or instrument channel that monitors a specific parameter. The redundant channels and coincident indicators should all be used to verify the emergency condition.

The emergency action levels specified in the guidelines do not necessitate initiation of any particular phase of the emergency plan but rather signify a need for assessment and classification of conditions. In many cases, the proper classification will be immediately apparent from in-plant instrumentation. In others, further assessment is necessary to determine the applicable emergency classification.

The plant operating staff should consider the effect that combinations of initiating events have, that if taken individually would constitute a lower emergency classification but collectively may exceed the criteria for a higher classification.

In the Unusual Event classification, numerous EALs are related to limiting conditions for operation (LCOs) as specified in Technical Specifications. In these cases, the EAL is not considered exceeded and an emergency condition does not exist if the appropriate corrective action for exceeding the LCO is taken. The EAL is exceeded and an Unusual Event has occurred if the event results in a forced shutdown by the LCO.

C. Computer Aid For Classification

Part of the TSC equipment is an APPLE Computer. The computer is programmed to parallel this procedure and may be used for event classification. Use of the computer, however, does not remove the requirement for complying with the steps of this procedure. The result of the APPLE software should be verified by locating the appropriate Guideline(s) in this procedure.

NOTE: In situations where timeliness is critical, the computer should not be used because of the time it adds to the classification process.

RESPONSIBILITIES

A. Emergency Director (Shift Supervisor)

1. Prior to EOF activation, the Emergency Director shall declare the appropriate emergency condition as soon as the event has been indicated and verified.

   After EOF activation, the Emergency Director shall notify the Emergency Manager when change in classification is indicated and verified.

2. After the emergency condition has been declared, the Emergency Director is responsible for implementing the actions as specified in the following procedures:

   a. Notification of an Unusual Event, A.2-102
   b. Alert, A.2-103
   c. Site Area Emergency, A.2-104
   d. General Emergency, A.2-105

B. Control Room Operator

1. The control room operator shall immediately notify the Shift Supervisor of any events that may be classified as emergency conditions.

2. The operator shall attempt to verify any indications.

3. The operator shall assist the Shift Supervisor in assessing the indicatic and determining the classification of emergency.

4. The operator shall take immediate actions as dictated by plant procedures and his general knowledge to control the event and place the plant in a safe condition.

C. Shift Technical Advisor

The Shift Technical Advisor shall advise the Shift Supervisor in identifying the event.

D. Shift Emergency Communicator

The Shift Emergency Communicator shall assist the Shift Supervisor in event classification.

PROCEDURE

STEP 1: Verify the initial indication by comparing the indication to redundant instrument channels or to related parameters, physical observations, and field reports, as applicable. If not already present, notify the STA and/or SEC as appropriate. Initiate Form 5790-101-1, EMERGENCY CLASSIFICATION CHECKLIST (Attachment 3).

STA: Pager
House , Extension, or

SEC: Pager
House Extension or

STEP 2: Use Attachment 1 to identify any Guidelines applicable to the initiating condition.

STEP 3: Locate the applicable guideline sheets in Attachment 2.

STEP 4: Determine the appropriate emergency classification by comparing the verified plant parameters to the EALs for each emergency condition. If more than one guideline is applicable to the initiating condition, use the guideline which indicates the most severe classification.

STEP 5 If the EOF is not activated, declare the appropriate emergency and implement the corresponding response procedure. If the EOF is activated, contact the Emergency Manager for consultation on whether or not to change the emergency classification. If a change is to be made, implement the corresponding procedure. (The Emergency Manager will declare the new classification.)

a. Notification of Unusual Event, A.2-102
b. Alert, A.2-103
c. Site Area Emergency, A.2-104
d. General Emergency, A.2-105

STEP 6: Continue to assess the events and, if necessary, the emergency classification, as more definitive information becomes available or if plant conditions change significantly.

REFERENCES

1. NSP Monticello Nuclear Generating Plant, Plant Emergency Plan

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

3. Title 10, Code of Federal Regulation Part 50, Appendix E

ATTACHMENTS

1. Attachment 1, List of Initating Condition Categories

2. Attachment 2, Guidelines for Classification of Emergency Conditions

3. Example of Emergency Classification Checklist

Attachment 1
List of Initiating Condition Categories

| Initiating Condition | Guideline |
|---|---|
| Radioactive effluents-high release rate or unmonitored --- | 1 |
| Increase in plant radiation levels ---------------------- | 2 |
| Release or loss of control of radioactive material within plant ---------------------------------------------------- | 2 |
| Fuel handling accident ---------------------------------- | 2 |
| Reactor pressure high ----------------------------------- | 3 |
| Reactor coolant leak ------------------------------------ | 4 |
| Main steam line break ----------------------------------- | 5 |
| Fuel cladding degradation ------------------------------- | 6 |
| High coolant or off-gas activity ------------------------ | 6 |
| Safety relief valve failure ----------------------------- | 7 |
| ECCS initiation ----------------------------------------- | 8 |
| Reactor coolant pump seizure ---------------------------- | 9 |
| Loss of primary containment ----------------------------- | 10 |
| Loss of engineered safety or fire protection features ---- | 11 |
| Failure of RPS to initiate or complete scram ------------ | 12 |
| Loss of plant control/safety systems -------------------- | 13 |
| Loss of indicators or alarms (annunciators) ------------- | 14 |
| Control room evacuation --------------------------------- | 15 |
| Toxic or flammable gas ---------------------------------- | 16 |
| Security compromise ------------------------------------- | 17 |
| Loss of AC power ---------------------------------------- | 18 |
| Loss of DC power ---------------------------------------- | 19 |
| Tornado or sustained winds ------------------------------ | 20 |
| Flood or low water -------------------------------------- | 21 |
| Earthquake ---------------------------------------------- | 22 |
| Fire ---------------------------------------------------- | 23 |
| Explosion ----------------------------------------------- | 24 |
| Aircraft or missiles ------------------------------------ | 25 |
| Train accident ------------------------------------------ | 26 |

Attachment 1 (Cont'd.)

List of Initiating Condition Categories


| Initiating Condition | Guideline |
|---|---|
| Contaminated injury | 26 |
| Turbine failure | 26 |
| FSAR transients | 27 |
| General emergency | 28 |
| Other plant conditions | 29 |
| Spent fuel, major damage to | 30 |


WP/dw

ATTACHMENT 2

Guideline 1 RADIOACTIVE EFFLUENT

UNUSUAL EVENT

Radiological effluent technical specification limits exceeded.

EAL's

1. Discharge Canal Monitor exceeds 20 cps.

   (High alarm annunciated on C04-A-22, DISCHARGE CANAL RADIATION, and recorded by C02-17.358)

   or

2. Unmonitored liquid release to river which exceeds 10CFR20 App. B limits.

   or

3. Stack Effluent Monitor (Ch A or B) exceeds 90,000 μCi/sec.

   (Hi-Hi alarm annunciated on C259-A-1, STACK EFFLUENT HI-HI RADIATION; recorded on C257 and C258 (RR 7858A and RR 7858B), STACK NOBLE GAS RELEASE RATE; and alarmed by computer point D-061.)

   or

4. Reactor Building Vent Noble Gas Monitor exceeds 1100 cps or 28,000 μCi/sec. (Recorded on C2-NR-7391)

   or

5. Unmonitored gaseous release to the atmosphere which is estimated or suspected to exceed Appendix B Tech. Spec. limits.

ALERT

Radiological effluents greater than 10 times technical specification instantaneous limits (an instantaneous rate which, if continued over 2 hours, would result in about 1 mR at the site boundary under average meteorological conditions).

EAL's

1. Discharge Canal Monitor exceeds 200 cps.

   or

ATTACHMENT 2 (Cont'd.)

Guideline 1 (Cont'd.)

RADIOACTIVE EFFLUENT

2. Unmonitored liquid release to river which is 10 times the limits in 10CFR20 Appendix B.

or

3. Stack Effluent Monitor (Ch A or B) exceeds 9.0E+5 μCi/sec.

or

4. Reactor Building Vent Noble Gas Monitor exceeds 10,000 cps or 2.8E+5 μCi/sec.

or

5. Unmonitored gaseous release to the atmosphere which is estimated or expected to exceed 10 times Appendix B Tech Spec limits.

SITE AREA

a. Effluent monitors detect levels corresponding to greater than 50 mR/hr for ½ hour or greater than 500 mR/hr Whole Body for two minutes (or five times these levels to the thyroid) at the site boundary for adverse meteorology,

b. These dose rates are projected based on other plant parameters (e.g., radiation level in containment with leak rate appropriate for existing containment pressure) or are measured in the environs; or

c. EPA Protective Action Guidelines are projected to be exceeded outside the Site Boundary.

EAL's

1. Stack Effluent Monitor (Ch A or B) exceeds 9.0E+5 μCi/sec for 30 minutes

or

2. Stack Effluent Monitor (Ch A or B) exceeds 9.0E+6 μCi/sec for 2 minutes

or

3. Stack release rate of radioiodines exceeds 1.7E+4 μCi/sec for 30 minutes

or

4. Stack release rate of radioiodines exceeds 1.7E+5 μCi/sec for 2 minutes

or

5. RBV Noble Gas Monitor exceeds 840 cps or 2.1E+4 μCi/sec for 30 minutes

ATTACHMENT 2 (Cont'd.)

Guideline 1 (Cont'd.) RADIOACTIVE EFFLUENT

or

6. RBV Noble Gas Monitor exceeds 8400 cps or 2.1E+5 μCi/sec for 2 minutes.

or

7. RBV release rate of radioiodines exceeds 2100 μCi/sec for 30 minutes

or

8. RBV release rate of radioiodines exceeds 2.1E+4 μCi/sec for 2 minutes

or

9. Whole body doses greater than 1 Rem or thyroid doses of greater than 5 Rem are projected beyond the site boundary.

or

10. Containment Radiation Monitor reading indicates above the .01% curve when plotted versus time after shutdown on the graph shown in Figure 1.

or

11. Measured W.B. dose rates at site boundary or beyond exceed 50 mR/hr for 30 minutes or 500 mR/hr for 2 minutes

or

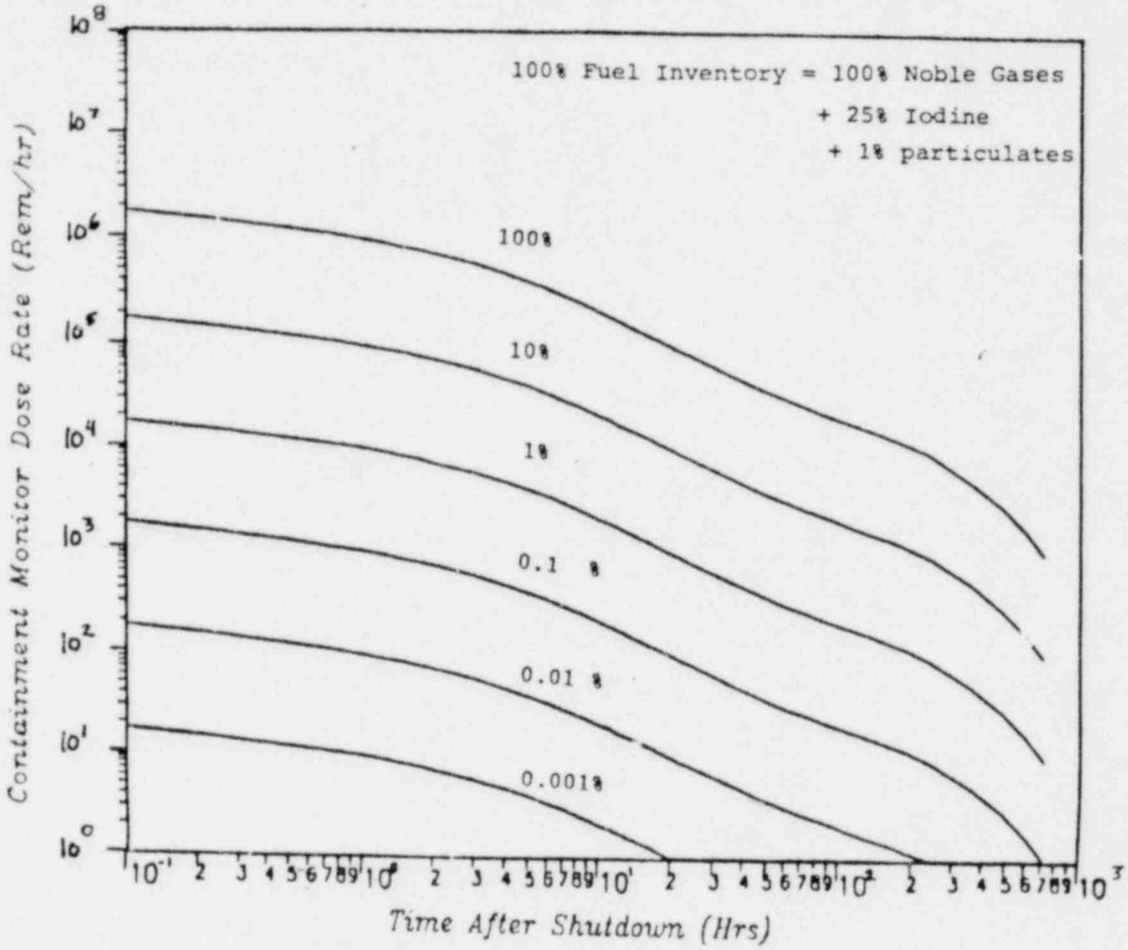
12. Radioiodine concentrations measured at site boundary or beyond exceed 7.0E-8 μCi/cc for 30 minutes or 7.0E-7 μCi/cc for 2 minutes.

GENERAL

As specified in Guideline 28.

FIGURE 1

Percent of Fuel Inventory Airborne in the Containment




| % Fuel Inventory Released | Approximate Source and Damage Estimate |
|---|---|
| 100. | 100% TID-14844, 100% fuel damage, potential core melt. |
| 50. | 50% TID noble gases, TMI source. |
| 10. | 10% TID, 100% NRC gap activity, total clad failure, partial core uncovered. |
| 3. | 3% TID, 100% WASH-1400 gap activity, major clad failure. |
| 1. | 1% TID, 10% NRC gap, Max. 10% clad failure. |
| .1 | .1% TID, 1% NRC gap, 1% clad failure, local heating of 5-10 fuel assemblies. |
| .01 | .01% TID, .1% NRC gap, clad failure of 3/4 fuel element (36 rods). |
| $10^{-3}$ | .01% NRC gap, clad failure of a few rods. |
| $10^{-4}$ | 100% coolant release with spiking. |
| $5x10^{-6}$ | 100% coolant inventory release. |
| $10^{-6}$ | Upper range of normal airborne noble gas activity in containment. |

WP/dw

ATTACHMENT 2 (Cont'd.)

Guideline 2 IN-PLANT RADIATION LEVELS

UNUSUAL EVENT

Not Applicable

ALERT

Severe degradation in control of radioactive materials.

EAL

1. Increase by factor of 1000 in plant radiation levels as indicated by Area Radiation Monitoring System:

| Panel | | Description | Normal | EAL |
|---|---|---|---|---|
| C-11 | A-1 | Refuel Floor Low Range | 2 | Full scale |
| C-11 | A-2 | Refuel Floor High Range | 5 | 5000 |
| C-11 | A-3 | Refuel Floor S.W. Stairway | 1 | 1000 |
| C-11 | A-4 | New Fuel Storage | 20 | Full scale |
| C-11 | A-5 | Fuel Pool Skimmer Tk Area | 20 | Full scale |
| C-11 | A-6 | 1001' Rx South | 3 | Full scale |
| C-11 | A-7 | 985' Sample Hood | 5 | Full scale |
| C-11 | A-8 | Rx Cleanup System Access | 0.25 | 250 |
| C-11 | A-9 | 962' Rx Tool Storage Area | 0.8 | 800 |
| C-11 | A-10 | East CRD Module Area | 7 | Full scale |
| C-11 | A-11 | West CRD Module Area | 3 | Full scale |
| C-11 | A-12 | TIP Drive Area | 2 | Full scale |
| C-11 | A-13 | TIP Cubicle | 30 | Full scale |
| C-11 | A-14 | HPCI Turbine Area | 2 | Full scale |
| C-11 | A-15 | Rx. Bldg Drain Tk Area | 3 | Full scale |
| C-11 | A-16 | RCIC Pump Area | 1 | 1000 |
| C-11 | A-17 | East C.S. and RHR Area | 10 | Fullscale |
| C-11 | A-18 | West C.S. and RHR Area | 5 | Fullscale |
| C-11 | A-19 | Hot Lab | 0.25 | 250 |
| C-11 | A-20 | Control Room Low Range | 0.02 | 20 |

ATTACHMENT 2 (Cont'd.)

Guideline 2 (Cont'd.)

IN-PLANT RADIATION LEVEL

| Panel | | Description | Normal | EAL |
|---|---|---|---|---|
| C-11 | A-21 | Control Room High Range | 3 | 3000 |
| C-11 | B-1 | Turbine Operating Floor | 20 | Fullscale |
| C-11 | B-2 | Turbine Front Standard | 10 | Fullscale |
| C-11 | B-3 | Cond Demin Operating Area | 1 | 1000 |
| C-11 | B-4 | Mechanical Vacuum Pump Rm | 9 | Fullscale |
| C-11 | B-5 | Feedwater Pump Area | 1 | 1000 |
| C-11 | C-1 | Radwaste Control Room | 0.2 | 200 |
| C-11 | C-2 | Sample Tank Area | 2 | Fullscale |
| C-11 | C-3 | Conveyor Operating Area | 0.2 | 200 |
| C-11 | D-1 | Hot Machine Shop | 0.2 | 200 |
| C-252 | E-1 | Recombiner Instrument Room | 2 | Fullscale |
| C-252 | E-2 | Recombiner Pump Room | 2 | Fullscale |
| C-252 | F-1 | Offgas Storage Foyer | 0.1 | 100 |
| C-11 | F-2 | Offgas Storage Foyer High Range | <100 | 100 |
| C-257 & C-258 | | Containment Radiation Monitor | | 50 R/hr |

NOTE: EAL's shown as FULLSCALE indicate that an increase by a factor of 1000 is beyond the range of the particular monitor. In these cases, a fullscale reading combined with the Shift Supervisor's concurrence, shall meet the criteria for the ALERT classification.

or

2. Direct measurement of radiation levels corresponding to an increase by a factor of 1000.

SITE AREA

Not applicable

GENERAL

As specified in Guideline 28.

WP/dw

ATTACHMENT 2 (Cont'd.)

Guideline 3 — REACTOR PRESSURE HIGH

UNUSUAL EVENT

1. Reactor Pressure exceeds safety limit (1335 psig).

| Instrument | Description | EAL |
|---|---|---|
| C05-FPR 6/97 | Reactor Wide Range Pressure Recorder | 1200 |
| C05-6.90 A/B | Reactor Pressure Indicators | 1200 |

Verify 1335 psig exceeded by checking pressure indicator PI 2-3-60B on C56.

2. Alert

Not Applicable

3. Site Area Emergency

Not Applicable

4. General Emergency

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 4

REACTOR COOLANT LEAK

NOTE: There are no instruments that directly measure reactor coolant leakage. However, there are many instruments that provide indications that leakage exists. Based on coincident indicators the operators must determine what, if any, would be absolute indication of leakage. The following indications and alarms may be used by operators to assess the possibility of coolant leakage.

| Indicator/Alarm | Description |
|---|---|
| C03-LR7409 | Drywell Floor Drain Tank Recorder (Red Pen) |
| C03-LR7409 | Drywell Equipment Drain Tank Recorder (Green Pen) |
| C04-FR2544 | Drywell Floor Drain Pump Flow Recorder (Black Pen) |
| C04-FR2544 | Drywell Equipment Drain Pump Flow Recorder (Red Pen) |
| C04-FQ2543 | Drywell Floor Drain Sump Totalizer |
| C04-FQ2544 | Drywell Equipment Drain Sump Totalizer |
| C21-TR2166 | Safety Relief Valve Temperature Recorder |
| C04-B-13 | Drywell Equipment Drain Leak Rate High Alarm |
| C04-B-18 | Drywell Equipment Drain Leak Rate Change High Alarm |
| C04-B-02 | Drywell Equipment Drain Sump High Level Alarm |
| C04-B-17 | Drywell Floor Drain Sump High Level Alarm |
| C04-B-23 | Drywell Floor Drain Leak Rate High Alarm |
| C04-B-28 | Drywell Floor Drain Leak Rate Change High Alarm |
| C03-A-09 | Auto Blowdown Relief Leaking Alarm |

ATTACHMENT 2 (Cont'd.)

Guideline 4 (Cont'd.)

REACTOR COOLANT LEAK

UNUSUAL EVENT

Primary system leak rate exceeds technical specification.

EAL's

1. Unidentified leakage calculated from C4-FQ2543 or by computer point D-122, Floor Drain Sump Rate of Change, exceeds 5 gpm

   OR

2. Total leakage calculated from C4-FQ2543 and FQ-2544 or from computer points D-120, Equipment Drain Sump Rate of Change, and D-122, Floor Drain Sump Rate of Change, exceeds 25 gpm.

ALERT

Primary coolant leak rate greater than 50 gpm.

EAL

1. Total leakage calculated from C4-FQ2543 and FQ-2544 or from computer points D-120, Equipment Drain Sump Rate of Change, D-122, Floor Drain Sump Rate of Change, exceeds 50 gpm.

SITE AREA

Known loss of coolant accident greater than makeup pump capacity.

EAL's

1 Reactor water level (C05-2.3.85 A/B) decreasing below 1 foot above active fuel (-114 inches)

GENERAL

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 5 MAIN STEAMLINE BREAK

UNUSUAL EVENT

Not Applicable

ALERT

Steamline break with MSIV malfunction causing leakage to secondary containment.

EAL's

1. Shift Supervisor's opinion that MSIV is malfunctioning or continuing steam flow with evidence that steam line break is outside of primary containment (e.g. visual observation, radiation or temperature),

and

2a. Annunciator alarms on MAIN STEAM LINE HIGH FLOW A/B (C05-A-25/26) and RX WATER LEVEL HI/LO (C05-B-24),

or

2b. Annunciator alarm MAIN STEAM TUNNEL HIGH TEMPERATURE A/B (C05-A17/18)

or

2c. Annunciator alarm MAIN STEAM LINE LEAKAGE (C05-B-32).

SITE AREA

Main steam line break with failure of MSIV's to isolate leak and causing leakage outside of secondary containment.

EAL's

1. Shift Supervisor's opinion that MSIV is malfunctioning or continuing steam flow with evidence that steam line break is outside of primary containment

and

2a. Annunciator alarms on MAIN STEAM LINE HIGH FLOW A/B (C05-A-25/26) and RX WATER LEVEL HI/LO (C05-B-24)

or

ATTACHMENT 2 (Cont'd.)

Guideline 5 (Cont'd.) MAIN STEAMLINE BREAK

2b. Annunciator alarm on MAIN STEAM TUNNEL HIGH TEMPERATURE (C-5-A-17/18)

or

2c. Annunciator alarm on MAIN STEAM LINE LEAKAGE (C05-B-32)

and

3a. Annunciator alarm on TURBINE BUILDING HIGH RADIATION ALARM (C04-A-21)

or

3b. High airborne radioactive material levels in Turbine Bldg. indicated by air monitors or direct measurement

or

3c. Visual observation that blow-out panels between steam chase and turbine building have been ruptured.

GENERAL

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 6

FUEL CLADDING DEGRADATION

UNUSUAL EVENT

Fuel damage indication

EAL's

1. Offgas Radiation Monitor exceeds 20,000 mR/hr
   or
2. Offgas Radiation Monitor increases by 4000 mR/hr within 30 minutes at steady power
   or
3. Reactor coolant I-131 dose equivalent exceeds 5 μCi/gram as determined by sample and analysis.

ALERT

Severe loss of fuel cladding.

a. High offgas at air ejector monitor (greater than 5 ci/sec; corresponding to 16 isotopes decayed 30 minutes)
   or
b. Very high coolant activity sample (e.g., 300 μCi/cc equivalent of I-131)

EAL's

1. Offgas Radiation Monitor exceeds 200,000 mR/hr
   or
2. Reactor coolant I-131 dose equivalent exceeds 300 μCi/gm as determined by sample and analysis.
   or
3. Main Steam Line monitor initiates trip due to high radiation.
   NOTE: Resin intrusion may cause high radiation without fuel cladding damage.

SITE AREA

Degraded Core with possible loss of coolable geometry

EAL's

1. More than 1/3 of core uncovered as indicated by reactor water level below -174 inches and
2. a. Reactor coolant I-131 dose equivalent exceeds 3000 μCi/gm as determined by sample and analysis.
      or
   b. Inability to insert control rods fully
      or
   c. Inability to position SRM's or IRM's within core.

GENERAL

As specified in Guideline 28.

WP/dw

ATTACHMENT 2 (Cont'd.)

Guideline 7 SAFETY RELIEF VALVE FAILURE

## UNUSUAL EVENT

1. Safety Relief Valve Open or Leaking

| Indication/Alarms | Description |
|---|---|
| C02-A-09 | Auto Blowdown Relief Valve Leakage Alarm |
| C21-TR 2-166 | Safety and Relief Valve Temperature Recorder (10 points) |
| C05-A-54 | SRV Open Alarm |

2. Safety Relief Valve Fails to Operate

   Safety valve fails to operate at setpoint. Valve is declared inoperable.

## ALERT

Not applicable

## SITE AREA EMERGENCY

Not applicable

## GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 8

ECCS INITIATION

UNUSUAL EVENT

Valid Emergency Core Cooling System (ECCS) initiated and discharge to vessel.

| Instrument/Alarm | Description |
|---|---|
| C05-A-9/10 | Reactor Vessel Low/Low Water Level Ch A/B Alarm |
| C05-B-28 | Drywell High Pressure Trip Alarm |
| C03-A-33 | High Drywell Pressure Signal A/B/C/D Seal-In Alarm |
| C03-B-53 | High Drywell Pressure Alarm |
| C03-10.139A/B | RHR Flow A/B Indicator |
| C03-14.50A/B | Core Spray Flow A/B Indicator |
| C03-FIC 23-108 | HPCI Flow Indicator |

ALERT

Not Applicable

SITE AREA EMERGENCY

Not Applicable

GENERAL EMERGENCY

See Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 9 RECIRC PUMP SEIZURE

Recirc pump impeller seizure leading to fuel failure. See Guideline 6 for classification and action levels.

| Indication/Alarm | Description |
|---|---|
| C04-B-31 | Recirc Drive Motor Trip Alarm |
| C04-B-26 | Recirc Drive Motor OL Alarm |
| C04-B-06 | Recirc Pump Motor A Locked Rotor Trip Alarm |
| C04-B-01 | Recirc A Lockout Alarm |
| C04-B-11 | Recirc Generator A Auxiliary Lockout Alarm |
| C04-B-07 | Recirc Pump Motor B Locked Rotor Trip Alarm |
| C04-B-2 | Recirc B Lockout Alarm |
| C04-B-27 | Recirc Drive Motor B OL Alarm |
| C04-B-28 | Recirc Drive Motor B Trip Alarm |
| C04-B-12 | Recirc Generator B Auxiliary Lockout Alarm |

ATTACHMENT 2 (Cont'd.)

Guideline 10

LOSS OF CONTAINMENT INTEGRITY

UNUSUAL EVENT

Loss of primary containment integrity requiring shutdown in accordance with Technical Specifications.

| Instrument/Alarm | Description |
|---|---|
| C04-PR2994 | Drywell and Suppression Chamber Pressure |
| C04-DP1 C/D | Drywell to Torus Differential Pressure Indicator |

ALERT

Not Applicable

SITE AREA EMERGENCY

Not Applicable

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 11

LOSS OF ESF OR
FIRE PROTECTION
SYSTEM

UNUSUAL EVENT

1. Loss of Engineered Safety Features (ESF) or fire protection system requiring shutdown by Technical Specifications. The following is a list of operable ESF and fire protection subsystems necessary to meet LCO:

   Core Spray System

   Low Pressure Coolant Injection Subsystem

   Containment Cooling Capability
   (RHR Service Water System)

   High Pressure Coolant Injection System

   Automatic Pressure Relief

   Diesel Generator System

   Fire Protection System

   Standby Liquid Control System

ALERT

Not Applicable

SITE AREA EMERGENCY

Not Applicable

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 12

REACTOR PROTECTION SYSTEM FAILURE

UNUSUAL EVENT

Not Applicable

ALERT

Failure of the reactor protection system to initiate and complete a scram which brings the reactor subcritical.

