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May 7, 1981

Director of Nuclear Reactor Regulation
U S Nuclear Regulatory Commission
Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

EMERGENCY RESPONSE PLAN
IMPLEMENTING PROCEDURES

In our letter dated February 27, 1981, which transmitted copies of both the Corporate and Plant Emergency Response Plan Implementing Procedures, we stated that experience gained with these documents during the initial training and drill activities would be utilized to further refine and revise the procedures. These revised procedures were issued for use about April 1, 1981.

Ten sets of revised plant procedures are furnished with this letter for the purpose of information reference and use related to activation of your Incident Response Plan. Copies of revised corporate procedures will follow.

In the February 27, 1981 submittal, we requested that the procedure documents not be placed in the Public Document Room, since they include names and telephone numbers of persons and facilities involved in Emergency Plans activities, to maintain the confidentiality of this information for reasons of privacy and plan effectiveness.

We have learned recently that the previously submitted procedure documents were placed in the Public Document Room in Washington and the Local Public Document Room. To preclude future uncontrolled dissemination of this sensitive information, we have deleted telephone numbers and other sensitive information from these procedure documents.

L. O. Mayer

L O Mayer, PE
Manager of Nuclear Support Services

LOM/jh

cc: J G Keppler (w/attachment & enclosure) (3)
NRC Resident Inspector (w/o enclosure)
G Charnoff (w/o enclosure)

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List of Current Procedures

Procedure #	Procedure Title	Revision Number
000 Series	Organization	
A.2-001	Emergency Organization	0
100 Series	Activation	
A.2-101	Classification of Emergencies	0
A.2-102	Notification of an Unusual Event	0
A.2-103	Alert	0
A.2-104	Site Area Emergency	0
A.2-105	General Emergency	0
A.2-106	Activation of Technical Support Center	0
A.2-107	Activation of Operation Support Center	0
200 Series	Assessment	
A.2-201	Onsite Monitoring During an Emergency	0
A.2-202	Offsite Monitoring During an Emergency	0
A.2-203	Evacuation Criteria for Onsite Personnel	0
A.2-204	Offsite 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	0
A.2-302	Assembly Point Activation	0
A.2-303	Search and Rescue	0
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	0
A.2-404	Emergency Sampling and Analysis	0
A.2-405	Release Rate Determination	0
A.2-406	Offsite Dose Projection	0
A.2-407	Personnel and Vehicle Monitoring	0
A.2-408	Sample Coordination During an Emergency	0
500 Series	Communications and Documentation	
A.2-501	Communications 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	0

List of Current Procedures (Cont'd)

Procedure #	Procedure Title	Revision Number
700 Series	Emergency Preparedness	
A.2-702	Response to an Emergency at Prairie Island	0

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: C. [illegible]/Quaelex ALARA Review: CD Mathiasen Date 3/16/81
Reviewed by: [illegible] Nolan Q.A. Review: RL Scheinost Date 3/18/81
Operations Committee Final Review: Meeting Number 946 Date 3/20/81
Approved by: [illegible] Date 3-21-81
Op. Com. Results Review: Not Req'd Mtg. 946 Date 3/20/81

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. 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.

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.

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).

RESPONSIBILITIES; ASSIGNMENTS; ORDER OF SUCCESSION

A. Emergency Director

In the initial stage of an emergency condition, the Emergency Director has overall coordinating authority for Northern States Power. He alone has the authority and responsibility to immediately and unilaterally initiate any emergency actions, including providing protective action recommendations to authorities responsible for implementing off-site emergency measures. At such time as the Emergency Operations Facility is officially activated, the Emergency Manager will assume overall coordinating authority. The Emergency Director will retain the responsibility for plant operations.

1. Order of Succession

The following is the order of succession of the Emergency Director: This does not include the designated alternates for these (b through f) positions.

a. Plant Manager
b. Plant Supt., Engineering & Radiation Protection
c. Plant Supt., Operations & Maintenance
d. Supt., Security & Services
e. Supt., Quality Engineering
f. Supt., Operations
g. Duty Shift Supervisor

During an emergency, the Duty Shift Supervisor assumes the responsibility of the Emergency Director. The duty Shift Supervisor shall be relieved of the Emergency Director responsibilities by one of the above individuals after arrivial on-site. Any of the above may take over the responsibility of Emergency Dirctor when he arrives on-site if he is above the present Emergency Director as indicated in the order of succession and it is probable that no individual above him is going to arrive within 2 hours. Exceptions to the order of Emergency Director are individuals serving as STA.

NOTE: The Shift Supervisor should perform the duties of Emergency Director while remaining in the Control Room. The individual relieving the Shift Supervisor as Emergency Director should transfer to the Technical Support Center.

2. Responsibilities (Attachment 2)

The functional responsibilities assigned to the Emergency Director are as follows:

a. Coordinate response of plant emergency organization;

b. Recommend off-site protective meaures (this responsibility may not be delegated);

c. Assume control of Technical Support Center personnel and activities;

d. Insure 24 hour coverage for key positions in plant emergency organization;

e. Make decisions regarding habitability of emergency centers; and,

f. Approve radiation exposures in excess of normal limits.

g. Initiate and supervise "Personnel Accountability-TSC/Control Room" (Procedure A.2-205).

B. Onsite Emergency Organizations

Under emergency conditions, the organization of the plant staff is altered to simplify communication channels and to make more efficient use of personnel resources (see Attachment 1). The emergency organization consists of a Coordination and Direction Group, six subordinate groups and the Fire Brigade. A description of the composition of these groups, as well as their responsibilities (Attachment 2), leadership, and orders-of-succession follow:

1. Coordination and Direction Group

The Coordination and Direction Group consists of the Plant Manager and the Plant Superintendent, Engineering and Radiation Protection, and the Shift Technical Advisor.

a. Group Leader

The group leader shall be the individual assigned as Emergency Director.

b. Group Responsibilities

The group shall assist the Emergency Director in providing emergency direction and control.

2. Operations Group

The Operations Group consists of the Superintendent of Operations, the Shift Supervisors, and all operators.

a. Group Leader

The order of succession shall be as follows:

(1) Superintendent, Operations
(2) Duty Shift Supervisor
(3) Most Senior Shift Supervisor present
(4) Most Senior Lead Plant Equipment & Reactor Operator present

b. Group Responsibilities

The group shall have the responsibility for plant operations and assessment of operational aspects.

3. 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. Group Leader

The order-of-succession shall be as follows:

(1) Plant Superintendent, Operations and Maintenance

(2) Superintendent, Maintenance

(3) Mechanical Supervisor

b. Group Responsibilities

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

4. 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. Group Leader

The order-of-succession shall be as follows:

(1) Superintendent, Technical Engineering

(2) Superintendent, Operations Engineering

(3) Most Senior Technical or Operations Engineer present

b. Group Responsibilities

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

5. Health Physics Group

The Health Physics Group consists of the Superintendent, Radiation Protection, and all members of the Radiation Protection Group.

a. Group Leader

The order-of-succession shall be as follows:

(1) Superintendent, Radiation Protection

(2) Plant Health Physicist

(3) Chemist (Senior Individual)

(4) Chemical Engineer (Senior Individual)

b. Group Responsibilities

The group has primary responsibility for surveys in the plant, onsite surveys out of the plant, plant chemistry, access control, off-site dose projection, contamination/radiation control, and accident assessment.

6. Support Group

The Support Group consists of the Plant Office Manager, all Administrative Aids and Plant Administrative Specialists, the Superintendent, Quality Engineering, all Quality Engineers and Quality Specialists.

a. Group Leader

The order-of-succession shall be as follows:

(1) Superintendent, Quality Engineering

(2) Plant Office Manager

(3) Quality Engineer (Senior Individual)

b. Group Responsibilities

The group shall provide administrative support, communications and first aid services to the emergency effort.

7. Security Group

The Security Group consists of the Superintendent, Security & Services, the Supervisor, Security & Services, and the contract security force.

a. Group Leader

The order-of-succession shall be as follows:

(1) Superintendent, Security & Services

(2) Supervisor, Security & Services

(3) Most Senior Security Officer present

b. Group Responsibilities

(1) The group shall continue to carry out the plant security and access control functions.

(2) The group shall maintain strict personnel accountability onsite.

(3) The group shall provide communications capabilities for each team of the Fire Brigade.

8. Fire Brigade

The Fire Brigade consists of three Emergency teams made up of individuals trained in fire fighting and damage control.

a. Brigade Organization

(1) The Brigade Chief is in charge of the Fire Brigade and the Assistant Brigade Chief is his assistant and alternate.

(2) Each Emergency Team is lead by a Team Leader and has an Alternate Team Leader assigned.

(3) During backshifts, weekends, and holidays, the Team Leader is the third man in the control room and the Alternate Team Leader is the Plant Attendant.

b. Brigade Responsibilities

The Fire Brigade shall be responsible for fire fighting, damage control and search and rescue.

C. Onsite Emergency Personnel

1. Shift Technical Advisor

The duty Shift Technical Advisor shall be responsible for advising the Emergency Director and the Shift Supervisor.

2. Emergency Director

The Emergency Director shall be responsible for:

a. Notification of the plant staff
b. Emergency classification
c. Notification - State, Local, and Corporate Authorities
d. Emergency direction and control
e. Personnel accountability
f. Accident assessment
g. Damage control
h. Search and rescue

3. Control Room Operators

The Operators on duty in the Control Room shall be responsible to assist in the following areas:

a. Notification of the plant staff
b. Emergency classification
c. Accident assessment
d. Off-site dose projection

4. Shift Emergency Communicator

Initial notifications are the responsibility of the Shift Emergency Communicator. As the emergency organization comes to full strength, additional Emergency Communicators will be assigned as needed.

5. Shift Radiation Protection Specialist

The Shift Radiation Protection Specialist performs the function of the Health Physics Group during off-normal working hours. As the emergency organization comes to full strength, the Health Physics Group assumes its responsibilities.

6. Assembly Point Coordinator

The Assembly Point Coordinator shall be responsible for the following:

a. Determining if the assembly area is safe.

b. Supervising contamination surveys of evacuated persons, if necessary.

c. Initiating and supervising Procedure A.2-206, "Personnel Accountability Procedure Assembly Point", as applicable.

d. Establishing and maintaining communications with the Technical Support Center.

e. Moving personnel to an alternate Assembly Point if necessary.

The Assembly Point Coordinator shall be as directed by the Emergency Director.

7. Radiological Emergency Coordinator

The Radiological Emergency Coordinator is responsible for:

a. On-site protective actions
b. Accident assessment
c. Off-site dose projection
d. Contamination/radiation control
e. Off-site protective action recommendations
f. Re-entry/Recovery operations
g. Monitoring team coordination

The order-of-succession for the Radiological Emergency Coordinator is as follows:

(1) Superintendent, Radiation Protection
(2) Plant Health Physicist
(3) Chemical Engineer (Senior Individual)
(4) Chemist (Senior Individual)
(5) Emergency Planner

8. Emergency Team Coordinator

The Emergency Team Coordinator is responsible fo directing the efforts of the Emergency Team(s) from the TSC during search and rescue, fire fighting or emergency repair operations. He reports to the Emergency Director. The order-of-succession for the Emergency Team Coordinator shall be as follows:

a. Plant Superintendent, Operations & Maintenance
b. Superintendent, Maintenance
c. Senior available Mechanical or Electrical Supervisor
d. Other individuals designated by the Emergency Director

PROCEDURE

STEP 1: Notification of an Unusual Event (NUE).

Declaration of an NUE may not require activation of the Emergency Organization beyond the participation of the Shift Supervisor, Shift Emergency Communicator, Shift Technical Advisor and other shift personnel.

STEP 2: Alert

In addition to the requirements for an NUE, an Alert requires notification of plant management and placing key personnel in standby status.

STEP 3: Site Area Emergency or General Emergency

Declaration of a Site Area or General Emergency shall require that the on-site emergency organization be fully activated.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Monticello Nuclear Generating Plant Operations Manual

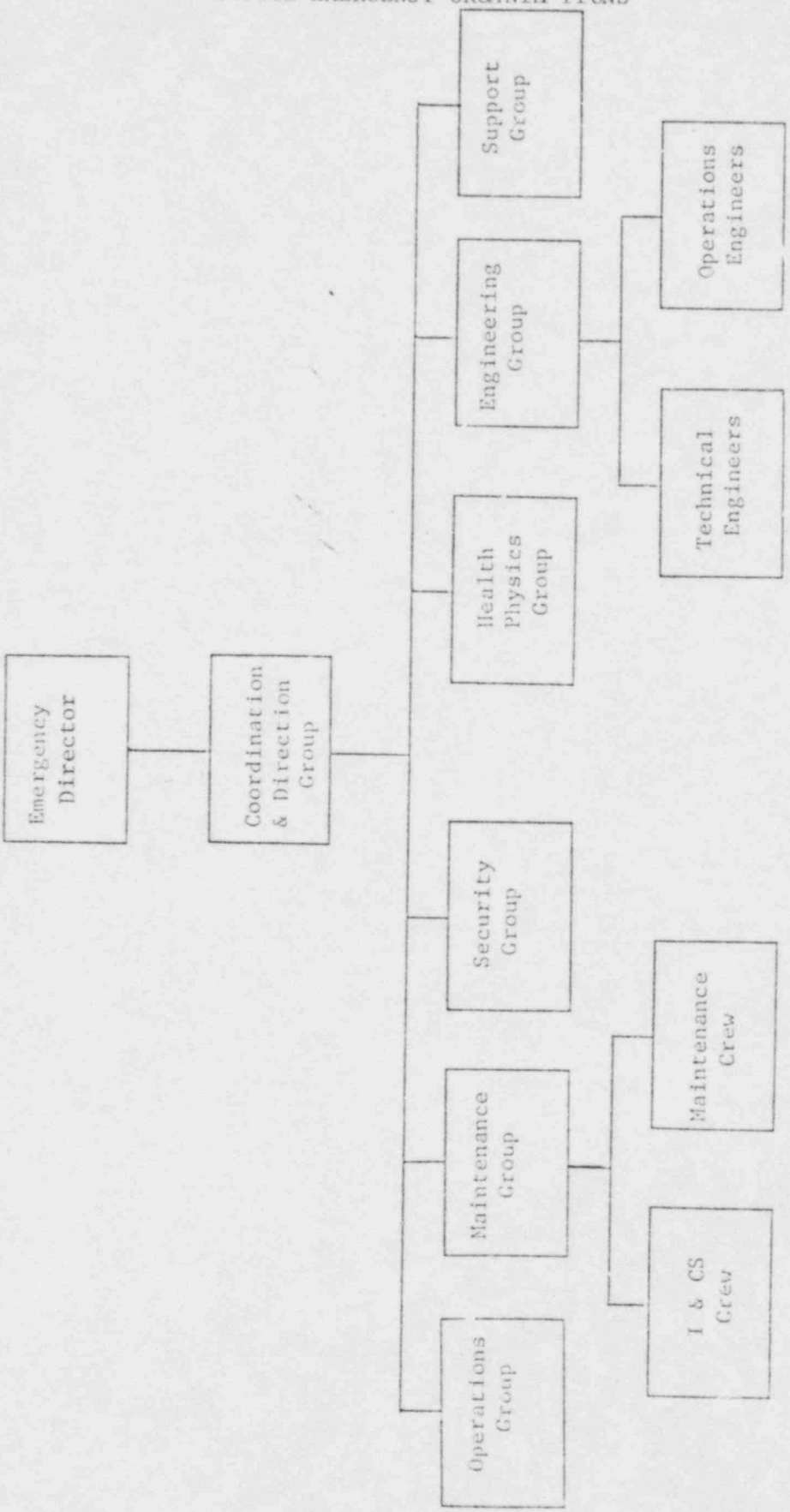
3. NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

ATTACHMENTS

1. On-Site Emergency Organization
2. Monticello Plant Emergency Organization Responsibilities

ATTACHMENT 1

ONSITE EMERGENCY ORGANIZATIONS



MONTICELLO PLANT EMERGENCY ORGANIZATION RESPONSIBILITIES

Responsibility	Emergency Director	Shift Technical Advisor	Shift Supervisor	Control Room Operators	Shift Emergency Communicator	Radiation Protection Designee	Radiological Emergency Coordinator	Security Group	Health Physics Group	Emergency Manager	Recovery Manager	Fire Brigade		
Command/Control	P		S											
Notification (State/Local/Corp.)	S		S		P									
Notification (Plant Staff)			S	S	P	S								
Emergency Classification	P	S	S	S	S		S							
Protective Actions (On-Site)	P		S				S							
Personnel Accountability	P		S					S						
Accident Assessment	P*	S	S	S			S		S	P				
Off-Site Dose Projection	P			S			S		S					
Contamination/ Radiation Control							P		S					
Damage Control	P		S									S		
Protective Actions Off-Site Recommendations	P*						S			P				
Search/Rescue	P		S									S		
Access Control							P	S	S					
Recovery Operations	S						S				P			

P - Primary Responsibility

S - Secondary Responsibility

* - Prior to establishing EOF operation

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: L. Lacey/Quadrex ALARA Review: C D Mathiasen Date 3-31-81
Reviewed by: D Nolan Q.A. Review: RL Schemm Date 3-31-81
Operations Committee Final Review: Meeting Number 946 Date 20MAR81
Approved by: J L Tey Date 31 MAR81
Op. Com. Results Review: Not Req'd Mtg. # 946 Date 20MAR81

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 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 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 3, 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.

Attachment 1 lists the accidents/events identified in the Monticello FSAR and those specified in NUREG 0654. For each of the events/accidents an emergency classification corresponding to the postulated outcome is identified. This should be used as a guide only, as it is unlikely that actual conditions will be identical to those specified. It is possible that compounding conditions will warrant higher emergency classifications.

Attachment 2 provides a table that demonstrates how an initiating condition leads directly to an emergency classification based on the magnitude of the event. It is possible to have an event initially classified at one level and later reclassified to a higher or lower level as the available information is refined and analyzed. Also, Table 1 shows that a particular event may not be applicable to one or more of the 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.

RESPONSIBILITIES

A. Shift Supervisor

1. The Shift Supervisor shall declare the appropriate emergency condition as soon as the event has been indicated and verified.

2. After the event has been classified the Shift Supervisor 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 indications 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 A.2-101-1, EMERGENCY CLASSIFICATION CHECKLIST (Attachment 1).

STEP 2: Use Attachment 2 to identify the Guideline for the applicable initiating condition.

STEP 3: Locate the guideline sheet in Attachment 3 that corresponds to the initiating event.

STEP 4: Determine the appropriate emergency classification by comparing the verified plant parameters to the EALs for each emergency condition.

STEP 5: Declare the appropriate emergency condition (this is the responsibility of the Emergency Director). Perform the actions specified in the appropriate response procedure as applicable to the event 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, Accidents Analyzed in the FSAR and Events Specified in NUREG-0654

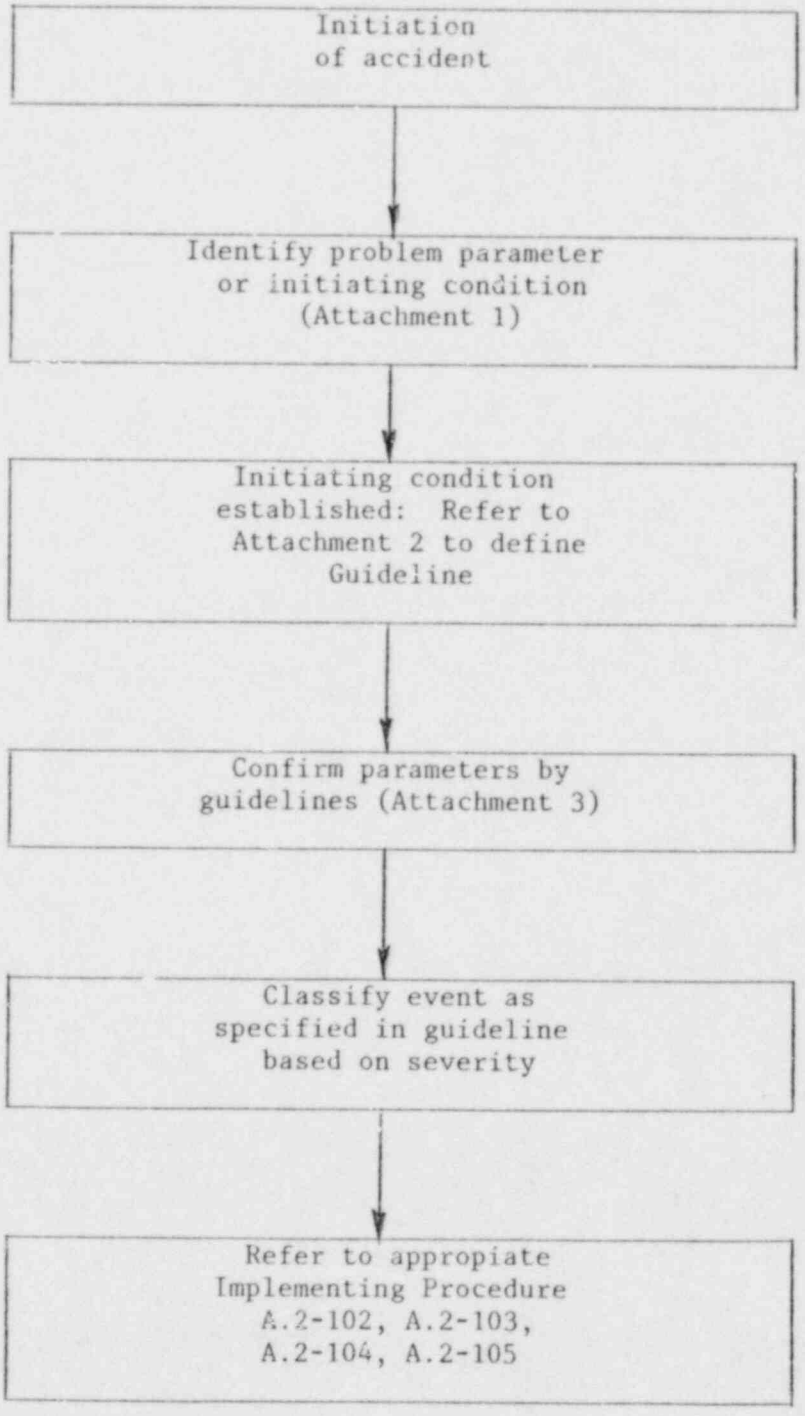
2. Attachment 2, Action Level Criteria for Classification of Emergency Conditions

3. Attachment 3, Guidelines for Classification of Emergency Conditions

4. Example of Emergency Classification Checklist

TABLE 1

FLOW CHART
OVERVIEW OF CLASSIFICATION PROCEDURE



ATTACHMENT 1

Accidents Analyzed in the FSAR and Events Specified in NUREG 0654

A. Initiating Conditions: Notification of Unusual Event

1. Emergency Core Cooling System (ECCS) initiated and discharge to vessel.

2. Radiological effluent technical specification instantaneous limits exceeded.

3. Fuel damage indication. Examples:

   a. High off-gas at air ejector monitor (greater than 500,000 μCi/sec) corresponding to 16 isotopes decayed to 30 minutes (about 20,000 mR/hr); or an increase of 100,000 μCi/sec within a 30 minute time period (about 4,000 mR/hr).

   b. High coolant activity sample requiring plant shutdown. Example: Exceeding Technical Specification Limit for iodine concentration.

4. Reactor pressure outside of technical specification limits (1335 psig).

5. Exceeding primary system coolant leak rate technical specification requiring shutdown (5 gpm unidentified; 25 gpm total).