EAL's

Valid Scram Signal

and

Neutron count rate indicates reactor critical.

SITE AREA EMERGENCY

Transient requiring operation of shutdown systems with failure to scram (continued power operation but no core damage immediately evident.)

EAL's

Failure to bring reactor subcritical with control rods

and

Failure of the standby liquid control system

and

Shift Supervisor's opinion that a transient is in progress

and

No indication of core damage (if core damage indicated, call a general emergency)

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 13

LOSS OF PLANT SHUTDOWN CAPABILITY

UNUSUAL EVENT

Not Applicable

ALERT

Loss of Capability to Achieve Cold Shutdown

SITE AREA EMERGENCY

Loss of Capability to Achieve Hot Shutdown

GENERAL EMERGENCY

As specified in Guideline 28.

WP/dw

ATTACHMENT 2 (Cont'd.)

Guideline 14 LOSS OF INSTRUMENTATION

NOTE: Indication of alarm or instrumentation failure may be difficult to determine. A failure of normally lighted indicators or the failure of certain alarms to annunciate during a surveillance procedure may provide an initial warning. A cause of annunciator failure, and thus an indication of failure, could be a loss of the uninterruptable MG set and no transfer to CKT Y10.

UNUSUAL EVENT

Indications or alarms on process or effluent parameters not functional in the Control Room to an extent requiring plant shutdown.

ALERT

Loss of most or all annunciators (on panels C03, C04, C05, C08) sustained for > 15 minutes with the plant not in cold shutdown.

SITE AREA EMERGENCY

1. Loss of most or all annunciators (on panels C03, C04, C05, C08) > 15 minutes and plant transient initiated or in progress.

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 15 CONTROL ROOM EVACUATION

UNUSUAL EVENT

Not Applicable

ALERT

Control Room evacuation required or anticipated - control at local panels.

Evacuation of the Control Room is required or anticipated and control of shutdown systems has been established at local stations.

| Instrument | Description |
|---|---|
| C02-NR1855 | Main Control Room Area Monitor Point 19 and 20 |

OR

Fire in Control Room

OR

Heavy Smoke in Control Room

OR

Other Toxic/Flammable Gases Observed in Control Room

SITE AREA EMERGENCY

Evacuation of Control Room and control of shutdown systems not established from local stations in 15 minutes.

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 16

TOXIC/FLAMMABLE GASES

UNUSUAL EVENT

1. Uncontrolled release near-by or on-site potentially harmful

| Instrument | Description |
|---|---|
| (local) | Tank Room Chlorine Detector |
| (local) | Evaporator Room Chlorine Detector |

Observation by irritation, noticeable odor, samples, verbal reports of authenticated accidents resulting in release.

ALERT

1. Enters Reactor Building or Turbine Building, causes potential habitability problems.

SITE AREA EMERGENCY

1. Entry of uncontrolled toxic or flammable gases into vital areas essential for safe shutdown where evacuation of the area constitutes a safety problem.

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 17 SECURITY COMPROMISE

UNUSUAL EVENT

Security Compromise

1. Attempted or confirmed intrusions of vital areas or protected area.

2. Attempted intrusions into protected area by protesting groups.

3. Discovery of or attempted introduction of unauthorized weapons, explosives, or incendiary devices inside the protected area.

4. Bomb threats or extortion threats.

5. Mass demonstrations or civil disturbances, at the plant site.

ALERT

Security Compromise consisting of forced entry into protected or vital areas lasting longer than 30 minutes.

SITE AREA EMERGENCY

Imminent Loss of Physical Control of Plant Due to Security Compromise

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 18

LOSS OF AC POWER

NOTE: On a loss-of-plant AC or Off-site AC capability many alarms will annunciate in the Control Room. The operator must observe the specific combination of alarms, tripped breakers and bus voltage indicators to determine the extent of loss of AC power. Alarms that may indicate various losses are as follows:

| Alarm | Description |
|---|---|
| C08-B-02 | No. 11 Aux Trans Lockout |
| C08-B-06 | No. 11 Aux Trans To No. 13 Bus Trip |
| C08-B-11 | No. 13 4160V Bus Lockout |
| C08-B-07 | No. 1R Res Trans to No. 13 Bus Bkr Trip |
| C08-B-17 | No. 13 to No. 15 Bus Breaker Trip |
| C08-B-18 | No. 15 4160V Bus Lockout |
| C08-B-23 | No. 11 Diesel Lockout |
| C08-B-14 | No. 11 4160V Bus Lockout |
| C08-B-19 | No. 15 to No. 16 Bus Bkr Trip |
| C08-B-09 | No. 11 Aux Trans to No. 11 Bus Bkr Trip |
| C08-B-10 | No. 1R Res Trans to No. 11 Bus Bkr Trip |
| C08-C-06 | No. 1R Res Trans to No. 12 Bus Bkr Trip |
| C08-C-07 | No. 11 Aux Trans to No. 12 Bus Bkr Trip |
| C08-C-12 | No. 12 4160V Bus Lockout |
| C08-C-17 | No. 16 4160V Bus to No. 15 Bus Bkr Trip |
| C08-C-08 | No. 1AR Res Trans to No. 15 Bus Bkr Trip |
| C08-C-18 | No. 16 4160V Bus Lockout |
| C08-C-23 | No. 12 Diesel Gen Lockout |
| C08-C-04 | No. 1R Res Trans Lockout |
| C08-C-09 | No. 1R Res Trans to No. 14 Bus Bkr Trip |

ATTACHMENT 2 (Cont'd.)

Guideline 18 (Cont'd.) LOSS OF AC POWER

| | |
|---|---|
| C08-C-19 | No. 14 4160V Bus to No. 16 Bus Bkr Trip |
| C08-C-10 | No. 11 Aux Trans to No. 14 Bus Bkr Trip |
| C08-C-15 | No. 14 4160V Bus Lockout |

UNUSUAL EVENT

1. Loss of all busses except 15 and 16 when the plant is not in cold shutdown.

   OR

2. Loss of both Emergency Diesel Generators when they are required to be operable by Technical Specifications.

ALERT

Temporary loss of both on-site and off-site AC power. Capability for less than 15 minutes, excluding testing or normal power transferring transients.

SITE AREA EMERGENCY

Loss of both on-site and off-site power capability for longer than 15 minutes.

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 19 — LOSS OF DC POWER

UNUSUAL EVENT

Loss of DC power systems which require plant shutdown by Technical Specifications.

| Alarm | Description |
|---|---|
| C08-A-20 | 250V Bus Low Voltage |
| C08-B-13 | No. 12 125V DC Bus Low Voltage |
| C08-B-15 | Undervoltage on RCIC DC MCC |
| C08-B-20 | Undervoltage on HPCI DC MCC |
| C08-B-25 | Undervoltage on MG Set DC MCC |
| C08-C-13 | No. 11 125V DC Bus Low Voltage |

ALERT

1. Loss of both 125 V DC Power Sources for less than 15 minutes (indicators see above).

SITE AREA EMERGENCY

1. Loss of both 125 V DC power sources sustained for longer than 15 minutes (indicators - see as above).

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 20

TORNADO OR
SUSTAINED WINDS

UNUSUAL EVENT

1. Tornado Sighted On-Site - Probable Effect on Station

2. Sustained winds above 75 mph for greater than 10 minutes at the site.

ALERT

1. Tornado Strikes Vital Plant Structures

2. Sustained winds above 90 mph for greater than 10 minutes at the site.

SITE AREA EMERGENCY

1. Tornado Causes Damage to Vital Plant Equipment or Structures

2. Sustained winds above 100 mph or gusts above 110 mph or wind causes damage to vital plant equipment or structures.

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 21

RIVER WATER HI/LOW

UNUSUAL EVENT

1. River water level in excess of 918 Feet

2. River flow below 240 CFS (about 902.4 FT river level)

ALERT

1. River water level between 921 and 930 FT.

2. River flow below 220 CFS (about 902.3 FT).

SITE AREA EMERGENCY

1. River water level exceeds 930 FT.

2. River water level below 899 FT.

3. Flood or low water causes damage to vital equipment.

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 22 EARTHQUAKE

| Alarm | Description |
|---|---|
| C06-C-8 | Earthquake (0.01 g) |
| C06-C-13 | Operational Basis Earthquake (0.03 g) |
| C06-C-18 | Design Basis Earthquake (0.06 g) |

UNUSUAL EVENT

Earthquake felt in-plant or detected by site seismic instrumentation.

The Accelerograph Recording System initiates upon detection of a seismic event resulting in 0.01 g acceleration. The Teledyne Geotech Panel indicates a seismic event.

ALERT

Earthquake greater than 0.03 g (OBE) occurs.

SITE AREA EMERGENCY

Earthquake greater than 0.06 g (DBE) occurs.

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 23 FIRE

UNUSUAL EVENT

Fire within plant which is not brought under control within 10 minutes from start of firefighting efforts.

ALERT

Fire Not Under Control in 10 Minutes Which Potentially Affects Safety Systems.

SITE AREA EMERGENCY

Fire compromising the function of safety systems.

GENEAL EMERGENCY

As specified in Guideline 28.

WP/dw

ATTACHMENT 2 (Cont'd.)

Guideline 24

EXPLOSION

UNUSUAL EVENT

Near or On-site explosion with significant damage not affecting plant operations.

ALERT

Explosion with known damage to facility, affecting plant operation.

SITE AREA EMERGENCY

Explosion causes severe damage to equipment required for safe shutdown.

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 25 AIRCRAFT & MISSILES

UNUSUAL EVENT

1. Unusual Aircraft Activity Over Facility

OR

2. Aircraft Crashes On-site

ALERT

Aircraft or Missile Strikes a Station Structure

SITE AREA EMERGENCY

Aircraft or Missile Crash Affects Vital Structure by Impact or Fire

GENERAL EMERGENCY

As specified in Guideline 28.

WP/dw

ATTACHMENT 2 (Cont'd.)

Guideline 26

MISCELLANEOUS

UNUSUAL EVENT

1. Train Derails Onsite

   Observation

2. Contaminated Injury

   Personnel injury occurs which results in the transportation of contaminated and injured personnel to an off-site hospital.

3. Turbine Casing Failure

   Turbine rotating component failure causing rapid plant shutdown.

ALERT

Turbine failure causing penetration.

SITE AREA EMERGENCY

Not Applicable

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 27 FSAR ACCIDENTS

Control Rod Drop See Guideline 6.

ATTACMENT 2 (Cont'd.)

Guideline 28 — ALL GUIDELINES - GENERAL EMERGENCY

GENERAL EMERGENCY

a. Effluent monitors detect levels corresponding to 1 rem/hr W.B. or 5 rem/hr thyroid at the site boundary under actual meteorological conditions.

b. These dose rates are projected based on other plant parameters (e.g., radiation levels in containment with leak rate appropriate for existing containment pressure with some confirmation from effluent monitors) or are measured in the environs.

EAL's

1. Stack Effluent Monitor (Ch. A or B) exceeds:

   1.2E+8 μCi/sec in stability class A
   1.7E+8 μCi/sec in stability class B
   1.3E+9 μCi/sec in stability class C
   9.2E+12 μCi/sec in stability class D
   9.8E+18 μCi/sec in stability class E
   3.3E+37 μCi/sec in stability class F

or

2. RBV High Range Monitor exceeds:

| | |
|---|---|
| 25 R/hr in stability class A | (9.6E+7 μCi/sec) |
| 8 R/hr in stability class B | (3.1E+7 μCi/sec) |
| 4 R/hr in stability class C | (1.5E+7 μCi/sec) |
| 2 R/hr in stability class D | (7.1E+6 μCi/sec) |
| 1 R/hr in stability class E | (4.4E+6 μCi/sec) |
| .75 R/hr in stability class F | (2.8E+6 μCi/sec) |

or

3. Stack radioiodine release rate exceeds:

   2.3E+6 μCi/sec in stability class A
   3.3E+6 μCi/sec in stability class B
   2.6E+7 μCi/sec in stability class C
   1.8E+11 μCi/sec in stability class D
   1.9E+17 μCi/sec in stability class E
   6.5E+35 μCi/sec in stability class F

or

ATTACHMENT 2 (Cont'd.)

Guideline 28 (Cont'd.) ALL GUILELINES - GENERAL EMERGENCY

4. RBV radioiodine release rate exceeds:

   1.9E+6 μCi/sec in stability class A
   6.0E+5 μCi/sec in stability class B
   3.0E+5 μCi/sec in stability class C
   1.4E+5 μCi/sec in stability class D
   8.6E+4 μCi/sec in stability class E
   5.6E+4 μCi/sec in stability class F

or

5. Release rate projection based on Containment Radiation Monitor exceeds any of the values in 1 or 2 above

or

6. Dose rates of 1 rem/hr W.B. are measured at the site boundary or beyond

or

7. Radioiodine concentrations measured at the site boundary or beyond exceed 7E-6 μCi/cc.

NOTE: Consider evacuation only within about 2 miles of the site boundary unless these levels are exceeded by a factor of 10 or projected to continue for 10 hours or EPA Protective Action Guideline exposure levels are predicted to be exceeded at larger distances.

c. Loss of 2 of 3 fission product barriers with a potential loss of 3rd barrier, (e.g., loss of primary coolant boundary, clad failure and high potential for loss of containment).

EAL's

1. Failure of fuel cladding (per guideline 6)

   and

   Failure of primary coolant boundary as evidenced by high drywell pressure or high drywell temperature or failure of MSIV's to isolate or safety relief valve stuck open

   and

   Potential loss of containment as evidenced by:

   containment pressure near design limits and pressure increasing; or

   loss of containment cooling and Shift Supervisor's opinion that loss of containment is likely; or failure of MSIV's to isolate.

ATTACHMENT 2 (Cont'd.)

Guideline 28 (Cont'd.) ALL GUIDELINES - GENERAL EMERGENCY

2. Failure of fuel cladding (per guideline 6)

and

Failure of containment as evidenced by all containment penetrations required for isolation not valved off or closed; or Shift Supervisors opinion that containment has failed

and

Potential loss of primary coolant boundary as evidenced by reactor pressure near design limits and increasing or loss of ECCS.

3. Failure of containment as evidenced by all containment penetrations required for isolation not valved off or closed or Shift Supervisor's opinion

and

Failure of primary coolant boundary as evidenced by high drywell pressure or temperature or failure of MSIV's to isolate or stuck open safety relief valve

and

Potential for loss of cladding as evidenced by ECCS failure or reactor water level low and decreasing.

NOTE: Consider 2 mile precautionary evacuation. If more than fuel gap activity released, extend this to 5 miles downwind.

d. Loss of physical control of the plant.

NOTE: Consider 2 mile precautionary evacuation.

e. Other plant conditions exist, from whatever source, that make release of large amounts of radioactivity in a short time period possible, e.g., any core melt situation. See the example BWR sequences.

NOTE: a. For core melt sequences where significant releases from containment are not yet taking place and large amounts of fission products are not yet in the containment atmosphere, consider 2 mile precautionary evacuation. Consider 5 mile downwind evacuation (45° to 90° sector) if large amounts of fission products (greater than gap activity) are in the containment atmosphere. Recommend sheltering in other parts of the plume exposure Emergency Planning Zone under this circumstance (radius 10 miles).

ATTACHMENT 2 (Cont'd.)

Guideline 28 (Cont'd.) ALL GUIDELINES - GENERAL EMERGENCY

b. For core melt sequences where significant releases are not yet taking place and containment failure leading to a direct atmospheric release is likely in the sequence but not imminent and large amounts of fission products in addition to noble gases are in the containment atmosphere, consider precautionary evacuation to 5 miles and 10 mile downwind evacuation (45° to 90° sector).

c. For core melt sequences where large amounts of fission products other than noble gases are in the containment atmosphere and containment failure is judged imminent, recommend shelter for those areas where evacuation cannot be completed before transport of activity to that location.

d. As release information becomes available adjust these actions in accordance with dose projections, time available to evacuate and estimated evacuation times given current conditions.

Example BWR Sequences

1. Transient (e.g., loss of off-site power) plus failure of requisite core shutdown systems (e.g., scram or standby liquid control system). Could lead to core melt in several hours with containment failure likely. More severe consequences if pump trip does not function.

2. Small or large LOCA's with failure of ECCS to perform, leading to core degradation or melt in minutes to hours. Loss of containment integrity may be imminent.

3. Small or large LOCA occurs and containment performance is unsuccessful affecting longer term success of the ECCS. Cou d lead to core degradation or melt in several hours without containmen boundary.

4. Shutdown occurs but requisite decay heat removal systems (e.g., RHR) or non-safety systems heat removal means are rendered unavailable. Core degradation or melt could occur in about ten hours with subsequent containment failure.

5. Any major internal or external events (e.g., fires, earthquakes, substantially beyond design basis) which could cause massive common damage to plant systems resulting in any of the above.

ATTACHMENT 2 (Cont'd.)

Guideline 29 OTHER PLANT CONDITIONS

UNUSUAL EVENT

1. Plant conditions exist that warrant increased awareness on the part of plant operating staff or State and/or local offsite authorities.

2. Plant conditions exist that require shutdown under technical specification requirements.

3. Plant conditions exist that involve other than normal controlled shutdown (e.g. cooldown rate exceeding technical specification limits or pipe cracking found during operation).

ALERT

Plant conditions exist that warrant precautionary activation of TSC and placement of EOF and other key emergency personnel on standby.

SITE AREA EMERGENCY

Other plant conditions exist that warrant activation of emergency centers and monitoring teams or precautionary notification to nearsite public.

ATTACHMENT 2 (Cont'd.)

Guideline 30 MAJOR DAMAGE TO SPENT FUEL

UNUSUAL EVENT

Not applicable

ALERT

Not applicable

SITE AREA

Major damage to spent fuel in containment (e.g., large object damages fuel or water loss below fuel level).

EAL's

1. a. Decrease in fuel pool level below 36'9" confirmed by LT-2787, Spent Fuel Pool Level Hi/Lo alarm

   or

   b. Dropping of heavy object onto spent fuel confirmed by direct observation

   and

2. Fuel Pool Radiation Monitor Ch A or B (Confirmed by annunciator 5-A-1 or 5-A-2) $>$50 mR/hr

GENERAL

As specified in Guideline 28.

WP/dw

ATTACHMENT 3

Form 5790-101-1
Rev. 1, 10/20/81
Page 1 of 1

Example of
EMERGENCY CLASSIFICATION CHECKLIST
(For Use With Procedure A.2-101)

1. Initiating Condition: ______________________________

______________________________ ____________ ________ ________
ED Initials Time Date

2. Attachment 1 directs use of Guideline Number(s): ______________.

____________ ________ ________
ED Initials Time Date

3. Attachment 2 classification: ______________________________

______________________; Declared: ____________ ________ ________
ED Initials Time Date

4. Implemented Procedure A.2- ________. ____________ ________ ________
ED Initials Time Date

NOTE: If reclassification becomes necessary, start a new Emergency Classification Checklist.

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/dw

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

# NOTIFICATION OF AN UNUSUAL EVENT (NUE)

A.2-102

| | | | | | |
|---|---|---|---|---|---|
| Prepared by: | GDMathiasen | ALARA Review: | Revision 0 | Date | 3/29/81 |
| Reviewed by: | JWinterhill | Q.A. Review: | Revision 0 | Date | 3/29/81 |
| Operations Committee Final Review: Meeting Number | | | 1068 | Date | 3/1/82 |
| Approved by: | | | FL Fey | Date | 3-1-82 |
| Op. Com. Results Review: | Not Required | Mtg. # | 950 | Date | 3/27/81 |

## PURPOSE

This procedure describes the actions to be taken when an NUE has been declared at the Monticello Nuclear Generating Plant. This procedure also designates the pre-planned response action necessary to contend with the condition and references applicable procedures that describe the necessary supplementary actions.

The Emergency Director (Shift Supervisor, until properly relieved by a designated alternate) is responsible for implementation of the actions prescribed in this instruction. The Emergency Director may delegate responsibility for performance of the prescribed tasks to available qualified NSP personnel, except where otherwise specified in this procedure.

## CONDITIONS AND PREREQUISITES

A. An NUE has been declared based on the occurrence of off-normal event(s) which indicate a potential degradation of the level of safety of the plant. Events characterized as Unusual Events are described in A.2-101 (Classification of Emergencies).

B. No releases of radioactive material requiring off-site response or monitoring are expected unless further degradation of the situation occurs.

## PRECAUTIONS

Continued surveillance and assessment of plant conditions are necessary to ensure that the emergency classification is appropriately revised as conditions change, or more definitive information is obtained.

## ORGANIZATION

A. Overall Responsibility - Emergency Director

B. In-Charge

Control Room - Shift Supervisor

C. Assistance

Control Room - Lead Plant Equipment and Reactor Operator (LPE&RO)
Shift Technical Advisor (STA), when assigned
Shift Emergency Communicator (SEC)

RESPONSIBILITIES

A. Emergency Director (Initially Shift Supervisor; LPE&RO if SS not available)

1. Implement appropriate Emergency Plan Implementing Procedures.

2. Determine what support, if any, is required and direct the Shift Emergency Communicator to make necessary calls.

3. Respond to situation with the objective of returning plant to normal status (or cold shutdown if this is determined to be necessary). Utilize the guidance in the PROCEDURE Section of this procedure as appropriate.

4. Watch the situation closely to determine when the threat to plant safety has passed. Be prepared to escalate to more severe class of emergency if required.

5. Escalate to more severe class or terminate emergency condition.

NOTE: Emergency Director responsibilities that may NOT be delegated include:

a. Decision to notify off-site emergency management agencies.
b. Making protective action recommendations as necessary to off-site emergency management agencies.
c. Classification of Emergency Event.
d. Determining the necessity for on-site evacuation.
e. Authorization for emergency workers to exceed normal radiation exposure limits.

B. Control Room Personnel

1. Assist the Shift Supervisor as requested.

2. Monitor control room instruments continually for any sign of increasing radiation, system degradation or any new developments. Notify the Shift Supervisor immediately in any of these cases.

C. Shift Technical Advisor

Provide the Shift Supervisor with technical advice.

D. Shift Emergency Communicator

1. Notify off-site personnel, Federal, State and local agencies.
2. Coordinate communications from the Emergency Director as required.

PROCEDURE

STEP 1: As necessary, contact the Shift Technical Advisor and the Shift Emergency Communicator using the following numbers:

STA: Pager
House or extension

Shift Emergency Communicator: Pager
House or extension

Initiate NUE Checklist Form (Attachment 1).

STEP 2 Using the public address system, announce or have announced, a message advising plant personnel of the situation. The following is appropriate for most situations:

"ATTENTION ALL PLANT PERSONNEL: AN UNUSUAL EVENT HAS BEEN DECLARED. ALL PERSONNEL SHOULD CONTINUE WITH NORMAL DUTIES UNLESS FURTHER INSTRUCTIONS ARE GIVEN".

NOTE 1: During drills or tests, the message will begin and end with the phrase, "THIS IS A DRILL" or "THIS IS A TEST".

NOTE 2: Messages may be modified to give more information or to fit the situation.

STEP 3: Depending on the emergency action level, ensure that the appropriate Abnormal Operating Procedures have been implemented.

STEP 4: Until the REC position is activated, ensure that onsite and inplant radiation surveys are conducted as necessary and that appropriate radiochemistry samples are taken as necessary.

STEP 5: If the initial notifications have not been made under a previous procedure, direct the SEC to compose Emergency Notification Report, Form 5790-102-2 (Attachment 2) and submit for Emergency Director approval, transmit initial notification using Emergency Call List-NUE, Form 5790-102-4 (Attachment 4).

STEP 6: If the initial notifications have been made and the emergency is being reclassified, direct the SEC to compose Emergency Classification Change, Form 5790-102-7 (Attachment 6) and submit for Emergency Director approval, transmit classification change using Emergency Call List-NUE, Form 5790-102-4 (Attachment 4).

NOTE: Communications should be per Procedure A.2-501, Communications During an Emergency.

STEP 7: If federal, state, or local off-site support is required, direct the Shift Emergency Communicator to request assistance. Use Form 5790-102-6 (Attachment 5) to compile list.

STEP 8: Consider augmentation of on-shift personnel. As required, direct the Shift Emergency Communicator to contact appropriate individuals from the Monticello Emergency Augmentation List, Form 5790-102-5.

STEP 9: Assess plant conditions and respond appropriately. Consider implementation of strict plant status controls.

STEP 10: As soon as sufficient information becomes available, direct the Shift Emergency Communicator to compose an Emergency Notification Followup Message, Form 5790-102-3 (Attachment 3). Review and approve the message content and direct the SEC to transmit the information to the same authorities who received initial notification.

NOTE 1: The minimum frequency of followup messages should be every 30 minutes.

STEP 11: Based upon assessment of plant conditions, either close out the NUE or escalate to a higher class of emergency per Procedure A.2-101 (Classification of Emergencies).

STEP 12: Should reclassification of the emergency condition become necessary, initiate a new procedure (A.2-103, 104 or 105).

STEP 13: In the event of close-out, ensure that all appropriate agencies and individuals are promptly notified. The message should include a brief summary of the event, the fact that it has been terminated and whether or not a recovery will be initiated.

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"

ATTACHMENTS

1. Example of NUE Checklist
2. Example of Emergency Notification Report Form
3. Example of Emergency Notification Followup Message
4. Example of Emergency Call List - NUE
5. Example of Secondary Notification List
6. Example of Emergency Classification Change

WP/kk

ATTACHMENT 1

Form 5790-102-1,
Rev. 2, 02/26/82
Page 1 of 1

Example of
NOTIFICATION OF AN UNUSUAL EVENT (NUE) CHECKLIST

(For Use With Procedure A.2-102)

1. STA and SEC summoned. ______ ED Initial ______ Time ______ Date

2. Announced NUE over public address system. ______ ED Initial ______ Time ______ Date

3. Abnormal Operating Procedure implemented. ______ ED Initial ______ Time ______ Date

4. On-site and in-plant rad surveys and radiochemistry samples directed as necessary. ______ ED Initial ______ Time ______ Date

5. Directed SEC to make offsite notifications, Form 5790-102-4 (Attachment 4). ______ ED Initials ______ Time ______ Date

6. Directed SEC to request Off-Site Support, Form 5790-102-6 (Attachment 5). ______ ED Initials ______ Time ______ Date

7. Directed SEC to contact Plant Staff as required for Shift Augmentation. ______ ED Initials ______ Time ______ Date

8. Closed out/escalated to a higher class based upon Procedure A.2-101. ______ 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 5790-102-2
Revision 3, 02/19/82
Page 1 of 1

Example of
EMERGENCY NOTIFICATION REPORT*

Verify that the organization/person called is correct prior to relaying emergency information.

THIS IS ____________________ (Name), ________________ (Title) AT THE MONTICELLO NUCLEAR GENERATING PLANT.
WE HAVE DECLARED A(N) ________________________ AT _______ HOURS.
(Emergency Class) (Time)

Pick one of the following, based on information from Control Room Personnel or Shift Supervisor:

( ) WE HAVE NOT HAD A RADIOACTIVE RELEASE.
( ) WE HAVE HAD A(N) ________________ (Liquid or Airborne) RADIOACTIVE RELEASE.

ATMOSPHERIC CONDITIONS AT THE PRESENT TIME ARE AS FOLLOWS:
WIND DIRECTION IS FROM THE _______ (Direction) AT _____ (Speed) MPH.

THE AFFECTED SECTOR(S) IS(ARE) ______________________________.
(List sector(s) by letter designation as determined by map in TSC.)

Protective Action Recommendation (pick one):

THE PROTECTIVE ACTION RECOMMENDED AT THIS TIME IS (From Emer. Dir./Procedure A.2-204):

( ) None
( ) SHELTER OUT TO _________ (Distance) MILES
( ) EVACUATE OUT TO _________ (Distance) MILES
( ) ACTIVATE PUBLIC ALERT & NOTIFICATION SYSTEM
( ) CLOSE MINNEAPOLIS AND ST. PAUL WATER INTAKES

Give a brief description of the emergency.

______________________________________________________________

______________________________________________________________

PLEASE RELAY THIS INFORMATION TO YOUR EMERGENCY ORGANIZATION PERSONNEL.

Emergency Director Approval ____________________________ (Name/Date)

Emergency Communicator ________________________________ (Name/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.

* Complete as much of the form as information available or time allows. All blanks need not be filled out.

WP/kk

ATTACHMENT 3

Form 5790-102-3
Rev. 3, 02/22/82
Page 1 of 2

Example of
EMERGENCY NOTIFICATION FOLLOWUP MESSAGE*

Date ____________________

Sample Time ____________________ AM/PM

1. Location of incident: Monticello

2. Class of emergency: ______________________________

3. Type of actual or projected release:
   ( ) airborne
   ( ) waterborne
   ( ) surface spill

4. Height of release:
   ( ) ground level
   ( ) 100 meters (stack)

   Relative quantity: ____________________% Noble Gases ____________________µCi/sec
   ____________________% Iodines ____________________µCi/sec
   ____________________% Particulates ____________________µCi/sec

   Estimated quantity of radioactive material released or being released: ________ curies

5. Meteorological Conditions:
   Wind Direction (from): _____ degrees
   Atmospheric Stability Class ______
   Wind Velocity ________ mph
   Temperature ________ °C
   Form of Precipitation ________

6. Release is expected to continue for ______________ hours.
   (hours)

7.

| | | Whole Body | | Thyroid | | Sectors Affected |
|---|---|---|---|---|---|---|
| Projected dose rates: | S.B. | __________ | mrem/hr | __________ | mrem/hr | __________ |
| | 2 miles | __________ | mrem/hr | __________ | mrem/hr | __________ |
| | 5 miles | __________ | mrem/hr | __________ | mrem/hr | __________ |
| | 10 miles | __________ | mrem/hr | __________ | mrem/hr | __________ |
| Projected integrated dose at: | S.B | __________ | mrem | __________ | mrem | __________ |
| | 2 miles | __________ | mrem | __________ | mrem | __________ |
| | 5 miles | __________ | mrem | __________ | mrem | __________ |
| | 10 miles | __________ | mrem | __________ | mrem | __________ |

* Complete as much of the form as information availability and time allows. All blanks need not be completed.

WP/kk

ATTACHMENT 3 (Cont'd.)

Form 5790-102-3
Rev. 3, 02/22/82
Page 2 of 2

8. Survey Results

| TIME | SURVEY POINT | READING |
|---|---|---|
| _______ | _______ | _______________________________ |
| _______ | _______ | _______________________________ |
| _______ | _______ | _______________________________ |
| _______ | _______ | _______________________________ |
| _______ | _______ | _______________________________ |

9. Estimate of any surface radioactive contamination: _________ dpm/100 $cm^2$

10. Chemical and physical form of released material: _______________________

11. Emergency response actions underway: _______________________________
_______________________________________________________________
_______________________________________________________________

12. For liquid release to the River, estimate release volume, release activity and estimated time for concentration to reach public water:
_______________________________________________________________

13. See the CAUTION. Recommended emergency actions, including protective actions:
_______________________________________________________________
_______________________________________________________________

CAUTION: Do NOT relay this information to local or county officials once the State EOC is activated.

14. Request for any needed support by off-site organizations:
_______________________________________________________________
_______________________________________________________________

15. Prognosis for worsening or termination of event based on plant information:
_______________________________________________________________
_______________________________________________________________

_______________________________
Emergency Director (or Designee)

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

Form 5790-102-4
Revision 2, 12/11/81
Page 1 of 4

Example of
EMERGENCY CALL LIST - NUE

NOTE 1: The Shift Emergency Communicator shall make notifications to the individuals and organizations listed on this Emergency Call List.

NOTE 2: For those notifications made by telephone, make the call as follows:

a. Contact each organization or individual using the contact information listed in the Attachment for the appropriate emergency class.

b. When the party answers, read the text of the notification.

c. Note the name of the individual contacted and the time of the contact.

d. Proceed to the next party on the call-list.

e. If a party can not be contacted in two attempts, bypass that party and proceed down the list. After the other notifications are complete, re-attempt to contact any bypassed parties. If a party still can not be reached, consider other means such as dispatching a courier, relay through another party or similar actions.

f. If the parties call back for further information, note the time and the name of the individuals.

g. If a party not specified on the call list requests information, refer the party to the NSP Communications Department or to the local emergency services organization in his/her community, as appropriate.

NOTE 3: Some of the below listed individuals may be on site when the emergency is declared. They will not require additional notification if it is known that they are at their designated emergency duty station.

WP/kk

ATTACHMENT 4 (Cont'd.)

Form 5790-102-4
Revision 2, 12/11/81
Page 2 of 4

EMERGENCY CALL LIST-NUE (Cont'd.)

NOTIFICATIONS

1. Notify the Minnesota Division of Emergency Services. The telephone number is night or day (Ask for the Duty Officer). Request Emergency Services to notify the Department of Health.

| Contact Person | Time | Initial Notification-SEC initials | Verification-SEC Initials |
|---|---|---|---|

NOTE 1: This notification shall be made within 15 minutes of declaration of emergency class.

NOTE 2: This call will be verified via the line. If no verification within 30 minutes, contact the State again.

2. Notify the local authorities by telephone as follows: Notification

a. Wright County Sheriff -------
or -------
or -------
SEC Initials

b. Sherburne County Sheriff ----
SEC Initials

| | Working Hours | Nights/ Holidays | |
|---|---|---|---|
| c. Monticello Civil Defense | Or Pager | | SEC Initials |

NOTE 1: These notifications shall be made within 15 minutes of declaration of emergency class.

NOTE 2: The Monticello Civil Defense notification is not required after the initial notification of the event.

WP/kk

ATTACHMENT 4 (Cont'd.)

Form 5790-102-4
Revision 2, 12/11/81
Page 3 of 4

EMERGENCY CALL LIST-NUE (Cont'd.)

3. Using the telephone pager system, notify the individuals listed below. Calmly transmit the following message to each individual:

"PLEASE CALL THE CONTROL ROOM IMMEDIATELY. I REPEAT, PLEASE CALL THE CONTROL ROOM IMMEDIATELY."

When the individuals call, calmly indicate that an Unusual Event has been declared and that they should report if requested by the Emergency Director. Complete blanks as calls are made.

| | Pager Numer | Contact Person / Time / SEC Initial |
|---|---|---|
| Radiation Protection Designee ----------- | | / / |
| Radiological Emergency Coordinator ------ | | / / |
| EOF Coordinator ------------------------ | | / / |

If, after 5 minutes, a contact has not been verified, or if circumstances prevent individuals from reporting in a timely manner, consult the EOF Coordinator and Radiation Protection Designee duty roster and call an alternate, if requested by the Emergency Director.

Alternate Radiation Protection Designee ____________________

Alternate EOF Coordinator ____________________

4. Notify the Plant Manager (or acting Plant Manager) to appraise him of the situation. There is no requirement that he report to the plant.

Plant Manager pager number is

Person ______ Time ______ SEC Initials ______

5. Notify the Systems Dispatcher using the hotline (in the Control Room), the low-band radio link (TSC and Control Room), or normal telephone line ( , night or day).

SEC Initials ______

6. Notify one of the site NRC Resident Inspectors (Extension

C. Brown (Home)

SEC Initials ______

OR

A. Madison (Home)

SEC Initials ______

WP/kk

ATTACHMENT 4 (Cont'd.)

Form 5790-102-4
Revision 2, 12/11/81
Page 4 of 4

EMERGENCY CALL LIST-NUE (Cont'd.)

7. Notify the NRC Emergency Response Center via the ENS hotline. Use Form 3125 to assemble information which will be requested by the NRC. Determine from the NRC whether or not continuous manning is required. ______ SEC Initials

NOTE: If the ENS is out of order, attempt contact in the following order until notification is made:

(a) Commercial Telephone System to NRC Operations Center (via Bethesda Central Office) 301/492-8111

(b) Commercial Telephone System to NRC Operations Center (via Silver Springs Central Office) 301/427-4056

(c) Health Physics Network (HPN) to NRC Operations Center *22 (Touch-Tone) or 22 (Rotary Dial)

(d) Commercial Telephone System to NRC Operator (via Bethesda Central Office) 301/492-7000

NOTE: Notification to be made within one hour of event declaration, as required by 4 ACD-3.9.

8. Inform the Emergency Director of the completion of the notifications. ______ SEC Initials

Completed: Shift Emergency Communicator: ______ Time ______ Date ______

Reviewed by: ______________________
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 Emergency Records.

WP/kk

Form 5790-102-6
Revision 2, 02/15/82
Page 1 of 2

ATTACHMENT 5
Example of
SECONDARY NOTIFICATION LIST

Backup Agencies That May Be Notified If Necessary

( ) 1. Chicago Operations Office of DOE
Radiological Assistance Program

( ) 2. Area Civil Defense Groups

a) Region VI Commander (St. Cloud)

b) Wright County

c) Sherburne County

( ) 3. State Highway Patrol

a) St. Cloud

b) Golden Valley
Emergency Radio

c) St. Paul or Dial Operator and
Emergency Radio

( ) 4. Highway Department

( ) 5. Monticello Police Department

( ) 6. Monticello Fire Department

( ) 7. Burlington Northern Railroad
(Chief Dispatcher)

( ) 8. Minneapolis Water Department

( ) 9. St. Paul Water Department

( ) 10. Big Lake-Monticello Ambulance Service

( ) 11. Monticello-Big Lake Community Hospital

WP/kk

Form 5790-102-6
Revision 2, 02/15/82
Page 2 of 2

SECONDARY NOTIFICATION LIST (Cont'd.)

( ) 12. EPA Monticello Field Station

( ) 13. Big Oaks Park (During Camping Season)

( ) 14. Minnesota Pollution Control Agency

( ) 15. Northern States Power
N.W. Division

( ) 16. G.E. Site Representative
C. H. Ballard

WP/kk

Form 5790-102-7
Revision 2, 02/19/82
Page 1 of 1

ATTACHMENT 6

Example of
EMERGENCY CLASSIFICATION CHANGE

Verify that the organization/person called is correct prior to relaying emergency information.

THIS IS ______________________ (Name), ______________________ (Title) AT THE

MONTICELLO NUCLEAR GENERATING PLANT.

WE HAVE RE-CLASSIFIED THE EVENT AND ( ) Escalated

( ) Down-graded

TO a(N) ( ) Event May Be Terminated

( ) Unusual Event

( ) Alert

( ) Site Area Emergency

( ) General Emergency

at ______________ (Time) hours.

Meteorological Conditions:
Wind Direction (Form): __________ Degrees
Atmospheric Stability Class __________

Wind Velocity __________ mph
Temperature ________ °C
Form of Precipitation __________

Give a brief description of the emergency:

_______________________________________________

_______________________________________________

_______________________________________________

PLEASE RELAY THIS INFORMATION TO YOUR EMERGENCY ORGANIZATION PERSONNEL.

Emergency Director/Manager Approval ______________________ (Name/Date)

Emergency Communicator ______________________ (Name/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 ___ No X

# ALERT
A.2-103

| | | | |
|---|---|---|---|
| Prepared by: CDMathiasen | ALARA Review: Revision 0 | Date 3/29/81 | |
| Reviewed by: JWinkelhill | Q.A. Review: Revision 0 | Date 3/30/81 | |
| Operations Committee Final Review: Meeting Number | 1068 | Date 3/1/82 | |
| Approved by: | FJ Fey | Date 3-1-82 | |
| Op. Com. Results Review: Not Required | Mtg. # 950 | Date 3/27/81 | |

## PURPOSE

This procedure describes the actions to be taken when an Alert has been declared at Monticello Nuclear Generating Plant. This also designates the pre-planned response actions necessary to contend with the emergency condition and references applicable procedures that prescribe the necessary supplementary actions.

The Emergency Director (Shift Supervisor, until properly relieved by a designated alternate) is responsible for the completion of the prescribed actions in this instruction. The Emergency Director may delegate responsibility for performance of the prescribed tasks to available qualified NSP personnel, except where otherwise specified in this procedure.

## CONDITIONS AND PREREQUISITES

A. An Alert emergency condition has been declared based on the occurrence of events which indicate an actual or potential degradation of the level of safety of the plant. Events classified as Alert emergencies are described in A.2-101 (Classification of Emergencies).

OR

B. An Unusual Event had been declared and emergency measures are being performed; and on the basis of subsequent information or upon a deterioration in plant conditions, the condition has been reclassified as an Alert.

## PRECAUTIONS

Continued surveillance and assessment of plant conditions are necessary to ensure that the emergency classification is appropriately revised as conditions change, or more definitive information is obtained.

## ORGANIZATION

A. Overall Responsibility - Emergency Director (Shift Supervisor until relieved)

B. In Charge

Control Room - Shift Supervisor
* Technical Support Center - Emergency Director (upon relieving Shift Supervisor)
* Emergency Operations Facility - Emergency Manager
* Assembly Point - Assembly Point Coordinator

C. Assistance

Control Room - Lead Plant Equipment & Reactor Operator; Shift Technical Advisor when assigned, and Shift Emergency Communicator
* Technical Support Center - Plant management, technical & engineering support

* After the augmentation.

RESPONSIBILITIES

A. Emergency Director (Shift Supervisor until relieved)

1. Implement appropriate Emergency Plan Implementing Procedures

2. Ensure that appropriate Emergency Operating Procedures are implemented.

3. Determine what support, if any, is required and direct the Shift Emergency Communicator to make necessary calls.

4. Respond to situation with the objective of returning plant to normal status (or cold shutdown if this is determined to be necessary).

5. Watch the situation closely to determine when the threat to plant safety has passed. Be prepared to escalate to more severe class of emergency if required.

6. Escalate to more severe class or terminate emergency condition.

NOTE: Emergency Director responsibilities that may NOT be delegated include:

a. Decision to notify off-site emergency management agencies.

b. Making protective action recommendations as necessary to off-site emergency management agencies.

c. Classification of Emergency Event.

d. Determining the necessity for on-site evacuation.

e. Authorization for emergency workers to exceed normal radiation exposure limits.

B. Shift Supervisor (LPE&RO, if SS not available)

1. Implement appropriate Emergency Operating Procedures.

2. Assist the Emergency Director as requested.

C. Control Room Personnel

1. Assist the Shift Supervisor as requested.

Monitor the Control Room instruments continually for any sign of increasing radiation, system degradation, or any new developments. Notify the Shift Supervisor immediately in any of these cases.

.echnical Advisor

.ide the Emergency Director and the Shift Supervisor with technical advice.

E. Shift Emergency Communicator

1. Report to the Control Room.

2. Notify off-site personnel, Federal, State and Local Agencies.

3. Coordinate communications from the Emergency Director as required.

F. Shift Radiation Protection Specialist

Report to Operations Support Center. Be prepared to assist the Emergency Director with any immediate matters as requested.

PROCEDURE

STEP 1: As necessary contact the Shift Technical Advisor and the Shift Emergency Communicator using the following numbers:

STA: Pager
House or extension
Shift Emergency Communicator: Pager
House or extension

Initiate Alert Checklist Form 5790-103-1 (Attachment 1).

STEP 2: Using the public address system, announce or have announced, a message advising plant personnel of the situation. The following example is appropriate for most situations:

"ATTENTION ALL PLANT PERSONNEL: AN ALERT HAS BEEN DECLARED. ALL MEMBERS OF THE EMERGENCY ORGANIZATION REPORT TO YOUR DUTY STATIONS. ALL OTHER PERSONNEL STANDBY FOR FURTHER INSTRUCTIONS."

Repeat message slowly.

NOTE 1: During drills and tests, the message shall begin and end with the phrase, "THIS IS A DRILL" or "THIS IS A TEST".

NOTE 2: Messages may be modified to give more information or to fit the situtation.

STEP 3: Depending on the emergency action level, ensure that the appropriate Abnormal Operating Procedures have been implemented.

STEP 4: Ensure implementation of Procedures A.2-106, Activation of Technical Support Center and A.2-107, Activation of Operational Support Center.

STEP 5: Until the REC position is activated, ensure that onsite and inplant radiation surveys are conducted as necessary and that appropriate radiochemistry samples are taken as necessary.

STEP 6: If the initial notifications have not been made under a previous procedure, direct the SEC to compose Emergency Notification Report, Form 5790-102-2 (Attachment 2) and submit for Emergency Director approval, transmit initial notification using Emergency Call List-ALERT/SITE AREA/GENERAL, Form 5790-104-4 (Attachment 4).

STEP 7: If the initial notifications have been made and the emergency is being reclassified, direct the SEC to compose Emergency Classification Change, Form 5790-102-7 (Attachment 6) and submit for Emergency Director approval, transmit classification change using Emergency Call List-ALERT/SITE AREA/GENERAL, Form 5790-104-4 (Attachment 4).

NOTE: Communications should be per Procedure A.2-501, Communications During an Emergency.

STEP 8: If federal, state, or local off-site support is required, direct the Shift Emergency Communicator to request assistance. Use Form 5790-102-6 (Attachment 5) to compile list.

STEP 9: Consider augmentation of on-shift personnel. As required, direct the Shift Emergency Communicator to contact appropriate individuals from the Monticello Emergency Augmentation List Form 5790-102-5.

STEP 10: Direct REC to implement procedure A.2-201, ONSITE MONITORING DURING AN EMERGENCY. Assess plant conditions and consider implementation of procedure A.2-202, (Off-Site Monitoring During an Emergency). Consider implementation of strict plant status controls. If it is a radiological emergency implement high radiation area controls. Respond as appropriate.

STEP 11: Consider augmentation of Radiation Protection Staff and/or counting facilities. If appropriate call Prairie Island Plant and have the Shift Supervisor initiate Procedure F3-22 (Prairie Island Radiation Protection Group Response to Monticello Emergency). If additional contract health physics support is required, contact Institute for Resource Management Inc.

STEP 12: Direct the REC (or SEC until the REC is activated) to prepare periodic followup information messages, using form 5790-102-3, EMERGENCY NOTIFICATION FOLLOWUP MESSAGE. Review and approve the message content and direct the SEC to transimt the information to the State EOC and the two county EOC's.

NOTE 1: The minimum frequency of followup messages should be every 30 minutes.

NOTE 2: As specified on the message form, protective action recommendations should not be given to local or county officials once the State EOC is activated.

NOTE 3: When the EOF becomes operational, the followup information messages shall be forwarded to the EOF for transmission to offsite officials.

STEP 13: Based upon assessment of plant conditions either:

a. Escalate to a higher class of emergency, or

b. Recommend reduction in class to NUE, or

c. Close out the Alert,

per Procedure A.2-101 (Classification of Emergencies).

STEP 14: Should reclassification of the emergency be necessary, initiate a new procedure (A.2-102, 104 or 105).

STEP 15: In the event of close-out, ensure that all appropriate agencies and individuals are promptly notified. The message should include a brief summary of the event, the fact that it has been terminated, and whether or not a recovery will be initiated.

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"

ATTACHMENTS

1. Example of Alert Checklist
2. Example of Emergency Notification Report Form
3. Example of Emergency Notification Followup Message
4. Example of Emergency Call List - Alert
5. Example of Secondary Notification List
6. Example of Emergency Classification Change

ATTACHMENT 1

Form 5790-103-1
Revision 2, 12/15/81
Page 1 of 1

Example of
ALERT CHECKLIST
(For Use With Procedure A.2-103)

1. STA and SEC summoned.

ED Initial ______ Time ______ Date ______

2. Announced ALERT over public address system.

ED Initial ______ Time ______ Date ______

3. Abnormal Operating Procedures implemented.

ED Initial ______ Time ______ Date ______

4. TSC and OSC activated.

ED Initial ______ Time ______ Date ______

5. Onsite and inplant rad surveys and radiochemistry samples directed as necessary.

ED Initial ______ Time ______ Date ______

6. Offsite notification directed.

ED Initial ______ Time ______ Date ______

7. Directed SEC to request Off-Site Support Form 5790-102-6.

ED Initial ______ Time ______ Date ______

8. Directed SEC to contact Plant Staff as required for Shift Augmentation, Form 579C-102-5.

ED Initial ______ Time ______ Date ______

9. Assessment: Implemented Procedure A.2-201 and A.2-202 (Yes/No).

ED Initial ______ Time ______ Date ______

10. Rad. Prot. Staff augmentation implemented.

ED Initial ______ Time ______ Date ______

11. Followup notification initiated.

ED Initial ______ Time ______ Date ______

12. Closed Out/Escalated to a higher class/ down-grade to NUE based upon Procedure A.2-101.

ED Initial ______ 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 5790-102-2
Revision 3, 02/19/82
Page 1 of 1

Example of
EMERGENCY NOTIFICATION REPORT*

Verify that the organization/person called is correct prior to relaying emergency information.

THIS IS ____________________ (Name), ________________ (Title) AT THE MONTICELLO NUCLEAR GENERATING PLANT.
WE HAVE DECLARED A(N) ________________________ AT ________ HOURS.
(Emergency Class) (Time)

Pick one of the following, based on information from Control Room Personnel or Shift Supervisor:

( ) WE HAVE NOT HAD A RADIOACTIVE RELEASE.
( ) WE HAVE HAD A(N) ________________ (Liquid or Airborne) RADIOACTIVE RELEASE.

ATMOSPHERIC CONDITIONS AT THE PRESENT TIME ARE AS FOLLOWS:
WIND DIRECTION IS FROM THE _______ (Direction) AT _____ (Speed) MPH.

THE AFFECTED SECTOR(S) IS(ARE) ______________________________.
(List sector(s) by letter designation as determined by map in TSC.)

Protective Action Recommendation (pick one):

THE PROTECTIVE ACTION RECOMMENDED AT THIS TIME IS (From Emer. Dir./Procedure A.2-204):

( ) None
( ) SHELTER OUT TO __________ (Distance) MILES
( ) EVACUATE OUT TO __________ (Distance) MILES
( ) ACTIVATE PUBLIC ALERT & NOTIFICATION SYSTEM
( ) CLOSE MINNEAPOLIS AND ST. PAUL WATER INTAKES

Give a brief description of the emergency.

______________________________________________________________________

______________________________________________________________________

PLEASE RELAY THIS INFORMATION TO YOUR EMERGENCY ORGANIZATION PERSONNEL.

Emergency Director Approval ______________________________ (Name/Date)

Emergency Communicator __________________________________ (Name/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.

* Complete as much of the form as information available or time allows. All blanks need not be filled out.

WP/kk

ATTACHMENT 3

Form 5790-102-3
Rev. 3, 02/22/82
Page 1 of 2

Example of
EMERGENCY NOTIFICATI FOLLOWUP MESSAGE*

Date ____________________

Sample Time ____________________ AM/PM

1. Location of incident: Monticello

2. Class of emergency: ______________________________

3. Type of actual or projected release: ( ) airborne
( ) waterborne
( ) surface spill

4. Height of release: ( ) ground level
( ) 100 meters (stack)

Relative quantity: ____________________% Noble Gases ____________________μCi/sec
____________________% Iodines ____________________μCi/sec
____________________% Particulates ____________________μCi/sec

Estimated quantity of radioactive material released or being released: ________ curies

5. Meteorological Conditions: Wind Velocity ________ mph
Wind Direction (from): _____ degrees Temperature ________ °C
Atmospheric Stability Class ______ Form of Precipitation ________

6. Release is expected to continue for ______________ hours.
(hours)

7. Projected dose rates:

| | | Whole Body | Thyroid | Sectors Affected |
|---|---|---|---|---|
| Projected dose rates: | S.B. | ____________mrem/hr | ____________mrem/hr | ____________ |
| | 2 miles | ____________mrem/hr | ____________mrem/hr | ____________ |
| | 5 miles | ____________mrem/hr | ____________mrem/hr | ____________ |
| | 10 miles | ____________mrem/hr | ____________mrem/hr | ____________ |
| Projected integrated dose at: | S.B | ____________mrem | ____________mrem | ____________ |
| | 2 miles | ____________mrem | ____________mrem | ____________ |
| | 5 miles | ____________mrem | ____________mrem | ____________ |
| | 10 miles | ____________mrem | ____________mrem | ____________ |

* Complete as much of the form as information availability and time allows. All blanks need not be completed.

ATTACHMENT 3 (Cont'd.)

Form 5790-102-3
Rev. 3, 02/22/82
Page 2 of 2

8. Survey Results

| TIME | SURVEY POINT | READING |
|---|---|---|
| ________ | ________ | ______________________ |
| ________ | ________ | ______________________ |
| ________ | ________ | ______________________ |
| ________ | ________ | ______________________ |
| ________ | ________ | ______________________ |

9. Estimate of any surface radioactive contamination: ________ dpm/100 $cm^2$

10. Chemical and physical form of released material: ______________________

11. Emergency response actions underway: ______________________
______________________________________________
______________________________________________

12. For liquid release to the River, estimate release volume, release activity and estimated time for concentration to reach public water:
______________________________________________

13. Recommended emergency actions, including protective actions:
______________________________________________
______________________________________________

CAUTION: Do NOT relay this information to local or county officials once the State EOC is activated.

14. Request for any needed support by off-site organizations:

______________________________________________
______________________________________________

15. Prognosis for worsening or termination of event based on plant information:

______________________________________________
______________________________________________

______________________________
Emergency Director (or Designee)

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

Form 5790-104-4
Revision 4, 2/26/82
Page 1 of 5

Example of
EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL

NOTE 1: The Shift Emergency Communicator shall make notifications to the individuals and organizations listed on the appropriate Emergency Call List.

NOTE 2: For those notifications made by telephone, make the call as follows:

a. Contact each organization or individual using the contact information listed in the attachment for the appropriate emergency class.

b. When the party answers, read the text of the notification.

c. Note the name of the individual contacted and the time of the contact.

d. Proceed to the next party on the call-list.

e. If a party can not be contacted in two attempts, bypass that party and proceed down the list. After the other notifications are complete, re-attempt to contact any bypassed parties. If a party still can not be reached, consider other means such as dispatching a courier, relay through another party or similar actions.

f. If the parties call back for further information, note the time and the name of the individuals.

g. If a party not specified on the call list requests information, refer the party to the NSP Communications Department or to the local emergency services organization in his/her community, as appropriate.

NOTE 3: Some of the below listed individuals may be on site when the emergency is declared. They will not require additional notification if it is known that they are at their designated emergency duty stations.

ATTACHMENT 4 (Cont'd.)

Form 5790-104-4
Revision 4, 2/26/82
Page 2 of 5

EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL (Cont'd.)

NOTIFICATIONS

1. Notify the Minnesota Division of Emergency Services. The telephone number is night or day (ask for the Duty Officer). Request Emergency Services to notify the Department of Health.

| Contact Person | Time | Initial Notification SEC Initials | Verification SEC Initials |
|---|---|---|---|

NOTE 1: This notification shall be made within 15 minutes of declaration of emergency class.

NOTE 2: This call will be verified via the line. If no verification within 30 minutes, contact the State again.

2. Notify the local authorities by telephone as follows: Notification

a. Wright County Sheriff ---
---
----

SEC Initials

b. Sherburne County Sheriff ---

SEC Initials

| | Working Hours | Nights/ Holidays | |
|---|---|---|---|
| c. Monticello Civil Defense | Or Pager | | SEC Initials |

NOTE 1: These notifications shall be made within 15 minutes of declaration of emergency class.

NOTE 2: The M cello Civil Defense notification is not req after the initial notification of the event.