6. Failure of a safety relief valve to close (reactor coolant system) following reduction of applicable pressure.

7. Loss of all off-site power or loss of on-site AC power capability.

8. Loss of primary containment integrity requiring shutdown by technical specifications.

9. Loss of engineered safety feature or fire protection system function requiring shutdown by technical specifications (e.g., because of malfunction, personnel error, or procedural inadequacy).

10. Fire within the plant lasting more than 10 minutes after the start of fire fighting.

11. Indications or alarm on process or effluent parameters not functional in control room to an extent requiring plant shutdown or other significant loss of assessment or communication capability (not including loss of process computer or all meteorological instrumentation).

ATTACHMENT 1 (Cont'd.)

12. Security threat, attempted entry or attempted sabotage.

13. Natural phenomenon being experienced or projected beyond usual levels.

    a. Any earthquakes felt in-plant or detected on station seismic instrumentation (>.01 g).

    b. Unusually low or high river water level.

    c. Any tornado on site.

14. Other hazards being experienced or projected:

    a. Aircraft crash on-site or unusual aircraft activity over facility.

    b. Train derailment on-site.

    c. Near or on-site toxic or flammable gas release.

    d. Near or on-site explosion.

    e. Turbine rotating component failure causing a rapid plant shutdown.

15. Other plant conditions exist that warrant increased awareness on the part of plant operating staff or state and/or local off-site authorities or require a plant shutdown under technical specification requirements or involve other than a normal controlled shutdown (e.g. cooldown exceeding technical specification limits).

16. Transportation of contaminated injured individual to off-site hospital.

B. Initiating Conditions: Alert

1. Severe loss of fuel cladding.

    a. High off-gas air ejector monitor (greater than 5 Ci/sec; corresponding to 16 isotopes decayed 30 minutes (25,000 mR/hr).

    b. Very high coolant activity sample (e.g., 300 Ci/cc equivalent of I-131, but not an iodine spike).

2. Main steam line break with proper isolation.

3. Primary coolant leak rate greater than 50 gpm with reactor at operating temperature and pressure.

4. Unexpected high radiation levels or high airborne concentration which indicates a severe, degradation in the control of radioactive materials (e.g., increase by factor of 1000 in direct radiation readings).

ATTACHMENT 1 (Cont'd.)

5. Loss of off-site power and loss of all on-site AC power.

6. Loss of all on-site DC power.

7. Coolant pump seizure leading to fuel failure.

8. Loss of capability to achieve plant cold shutdown.

9. Failure of the reactor protection system to initiate and complete a scram which brings the reactor subcritical.

10. Fuel handing accident with release of radioactivity to containment.

11. Fire of greater than 10 minutes duration from initiation of fire fighting potentially affecting safety systems performance.

12. Most or all alarms (annunciators) lost with plant not in cold shutdown.

13. Radiological effluents greater than 10 times technical specification instantaneous limits. This would result in 1 mR at the site boundary, under average meteorological conditions, if continued for 2 hours. (Corresponds to about 10^6 cps on the Stack Gas monitor or 20 mR/hr on the Rx vent monitors.)

14. Severe natural phenomena being experienced or projected.

    a. Earthquake greater than OBE levels (.03 g).

    b. Flood above design level or low water below design level.

    c. Any tornado striking facility or winds near design level.

15. Other hazards being experienced or projected.

    a. Aircraft crash on facility.

    b. Known explosion damage to facility affecting plant operation.

    c. Entry into facility environs of uncontrolled toxic or flammable gases causing potential habitability problems.

    d. Turbine failure causing casing penetration.

    e. Missile impacts from whatever source on facility.

ATTACHMENT 1 (Cont'd.)

16. Evacuation of control room anticipated or required with control of shutdown systems established from local stations.

17. Ongoing security compromise.

18. Other plant conditions exist that warrant precautionary activation of the Technical Support Center and placing the near-site Emergency Operations Facility and other key emergency personnel on standby.

19. Accidents analyzed in the FSAR that would be classified as an Alert Condition:

    a. Design basis accidents:

        1. Control Rod Drop Accident with severe fuel failure

C. Initiating Conditions: Site Area Emergency

1. Loss of coolant accident greater than makeup capacity.

2. Degraded core with possible loss of coolable geometry.

3. Steam line break outside containment without isolation.

4. Loss of off-site power and loss of on-site AC power for more than 15 minutes.

5. Loss of all vital on-site DC power for more than 15 minutes.

6. Loss of functions needed to reach hot shutdown.

7. Major damage to spent fuel in containment (e.g., large object damages fuel or water loss below fuel level).

8. Fire compromising the functions of safety systems.

9. Most or all alarms (annunciators) lost for more than 15 minutes and plant is not in cold shutdown or plant transient initiated while all alarms lost.

10. a. Effluent monitors detect levels corresponding to greater than 50 mR/hr for 1/2 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 exposure rates are projected based on other plant parameters or are measured in the environs.

    c. EPA Protective Action Guidelines are projected to be exceeded outside the site boundary.

ATTACHMENT 1 (Cont'd.)

11. Severe natural phenomena being experienced or projected with plant not in cold shutdown.

    a. Earthquake greater than DBE levels (>.06 g).

    b. Flood, low water, greater than design levels.

    c. Sustained winds in excess of design levels or tornado causes damage to vital plant equipment or structures.

12. Other hazards being experienced or projected with plant not in cold shutdown.

    a. Aircraft crash affecting vital structures by impact or fire.

    b. Severe damage to safe shutdown equipment from missiles or explosion.

    c. Entry of uncontrolled toxic or flammable gases into vital areas essential for safe shutdown where evacuation of the area constitutes a safety problem.

13. Evacuation of control room and control of shutdown systems not established from local stations in 15 minutes.

14. Security compromise resulting in imminent loss of physical control of the plant.

15. Other plant conditions exist that warrant activation of emergency centers and monitoring teams or a precautionary notification to the public near the site.

16. Accidents analyzed in the FSAR that would be classified as a Site Area Emergency.

    a. Design oasis accidents.

        1. Loss of coolant accident (LOCA)
        2. Refueling accident

D. Initiating Considerations: General Emergency

1. 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.

ATTACHMENT 1 (Cont'd.)

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.

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 longer distances.

2. 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).

NOTE: Consider 2 mile precautionary evacuation. If more than fuel gap activity released, extend this to 5 miles downwind.

3. Loss of physical control of the plant.

4. 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 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.

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.

ATTACHMENT 1 (Cont'd.)

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 or 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. Could lead to core degradation or melt in several hours without containment 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 occur in about ten hours with subsequent containment failure.

5. Any major internal or external events (e.g., fires, earthquakes, etc.) substantially beyond design basis which could cause massive common damage to plant systems resulting in any of the above.

ACTION LEVEL CRITERIA FOR CLASSIFICATION OF EMERGENCY CONDITIONS

INITIATING CONDITION	UNUSUAL EVENT Off-normal events which could indicate a potential degradation of the level of safety of the plant	ALERT Events which indicate an actual degradation of the level of safety of the plant	SITE AREA EMERGENCY Events which involve actual or likely major failures of plant functions needed for protection of the public	GENERAL EMERGENCY Events which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity
Radioactive Effluent Applicable to Any Release Point(s) and Resulting from Any Initiating Event Guideline 1	Release exceeds instantaneous tech spec limit; unplanned or unmonitored releases	Release exceeds 10 times instantaneous tech spec limit -or- 1 mr/hr at site boundary -or- 10^6 cps on Stack Gas Monitor -or- 20 mr/hr on Rx Bldg Monitor	Release corresponds to 100 mrem/hr or 500 mr/hr for two minutes at site boundary -or- Off-site dose due to event is projected to exceed above limits to whole body or thyroid	Release corresponds to 1000 mrem/hr to whole body at site boundary -or- ** 5 rem/hr thyroid -or- Off-site dose due to event is projected to exceed 1 rem to whole body or 5 rem to the thyroid
Release or loss of control of radioactive material within the plant Guideline 2	N/A	Fuel handling accident or other event resulting in unexpected increase of in-plant radioactivity levels by a factor of >1000	Major damage to spent fuel due to fuel handling accident -or- Uncontrolled decrease in fuel pool water to below level of fuel	Loss of 2 of 3 fission produce barriers with potential loss of third

** See Guideline 28 for EAL.

ACTION LEVEL CRITERIA FOR CLASSIFICATION OF EMERGENCY CONDITIONS

INITIATING CONDITION	UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
Reactor Pressure-High Guideline 3	Exceeds Safety Limit	N/A	N/A	Loss of 2 of 3 fission product barriers with a potential loss of third barrier Applicable to any initiating event that may lead to this condition -or- Any initiating events, from whatever source that makes release of large amounts of radioactivity in a short time probable, for example: 1. LOCA with a failure of ECC systems leading to core degradation. Loss of containment integrity imminent. 2. Shutdown occurs but decay heat removal systems are not functioning properly. Core degradation could occur in hours. 3. An operational transient w/failure of reach protection system to shutdown plant. Core damage likely in several hours w/potential containment failure. 4. LOCA w/unsuccessful containment performance affecting the longer turn success of ECCS. 5. Any major external or internal event which could cause massive common damage to plant systems resulting in any of the above. -or- Loss of plant control occurs.
Reactor Coolant Leak Guideline 4	Exceeds LCO 5 gpm unidentified or 25 gpm total	Exceeds 50 gpm	Exceeds make-up capacity -or- Rx level exceeds safety limit	
Main Steam Line Break Guideline 5		MSL break w/MSIV proper isolation	Main steam break outside containment and MSIV failure	
Fuel Cladding Degradation Guideline 6	Coolant activity exceeds LCO (5 uCi/cc)	RCS ^{131}I Activity >300 uCi/cc High SJAE Off-GAS >5 Ci/sec	Degraded core--possible loss of coolable geometry	
Safety or Relief Valve Failure Guideline 7	Failure of safety valve to close	N/A	N/A	
Initiation of ECCS Guideline 8	Valid safety circuit trip or ..ecessary manual initiation	N/A	N/A	
Recirc Pump Seizure Guideline 9	N/A	Impeller seizure with fuel failure. See Guideline 6.	N/A	
Loss of Primary Containment Guideline 10	Requiring shutdown by LCO	N/A	N/A	
Loss of Engineered Safety or Fire Protection Features Guideline 11	Required shutdown by LCO	N/A	N/A	

ACTION LEVEL CRITERIA FOR CLASSIFICATION OF EMERGENCY CONDITIONS

INITIATING CONDITION	UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
Failure of Reactor Protection System to Initiate or Complete " Scram Guideline 12	N/A	Reactor not subcritical after valid scram signal(s)	Transient requiring operation of shutdown system with failure to scram	Loss of 2 of 3 fission product barriers with a potential loss of third barrier Applicable to any initiating event that may lead to this condition -or- Any initiating events, from whatever source that makes release of large amounts of radioactivity in a short time probable, for example: 1. LOCA with a failure of ECCS systems leading to core degradation. Loss of containment integrity imminent. 2. Shutdown occurs but decay heat removal systems are not functioning properly. Core degradation could occur in 10 hours. 3. An operational transient w/failure of reach protection system to shutdown plant. Core damage likely in several hrs w/potential containment failures. 4. LOCA with unsuccessful containment performance affecting the longer term success of ECCS. 5. Any major external or internal event which could cause massive common damage to plant systems resulting in any of the above. -or- Loss of plant control occurs.
Loss of Plant Control/ Safety Systems Guideline 13	N/A	Loss of capability to achieve cold shutdown	Loss of ability to achieve hot shutdown	
Loss of Indicators, Annunciators or Alarms Guideline 14	Loss on process or effluent parameters, requiring shutdown by LCO	Loss of alarms (annunciators) sustained for 15 minutes	Loss of alarms 15 min. and Plant transient occurs while alarms are lost	
Control Room Evacuation Guideline 15	N/A	Required or anticipated. Control of shutdown systems established at local stations	Required Shutdown system control at local panels not established within 15 min	
Toxic or Flammable Gases Guideline 16	Near-by or on-site release potentially harmful	Enters facility. Potential habitability problems	Enters vital areas and restricts necessary access	
Security Compromise Guideline 17	Security compromise	On going. Security compromise	Imminent loss of physical control of plant	
Loss of On-site AC Power Guideline 18	Loss of capability Upon occurrence	Temporary loss of both for less than 15 minutes	Loss of both for more than 15 minutes	
Loss of All Off-site Power Guideline 18	Upon occurence			
Loss of All On-site DC Power Guideline 19	Loss of DC power which requires shutdown by LCO	Loss of both 125 VDC sources Upon occurence	Loss of both 125 VDC sources for more than 15 minutes	
Tornado or Sustained Winds Guideline 20	Tornado crosses site boundary winds >75 mph	Tornado strikes vital plant structures. Winds: >90 mph	Tornado damage, sustained winds in excess of design levels (100 mph)	
Flood Water Low Water Guideline 21	Flood >918 feet MSL, River <240 CFS	Flood >921 feet MSL River <220 CFS	Flood >930 feet MSL -or- Damage to vital equipment River< 899 FT	

ACTION LEVEL CRITERIA FOR CLASSIFICATION OF EMERGENCY CONDITIONS

INITIATING CONDITION	UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
Earthquake Guideline 22	Felt in-plant or Detected on site seismic instrumentation	Greater than OBE occurs (.03g)	Greater than DBE occurs (.06g)	Loss of 2 of 3 fission product barriers with a potential loss of third barrier Applicable to any initiating event that may lead to this condition -or- Any initiating events, from whatever source that makes release of large amounts of radioactivity in a short time probable, for example: 1. LOCA with a failure of ECCS systems leading to core degradation. Loss of containment integrity imminent. 2. Shutdown occurs but decay heat removal systems are not functioning properly. Core degradation could occur in hrs. 3. An operational transient w/failure of reactor protection system to shutdown plant. Core damage likely in several hours w/potential containment failure. 4. LOCA w/unsuccessful containment performance affecting the longer term success of ECCS. 5. Any major external or internal event which could cause massive common damage to plant systems resulting in any of the above. -or- Loss of plant control occurs.
Fire Guideline 23	Within plant, under control in 10 minutes after fire fighting commenced	Fire not under control in 10 minutes potentially affecting safety systems	Affecting safety systems required for shutdown	
Explosion Guideline 24	Near or on-site explosion. Potential significant damage	Known damage to facility, affecting operation	Severe damage to safety systems required for shutdown	
Aircraft & Missiles Guideline 25	Unusual activity over facility -or- Aircraft crashes onsite	Aircraft or missle strikes a station structure	Crash affects vital structures by impact or fire	
Train Guideline 26	Derailment in on-site areas	N/A	N/A	
Contaminated injury Guideline 26	Transportation of injured and contaminated individual(s) to off-site hospital.			
Turbine Failure Guideline 26	Failure resulting in major repair	Penetration of casing		
FSAR Transients Guideline 27		1. Control rod drop See Guideline 6.		
All Guidelines - General Emergency Guideline 28	N/A	N/A	N/A	

ATTACHMENT 3

Guideline 1 — RADIOACTIVE EFFLUENT

UNUSUAL EVENT

1. Monitored Release Exceeds Technical Specification

A radioactivity release in excess of MPC limits for an isotopic mix in a liquid release, or in excess of the Technical Specification (Appendix B) for a gaseous release.

Instrument	Description	
C02-17.358	Discharge Canal Sampler Recorder	> 20 cps
C02-17.51 (Red/ Black)	Stack Gas Monitor Recorder	> 2×10^5 cps
C02-17.455	Reactor Building Ventilation Monitor Recorder	> 2 mR/hr
	NOTE: Verify by checking Reactor Building Vent Noble Gas Monitor.	1100 cps
		Alarms
C04-A-03	Stack Gas Radiation	Hi-Hi
C04-A-08	Stack Gas Radiation	High
C04-A-22	Discharge Canal Radiation	High
C04-A-23	Liquid Process Monitor Radiation	High

NOTE: Check indication when alarm is received.

2. Unplanned or Unmonitored Release

Any liquid or gaseous radioactivity release via an unmonitored path of which is estimated or suspected to exceed 10CFR20 Appendix B limits following dilution. If an isotopic breakdown is not available, the MPC limit is 5×10^{-7} µCi/cc gross beta-gamma following dilution.

ALERT

1. Release-Liquid

A liquid release estimated or suspected to exceed 10 times MPC.

ATTACHMENT 3 (Cont'd.)

Guideline 1 (Cont'd.) RADIOACTIVE EFFLUENT

2. Release-Gaseous

A gaseous release estimated or suspected to exceed 10 times the gaseous release technical specification. This corresponds to the indications below for the listed monitors.

C02-17.51 (Red/Black)	Stack Gas Monitor	10^6 cps
C02-17.455	Reactor Building Vent Monitor	20 mR/hr

SITE AREA EMERGENCY

1. Airborne Release Corresponds to:

a. Effluent monitors detect levels corresponding to greater than 50 mR/hr for 1/2 hour or greater than 500 mR/hr whole body for two minutes (or 5 times this level to the thyroid) at the site boundary for adverse meteorology.

OR

b. Off-site dose due to the extent is projected to exceed above limits to the whole body or 5 times those limits for the thyroid for 2 minutes.

OR

c. These doses are projected.

OR

d. Reactor Building Ventilation Noble Gas Monitor @ C02 1×10^4 cps

OR

e. High Range Stack Gas Monitor
Point #2 on C252-RR7573
(or local readout)
1.5 R/Hr @ 1/2 hr after Reactor Shutdown
1.2 R/Hr @ 1 hour after Reactor Shutdown

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 3 (Cont'd.)

Guideline 2 — IN-PLANT RADIATION LEVELS

UNUSUAL EVENT

Not Applicable

ALERT

1. Unexpected Increase in In-Plant Radioactivity Level

Fuel Handling Accident or another verified uncontrolled event increases radiation levels by a factor of 1000 or higher; as indicated by the below instrument readings. If the factors of 1000 would result in an instrument reading in excess of fullscale, then field measurements must be made to determine the radiation level.

Instrument	Description	Normal	EAL
C02-NR-18-55			
Point 0	Refuel Flocr Low Range	2	1000 x normal *
Point 1	Refuel Floor High Range	5	1000 x normal *
Point 2	Refuel Floor Stairway	1	1000 x normal *
Point 3	New Fuel Range	7	1000 x normal *
Point 4	Control Equipment Area	9	1000 x normal *
Point 5	Control Storage Area	2	1000 x normal *
Point 6	Radwaste Access	5	1000 x normal *
Point 7	Cleanup System Area Access	0.25	1000 x normal *
Point 8	C.R.D. Repair Area	0.65	1000 x normal *
Point 9	East C.R.D. Mod Area	7	1000 x normal *
Point 10	West C.R.D. Mod Area	5	1000 x normal *
Point 11	TIP Drive Area	2	1000 x normal *
Point 12	TIP Cubicle	30	1000 x normal *
Point 13	HPCI Turbine Area	0.25	1000 x normal *
Point 14	CRD Pump Area	6	1000 x normal *
Point 15	RCIC Pump Area	1	1000 x normal *

* EAL is above the fullscale reading of the instrument. Any fullscale reading necessitates field measurements to determine event classification.

ATTACHMENT 3 (Cont'd.)

Guideline 2 (Cont'd.)

IN-PLANT RADIATION LEVEL

Instrument	Description	Normal	EAL
Point 16	East C.S. and RHR Area	10	1000 x normal *
Point 17	West C.S. and RHR Area	10	1000 x normal *
Point 18	Control Lab	0.26	1000 x normal *
Point 19	Control Room Low Range	0.02	1000 x normal *
Point 20	Control Room High Range	3	1000 x normal
Point 21	Operating Floor	20	1000 x normal
Point 22	T.G. Front Standard	10	1000 x normal *
Point 23	Cond Demin Operating Area	1	1000 x normal
Point 24	Cond Sys Area	9	1000 x normal *
Point 25	FW Pump Area	1	1000 x normal
Point 26	R.W. Control Area	0.2	1000 x normal *
Point 27	Sample Tank Area	3	1000 x normal *
Point 28	Conveyor Operating	0.2	1000 x normal
Point 29	Machine Shop	0.2	1000 x normal

* EAL is above the fullscale reading of the instrument. Any fullscale reading necessitates field measurements to determine event classification.

2. Any of the alarms listed below and field measurements are > 1000 times normal.

Alarms	Description	
C04-A-01	Refueling Floor Area High Radiation Alarm	High
C04-A-06	New Fuel Storage Area High Radiation Alarm	High
C04-A-11	Reactor Building High Radiation Area	High
C04-A-13	CR Lab Shop High Radiation Alarm	High
C04-A-21	Turbine Building High Radiation Alarm	High
C04-A-26	Radwaste Building High Radiation Alarm	High
C04-A-32	High Radiation in Storage Building	High

and

Field measurements with portable survey instruments > 1000 times normal.

ATTACHMENT 3 (Cont'd.)

Guideline 2 (Cont'd.) IN-PLANT RADIATION LEVELS

Site Area Emergency

1. Spent Fuel Damage

   Major damage to irradiated fuel due to fuel handling accident.

2. Spent Fuel Pool Level Decrease

   Uncontrolled decrease in fuel pool water below 33 feet.

   Instruments indicating decrease water level.

Instrument	Description	ALARM
LT-2787	Spent Fuel Pool Level Hi/Lo	36' 9"

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 3 (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	1335
C05-6.90 A/B	Reactor Pressure Indicators	1335

2. Alert

Not Applicable

3. Site Area Emergency

Not Applicable

4. General Emergency

As specified in Guideline 28.

ATTACHMENT 3 (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 3 (Cont'd.)

Guideline 4 (Cont'd.) REACTOR COOLANT LEAK

UNUSUAL EVENT

1. Unidentified leakage of 5 gpm	-	Calculated from C04-FQ2543
OR		
Total leakage of 25 gpm.	-	Calculated from C04-FQ2543 and C04-FQ2544
2. Failure of a safety/relief valve to close following a reduction of applicable pressure.	-	Status lights amber OR Temperature > 250°F.

ALERT

Leakage exceeds 50 gpm.		Calculated from C04-FQ2543 and C04-FQ2544

SITE AREA EMERGENCY

1. Leakage exceeds makeup capacity	-	Reactor level C05-2.3.85A/B decreasing continuously below -47"
OR		
2. Level exceeds safety limit	-	Reactor level C03-2.3.91A/B decreasing continuously below 209 inches (hot).

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 3 (Cont'd.)

Guideline 5

MAIN STEAMLINE BREAK

UNUSUAL EVENT

Not Applicable

ALERT

1. Main steam line break with proper MSIV isolation.

Indicators/Alarms	Description
C05-6.88 A/B/C/D	Individual Steam Line Flow
C05-FPR 6/97	Total Steam Flow Recorder
C04-Lights	MSIV Status Lights indicate closed
C05-A25/26	Main Steam Line High Flow A/B
C05-A33/34	Main Steam Line Low Pressure A/B
C05-A44/52	Group 1 Isolation Channel A/B Trip
C05-A17/18	Main Steam Tunnel High Temperature A/B

SITE AREA EMERGENCY

1. Main steam line break outside containment with failure of MSIVs to isolate the leak.

   Instruments and annunciators are the same as above.

GENERAL EMERGENCY

1. As specified in Guideline 28.

ATTACHMENT 3 (Cont'd.)

Guideline 6 — FUEL CLADDING DEGRADATION

UNUSUAL EVENT

1. Sample of coolant activity exceeds Technical Specification (5 µCi/ml. equivalent of I-131).

	Indicators/Alarms	Description
2.	C02-17.152	Offgas Radiation Recorder exceeds 20,000 mR/hr Or increases by 4,000 MR/HR within 30 minutes at steady power.