ATTACHMENT 4 (Cont'd.)

Form 5790-104-4
Revision 4, 02/26/82
Page 3 of 5

EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL (Cont'd.)

3. See the NOTE.

Using the telephone pager system, notify the group of individuals listed below. Calmly transmit the following message each individual.

"PLEASE CALL THE CONTROL ROOM IMMEDIATELY. I REPEAT, PLEASE CALL THE CONTROL ROOM IMMEDIATELY.

When the individuals call, calmly indicate that a SITE AREA EMERGENCY has been declared and that they should report to the plant immediately.

| | Page Number | Contact Person/Time/SEC Initials |
|---|---|---|
| Plant Manager ----------------------- | | / / |
| Radiation Protection Designee --------- | | / / |
| Radiological Emergency Coordinator----- | | / / |
| EOF Coordinator --------------------- | | / / |

If after 5 minutes a contact has not been verified or if circumstances prevent individuals from reporting in a timely manner, consult the EOF Coordinator and Radiation Protection Designee duty roster and call an alternate. Record the names of alternates contacted.

Alternate Radiation Protection Designee ____________________

Alternate EOF Coordinator ____________________

NOTE: This step not required if the Emergency Response Organization has already been activated.

4. See the NOTE.

Using the tone-activated radios, notify the remainder of the ERO, local officials and near-site residents according to the following steps:

a. Insert the prerecorded tape designated 'ERO Callout' into the TRANSMITTING UNIT.

b. Set the selector switch on the TRANSMITTING UNIT to 'ANSWER'.

c. On the CONTROL UNIT, turn the key in the 'TRANSMIT ENABLE' switch. The red 'XMIT' lamp should light.

ATTACHMENT 4 (Cont'd.)

Form 5790-104-4
Revision 4, 02/26/82
Page 4 of 5

EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL (Cont'd.)

d. Enter 06 on the ENCODER UNIT and press 'P'. (The tape will be trasmitted 3 times automatically.)

e. When the transmissions have ended, remove the tape and insert the tape designated 'Local Notifications' into the TRANSMITTING UNIT.

f. Enter 01 on the ENCODER UNIT and press 'P'. When the series of toner stops enter 04 and press 'P'.

g. The tape will be transmitted three times. When the transmissions have ended, turn the key in the 'TRANSMIT ENABLE' switch. The green 'TEST' lamp shall light.

h. Remove the message cassette from the TRANSMITTING UNIT and insert it into the ANSWERING UNIT.

ERO Personnel With Tone Activated Radios

12 SEC's
6 Site Superintendents
2 Maintenance Supervisors
2 Electricians
4 I&CS Personnel
3 STA's
Radiation Protection Group

NOTE: This step not required if the Emergency Response Organization (ERO) and the local officials have already been notified.

5. Notify the System Dispatcher using the hotline (in the Control Room), the low-band radio link (TSC and Control Room), or normal telephone line night or day). ____________
SEC Initials

6. Notify one of the site NRC Resident Inspectors (Extension

(Home) ____________
SEC Initials

OR

(Home) ____________
SEC Initials

7. Notify the NRC Emergency Response Center via the ENS hotline. Use Form 3195 to assemble information which will be requested by NRC. Determine from the NRC whether or not continuous manning is required. ____________
SEC Initials

ATTACHMENT 4 (Cont'd.)

Form 5790-104-4
Revision 4, 2/26/82
Page 5 of 5

EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL (Cont'd.)

NOTE 1: If the ENS is out of order, attempt contact in the following order until notification is made:

(a) Commercial Telephone System to NRC Operations Center (via Bethesda Central Office) 301/492-8111

(b) Commercial Telephone System to NRC Operations Center (via Silver Springs Central Office) 301/427-4056

(c) Health Physics Network (HPN) to NRC Operations Center *22 (Touch-Tone) or 22 (Rotary Dial)

(d) Commercial Telephone System to NRC Operator (via Bethesda Central Office) 301/492-7000

NOTE 2: Notification to be made within one hour of event declaration, as required by 4 ACD-3.9.

8. Inform the Emergency Director of the completion of the notifications.

_____________
SEC Initials

Completed: Shift Emerg. Communicator ____________________ Date ________ Time _______

Reviewed by: 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 Emergency Records.

WP/kk

Form 5790-102-6
Revision 2, 02/15/82
Page 1 of 2

ATTACHMENT 5
Example of
SECONDARY NOTIFICATION LIST

Backup Agencies That May Be Notified If Necessary

( ) 1. Chicago Operations Office of DOE
Radiological Assistance Program

( ) 2. Area Civil Defense Groups

a) Region VI Commander (St. Cloud)

b) Wright County

c) Sherburne County

( ) 3. State Highway Patrol

a) St. Cloud

b) Golden Valley
Emergency Radio

c) St. Paul or Dial Operator and
Emergency Radio

( ) 4. Highway Department

( ) 5. Monticello Police Department

( ) 6. Monticello Fire Department

( ) 7. Burlington Northern Railroad
(Chief Dispatcher)

( ) 8. Minneapolis Water Department

( ) 9. St. Paul Water Department

( ) 10. Big Lake-Monticello Ambulance Service

( ) 11. Monticello-Big Lake Community Hospital

WP/kk

Form 5790-102-6
Revision 2, 02/15/82
Page 2 of 2

SECONDARY NOTIFICATION LIST (Cont'd.)

( ) 12. EPA Monticello Field Station

( ) 13. Big Oaks Park (During Camping Season)

( ) 14. Minnesota Pollution Control Agency

( ) 15. Northern States Power
N.W. Division

( ) 16. G.E. Site Representative
C. H. Ballard

WP/kk

Form 5790-102-7
Revision 1, 02/19/82
Page 1 of 1

ATTACHMENT 6

Example of
EMERGENCY CLASSIFICATION CHANGE

Verify that the organization/person called is correct prior to relaying emergency information.

THIS IS ________________________, ___________________________ AT THE
(Name) (Title)

MONTICELLO NUCLEAR GENERATING PLANT.

WE HAVE RE-CLASSIFIED THE EVENT AND ( ) Escalated

( ) Down-graded

TO a(N) ( ) Event May Be Terminated

( ) Unusual Event

( ) Alert

( ) Site Area Emergency

( ) General Emergency

at _______________ hours.
(Time)

Meteorological Conditions: Wind Velocity _________ mph
Wind Direction (Form): _________ Degrees Temperature _______ °C
Atmospheric Stability Class _________ Form of Precipitation _________

Give a brief description of the emergency:

______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

PLEASE RELAY THIS INFORMATION TO YOUR EMERGENCY ORGANIZATION PERSONNEL.

Emergency Director/Manager Approval ________________________________
(Name/Date)

Emergency Communicator ________________________________________
(Name/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 ___ No X

# SITE AREA EMERGENCY

A.2-104

| | | | | | |
|---|---|---|---|---|---|
| Prepared by: | CDMathiasen | ALARA Review: | Revision 0 | Date | 3/29/81 |
| Reviewed by: | JWindschill | Q.A. Review: | Revision 0 | Date | 3/30/81 |
| Operations Committee Final Review: | | Meeting Number | 1068 | Date | 3/1/82 |
| Approved by: | | | | Date | 3-1-82 |
| Op. Com. Results Review: | Not Required | Mtg. # | 950 | Date | 3/27/81 |

## PURPOSE

This procedure describes the action to be taken in the event that a Site Area Emergency has been declared at the Monticello Nuclear Generating Plant. This procedure also designates the preplanned response actions necessary to contend with the emergency condition and references applicable procedures that prescribe the necessary supplementary actions.

The Emergency Director (Shift Supervisor, until properly relieved by a designated alternate) is responsible for the completion of the prescribed actions in this instruction. The Emergency Director may delegate responsibility for performance of the prescribed tasks to available qualified NSP personnel, except where otherwise specified in this instruction.

## CONDITIONS AND PREREQUISITES

A. A Site Area Emergency has been declared based on the occurrence of events which involve actual or likely failures of plant functions needed for the protection of the public. Events classified as Site Area Emergencies are described in A.2-101 (Classification of Emergencies).

OR

B. An Unusual Event or an Alert emergency condition had been declared and emergency condition measures are being performed; and on the basis of subsequent information or upon a deterioration in plant conditions, the condition has been reclassified as a Site Area Emergency.

## PRECAUTIONS

A. Continued surveillance and assessment of plant conditions are necessary to ensure that the emergency classification is appropriately revised as conditions change or more definitive information is obtained.

WP/dw

B. The Site Area Emergency is the lowest emergency classification in which off-site protective actions for airborne releases may be warranted. In consideration of the lead time necessary to implement off-site protective actions, notifications to off-site authorities must be made as soon as possible following the initiating event and immediately after declaration of a Site Area Emergency.

ORGANIZATION

A. Overall Responsibility - Emergency Director (Shift Supervisor until relieved)

B. In Charge

Control Room - Shift Supervisor
* Technical Support Center - Emergency Director
* Emergency Operations Facility - Emergency Manager
* Assembly Point - Assembly Point Coordinator (Senior Staff Member)

C. Assistance

Control Room - Lead Plant Equipment & Reactor Operator; Shift Technical Advisor
* Technical Support Center - Plant management, technical & engineering support

* After augmentation.

RESPONSIBILITIES

A. Emergency Director (Shift Supervisor, until relieved)

1. Implement appropriate Emergency Plan Implementing Procedures.

2. Ensure that appropriate Emergency Operating Procedures are implemented.

3. Determine what support is required and assign the Shift Emergency Communicator to make necessary calls.

4. Implement any assessment, protective, or corrective actions necessary on-site and make recommendations for any necessary off-site protective actions.

5. Respond to situation with the objective of returning plant to normal status (or cold shutdown if this is determined to be necessary).

6. Watch the situation closely to determine when the threat to plant safety has passed. Be prepared to escalate to more severe class of emergency if required.

7. Escalate to more severe class or terminate emergency condition.

NOTE: Emergency Director responsibilities that may NOT be delegated include:

a. Decision to notify off-site emergency management agencies.

b. Making protective action recommendations as necessary to off -site emergency management agencies.

c. Classification of Emergency Event.

d. Determining the necessity for on-site evacuation.

e. Authorization for emergency workers to exceed normal radiation exposure limits.

B. Shift Supervisor (LPE&RO, if SS not available)

1. Implement appropriate Emergency Operating Procedures.

2. Assist the Emergency Director as requested.

C. Control Room Personnel

1. Assist the Shift Supervisor as requested.

2. Monitor control room instruments continually for any sign of increasing radiation, system degradation or any new developments. Notify the Shift Supervisor immediately in any of these cases.

D. Shift Technical Advisor

Provide the Emergency Director and the Shift Supervisor with technical advice.

E. Shift Emergency Communicator

1. Report to the Control Room.

2. Notify off-site personnel, Federal, State and Local Agencies.

3. Coordinate communications from the Emergency Director as required.

F. Shift Radiation Protection Specialist

1. Report to Operations Support Center. Be prepared to assist the Shift Supervisor with any immediate matters as requested.

2. Be prepared to implement procedures which may be required if the situation degrades.

PROCEDURE

STEP 1: As necessary, contact the Shift Technical Advisor and the Shift Emergency Communicator using the following numbers:

STA: Pager
House extension
SEC: Pager
House or extension

Initiate Site Area Emergency Checklist Form . (Attachment 1).

STEP 2: Using the public address system, announce or have announced, a message advising plant personnel of the situation.

For example:
"ATTENTION ALL PLANT PERSONNEL: A SITE AREA EMERGENCY HAS BEEN DECLARED".

If appropriate add:
"ALL MEMBERS OF THE EMERGENCY ORGANIZATION REPORT TO YOUR EMERGENCY DUTY STATIONS. ALL OTHER PERSONNEL STANDBY FOR FURTHER INSTRUCTIONS"

Repeat message slowly.

NOTE 1: During drills or tests, the message will begin and end with the phrase, "THIS IS A DRILL" or "THIS IS A TEST".

NOTE 2: Messages may be modified to give more information or to fit the situation.

STEP 3 Ensure that appropriate Abnormal Operating Procedures have been implemented.

STEP 4 Ensure implementation of Procedure A.2-106, Activation of Technical Support Center, and Procedure A.2-107, Activation of Operational Support Center.

STEP 5 Consider a plant evacuation. To initiate a plant evacuation, implement procedure A.2-301.

NOTE 1: A plant evacuation will normally be initiated during a Site Area Emergency. However, the Emergency Director must consider special conditions (e.g. tornado or high winds) where an evacuation is not advisable. Procedure A.2-201, Onsite Monitoring During an Emergency, contains additional guidance concerning evacuation action levels.

STEP 6: Until the REC position is activated, ensure that onsite and inplant radiation surveys are conducted as necessary and that appropriate radiochemistry samples are taken as necessary.

STEP 7: If the initial notifications have not been made under a previous procedure, direct the SEC to compose Emergency Notification Report, Form 5790-102-2 (Attachment 2) and submit for Emergency Director approval, transmit initial notification using Emergency Call List-ALERT/SITE AREA/GENERAL, Form 5790-104-4 (Attachment 4).

STEP 8: If the initial notifications have been made and the emergency is being reclassified, direct the SEC to compose Emergency Classification Change, Form 5790-102-7 (Attachment 6) and submit for Emergency Director approval, transmit classification change using Emergency Call List-ALERT/SITE AREA/GENERAL, Form 5790-104-4 (Attachment 4).

NOTE: Communications should be per Procedure A.2-501, Communications During an Emergency.

STEP 9: If federal, state or local off-site support is required, direct the Shift Emergency Communicator to request assistance. Use Form 5790-102-6 (Attachment 5) to compile list.

STEP 10: Augment on-shift personnel. As required, direct the Shift Emergency Communicator to contact appropriate individuals from the Monticello Emergency Augmentation List, Form 5790-102-5.

STEP 11: Direct the REC to implement the following procedures:

a. A.2-201 (On-Site Monitoring During an Emergency)

b. A.2-202 (Off-Site Monitoring During an Emergency)

NOTE: Off-site monitoring is the responsibility of the on-site emergency organization only until the EOF attains the capability to perform this task.

c. A.2-204 (Off-Site Protective Action Recommendations).

Consider implementation of strict plant status controls. If it is a radiological emergency implement high radiation area controls in accordance with 4 ACD-4.7.

STEP 12: Consider augmentation of Radiation Protection Staff and/or Counting Facilities. If appropriate call Prairie Island Plant and have the Shift Supervisor initiate Procedure F3-22 (Prairie Island Radiation Protection Group Response to Monticello Emergency). If additional contract health physics support is required, contact Institute for Resource Management Inc.

STEP 13. Direct the REC (or SEC until the REC is activated) to prepare periodic followup information messages, using form 5790-102-3, EMERGENCY NOTIFICATION FOLLOWUP MESSAGE. Review and approve the message content and direct the SEC to transmit the information to the State EOC and the two county EOC's.

NOTE 1: The minimum frequency of followup messages should be every 30 minutes.

NOTE 2: As specified on the message form, protecive action recommendations should not be given to local or county officials once the State EOC is activated.

NOTE 3: When the EOF becomes operational, the followup information messages shall be forwarded to the EOF for transmission to offsite officials.

NOTE 4: Senior technical and management personnel on the plant staff should be made available for consultation with NRC and State personnel on a periodic basis.

STEP 14: Based upon assessment of plant conditions either:

a. Escalate to a higher class of emergency, or

b. Recommend reduction in class, or

c. Close-out the Site Area Emergency,

per Procedure A.2-101 (Classification of Emergencies).

STEP 15: Should reclassification of the emergency be necessary, initiate a new procedure (A.2-102, 103 or 105).

STEP 16: In the event of a close-out, ensure that all appropriate agencies and individuals are promptly notified. The message should include a brief summary of the event, the fact that it has been terminated, and whether or not a recovery will be initiated.

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"

ATTACHMENTS

1. Example of Site Area Emergency Checklist
2. Example of Emergency Notification Report Form
3. Example of Emergency Notification Followup Message
4. Example of Emergency Call List - ALERT/SITE AREA/GENERAL
5. Example of Secondary Notification List
6. Example of Emergency Classification Change

WP/dw

ATTACHMENT 1

Form 5790-104-1
Revision 2, 12/15/81
Page 1 of 1

Example of
SITE AREA EMERGENCY CHECKLIST
(For Use With Procedure A.2-104)

1. STA and SEC summoned. ________ ED Initial ________ Time ________ Date

2. Announced Site Area Emergency over public address system. ________ ED Initial ________ Time ________ Date

3. Abnormal Operating Procedures implemented. ________ ED Initial ________ Time ________ Date

4. TSC and OSC activated. ________ ED Initial ________ Time ________ Date

5. Plant evacuation considered. ________ ED Initial ________ Time ________ Date

6. Onsite and inplant rad surveys and radiochemistry samples directed as necessary. ________ ED Initial ________ Time ________ Date

7. Offsite officials/agencies notified. ________ ED Initial ________ Time ________ Date

8. Directed SEC to request Off-Site Support Form 5790-102-6. ________ ED Initial ________ Time ________ Date

9. Directed SEC to contact Plant Staff as required for Shift Augmentation, Form 5790-102-5. ________ ED Initial ________ Time ________ Date

10. Assessment: implemented the following procedures:

    A.2-201 (On-Site Monitoring) ________ ________ ________

    A.2-202 (Off-Site Monitoring) ________ ________ ________

    A.2-204 (Off-Site Protective Actions ________ ED Initials ________ Time ________ Date

11. Rad. Prot. Staff augmentation implemented. ________ ED Initial ________ Time ________ Date

12. Followup notification initiated. ________ ED Initial ________ Time ________ Date

13. Closed Out/Escalated to a higher class/ down-grade to a lower class based upon Procedure A.2-101. ________ ED Initial ________ 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/dw

ATTACHMENT 2

Form 5790-102-2
Revision 3, 02/19/82
Page 1 of 1

Example of
EMERGENCY NOTIFICATION REPORT*

Verify that the organization/person called is correct prior to relaying emergency information.

THIS IS ______________________ (Name), __________________ (Title) AT THE MONTICELLO NUCLEAR GENERATING PLANT.
WE HAVE DECLARED A(N) ___________________________ AT ________ HOURS.
(Emergency Class) (Time)

Pick one of the following, based on information from Control Room Personnel or Shift Supervisor:

( ) WE HAVE NOT HAD A RADIOACTIVE RELEASE.
( ) WE HAVE HAD A(N) __________________ (Liquid or Airborne) RADIOACTIVE RELEASE.

ATMOSPHERIC CONDITIONS AT THE PRESENT TIME ARE AS FOLLOWS:
WIND DIRECTION IS FROM THE _______ (Direction) AT ______ (Speed) MPH.

THE AFFECTED SECTOR(S) IS(ARE) ________________________________________.
(List sector(s) by letter designation as determined by map in TSC.)

Protective Action Recommendation (pick one):

THE PROTECTIVE ACTION RECOMMENDED AT THIS TIME IS (From Emer. Dir./Procedure A.2-204):

( ) None
( ) SHELTER OUT TO _________ (Distance) MILES
( ) EVACUATE OUT TO _________ (Distance) MILES
( ) ACTIVATE PUBLIC ALERT & NOTIFICATION SYSTEM
( ) CLOSE MINNEAPOLIS AND ST. PAUL WATER INTAKES

Give a brief description of the emergency.

________________________________________________________________________________

________________________________________________________________________________

PLEASE RELAY THIS INFORMATION TO YOUR EMERGENCY ORGANIZATION PERSONNEL.

Emergency Director Approval ________________________________ (Name/Date)

Emergency Communicator ______________________________________ (Name/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.

* Complete as much of the form as information available or time allows. All blanks need not be filled out.

ATTACHMENT 3

Form 5790-102-3
Rev. 3, 02/22/82
Page 1 of 2

Example of
EMERGENCY NOTIFICATION FOLLOWUP MESSAGE*

Date ________________

Sample Time ________________ AM/PM

1. Location of incident: Monticello

2. Class of emergency: ________________________

3. Type of actual or projected release: ( ) airborne
( ) waterborne
( ) surface spill

4. Height of release: ( ) ground level
( ) 100 meters (stack)

Relative quantity: ________________% Noble Gases ________________µCi/sec
________________% Iodines ________________µCi/sec
________________% Particulates ________________µCi/sec

Estimated quantity of radioactive material released or being released: _______ curies

5. Meteorological Conditions: Wind Velocity _______ mph
Wind Direction (from): _____ degrees Temperature _______ °C
Atmospheric Stability Class _____ Form of Precipitation _______

6. Release is expected to continue for ____________ hours.
(hours)

7.

| | | Whole Body | Thyroid | Sectors Affected |
|---|---|---|---|---|
| Projected dose rates: | S.B. | ________ mrem/hr | ________ mrem/hr | ____________ |
| | 2 miles | ________ mrem/hr | ________ mrem/hr | ____________ |
| | 5 miles | ________ mrem/hr | ________ mrem/hr | ____________ |
| | 10 miles | ________ mrem/hr | ________ mrem/hr | ____________ |
| Projected integrated dose at: | S.B | ________ mrem | ________ mrem | ____________ |
| | 2 miles | ________ mrem | ________ mrem | ____________ |
| | 5 miles | ________ mrem | ________ mrem | ____________ |
| | 10 miles | ________ mrem | ________ mrem | ____________ |

* Complete as much of the form as information availability and time allows. All blanks need not be completed.

ATTACHMENT 3 (Cont'd.)

Form 5790-102-3
Rev. 3, 02/22/82
Page 2 of 2

8. Survey Results

| TIME | SURVEY POINT | READING |
|---|---|---|
| ________ | ________ | ________________________________ |
| ________ | ________ | ________________________________ |
| ________ | ________ | ________________________________ |
| ________ | ________ | ________________________________ |
| ________ | ________ | ________________________________ |

9. Estimate of any surface radioactive contamination: ________ dpm/100 $cm^2$

10. Chemical and physical form of released material: ____________________

11. Emergency response actions underway: ____________________
________________________________________
________________________________________

12. For liquid release to the River, estimate release volume, release activity and estimated time for concentration to reach public water:
________________________________________

13. Recommended emergency actions, including protective actions:
________________________________________
________________________________________

CAUTION: Do NOT relay this information to local or county officials once the State EOC is activated.

14. Request for any needed support by off-site organizations:
________________________________________
________________________________________

15. Prognosis for worsening or termination of event based on plant information:
________________________________________
________________________________________

________________________________
Emergency Director (or Designee)

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/dw

ATTACHMENT 4

Form 5790-104-4
Revision 4, 2/26/82
Page 1 of 5

Example of
EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL

NOTE 1: The Shift Emergency Communicator shall make notifications to the individuals and organizations listed on the appropriate Emergency Call List.

NOTE 2: For those notifications made by telephone, make the call as follows:

a. Contact each organization or individual using the contact information listed in the attachment for the appropriate emergency class.

b. When the party answers, read the text of the notification.

c. Note the name of the individual contacted and the time of the contact.

d. Proceed to the next party on the call-list.

e. If a party can not be contacted in two attempts, bypass that party and proceed down the list. After the other notifications are complete, re-attempt to contact any bypassed parties. If a party still can not be reached, consider other means such as dispatching a courier, relay through another party or similar actions.

f. If the parties call back for further information, note the time and the name of the individuals.

g. If a party not specified on the call list requests information, refer the party to the NSP Communications Department or to the local emergency services organization in his/her community, as appropriate.

NOTE 3: Some of the below listed individuals may be on site when the emergency is declared. They will not require additional notification if it is known that they are at their designated emergency duty stations.

ATTACHMENT 4 (Cont'd.)

Form 5790-104-4
Revision 4, 2/26/82
Page 2 of 5

EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL (Cont'd.)

NOTIFICATIONS

1. Notify the Minnesota Division of Emergency Services. The telephone number is , night or day (ask for the Duty Officer). Request Emergency Services to notify the Department of Health.

| Contact Person | Time | Initial Notification SEC Initials | Verification SEC Initials |
|---|---|---|---|

NOTE 1: This notification shall be made within 15 minutes of declaration of emergency class.

NOTE 2: This call will be verified via the line. If no verification within 30 minutes, contact the State again.

2. Notify the local authorities by telephone as follows: Notification

a. Wright County Sheriff ----
---
---

SEC Initials

b. Sherburne County Sheriff ---

SEC Initials

| | Working Hours | Nights/ Holidays | |
|---|---|---|---|
| c. Monticello Civil Defense | Or Pager | | SEC Initials |

NOTE 1: These notifications shall be made within 15 minutes of declaration of emergency class.

NOTE 2: The Monticello Civil Defense notification is not required after the initial notification of the event.

ATTACHMENT 4 (Cont'd.)

Form 5790-104-4
Revision 4, 02/26/82
Page 3 of 5

EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL (Cont'd.)

3. See the NOTE.

Using the telephone pager system, notify the group of individuals listed below. Calmly transmit the following message each individual.

"PLEASE CALL THE CONTROL ROOM IMMEDIATELY. I REPEAT, PLEASE CALL THE CONTROL ROOM IMMEDIATELY.

When the individuals call, calmly indicate that a SITE AREA EMERGENCY has been declared and that they should report to the plant immediately.

| | Page Number | Contact Person/Time/SEC Initials |
|---|---|---|
| Plant Manager ---------------------- | | / / |
| Radiation Protection Designee --------- | | / / |
| Radiological Emergency Coordinator----- | | / / |
| EOF Coordinator ---------------------- | | / / |

If after 5 minutes a contact has not been verified or if circumstances prevent individuals from reporting in a timely manner, consult the EOF Coordinator and Radiation Protection Designee duty roster and call an alternate. Record the names of alternates contacted.

Alternate Radiation Protection Designee ______________________

Alternate EOF Coordinator ______________________

NOTE: This step not required if the Emergency Response Organization has already been activated.

4. See the NOTE.

Using the tone-activated radios, notify the remainder of the ERO, local officials and near-site residents according to the following steps:

a. Insert the prerecorded tape designated 'ERO Callout' into the TRANSMITTING UNIT.

b. Set the selector switch on the TRANSMITTING UNIT to 'ANSWER'.

c. On the CONTROL UNIT, turn the key in the 'TRANSMIT ENABLE' switch. The red 'XMIT' lamp should light.

ATTACHMENT 4 (Cont'd.)

Form 5790-104-4
Revision 4, 02/26/82
Page 4 of 5

EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL (Cont'd.)

d. Enter 06 on the ENCODER UNIT and press 'P'. (The tape will be trasmitted 3 times automatically.)

e. When the transmissions have ended, remove the tape and insert the tape designated 'Local Notifications' into the TRANSMITTING UNIT.

f. Enter 01 on the ENCODER UNIT and press 'P'. When the series of toner stops enter 04 and press 'P'.

g. The tape will be transmitted three times. When the transmissions have ended, turn the key in the 'TRANSMIT ENABLE' switch. The green 'TEST' lamp shall light.

h. Remove the message cassette from the TRANSMITTING UNIT and insert it into the ANSWERING UNIT.

ERO Personnel With Tone Activated Radios

12 SEC's
6 Site Superintendents
2 Maintenance Supervisors
2 Electricians
4 I&CS Personnel
3 STA's
Radiation Protection Group

NOTE: This step not required if the Emergency Response Organization (ERO) and the local officials have already been notified.

5. Notify the System Dispatcher using the hotline (in the Control Room), the low-band radio link (TSC and Control Room), or normal telephone line ) night or day). ____________
SEC Initials

6. Notify one of the site NRC Resident Inspectors (Extension

C. Brown (Home) ____________
SEC Initials

OR

A. Madison (Home) ____________
SEC Initials

7. Notify the NRC Emergency Response Center via the ENS hotline. Use Form 3195 to assemble information which will be requested by NRC. Determine from the NRC whether or not continuous manning is required. ____________
SEC Initials

ATTACHMENT 4 (Cont'd.)

Form 5790-104-4
Revision 4, 2/26/82
Page 5 of 5

EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL (Cont'd.)