ALERT

1. Reactor coolant activity exceeds 300 µCi/cc equivalent to I-131.

2. High SJAE off-gas calculation exceeds 5 Ci/sec.
C02-17.152 - Off-gas Radiation recorder exceeds 200,000 mR/hr.

SITE AREA EMERGENCY

1. Degraded Core - Possible Loss of Coolable Geometry

Indicator	Description	Reading
C03-2 3.91A/B	Wide Range Reactor Level	Below 135 Cold 170 Hot

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 3 (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 3 (Cont'd.)

Guideline 8 — ECCS INITIATION

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

UNUSUAL EVENT

Valid Emergency Core Cooling System (ECCS) initiated and discharge to vessel.

ALERT

Not Applicable

SITE AREA EMERGENCY

Not Applicable

GENERAL EMERGENCY

See Guideline 28.

ATTACHMENT 3 (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 3 (Cont'd.)

Guideline 10 — LOSS OF CONTAINMENT INTEGRITY

Instrument/Alarm	Description
C04-PR2994	Drywell and Suppression Chamber Pressure
C04-DP1 C/D	Drywell to Torus Differential Pressure Indicator

UNUSUAL EVENT

Loss of primary containment integrity requiring shutdown in accordance with Technical Specifications.

ALERT

Not Applicable

SITE AREA EMERGENCY

Not Applicable

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 3 (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 3 (Cont'd.)

Guideline 12

REACTOR PROTECTION SYSTEM FAILURE

UNUSUAL EVENT

Not Applicable

ALERT

Reactor Not Subcritical After Valid Trip Signal(s)

SITE AREA EMERGENCY

Transient requiring operation of shutdown systems with failure to scram (continued power operation but no core damage immediately evident.)

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 3 (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.

ATTACHMENT 3 (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 3 (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 3 (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 3 (Cont'd.)

Guideline 17 SECURITY COMPROMISE

UNUSUAL EVENT

Security Compromise

1. Attempted or confirmed intrusions of vital material access, 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 3 (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 3 (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 3 (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 3 (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 3 (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 MSL.
2. River flow below 220 CPS (about 902.3 FT).

SITE AREA EMERGENCY

1. River water level exceeds 930 MSL.
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 3 (Cont'd.)

Guideline 22

EARTHQUAKE

Alarm	Description
C05-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 3 (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.

ATTACHMENT 3 (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 3 (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.

ATTACHMENT 3 (Cont'd.)

Guideline 28

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 3 (Cont'd.)

Guideline 27	FSAR ACCIDENTS
Control Rod Drop	See Guideline 6.

ATTACMENT 3 (Cont'd.)

Guideline 28

ALL GUIDELINES - GENERAL EMERGENCY

GENERAL EMERGENCY

1. 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.

Stack High Range Monitor (Point #1 on C252-RR7573)	40 R/Hr.
Reactor Building High Monitor (Point #2 on C252-RR7573)	1.6 R/Hr.

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.

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.

2. 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).

NOTE: Consider 2 mile precautionary evacuation. If more than fuel gap activity released, extend this to 5 miles downwind.

3. Loss of physical control of the plant.

4. 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 are not yet taking place and large amounts of fission products are not yet in the containment atmosphere, consider 2 mile precautionary evacuation (45° to 90° sector) if large amounts of fission products (greater than gap activity) are in the containment atmosphere. Recommended sheltering in other parts of the plume exposure Emergency Planning Zone under this circumstance (10 mile radius).

ATTACHMENT 3 (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 no 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 or 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. Could lead to core degradation or melt in several hours without containment 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 occur in about ten hours with subsequent containment failure.

5. Any major internal or external events (e.g., fires, earthquakes, etc.) substantially beyond design basis which could cause massive common damage to plant systems resulting in any of the above.

ATTACHMENT 4

Form 5790-101-1, Rev. 0, 03/12/81
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Example of
EMERGENCY CLASSIFICATION CHECKLIST
(For Use With Procedure A.2-101)

1. Initiating Condition: _____

_____ _____ _____ _____
SS Initials Time Date

2. Attachment 2 directs use of Guideline No. _____.

_____ _____ _____
SS Initials Time Date

3. Attachment 3 classification: _____

_____; Declared: _____ _____ _____
SS Initials Time Date

4. Implemented Procedure A.2- _____. _____ _____ _____
SS 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.

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: L. Lacey/Quadrex ALARA Review: GS Mathiason Date 3/29/81
Reviewed by: K Nolan Q.A. Review: RL Scheuerer Date 3/29/81
Operations Committee Final Review: Meeting Number 950 Date 3/27/81
Approved by: FL Fay Date 30MAR81
Op. Com. Results Review: not req'd 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. 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: Announce or have announced the following message over the public address system words to the effect:

"ATTENTION ALL PLANT PERSONNEL: AN UNUSUAL EVENT HAS BEEN DECLARED. MEMBERS OF THE ON-SHIFT EMERGENCY ORGANIZATION REPORT TO YOUR EMERGENCY DUTY STATIONS AS REQUIRED. ALL OTHER PERSONNEL SHOULD CONTINUE WITH THEIR NORMAL DUTIES UNLESS FURTHER INSTRUCTIONS ARE GIVEN." Give a brief description of the event and repeat the announcement, if appropriate.)

NOTE: As necessary, contact the Shift Technical Advisor and the Shift Emergency Communicator using the following numbers:

DELETED

STEP 2: Depending on the emergency action level, ensure that the appropriate Abnormal Operating Procedures have been implemented.

STEP 3: Direct the Shift Emergency Communicator to compose the Emergency Notification Report, Form 5790-102-2 (Attachment 2) for the Emergency Director's approval.

STEP 4: Direct the Shift Emergency Communicator to make the initial notifications using the Emergency Call List-NUE, Form 5790-102-4, (Attachment 4).

NOTE: Communications should be per Procedure A.2-501, Communications During an Emergency.

STEP 5: If local off-site support (fire, ambulance, police) is required, direct the Shift Emergency Communicator to request assistance. See Attachment 6 for telephone numbers.

STEP 6: Consider augmentation of on-shift personnel. As required, direct the Shift Emergency Communicator to contact appropriate individuals or agencies as required from the Monticello Emergency Recall List (Attachment 5).

STEP 7: Assess plant conditions and respond appropriately. Consider implementation of strict plant status controls.

STEP 8: 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).

STEP 9: Direct the Shift Emergency Communicator to transmit the followup message to the same authorities who received initial notification.

STEP 10: As additional information becomes available, or as conditions change, compose updated follow-up message and have them transmitted.

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 the new procedure (A.2-103, 4 or 5) and instruct the Shift Emergency Communicator to begin agency re-notification using Form 5790-103-4 (Attachment 4) from the Alert (A.2-103), Form 5790-104-4 (Attachment 4) for Site Area Emergency (A.2-104) or Form 5790-105-4 (Attachment 4) for General Emergency (A.2-105) procedure whichever is required by reclassification.

STEP 13: In the event of close out, compose a brief summary of the event and direct the Emergency Communicator to begin notification of off-site authorities.

NOTE: Summary to follow within 24 hours of closeout or class reduction.

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. Monticello Emergency Recall List
6. Secondary Notification List

ATTACHMENT 1

Form 5790-102-1,
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Example of

NOTIFICATION OF AN UNUSUAL EVENT (NUE) CHECKLIST

(For Use With Procedure A.2-102)

1. Announced NUE over public address system and implemented Attachment 4, "Emergency Call List".

   _____ _____ _____
   ED Initial Time Date

2. Type of off-site support requested (if applicable): _____

   _____ _____ _____ _____
   ED Initial Time Date

   _____ _____ _____ _____
   ED Initial Time Date

   _____ _____ _____ _____
   ED Initial Time Date

   _____ _____ _____ _____
   ED Initial Time Date

3. Augmented on-shift personnel as follows (if applicable):

   _____ _____ _____ _____
   ED Initials Time Date

4. 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.

ATTACHMENT 2

Form 5790-102-2
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Example of

EMERGENCY NOTIFICATION REPORT

This is _____(name/title)_____ at the Monticello Nuclear Generating Plant calling. Have I reached (name/organization calling) and can you followup on your Emergency Plan Requirements? (If YES continue with the message, if NO try to get contact with the right person or call back.)

We have declared an Unusual Event at _____(time)_____ hours

AND (based upon Emergency Director judgement, use one of the following statements).

( ) 1) We have not had a radioactive release

OR:

( ) 2) We have had a radioactive release but do not expect this situation to result in detectable changes in off-site radiation levels.

OR:

( ) 3) We have had a radioactive release but do not know if there will be detectable changes in off-site radiation levels. We will be keeping the State Division of Emergency Services and Department of Health informed of the results of our investigation.

OR:

( ) 4) We have had a radioactive release and expect to be able to detect changes in off-site radiation levels but they are expected to be less than the levels calling for an alert. We will be keeping the State Division of Emergency Services and Department of Health informed.

ATTACHMENT 2 (Cont'd.)

Form 5790-102-2
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(EMERGENCY DIRECTOR TO COMPOSE):

c. Give a short non-technical description of the emergency and any potentially affected population and areas. Note if event has been terminated or is still in progress. _____

_____

_____

Prepared by: _____ Approved by: _____
Shift Emergency Communicator 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.

ATTACHMENT 3

Form 5790-102-3
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Example of

EMERGENCY NOTIFICATION FOLLOWUP MESSAGE *

Date _____

Time _____ AM/PM

1. Location of incident: Monticello

2. Date/time of incident: _____

3. Class of emergency: _____

4. Type of actual or projected release:
   ( ) airborne
   ( ) waterborne
   ( ) surface spill

   Estimated duration: _____ hours

5. Estimated quantity of radioactive material released or being released: _____ curies

   Height of release:
   ( ) ground level
   ( ) 100 meters (stack)
   ( ) 38 meters (Rx Bldg Vent)

6. Chemical and physical form of released material: _____

   _____

   Relative quantity:
   _____ % Noble Gases _____ µCi/cc
   _____ % Iodines _____ µCi/cc
   _____ % Particulates _____ µCi/cc

7. Meteorological Conditions: Wind Velocity _____ mph
   Wind Direction (frm): _____ degrees Temperature _____ °F
   Atmospheric Stability Class _____ Form of Precipitation _____

8. Actual or projected dose rates at site boundary:
   W.B. _____ mrem/hr
   Thyroid _____ mrem/hr

   Projected integrated dose at site boundary:
   W.B. _____ mrem/hr
   Thyroid _____ mrem/hr

* Complete as much of the form as information available and time allows. All blanks need not be filled to make a followup report.

EMPROC1I

ATTACHMENT 3 (Cont'd.)

Form 5790-102-3
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		Whole Body		Thyroid		Sectors Affected
9. Projected dose rates:	2 miles	_____	mrem/hr	_____	mrem/hr	_____
	5 miles	_____	mrem/hr	_____	mrem/hr	_____
	10 miles	_____	mrem/hr	_____	mrem/hr	_____
Projected integrated dose at:	2 miles	_____	mrem/hr	_____	mrem/hr	_____
	5 miles	_____	mrem/hr	_____	mrem/hr	_____
	10 miles	_____	mrem/hr	_____	mrem/hr	_____

10. Estimate of any surface radioactive contamination: _____ dpm/100 cm^2

11. Emergency response actions underway: _____

_____

_____

12. Recommended emergency actions, including protective actions:

_____

_____

_____

13. Request for any needed on-site support by off-site organizations:

_____

_____

_____

14. Prognosis for worsening or termination of event based on plant information:

_____

_____

_____
(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.

EMPROC1I

ATTACHMENT 4

Form 5790-102-4
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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.

ATTACHMENT 4 (Cont'd.)

Form 5790-102-4
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NOTIFICATIONS

1. 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 emergency 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 ----------	DELETED	/ /
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 _____

2. 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 DELETED

   _____ (Person) _____ (Time) _____ (SEC Initials)

3. Notify the Minnesota Division of Emergency Services. Telephone number is DELETED 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: This call will be verified to the Control Room. If no verification within 30 minutes contact State again.

ATTACHMENT 4 (Cont'd.)

Form 5790-102-4
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4. Notify the Monticello Civil Defense Director

Working Hours Nights/Holidays

DELETED

Contact Person Time SEC Initials

5. Notify the Systems Dispatcher using the hotline or dedicated line. The telephone number is DELETED night or day.

SEC Initials

6. Notify the NRC Emergency Response Center via the ENS hotline. Use Form 3195 to assemble information which will be requested by the NRC. Establish with the NRC if continuous manning is required.

SEC Initials

NOTE: Notification to be made within one hour of event declaration, as required by 4 ACD-3.9.

7. Notify the site NRC Resident Inspectors:

DELETED

SEC Initials

SEC Initials

8. Inform the Shift Supervisor/Emergency Director of the completion of the notifications.

SEC Initials

Completed: Shift Emergency Coordinator: _____ 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.

ATTACHMENT 5

MONTICELLO EMERGENCY RECALL LIST

DELETED DELETED

Plant Manager

Plant Superintendent, Operations and Maintenance

Plant Superintendent, Engineering and Radiation Protection

DELETED

DELETED

Superintendent, Radiation Protection

Superintendent, Technical Engineering

Superintendent, Operations Engineering

Superintendent, Operations DELETED

Relief Shift Supervisor

Relief Shift Supervisor

Superintendent, Security & Services

Superintendent, Maintenance DELETED

Plt. Scheduling Administrator

Lead Production Engineer

Assoc. Prod. Engr. (Lead)

Lead Chemical Engineer

Senior Chemist

Asst. Health Physicist

Engineer, Instruments & Controls

GE Operations Engineer

NRC Senior Resident Inspector

NRC Resident Inspector

ATTACHMENT 5 (Cont'd.)

MONTICELLO EMERGENCY RECALL LIST (Cont'd.)

	Radiation Protection Group	
	Radiation Protection Group	
	Radiation Protection Group	
	Radiation Protection Group	
	Radiation Protection Group	
DELETED	Radiation Protection Group	DELETED
	Technical Support	
	Technical Support	
	Technical Support	
	Technical Support	
	Technical Support	
	Technical Support	
	Training	
	Training	
	Training	
	Training	
	Training	

ATTACHMENT 5 (Cont'd.)

Example of
EMERGENCY TEAM MEMBERS

Members of Emergency Team #1 Include:

	Rank	Position
	Brigade Chief	Maint. Supv.
	Alternate Team Leader	Machinist
DELETED		Welder
		Machinist
	DELETED	Repairman
		I&CS

Members of Emergency Team #2 Include:

	Asst. Brigade Chief	Lead Machinist
DELETED	Alternate Team Leader	Welder
		Repairman
		Machinist
		I&CS

Members of Emergency Team #3 Include:

	Team Leader	Electrician
DELETED	Alternate Team Leader	Rigger
		Welder
		Machinist
		I&CS

ATTACHMENT 5 (Cont'd.)

Example of
EMERGENCY TEAM MEMBERS (Cont'd.)

Back Shifts, Weekends, Holidays

Duty Shift	Team Leader	--	Third Man in Control Room or Extra Plant Attendant
	Alternate Team Leader	--	Plant Attendant

Assigned Security Force Members (three per shift)

ATTACHMENT 6

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 — DELETED

   a) St. Cloud

   b) Golden Valley

   c) St. Paul or Dial Operator and
      Ask for

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

ATTACHMENT 6 (Cont'd.)

12. EPA Monticello Field Station

13. Big Oaks Park (During Camping Season)

14. Minnesota Pollution Control Agency DELETED

15. Northern States Power
N.W. Division

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: L. Lacey/Quadrex ALARA Review: C S Mathiesen Date 3/29/81
Reviewed by: [signature] Q.A. Review: R L Schamont Date 3/30/81
Operations Committee Final Review: Meeting Number 950 Date 3/27/81
Approved by: [signature] Date 30MAR81
Op. Com. Results Review: Not Req'd 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.

2. 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.

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

Report to Operations Support Center. Be prepared to assist the Emergency Director with any immediate matters as requested.

PROCEDURE

STEP 1: Announce or have announced the following message over the public address system words to the effect:

"ATTENTION ALL PLANT PERSONNEL: AN ALERT HAS BEEN DECLARED. ALL MEMBERS OF THE ON-SHIFT AND ONSITE EMERGENCY ORGANIZATION REPORT TO YOUR EMERGENCY DUTY STATIONS. ALL OTHER PERSONNEL STANDBY FOR FURTHER INSTRUCTIONS." (Give a brief description of the event and repeat the announcement, if appropriate.)

NOTE: As necessary contact the Shift Technical Advisor and the Shift Emergency Communicator using the following numbers:

DELETED

STEP 2: Depending on the emergency action level, ensure that the appropriate Abnormal Operating Procedures have been implemented.

STEP 3: Direct the Shift Emergency Communicator to compose the Emergency Notification Report, Form 5790-103-2 (Attachment 2) for the Emergency Director's approval.

STEP 4: Direct the Shift Emergency Communicator to make the initial notifications using the Emergency Call List-ALERT, Form 5790-103-4, (Attachment 4).

STEP 5: If local off-site support (fire, ambulance, police) is required, direct the Shift Emergency Communicator to request assistance. See Attachment 6 for telephone numbers.

STEP 6: Consider any additional augmentation of on-shift personnel beyond that called for in the Emergency Call List, Attachment 4. Instruct the Emergency Communicator to begin appropriate notification from the Monticello Emergency Call List, Attachment 5 and Attachment 6.

STEP 7: When appropriate implement Procedure A.2-106 (Activation of Technical Support Center) and ensure that Procedure A.2-107 (Activation of Operations Support Center) is implemented.

STEP 8: Assess plant conditions and consider implementation of Procedures A.2-201 (On-Site Monitoring During an Emergency) and 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 9: Have Emergency Communicator provide off-site authorities with the following:

NOTE: Initial communications will come from the plant emergency organization. Once the EOF is operational off-site communications will be conducted from the EOF.

a. Periodic plant status updates (at least every 15 minutes) to the Division of Emergency Services while conditions are changing.

b. Periodic meteorological assessments (if any releases are occurring; include dose estimates for actual releases).

NOTE: Use the Emergency Notification Followup Message, Form 5790-103-3 (Attachment 3).

STEP 10: 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 11: Should reclassification of the emergency be necessary, initiate a new procedure (A.2-102, 104 or 105) and instruct the Shift Emergency Communicator (or EOF personnel, if appropriate) to begin off-site agency re-notification using Form 5790-102-4 (Attachment 4) for the NUE (A.2-102), Form 5790-104-4 (Attachment 4) for Site Area Emergency (A.2-104), or Form 5790-105-4 for General Emergency (A.2-105).

STEP 12: In the event of close-out or reduction in emergency class, compose a brief summary of the event and direct the Emergency Communicator to begin notifications to off-site authorities originally notified (notification via EOF).

NOTE: Summary to follow within 8 hours of close-out or reduction.

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. Monticello Emergency Recall List

6. Secondary Notification List

ATTACHMENT 1

Form 5790-103-1
Rev. 0, 03/12/81
Page 1 of 1

Example of
ALERT CHECKLIST
(For Use With Procedure A.2-103)

1. Announced over public address system and implemented Attachment 4, Emergency Call List.

   _____ _____ _____
   ED Initial Time Date

2. Type of off-site support requested (if applicable): _____

   _____ _____ _____ _____
   ED Initial Time Date

3. Emergency Center activation procedures implemented (A.2-106 and A.2-107).

   _____ _____ _____
   ED Initial Time Date

4. Assessment: Implemented Procedure A.2-201 (Yes/No) and for A.2-202 (Yes/No).

   _____ _____ _____
   ED Initial Time Date

5. (Closed-out/Escalated to a higher class/reduced 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.

ATTACHMENT 2

Form 5790-103-2
Rev. 0, 03/12/81
Page 1 of 1

Example of
EMERGENCY NOTIFICATION REPORT FORM

This is _____(name/title)_____ at the Monticello Nuclear Generating Plant calling. Have I reached (name/organization calling) and can you followup on your Emergency Plan requirements? (If YES continue with message, if NO try to get in contact with the right person or call back.) We have declared an ALERT at _____(time)_____ hours AND (based upon Emergency Director judgement, use one of the following statements).

( ) 1) We have not had a radioactive release.

OR

( ) 2) We have had a radioactive release but do not expect this situation to result in detectable changes in off-site radiation levels.

OR

( ) 3) We have had a radioactive release but do not know if there will be detectable changes in off-site radiation levels. We will be keeping the State Division of Emergency Services and Department of Health informed of the results of our investigation.

OR

( ) 4) We have had a radioactive release and expect to be able to detect changes in off-site radiation levels but they are expected to be less than the levels calling for an SITE AREA EMERGENCY. We will be keeping the State Division of Emergency Services and Department of Health informed.

(EMERGENCY DIRECTOR TO COMPOSE):

c. Give a short non-technical description of the emergency and any potentially affected population and areas. _____

_____

Prepared by: _____ Approved by: _____

Shift Emergency Coord. 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.

ATTACHMENT 3

Form 5790-103-3
Rev. 0, 03/12/81
Page 1 of 2

Example of
EMERGENCY NOTIFICATION FOLLOWUP MESSAGE*

Date _____

Time _____ AM/PM

1. Location of incident: Monticello

2. Date/time of incident: _____

3. Class of emergency: _____

4. Type of actual or projected release:
( ) airborne
( ) waterborne
( ) surface spill

Estimated duration: _____ hours

5. Estimated quantity of radioactive material released or being released: _____ curies

Height of release:
( ) ground level
( ) 100 meters (stack)
( ) 38 meters (Rx Bldg Vent)

6. Chemical and physical form of released material: _____

_____

Relative quantity:
_____ % Noble Gases _____ µCi/cc
_____ % Iodines _____ µCi/cc
_____ % Particulates _____ µCi/cc

7. Meteorological Conditions: Wind Velocity _____ mph
Wind Direction (frm): _____ degrees Temperature _____ °F
Atmospheric Stability Class _____ Form of Precipitation _____

8. Actual or projected dose rates at site boundary:
W.B. _____ mrem/hr
Thyroid _____ mrem/hr

Projected integrated dose at site boundary:
W.B. _____ mrem/hr
Thyroid _____ mrem/hr

* Complete as much of the form as information available or time allows. All blanks need not be filled to make a followup report.

ATTACHMENT 3 (Cont'd.)

Form 5790-103-3
Rev. 0, 03/12/81
Page 2 of 2

		Whole Body	Thyroid	Sectors Affected
9.	Projected dose rates: 2 miles	_____ mrem/hr	_____ mrem/hr	_____
	5 miles	_____ mrem/hr	_____ mrem/hr	_____
	10 miles	_____ mrem/hr	_____ mrem/hr	_____
	Projected integrated dose at: 2 miles	_____ mrem/hr	_____ mrem/hr	_____
	5 miles	_____ mrem/hr	_____ mrem/hr	_____
	10 miles	_____ mrem/hr	_____ mrem/hr	_____

10. Estimate of any surface radioactive contamination: _____ dpm/100 cm^2

11. Emergency response actions underway: _____

_____

_____

12. Recommended emergency actions, including protective actions:

_____

_____

_____

13. Request for any needed on-site support by off-site organizations:

_____

_____

14. Prognosis for worsening or termination of event based on plant information:

_____

_____

_____
(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.

EMPROC1M

ATTACHMENT 4

Form 5790-103-4
Rev. 0, 03/12/81
Page 1 of 3

Example of
EMERGENCY CALL LIST - ALERT

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 5790-103-4
Rev. 0, 03/12/81
Page 2 of 3

NOTIFICATIONS

1. 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 site area emergency has been declared and that they should report to the plant immediately.

DELETED	Contact Person/Time/Initials	SEC
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 _____

2. Notify the Minnesota Division of Emergency Services. The telephone number is DELETED 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: This call will be verified to the Control Room. If no verification within 30 minutes, contact the State again.

ATTACHMENT 4 (Cont'd.)

Form 5790-103-4
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Page 3 of 3

4. Notify the local authorities by telephone as follows:

	Notification
a. Wright County Sheriff----- DELETED or----- or-----	
	SEC Initials
b. Sherburne County Sheriff--	
	SEC Initials

	Working Hours	Nights/ Holidays
c. Monticello Civil Defense	DELETED	

SEC Initials

4. Notify the System Dispatcher using the hotline or dedicated line. The telephone number is DELETED night or day.

SEC Initials

5. Transmit the message designated for an Alert in order to actuate the "tonal" alert home receiver, if requested by the Emergency Director.

SEC Initials

6. Notify the NRC Emergency Response Center via the ENS hotline. Use Form 3195 to assemble information which will be requested by NRC. Establish with the NRC if continous manning is required.

SEC Initials

NOTE: Notification to be made within one hour of event declaration, as required by 4 ACD-3.9.

7. Notify the site NRC Resident Inspectors: DELETED

SEC Initials

DELETED

SEC Initials

8. Inform the Shift Supervisor/Emergency Director of the completion of the notification.

SEC Initials

Completed: _____ 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.

EMPROC1M

ATTACHMENT 5

Example of
MONTICELLO EMERGENCY RECALL LIST

DELETED

Plant Manager

Plant Superintendent, Operations and Maintenance

Plant Superintendent, Engineering and Radiation Protection

DELETED

Superintendent, Radiation Protection

DELETED

Superintendent, Technical Engineering

Superintendent, Operations Engineering

Superintendent, Operations

DELETED

Relief Shift Supervisor

Relief Shift Supervisor

Superintendent, Security & Services

Superintendent, Maintenance DELETED

Plant Office Manager

Supt., Quality Engineering

Plt. Scheduling Administrator

Lead Production Engineer

Assoc. Prod. Engr. (Lead)

Lead Chemical Engineer

Senior Chemist

Asst. Health Physicist

Engineer, Instruments & Controls

ATTACHMENT 5 (Cont'd.)

		Pager
	GE Operations Engineer	
	NRC Senior Resident Inspector	
	NRC Resident Inspector	
DELETED	Radiation Protection Group	DELETED
	Radiation Protection Group	
	Radiation Protection Group	
	Radiation Protection Group	
	Radiation Protection Group	
	Radiation Protection Group	
	Technical Support	
	Technical Support	
	Technical Support	
	Technical Support	
	Technical Support	
	Technical Support	
	Training	
	Training	
	Training	
	Training	
	Training	

ATTACHMENT 5 (Cont'd.)

EMERGENCY TEAM MEMBERS

Members of Emergency Team #1 Include:

Name	Rank		Position
	Brigade Chief		Maint. Supv.
DELETED	Alternate Team Leader	DELETED	Machinist
			Welder
			Machinist
			Repairman
			I&CS

Members of Emergency Team #2 Include:

DELETED	Asst. Bridgade Chief		Lead Machinist
	Alternate Team Leader		Welder
			Repairman
			Machinist
			I&CS

Members of Emergency Team #3 Include:

	Team Leader		Electrician
DELETED	Alternate Team Leader		Rigger
			Welder
			Machinist
			I&CS

ATTACHMENT 5 (Cont'd.)

EMERGENCY TEAM MEMBERS (Cont'd.)

Back Shifts, Weekends, Holidays

Duty Shift	Team Leader	--	Third Man in Control Room or Extra Plant Attendant
	Alternate Team Leader	--	Plant Attendant

Assigned Security Force Members (three per shift)

ATTACHMENT 6

SECONDARY NOTIFICATION LIST

A. Notification has been made as directed by the Emergency Director from the Monticello Emergency Recall List, Attachment 5.

B. 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 DELETED

   a) St. Cloud

   b) Golden Valley

   c) St. Paul or Dial Operator and
      Ask for DELETED

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

ATTACHMENT 6 (Cont'd.)

SECONDARY NOTIFICATION LIST (Cont'd.)

11. Monticello-Big Lake Community Hospital

12. EPA Monticello Field Station DELETED

13. Big Oaks Part (During Camping Season)

14. Minnesota Pollution Control Agency

15. Northern States Power Company
Northwest Division

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: L. Lacey/Quadrex ALARA Review: GD Mathiason Date 3/29/81
Reviewed by: L Nolan Q.A. Review: RL Schenart Date 3/30/81
Operations Committee Final Review: Meeting Number 950 Date 3/27/81
Approved by: JJ Ley Date 30MAR81
Op. Com. Results Review: Not Req'd 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.

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 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: Announce, or have announced, the following message over the public address system words to the effect:

NOTE: A plant evacuation will normally be initiated during a Site Area Emergency, however the Emergency Director must consider special conditions (i.e. high winds or tornado) where an evacuation is not advisable. Also consider Procedure A.2-203, Evacuation Criteria for On-Site Personnel.

"ATTENTION ALL PLANT PERSONNEL: A SITE AREA EMERGENCY HAS BEEN DECLARED. ALL MEMBERS OF THE ON-SHIFT AND ON-SITE EMERGENCY ORGANIZATION REPORT TO YOUR EMERGENCY DUTY STATIONS. ALL OTHER PERSONNEL REPORT TO THE (WAREHOUSE/ SUBSTATION) ON-SITE ASSEMBLY POINT." (Repeat message slowly.)

NOTE: As necessary, contact the Shift Technical Advisor and the Shift Emergency Communicator using the following numbers:

DELETED

STEP 2: Depending on the emergency action level, ensure that the appropriate Emergency Operating Procedures have been implemented, including Accountability if necessary.

STEP 3: Direct the Shift Emergency Communicator to compose the Emergency Notification Report, Form 5790-104-2 (Attachment 2) for the Emergency Director's approval.

STEP 4: Direct the Shift Emergency Communicator to make the initial notifications using the Emergency Call List-NUE, Form 5790-104-4, (Attachment 4).

NOTE: Communications should be per Procedure A.2-501, Communications During an Emergency.

STEP 5: If local off-site support (fire, ambulance, police) is required, direct the Shift Emergency Communicator to request assistance. See Attachment 6 for telephone numbers.

STEP 6: Augment on-shift personnel. As required, direct the Shift Emergency Communicator to contact appropriate individuals or agencies as required from the Monticello Emergency Recall List (Attachment 5).

STEP 7: When appropriate implement Procedure A.2-106 (Activation of Technical Support Center) and ensure that Procedure A.2-107 (Activation of Operations Support Center) is implemented.

NOTE: Parallel activation of the Emergency Operations Facility shall be underway by the corporate emergency organizations.

STEP 8: Assess plant conditions and consider implementation of 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.2-203 (Evacuation Criteria for On-Site Personnel).

NOTE: Implementation of the above Procedure will automatically implement A.2-205 (Personnal Accountability).

d. A.2-204 (Off-Site Protective Action Recommendations).

e. Consider implementation of strict plant status controls. If it is a radiological emergency implement high radiation area controls.

STEP 9: Have the Emergency Communicator provide off-site authorities with the following:

NOTE: Initial communications will come from the plant emergency organization. Once the EOF is operational, off-site communications will be conducted from the EOF.

a. Periodic plant status updates (at least every 15 minutes) to the Devision of Emergency Services while conditions are changing.

b. Periodic meteorologic[al] assessments and dose estimates.

c. Release and dose projections based on available plant condition information and forseeable contingencies.

NOTE: Senior technical and management personnel on the plant staff should be made available for consultation with NRC and State personnel on a periodic basis.

NOTE: Use the Emergency Notification Followup Message, Form 5790-104-3 (Attachment 3).

STEP 10: 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 11: Should reclassification of the emergency be necessary, initiate a new procedure (A.2-102, 103 or 105) and instruct the Shift Emergency Communicator (or EOF personnel, if appropriate) to begin off-site agency re-notification using Form 5790-102-4 (Attachment 4) for NUE (A.2-102), Form 5790-103-4 (Attachment 4) for Alert, or Form 5790-103-5 (Attachment 5) for General Emergency.

STEP 12: In the event of close-out or recommended reduction in class, compose a brief summary of the event and direct the Emergency Communicator to begin notifications off-site authorities.

NOTE: Summary to follow within 8 hours of close-out or reduction.

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

5. Monticello Emergency Recall List

6. Secondary Notification List

ATTACHMENT 1

Form 5790-104-1
Rev. 0, 03/12/81
Page 1 of 1

Example of
SITE AREA EMERGENCY CHECKLIST
(For Use With Procedure A.2-104)

1. Announced Site Area Emergency over public address system and implemented Attachment 4 Emergency Call List.

ED Initials _____ Time _____ Date _____

2. Type of off-site support requested (if applicable): _____

_____ ED Initials _____ Time _____ Date _____

3. Emergency center activation procedures implemented (A.2-106 & A.2-107).

ED Initials _____ Time _____ Dat _____

4. Assessment: implemented the following procedures:

A.2-201 (On-Site Monitoring) _____ _____ _____

A.2-202 (Off-Site Monitoring) _____ _____ _____

A.2-203 (On-Site Evacuation) _____ _____ _____

A.2-204 (Off-Site Protective Actions)

ED Initials _____ Time _____ Date _____

5. (Closed-out/Escalated to a higher class/reduced to a lower 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.

EMPROC1N

ATTACHMENT 2

Form 5790-104-2, Rev. 0, 03/12/81
Page 1 of 1

Example of
EMERGENCY NOTIFICATION REPORT FORM

This is (name/title) at the Monticello Nuclear Generating Plant calling. Have I reached (name/organization) and can you followup on your Emergency Plan requirement? (If YES, continue with message, if NO, try to get in contact with the right person or call back.) We have declared a Site Area Emergency at (time) hours and (based upon Emergency Director judgement, use one of the following):

( ) 1) We have not had a radioactive release.

OR

( ) 2) We have had a radioactive release but do not expect the situation to result in detectable changes in off-site radiation levels.

OR

( ) 3) We have had a radioactive release but do not know if there will be detectable change in off-site radiation levels. We will be keeping the State Division of Emergency Services and the Department of Health informed of the results of our investigation.

OR

( ) 4) We have had a radioactive release and expect to be able to detect changes in off-site radiation levels but they will be less than the levels calling for a General Emergency. We will be keeping the State Division of Emergency Services and the Department of Health informed.

(EMERGENCY DIRECTOR TO COMPOSE:)

Give a short non-technical description of the emergency and any potentially affected population and areas.

_____

_____

Prepared by: _____ Approved by: _____
Shift Emergency Coordinator 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.

EMPROC1N

ATTACHMENT 3

Form 5790-104-3, Rev. 0, 03/12/81
Page 1 of 2

Example of
EMERGENCY NOTIFICATION FOLLOWUP MESSAGE*

Date _____

Time _____ AM/PM

1. Location of incident: Monticello

2. Date/time of incident: _____

3. Class of emergency: _____

4. Type of actual or projected release:
( ) airborne
( ) waterborne
( ) surface spill

Estimated duration _____ hours

5. Estimated quantity of radioactive material released or being released: _____ curies

Height of release:
( ) ground level
( ) 100 meters (stack)
( ) 33 meters (Rx Bldg Vent)

6. Chemical and physical form of released material: _____

_____

Relative quantity:
_____ % Noble Gases _____ µCi/cc
_____ % Iodines _____ µCi/cc
_____ % Particulates _____ µCi/cc

7. Meteorological Conditions: Wind Velocity _____ mph
Wind Direction (frm): _____ degrees Temperature _____ °F
Atmospheric Stability Class _____ Form of Precipitation _____

8. Actual or projected dose rates at site boundary:
W.B. _____ mrem/hr
Thyroid _____ mrem/hr

Projected integrated dose at site boundary:
W.B. _____ mrem
Thyroid _____ mrem

* Complete as much of the form as information available or time allows. All blanks need not be filled to make a followup report.

EMPROC1N

ATTACHMENT 3 (Cont'd.)

Form 5790-104-3, Rev. 0, 03/12/81
Page 2 of 2

		Whole Body		Thyroid		Sectors Affected
9.	Projected dose rates:	2 miles _____	mrem/hr	_____	mrem/hr	_____
		5 miles _____	mrem/hr	_____	mrem/hr	_____
		10 miles _____	mrem/hr	_____	mrem/hr	_____
	Projected integrated dose at:	2 miles _____	mrem/hr	_____	mrem/hr	_____
		5 miles _____	mrem/hr	_____	mrem/hr	_____
		10 miles _____	mrem/hr	_____	mrem/hr	_____

10. Estimate of any surface radioactive contamination: _____ dpm/100 cm^2

11. Emergency response actions underway: _____

_____

_____

12. Recommended emergency actions, including protective actions:

_____

_____

_____

13. Request for any needed on-site support by off-site organizations:

_____

_____

_____

14. Prognosis for worsening or termination of event based on plant information:

_____

_____

_____

_____
(Shift Supervisor/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.

EMPROC1N

ATTACHMENT 4

Form 5790-104-4, Rev. 0, 03/12/81
Page 1 of 3

Example of
EMERGENCY CALL LIST - SITE AREA EMERGENCY

PROCEDURE

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 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, Rev. 0, 03/12/81
Page 2 of 3

NOTIFICATIONS

1. 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 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 ----------	DELETED	/ /
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 _____

2. 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: This call will be verified to the Control Room. If no verification within 30 minute tact the State again.

ATTACHMENT 4 (Cont'd.)
Form 5790-104-4, Rev. 0, 03/12/81
Page 3 of 3

3. Notify the local authorities by telephone as follows:

Notification

a) Wright County Sheriff
DELETED
or
or

SEC Initials

b) Sherburne County Sheriff DELETED

SEC Initials

Working Hours Nights/Holidays

c) Monticello Civil Defense

DELETED

SEC Initials

4. Notify the Systems Dispatcher using the hotline or the dedicated line. The telephone number is DELETED night or day.

SEC Initials

5. Transmit the message designated for a Site Area Emergency in order to actuate the "tonal" alert home receivers, if requested by the Emergency Director.

SEC Initials

6. Notify the NRC Emergency Response Center via the ENS hotline. Use Form 3195 to assemble the information which will be requested by the NRC. Establish with the NRC if continuous manning is required.

SEC Initials

NOTE: Notification to be made within one hour of event declaration, as required by 4 ACD-3.9.

7. Notify the site NRC Resident Inspectors:

DELETED

SEC Initials

SEC Initials

8. Inform the Shift Supervisor/Emergency Director of the completion of the notification.

SEC Initials

Completed: _____ _____
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.

EMPROC1N

ATTACHMENT 5

MONTICELLO EMERGENCY RECALL LIST

	Pager
Plant Manager	
Plant Superintendent, Operations and Maintenance	DELETED
DELETED — Plant Superintendent, Engineering and Radiation Protection	
Superintendent, Radiation Protection	
Superintendent, Technical Engineering	
Superintendent, Operations Engineering	
Superintendent, Operations	
Relief Shift Supervisor	
Relief Shift Supervisor	
Superintendent, Security & Services	
Superintendent, Maintenance	
Plant Office Manager	
Supt., Quality Engineering	
Plant Scheduling Administrator	
Lead Production Engineer	
Assoc. Prod. Engr. (Lead)	
Lead Chemical Engineer	
Senior Chemist	
Asst. Health Physicist	
Engineer, Instruments & Controls	
GE Operations Engineer	
NRC Senior Resident Inspector	
NRC Resident Inspector	

ATTACHMENT 5 (Cont'd.)

MONTICELLO EMERGENCY RECALL LIST (Cont'd.)

		Pager
	Radiation Protection Group	
	Radiation Protection Group	
	Radiation Protection Group	DELETED
	Radiation Protection Group	
DELETED	Radiation Protection Group	
	Radiation Protection Group	
	Technical Support	
	Technical Support	
	Technical Support	
	Technical Support	
	Technical Support	
	Technical Support	
	Training	
	Training	
	Training	
	Training	
	Training	

ATTACHMENT 5 (Cont'd.)

EMERGENCY TEAM MEMBERS

mergency Team #1 Include:

Rank	Position
Brigade Chief	Maint. Supv.
Alternate Team Leader	Machinist
DELETED	Welder
	Machinist
	Repairman
	I&CS

DELETE

Emergency Team #2 Include:

Asst. Brigade Chief	Lead Machinist
Alternate Team Leader	Welder
	Repairman
	Machinist
	I&CS

Emergency Team #3 Include:

Team Leader	Electrician
Alternate Team Leader	Rigger
	Welder
	Machinist
	I&CS

EMPROC1N

ATTACHMENT 5 (Cont'd.)

EMERGENCY TEAM MEMBERS (Cont'd.)

Back Shifts, Weekends, Holidays

Duty Shift	Team Leader	--	Third Man In Control Room or Extra Plant Attendant
	Alternate Team Leader	--	Plant Attendant

Assigned Security Force Members (three per shift)

ATTACHMENT 6

SECONDARY NOTIFICATION LIST

A. Notifications have been made as directed by the Emergency Director from the Monticello Emergency Recall List Attachment 5.

B. 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

DELETED

3. State Highway Patrol

   a) St. Cloud

   b) Golden Valley

   c) St. Paul or Dial Operator and
      Ask for Zenith 7000

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

ATTACHMENT 6 (Cont'd.)

SECONDARY NOTIFICATION LIST (Cont'd.)

11. Monticello-Big Lake Community Hospital

12. EPA Monticello Field Station

13. Big Oaks Park (During Camping Season)

14. Minnesota Pollution Control Agency DELETED

15. Northern States Power Company
Northwest Division

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: L. Lacey/Quadrex ALARA Review: C.D. Mathiesen Date 3/29/81
Reviewed by: L Nolan Q.A. Review: R L Schamert Date 3/29/81
Operations Committee Final Review: Meeting Number 950 Date 3/27/81
Approved by: J P Fay Date 30MAR81
Op. Com. Results Review: not req'd 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 e nts 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

* 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.

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 Desig.

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: Announce, or have announced, the following message over the public address system words to the effect:

NOTE: A plant evacuation will normally be initiated during a General Emergency, however the Emergency Director must consider special conditions (i.e. high winds or tornado) where an evacuation is not advisable. Also consider Procedure A.2-203, Evacuation Criteria for On-Site Personnel.

"ATTENTION ALL PLANT PERSONNEL: A GENERAL EMERGENCY HAS BEEN DECLARED. ALL MEMBERS OF THE ON-SHIFT AND ON-SITE EMEPGENCY ORGANIZATION REPORT TO YOUR EMERGENCY DUTY STATIONS. ALL OTHER PERSONNEL REPORT TO THE (WAREHOUSE/ SUBSTATION) ON-SITE ASSEMBLY POINT." (Repeat message slowly.)

NOTE: As necessary contact the Shift Technical Advisor and the Shift Emergency Communicator using the following numbers:

DELETED

STEP 2: Depending on the emergency action level, ensure that the appropriate Emergency Operating Procedures have been implemented, including Accountability, if necessary.

STEP 3: Direct the Shift Emergency Communicator to compose the Emergency Notification Report, Form 5790-105-2 (Attachment 2) for the Emergency Director's approval.

STEP 4: Direct the Shift Emergency Communicator to make the initial notifications using the Emergency List-NUE, Form 5790-105-4, (Attachment 4).

NOTE: Communications should be per Procedure A.2-501, Communications During an Emergency.

STEP 5: If local off-site support (fire, ambulance, police) is required, direct the Shift Emergency Communicator to request assistance. See Attachment 6 for telephone numbers.

STEP 6: Augment on-shift personnel. As required, direct the Shift Emergency Communicator to contact appropriate individuals or agencies as required from the Monticello Emergency Recall List (Attachment 5).

STEP 7: When appropriate implement Procedure A.2-106 (Activation of Technical Support Center) and ensure that Procedure A.2-107 (Activation of Operations Support Center) is implemented.

NOTE: Parallel activation of the Emergency Operations Facility shall be underway by the corporate emergency organizations.

STEP 8: Assess plant conditions and consider implementation of 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.2-203 (Evacuation Criteria for On-Site Personnel)

NOTE: Implementation of the above Procedure will automatically implement A.2-205 (Personnel Accountability).

d. A.2-204 (Off-Site Protective Action Recommendations)

e. A.2-301 (Emergency Evacuation)

f. Consider implementation of strict plant status controls. If it is a radiological emergency, implement high radiation area controls.

STEP 9: Have the Emergency Communicator provide off-site authorities with the following:

NOTE: Initial communications will come from the plant emergency organization. Once the EOF is operational, off-site communications will be from the EOF.

a. Periodic plant status updates (at least every 15 minutes) to the Division of Emergency Services while conditions are changing.

b. Periodic meteorological assessments and dose estimates.

c. Provide release and dose projections based on available plant condition information and foreseeable contingencies.

NOTE: Senior technical and management personnel on the plant staff should be made available for consultation with NRC and State personnel on a periodic basis.

NOTE: Use the Emergency Notification Follow-up Message Form 5790-105-3 (Attachment 3).

STEP 10: 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 11: Should reclassification of the emergency be necessary, initiate a new procedure (A.2-102, 103 or 104) and instruct the Shift Emergency Communicator (or EOF personnel, if appropriate) to begin off-site agency re-notification using Form 5790-102-4 (Attachment 4) for NUE (A.2-102), Form 5790-103-4 (Attachment 4) for Alert (A.2-103) or Form 5790-104-4 (Attachment 4) for Site Area Emergency.

STEP 12: In the event of close-out or recommended reduction in class, brief summary of the event and direct the Emergency Communicator to begin notification to off-site authorities. If a close-out, proceed to EOF and conduct a briefing.

NOTE: Summary to follow within 8 hours of close-out or reduction.

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 General Emergency Checklist
2. Example of Emergency Notification Report Form
3. Example of Emergency Notification Followup Message
4. Example of Emergency Call List - Alert
5. Monticello Emergency Recall List
6. Secondary Notification List

ATTACHMENT 1

Form 5790-105-1, Rev. 0, 03/12/81
Page 1 of 1

Example of
GENERAL EMERGENCY CHECKLIST
(For Use With Procedure A.2-105)

1. Announce a General Emergency over public address system and implemented Attachment 4 Emergency Call List.

	ED Initial	Time	Date

2. Type of off-site support requested (if applicable): _____

	ED Initials	Time	Date

3. Emergency Center activation procedures implemented (A.2-106 and A.2-107).

	ED Initials	Time	Date

4. Assessment: implemented the following procedures:

A.2-201 (On-Site Monitoring)			
A.2-202 (Off-Site Monitoring)			
A.2-203 (On-Site Evacuation)			
A.2-204 (Off-Site Protective Actions)			
A.2-301 (Emergency Evacuation)			
	ED Initials	Time	Date

5. (Closed-out/reduced to a lower 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.

ATTACHMENT 2

Form 5790-105-2, Rev. 0, 03/12/81
Page 1 of 2

Example of
EMERGENCY NOTIFICATION REPORT FORM

This is (name/title) at the Monticello Nuclear Generating Plant calling. Have I reached (name/organization) and can you followup on your Emergency Plan requirements? (If YES continue with the message, if NO, try to get in contact with the right person or call back.) We have declared a General Emergency at (time) hours and (based upon Emergency Director judgement use one of the following):

( ) 1) We have not had a radioactive release however we have the potential for a significant radioactive release

OR

( ) 2) We have had a significant radioactive release and off-site radiation levels are expected to require protective action. We will be keeping the Department of Emergency Services and Health Department informed.

(EMERGENCY DIRECTOR TO COMPOSE:)

Provide a short non-technical description of the emergency and the extent of the radioactive release and potentially affected populations and areas:

_____

_____

_____

_____

ATTACHMENT 2 (Cont'd.)