NOTE 1: If the ENS is out of order, attempt contact in the following order until notification is made:

(a) Commercial Telephone System to NRC Operations Center (via Bethesda Central Office) 301/492-8111

(b) Commercial Telephone System to NRC Operations Center (via Silver Springs Central Office) 301/427-4056

(c) Health Physics Network (HPN) to NRC Operations Center *22 (Touch-Tone) or 22 (Rotary Dial)

(d) Commercial Telephone System to NRC Operator (via Bethesda Central Office) 301/492-7000

NOTE 2: Notification to be made within one hour of event declaration, as required by 4 ACD-3.9.

8. Inform the Emergency Director of the completion of the notifications.

_____________
SEC Initials

Completed: Shift Emerg. Communicator ____________________ Date ________ Time _______

Reviewed by: 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 Emergency Records.

WP/dw

Form 5790-102-6
Revision 2, 02/15/82
Page 1 of 2

ATTACHMENT 5

Example of
SECONDARY NOTIFICATION LIST

Backup Agencies That May Be Notified If Necessary

( ) 1. Chicago Operations Office of DOE
Radiological Assistance Program

( ) 2. Area Civil Defense Groups

a) Region VI Commander (St. Cloud)

b) Wright County

c) Sherburne County

( ) 3. State Highway Patrol

a) St. Cloud

b) Golden Valley
Emergency Radio

c) St. Paul or Dial Operator and
Emergency Radio

( ) 4. Highway Department

( ) 5. Monticello Police Department

( ) 6. Monticello Fire Department

( ) 7. Burlington Northern Railroad
(Chief Dispatcher)

( ) 8. Minneapolis Water Department

( ) 9. St. Paul Water Department

( ) 10. Big Lake-Monticello Ambulance Service

( ) 11. Monticello-Big Lake Community Hospital

WP/kk

Form 5790-102-6
Revision 2, 02/15/82
Page 2 of 2

ATTACHMENT 5 (Cont'd)

Example of
SECONDARY NOTIFICATION LIST (Cont'd.)

( ) 12. EPA Monticello Field Station

( ) 13. Big Oaks Park (During Camping Season)

( ) 14. Minnesota Pollution Control Agency

( ) 15. Northern States Power
N.W. Division

( ) 16. G.E. Site Representative
C. H. Ballard

Form 5790-102-7
Revision 2, 02/19/82
Page 1 of 1

ATTACHMENT 6

Example of
EMERGENCY CLASSIFICATION CHANGE

Verify that the organization/person called is correct prior to relaying emergency information.

THIS IS ______________________, ______________________ AT THE
(Name) (Title)

MONTICELLO NUCLEAR GENERATING PLANT.

WE HAVE RE-CLASSIFIED THE EVENT AND ( ) Escalated

( ) Down-graded

TO a(N) ( ) Event May Be Terminated

( ) Unusual Event

( ) Alert

( ) Site Area Emergency

( ) General Emergency

at ______________ hours.
(Time)

Meteorological Conditions:
Wind Direction (Form): __________ Degrees
Atmospheric Stability Class __________

Wind Velocity __________ mph
Temperature __________ °C
Form of Precipitation __________

Give a brief description of the emergency:

______________________________________________
______________________________________________
______________________________________________

PLEASE RELAY THIS INFORMATION TO YOUR EMERGENCY ORGANIZATION PERSONNEL.

Emergency Director/Manager Approval ______________________
(Name/Date)

Emergency Communicator ______________________
(Name/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 ___ No X

# GENERAL EMERGENCY

A.2-105

| | | | | | |
|---|---|---|---|---|---|
| Prepared by: | G.J. Mathiasen | ALARA Review: | Revision 0 | Date | 3/29/81 |
| Reviewed by: | [illegible signature] | Q.A. Review: | Revision 0 | Date | 3/29/81 |
| Operations Committee Final Review: Meeting Number | | | 1068 | Date | 3/1/82 |
| Approved by: | | | [illegible signature] | Date | 3-1-82 |
| Op. Com. Results Review: | Not Required | | Mtg. # 950 | Date | 3/27/81 |

## PURPOSE

This procedure describes the actions to be taken in the event that a General Emergency has been declared at the Monticello Nuclear Generating Plant. This procedure also designates the prescribed pre-planned response actions necessary to contend with the emergency condition and references applicable procedures that describe the necessary supplementary actions.

The Emergency Director (Shift Supervisor, until properly relieved by a designated alternate) is responsible for the completion of the prescribed actions in this procedure. The Emergency Director may delegate responsibility for performance of the prescribed tasks available qualified NSP personnel, except where otherwise specified in this procedure.

## CONDITIONS AND PREREQUISITES

A. A General Emergency has been declared based on the occurrence of events which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Events classified as General Emergencies are described in A.2-101 (Classification of Emergencies).

OR

B. A lesser emergency had been declared and emergency measures are being performed; and on the basis of subsequent information or upon a deterioration in plant conditions, the emergency has been reclassified as a General Emergency.

## PRECAUTIONS

A. Continued surveillance and assessment of plant conditions are necessary to ensure that the emergency classification is revised appropriately as conditions change or more definitive information is obtained.

B. The General Emergency classification includes actual or imminent events for which off-site protective actions will be needed. In consideration of the lead time necessary to implement off-site protective actions, notification to off-site authorities must be made as soon as possible following the initiating event and immediately after declaration of General Emergency.

ORGANIZATION

A. Overall Responsibility - Emergency Director (Shift Supervisor, until relieved)

B. In Charge

Control Room - Shift Supervisor
* Technical Support Center - Emergency Director
* Emergency Operations Facility - Emergency Manager
* Assembly Point - Assembly Point Coordinator (Senior Staff Member)

C. Assistance

* Technical Support Center - Plant Management, Technical & Engineering Support
Control Room - Lead Plant Equipment & Reactor Operator; Shift Technical Advisor When assigned, & Shift Emergency Communicator

* After augmentation

RESPONSIBILITIES

A. Emergency Director (Shift Supervisor, until relieved)

1. Implement appropriate Emergency Plan Implementing Procedures.

2. Ensure that appropriate Emergency Operating Procedures are implemented.

3. Determine what support is required and assign the Shift Emergency Communicator to make necessary calls.

4. Implement any assessment, protective or corrective actions necessary on-site and make recommendations for any necessary off-site protective actions.

5. Respond to situation with the objective of returning plant to normal status (or cold shutdown if this is determined to be necessary).

6. Watch the situation closely to determine when the threat to plant safety has passed.

7. Recommend reduction to a lower class or terminate emergency condition.

NOTE: Emergency Director responsibilities that may NOT be delegated include:

a. Decision to notify off-site emergency management agencies.

b. Making protective action recommendations as necessary to off-site emergency management agencies.

WP/kk

c. Classification of Emergency Event.

d. Determining the necessity for on-site evacuation.

e. Authorization for emergency workers to exceed normal radiation exposure limits.

B. Shift Supervisor (LPE&RO, if SS not available)

1. Implement appropriate Emergency Operating Procedures.

2. Assist the Emergency Director as requested.

C. Control Room Personnel

1. Assist the Shift Supervisor as requested.

2. Monitor control room instruments continually for any sign of increasing radiation, system degradation or any new developments. Notify the Shift Supervisor immediately in any of these cases.

D. Shift Technical Advisor

Provide the Emergency Director and the Shift Supervisor with technical advice.

E. Shift Emergency Communicator

1. Report to the Control Room.

2. Notify off-site personnel, Federal, State and Local Agencies.

3. Coordinate communications from the Emergency Director as required.

F. Shift Radiation Protection Specialist

1. Report to Operations Support Center. Be prepared to assist the Shift Supervisor with any immediate matters as requested.

2. Be prepared to implement procedures which may be required if the situation degrades.

PROCEDURE

STEP 1: As necessary, contact the Shift Technical Advisor and the Shift Emergency Communicator using the following numbers:

| | | |
|---|---|---|
| STA: | Pager | |
| | House | extension |
| SEC: | Pager | |
| | House | or extension |

Initiate General Emergency Checklist Form 5790-105-1 (Attachment 1).

STEP 2: Using the public address system, announce or have announced, a message advising plant personnel of the situation.

For example:
"ATTENTION ALL PLANT PERSONNEL: A GENERAL EMERGENCY HAS BEEN DECLARED".

If appropriate add:
"ALL MEMBERS OF THE EMERGENCY ORGANIZATION REPORT TO YOUR EMERGENCY DUTY STATIONS.

Repeat message slowly.

NOTE 1: During drills or tests, the message will begin and end with the phrase, "THIS IS A DRILL" or "THIS IS A TEST".

NOTE 2: Messages may be modified to give more information or to fit the situation.

STEP 3 Ensure that appropriate Abnormal Operating Procedures have been implemented.

STEP 4 Ensure implementation of Procedure A.2-106, Activation of Technical Support Center, and Procedure A.2-107, Activation of Operational Support Center.

STEP 5 Initiate a plant evacuation (if it has not been executed) unless extreme circumstances make it inadvisable. Implement procedure A.2-301, Emergency Evacuation.

STEP 6: Until the REC position is activated, ensure that onsite and inplant radiation surveys are conducted as necessary and that appropriate radiochemistry samples are taken as necessary.

STEP 7: SEE NOTE 2 BELOW. If the initial notifications have not been made under a previous procedure, direct the SEC to compose Emergency Notification Report, Form 5790-102-2 (Attachment 2) and submit for Emergency Director approval, transmit initial notification using Emergency Call List-General Emergency, Form 5790-104-4 (Attachment 4). Ensure that recommendations include activation of public notification system and sheltering out to 2 miles in all directions.

STEP 8: SEE NOTE 2 BELOW. If the initial notifications have been made and the emergency is being reclassified, direct the SEC to compose Emergency Classification Change, Form 5790-102-7 (Attachment 7) and submit for Emergency Director approval, transmit classification change using Emergency Call List-General Emergency Form 5790-104-4 (Attachment 4). Ensure that a recommendation for activation of public notification system and sheltering out to 2 miles in all directions is made.

NOTE 1: Communications should be per Procedure A.2-501, Communications During an Emergency.

NOTE 2: When the EOF is fully activated, the plant will be relieved of the responsibility for offsite notifications (STEPS 4 and 5).

STEP 9: If federal, state or local off-site support is required, direct the Shift Emergency Communicator to request assistance. Use Form 5790-102-6 (Attachment 5) to compile list.

STEP 10: Augment on-shift personnel. As required, direct the Shift Emergency Communicator to contact appropriate individuals or agencies as required from the Monticello Emergency Augmentation List, Form 5790-102-5.

STEP 11: Direct the REC to implement the following procedures:

a. A.2-201 (On-Site Monitoring During an Emergency)

b. A.2-202 (Off-Site Monitoring During an Emergency)

NOTE: Off-site monitoring is the responsibility of the on-site emergency organization only until the EOF attains the capability to perform this task.

c. A.2-204 (Off-Site Protective Action Recommendations).

Consider implementation of strict plant status controls in accordance with 4 ACD-4.7. If it is a radiological emergency, implement high radiation area controls.

STEP 12: Consider augmentation of Radiation Protection Staff and/or Counting Facilities. If appropriate call Prairie Island Plant and have the Shift Supervisor initiate Procedure F3-22 (Prairie Island Radiation Protection Group Response to Monticello Emergency). If additional contract health physics support is required, contact Institute for Resource Management Inc.

STEP 13: Direct the REC (or SEC until the REC is activated) to prepare periodic followup information messages, using form 5790-102-3, EMERGENCY NOTIFICATION FOLLOWUP MESSAGE. Review and approve the message content and direct the SEC to transmit the information to the State EOC and the two county EOC's.

NOTE 1: The minimum frequency of followup messages should be every 30 minutes.

NOTE 2: As specified on the message form, protecive action recommendations should not be given to local or county officials once the State EOC is activated.

NOTE 3: When the EOF becomes operational, the followup information messages shall be forwarded to the EOF for transmission to offsite officials.

NOTE 4: Senior technical and management personnel on the plant staff should be made available for consultation with NRC and State personnel on a periodic basis

STEP 14: Based upon assessment of plant conditions either:

a. Recommend reduction in class, or

b. Close-out the General Emergency,

per Procedure A.2-101 (Classification of Emergencies).

STEP 15: Should reclassification of the emergency be necessary, initiate a new procedure (A.2-102, 103 or 105).

STEP 16: In the event of a close-out, ensure that all appropriate agencies and individuals are promptly notified. The message should include a brief summary of the event, the fact that it has been terminated, and whether or not a recovery will be initiated.

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"

ATTACHMENTS

1. Example of Site Area Emergency Checklist
2. Example of Emergency Notification Report Form
3. Example of Emergency Notification Followup Message
4. Example of Emergency Call List - General Emergency
5. Example of Secondary Notification List
6. Example of Emergency Classification Change

ATTACHMENT 1

Form 5790-105-1
Revision 2, 12/15/81
Page 1 of 1

Example of
GENERAL EMERGENCY CHECKLIST
(For Use With Procedure A.2-104)

| | | | |
|---|---|---|---|
| 1. STA and SEC summoned. | ED Initial | Time | Date |
| 2. Announced emergency classification. | ED Initial | Time | Date |
| 3. Abnormal Operating Procedures implemented. | ED Initial | Time | Date |
| 4. TSC and OSC activated. | ED Initial | Time | Date |
| 5. Plant evacuation initiated. | ED Initial | Time | Date |
| 6. Onsite and inplant rad surveys and radiochemistry samples directed as necessary. | ED Initial | Time | Date |
| 7. Offsite notifications directed. | ED Initial | Time | Date |
| 8. Directed SEC to request Off-Site Support (Form 5790-102-6). | ED Initial | Time | Date |
| 9. Directed SEC to contact Plant Staff as required for Shift Augmentation, Form 5790-102-5. | ED Initial | Time | Date |
| 10. Assessment: implemented the following procedures: | | | |
| A.2-201 (On-Site Monitoring) | | | |
| A.2-202 (Off-Site Monitoring) | | | |
| A.2-204 (Off-Site Protective Actions | ED Initials | Time | Date |
| 11. Rad. Prot. Staff augmentation implemented. | ED Initial | Time | Date |
| 12. Followup notification initiated. | ED Initial | Time | Date |
| 13. (Closed Out/down-grade to a lower class) based upon Procedure A.2-101. | ED Initial | 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 5790-102-2
Revision 3, 02/19/82
Page 1 of 1

Example of
EMERGENCY NOTIFICATION REPORT*

Verify that the organization/person called is correct prior to relaying emergency information.

THIS IS ____________________ (Name), __________________ (Title) AT THE MONTICELLO NUCLEAR GENERATING PLANT.
WE HAVE DECLARED A(N) __________________________ AT ________ HOURS.
(Emergency Class) (Time)

Pick one of the following, based on information from Control Room Personnel or Shift Supervisor:

( ) WE HAVE NOT HAD A RADIOACTIVE RELEASE.
( ) WE HAVE HAD A(N) __________________ (Liquid or Airborne) RADIOACTIVE RELEASE.

ATMOSPHERIC CONDITIONS AT THE PRESENT TIME ARE AS FOLLOWS:
WIND DIRECTION IS FROM THE _______ (Direction) AT ______ (Speed) MPH.

THE AFFECTED SECTOR(S) IS(ARE) ______________________________________.
(List sector(s) by letter designation as determined by map in TSC.)

Protective Action Recommendation (pick one):

THE PROTECTIVE ACTION RECOMMENDED AT THIS TIME IS (From Emer. Dir./Procedure A.2-204):

( ) None
( ) SHELTER OUT TO __________ (Distance) MILES
( ) EVACUATE OUT TO __________ (Distance) MILES
( ) ACTIVATE PUBLIC ALERT & NOTIFICATION SYSTEM
( ) CLOSE MINNEAPOLIS AND ST. PAUL WATER INTAKES

Give a brief description of the emergency.

______________________________________________________________________________

______________________________________________________________________________

PLEASE RELAY THIS INFORMATION TO YOUR EMERGENCY ORGANIZATION PERSONNEL.

Emergency Director Approval __________________________________ (Name/Date)

Emergency Communicator ______________________________________ (Name/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.

* Complete as much of the form as information available or time allows. All blanks need not be filled out.

ATTACHMENT 3

Form 57^0-102-3
Rev. 3, 02/22/82
Page 1 of 2

Example of
EMERGENCY NOTIFICATION FOLLOWUP MESSAGE*

Date ____________________

Sample Time ____________________ AM/PM

1. Location of incident: Monticello

2. Class of emergency: ____________________________

3. Type of actual or projected release: ( ) airborne
( ) waterborne
( ) surface spill

4. Height of release: ( ) ground level
( ) 100 meters (stack)

| | | | |
|---|---|---|---|
| Relative quantity: | ____________________% | Noble Gases | ________________ μCi/sec |
| | ____________________% | Iodines | ________________ μCi/sec |
| | ____________________% | Particulates | ________________ μCi/sec |

Estimated quantity of radioactive material released or being released: ________ curies

5. Meteorological Conditions: Wind Velocity ________ mph
Wind Direction (from): _____ degrees Temperature ________ °C
Atmospheric Stability Class ______ Form of Precipitation ________

6. Release is expected to continue for _____________ hours.
(hours)

| 7. | | Whole Body | Thyroid | Sectors Affected |
|---|---|---|---|---|
| Projected dose rates: | S.B. | __________ mrem/hr | __________ mrem/hr | ______________ |
| | 2 miles | __________ mrem/hr | __________ mrem/hr | ______________ |
| | 5 miles | __________ mrem/hr | __________ mrem/hr | ______________ |
| | 10 miles | __________ mrem/hr | __________ mrem/hr | ______________ |
| Projected integrated dose at: | S.B | __________ mrem | __________ mrem | ______________ |
| | 2 miles | __________ mrem | __________ mrem | ______________ |
| | 5 miles | __________ mrem | __________ mrem | ______________ |
| | 10 miles | __________ mrem | __________ mrem | ______________ |

* Complete as much of the form as information availability and time allows. All blanks need not be completed.

ATTACHMENT 3 (Cont'd.)

Form 5790-102-3
Rev. 3, 02/22/82
Page 2 of 2

8. Survey Results

| TIME | SURVEY POINT | READING |
|---|---|---|
| ________ | ________ | ____________________ |
| ________ | ________ | ____________________ |
| ________ | ________ | ____________________ |
| ________ | ________ | ____________________ |
| ________ | ________ | ____________________ |

9. Estimate of any surface radioactive contamination: ________ dpm/100 $cm^2$

10. Chemical and physical form of released material: ____________________

11. Emergency response actions underway: ____________________

____________________

____________________

12. For liquid release to the River, estimate release volume, release activity and estimated time for concentration to reach public water:

____________________

13. Recommended emergency actions, including protective actions:

____________________

____________________

CAUTION: Do NOT relay this information to local or county officials once the State EOC is activated.

14. Request for any needed support by off-site organizations:

____________________

____________________

15. Prognosis for worsening or termination of event based on plant information:

____________________

____________________

____________________
Emergency Director (or Designee)

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

Form 5790-104-4
Revision 4, 2/26/82
Page 1 of 5

Example of
EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL

NOTE 1: The Shift Emergency Communicator shall make notifications to the individuals and organizations listed on the appropriate Emergency Call List.

NOTE 2: For those notifications made by telephone, make the call as follows:

a. Contact each organization or individual using the contact information listed in the attachment for the appropriate emergency class.

b. When the party answers, read the text of the notification.

c. Note the name of the individual contacted and the time of the contact.

d. Proceed to the next party on the call-list.

e. If a party can not be contacted in two attempts, bypass that party and proceed down the list. After the other notifications are complete, re-attempt to contact any bypassed parties. If a party still can not be reached, consider other means such as dispatching a courier, relay through another party or similar actions.

f. If the parties call back for further information, note the time and the name of the individuals.

g. If a party not specified on the call list requests information, refer the party to the NSP Communications Department or to the local emergency services organization in his/her community, as appropriate.

NOTE 3: Some of the below listed individuals may be on site when the emergency is declared. They will not require additional notification if it is known that they are at their designated emergency duty stations.

ATTACHMENT 4 (Cont'd.)



EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL (Cont'd.)

NOTIFICATIONS

1. Notify the Minnesota Division of Emergency Services. The telephone number is ___ night or day (ask for the Duty Officer). Request Emergency Services to notify the Department of Health.

| Contact Person | Time | Initial Notification SEC Initials | Verification SEC Initials |
|---|---|---|---|
| | | | |

NOTE 1 This notification shall be made within 15 minutes of declaration of emergency class.

NOTE 2: This call will be verified via the line. If no verification within 30 minutes, contact the State again.

2. Notify the local authorities by telephone as follows: Notification

a. Wright County Sheriff ---
---
----

SEC Initials

b. Sherburne County Sheriff ---

SEC Initials

| | Working Hours | Nights/ Holidays |
|---|---|---|
| c. Monticello Civil Defense | Or Pager | |

SEC Initials

NOTE 1: These notifications shall be made within 15 minutes of declaration of emergency class.

NOTE 2: The Monticello Civil Defense notification is not required after the initial notification of the event.

WP/kk

ATTACHMENT 4 (Cont'd.)

Form 5790-104-4
Revision 4, 02/26/82
Page 3 of 5

EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL (Cont'd.)

3. See the NOTE.

Using the telephone pager system, notify the group of individuals listed below. Calmly transmit the following message each individual.

"PLEASE CALL THE CONTROL ROOM IMMEDIATELY. I REPEAT, PLEASE CALL THE CONTROL ROOM IMMEDIATELY.

When the individuals call, calmly indicate that a SITE AREA EMERGENCY has been declared and that they should report to the plant immediately.

| | Page Number | Contact Person/Time/SEC Initials |
|---|---|---|
| Plant Manager ---------------------- | | / / |
| Radiation Protection Designee --------- | | / / |
| Radiological Emergency Coordinator----- | | / / |
| EOF Coordinator --------------------- | | / / |

If after 5 minutes a contact has not been verified or if circumstances prevent individuals from reporting in a timely manner, consult the EOF Coordinator and Radiation Protection Designee duty roster and call an alternate. Record the names of alternates contacted.

Alternate Radiation Protection Designee ____________________

Alternate EOF Coordinator ____________________

NOTE: This step not required if the Emergency Response Organization has already been activated.

4. See the NOTE.

Using the tone-activated radios, notify the remainder of the ERO, local officials and near-site residents according to the following steps:

a. Insert the prerecorded tape designated 'ERO Callout' into the TRANSMITTING UNIT.

b. Set the selector switch on the TRANSMITTING UNIT to 'ANSWER'.

c. On the CONTROL UNIT, turn the key in the 'TRANSMIT ENABLE' switch. The red 'XMIT' lamp should light.

ATTACHMENT 4 (Cont'd.)

Form 5790-104-4
Revision 4, 02/26/82
Page 4 of 5

EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL (Cont'd.)

d. Enter 06 on the ENCODER UNIT and press 'P'. (The tape will be trasmitted 3 times automatically.)

e. When the transmissions have ended, remove the tape and insert the tape designated 'Local Notifications' into the TRANSMITTING UNIT.

f. Enter 01 on the ENCODER UNIT and press 'P'. When the series of toner stops enter 04 and press 'P'.

g. The tape will be transmitted three times. When the transmissions have ended, turn the key in the 'TRANSMIT ENABLE' switch. The green 'TEST' lamp shall light.

h. Remove the message cassette from the TRANSMITTING UNIT and insert it into the ANSWERING UNIT.

ERO Personnel With Tone Activated Radios

12 SEC's
6 Site Superintendents
2 Maintenance Supervisors
2 Electricians
4 I&CS Personnel
3 STA's
Radiation Protection Group

NOTE: This step not required if the Emergency Response Organization (ERO) and the local officials have already been notified.

5. Notify the System Dispatcher using the hotline (in the Control Room), the low-band radio link (TSC and Control Room), or normal telephone line ( night or day).

SEC Initials

6. Notify one of the site NRC Resident Inspectors (Extension

(Home)

SEC Initials

(Home)

SEC Initials

7. Notify the NRC Emergency Response Center via the ENS hotline. Use Form 3195 to assemble information which will be requested by NRC. Determine from the NRC whether or not continuous manning is required.

SEC Initials

ATTACHMENT 4 (Cont'd.)

Form 5790-104-4
Revision 4, 2/26/82
Page 5 of 5

EMERGENCY CALL LIST - ALERT/SITE AREA/GENERAL (Cont'd.)

NOTE 1: If the ENS is out of order, attempt contact in the following order until notification is made:

(a) Commercial Telephone System to NRC Operations Center (via Bethesda Central Office) 301/492-8111

(b) Commercial Telephone System to NRC Operations Center (via Silver Springs Central Office) 301/427-4056

(c) Health Physics Network (HPN) to NRC Operations Center *22 (Touch-Tone) or 22 (Rotary Dial)

(d) Commercial Telephone System to NRC Operator (via Bethesda Central Office) 301/492-7000

NOTE 2: Notification to be made within one hour of event declaration, as required by 4 ACD-3.9.

8. Inform the Emergency Director of the completion of the notifications.

_____________
SEC Initials

Completed: Shift Emerg. Communicator ____________________ Date ________ Time ________

Reviewed by: 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 Emergency Records.

WP/kk

Form 5790-102-6
Revision 2, 02/15/82
Page 1 of 2

ATTACHMENT 5

Example of
SECONDARY NOTIFICATION LIST

Backup Agencies That May Be Notified If Necessary

( ) 1. Chicago Operations Office of DOE
Radiological Assistance Program

( ) 2. Area Civil Defense Groups

a) Region VI Commander (St. Cloud)

b) Wright County

c) Sherburne County

( ) 3. State Highway Patrol

a) St. Cloud

b) Golden Valley
Emergency Radio

c) St. Paul or Dial Operator and
Emergency Radio

( ) 4. Highway Department

( ) 5. Monticello Police Department

( ) 6. Monticello Fire Department

( ) 7. Burlington Northern Railroad
(Chief Dispatcher)

( ) 8. Minneapolis Water Department

( ) 9. St. Paul Water Department

( ) 10. Big Lake-Monticello Ambulance Service

( ) 11. Monticello-Big Lake Community Hospital

WP/kk

Form 5790-102-6
Revision 2, 02/15/82
Page 2 of 2

ATTACHMENT 5 (Cont'd.)

Example of
SECONDARY NOTIFICATION LIST (Cont'd.)

( ) 12. EPA Monticello Field Station

( ) 13. Big Oaks Park (During Camping Season)

( ) 14. Minnesota Pollution Control Agency

( ) 15. Northern States Power
N.W. Division

( ) 16. G.E. Site Representative
C. H. Ballard

WP/kk

Form 5790-102-7
Revision 2, 02/19/82
Page 1 of 1

ATTACHMENT 6

Example of
EMERGENCY CLASSIFICATION CHANGE

Verify that the organization/person called is correct prior to relaying emergency information.

THIS IS ____________________, ____________________ AT THE
(Name) (Title)

MONTICELLO NUCLEAR GENERATING PLANT.

WE HAVE RE-CLASSIFIED THE EVENT AND ( ) Escalated

( ) Down-graded

TO a(N) ( ) Event May Be Terminated

( ) Unusual Event

( ) Alert

( ) Site Area Emergency

( ) General Emergency

at ____________ hours.
(Time)

Meteorological Conditions: Wind Velocity ________ mph
Wind Direction (Form): ________ Degrees Temperature ______ °C
Atmospheric Stability Class ________ Form of Precipitation ________

Give a brief description of the emergency:

PLEASE RELAY THIS INFORMATION TO YOUR EMERGENCY ORGANIZATION PERSONNEL.

Emergency Director/Manager Approval ____________________
(Name/Date)

Emergency Communicator ____________________
(Name/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

# ON-SITE MONITORING AND PROTECTIVE ACTION CRITERIA

Procedure A.2-201

Prepared by: JWinkchill ALARA Review: CDMathias Date 3-1-82
Reviewed by: CDMathias Q.A. Review: Rev 0 Date 3-28-81
Operations Committee Final Review: Meeting Number 1068 Date 3-1-82
Approved by: FL Fey Date 3-1-82
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, Radiological Emergency Coordinator, or Monitoring Section Leader 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 portable radio. 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.