Form 5790-105-2, Rev. 0, 03/12/81
Page 2 of 2

Example of
EMERGENCY NOTIFICATION REPORT FORM (Cont'd.)

Prepared by: _____ Approved by: _____
Shift Emergency Coordinator 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.

ATTACHMENT 3

Form 5790-105-3, Rev. 0, 03/12/81
Page 1 of 2

Example of
EMERGENCY NOTIFICATION FOLLOWUP MESSAGE*

Date _____

Time _____ AM/PM

1. Location of incident: Monticello

2. Date/time of incident: _____

3. Class of emergency: _____

4. Type of actual or projected release:
( ) airborne
( ) waterborne
( ) surface spill

Estimated duration: _____ hours

5. Estimated quantity of radioactive material released or being released: _____ curies

Height of release:
( ) ground level
( ) 100 meters (stack)
( ) 38 meters (Rx Bldg Vent)

6. Chemical and physical form of released material: _____ _____

_____

Relative quantity:
_____ % Noble Gases _____ µCi/cc
_____ % Iodines _____ µCi/cc
_____ % Particulates _____ µCi/cc

7. Meteorological Conditions: Wind Velocity _____ mph
Wind Direction (frm): _____ degrees Temperature _____ °F
Atmospheric Stability Class _____ Form of Precipitation _____

8. Actual or projected dose rates at site boundary:
W.B. _____ mrem/hr
Thyroid _____ mrem/hr

Projected integrated dose at site boundary:
W.B. _____ mrem
Thyroid _____ mrem

* Complete as much of the form as information available or time allows. All blanks need not be filled to make a followup report.

ATTACHMENT 3 (Cont'd.)

Form 5790-105-3, Rev. 0, 03/12/81
Page 2 of 2

		Whole Body		Thyroid		Sectors Affected
9.	Projected dose rates:	2 miles _____	mrem/hr	_____	mrem/hr	_____
		5 miles _____	mrem/hr	_____	mrem/hr	_____
		10 miles _____	mrem/hr	_____	mrem/hr	_____
	Projected integrated dose at:	2 miles _____	mrem/hr	_____	mrem/hr	_____
		5 miles _____	mrem/hr	_____	mrem/hr	_____
		10 miles _____	rem/hr	_____	mrem/hr	_____

10. Estimate of any surface radioactive contamination: _____ dpm/100 cm^2

11. Emergency response actions underway: _____

_____

_____

12. Recommended emergency actions, including protective actions:

_____

_____

_____

13. Request for any needed on-site support by off-site organizations:

_____

_____

_____

14. Prognosis for worsening or termination of event based on plant information:

_____

_____

_____

_____
(Shift Supervisor/Emergency Director)

ATTACHMENT 4

Form 5790-105-4, Rev. 0, 03/12/81
Page 1 of 3

Example of
EMERGENCY CALL LIST - GENERAL EMERGENCY

PROCEDURE

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 individual.

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.

1. 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."

ATTACHMENT 4 (Cont'd.)

Form 5790-105-4, Rev. 0, 03/12/81
Page 2 of 3

When the individuals call, calmly indicate that a General Emergency has been declared and that they should report to the plant immediately.

	Contact Person/Time/SEC Initials
Plant Manager ---------- DELETED	
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 EOF Coordinator _____

Alternate Radiation Protection Designee _____

2. Notify the Minnesota Division of Emergency Services. The telephone number is DELETED night or day. Request Emergency Services to notify the Department of Health. Ask for the Duty Officer.

Contact Person	Time	Initial Notification SEC Initials	Verification SEC Initials

NOTE: This call will be verified to the Control Room. If no verification within 30 minutes contact the State again.

3. Notify the local authorities by telephone as follows:

	Notification
a) Wright County Sheriff ---- DELETED or ---- or ----	
	SEC Initials
b) Sherburne County Sheriff-- DELETED	
	SEC Initials

ATTACHMENT 4 (Cont'd.)

Form 5790-105-4, Rev. 0, 03/12/81
Page 3 of 3

	Working Hours	Nights/Holidays
c) Monticello Civil Defense	DELETED	

SEC Initials

4. Notify the Systems Dispatcher using the hotline or the dedicated line. The telephone number is DELETED night or day.

SEC Initials

5. Transmit the message designated for a General Emergency in order to activate the "tonal" alert home receivers, if requested by the Emergency Director.

SEC Initials

6. Notify the NRC Emergency Response Center via the ENS hotline. Use Form 3195 to assemble the information which will be requested by the NRC. Establish with the NRC if continuous manning is required.

SEC Initials

NOTE: Notification to be made within one hour of event declaration, as required by 4 ACD-3.9.

7. Notify the site NRC Resident Inspectors:

DELETED

8. Inform the Shift Supervisor/Emergency Director of the Completion of the Notification.

SEC Initials

Completed: _____ _____
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.

ATTACHMENT 5

Page 1 of 4

MONTICELLO EMERGENCY RECALL LIST

	Pager	
DELETED	Plant Manager	
	Plant Superintendent, Operations and Maintenance	
	Plant Superintendent, Engineering and Radiation Protection	DELETED
	Superintendent, Radiation Protection	
	Superintendent, Technical Engineering	
	Superintendent, Operations Engineering	
	Superintendent, Operations	
	Relief Shift Supervisor	
	Relief Shift Supervisor	
	Superintendent, Security & Services	
	Superintendent, Maintenance	
	Plant Office Manager	
	Supt., Quality Engineering	
	Plant Scheduling Administrator	
	Lead Production Engineer	
	Assoc. Prod. Engr. (Lead)	
	Lead Chemical Engineer	
	Senior Chemist	
	Asst. Health Physicist	
	Engineer, Instruments & Controls	

ATTACHMENT 5 (Cont'd.)

MONTICELLO EMERGENCY RECALL LIST (Cont'd.)

		Pager
	GE Operations Engineer	
	NRC Senior Resident Inspector	
	NRC Resident Inspector	
DELETED	Radiation Protection Group	DELETED
	Radiation Protection Group	
	Radiation Protection Group	
	Radiation Protection Group	
	Radiation Protection Group	
	Radiation Protection Group	
	Technical Support	
	Technical Support	
	Technical Support	
	Technical Support	
	Technical Support	
	Technical Support	
	Training	
	Training	
	Training	
	Training	
	Training	

ATTACHMENT 5 (Cont'd.)

EMERGENCY TEAM MEMBERS

Members of Emergency Team #1 Include:

	Rank		Position
	Brigade Chief		Maint. Supv.
	Alternate Team Leader	DELETED	Machinist
DELETE			Welder
			Machinist
			Repairman
			I&CS

Members of Emergency Team #2 Include:

	Asst. Brigade Chief		
DELETE	Alternate Team Leader		Lead Machinist
			Welder
			Repairman
			Machinist
			I&CS

Members of Emergency Team #3 Include:

	Team Leader		
	Alternate Team Leader		Electrician
			Rigger
DELETE			Welder
			Machinist
			I&CS

ATTACHMENT 5 (Cont'd.)

EMERGENCY TEAM MEMBERS (Cont'd.)

Back Shifts, Weekends, Holidays

Duty Shift	Team Leader	--	Third Man in Control Room or Extra Plant Attendant
	Alternate Team Leader	--	Plant Attendant

Assigned Security Force Members (three per shift)

ATTACHMENT 6

SECONDARY NOTIFICATION LIST

A. Notifications have been made as directed by the Emergency Director from the Monticello Emergency Recall List Attachment 5.

B. Backup Agencies That May Be Notified If Necessary

1. Chicago Operations Office of DOE
   Radiological Assistance Program

2. Area Civil Defense Groups — DELETED

   a) Region VI Commander (St. Cloud)

   b) Wright County

   c) Sherburne County

3. State Highway Patrol

   a) St. Cloud

   b) Golden Valley

   c) St. Paul or Dial Operator and
      Ask for Zenith 7000

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

ATTACHMENT 6 (Cont'd.)

SECONDARY NOTIFICATION LIST (Cont'd.)

12. EPA Monticello Field Station

13. Big Oaks Park (During Camping Season)

14. Minnesota Pollution Control Agency DELETED

15. Northern States Power Company
Northwest Division

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: L. Lacey/Quadrex ALARA Review: C D Mathiason Date 3/27/81
Reviewed by: L Nolan Q.A. Review: R L Schmoll Date 3/28/81
Operations Committee Final Review: Meeting Number 948 Date 3/25/81
Approved by: L L Tay Date 3/28/81
Op. Com. Results Review: not req'd 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.

PERSONNEL REQUIREMENTS

A. In the event of an Alert, Site Area, or General Emergency, the following personnel are assigned to report to the TSC, when activated, as determined by the Emergency Director:

Emergency Director
Radiological Emergency Coordinator
Emergency Communicator

The following personnel may report to the TSC if their presence in the Control Room is not necessary:

Plant Supt., Engineering and Radiation Protecton
Plant Supt., Operations and Maintenance
Supt., Technical Engineering
Supt., Operations Engineering
Supt., Maintenance
Supt., Quality Engineering
Supt., Security & Services

B. The Emergency Director will have overall responsibility and everyone else will be responsible for his own specialty as indicated by title.

C. Additional personnel shall be assigned to the TSC as determined by the Emergency Director. Personnel not required to report to the TSC by procedure or at the direction of the Emergency Director shall remain clear of the TSC.

NOTE: Provision is made for the presence of NRC personnel in the TSC and a separate space is available for NRC consultations.

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 in the southeast corner, second floor of the Administration Building (2nd floor Engineers Offices).

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)

D. Communications

The TSC contains the following:

1. NRC Operations-Hotline Telephone (ENS)
2. NRC Health Physics-Dedicated Telephone (HPN)
3. Emergency Operations Facility-Hotline Telephone
4. Control Room-Intercom
5. Operational Support Center-Intercom
6. State EOC-Hotline Telephone
7. Dedicated Telephones

E. Equipment and Facilities

The TSC contains the following:

1. Two Process Computer CRT's (Control Room Repeaters)
2. Meteorological Computer Terminal
3. CRT for Control Room CCTV
4. Offsite Dose Projection Computer Terminal (Normally located at Access Control)

F. TSC Operation

1. Upon determination of an Alert, Site Area Emergency, or General Emergency, the first individual arriving at the TSC shall execute Attachment 1, "TSC Activation Checklist".

2. The Emergency Director will decide whether or not the TSC is equipped to serve its intended function. If it is found unsuitable, the Director will designate certain personnel that should proceed to the Control Room, designate someone to be in charge of the TSC, and then proceed to the Control Room to carry out assigned duties.

NOTE: Habitability Criteria

Radiation protection personnel responsible for radiological surveys in the TSC will notify the Emergency Director if radiation levels exceed any of the following:

Smearable contamination	500 dpm/100 cm^2;
Airborne MPC Ratio	1;
Whole Body Exposure	25 mr/hr

At this notification, the Emergency Director will make a decision to evacuate to the Control Room or stay in the TSC based on his estimate of how long the emergency will persist.

3. TSC personnel respond to requests from the Emergency Director and from Control Room personnel for technical assistance and/or engineering support to mitigate the emergency, to contain radioactivity releases, to provide alternate mechanical and electrical systems to replace or repair those affected by the emergency, to develop emergency operating procedures, and other similar support activities.

4. TSC personnel identify needed assistance and request necessary support from other NSP departments and divisions as appropriate.

5. TSC personnel provide continuing assessment of plant conditions and make appropr recommendations to the Emergency Director.

6. TSC personnel maintain communications with the EOF (if/when manned) and relay information to the EOF as necessary. Perform the functions of the EOF until manned.

PROCEDURE

NOTE: Procedure executed by first person arriving.

STEP 1: Complete TSC Activation Checklist, Form 5790-106-1 (Attachment 1).

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Monticello Nuclear Generating Plant Operating 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 TSC Activation Checklist, Form 5790-106-1

ATTACHMENT 1

Form 5790-106-1, Rev. 0, 03/12/81
Page 1 of 1

Example of
TSC ACTIVATION CHECKLIST

(For Use With Procedure A.2-106)

	Initial
1. The following are turned on:	
Process Computer CRT's	_____
Intercom to OSC	_____
Meteorological Computer Terminal	_____
Control Room CCTV	_____
2. If habitability is of concern, perform radiological survey of the TSC and OSC.	
Results: _____	_____

TSC Activated by: _____

Completed: _____ hours, Date: _____

Emergency Director Notified: _____ 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.

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

Prepared by: L. Lacey/Quadrex ALARA Review: C.D. Mathiaken Date 3/28/81
Reviewed by: _____ Q.A. Review: R.L. Scheimert Date 3/28/81
Operations Committee Final Review: Meeting Number 948 Date 3/25/81
Approved by: T.J. Ferg Date 3/28/81
Op. Com. Results Review: not req'd Mtg.# 948 Date 3/25/81

PURPOSE

This procedure provides 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 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 for in the MNGP Emergency Plan.

PERSONNEL REQUIREMENTS

All Operating personnel not assigned in the Control Room or Technical Support Center (TSC). The senior individual present shall act as OSC Coordinator. Any additional personnel as assigned.

The following personnel, when on plant site shall immediately report to the Operational Support Center when an Emergency Alert, Site Area Emergency or General Emergency is announced.

1. Plant Electricians
2. Members of Relief Shift and other operators on-site and not on duty shift.
3. Radiation Protection Coordinator for Chemistry and the two specialists assigned to Chemistry.

DISCUSSION

A. OSC Function

To provide an assembly area for operations support personnel that is close to the Control Room and likely to be habitable in an emergency.

B. Location

The OSC is located in the Shift Supervisors Office, second floor of the Administration Building just outside of the Control Room.

C. Communications

The OSC contains the following:

1. NRC Operations - Hotline Telephone (ENS)
2. Technical Support Center - Intercom
3. Control Room - Intercom

D. OSC Operation

1. The OSC will be monitored in conjunction with the TSC.

NOTE: Habitability Criteria

Radiation protection personnel responsible for radiological surveys in the TSC/OSC will notify the Emergency Director if radiation levels exceed any of the following:

Smearable Contamination	500 dpm/100 cm^2;
Airborne MPC Ratio	1;
Whole Body Exposure	25 mr/hr.

The Emergency Director will make a decision to evacuate or stay in the OSC based on his estimate of how long the emergency will persist.

2. Respond to requests from the Shift Supervisor, Emergency Director, Shift Technical Advisor, and other Control Room personnel for operational assistance and/or support.

PROCEDURE

STEP 1: Assigned personnel report to the OSC.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Monticello Nuclear Generating Plant Operating 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

None

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

ONSITE MONITORING DURING AN EMERGENCY

A.2-201

Prepared by: L. Lacey/Quadrex ALARA Review: [signature] Date 3/27/81
Reviewed by: [signature] Q.A. Review: RL Scheinost Date 3/28/81
Operations Committee Final Review: Meeting Number 948 Date 3/25/81
Approved by: [signature] Date 3/28/81
Op. Com. Results Review: not req'd Mtg. # 948 Date 3/25/81

PURPOSE

The purpose of this procedure is to provide coordination and direction to on-site radiological monitoring efforts during an emergency at Monticello Nuclear Generating Plant.

CONDITIONS AND PREREQUISITES

A. This procedure applies when an airborne release has occurred and covers radiological monitoring on-site both inside and outside of the plant.

B. The Emergency Director has requested an on-site survey.

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.

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 work or unit, i.e., "millirem".

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

PERSONNEL REQUIREMENTS

Radiological Emergency Coordinator

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, with the assistance and advice of the Radiological Emergency Coordinator, 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 Radiological Emergency Coordinator 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. Normal activated charcoal cartridges will be used for all air samples until such time as field screening, or laboratory analyses performed on the air samples returned from the field, indicate that significant radioiodine may have been released. In that case, silver zeolite cartridges should be used for subsequent sampling. The Radiological Emergency Coordinator will determine which sample media are suitable and will direct the monitoring teams accordingly. If a monitoring team reports an air sample with activity greater than the field screening level on normal activated charcoal cartridge (100 counts greater than background), the monitoring teams should be directed to obtain additional backup samples using silver zeolite cartridges. If the backup silver zeolite cartridge also has an activity in excess of the screening level, both cartridges should be returned to the Plant (or to another designated location) for analysis with laboratory instrumentation as soon as possible. In any case, all sample media obtained by the monitoring teams will be returned to the Plant for 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 will direct the reuse of sample cartridges if warranted. CAUTION: Exposure of charcoal cartridges to high humidity could severely limit collection efficiency.

E. 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.

F. 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.

G. A survey should be performed in the Control Room to verify the reading of the Control Room area radiation monitor, and an air sample for particulate and iodine radioactivity should be obtained, if the monitor indicates the need, or if airborne activity is suspected.

NOTE: Appropriate isotopic identification should be performed on a priority basis if the result of the gross counting of a Control Room air sample exceeds 1 E-9 μCi/cc (less noble gases). Based on this analysis, respirators should be used to maintain personnel exposure less than 40 MPC-hours/week (less noble gases) while minimizing unnecessary respirator use.

PROCEDURE

STEP 1: Use available information (meteorological information, effluent monitors, radiation monitors, etc.) to define sector(s) or area(s) to be monitored. Initiate Form 5790-201-1, ON-SITE MONITORING CHECKLIST (Attachment 1).

a. If in-plant monitoring is indicated, decide area(s) to be monitored and best route for monitoring team(s) to approach area(s).

b. If outside on-site monitoring is indicated, determine the direction of the plume and decide which sector(s) should be monitored. Identify specific locations 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.2-403.

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 Radiation Work Permit(s) and/or Emergency Exposure Authorizations are obtained.

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. Direct backup readings or samples be taken if appropriate. Remind team members to monitor their own exposure.

NOTE: If observed dose rates exceed 10 millirem per hour during out-of-plant monitoring, advise monitoring teams to evacuate the area and seek shelter. (This note refers to airborne particulate and/or halogen radioactivity, not airborne noble gases or shine from the plant itself.)

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 and advise the Emergency Director of results. Implement procedure A.2-402 (Contamination Control) if appropriate. Complete ON-SITE MONITORING CHECKLIST, Form 5790-201-1, Attachment 1.

STEP 9: Implement procedures A.2-404 (Emergency Sampling and Analysis) and A.2-408 (Sample Coordination During an Emergency) as appropriate. Report sample results to the Emergency Director.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Monticello Nuclear Generating Plant Operations Manual

ATTACHMENTS

1. Example of On-Site Monitoring Checklist

ATTACHMENT 1

Form 5790-201-1, Rev. 0, 03/12/81
Page 1 of 1

Example of
ON-SITE MONITORING CHECKLIST

(For Use With Procedure A.2-201)

1. On-site monitoring to be performed at the following locations: _____

_____

_____

_____ _____ _____
REC Initials Time Date

2. Monitoring team(s) briefed and dispatched.

_____ _____ _____
REC Initials Time Date

3. Monitoring team(s) recalled.

_____ _____ _____
REC Initials Time Date

4. Summary of radiological conditions: _____

_____

_____

_____

_____

_____

Reported to Emergency Director:

_____ _____ _____
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.

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: L. Lacey/Quadrex ALARA Review: CdMathews Date 3/27/81
Reviewed by: JWinkelill Q.A. Review: R L Scheinost Date 3/28/81
Operations Committee Final Review: Meeting Number 948 Date 3/25/81
Approved by: F J Fey Date 3/28/81
Op. Com. Results Review: not req'd Mtg. # 948 Date 3/25/81

PURPOSE

The purpose of this procedure is to provide coordination and direction to 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 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 it 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.

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.

PERSONNEL REQUIREMENTS

Radiological Emergency Coordinator

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, with the assistance and advise of the 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 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. Normal activated charcoal cartridges will be used for all air samples until such time as field screening, or laboratory analyses performed on the air samples returned from the field indicate that significant radioiodine may have been released. In that case, silver zeolite cartridges should be used for subsequent sampling. The Radiological Emergency Coordinator will determine which sample media are suitable and will direct the monitoring teams accordingly. If a monitoring team reports an air sample with activity greater than the field screening level on a normal activated charcoal cartridge (100 counts greater than background), the monitoring teams should be directed to obtain additional backup samples using silver zeolite cartridges. If the backup silver zeolite cartridge also has an activity in excess of the screening level, both cartridges should be returned to the Plant (or to another designated location) for analysis with laboratory instrumentation as soon as possible. In any case, all sample media obtained by the monitoring teams will be returned to the Plant for 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 previously used within the plant in areas having noble gas activity as well as

high radioiodine concentrations. The Radiological Emergency Coordinator will direct the reuse of sample cartridges, if warranted. CAUTION: Exposure of charcoal cartridges to high humidity could severely limit collection efficiency.

PROCEDURE

STEP 1: Use available information (meteorological instrumentation, effluent monitors, radiation monitors, etc.) to define sector(s) or location(s) to be monitored. Initiate Form 5790-202-1, OFF-SITE MONITORING CHECK-LIST (Attachment 1).

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.

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.

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. Direct backup readings or samples be taken if appropriate. Remind team members to monitor their own exposure.

NOTE: If observed dose rates offsite exceed 10 millirem per hour, advise monitoring teams to evacuate the area and seek shelter. (This note refers to airborne part and/or halogen radioactivity, not noble gases.)

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 of specified locations.

STEP 7: Upon completion of monitoring, recall monitoring team(s). Instruct team leader to report to the TSC for debriefing, if necessary. Complete OFF-SITE MONITORING CHECKLIST, Attachment 1.

STEP 8: Evaluate monitoring data and advise the Emergency Director of results.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Monticello Nuclear Generating Plant Operations Manual

ATTACHMENTS

1. Example of Off-site Monitoring Checklist, Form 5790-202-1

ATTACHMENT 1

Form 5790-202-1, Rev. 0, 03/12/81
Page 1 of 1

Example of
OFF-SITE MONITORING CHECKLIST
(For Use With Procedure A.2-202)

1. Off-site monitoring to be performed at the following location(s): _____

_____

_____

REC Initial _____ Time _____ Date _____

2. Monitoring team(s) briefed and dispatched.

REC Initial _____ Time _____ Date _____

3. Monitoring team(s) recalled.

REC Initial _____ Time _____ Date _____

4. Summary of radiological conditions: _____

_____

_____

_____

_____

_____

_____

Reported to Emergency Director:

REC 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.

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

EVACUATION CRITERIA FOR ON-SITE PERSONNEL

A.2-203

Prepared by: L. Lacey/Quadrex ALARA Review: C D Mathiasen Date 3/27/81
Reviewed by: J Windschill Q.A. Review: RL Scheinost Date 3/28/81
Operations Committee Final Review: Meeting Number 948 Date 3/25/81
Approved by: [signature] Date 3/28/81
Op. Com. Results Review: not req'd Mtg. # 948 Date 3/25/81

PURPOSE

This procedure provides criteria for making evacuation decisions for radiologically affected areas within the Monticello Nuclear Generating Plant and adjacent areas on-site. This procedure applies to local, plant and site evacuations; it does not apply to evacuation of members of the general public from affected areas off-site. 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.

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

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

PRECAUTIONS

A. 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.

B. 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.

C. The evacuation criteria specified in Attachment 1 are based on the recommendations of the National Council on Radiation Protection (NCRP), and apply only to emergency situations in which the increased personnel exposure is necessary to mitigate the consequences of an accident. Such exposures, although technically justifiable, are in excess of Federal radiation exposure standards and are therefore not applicable to non-emergency situations, or to most recovery operations following an emergency. Evacuations or any other appropriate protective actions should be implemented to maintain exposure of non-essential personnel as low as is reasonably achievable and within normal MNGP radiation exposure guidelines and limits. Refer to A.2-401, (Emergency Exposure Control) for additional emergency exposure requirements.

PERSONNEL REQUIREMENTS

Radiological Emergency Coordinator - procedure implementation
Emergency Director - evacuation decision

DISCUSSION

The Emergency Director (Shift Supervisor, until relieved) is responsible to ensure that an appropriate evacuation is implemented when radiological conditions warrant such action. The Radiological Emergency Coordinator is responsible, through implementation of this procedure, to recommend that an appropriate evacuation be implemented when warranted.

PROCEDURE

NOTE: 1. Recommendations will be made to the Emergency Director.
2. Initiate Form 5790-203-1, EVACUATION CRITERIA CHECKLIST, (Attachment 2)

STEP 1: Local Evacuation

a. Recommend Local Evacuation of the affected area if one or more of the following conditions exist:

1. The whole body dose rate or radioiodine concentration in an area exceeds the Criteria for Mandatory Evacuations (Attachment 1). Evacuation shall be implemented within the time ranges specified.

2. Alarm on an area radiation monitor.

3. Alarm or indication in excess of 10 times MPC on an airborne particulate or gas monitor, or air sample.

4. Alarm on a portable radiation monitor or continuous air monitor (CAM).

5. Results of surveys with portable survey instruments indicating significant unexpected increases in area radiation levels.

6. Fire, toxic or flammable gases, or heavy smoke in any occupied area.

b. Recommend a Local Evacuation of the Control Room only after respiratory protective equipment and other protective measures prove inadequate. Evacuation should only be recommended when one or more of the following conditions occur:

1. Uncontrolled fire, toxic or flammable gases, or heavy smoke in the Control Room.

2. Radiation dose rates, radioiodine concentrations and associated permissible occupancy times (Attachment 1) are exceeded.

c. A Local Evacuation of the Reactor Building should be recommended in accorance with the criteria listed in STEP 1.a previously.

STEP 2: Plant Evacuation

a. A plant evacuation should be recommended within the time range specified in Attachment 1 for each range of dose rates or radioiodine concentrations when they prevail in wide areas of the plant.

b. A plant evacuation should be considered when:

1. Multiple valid radiation monitor alarms indicate a widespread problem (large area-non-localized).

2. The radiological conditions in any Clean Area of the plant may result in personnel exposure rates in excess of 2.5 mrem/hr from uncontrolled sources of radiation.

NOTE: If the primary Assembly Point is effected, an alternate Assembly Point should be designated or a Site Evacuation should be recommended.

STEP 3: Site Evacuation

a. A Site Evacuation should be recommended within the times specified in Attachment 1 for each range of dose rates or radioiodine concentrations prevailing in the affected areas. The primary difference between a Plant and Site Evacuation is the size of the affected area.

b. A Site Evacuation should be considered when:

1. Significant ground level releases have occurred or are projected.

2. Other safety hazards, such as toxic gases, fire, or flammable gases which affect large areas of the plant and/or site.

3. Adverse weather conditions, such as floods, hurricanes, or tornados, are present or are expected to occur. In the case of adverse weather, advance weather warnings will normally provide adequate time for an orderly dismissal of plant personnel, without the need for evacuation.

STEP 4: Submit recommendation to Emergency Director for review and implementation (if applicable).

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. Criteria for Mandatory Evacuations

2. Example of Evacuation Criteria Checklist, Form 5790-203-1

Attachment #1
Page 1 of 1

CRITERIA FOR MANDATORY EVACUATIONS[1]

WHOLE BODY[2] DOSE RATE (mrem/hr)	IMPLEMENT EVACUATION WITHIN	RADIOIODINE[3] CONCENTRATION (µCi/cc)
Up to 600	8 Hours	Up to 1E-5
600 to 1000	4 Hours	1E-5 to 2E-5
1000 to 2500	2 Hours	2E-5 to 4E-5
2500 to 5000	1 Hour	4E-5 to 7E-5
5000 to 10,000	30 Minutes	7E-5 to 1E-4
10,000 to 20,000	15 Minutes	1E-4 to 3E-4
> 20,000	IMMEDIATELY	> 3E-4

1. It is important to realize that there is no direct correlation between the whole body dose rates and radioiodine concentrations; and the measurements or projections of each must be performed independently. In the event that only a direct radiation determination is available, with no corresponding knowledge of the concentration or fraction of the total which is attributable to radioiodine, the most conservative assumptions specified in the USEPA Manual for Protective Action Guides would be required. Such assumptions, based only on direct radiation determinations, would likely result in gross over-estimation of thyroid dose commitment.

2. Whole body dose to non-emergency personnel should not exceed 5000 mrem from the event. The whole body dose rates specified above are based on 5000 mrem. This value is based on the USEPA PAG Manual specified upper limit for members of the general public. Although this table specifies mandatory evacuation times, in the absence of significant constraints evacuations should be implemented to maintain personnel exposure as low as reasonably achievable and within specified quarterly exposure limits.

3. Maximum concentrations for specified time corresponds to approximately 25,000 mrem adult thyroid dose commitment. Radioiodine concentration vs. adult thyroid dose commitment is based on Appendix D, (January, 1979) to USEPA Manual of Protective Action Guides. Radioiodine nuclide distribution corresponds to 4 hours following reactor shutdown.

ATTACHMENT 2

Form 5790-203-1, Rev. 0, 03/12/81
Page 1 of 1

Example of
EVACUATION CRITERIA CHECKLIST
(For Use With Procedure A.2-203)

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

_____ _____

_____

_____ _____ _____
REC Initials Time Date

2. Area(s) affected: _____

_____

_____ _____ _____
REC Initials Time Date

3. Precaution: Section of Procedure A.2-203 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 Direct 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.

EMPROC1L

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: L. Lacey/Quadrex ALARA Review: G Mathisen Date 3/29/81
Reviewed by: J. Windhill Q.A. Review: RL Scheuret Date 3/29/81
Operations Committee Final Review: Meeting Number 948 Date 3/25/81
Approved by: [signature] Date 30MAR81
Op. Com. Results Review: not req'd Mtg. # 948 Date 3/25/81

PURPOSE

This procedure provides guidance for the Radiological Emergency Coordinator to use in making recommendations for offsite protective actions to State and local emergency authorities. The Emergency Director retains the non-delegatable authority to make such recommendations, but he will normally do so with the advice of the Radiological Emergency Coordinator. Monticello Nuclear Generating Plant is required to make such recommendations if the nature and severity of the actual or potential radioactivity release warrants protective actions for the general public.

CONDITIONS AND PREREQUISITES

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

B. Initial assessment actions have been taken and a dose projection has been made as per Procedure A.2-406 (Off-Site Dose Projection) and this projection indicates the need for offsite protective actions.

PRECAUTIONS

Initiation of protective actions for offsite areas is the responsibility of the State of Minnesota. The Emergency Director will make recommendations for protective actions if it is determined by the Radiological Emergency Coordinator that they are necessary. Recommendations will be directed to the State EOC and will come directly from the Emergency Director. If it is determined by NSP that, due to the nature of the emergency, immediate protective actions should be initiated at the local level, the recommendation will be made directly to the Local authorities if the State EOC is not yet manned or otherwise unable to respond in a timely manner.

PERSONNEL REQUIREMENTS

Radiological Emergency Coordinator - procedure implementation
Emergency Director - decisions to make offsite protective action recommendations

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.

1. No protective action may be necessary for incidents involving actual or potential radioactivity releases which are projected to result in whole body doses less than 100 mrem or thyroid doses less than 200 mrem* to members of the general public.

2. Sheltering of members of the general public within affected areas should be recommended, as a minimum, for incidents involving actual or potential radioactivity releases which are projected to result in doses greater than 100 mrem or thyroid doses greater than 200 mrem*, but less than 1 rem whole body/5 rem thyroid (child).

3. Recommendations shall be made to downstream water treatment plants to secure taking water from the Mississippi River for liquid releases projected to exceed the concentration of radionuclides that will cause a whole body equivalent exposure of 48 mrem. This is equivalent to 12 times the EPA Primary Drinking Water Standards as measured at the water treatment plant discharge (to the public distribution system).

* This 200 mrem is for an adult thyroid. An infant exposed to the same conditions may receive a dose to the thyroid which is 3 times greater than the adult dose.

B. Protective Action Options

1. 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.

2. 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. An estimate of the time necessary to effect an evacuation of the entire MNGP emergency planning zone (10 mile radius) is approximately 3.3 hours following notification of county officials. However, this time estimate is expected to increase by 30% in inclement weather. 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.

3. 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.

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 pie whole 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 or 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 large inadvertant release to the Mississippi River corresponding to Alert level or greater, estimate the volume and amount of radioactivity released. Initiate Form 5790-204-1 OFF-SITE PROTECTIVE ACTION RECOMMENDATION CHECKLIST, Attachment 8.

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

STEP 3: Advise Emergency Director to make the recommendations for appropriate off-site protective actions (see Form 5790-204-1, Attachment 8, for contact information):

NOTE: State and Local authorites will assess hazard and take protective action if necessary.

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.

STEP 2: Using meteorological data, determine the plume direction and wind speed. Evaluate the potential for wind direction shifting.

STEP 3: Evaluate plant parameter to approximate how long the release will continue; or if the release has not started yet, how long until the release does start and how long it will continue.

STEP 4: Using the data accumulated in the foregoing steps, determine the appropriate protective action recommendation by utilizing Attachments 3, 4 and 5.

NOTE: Attachments 6 and 7 may be used to determine the effectiveness of sheltering.

STEP 5: Determine the affected area.

STEP 6: Advise the Emergency Director to make the recommendation for appropriate off-site protective action.

a. Identify the affected area(s) by radius. (For example: "Evacuate within a 5 mile radius, seek shelter beyond 5 miles".)

b. If the wind variability permits, use sector numbers. (For example: "Evacuate within a 5 mile radius and in sectors C and D to 10 miles. Seek shelter in all other sectors to 10 miles".)

NOTE: State and Local Authorities will assess hazard and make protective action if necessary.

STEP 7: If, as a result of continuing assessment, dose projection result 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. USEPA 570/9-76-003 "National Interim Primary Drinking Water Regulations"
6. Title 10 Code of Federal Regulations Part 50, Appendix E

ATTACHMENTS

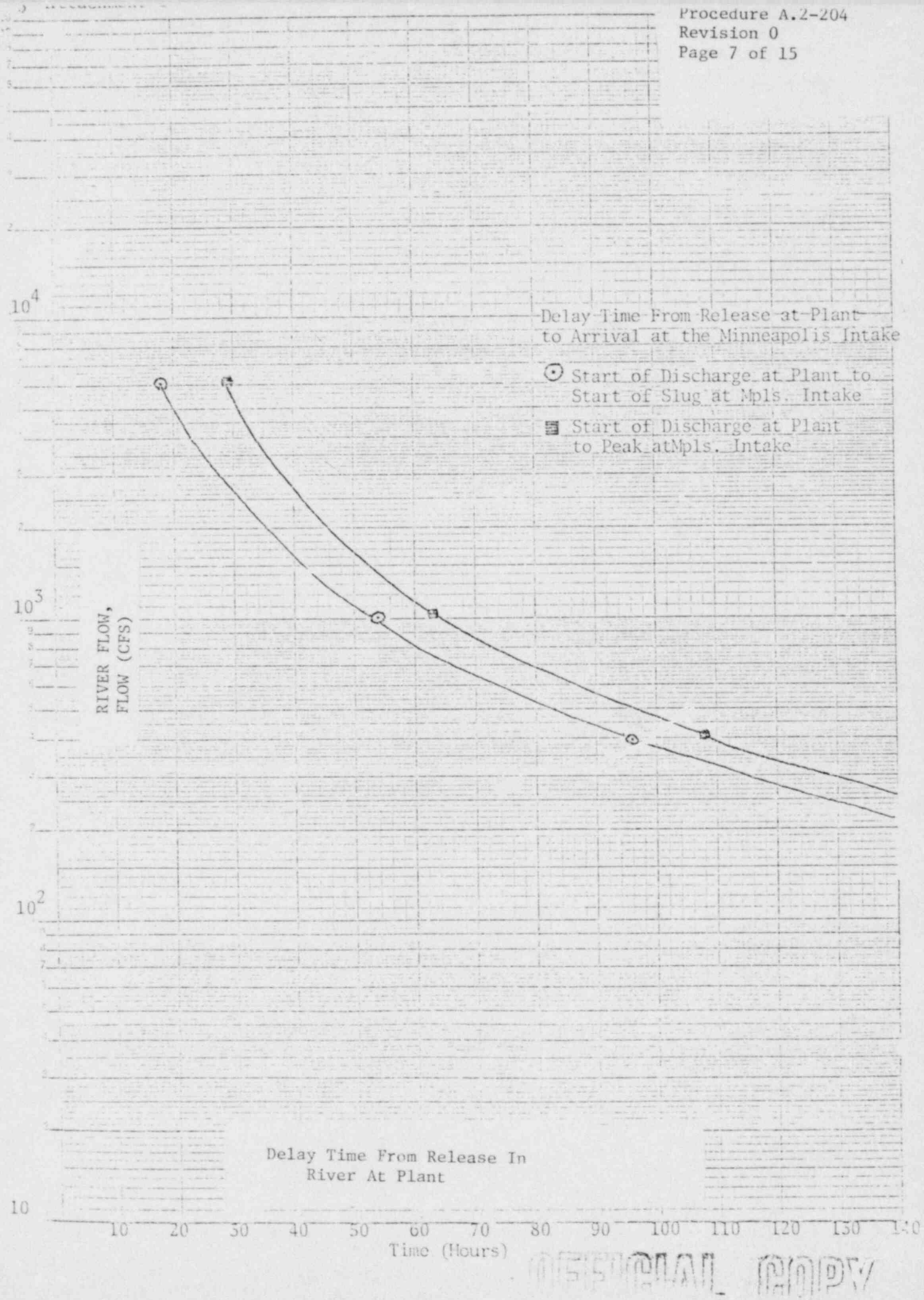
1. Delay Time from Release in River at Plant to Arrival at Minneapolis Intake
2. Delay Time from Release in River at Plant to Arrival at St. Paul Intake
3. Recommended Protective Actions to Avoid Whole Body and Thyroid Dose From Exposure to Gaseous Plume
4. Guidelines for Protection Against Ingestion of Contamination
5. Recommended Protective Actions (by Accident Phase)

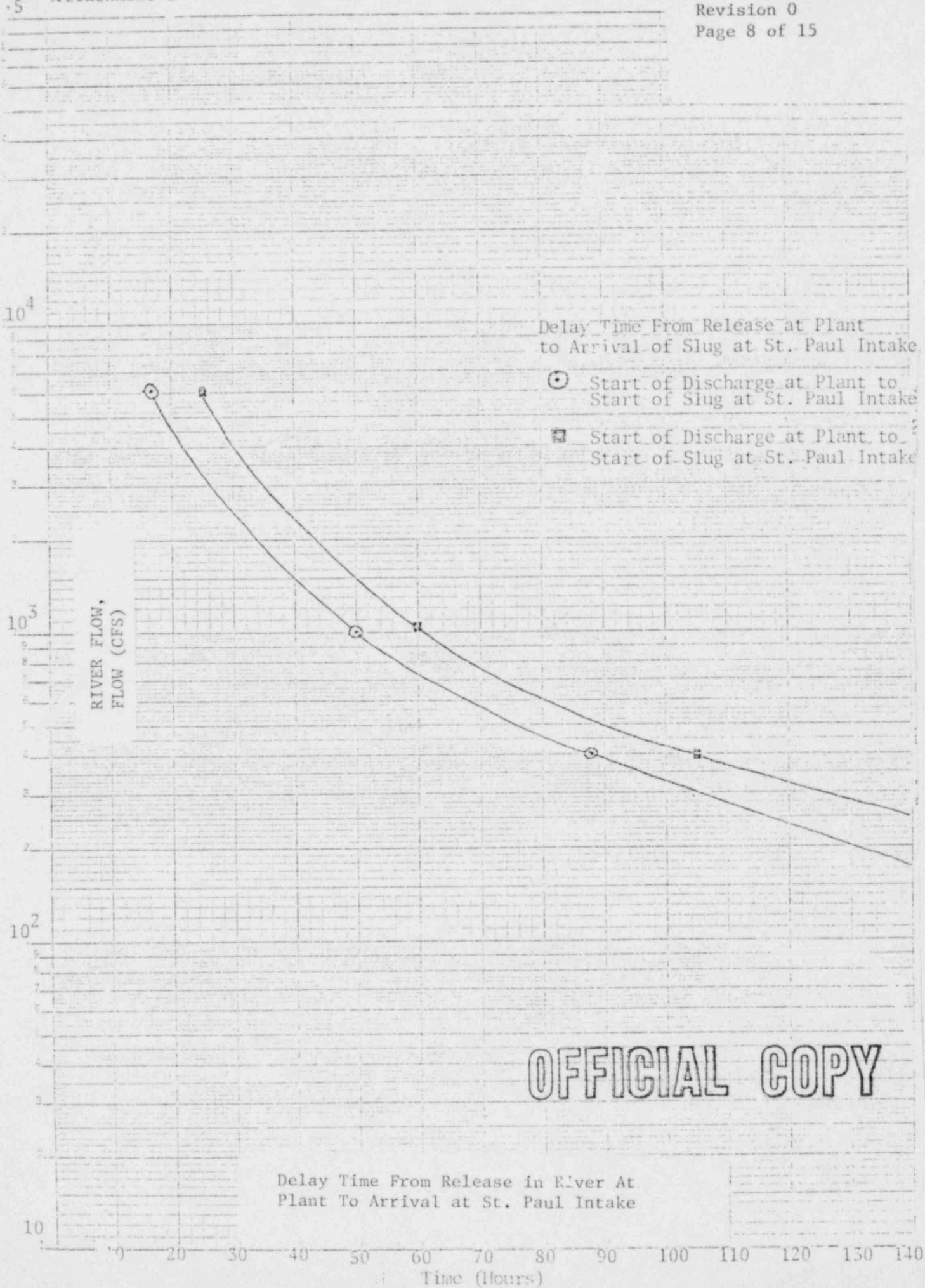
ATTACHMENTS (Cont'd.)

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.





Delay Time From Release in River At Plant To Arrival at St. Paul Intake

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 Thyroid < 5 (child)	No planned protective actions. [b] Issue an advisory to seek shelter and await further instructions. Monitor environmental radiation levels.	Previously recommended protective actions may be reconsidered or terminated.
Whole Body 1 to < 5 Thyroid 5 to < 25 (child)	Seek shelter as a minimum. Consider evacuation. Evacuate unless constraints make it impractical. Monitor environmental radiation levels. Control access.	If constraints exists, special consideration should be given for evacuation of children and and pregnant women.
Whole Body 5 and above Thyroid 25 and above (child)	Conduct mandatory evacuation. Monitor environmental radiation levels and adjust area for mandatory evacuation based on these levels. Control access.	Seeking shelter would be an alternative if evacuation were not immediately possible.
Projected Dose (Rem) To Emergency Workers		
Whole Body 25 Thyroid 125	Control exposure of emergency team members to these levels except for lifesaving missions. (Appropriate controls include time limitations, respirators and thyroid prophylaxis.)	Although respirators and thyroid prophylaxis should be used where effective to control dose to emergency workers, Thyroid dose should not be the limiting factor for lifesaving missions.
Whole Body 75	Control exposure of emergency team members performing a 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.

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-accider
   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

Nuclide*	Concentration in Milk or Water (0.5 rem WB or bone: 1.5 Rem Thyroid) Preventive Level (μCi/l)	Concentration in Milk or Water (5 rem WB or bone: 15 Rem Thyroid) Emergency Level (μCi/l)	Total Intake via all Food & Water Pathways Preventive (μCi)	Total Intake via all Food & Water Pathways Emergency (μCi)	Pasture Grass (Fresh Weight) Preventive (μCi/kg)	Pasture Grass (Fresh Weight) Emergenc (μCi/kg)
I-131 (Thyroid)	0.012	0.12	0.09	0.9	0.27	2.
Cs-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. 24 December 15, 1978.

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, radioiodine, or particulate	Evacuation, shelter, access control, respiratory protection, prophylaxis (thyroid protection).
	Direct whole body exposure	Evacuation, shelter, access control
INTERMEDIATE PHASE[2] (24 hours to 30 days) *	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.
	Whole body exposure and inhalation	Relocation, decontamination, access control.
LONG TERM PHASE[3] (Over 30 days)*	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.
	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.

EMPROC2H

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)

ATTACHMENT 8

Form 5790-204-1, Rev. 0, 03/12/81
Attachment 8
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: _____

   _____ _____ _____
   REC Initials Time Date

2. Communicated release information to Emergency Director.

   _____ _____ _____
   REC Initials Time Date

FOR GASEOUS/AIRBORNE RELEASES:

1. Results of off-site dose projection: _____

   _____

   _____ _____ _____ _____
   REC Initials Time Date

2. Plume direction _____. Windspeed _____ mph.

   Prognosis for wind direction shifting: _____

   _____ _____ _____ _____
   REC Initials Time Date

ATTACHMENT 8 (Cont'd.)

Form 5790-204-1, Rev. 0, 03/12/81
Attachment 8
Page 2 of 2

3. Duration (estimate if necessary) of release: _____

REC Initials _____ Time _____ Date _____

4. Protection action(s) recommended: _____

_____

_____.

REC Initials _____ Time _____ Date _____

Completed: _____
Radiological Emergency Coordinator Time _____ Date _____

5. Affected area(s): _____

_____.

REC Initials _____ Time _____ Date _____

6. Protective action recommendations reviewed with the Emergency Director.

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 the Emergency Records.

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-CONTROL ROOM/TSC/OSC

A.2-205

Prepared by: L. Lacey/Quadrex ALARA Review: C.D. Mathiesen Date 3/27/81
Reviewed by: K Nolan Q.A. Review: R L Scheimet Date 3/28/81
Operations Committee Final Review: Meeting Number 948 Date 3/25/81
Approved by: [signature] Date 3/28/81
Op. Com. Results Review: not req'd Mtg. # 948 Date 3/25/81

PURPOSE

This procedure provides instructions for accounting for site personnel and visitors in the event of an evacuation of plant areas. This procedure applies specifically to: 1) local evacuations and 2) maintaining accountability of emergency personnel and other essential personnel remaining behind during a plant or site evacuation.

This procedure is primarily directed at accountability for evacuations initiated by actual or imminent radiological conditions. It also applies, where appropriate, to evacuations related to other habitability hazards, such as toxic gases or fire, etc.

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.

PERSONNEL REQUIREMENTS

Emergency Director/Shift Supervisor

DISCUSSION

A. The Emergency Director is responsible for ensuring personnel accountability under two circumstances: 1) in the event of a local evacuation or 2) for individuals involved with emergency organization activities and remaining behind in a plant or site evacuation. He is further responsible for initiating search and rescue activities, if necessary.

B. If a plant or site evacuation follows a local evacuation, Personnel Accountability will proceed according to Procedure A.2-206.

PROCEDURE

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: 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.

STEP 3: Instruct the available personnel 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).

Emergency Organization - Essential Personnel
(For Use in a Plant or Site Evacuation)

STEP 1: Compile a list of names and badge numbers for all personnel present in the Control Room, OSC and TSC. Transmit the list to the Assembly Point Coordinator. Initiate Personnel Accountability-Plant or Site Evacuation Checklist, Form 5790-205-2 (Attachment 2).

STEP 2: If a hazard exists for areas outside of the Protected Area, consider expanding accountability to cover personnel in Owner-Controlled Area.