OSC 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 returned to the EOF 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 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 as appropriate. Remind team members to monitor their own exposure.

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

STEP 8: 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

WP/dw

ATTACHMENT 1



ON-SITE MONITORING CHECKLIST

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

   a. Control Room/TSC*

   b. OSC (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

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

WP/dw

ATTACHMENT 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. |
| > 500 | Consider protective clothing use |
| > 5000 | Ensure protective clothing use |

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<br>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/dw

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.

WP/dw

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

# OFFSITE MONITORING DURING AN EMERGENCY

A.2-202

| | | | | | |
|---|---|---|---|---|---|
| Prepared by: | Larry Nolan | ALARA Review: | CD Mathews | Date | 2/25/82 |
| Reviewed by: | CD Mathews | Q.A. Review: | Rev 0. | Date | 3/28/81 |
| Operations Committee Final Review: Meeting Number | | | 1068 | Date | 3-1-82 |
| Approved by: | | | [illegible] | Date | 3-1-82 |
| Op. Com. Results Review: | Not Required | Mtg. # | 948 | Date | 3/25/81 |

## PURPOSE

The purpose of this procedure is to provide coordination and direction for off-site radiological monitoring efforts by Monticello Nuclear Generating Plant personnel during an emergency at the Monticello Nuclear Generating Plant. Off-site monitoring is normally a function of the Corporate Emergency Organization, and this procedure is intended to be used only if off-site monitoring is required before the Emergency Operations Facility has monitoring teams available.

## CONDITIONS AND PREREQUISITES

A. An airborne or liquid release has occurred which may cause significant radiological conditions off-site, and

B. The Emergency Director or REC has requested off-site monitoring, and

C. The EOF does not have the resources to perform off-site monitoring.

## 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 radio/Walkie-Talkie. Since radio communications at this frequency can be intercepted by commercially available scanners, ensure that all communications related to reporting survey data are brief and factual and free of exclamatory or alarming expressions. Use DVP mode 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.

## ORGANIZATION AND RESPONSIBILITIES

Emergency Director - Overall Responsibility

Radiological Emergency Coordinator - Responsible for implementation of this procedure.

Monitoring Section Leader - Responsible for directing survey teams, recording data, and review of results.

## DISCUSSION

A. The extent and degree of off-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, Monitoring Section Leader or Radiological Emergency Coordinator, will determine the extent and nature of post-accident off-site radiological monitoring, until the EOF attains off-site monitoring capabilities.

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 Radiological Emergency Coordinator or Monitoring Section Leader 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. Silver zeolite cartridges will be used for all air samples. All sample media obtained by the monitoring teams will be returned to the EOF for possible further analysis.

NOTE: Silver Zeolite 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 Monitoring Section Leader will direct the reuse of sample cartridges, if warranted.

## PROCEDURE

STEP 1: Use available information (meteorological instrumentation, effluent monitors, radiation monitors, offsite dose projection results, etc.) to define sector(s) or location(s) to be monitored.

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

STEP 3: Brief monitoring team(s) on sector(s) or location(s) to be monitored, radiological conditions, precautions to be observed, and protective clothing or equipment as necessary.

CAUTION: Survey teams should be cautioned to avoid the high concentration areas at the plume as much as possible, consistent with obtaining necessary samples and readings.

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 If significant gaseous releases have occurred, locate the plume by directing the monitoring team(s) to perform a survey in a direction across the projected path of the plume. The center line of the plume should be in the direction the wind is blowing. Plot plume location on map.

STEP 6 If a liquid release has been made or is in progress, direct the monitoring team(s) to take samples of the Mississippi River water for analysis. Samples should be taken as close to the release point as possible (i.e., discharge canal), and at down stream locations as appropriate (i.e., bridge at Monticello, Elk River and Anoka).

STEP 7: Record monitoring data as it is received over the radio. Direct backup readings or samples be taken if appropriate. Remind team members to monitor their own exposure. Use Form 5790-202-1, OFF-SITE SURVEY RESULTS DATA SHEET (Attachment #1).

STEP 8 Consider advising the monitoring teams to don protective clothing, including respirators if conditions warrant. In general, protective clothing should only be used in areas that have been evacuated. If airborne iodine concentrations are above the MPC limits, the use of respirators with charcoal cartridges should be considered. Refer to procedure A.2-304, Thyroid Prophylaxis if exposure to high concentrations of airborne iodine is anticipated.

STEP 9: 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 of specified locations. Compare field survey data with dose projection data.

STEP 10 Evaluate monitoring data and advise the Emergency Director of results.

STEP 11: Upon completion of monitoring, recall monitoring team(s).

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan
2. Monticello Nuclear Generating Plant Operations Manual

ATTACHMENTS

1. Example of Off-Site Survey Results Data Sheet

WP/dw

ATTACHMENT 1

Form 5790-202-1
Rev. 2, 02/24/82
Page 1 of 1

Example of
OFF-SITE SURVEY RESULTS DATA SHEET
(For use with Procedure A.2-202)

| Date Time | Location | Team No. | Survey Results | Comments |
|---|---|---|---|---|
| | | | | |
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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/dw

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

# THYRO'D PROPHYLAXIS (POTASSIUM IODIDE USE)
A.2-304

| | | | | | |
|---|---|---|---|---|---|
| Prepared by: | JWindschill | ALARA Review: | Revision 0 | Date | 2/19/81 |
| Reviewed by: | C.A. Mathiasen | Q.A. Review: | Revision 0 | Date | 2/23/81 |
| Operations Committee Final Review: Meeting Number | | | 1068 | Date | 3-1-82 |
| Approved by: | | | [illegible] | Date | 3-1-82 |
| Op. Com. Results Review: | Not Required | Mtg. # | 941 | Date | 3/9/81 |

## PURPOSE

The purpose of this procedure is to provide instructions and guidance regarding the use of a thyroid blocking agent (THYRO-BLOCK TM) potassium iodide-KI in the event of an emergency at Monticello Nuclear Generating Plant. This procedure applies specifically to MNGP personnel and other NSP personnel who may be involved in the emergency and/or recovery effort. This procedure does not apply to members of the general public offsite.

## CONDITIONS AND PREREQUISITES

An emergency condition at Monticello Nuclear Generati has resulted in the release of significant quantities of airborne radioiodine or the potential for such a release exists.

## PRECAUTIONS

A. Potassium iodide should not be used by people allergic to iodine. In case of overdose or allergic reaction, refer individual to medical personnel.

B. Doses recommended by this procedure should be followed by all applicable personnel to avoid overdoses or insufficient protection.

C. Only the Emergency Director can authorize the use of THYRO-BLOCK TM. He shall establish the extent and duration of the THYRO-BLOCK TM based on radiological conditions and the advice of the Radiological Emergency Coordinator.

## PERSONNEL REQUIREMENTS

Radiological Emergency Coordinator - procedure implementation
Emergency Director - decision to authorize use of potassium iodide

## DISCUSSION

A. How THRYO-BLOCK TM Works:

Certain forms of iodine help the thyroid gland work. The thyroid can "store" or hold only a certain amount of iodine. In a radiation emergency, radioactive iodine may be released in the air where it may be breathed or swallowed. It may enter the thyroid gland and damage it by overexposure. The damage would probably not show itself for years. Children are mostly likely to have thyroid damage.

If potassium iodide (THYRO-BLOCK TM) is administered, it will saturate the thyroid gland. This reduces the chances that harmful radioactive iodine will enter the thyroid gland.

B. Side Effects:

Usually, side effects of potassium iodide happen when people take high doses for a long time. One should be careful not to take more than the recommended dose or take it for longer than directed. Side effects are unlikely because of the low dose and the short time one will be taking the drug.

Possible side effects include skin rashes, swelling of the salivary glands, and "iodism" (metallic tastes, bu ing mouth and throat, sore teeth and gums, symptoms of a head cold, and sometimes stomach upset and diarrhea).

A few people have an allergic reaction with more serious symptoms. These could be fever and joint pains, or swelling of parts of the face and body and at time severe shortness of breath requiring immediate medical attention.

Taking iodine may rarely cause overactivity of the thyroid gland, underactivity of the thyroid gland, or enlargement of the thyroid gland (goiter).

C. Personnel Who Should Not Take Potassium Iodide:

The only people who should not take potassium iodide are people who know they are allergic to iodine. One may take potassium iodide even if you are taking medicines for a thyroid problem (for example, a thyroid hormone or anti-thyro drug). Pregnant and nursing women may also take this drug.

ORGANIZATION

A. Emergency Director - has authority to authorize the use of Potassium Iodide.

B. Radiological Emergency Coordinator - has the responsibility to execute this procedure and make recommendations to the Emergency Director.

NOTE: Use of Potassium Iodide will be on a strictly voluntary basis.

PROCEDURE

STEP 1: Determine the projected thyroid dose using Figure 1 of this procedure. If the projected dose is 5 Rem or more to the thyroid recommend the use of THYRO-BLOCK TM to the Emergency Director.

NOTE: To be effective, THYRO-BLOCK TM must be taken within a few hours after exposure to high concentrations of radioiodide.

STEP 2: When the decision is reached to administer potassium iodide to personnel, an individual shall be designated by the Emergency Director to distribute potassium iodide to affected personnel. Form 5790-304-1 should be completed (copy attached). The following guidelines apply:

a. Prior to administering potassium iodide, personnel should be warned that if they know themselves to be allergic to iodine, thev should not participate.

b. The dose is one (1) tablet per day for 10 days or until directed otherwise by the Emergency Director.

c. Personnel exhibiting allergic reactions or side effect symptoms should be evacuated to medical facilities.

NOTE: Conditions should be continually evaluated by the Emergency Director and the Radiological Emergency Coordinator. The Emergency Director should terminate THYRO-BLOCK TM use as soon as it is safe to do so.

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".

3. USEPA 520/1-75-001 (and subsequent revisions) "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents".

4. NCRP Report 55 "Protection of the Thyroid Gland in the Event of Radioiodine".

ATTACHMENTS

1. Thyro-Block TM Use Checklist

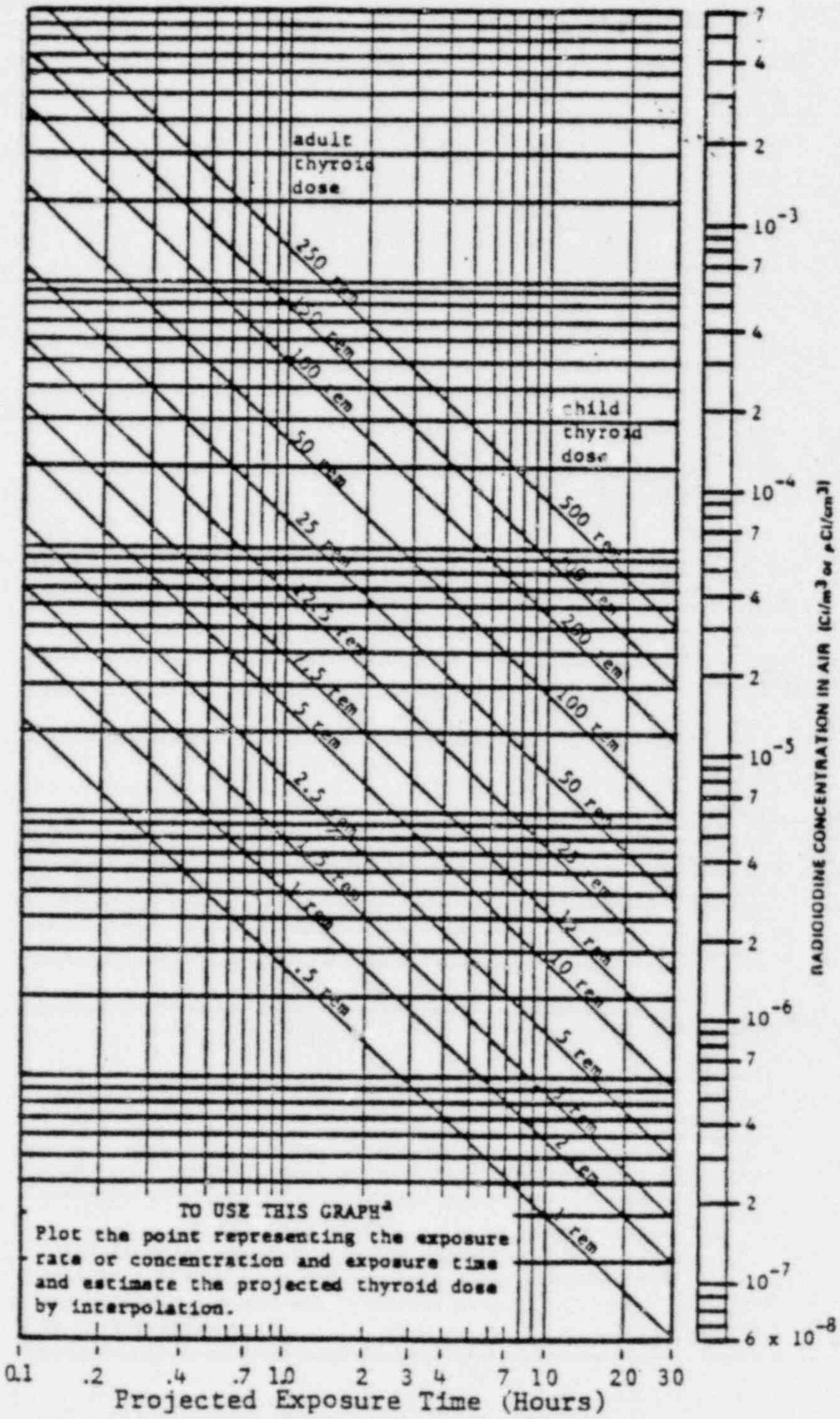



FIGURE 4.3 PROJECTED THYROID DOSE AS A FUNCTION OF EITHER GAMMA EXPOSURE RATE, OR RADIOIODINE CONCENTRATION IN AIR AND THE PROJECTED EXPOSURE TIME.

FIGURE 1

WP/kk

ATTACHMENT 1

Form 5790-304-1
Revision 1, 12/11/81
Page 1 of 1

Example of
THYRO-BLOCK TM USE CHECKLIST
(For Use With Procedure A.2-304)

1. Recommendation to use THYRO-BLOCK TM by Radiological Emergency Coordinator.

   ________ Initial ________ Time ________ Date

2. Approval to use THYRO-BLOCK TM by Emergency Director.

   ________ Initial ________ Time ________ Date

3. Individual designated by the Emergency Director to administer THYRO-BLOCK TM shall complete the following table for all individuals recommended to take THYRO-BLOCK TM. The Emergency Director should be advised if any individuals decline to use the THYRO-BLOCK TM.

| Name | Will Use? Circle One YES/NO | Time Start | Date Start | Date Stop |
|---|---|---|---|---|
| | YES/NO | | | |
| | YES/NO | | | |
| | YES/NO | | | |
| | YES/NO | | | |
| | YES/NO | | | |
| | YES/NO | | | |
| | YES/NO | | | |
| | YES/NO | | | |
| | YES/NO | | | |
| | YES/NO | | | |
| | YES/NO | | | |
| | YES/NO | | | |
| | YES/NO | | | |
| | YES/NO | | | |

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the apppropriate 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 ___ |

# EMERGENCY SAMPLING AND ANALYSIS

A.2-404

| | | | |
|---|---|---|---|
| Prepared by: [signature] | ALARA Review: CDMathiasen | Date 2/25/82 |
| Reviewed by: RP Pepson | Q.A. Review: Revision 0 | Date 3/10/81 |
| Operations Committee Final Review: Meeting Number: | 1068 | Date 3-1-82 |
| Approved by: | [signature] | Date 3-1-82 |
| Op. Com. Results Review: Not Required | Mtg. # 942 | Date 3/12/81 |

## PURPOSE

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

## CONDITIONS AND PREREQUISITES

Actual or potential radiological conditions are such that special methods and/or precautions are necessary in order to collect and analyze a large quantity of samples under conditions which may represent a much greater than normal radiation hazard to individuals performing the sampling and analyses. A RWP is required prior to using Attachments 1 through 5. Unless directed otherwise, these procedures should be used in lieu of routine sampling and analysis procedures whenever a Site Area Emergency or General Emergency is declared.

## 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.

DISCUSSION

Emergency sampling operations shall be coordinated by the Radiological Emergency Coordinator. The Radiological Emergency Coordinator shall assume responsibility for authorizing emergency samples and should ensure that such operations are well-planned and executed in a radiologically safe manner. All sampling operations shall be coordinated with appropriate Control Room personnel and the Shift Supervisor shall be kept fully informed.

Emergency sampling and analysis operations (eg.; sampling undertaken during a declared emergency and under conditions which (1) may represent a much greater than normal radiation hazard to personnel or (2) may have an impact on plant operations or emergency response) shall be approved in detail by the Radiological Emergency Coordinator.

Emergency sampling and analyses shall be carried out in accordance with methods established in attachments to this procedure as follows (coordinate with Control Room as appropriate):

1. Reactor Coolant Sampling and Analysis - Attachment 1

2. Reactor Building Vents Charcoal - Particulate Sampling and Analysis - Attachment 2

3. Stack Charcoal - Particulate Sampling and Analysis - Attachment 3

4. Containment Atmosphere Sampling and Analysis - Attachment 4

5. Airborne Iodine Sampling and Analysis - Attachment 5

6. Emergency Sample and Measurement Considerations - Attachment 6

PROCEDURE

STEP 1: Go to Attachments 1 through 5, depending upon the type of sample requested.

STEP 2: Report all results and submit documentation to the Chemistry Section Leader or Radiological Emergency Coordinator.

NOTE: The attachments 1 through 6 are written for use only by experienced and knowledgeable plant personnel.

REFERENCES

1. MNGP Operations Manual, Section E.1

2. MNGP Plant Chemistry Manual and Procedures

ATTACHMENTS

1. Reactor Coolant Sampling and Analysis
2. Reactor Building Vents Charcoal - Particulate Sampling and Analysis
3. Stack Charcoal - Particulate Sampling and Analysis
4. Containment Atmosphere Sampling and Analysis
5. Airborne Iodine Sampling and Analysis
6. Emergency Sample and Measurement Considerations

WP/kk

Attachment 1
Page 1 of 3

# REACTOR COOLANT SAMPLING AND ANALYSIS

## Remarks

Refer to chemistry manual for sampling when ARM #7 reads ≦ 1 rem/hr. Prior to sampling notify the Control Room of your intentions.

## PREREQUISITES

CAUTION: The following steps shall only be performed by an operator when specified by the Emergency Director. Refer to Attachment 6 prior to proceeding.

If a Group 1 isolation signal exists and cannot be reset, perform the following steps to open the recirc loop sample valves, CV-2790 and CV-2791.

1. Place the CV-2790 and CV-2791 handswitches to CLOSE.

2. At panel C04 jumper the following terminals:

   a. EE11 - EE13 (CV-2790)
   b. KK21 - KK22 (CV-2791)

3. Open the valves by placing the handswitches to AUTO/OPEN.

## EQUIPMENT REQUIRED

Survey Meter
1 Liter poly bottles, in Hot Lab
1 ml. pipet and pipet bulb, in Hot Lab
Shielded Sample Container with Stop Watch

## PROCEDURE

NOTE 1: Obtain Vital Key #211 from S.S. for emergency sample route.

NOTE 2: If the recirc sample line is isolated wait for about 25 minutes but no less than 15 minutes upon opening the recirc loop sample valves before sampling.

STEP 1: Don all protective clothing, equipment and dosimetry devices as required by the Health Physics Group (RWP).

CAUTION: Extremely high dose rates may exist at the sample hood. It is important that travel to and from the sample hood as well as the actual obtaining of the sample be done as quickly and safely as possible.

STEP 2: Proceed to the reactor sample hood area as directed by the Emergency Director or his designee while observing Health Physics precautions.

STEP 3: Purge the reactor recirc sample line for one second. (If the reactor recirc sample point is inoperable, purge and obtain the sample from an RHR sample point.) Note coolant or RHR conductivity as applicable.

STEP 4: Fill a 4 ml. counting vial one-half full with sample from the sample point. Start the stop watch. Place the vial and sample in the lead shielded container.

STEP 5: Proceed to the Hot Lab. Place the sample behind lead bricks in the south hot lab hood. Record sample time and conductivity in the Emergency Sample Log, Form #5790.

NOTE 3: Measure dose rate from sample. If ≦ 10 millirem per hour continue to STEP 6. If > 10 millirem per hour pipet 1 ml. of sample into a 100 ml. flask and fill to 100 ml. mark with D.I. water. Continue 1:100 dilutions until ≦ 10 millrem per hour. Note number of dilutions, proceed to STEP 6.

STEP 6: From the undiluted or diluted sample, place 1 ml. into a 1 liter poly bottle containing 500 ml. of demin water. Dilute the mixture to 1 liter with demin water. Record the number of dilutions in the Reactor Coolant Sampling and Analysis Checklist.

STEP 7: Place the labeled 1 liter poly bottle in a poly bag and count on the GeLi System for ≤ 1000 seconds.

STEP 8: When the count is complete, run the GAMMAK program on the resulting spectrum.

STEP 9: Transcribe the conductivity data (if applicable) and dilution data, to the resulting computer printout sheet. Calculate the Iodine dose equivalent and total μCi/cc depending on the dilution factors required.

STEP 10: Refer to Chemistry Manual Volume I for additional analysis procedures if required.

Chloride - Procedure I.1.3
pH - Procedure I.1.34
Boron - Procedure I.1.4)

STEP 11: Place the undiluted sample in the shielded in storage area. Flush the diluted, counted samples down the Hot Lab sink, using caution to minimize the total activity disposed in this manner.

STEP 12: Attach the sample results to the checklist and submit to Chemistry Section Leader or Radiological Emergency Coordinator.

WP/kk

Form 5790-404-1
Revision 1, 12/11/81
Page 1 of 1

Example of
REACTOR COOLANT SAMPLING AND ANALYSES CHECKLIST

| | | Initials |
|---|---|---|
| 1. | Sample taken (time noted: ______ hrs, Date ___ / ___ / ___) | __________ |
| 2. | Sample and sample data to hot lab. | __________ |
| 3. | Sample diluted to one liter (dilution factors ____ x ____). | __________ |
| 4. | Spectrum collected. | __________ |
| 5. | Spectrum analyzed. | __________ |
| 6. | Activity calculated, results reported to the Chemistry Section Leader or to the Radiological Emergency Coordinator, (______ μCi/cc). | __________ |
| 7. | Chloride Concentration ______________________ | __________ |
| 8. | Boron Concentration ______________________ | __________ |
| 9. | Conductivity ______________________ | __________ |
| 10. | pH ______________________ | __________ |

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

REACTOR BUILDING VENTS CHARCOAL - PARTICULATE
SAMPLING AND ANALYSIS

Remarks

Prior to sampling, notify the control room of your intentions. Refer to Attachment 6 prior to proceeding.

Equipment Required

Survey Meter
R. B. Vents Sample Kit Consisting of:

- Charcoal and Particulate Filter Holder with filters installed
- Shielded filter holder container
- Pair of tongs (or other remote handling device as appropriate)

Procedure

NOTE 1: Obtain Vital Access key #211 and key #145 from S.S. for emergency sample route.

STEP 1: Verify that the hood exhaust is functioning (use small piece of paper to check air flow) if not, contact Radiological Emergency Director and continue.

STEP 2: Don all protective clothing, equipment and dosimetry devices as required by the Health Physics Group (RWP).

STEP 3: Proceed to the Reactor Building vents sample area as directed by the Emergency Director or his designee while observing Health Physics precautions.

CAUTION: During filter holder changeout monitor radiation levels to ensure levels are below 200 mR/hour. If levels are above 200 mR/hour, use remote handling device to minimize exposure.

STEP 4 Shut the isolation valve for a Charcoal-Particulate Filter Holder Set. Replace the installed filter holder set with the fresh filter holder set. Note time of sample and process flow of the plenums.

NOTE: Be sure to sample from a filter set which is from a plenum with a dilution fan in service.

STEP 5 Open the isolation valve previously shut. Place the sample filter holder set into the shielded container.

STEP 6: Proceed to the Hot Lab and place the filter set and shielded container into the south hood.

Attachment 2
Page 2 of 4

STEP 7: Connect the sample filter holder to the purge air fitting in south hood of hot lab. Open fully the plant air supply valve in the hood and purge the filter holder set into the hood for about 2-3 minutes.

STEP 8 Remove the charcoal filter from the charcoal filter holder from behind the lead bricks.

STEP 9: Measure the contact dose rate from the charcoal filter. If $\leq$ 10 mR/hr proceed to STEP 12.

STEP 10 If $\geq$ 10mR/hr at contact then measure the dose rate at 1 foot. Apply a factor of 420 µCi/mR/hr. By using the sample volume, calculate the µCi/cc as I-131. Calculate the release rate via the R.B. vents in µCi/sec. I-131 assuming a 120,000 CFM vents flow*. Proceed to STEP 13.

* Use 120,000 CFM if flow rate indicators on 1027' Rx Bldg are inaccessible, in which case the flow rate based on actual readings should be used.

STEP 11: Place the charcoal filter into a labeled poly bag and count on the GeLi System for $\leq$ 1000 seconds.

STEP 12: When the count is complete, run the GAMMAK Program on the resulting spectrum. Run the SAVCAL Program to get the iodine release rate via the R.B. vents (use 120,000 CFM vents flow*).

* Use 120,000 CFM unless the flow indicators on 1027' Rx Bldg are inaccessible, in which case flow rate based on actual readings should be used.

STEP 13: Place the charcoal filter into the shielded storage area.

STEP 14: Place the particulate filter in a labeled petri dish.

STEP 15: Measure the contact dose rate of the petri dish and filter. If $\leq$ 10 mR/hr proceed to STEP 17.

STEP 16: If the measured dose rate is $\geq$ 10 mR/hr, measure the dose rate of the petri dish and filter at one foot. Apply a factor of 610 µCi/mR/hr and calculate the release rate via the R.B. vents in µCi/sec.* Proceed to STEP 18.

* Use 120,000 CFM unless the flow indicators on 1027' Rx Bldg are inaccessible, in which case the flow rate based on actual readings should be used.

WP/kk

STEP 17: Place the particulate filter in a labeled petri dish and count on the Ge(Li) system for $\leq$ 1000 seconds. When the count is complete, run the GAMMAK Program on the spectrum.

STEP 18: Run the PART Program to obtain the release rate for particulates from the RB vents (use 120,000 CFM vent flow*).

* Use 120,000 cfm unless the flow indicators on 1027' Rx Bldg are inaccessible, in which case the flow rate based on actual readings should be used.

STEP 19: Place the sample into the shielded container in the sample storage area.

STEP 20: Provide the release rate information to the Radiological Emergency Coordinator and submit the chekslist to the Chemistry Section Leader or Radiological Emergency Coordinator.

Form 5790-404-2
Revision 1, 12/11/81
Page 1 of 1

Example of
REACTOR BUILDING VENTS CHARCOAL-PARTICULATE ANALYSIS CHECKLIST

| | | Initial |
|---|---|---|
| 1. | Hot lab hood readied. | ________ |
| 2. | Protective clothing and dosimetry. | ________ |
| 3. | Replaced filter set. (Time Noted: _____ hrs, Date ________) | ________ |
| 4. | Sample to hot lab and purged. | ________ |
| 5. | If charcoal filter $\leq$ 10 mR/hr; ran spectrum. | ________ |
| | If $>$ 10 mR/hr (calculated activity = ________ μCi/cc) (= dose rate x 420 μCi/mR/hr). | ________ |
| 6. | Analyze spectrum, calculate release rate. (Iodine release rate ________ μCi/sec.) | ________ |
| 7. | If particulate filter $\leq$ 10 mr/hr; collect spectrum. If $\geq$ 10 mr/hr, (calculated activity = ________ μCi/cc) (= dose rate x 610 μCi/mr/hr) | ________ |
| 8. | Particulate Spectrum ran. | ________ |
| 9. | Analyze spectrum, calculate release rate. (Particulate release rate __________ μCi/sec.) | ________ |
| 10. | Provided results to Radiological Emergency Coordinator or Chemistry Section Leader. | ________ |

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

Attachment 3
Page 1 of 4

# STACK CHARCOAL - PARTICULATE SAMPLING AND ANALYSIS

## Remarks

Prior to samp.ing, notify the Control Room of your intentions. Refer to Attachment 6 prior to proceeding.