STEP 3: 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. Page the individual
b. Confer with the individual's supervisors or co-workers
c. Conduct brief searches of the last known location, if possible
d. Call the individuals home
e. Report back with any information relating to a-d

STEP 4: If any individual remains unaccounted for following STEP 3, and the individual may be in a hazardous area, trapped, or injured, instruct the Emergency Team Leader to conduct Search and Rescue Activities (Procedure A.2-303). Complete Personnel Accountability-Plant or Site Evacuation Checklist, Form 5790-205-2 (Attachment 2).

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

2. Example of Personnel Accountability - Plant or Site Evacuation Checklist, Form 5790-205-2

ATTACHMENT 1

Form 5790-205-1, Rev. 0, 03/12/81
Page 1 of 1

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

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

ED/SS Initials _____ Time _____ Date _____

2. Individual(s) Unaccounted For:

ED/SS Initials _____ Time _____ Date _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

3. Paged individuals unaccounted for.

ED/SS Initials _____ Time _____ Date _____

4. Contacted available personnel if appropriate (implement A.2-303).

ED/SS 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.

EMPROC3F

ATTACHMENT 2

Form 5790-205-2, Rev. 0, 03/12/81
Page 1 of 1

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

1. Compiled list and transmitted to Assembly Point Coordinator.

ED/SS Initials _____ Time _____ Date _____

2. Individual(s) Unaccounted For:

ED/SS Initials _____ Time _____ Date _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

3. Attempted to locate unaccounted for individual(s).

ED/SS Initials _____ Time _____ Date _____

4. Contacted Emergency Team Leader, if appropriate (A.2-303).

ED/SS 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.

EMPROC3F

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 AND SURVEYS-
ASSEMBLY POINTS

A.2-206

Prepared by: L. Lacey/Quadrex ALARA Review: C D Mathias Date 3/27/81
Reviewed by: R Nolan Q.A. Review: RL Scheuer Date 3/28/81
Operations Committee Final Review: Meeting Number 948 Date 3/25/81
Approved by: J L Ley Date 3/28/81
Op. Com. Results Review: not req'd Mtg. # 948 Date 3/25/81

PURPOSE

The purpose of this procedure is to provide instructions for surveying and accounting for site personnel and visitors in the event of a plant or site evacuation at Monticello Nuclear Generating Plant.

Normal security procedures provide the means for compiling a list of all personnel on site at any given time. This procedure is a means of verifying that list and until all persons are accounted for, this procedure is not complete.

CONDITIONS AND PREREQUISITES

A. An emergency condition has occurred at Monticello Nuclear Generating Plant resulting in radiological and/or other hazardous conditions, making plant and/or site evacuation to unaffected areas necessary (Procedure A.2-104, "Site Area Emergency", A.2-105, "General Emergency", or A.2-301, "Emergency Evacuation").

NOTE: This procedure is applicable only to Plant and Site Evacuations; it does not apply to evacuation of members of the general public from affected areas beyond site boundaries or for Local Evacuations.

B. Procedure A.2-302 (Assembly Point Activation) has been implemented and the assembly area has been deemed safe.

PRECAUTION

If the Assembly Point is found to be unsafe for any reason after inhabitation, the Emergency Director should be contacted and evacuation to a habitable Assembly Point should be initiated.

PERSONNEL REQUIREMENTS

A. Assembly Point Coordinator
B. Duty Shift Security Force Member
C. Radiation Protection Personnel

DISCUSSION

A. In the event a Plant or Site Evacuation is necessary at MNGP, the first priority is to account for all individuals on site/within the owner-controlled area. In such a situation, all non-essential personnel will report to an assembly point. This procedure will be implemented from that location. The Assembly Point Coordinator will supervise activities with the assistance of the Security Force Member, if necessary.

B. The Emergency Director will be responsible for accounting for personnel having emergency assignments and for accounting for personnel involved in a Local Evacuation (Procedure A.2-205). Search and Rescue activities (Procedure A.2-303) may be implemented by the Emergency Director as appropriate.

C. In accounting for personnel, documents brought to the Assembly Area by the Security Guard(s) will be utilized and include the following:

1. Computer Printout of Active Employees Onsite (EONS)

2. Visitor Register

3. Guards Sign-In Log

4. Owner-Controlled Area Log

D. Radiological Contamination Survey Instruments (friskers) will also be available at the assembly area for monitoring personnel. Many of the individuals may have been monitored before entering Assembly Point per Procedure A.2-407 (Personnel and Vehicle Monitoring) and need not be monitored again. If high background radiation makes contamination monitoring impractical, this function (and possibly the entire Assembly Point) should be relocated to a low background area.

E. If a Site Evacuation is implemented following assembly of personnel in the Primary (or Alternate) Assembly Points, personnel assembled will be directed offsite from the assembly area to the Offsite Assembly Point. The Assembly Point Coordinator and Security personnel will ensure that all personnel that have been accounted for, exit the site. No further accountability is required if accountability was complete at the primary (or alternate) Assembly Point.

F. The Assembly Point Coordinator will be responsible for ensuring that all individuals remain at the Assembly Point until otherwise directed by the Emergency Director.

PROCEDURE

STEP 1: Notify the Guard's Station. Ensure that a guard will be immediately reporting to the Assembly Point with appropriate personnel lists. Initiate Personnel Accountability Checklist, Form 5790-206-1 (Attachment 1).

STEP 2: Refer to the EONS List and/or other appropriate logs. Check names off as personnel are found present.

NOTE 1: Instruct individuals to step from one area (or room) to another and state their name and badge number.

NOTE 2: The Security Guard will aid the Assembly Point Coordinator in this step and any others, especially in establishing and maintaining orderliness.

STEP 3: Upon request of Emergency Director, direct a security force member to account for persons signed into the Owner Controlled Area Log. These persons are to be escorted to the Assembly Point.

STEP 4: Delegate the senior radiation protection personnel (or other qualified individual) present to provide contamination surveys to individuals as their names are checked (if appropriate).

STEP 5: Obtain list of names and badge numbers of personnel in the Control Room, TSC and OSC. (Emergency Director will assure that list is transmitted when compiled.)

STEP 6: Contact the Emergency Director. Relate to him the names of all personnel unaccounted for.

STEP 7: If it is requested by the Emergency Director, conduct interviews of personnel at the Assembly Point to get additional information as to the possible whereabouts of unaccounted for personnel.

STEP 8: If at any time conditions at the Assembly Point are found unsafe, contact the Emergency Director and report conditions.

STEP 9: Ensure that all individuals remain at the Assembly Point until otherwise directed by the Emergency Director.

STEP 10: Complete Personnel Accountability Checklist, Form 5790-206-1 (Attachment 1).

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 Personnel Accountability Checklist

ATTACHMENT 1

Form 5790-206-1, Rev. 0, 03/12/81
Page 1 of 1

Example of
PERSONNEL ACCOUNTABILITY CHECKLIST
(For Use With Procedure A.2-206)

1. Notified Guard's Station.

_____ _____ _____
APC Initials Time Date

2. Checked names of persons at Assembly Point/Personnel Monitoring initiated, if necessary.

_____ _____ _____
APC Initials Time Date

3. Completed accounting and personnel monitoring.

_____ _____ _____
APC Initials Time Date

4. Emergency Director contacted. The following personnel reported unaccounted for:

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

_____ _____ _____
APC Initials Time Date

5. Assembly Point Conditions reported, if appropriate.

_____ _____ _____
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 Emergency Records.

EMPROC3B

Op. 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: L. Lacey/Quadrex ALARA Review: C D Mathison Date 3/27/81
Reviewed by: J Winkelhill Q.A. Review: R L Scheinost Date 3/28/81
Operations Committee Final Review: Meeting Number 948 Date 3/25/81
Approved by: ___ Date 3/28/81
Op. Com. Results Review: not req'd 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.

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 be applicable to all Local Evacuations.

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

"ATTENTION ALL PLANT PERSONNEL: THERE IS A (HIGH RADIATION LEVEL/FIRE/- OTHER HAZARD -) INDICATED IN - SPECIFY AREA -. PERSONNEL IN AFFECTED AREAS SHOULD EVACUATE TO - SPECIFY LOCATION -."

Provide any additional instructions necessary.

STEP 2: Repeat the alarm and announcement two additional times at approximately one minute intervals. Initiate Emergency Evacuation Checklist, Form 5790-301-1 (Attachment 1).

STEP 3: Ensure that appropriate portions of procedure A.2-205 (Personnel Accountability) are implemented.

STEP 4: Implement the following procedures as appropriate and if not already implemented:

1. A.2-201 (On-site Monitoring During an Emergency). Ensure that Assembly Points are monitored.

2. A.2-303 (Search and Rescue).

NOTE: Search and rescue operations and emergency surveys shall be performed in accordance with Procedure A.2-401 (Emergency Exposure Control).

STEP 5: On the basis of radiation surveys performed in the affected area, allow personnel to return to the area, or direct radiation protection personnel to establish appropriate access control provisions until radiological conditions permit relaxing access controls.

STEP 6: Complete Emergency Evacuation Checklist, Form 5790-301-1 (Attachment 1).

Plant Evacuation

STEP 1: Initiate evacuation siren if not already initiated.

STEP 2: Have the following announcement made over the public address system:

> "ATTENTION, ALL PLANT PERSONNEL: THERE IS A (HIGH RADIATION LEVEL/FIRE/ - OTHER HAZARD -) INDICATED IN THE - SPECIFY AREA -. ALL UNASSIGNED PERSONNEL REPORT IMMEDIATELY TO YOUR DESIGNATED ASSEMBLY POINT AND AWAIT FURTHER INSTRUCTIONS. PERSONNEL WITH EMERGENCY ASSIGNMENTS REPORT TO YOUR ASSIGNED LOCATIONS."

Provide any additional instructions necessary.

STEP 3: Repeat announcement two additional times at approximately one minute intervals. Initiate Emergency Evacuation Checklist, Form 5790-301-2 (Attachment 2).

STEP 4: Ensure that apppropriate portions of procedures A.2-205 Personnel Accountability) are implemented.

STEP 5: Direct the Radiological Emergency Coordinator to implement Procedure A.2-407, "Personnel And Vehicle Monitoring".

STEP 6: Implement the following procedures as appropriate and if not already implemented:

1. A.2-201 (Onsite Monitoring During an Emergency). Ensure that Assembly Points are monitored.
2. A.2-303 (Search and Rescue).

NOTE: Search and rescue operations and emergency surveys shall be performed in accordance with Procedure A.2-401 (Emergency Exposure Control).

STEP 7: On the basis of radiation survey performed in the affected area, allow personnel to return to their normal work station or evacuate them to an off-site assembly point.

STEP 8: If personnel are to be allowed to return to their normal work locations (with the exception of those areas still affected, if applicable) have the following announced over the public address system 3 times:

"ATTENTION ALL PLANT PERSONNEL: ALL PERSONNEL - SPECIFY EXCEPTIONS, IF ANY - MAY RETURN TO THEIR NORMAL WORK LOCATIONS AND RESUME WORK."

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 remote assembly area for monitoring. If all remote 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 remote assembly areas are the EOF and the NSP Service Center in Monticello.) In this event, vehicles will be monitored as provided in the emergency plans of the affected jurisdiction.

STEP 1: If time allows, 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: If time allows, direct Security to provide appropriate personnel to direct traffic on-site and at the intersection of the site access road and RTE 75 - depending on other operations, State Police or local police will 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.

STEP 3: Sound the Site Evacuation Alarm.

STEP 4: Have one of the following announcements made over the public address system:

> "ATTENTION, ALL PLANT PERSONNEL: ALL PERSONNEL EXCEPT THOSE INDIVIDUALS 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 THE OFF-SITE ASSEMBLY POINT AT - SPECIFY LOCATION - AND AWAIT FURTHER INSTRUCTION."
>
> or,
>
> "ATTENTION ALL PLANT PERSONNEL: ALL PERSONNEL EXCEPT THOSE WITH EMERGENCY ASSIGNMENTS SHALL EVACUATE THE SITE IMMEDIATELY. PROCEED IN YOUR CAR TO - SPECIFY LOCATION - AND AWAIT FURTHER INSTRUCTIONS."

Provide any additional instruction necessary.

STEP 5: Repeat the alarm and announcement two additional times at approximately one minute intervals. Initiate Emergency Evacuation Checklist, Form 5790-301-3 (Attachment 3).

STEP 6: Ensure that Procedure A.2-205 (Personnel Accountability) is implemented.

STEP 7: Implement the following procedures as appropriate and if not already implemented:

1. A.2-201 (On-site Monitoring During an Emergency). Ensure that Assembly Points are monitored.

2. A.2-303 (Search and Rescue).

NOTE: Search and rescue operations and emergency surveys shall be performed in accordance with Procedure A.2-401 (Emergency Exposure Control).

STEP 8: Direct the Radiological Emergency Coordinator to assign Radiation Protection personnel to perform contamination monitoring at the remote assembly area or on-site as conditions dictate. A representative number of vehicles should be monitored if practicable in accordance with Procedure A.2-407 (Personnel and Vehicle Monitoring).

STEP 9: Upon completion of personnel accountability procedures, instruct assembled personnel to go home, return to work, or to relocate to another area, as necessary. To minimize traffic congestion, any movement of off-site personnel should be coordinated with State and local officials.

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

ATTACHMENT 1

Form 5790-301-1 , Rev. 0, 03/12/81
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. Implemented the following Procedures as indicated:

A.2-201 (On-Site Monitoring)

ED Initials _____ Time _____ Date _____

A.2-303 (Search and Rescue)

ED Initials _____ Time _____ Date _____

3. Summary of survey results: _____

_____

_____

Directed the following actions: (Plant Evacuation/Site Evacuation/Other: ___

_____

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.

ATTACHMENT 2

Form 5790-301-2, Rev. 0, 03/12/81
Page 1 of 1

Example of
EMERGENCY EVACUATION CHECKLIST

PLANT EVACUATION

(For Use With Procedure A.2-201)

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

2. The following procedures implemented as indicated:

A.2-205 (Personnel Accountability) _____ _____ _____
ED Initials Time Date

A.2-407 (Personnel & Vehicle Monitoring) _____ _____ _____
ED Initials Time Date

A.2-201 (On-Site Monitoring) _____ _____ _____
ED Initials Time Date

A.2-203 (Search and Rescue) _____ _____ _____
ED Initials Time Date

3. Summary of survey results: _____

_____

_____

Directed the following actions: (Site Evacuation/Other: _____

_____)

_____ _____ _____
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.

EMPROC4E

ATTACHMENT 3

Form 5790-301-3, Rev. 0, 03/12/81
Page 1 of 1

Example of
EMERGENCY EVACUATION CHECKLIST

SITE EVACUATION

(For Use With Procedure A.2-301)

1. Declared - Site Evacuation.

_____ _____ _____
ED Initials Time Date

2. Mobilized radiological monitoring stations (A.2-405) and Security Force.

_____ _____ _____
ED Initials Time Date

3. Announced a Site Evacuation.

_____ _____ _____
ED Initials Time Date

4. The following procedures implemented as indicated:

A.2-205 (Personnel Accountability)

_____ _____ _____
ED Initials Time Date

A.2-201 (On-Site Monitoring)

_____ _____ _____
ED Initials Time Date

A.2-303 (Search and Rescue)

_____ _____ _____
ED Initials Time Date

5. Instructed assembled personnel to (go home/return to work/other: _____)

_____ _____ _____
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.

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

ASSEMBLY POINT ACTIVATION

A.2-302

Prepared by: L. Lacey/Quadrex ALARA Review: C&M Mathieu Date 3/27/81
Reviewed by: R Nolan Q.A. Review: RL Scheuerle Date 3/28/81
Operations Committee Final Review: Meeting Number 948 Date 3/25/81
Approved by: JJ Fay Date 3/28/81
Op. Com. Results Review: not req'd Mtg. # 948 Date 3/25/81

PURPOSE

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

CONDITIONS AND PREREQUISITES

A. An emergency condition corresponding to a Site Area or General Emergency Classification and 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.

PERSONNEL REQUIREMENTS

A. In the event a Plant (or Site) Evacuation is declared, the following personnel shall report directly to the primary on-site (off-site) Assembly Point:

Assembly Point Coordinator (Normally, the first qualified person arriving will be the Assembly Point Coordinator. During off-normal hours, the Security Shift Sergeant or other person designated by Emergency Director will be the Assembly Point Coordinator.)

Security Force Members

All Non-essential Personnel

B. The Assembly Point Coordinator will have overall responsibility for Assembly Point Activation.

C. Security Force Members will assist the Assembly Point Coordinator as designated.

DISCUSSION

A. Assembly Point Function

In the event of a Site Area or General Emergency, or a Plant or Site Evacuation, one of the two on-site Assembly Points or an off-site Assembly Point, as appropriate, will be activated. 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.

B. Location

The primary onsite Assembly Point is located east of the reactor building, in the south end of Warehouse #2. The Assembly Point coincides with the office area located in that building. An alternate on-site Assembly Point is located approximately 1000 feet south of the reactor building across from the substation.

The location of the off-site Assembly Point is dependent upon the nature of emergency conditions. Its location will be announced over the public address system when announcement of evacuation is made.

C. Data and Information Resources

Each 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 1)
5. "Assembly Point Coordinator" hard hat

D. Communications

Each Assembly Point contains the following:

1. Normal Telephone Lines
2. Emergency Portable Radios

E. Equipment and Facilities

Each Assembly Point contains an emergency kit, including the following items:

1. Protective Equipment
2. Communications Equipment
3. Radiological Monitoring Equipment
4. Emergency Supplies

F. Operation of the Assembly Point

1. Upon implementation of a Plant or Site Evacuation, the Assembly Point Coordinator, upon arrival at the Assembly Point, shall execute Attachment 2, "Assembly Point Activation Checklist".

2. The Assembly Point Coordinator will decide whether or not the Assembly Point is properly equipped and safe for habitation. He will direct preliminary radiation surveys around the point if necessary and will check for proper emergency supplies.

NOTE: Habitability Criteria

a) < 100 mrem/hr - radiation levels
b) < 4E-8 µCi/cc - gross airborne radioactivity (less noble gases)
c) Continued occupancy expected to result in < 40 MPC-hours for isotopic mix less noble gases.

If any of the above criteria are not met, the Emergency Director should be notified and evacuation to another Assembly Area should be considered.

3. Establish and maintain communications with the TSC.

4. Remain at the Assembly Point with all other personnel until directed elsewhere.

PROCEDURE

STEP 1: The first qualified individual arriving at the Assembly Point shall don the "Assembly Point Coordinator" hard hat and assume the responsibility for executing this procedure and procedure A.2-206, "Personnel Accountability-Assembly Points". Initiate Assembly Point Activation Checklist, Form 5790-302-1 (Attachment 2).

STEP 2: Set up frisker for personnel surveys.

STEP 3: If there is reason to suspect the Assembly Point is unsafe, delegate Radiation Protection personnel (or other qualified individual) to make a radiation survey of the Assembly Point Area.

If habitability criteria are exceeded, immediately contact the Emergency Director and report conditions. Prepare to relocate to an alternate Assembly Point.

STEP 4: Test communcations as follows:

a. Telephone lines
b. Emergency portable radios
c. Security portable radios

Establish and maintain communications with the TSC.

STEP 5: Initiate Personnel Accountability-Assembly Point procedure (A.2-206). Establish and maintain communications with 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. Telephone Listing For Assembly Areas

2. Example of Assembly Point Activation Checklist

ATTACHMENT 1

Page 1 of 1

TELEPHONE LISTING FOR ASSEMBLY AREAS

Primary Assembly Area	121
Alternate Assembly Area	197
Emergency Operations Facility (EOF)	128, 250, 261
Technical Support Center (TSC)	122, 227
Operations Support Center (OSC)	140, 141
Control Room	136, 170, 214
Guard's Station	193, 246

ATTACHMENT 2

Form 5790-302-1, Rev. 0, 03/12/81
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. Survey of Assembly Point Area initiated (if necessary)

_____ _____ _____
APC Initials Time Date

3. Communication systems tested and communications established.

_____ _____ _____
APC Initials Time Date

4. Procedure A.2-206 "Personnel Accountability-Assembly Point" initiated.

_____ _____ _____
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.

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

SEARCH AND RESCUE

A.2-303

Prepared by: L. Lacey/Quadrex ALARA Review: C.D. Mathiasen Date 3/28/81
Reviewed by: J.W. Underhill Q.A. Review: R.L. Schaenert Date 3/28/81
Operations Committee Final Review: Meeting Number 949 Date 3/26/81
Approved by: T.L. Tay Date 3/28/81
Op. Com. Results Review: not req'd Mtg. # 949 Date 3/26/81

PURPOSE

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

CONDITIONS AND PREREQUISITES

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

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

PRECAUTIONS

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

PERSONNEL REQUIREMENTS

Emergency Team Coordinator (as designated by Emergency Director)
Special Emergency Teams (personnel designated by Emergency Team Coordinator)

DISCUSSION

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

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

   2. In all other situations, either A.2-401 (Emergency Exposure Control) or normal plant administrative radiation exposure guides and regulatory exposure limits apply depending on the circumstances.

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

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

PROCEDURE

STEP 1: Upon notification of missing/trapped/disabled individuals, contact Team Members (Attachment 1) and direct Emergency Team in search and rescue operation.

NOTE 1: For normal radiological conditions, teams shall meet the minimum dosimetry and protective clothing requirements for the areas to be searched.

NOTE 2: For post-radiological emergency operations (re-entry to an affected area), teams shall meet the minimum dosimetry and protective clothing requirements specified by the Radiological Emergency Coordinator.

STEP 2: Upon arrival at the scene, enter the area and assess the situation, conditions permitting.

STEP 3: Contact the control room, providing the following information, as known:

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

STEP 4: Direct Emergency Team members in the completion of the search and/or rescue.

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

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

c. Evaluate the condition of the individual:

1) If the individual is injured and requires off-site medical treatment, refer to MNGP Operations Manual, Section E.3.2.

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

STEP 5: Direct any Emergency Team personnel who received emergency exposures to report to the Health Physics Group.

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 Team Members List

ATTACHMENT 1

Example of
EMERGENCY TEAM MEMBERS

Members of Emergency Team #1 Include:

Name	Rank	Telephone Number	Position
	Brigade Chief		Maint. Supv.
	Alternate Team Leader		Machinist
			Welder
DELETE			Machinist
			Repairman
			I&CS

Members of Emergency Team #2 Include:

	Asst. Brigade Chief		Lead Machinist
DELETE	Alternate Team Leader		Welder
			Repairman
			Machinist
		DELETE	I&CS

Members of Emergency Team #3 Include:

DELETE	Team Leader		Electrician
	Alternate Team Leader		Rigger
			Welder
			Machinist
			I&CS

Back Shifts, Weekends, Holidays:

DELETE	Team Leader		Third Man in Control Room
	Alternate Team Leader	---	Plant Attendant

Assigned Security Force Members (three per shift)

EMPROC2K

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

THYROID PROPHYLAXIS (POTASSIUM IODIDE USE)

A.2-304

Prepared by: L Nolan ALARA Review: GD Mathias Date 2/19/81
Reviewed by: J Mulvey MD Q.A. Review: RL Schmidt Date 2/23/81
Operations Committee Final Review: Meeting Number 941 Date 9 March 81
Approved by: J L Fay Date 13 MAR 81
Op. Com. Results Review: Not Req'd 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 Generating 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.

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 taking the drug.

Possible side effects include skin rashes, swelling of the salivary glands, and "iodism" (metallic tastes, burning 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, under-activity 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-thyroid drug). Pregnant and nursing women may also take this drug.

ORGANIZATION

A. Emergency Director - has authority to direct the use of Potassium Iodide.

B. Radiological Emergency Coordinator - has the responsibility to execute this procedure and make recommendations to the Emergency Director.