## Equipment Required

Survey Meter
Pair of tongs (or other remote handling device as appropriate)
Filter set with filters loaded if one set already removed

## Procedure

NOTE 1: Obtain key #9 from [redacted] to access stack.

STEP 1: Verify that the Hot Lab South hood exhaust is functioning (use small piece of paper to check air flow), if not contact Radiological Emergency Director and continue.

STEP 2: Go to the Control Room and set the timer on Stack Wide Range Gas Monitor Channel "A" according to the following chart. Note process flow (item 029 and use the non-zero sample flow itesm 028 or 033)

| Activity | Timer Setting |
|---|---|
| $<$1E4 μCi/sec | 5 minutes |
| $>$1E4 μCi/sec $<$1E5 μCi/sec | 90 seconds |
| $>$1E5 μCi/sec $<$1E6 μCi/sec | 30 seconds |
| $>$1E6 μCi/sec | 10 seconds |

STEP 3: Don all protective clothing, equipment and dosimetry devices as required by the OSC Coordinator.

STEP 4: Proceed to the stack sample area as directed by the Emergency Director or his designee while observing Health Physics precautions.

STEP 5 Close the four valves on the Grab Sample Filter apparatus. Disconnect and remove the Grab Sample filter holder. Replace previous set if already removed.

CAUTION: During filter holder changeout monitor radiation levels to ensure levels are below 200 mR/hour. If levels are above 200 mR/hr, use remote handling device to minimize exposure.

STEP 6: Proceed to the hot lab and place the filter set into the south hood.

STEP 7: Connect the sample filter holder to the purge air fitting in south hood of hot lab. Open fully the plant air supply valve in the hood and purge the filter holder set into the hood for about 2-3 minutes. If instrument air is not available, use compressed air from the yellow bottle that is located in the Hot Lab.

STEP 8: Measure the contact dose rate from the charcoal filter. If $\leq$ 10 mR/hr proceed to STEP 10.

STEP 9: If $\geq$ 10 mR/hr at contact then measure the dose rate at 1 foot. Apply a factor of 420 μCi/mR/hr. Calculate the μCi/cc as I-131. Proceed to STEP 11.

STEP 10: Place the charcoal filter into a labeled poly bag and count on the Ge(Li) System for $\leq$ 1000 seconds. When the count is complete, run the GAMMAK Program on the resulting spectrum.

STEP 11: Calculate the iodine release rate via the stack. (Use a sample flow of .06 cfm low flow or 1.6 cfm high flow and a process flow of 4300 cfm if WRGM inoperative.)

STEP 12: Place the charcoal filter into the shielded storage area.

STEP 13: Place the particulate filter in a labeled petri dish.

STEP 14: Measure the contact dose rate of the petri dish and filter. If $\leq$ 10 mR/hr, proceed to STEP 16.

STEP 15: If the measured dose rate is $\geq$ 10 mR/hr measure the dose rate of the petri dish and filter at one foot. Apply a factor of 610 μCi/mR/hr and calculate the particulates release rate via the stack in μCi/sec. (Use a sample flow of .06 cfm low flow or 1.6 cfm high flow and a process flow of 4300 cfm if WRGM inoperative.) Proceed to STEP 17.

STEP 16: Place the particulate filter in a labeled petri dish and count on the Ge(Li) System for $\leq$ 1000 seconds. When the count is complete, run a GAMMAK Program on the resulting spectrum.

STEP 17: Calculate the release rate for particulates from the stack. (Use a sample flow of .06 cfm or 1.6 cfm high flow and a process flow of 4300 cfm if WRGM inoperative.)

STEP 18: Place the sample into the shielded storage area.

Attachment 3
Page 3 of 4

STEP 19: Provide the release rate information to the Radiological Emergency Coordinator and submit the checklist to the Chemistry Section Leader or Radiological Emergency Coordinator.

STEP 20: Install fresh silver zeolite cartridge and particulate filter into filter holder.

Form 5790-404-3
Revision 1, 12/11/81
Page 1 of 1

Example of
STACK CHARCOAL-PARTICULATE ANALYSIS CHECKLIST

| | Initial |
|---|---|
| 1. Hot lab hood readied. | ______ |
| 2. Grab Sample Timer set ________ min/sec. | ______ |
| 3. Protective clothing and dosimetry. | ______ |
| 4. Removed filter set. Time Noted (_____ hrs, Date: _______) | ______ |
| 5. Sample to hot lab and purged. | ______ |
| 6. If charcoal filter $\leq$ 10 mR/hr, ran spectrum. | ______ |
| If $>$ 10 mR/hr after one hour, calculated activity (_______ µCi/cc) (= dose rate x 420 µCi/mR/hr). | ______ |
| 7. Analyze spectrum, calculate release rate. (Iodine release rate ________ µCi/sec.) | ______ |
| 8. If particulate filter $\leq$ 10 mr/hr; collect spectrum. If $\geq$ 10 mr/hr, (calculated activity = _____ µCi/cc) (= dose rate x 610 µCi/mr/hr). | ______ |
| 9. Ran Spectrum on particulate filter. | ______ |
| 10. Analyze spectrum, calculate release rate. (Particulate release rate ________ µCi/sec.) | ______ |
| 11. Provided results for Chemistry Section Leader or Radiological Emergency Coordinator. | ______ |

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

# CONTAINMENT ATMOSPHERE SAMPLING AND ANALYSIS

## Prerequisites

If a Group 2 isolation signal exists and cannot be reset, perform the following steps to open the sample isolation valves CV-3307 and CV-3308 and the sample return isolation valves CV-3313 and CV-3314.

The following steps shall only be performed by an operator when specified by the Emergency Director.

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

| | | |
|---|---|---|
| CV-3307 | CV-3311 | CV-3313 |
| CV-3308 | CV-3312 | CV-3314 |

2. Isolate the drywell CAM by closing DWV-33, DWV-34 and DWV-38.

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

   a. Q530/1
   b. Q528/1

4. At panel C26, jumper the following terminals:

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

5. Open sample isolation valves CV-3307, CV-3308 and sample return valves CV-3313 and CV-3314 by placing the handswitches to AUTO/OPEN.

## Remarks

Prior to sampling, notify the OSC and Control Room of your intention and turn on gas chromatograph per Chemistry Procedure I.1.36.

## Equipment Required

Containment Emergency Sampling Kit (stored in Access Control) Consisting of:

1 - 15 cc sample vial with septums
1 - Gas syringe with needle and valve
1 - piece surgical tubing (1 foot)
1 - shielded sample holder

Attachment 4
Page 2 of 4

CAUTION

Refer to Attachment 6 prior to proceeding.

PROCEDURE

NOTE 1: Obtain key #45 from S.S.

STEP 1: Evacuate a 15 cc sample vial and label as vial #1.

STEP 2: Don all protective clothing, equipment and dosimetry devices as required by the Health Physics group (RWP).

STEP 3: Proceed to the containment atmosphere sample area as directed by the Radiation Emergency Coordinator or his designee while observing Health Physics Precautions.

STEP 4: Connect the surgical tubing to the gas sample points.

STEP 5: Open valves DWV-18-2 and DWV-18-5.

STEP 6: Start pump P-89 check flow. Immediately retire to R.W. control room and wait for about 5 minutes.

NOTE: If there is a loss of power to the pump evacuate the area immediately.

STEP 7: Return to sample area and insert the syringe needle into the surgical tubing and withdraw 1 cc of gas.

STEP 8: Inject the gas into the evacuated 15 cc sample vial. Note the time of sample.

STEP 9: Stop pump P-89, shut valves DWV-18-2 and DWV-18-5.

STEP 10: Place the sample vial in the shielded sample holder and proceed to the Hot Lab.

STEP 11: Record the date and time of sample on the Containment Atmosphere Analyses Checklist.

STEP 12: Measure the dose rate of the sample vial at contact. If $\leq$ 10 mR/hr proceed to STEP 14.

STEP 13: If the dose rate is $\geq$ 10 mR/hr evacuate another 15 cc gas vial. Remove 1 cc of gas sample and inject into the evacuated 15 cc gas vial. Label the new sample vial as appropriate and repeat STEP 12.

Attachment 4
Page 3 of 4

STEP 14: Place the sample in a poly bag and count on the Ge(Li) System for ≤ 1000 seconds.

STEP 15: When the count is complete, run the GAMMAK Program on the resulting spectrum. Calculate the μCi/cc depending on the dilution factors.

STEP 16 If requested by Chemistry Section Leader complete Chemistry Manual, Volume I, Procedure I.1.36 to determine the percent hydrogen, oxygen and nitrogen in containment atmosphere.

STEP 17: Transcribe all pertinent sample data from the Containment Atmosphere Checklist to the spectrum analysis computer printout sheet.

STEP 18: Place the sample(s) into the shielded container in the Sample Storage Area.

STEP 19: Provide sample results to Radiological Emergency Coordinator, and submit checklist to Chemistry Section Leader and Radiological Emergency Coordinator.

Form 5790-404-4
Revision 1, 12/11/81
Page 1 of 1

Example of
CONTAINMENT ATMOSPHERE ANALYSIS CHECKLIST

| | Initial |
|---|---|
| 1. Evacuated sample vial. | ______ |
| 2. One cc sample taken, time noted. (______ hours, Date ____ / ____ / ____ ) | ______ |
| 3. If sample vial $\leq$ 10 mR/hr, ran spectrum. | ______ |
| If $>$ 10 mR/hr, diluted sample (dilution factor = 1 X _____), ran spectrum. | ______ |
| 4. Results of GAMMAK (adjusted for dilutions) (_____ µCi/cc). | ______ |
| 5. Report results to Chemistry Section Leader or Radiological Emergency Coordinator. | ______ |
| 6. % Hydrogen, Oxygen and Nitrogen ____% $H_2$ ____% $O_2$ ____% $N_2$ (Chem. Manual Procedure I.1.36) | ______ |

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

# AIRBORNE IODINE SAMPLING AND ANALYSIS

## PREREQUISITES

Determine if entry can be made into the required sample area, allowing sufficient time to obtain both types of samples, without exceeding established exposure limits.

Adequate radiological precautions specified for this work.

## PERSONNEL REQUIRED

2 Radiation Protection Specialists (RPS)
Radiological Emergency Coordinator

## EQUIPMENT REQUIRED

Radgun or equivalent
0-10R dosimeter
Radeco portable battery powered air sampler
Silver zeolite filters
Particulate filters
Protective Clothing
Scott Air Pak
Stopwatch
15 ml. off-gas sample vials
Needle

NOTE: All above equipment, except the Scott Air Paks, is located in the Access Control Emergency Cabinet. The Scott Air Paks are mounted on the wall in Access Control.

## PROCEDURE #1

STEP 1: If there is any chance the particulate/silver zeolite sample will be too "hct" to count, a gas vial sample should also be drawn. If no gas vial sample will be taken, simply disregard those portions of this procedure. Obtain direction from the Radiological Emergency Coordinator or the Monitoring Section Leader as to whether or not both types of samples should be taken.

STEP 2: Load the sampler with a silver zeolite and particulate filter.

STEP 3: Turn Radgun on to allow warmup.

STEP 4: Cap the vial and evacuate it using the tygon tubing with needle attached and the hot lab vacuum pump. To the extent which is practical, bag the vial so as to minimize external contamination.

STEP 5: Don protective clothing, proper dosimetry and Scott Air Pak, as required.

Form 5790-404-5
Attachment 5
Page 2 of 3

STEP 6: Proceed to determined entryway to sample area. Check the dose rate through the door. If it is determined that the dose rates are low enough to allow entry a short way into the building without exceeding established exposure limits, proceed to STEP 7; if not, contact the Radiological Emergency Coordinator for further instructions.

STEP 7: Proceed to the sample area by the shortest route possible. (If actual dose rates indicate that whole body dose received will exceed estimate, return to Access Control immediately.)

STEP 8: Run sampler for an appropriate length of time, but no shorter than 15 seconds. (Keep track of time with stopwatch.)

STEP 9: Puncture the vial cap with the needle and allow the vial to fill with room air. (Allow about 2 seconds to fill.)

STEP 10: Return to access control with the samples.

STEP 11: Open sampler head and check dose rate of silver zeolite sample.

STEP 12: If the dose rate is $\leq$ 10 mR/hr, bag the sample and count it on the Ge(Li) System using normal count room procedures for counting air samples.

STEP 13: If the silver zeolite filter dose rate is $\geq$ 10 mR/hr, unbag, then rebag the vial and count it on GeLi System using GAMMAK Program.

STEP 14: From the GAMMAK results, calculate the MPC ratio for each iodine listed below:

$$\text{Ratio} = \frac{\text{Concentration From GAMMAK}}{\text{MPC of Isotope}}$$

| Isotope | MPC |
|---|---|
| I-131 | $9 \times 10^{-9}$ |
| I-132 | $2 \times 10^{-7}$ |
| I-133 | $3 \times 10^{-8}$ |
| I-134 | $5 \times 10^{-7}$ |
| I-135 | $1 \times 10^{-7}$ |

STEP 15: Report results to Radiological Emergency Coordinator or Monitoring Section Leader.

STEP 16: Save the particulate, silver zeolite and gas vial samples, in case later analysis is desired.

Form 5790-404-5
Revision 2, 02/28/82
Page 1 of 1

Example of
AIRBORNE IODINE ANALYSIS PROCEDURE #1 CHECKLIST

Initial

1. Radgun, protective clothing, dosimetry, Scott Air Pak evacuated sample vial and sampler readied. ________

2. Samples taken, filter sample time noted (_____ sec.) (flow rate for sampler _______ CFM). ________

3. If filter $\leq$ 10 mR/hr, ran spectrum (MPRAIR) (Activity ________ μCi/cc). ________

4. If silver zeolite sample $>$ 10 mR/hr, GAMMAK Program ran on vial, and ratios calculated for:

   (I-131 ________ )

   (I-132 ________ )

   (I-133 ________ )

   (I-134 ________ )

   (I-135 ________ ) ________

Performed by: ______________________________ Date: ____________________________

Reviewed by: ______________________________ Date: ____________________________
REC or MSL

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 6
Page 1 of 2

## EMERGENCY SAMPLE AND MEASUREMENT CONSIDERATIONS

### INTRODUCTION

In the event of certain postulated accidents, it is possible that effluent release rates would exceed the upper limits of installed monitors and that access to normal sample points for effluents, coolant and containment atmosphere may be encumbered by extremely high radiation fields. The purpose of this guidance is to preclude any unnecessary exposure resulting from the execution of such emergency sample and measurement activities.

### SAMPLING PLENUM EFFLUENT

Plenum effluent is sampled on the 1027' level of the reactor building. Two matters to be considered are the route to the sample point and how to handle the sample filters.

The problem of getting to 1027' reduces to a problem of getting to the 985' level, above which radiation levels are tolerable. From calculations, it seems that the best way to approach is to enter secondary containment via the M.G. Set Room on 962'. From the air lock on 962', it is important to move as quickly as possible to the stairs in the northeast corner and to climb as fast as possible to the next level, 985'. Continue up the northeast stairs to the 1001' level and from there on the radiation levels permit a slower pace. Cross to the south side of the building through the fuel pool surge tank room and then climb to 1027' on the southwest stairs.

The filters could be a problem if removed from the filter holder and handled directly. We do not expect the whole body dose rate to be significant compared to levels encountered enroute to and from the sample stations. Precautions should be taken, however, after exiting containment.

Attachment 6
Page 2 of 2

## SAMPLING PRIMARY CONTAINMENT ATMOSPHERE

The containment atmosphere sampling station is located on the south side of the 935' level. The most efficient route is an outside route to the radwaste building. (CAUTION: There may be a very high field emanating from the reactor railroad access.) Make a cautious approach to the air lock leading to secondary containment. Radiation fields may preclude closer approach to sample station at any point. If conditions in the air lock permit a closer approach, realize that radiation levels will increase all along the way. Before entering the containment, know at what level you will decide to turn back. There is no place to hide in containment. Make sure your return to the radwaste building is unencumbered by security devices or interlocks on the air lock.

## SAMPLING PRIMARY CONTAINMENT

The procedure for sampling primary coolant provokes many considerations. The route to and from the sample station, status of sample points and the sample itself demand forethought.

The route to the sample hood on 985' is essentially the same as that used to reach the plenum sample point. The difference is that on the 985' level, you proceed to the sample hood via a route which cuts between the first two heat exchangers encountered.

The sample loop status must be considered before hand because an alternate point may have to be used, depending on which systems are operating and which are isolated. If the sampling is going to require some manual valving or you are going to be present while remote valving is executed, be aware of possible drastic changes in radiation levels.

The sample should be representative and consist of the minimum volume required. Every precaution must be taken with this sample. Dose rates could be significant even in the containment building.

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 __

# RELEASE RATE DETERMINATIONS

A.2-405

| | | | | | |
|---|---|---|---|---|---|
| Prepared by: | [signature] | ALARA Review: | C.D. Mathews | Date | 2/25/82 |
| Reviewed by: | R.R. Jepson | Q.A. Review: | Revision 0 | Date | 3/29/81 |
| Operations Committee Final Review: Meeting Number | | | 1068 | Date | 3-1-82 |
| Approved by: | | | F.L. Fey | Date | 3-1-82 |
| Op. Com. Results Review: | Not Required | Mtg. # | 949 | Date | 3/26/81 |

## PURPOSE

This procedure gives guidance and criteria for making release rate determinations for accidental releases from the Monticello Nuclear Generating Plant.

## CONDITIONS AND PREREQUISITES

An event at the facility has resulted in an unplanned release of radioactivity in excess of normal levels.

## DISCUSSION

This procedure is for making release rate determinations based on readings from monitors at the point of release. Verification of these determinations or determination of release rate from an unmonitored source (e.g., turbine building) should be made as per Procedures A.2-403, "Emergency Surveys" and A.2-404, "Emergency Sampling and Analysis".

## PERSONNEL REQUIREMENTS

Radiation Protection Specialist

## PROCEDURE

NOTE: This procedure is divided into four parts based on the point of release: Main Exhaust Plenum, Stack, Discharge Canal (Liquid Release), and Primary Containment.

### Determination of Main Exhaust Plenum Release Rate

NOTE: The method used to determine release rate from the Main Exhaust Plenum depends upon the reading of the Plenum Gas Continuous Air Monitor and the availability of the process computer or the operability of the Reactor Building Vent High Range monitor. This leads to four cases:

STEP 1: Case 1

Plenum Gas CAM ≤ 10,000 cps
Process Computer available.

a. Call for computer point T534. This is the calculated release rate in μCi/sec.

STEP 2: Case 2

Plenum Gas CAM ≤ 10,000 cps
Process Computer not available.

a. Read the Plenum CAM recorder in the Control Room.

b. Determine the total flow rate from the plenum (in cfm).

NOTE: Use 120,000 cfm unless flow indicators on 1027' Rx Building are accessible, in which case use a flow rate based on actual readings.

c. Calculate the release rate according to the following formula:

$$\text{Release Rate } (\mu\text{Ci/sec}) = \text{cps} \times \text{cfm} \times 472 \ \frac{\text{cc-min}}{\text{ft}^3\text{-sec}} \times 6 \times 10^{-7} \ \frac{\mu\text{Ci/cc}}{\text{cps}}$$

STEP 3: Case 3

Plenum Gas CAM > 10,000 cps
Reactor Building Vent High Range Monitor Operable

a. Read the RBV High Range Monitor readout (located behind MCC-43 on 931' level of turbine building) or the associated recorder (panel C-252D in Control Room).

b. Determine the flow from the plenum (cfm).

NOTE: Use 120,000 cfm unless flow indicators on 1027' Rx Building are accessible, in which case use a flow rate based on actual readings.

c. Calculate the release rate according to the following formula:

$$\text{Release Rate } (\mu\text{Ci/sec}) = \text{R/hr} \times (\text{Conversion factor}^{*}) \times \text{cfm} \times 472 \ \frac{\text{cc-min}}{\text{ft}^3\text{-sec}}$$

* See Plenum Exhaust Conversion Factor Table - Attachment 1.

STEP 4: Case 4

Plenum Gas CAM >10,000 cps
Reactor Building Vent High Range Monitor Not Operable

CAUTION: Monitor dose rate as you approach plenum (see Attachment 3).

a. Take a direct contact radiation reading on the plenum vent ducts immediately north of the high range monitor housing.

b. Determine the flow from the plenum (cfm)**.

NOTE:** Use 120,000 cfm unless flow indicators on 1027' Rx Building are accessible, in which case use a flow rate based on actual readings.

c. Calculate the release rate according to the following formula:

$$\text{Release Rate } (\mu Ci/sec) = R/hr \times (\text{conversion factor}^{*}) \times cfm \times 472 \ \frac{cc\text{-}min}{ft^3\text{-}sec}$$

* See Plenum Exhaust Conversion Factor Table - Attachment 1.

Determination of Stack Release Rate

NOTE: The method used to determine release rate from the Stack depends upon the reading of the Stack Gas Monitor and the availability of the process computer or the operability of the Stack High Range Monitor. This leads to three cases:

STEP 1: Case 1

Wide Range Gas Monitor Operable (WRGM)

a. Ensure flow and EFF lights are lit on WRGM and note effluent release rate in μCi/sec.

STEP 2 Case 2

WRGM not operating

Stack High Range Monitor operable.

CAUTION: Stack could be a high radiation area.

a. Read the Stack High Range Monitor readout or the associated recorder (panel C-252D in the Control Room).

b. Determine the flow rate from the stack (cfm).

NOTE: Use 4300 ± 100 cfm unless flow indicator in stack sample room is accessible, in which case the actual flow rate should be used.

c. Calculate the release rate according to the following formula:

$$\text{Release Rate } (\mu Ci/sec) = R/hr \times (\text{factor}^{*}) \times cfm \times 472 \ \frac{cc\text{-}min}{ft^3\text{-}sec}$$

* See Stack Exhaust Conversion Factor Table - Attachment 2.

STEP 3: Case 3

WRGM not operating
Stack High Range Monitor not operable.

CAUTION: Stack could be a high radiation area (see Attachment 3).

a. Take a direct contact radiation reading on the stack pipe at a point downstream of the dilution air inlet (reading can be taken with a teletector at a point near the isokinetic sample probe or with any dose rate instrument on the next level up).

b. Determine flow rate from stack (cfm).

NOTE: Use 4300 ± 100 cfm unless flow indicator in stack sample room is accessible, in which case the actual flow rate should be used.

c. Calculate the release rate according to the following formula:

$$\text{Release Rate } (\mu Ci/sec) = R/hr \times (\text{factor}^{*}) \times cfm \times 472 \ \frac{cc\text{-}min}{ft^3\text{-}sec}$$

* See Attachment 2

Discharge Canal Release Rate (Liquid Release)

STEP 1: Read both channels of the Discharge Canal Monitors (Control Room panel C02), and use the highest value for calculation.

STEP 2: Apply conversion factor of $1.58 \times 10^{-7}$ µCi/cc/cps to cps reading on monitor to arrive at µCi/cc.

STEP 3: Obtain river flow rate in CFS (Control Room panel D504) and multiply by 60 to obtain cfm.

STEP 4: Take µCi/cc value and divide by 28,320 cc/$ft^3$ to obtain µCi/$ft^3$ and multiply by the river flow rate in cfm to obtain µCi/min release rate.

Primary Containment Release Rate Determination

STEP 1: Go to Apple computer in TSC.

STEP 2: Follow computer instructions posted locally on computer.

WP/kk

## 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"

## ATTACHMENTS

1. Plenum Exhaust Conversion Factor Table

2. Stack Exhaust Conversion Factor Table

3. Emergency Sample and Measurement Considerations

ATTACHMENT 1

PLENUM EXHAUST CONVERSION FACTOR TABLE

| Time** | µCi/cc per R/hr |
|---|---|
| .1 hour | 6.7 (-2) |
| .5 hour | 1.2 (-1) |
| 1 hour | 1.4 (-1) |
| 2 hours | 1.8 (-1) |
| 4 hours | 2.3 (-1) |
| 8 hours | 3.3 (-1) |
| 16 hours | 5.2 (-1) |
| 24 hours | 7.0 (-1) |
| 48 hours | 8.8 (-1) |
| 96 hours | 1.1 (+0) |
| 7 d | 1.1 (+0) |
| 14 d | 1.0 (+0) |
| 30 d | 8.0 (-1) |
| 60 d | 2.5 (+0) |
| 120 d | 3.6 (+1) |
| 180 d | 3.9 (+1) |
| 1 yr | 3.9 (+1) |

** Time after accident

WP/kk

## ATTACHMENT 2

### STACK EXHAUST CONVERSION FACTOR TABLE

| Time** | µCi/cc per R/hr |
|---|---|
| .1 hr | 1.6 |
| .5 hr | 3.2 |
| 1 hr | 4.0 |
| 2 hr | 5.4 |
| 4 hr | 7.7 |
| 8 hr | 1.3 (+1) |
| 16 hr | 2.6 (+1) |
| 24 hr | 3.9 (+1) |
| 48 hr | 6.5 (+1) |
| 96 hr | 7.9 (+1) |
| 7 d | 8.0 (+1) |
| 14 d | 8.2 (+1) |
| 30 d | 1.0 (+2) |
| 60 d | 6.5 (+2) |
| 120 d | 1.1 (+3) |
| 180 d | 1.1 (+3) |
| 1 yr | 1.1 (+3) |

** Time after accident

WP/kk

ATTACHMENT 3

# EMERGENCY SAMPLE AND MEASUREMENT CONSIDERATIONS

## INTRODUCTION

In the event of certain postulated accidents, it is possible that effluent release rates would exceed the upper limits of installed monitors and that access to normal sample points for effluents, coolant and containment atmosphere may be encumbered by extremely high radiation fields. The purpose of this guidance is to preclude any unnecessary exposure resulting from the execution of such emergency sampling and measurement activities.

## ESTIMATING PLENUM RELEASE RATE THROUGH DIRECT RADIATION READING ON PLENUM DUCT

The procedure for quantifying the plenum release rate depends on taking a contact dose rate on the plenum duct which is located on the roof of the plenum room.

To get into a position to take this reading, one must climb first to the administration building roof and then up the side of the reactor building to the area of the air intake structure. From the time one reaches the administration building roof, that person should be aware of possible high radiation fields. The main source is expected to be the plenum duct work and stack. The method that seems to be most economical in terms of exposure involves moving quickly to the reactor building ladder, climbing to the next level and then transferring to the turbine building roof. Once on the turbine building roof, one can make a wide arc, keeping maximum distance from the plenum stack and then make a direct approach to the designated point.

One should also consider the instrument to be used. One option is an instrument with a telescoping probe such as a teletector. If such an instrument is unavailable, and more readings are anticipated, an instrument that has the capability of remote readout, such as the radgun can be used. The detector position could be positioned initially and subsequent readings could be made from 25' feet away. Lastly, a simple hand-held instrument such as a radector could be positioned by remote means and subsequent readings could be made with binoculars (and flashlight if necessary).

## ESTIMATING STACK RELEASE RATE THROUGH DIRECT RADIATION READING ON STACK PIPE

The procedure for quantifying the stack release rate depends on taking a contact dose rate on the stack pipe at a point downstream of the dilution air inlet. The stack area could be a high radiation area, especially in areas where there is no shielding for the stack pipe. The preferred method would seem to be one using a teletector which could be inserted through the penetration for the isokinetic sample probe. From this location, one could obtain the required readings while utilizing the installed shielding. The other option is to climb up the outside of the stack to the first landing. At this level, the stack pipe is not shielded and caution must be exercised.

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: B. Petersen | ALARA Review: | Revision 0 | Date | 3/29/81 |
| Reviewed by: R G Jepson | Q.A. Review: | Revision 0 | Date | 3/29/81 |
| Operations Committee Final Review: Meeting Number | | 1067 | Date | 2-25-82 |
| Approved by: | | F L Fey | Date | 2-26-82 |
| 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 interes extend frc 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 3 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 3 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 PDP-11/05 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 Computer (Alternate Method)

This method is functionally identical to the computer (MODCOM) method but utilizes a different computer system.

3. 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, 2 or 3. Attachment 1 is the most preferred method and Attachment 3 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 Computer (Alternate Method)
3. Dose Projection by Hand Calculation
4. Example of Off-Site Dose Projection Worksheet
5. Determination of Meteorological Data Using Instrumentation Available in the Control Room
6. Obtaining Meteorological Data From General Office Eclipse Computer System

ATTACHMENT 1



## DOSE PROJECTION BY COMPUTER (MODCOM)

PREREQUISITES

1. Proceed to the Chemistry Count Room and place the computer system in the timesharing mode (RUN TSGO).

2. Proceed to the Body Burden Analyzer Room and perform the following behind the LA-36 terminal:

   a. Place Switch 1 in the P1 position.
   b. Place Switch 3 in the P2 position.

3. Proceed to the TSC and turn on the MET Tower Data Terminal and 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 and depress the "300 BAUD" button. Ensure that the terminal is on line. 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)

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

INITIAL EVALUATION ? :

STEP 4: Respond as follows:

a. If this is the initial evaluation, type in "Y" and press carriage return. The terminal will respond with a list of the available options in the MODCOM program ending with:

PLEASE ENTER THE OPTION YOU DESIRE:

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

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.)



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 data is unavailable, wind speed, direction and stability class can be obtained from control room instrumentation at Panel C-20. See Attachment 5 of this procedure.

ATTACHMENT 1 (Cont'd.)



and proceed to request specific numerical information. Obtain this information from the Met Tower Data Terminal and type it in as requested. If the Met Tower Data is not available, enter a zero for the requested day and time information, the program will then request data from the control room instrumentation. The terminal will respond with:

PLEASE ENTER THE FOLLOWING EFFLUENTS RELEASE RATE DATA:

and proceed to 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 20% 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:

ATTACHMENT 1 (Cont'd.)

Page 4 of 4

b. Type in the sector letter (A-R). 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.

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



DOSE PROJECTION BY COMPUTER
(ALTERNATE METHOD)

PURPOSE

The purpose of this procedure is to provide guidance and instructions for using a backup computer system to perform off-site dose projections.

PROCEDURE

STEP 1 Proceed to the Body Burden Analyzer Room and perform the following:

a. Place Switch 2 in the F1 position.

b. Palce Switch 3 in the P2 position.

c. Read and follow instructions posted locally (near toggle switch) for starting and using the backup computer.

STEP 2 Proceed to the TSC and turn on the Met Tower Data terminal and plant computer CRT's, if this has not already been done.

STEP 3 Refer to Attachment 1, "Dose Projection by Computer (MODCOM)" and follow the procedure steps.

ATTACHMENT 3



DOSE PROJECTION BY HAND CALCULATION

EQUIPMENT REQUIRED

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

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 hte 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 in the Technical Support Center. If the printer is unavailable, refer to Attachment 6.

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.)

NOTE: If meteorological tower data is unavailable, windspeed, wind direction and stability class data can be obtained from Control Room instrumentation at Panel C-20. See Attachment 5 of this procedure.

ATTACHMENT 3 (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 the X/Q Catalog, select and record the X/Q values as required. Part One of the Catalog is divided into sectors and contains the values for Stack releases and Vent releases to the Site Boundary and nearest receptor. Part two contains the values for other Vent releases (which values are independent of sector designation). Use the fumigation X/Q value for one hour after sunrise. (This is a conservative approach.)

ATTACHMENT 3 (Cont'd.)

Page 3 of 3

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

TABLE III

| Elapsed Time (Hours) From | To | Noble Gases Factor | Iodines Factor |
|---|---|---|---|
| 0.00 | 0.50 | 6.49E-01 | 254 |
| 0.50 | 1.00 | 5.48E-01 | 282 |
| 1.00 | 2.00 | 4.06E-01 | 329 |
| 2.00 | 4.00 | 3.43E-01 | 398 |
| 4.00 | 8.00 | 2.93E-01 | 485 |
| 8.00 | 16.00 | 1.65E-01 | 607 |
| 16.00 | 24.00 | 8.70E-02 | 705 |
| 24.00 | 48.00 | 6.10E-02 | 923 |
| 48.00 | 96.00 | 3.90E-02 | 1117 |
| 96.00 | 168.00 | 3.30E-02 | 1270 |
| 168.00 | 336.00 | 3.30E-02 | 1280 |
| 336.00 | 720.00 | 3.20E-02 | 1280 |
| 720.00 | 1440.00 | 2.60E-02 | 1280 |
| 1440.00 | Beyond | 3.60E-03 | 1280 |

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 20% 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 4

Form 5790-406-4
Rev. 0, 02/24/82
Page 1 of 1

Example of
OFF-SITE DOSE RATE PROJECTION WORKSHEET
(For use with Procedure A.2-406, Attachment 3)

INPUT DATA

Time ____________ Date ____________
Time After Reactor Trip ____________ hours
Stability Class: RB Vent ____________ Stack ____________
Windspeed: RB Vent ____________ mph Stack ____________ mph
Wind Direction: ____________ Sector ____________

Location (S.B., N.R., or distance): ____________
X/Q Value for Location: ____________
Noble Gas Release Rate μCi/sec: ____________ (a)
Noble Gas Factor: ____________ (b)
Iodines Release Rate μCi/sec: ____________ (d)
Iodines Factor: ____________ (e)

WHOLE BODY DOSE RATE

Multiply (a) x (b) x X/Q: ____________ mrem/hr

THYROID DOSE RATE

Multiply (d) x (e) x X/Q: ____________ 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 5

### Determination of Meteorological Data Using Instrumentation Available In The Control Room

In the event the Met Tower data is not available, either from the printer at the TSC, or from the recorders at the Met Tower, the wind speed, wind direction and stability class can be determined from the instrumentation in the Control Room. In this event, only one set of data (speed, direction and stability) is available, and is to be used for both reactor building vent and stack releases.

STEP 1: Read wind speed and direction off wind speed recorder on CO-20. Use the average wind speed and direction from the past 15 minutes - visual observation.

STEP 2: Determine the stability class using the STABILITY CLASS INDICATOR located in the back of panel C20. For the first reading, verify the instrument is properly set up by performing the following:

a. Verify the SIGMA thumbwheel switch is set at 15.

b. Verify the SYNCHRO-DC switch is set at 0-100.

c. Verify the A/C - D/C switch of the Fluke Multimeter is in the DC position (pushbutton out).

d. Verify the 2 V range is selected.

e. Turn the power switch of the Fluke 8020A Multimeter to ON (green switch on left side of instrument).

f. Read the scale of the multimeter (units are V).

g. Determine the stability class by using the following table:

| Multimeter Reading | Stability Class |
|---|---|
| $\geq$ 1.12 V | A (Extremely unstable) |
| < 1.12 V to $\geq$ .88 V | B (Moderately unstable) |
| < .88 V to $\geq$ .62 V | C (Slightly unstable) |
| < .62 V to $\geq$ .38 V | D (Neutral) |
| < .38 V to $\geq$ .19 V | E (Slightly stable) |
| < .19 V to $\geq$ .10 V | F (Moderately stable) |
| Less than .10 V | G (Extremely stable) NOTE 1 |

NOTE 1: Use Stability Class F (Reference: Letter of March 9, 1981 from certified consulting meteorologist to [redacted].

h. When Met Tower data is no longer required, turn the multimeter power switch to OFF.

ATTACHMENT 6

## Obtaining Meteorological Data From General Office Eclipse Computer System

(READ ALL INSTRUCTIONS CAREFULLY BEFORE STARTING)

STEP 1 Turn the G.E. printer on, place phone receiver in data acoustic coupler.

STEP 2 Dial , (if no answer use

STEP 3 You will see the following:

**** NORTHERN STATES POWER / TYPE NEW-LINE TO BEGIN LOGGING ON ****

STEP 4 Type: RETURN

STEP 5 You will then see the followin,:

USERNAME:

STEP 6 Type: MONTI.SEDAR

STEP 7 See---PASSWORD:

STEP 8 Type: MONTI.SEDAR
(note password will not print)

STEP 9 System will display the current time in JULIAN form.

STEP 10 System will ask for beginning and ending time in JULIAN form, enter data with NO SPACES.

NOTE: Report is formatted by your entry.

(82DDDHHMM) ------- will give 15 minute samples
(82DDDHH) ------- will give hourly summaries
(82DDD) ------- will give daily summaries

(Data is only available for the previous few days)

STEP 11 The report will take several minutes to print out, there will be several bits of meaningless information printed after which the report will be printed.

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

# PERSONNEL AND VEHICLE MONITORING AND DECONTAMINATION

A.2-407

Prepared by: MKOffenbeker ALARA Review: GDMathiasen Date 3/1/82
Reviewed by: GDMathiasen Q.A. Review: R. L. Scheinost Date 3/29/81
Operations Committee Final Review: Meeting Number 1068 Date 3/1/82
Approved by: FLFey Date 3-1-82
Op. Com. Results Review: Not Required Mtg. # 949 Date 3/26/81

## PURPOSE

The purpose of this procedure is to specify requirements, methods, action levels and documentation for survey of personnel and vehicles during an evacuation. This is a total rewrite.

## CONDITIONS AND PREREQUISITES

A. An evacuation is underway as per A.2-301, "Emergency Evacuation" or

B. The Radiological Emergency Coordinator or other senior radiation protection individual has directed that appropriate sections of this procedure be implemented, and

C. The reasons for evacuation are radiological in nature, e.g., there is cause to suspect contamination of personnel/vehicles.

## PRECAUTIONS

A. The safety of personnel shall take precedence over the monitoring of personnel and vehicles for radiation/contamination control purposes. Monitoring of personnel and/or vehicles shall be terminated (or not implemented in the first place) if such monitoring is known or suspected to be increasing the hazard to personnel during evacuation.

B. If any personnel are injured, or are suspected to have received a biologically significant dose (greater than 25 rem whole body) report to Radiological Emergency Coordinator.

C. Monitoring stations should be selected and monitoring operations should be conducted in such a manner as to maintain personnel exposures as low as is reasonably achievable.

D. Personnel monitoring beyond normal frisking should be performed by qualified radiation protection personnel.

PERSONNEL REQUIREMENTS

Emergency Director - overall responsibility
Radiological Emergency Coordinator - in charge
Radiation Protection Specialist - procedure implementation

DISCUSSION

Evacuation may be grouped into three general types of procedures: Local, Plant and Site Evacuations, as per A.2-301, "Emergency Evacuation". For Site Evacuations personnel and vehicle monitoring and decontamination will be performed, if the EOF is activated, by EOF personnel per EPIP 1.1.16.

PROCEDURE

A. Local Evacuation

NOTE: Evacuated personnel should be directed to the monitoring and decontamination facilities at Access Control, located in the basement of the Administration Building. If these facilities are not accessible, an alternate location will be specified by the Emergency Director/REC.

STEP 1 Monitor personnel as per Attachment 1.

NOTE: If practicable, evacuated personnel should be passed through a portal monitor prior to frisking.

STEP 2 If conditions permit, an immediate attempt will be made to reduce to below limits any contamination detected on the person of an individual as per Attachment 3. If contamination is coincident with injury, procedure A.5-100 will be followed.

B. Plant Evacuation

NOTE: Evacuated personnel should be directed to monitoring and decontamination facilities at one of the assembly points. Personnel will be directed to the appropriate assembly point by the Emergency Director.

STEP 1 Monitor personnel as per Attachment 1.

NOTE: If practicable, evacuated personnel should be passed through a portal monitor prior to frisking.

STEP 2 If conditions permit, an immediate attempt will be made to reduce to below limits any contamination detected on the person of an individual as per Attachment 3. If contamination is coincident with injury procedure A.5-100 will be followed.

STEP 3 If a radioactive release has taken place or is taking place which could result in the contamination of vehicles, personnel should be directed to take their vehicles to a monitoring and decontamination facility. Vehicles should be monitored per Attachment 2.

STEP 4 If conditions permit decontamination of vehicles, decontamination should be performed per Attachment 4.

C. Site Evacuation

NOTE: Personnel evacuated from the site under these conditions may not have adequate time for contamination surveys onsite. It is likely that all non-essential, contractor and visiting personnel will have already been evacuated. The personnel involved should be plant staff. They may have passed through a frisking station or a portal monitor prior to entering their vehicle. However, the potential for recontamination enroute to their vehicles exists. The vehicles should be routed to the Main Access Road or the West access Road, depending on the direction of the plume. Personnel will be directed to a monitoring and decontamination facility offsite. The EOF would normally be activated by the time a site evacuation would be declared and EOF personnel would perform personnel and vehicle monitoring and decontamination per EPIP 1.1.16. However the possibility does exist that the EOF may not yet be manned in which case Plant Staff HP's will be required to perform monitoring and decontamination of personnel and vehicles.

STEP 1 Monitor personnel as per Attachment 1.

STEP 2 Attempt personnel decontamination if necessary per Attachment 3. If contamination is coincident with injury procedure A.5-100 will be followed.

STEP 3 Monitor vehicles per Attachment 2.

STEP 4 Attempt vehicle decontamination if necessary per Attachment 4.

WP/dw

## ATTACHMENT 1

## PERSONNEL MONITORING

NOTE: Personnel monitoring takes precedence over all other monitoring requirements. Guidelines expressed below should be followed for personnel monitoring.

Monitoring teams should dress in appropriate protective clothing.

STEP 1 Using a RM-14 with a 2" GM pancake probe (or equivalent instrumentation) quickly scan evacuees for contamination.

STEP 2 Segregate those personnel identified in Step 2 into three groups; highly contaminated (> 5000 cpm), contaminated (> 1000 cpm) and non-contaminated (< 1000 cpm). Non-contaminated personnel may be released immediately and should be directed to proceed to their homes and take a shower.

STEP 3 For highly contaminated personnel proceed as follows:

a. Initiate Whole Body Survey Form (Figure 1) for each contaminated person scanned.

b. Carefully scan personnel. If contamination appears to be confined to clothing, have the personnel carefully strip contaminated clothing and rescan. Pay particular attention to nose, mouth and eyes. Segregate contaminated clothing. Record results of initial scan on Figure 1.

NOTE: Contamination levels of 10,000 dpm/scan (1,000 cpm) of nose or mouth shall require further bioassay information. Direct affected personnel to blow nose and scan for loose contamination in mucus. Rescan nose. If results of either scan or nasal blow are greater than 1000 dpm/scan (100 cpm), record name and social security number for future Body Burden Analysis. Record results on Figure 1.

c. Personnel with body contamination levels greater than 1000 dpm/scan (100 cpm) should be segregated until they can be decontaminated in accordance with Attachment 3.

STEP 4 When monitoring of highly contaminated personnel is complete, begin monitoring the second group of contaminated personnel as specified in Step 3.a - c above.

STEP 5 When monitoring of personnel is complete, isolate all contaminated items and return them to plant for disposal.

ATTACHMENT 2

VEHICLE MONITORING

NOTE: If time and personnel permit, vehicle monitoring should be done concurrently with personnel monitoring, however, personnel monitoring will take precedence.

STEP 1 Dress monitoring teams in appropriate protective clothing.

STEP 2 Establish a "clean" area (non-contaminated) for vehicle staging, and monitoring.

STEP 3 Using a RM-14 with a 2" GM pancake probe (or equivalent instrumentation) scan interior and exterior of vehicles for surface contamination.

STEP 4 Initiate a Vehicle Survey Form (Figure 2) for each contaminated vehicle.

NOTE: To avoid decontamination of entire vehicles and the resultant generation of large volumes of dry waste, indicate small areas of contamination using a grease pencil to outline the area.

STEP 5 If area indicates greater than 1000 dpm/scan (100 cpm), smear the area with a paper disc smear and count.

STEP 6 Record results of monitoring effort on a Vehicle Survey Form, Figure 2.

STEP 7 If vehicle is not contaminated, i.e. less than 1000 dpm/100 $cm^2$ smearable (100 cpm), it may be released to a clean area.

STEP 8 Contaminated vehicles, i.e. greater than 1000 dpm/100 $cm^2$ smearable (100 cpm), shall have a Vehicle Survey Form taped to the front windshield and shall be isolated. They will be decontaminated on a time-allowed basis.

STEP 9 Decontamination of vehicles shall be performed in accordance with Attachment 4.

STEP 10 When monitoring of vehicles is complete, isolate all contaminated materials and return them to the plant.

## ATTACHMENT 3

## PERSONNEL DECONTAMINATION

NOTE: Personnel shall not be released if skin contamination levels exceed 1000 dpm/scan (100 cpm). Personnel who indicate nasal, ear canal, mouth or eye contamination shall be decontaminated under medical surpervision only. Personnel who indicate nasal or mouth contamination shall have further Body Burden Analysis performed as soon as practicable.

Decontamination of personnel shall begin with the most highly contaminated personnel receiving priority.

Personnel shall be decontaminated as follows:

STEP 1 Decontamination team personnel should be equipped with the following:

a. Lab coat
b. Rubber gloves
c. Shoe covers

STEP 2 Establish a decontamination area.

STEP 3 Using Whole Body Survey Form, decontaminate individual using the following guidance:

NOTE: These steps are provided as guidleines. It is not mandatory that each step be followed in sequence. The individual technician's judgement may be used to determine the complete decontamination method.)

a. Using soap and water, wash the affected area and survey.

b. If results indicate less than 1000 dpm/scan (100 cpm), record results on Figure 3 and release individual from control group.

c. If results are still greater than 1000 dpm/scan (100 cpm), repeat Step 3a as necessary.

d. If results continue to indicate greater than 1000 dpm/scan (100 cpm), proceed to Step 4.

STEP 4 NOTE: Do not use Tide paste near eyes, nose or ear canal.

Make a paste using plain water and Tide detergent. Using a soft cloth, apply paste liberally to contaminated area. Wait two minutes. Rinse area with copious amounts of plain water, catching the water in a poly bag. Wipe area one time and survey.

If results are less than 1000 dpm/scan (100 cpm), record results and release individual from control group. Issue appropriate clothing as necessary.

ATTACHMENT 3 (Cont'd.)

PERSONNEL DECONTAMINATION

If results are greater than 1000 dpm/scan (100 cpm), repeat Step 4.

STEP 5 If results continue to indicate greater than 1000 dpm/scan (100 cpm) after a second attempt to decon using Tide and water, record results and proceed to Step 6.

STEP 6 CAUTION: Do not use betadyne near eyes. The application of betadyne should be used one time only.

a. Using betadyne, water and soft cloth, make one application of betadyne, wipe one time with soft cloth. Fold cloth, rinse with copious amounts of water, wipe one final time with folded soft cloth and survey.

b. If results indicate less than 1000 dpm/scan (100 cpm), record results and release individual from control group.

c. If results are still greater than 1000 dpm/scan (100 cpm), notify the REC to receive medical guidance for more stringent decontamination methods.

STEP 7 Segregate all wastes generated by this procedure and label these materials as contaminated waste.

NOTE: Label all bags containing liquid or absorbed liquid for special processing.

## ATTACHMENT 4

## VEHICLE DECONTAMINATION

NOTE: Vehicles shall be decontaminated to less than 1000 dpm/100 $cm^2$ (100 cpm) smearable or 0.1 mrem/hr fixed. If these limits cannot be reached by techniques expressed in this Attachment notify the REC.

STEP 1 Establish a decontamination area.

STEP 2 Decontamination personnel should be equipped with the following:

a. Lab coat
b. Rubber gloves
c. Shoe covers

STEP 3 Using Vehicle Survey Form and indicated contamination areas as a guide, decontaminate vehicle as follows:

a. Using masslinn cloths or equivalent, wipe contaminated area.

b. After each wipe-down, survey the area by smear and scan, and record results on Figure 3.

c. Vehicle may be released when smearable contamination levels are below 1000 dpm/100 $cm^2$ (100 cpm) or fixed activity is less than 0.1 mREM/hr. Note that air filters, radiators and similar equipment may contain concentrated levels of contamination and should be checked separately.

d. If after a reasonable number of attempts, levels are still greater than in Step 3 above, isolate vehicle in a holding area.

e. Isolate all radioactive contaminated material.

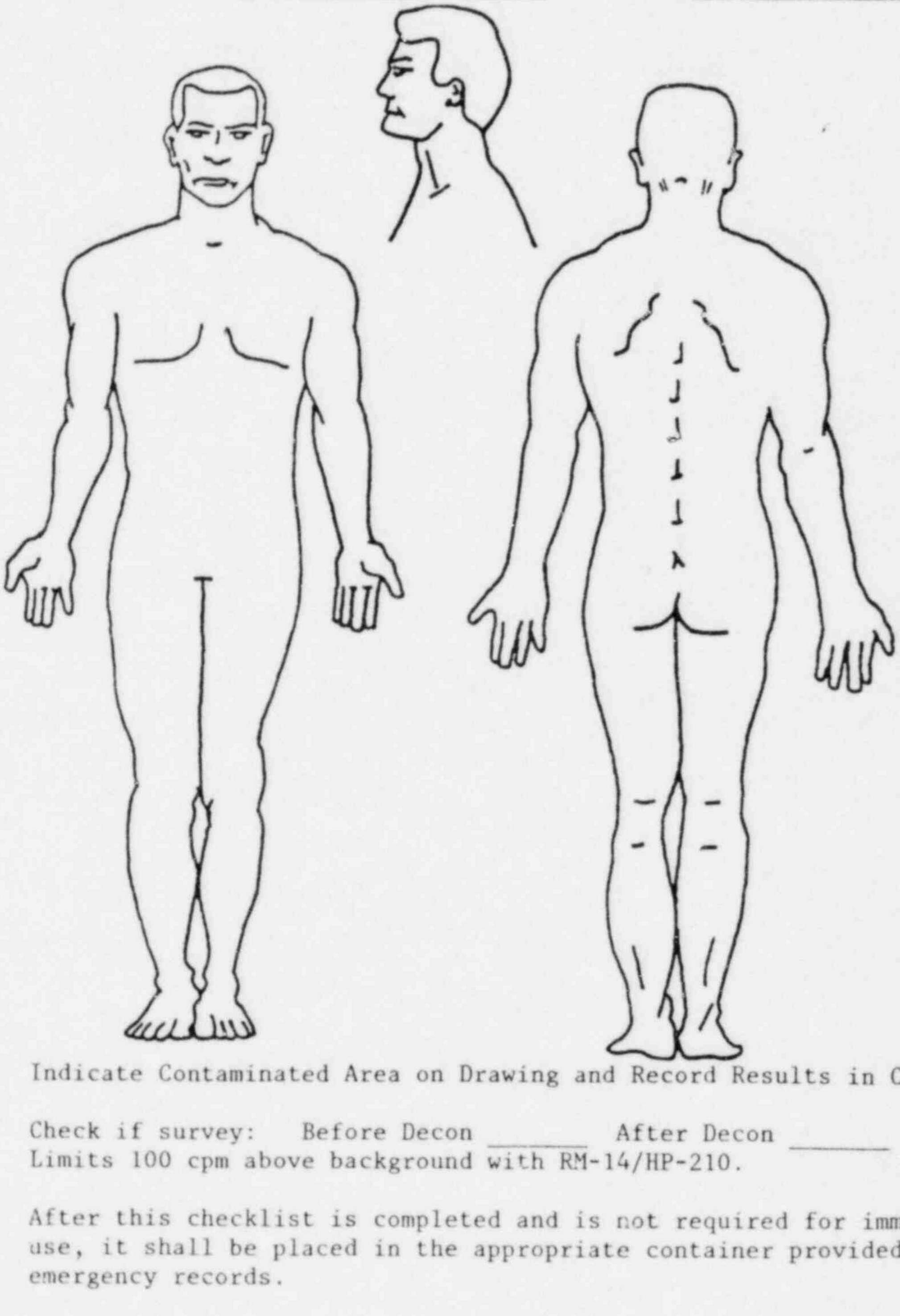
Form 5790-407-1
Revision 2, 02/25/82
Page 1 of 1

FIGURE 1

Example of
WHOLE BODY SURVEY FORM

NAME ______________________________ TLD NUMBER ______________

BIOASSAY REQUIRED: ________________ INITIAL ________________



NOTE: Indicate Contaminated Area on Drawing and Record Results in CPM.

Check if survey: Before Decon ______ After Decon ______
Limits 100 cpm above background with RM-14/HP-210.

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/dw

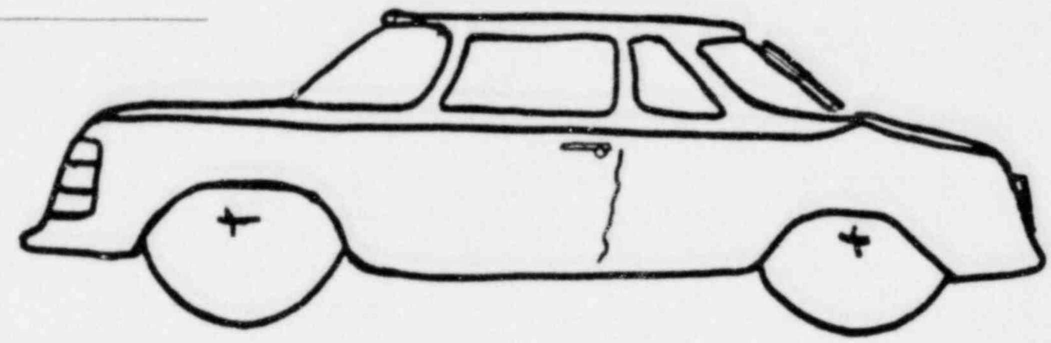
FIGURE 2

Form 5790-407-2
Rev. 2, 2/25/82
Page 1 of 1

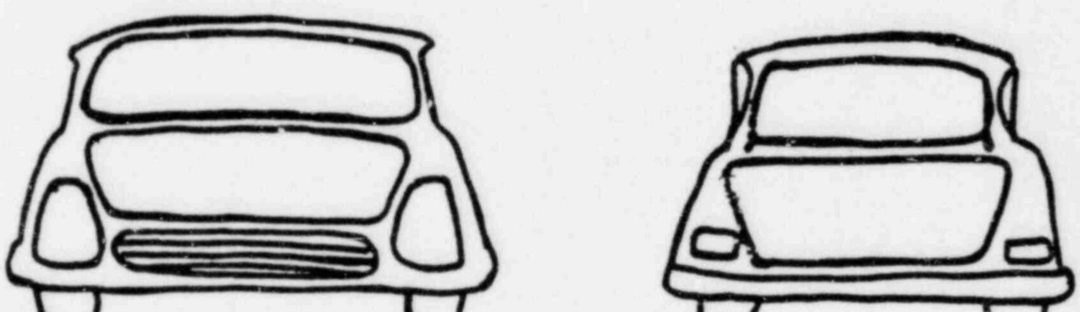
Example of
VEHICLE SURVEY FORM

Vehicle Owned by: ______________________________
Owners Social Security Number: _____-____-_____ or TLD # __________

Vehicle Identification
Type ________________
Make ________________
License No. __________
Color _______________



left side____ right side______



Front Back

NOTE: Indicate Contaminated Areas on drawing and record results in cpm.

Check if survey: Before Decon _______ or After Decon _______

Limits 100 cpm above background with RM-14/HP-210

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/dw

FIGURE 3

Form 5790-407-3
Rev. 2,2/25/82
Page 1 of 1

Example of
PERSONNEL AND VEHICLE SURVEY RECORD

| Name/ License No. | Date | Time | Before Decon Smearable dpm | Before Decon Fixed cpm | After Decon Smearable dpm | After Decon Fixed cpm | Initials |
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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/dw