PROCEDURE

STEP 1: As soon as possible following an airborne release, the Radiological Emergency Coordinator should direct that air samples be taken in all occupied areas in the plant and elsewhere onsite for airborne radio-iodine concentrations per A.2-201, "Onsite Monitoring During an Emergency".

STEP 2: 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.

If a large release of radioiodide is anticipated THYRO-BLOCK TM should be taken prior to the release.

The concentration of radiciodine can be estimated from the gamma radiation dose as provided in Figure 1 of this procedure. This provides a conservative estimate (Ref. EPA 520/1-75-001).

If unable to accurately determine possible iodine levels, start KI use if significant fuel failure is suspected.

STEP 3: 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, they 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

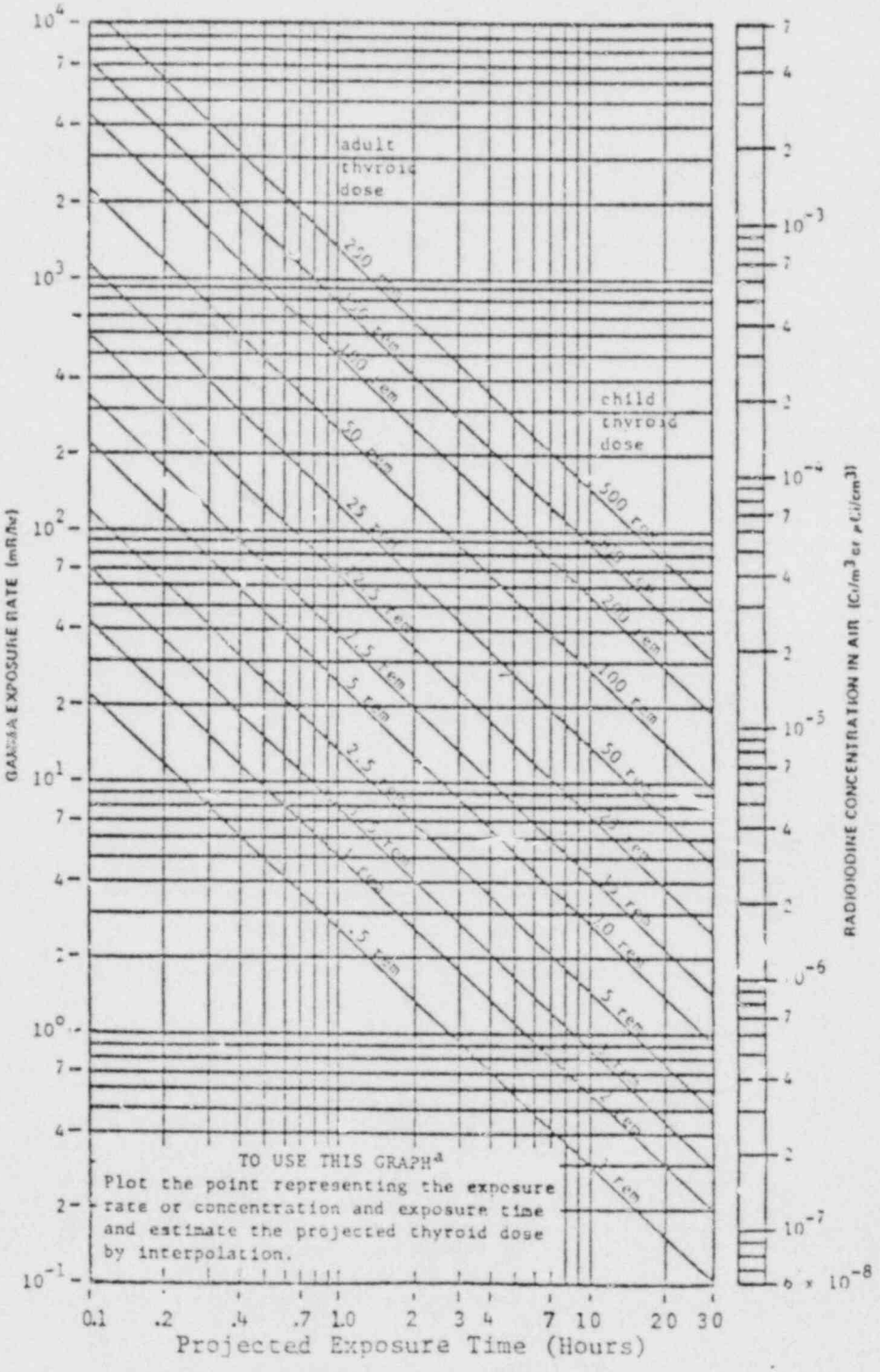
2. NUREG-0654/FEMA-REP-1 "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants".

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



Projected thyroid dose as a function of either gamma exposure rate, or radioiodine concentration in air and the projected exposure time.

FIGURE 1

0001I

Form 5790-304 1, Rev. 0, 03/09/81
Attachment 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			
	YES/NO			
	YES/NO			

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: L. Lacey/Quadrex ALARA Review: C D Mathiesen Date 3/28/81

Reviewed by: [signature] Q.A. Review: R L Scheuerer Date 3/28/81

Operations Committee Final Review: Meeting Number 949 Date 3/26/81

Approved by: [signature] Date 3/28/81

Op. Com. Results Review: not req'd 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

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.

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 methods, or if normal access control and radiological work practices will result in unacceptable delays, the Radiation Emergency Coordinator may, at his discretion, waive or modify the established exposure control criteria and methods in accordance with the provisions of the procedure. In making such decisions, the Radiation 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 safety condition. If necessary to affect these measures, the Emergency Director may direct the Radiation Emergency Coordinator to approve personnel exposures in excess of normal guides/limits, but less than the planned radiation exposure criteria established in this procedure, provided the pre-conditions of such exposure are met. The Radiation 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 will complete 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 Health Physics Group Leader 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

Page 1 of 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 availab...

** 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".

ATTACHMENT 2

Page 1 of 1

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.

ATTACHMENT 3

Form 5790-401-1, Rev. 0, 03/12/81
Page 1 of 2

Example of
EMERGENCY EXPOSURE AUTHORIZATION FORM

SECTION A

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

ATTACHMENT 3

Form 5790-401-1, Rev. 0, 03/12/81
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 forwarded to the Health Physics Group Leader for recording and filing.

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

CONTAMINATION CONTROL

A.2-402

Prepared by: L. Lacey/Quadrex ALARA Review: CD Mathiasen Date 3/28/81
Reviewed by: JW Winkelhake Q.A. Review: RL Scheinost Date 3/29/81
Operations Committee Final Review: Meeting Number 949 Date 3/26/81
Approved by: FL Fay Date 30MAR81
Op. Com. Results Review: not req'd Mtg. # 949 Date 3/26/81

PURPOSE

The purpose of this procedure is to provide contamination guidelines for emergency conditions, to minimize the spread of contamination during an emergency, and to provide methods to identify and handle contaminated personnel.

Radiation protection personnel are responsible for implementing appropriate portions of this procedure.

CONDITIONS AND PREREQUISITES

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

B. A radioactive spill, release, or other event has caused significant levels of radioactive contamination, and/or

C. There is reason to suspect that personnel may have become contaminated (e.g., portal monitor alarm while personnel are exiting controlled area).

PRECAUTIONS

A. Personnel entering a contaminated area must be properly attired in protective clothing, respiratory equipment, etc., in accordance with normal plant operating procedures and any Radiation Work Permit(s) that may be in force.

B. Medical treatment/first aid to seriously injured individuals always takes priority over contamination control measures.

C. Definitive detection of inhalation or ingestion of radioactive material depends on positive findings of radionuclides in urine, feces or the body by "whole-body counting" or excreta analysis. It is extremely important to decide whether a patient is a "potential inhalation/ingestion case" so that definitive evaluation may be initiated.

D. The Health Physics Group is responsible for controlling all food and water supplies at the plant during an emergency. Whenever an evacuation due to radiological conditions takes place, all food and water supplies within the evacuated area will be considered contaminated and measures will be taken to prevent their use.

E. Before any water or food may be consumed, the Health Physics Group must verify that the water/food itself and the eating surfaces are below emergency contamination guidelines for personnel (Attachment 1). Random samples of food/water shall be analyzed for low level contamination on a periodic basis.

PERSONNEL REQUIREMENTS

Radiological Emergency Coordinator - in charge
Radiation Protection Specialists - support

DISCUSSION

This procedure is divided into two parts:

1. Radioactive Spill or Release
2. Contaminated Personnel

Each part may be implemented separately or both may be implemented in parallel, depending on the situation.

PROCEDURE

NOTE: Document all surveys and measurements using appropriate data forms.

RADIOACTIVE SPILL OR RELEASE:

NOTE 1: This portion of the procedure applies only to a spill or release resulting in significantly elevated levels of contamination in-plant or elsewhere on site.

NOTE 2: If not in area at the time the event occurred, take time to don protective clothing and respiratory equipment prior to entering the vicinity.

STEP 1: If possible to do so in a safe manner, take immediate steps to terminate the spill or release.

STEP 2: Take steps to mitigate the consequence of the spill or release, e.g., perform the following actions as appropriate:

a. Inform others in the area.

b. Secure ventilation.

c. Inform the Radiological Emergency Coordinator (Emergency Director or Shift Supervisor if REC not available).

d. Contain the contaminated area by barricading, closing doors, etc.

STEP 3: Don protective clothing and respiratory equipment as necessary.

NOTE: If personnel were contaminated or are suspected to be, and must be moved, consider donning clean, protective clothing to contain the contamination.

STEP 4: Monitor the area to determine the extent of the contamination spread. Smear and radiation/airborne surveys should be in accordance with normal plant procedures.

STEP 5: Inform the Radiological Emergency Coordinator of the local radiological conditions.

STEP 6: Properly barricade and post the area in accordance with normal plant procedures and the guidelines in Attachment 1. Inform the Radiological Emergency Coordinator when done and await further instructions.

CONTAMINATED PERSONNEL

STEP 1: Monitor personnel suspected of being contaminated as follows:

a. Quickly survey the entire body of subject, including clothing, with Geiger-Mueller and/or alpha detectors.

b. If radioactivity is found, remove subject's clothing and resurvey entire body.

c. Mark contaminated areas of body and take care not to spread contamination.

d. In the case of suspected alpha contamination, take filter paper smears of representative areas and count.

e. Special care should be taken to survey areas under the fingernails, ear lobes and between skin folds (i.e., arm pits, buttocks, between toes) if individual has already showered.

f. The skin is considered to be contaminated if any radioactivity is found. However, the guidelines in Attachment 1 may be used in emergency conditions.

STEP 2: If skin is contaminated to levels greater than the guidelines in Attachment 1, initiate personnel decontamination efforts per normal plant procedures. If circumstances make decontamination impracticable, have individual don clean protective clothing to minimize spread of contamination.

STEP 3: If inhalation of radioactive material is suspected, determine if the individual is a potential inhalation case as follows:

NOTE 1: A history of possible exposure to airborne contamination, whether the employee was or was not using respiratory protective equipment, places him in the group of "potential inhalation cases".

NOTE 2: A positive Geiger-Mueller or alpha survey or a positive smear survey in the area of the nose and mouth places the employee in the category of "potential inhalation cases".

a. Smear sterile moistened cotton tipped applicator gently about the openings of the nose (not deep in the nose) and then count. Detectable radiation (> 1000 dpm) places the individual in the category of a "potential inhalation case".

b. All persons considered as "potential inhalation cases" will be given a body burden analysis.

STEP 4: If ingestion of radioactive materials is suspected, determine if the individual is a potential ingestion case as follows:

NOTE: A positive Geiger-Mueller or alpha survey or a positive smear survey in the area of the mouth places an individual in the group of potential ingestion cases.

a. Smear a sterile cotton tipped applicator within the mouth and count. Also, have the individual gargle with one ounce of water for 30 seconds, collect water and count. A positive result from either sample places an individual in the group of potential ingestion cases.

b. All individuals considered to be in the "potential ingestion group" will have body burden analysis initiated as in the potential inhalation group.

STEP 5: Report all results to the Radiological Emergency Coordinator and assure that individuals requiring followup analyses, decontamination, etc., are properly attended to.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Monticello Nuclear Generating Plant Operations Manual

REFERENCES (Cont'd.)

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. Emergency Contamination Guidelines

2. Personnel Contamination Record

3. Nasal Smear Test Data

4. Example of Contamination Control Checklist - Spills and Releases

5. Example of Contamination Control Checklist - Personnel

ATTACHMENT 1

Page 1 of 1

EMERGENCY CONTAMINATION GUIDELINES

	SMEARABLE		CONTACT * READING
Personnel	100 dpm/100 cm^2	OR	100 cpm above bkg.***
Equipment-Release To Clean Area	100 dpm/100 cm^2 beta-gamma 10 dpm/100 cm^2 alpha	AND	100 cpm above bkg.***
Equipment-Release To Controlled Area	500 dpm/100 cm^2 beta-gamma 100 dpm/100 cm^2 alpha	AND	2.5 mR/hr
AREAS**	500 dpm/100 cm^2 beta-gamma 50 dpm/100 cm^2 alpha		2.5 mR/hr

* approximately 1/4" from surface

** areas above guidelines should be barricaded and posted per normal plant operating procedures.

*** using HP-210 probe

ATTACHMENT 2

PERSONNEL CONTAMINATION RECORD

Name _____

Employer _____

Job Title _____ _____

Comments: _____

_____

_____

_____

Date	Time	Part of Body	Before Decon		After Decon		Initials
			Smearable dpm	Fixed cpm	Smearable dpm	Fixed cpm	

ATTACHMENT 3

NASAL SMEAR TEST DATA

NAME	Date	Time	Area Individual Was In	Net CPM	DPM*

* If $\geq$ 1000 dpm after 4 hours decay, perform Body Burden Analysis (BBA).

ATTACHMENT 4

Form 5790-402-1, Rev. 0, 03/12/81
Page 1 of 1

Example of

CONTAMINATION CONTROL CHECKLIST
SPILLS & RELEASES

IMMEDIATE ACTIONS (May be filled out later)

1. Actions taken to terminate and/or mitigate the spill/release (if applicable):

_____

_____ _____ _____ _____
Initial Time Date

2. Radiological Monitoring Completed. _____ Summary of Results:

Highest Smearable: _____ dpm/100 cm^2; Highest Contact _____ mr/hr; Airborne _____ µCi/ml. Extent of contamination:

_____

_____ _____ _____ _____
Initial Time Date

3. Personnel contaminated (yes / no). Description: _____

_____

_____ _____ _____ _____
Initial Time Date

4. Area properly barricaded and posted. Radiological Emergency Coordinator informed:

_____ _____ _____
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.

EMPROC2L

ATTACHMENT 5

Form 5790-402-2, Rev. 0, 03/12/81
Page 1 of 1

Example of

CONTAMINATION CONTROL SUMMARY

CONTAMINATED PERSONNEL

INDIVIDUAL	FRISK RESULTS BETA-GAMMA	FRISK RESULTS ALPHA	POTENTIAL INHALATION CASE (YES / NO)	POTENTIAL INGESTION CASE (YES / NO)	DISPOSITION

Completed: _____ _____
Radiation Protection Specialist Date

Reviewed: _____ _____
Radiological Emergency Coordinator Date

NOTE: When this form is completed and not required for immediate use, transmit to the Health Physics Group Leader for filing.

EMPROC2L

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

EMERGENCY SURVEYS

A.2-403

Prepared by: L. Lacey/Quadrex ALARA Review: C D Mathews Date 3/28/81
Reviewed by: J W Windschill Q.A. Review: R L Scheimont Date 3/28/81
Operations Committee Final Review: Meeting Number 949 Date 3/26/81
Approved by: J L Fay Date 3/28/81
Op. Com. Results Review: not req'd 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, high levels of beta radiation, and/or high airborne/surface contamination levels in the survey area.

CONDITIONS AND PREREQUISITES

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

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

PRECAUTIONS

A. In general, ion chamber instruments should be used to measure dose rates; however, a teletector may be used where high dose rates or location make it necessary.

B. 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.

C. 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.

D. 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.

E. 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.

F. 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 extentions, 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 swipes 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.

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

H. Special consideration must be given for operation of battery powered instruments in severe cold (below 32°F, 0°C). See Attachment 3 "Cold Weather Usage of Instruments".

I. The worst possible conditions should be assumed. Obtain at least two high range instruments having capability to detect beta and gamma radiations (neutrons if possibly present) that have been checked for proper operation prior to entry. High range direct-reading and/or alarm dosimeters should also be checked and set.

J. 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.

PERSONNEL REQUIREMENTS

Radiation Protection Specialist (2 person teams if practicable - one individual act as surveyor, one as recorder)

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 plant.

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. However, during an radiation emergency, the following unusual circumstances should be considered:

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 sources(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 by a rapid survey. The survey may entail the measurement of surface contamination levels directly on equipment and surfaces or it may require the collection of wipes for evaluation outside of the event site.

F. Air sampling should be performed as per Procedure A.2-404, "Emergency Sampling and Analysis", Attachment 6 "Emergency Field Air Sampling Procedure".

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

PROCEDURE

NOTE: Complete appropriate forms to document all survey data.

STEP 1: Obtain appropriate monitoring equipment from the monitoring team kit(s) located in the storage locations. Equipment selected will depend on the type of survey assigned. Obtain and re-zero assigned dosimeter, if applicable. Obtain a Radiation Work Permit, if applicable. Obtain applicable survey maps and emergency survey log sheets, etc.

STEP 2: Turn on instruments and allow for 2 minute warmup. Check instruments for proper response using a check source.

STEP 3: Obtain a portable radio transceiver and check operation before leaving to start survey. Check radios outside of the Control Room to minimize possible RF interference with instrumentation. Keep the radio operational at all times while performing surveys in order to maintain communications with the Radiological Emergency Coordinator.

STEP 4: IN-PLANT SURVEYS

a. If the Radiological Emergency Coordinator so directs, or if substantial airborne activity or contamination is suspected, or as mandated by cognizant RWP(s), don protective clothing and/or respirators, as appropriate. Avoid the unnecessary use of respirators and protective clothing. If observed dose rates significantly exceed those to be expected (as determined by section G of the Discussion), immediately notify the Radiological Emergency Coordinator, then proceed with survey unless otherwise directed.

b. 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 Radiological Emergency Coordinator. Record abnormal readings or other readings have special significance on the Emergency Survey Log Sheet.

c. Upon arriving at survey location, approach with caution and continue to monitor dose rates frequently as in "b" above. Take swipes and air samples as appropriate (air samples should be taken in accordance with procedure A.2-404, "Emergency Sampling and Analysis", Attachments 5 and/or 6). Record general area dose rates and any significant "hot spots" encountered. General area dose rates should be conducted as follows:

(1) Hold the beta shield (if applicable).

(2) Hold the instrument probe about 3 feet (waist height) above the ground and position for a maximum reading.

(3) Take a reading. Allow sufficient time for the meter to stabilize. Document the reading, in "mR/hr" on the Emergency Survey Log Sheet.

NOTE 1: To determine beta dose rates, a suitable instrument must be used. The existence of a beta window does not, by itself, qualify an instrument. Most instruments are calibrated for gamma response, and have beta responses which are not linear, precluding the use of conversion factors. When the "OPEN" window - "CLOSED" window reading is taken the difference is an "indicated" beta dose rate. This indicated level must be multiplied by a corrective factor (2.5 for RO-2 at 12 inches) to obtain an estimate of the beta dose rate. (Only instruments designed for beta dose rate measurement should be used to make these measurements.)

NOTE 2: The type and extent of the survey will depend upon the nature of radiological conditions and the instructions given at the pre-survey briefing.

STEP 5: OUT OF PLANT SURVEYS

a. If the survey will be performed outside of the security fence, leave the station via the guardhouse. Retain your TLD and dosimeters while performing radiological monitoring.

b. Obtain an NSP vehicle, if available. Otherwise, use any available privately-owned vehicle. Record starting mileage and gas tank level. There should be at least 1/2 tank of gas. Obtain another vehicle if necessary and practicable.

c. 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.

d. Perform measurements as assigned by the Radiological Emergency Coordinator as follows:

1. Moving Dose Rate Survey

(a) While enroute to the first assigned survey location, and at any other time while moving about the site, have the survey instrument turned on, with the beta window open. Frequently observe the survey meter and report readings to the Radio-

logical Emergency Coordinator. If a level of 1.0 millirem per hour or greater is observed, immediately notify the Radiological Emergency Coordinator.

(b) Take occasional beta-gamma (beta-window open) readings with the instrument probe extended through an open vehicle window. Note and record any readings significantly higher than the average and record these readings on the Emergency Survey Log Sheet.

2. Stationary Dose Rate Survey

(a) Open the beta shield.

(b) Hold the instrument probe about 3 feet (waist height) above the ground and position for a maximum reading.

(c) Take a reading. Allow sufficient time for the meter to stabilize. Document the reading, in mR/hr on the Emergency Survey Log Sheet.

(d) Move the instrument probe to about three inches above the ground and take another reading. Document this reading on the Emergency Survey Log Sheet.

NOTE 1: To determine beta dose rates, a suitable instrument must be used. The existence of a beta window does not, by itself, qualify an instrument. Most instruments are calibrated for gamma response, and have beta responses which are not linear, precluding the use of conversion factors. When the "OPEN" window - "CLOSED" window reading is taken, the difference is an "indicated" beta dose rate. This indicated level must be multiplied by a correction factor (2.5 for RO-2 at 12 inches) to obtain an estimate of the beta dose rate. (Only instruments designed for beta dose rate measurement should be used to make these measurements).

NOTE 2: The type and extent of the survey will depend upon the nature of radiological conditions and the instructions given at the pre-survey briefing.

STEP 6: After all of the required data have been collected at the first survey location, establish radio contact with the Radiological Emergency Coordinator and report all data.

STEP 7: Proceed to subsequent survey points and repeat appropriate survey steps.

STEP 8: Periodically, read pocket dosimeters of the entire monitoring team. Report these readings to the Radiological Emergency Coordinator at least every 30 minutes, or when accumulated exposure reaches 100 mrem.

STEP 9: After reporting the survey data from the last survey point, request further instructions from the Radiological Emergency Coordinator.

NOTE: Air sampling should be performed as per Procedure A.2-404, "Emergency Sampling and Analysis", Attachment 6, "Emergency Field Air Sampling Procedure".

STEP 10: Other Surveys

The basic steps or surveys for alpha contamination, neutron exposure rate, and surface contamination will be conducted using the general methods established in the MNGP Operations Manual, Section E.1.4. However, appropriate sections of this procedure, particularly, "Precautions" shall still apply.

STEP 11: Submit all completed forms to the Health Physics Group Leader for filing.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Monticello Nuclear Generating Plant Operating 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. Maps of Radiological Sampling Points from "Minnesota Nuclear Power Plant Emergency Plan"

ATTACHMENTS

1. Example of Emergency Survey Log Sheet

2. Cold Weather Usage of Instruments

EMPROC4C

LOCATION (Designate By Radiological Survey Point number from Survey Map or describe location in detail)	DATE	TIME	Open Window ($\beta+\gamma$) mR/hr	Closed Window γ mR/hr	True β* mR/hr	NOTES**

* $((\beta+\gamma)-\gamma)$ x Correction factor = mRad/hr (true β)

** Give conditions that may effect readings (e.g., height of probe, reading inside vehicle, etc.)

Survey Inst. S/N and Type _____, _____ Cal. Due _____ Beta Correction Factor _____

Survey Performed by: _____ Completed _____ hrs, Date ____ / ____ / ____

Reviewed by Radiological Emergency Coordinator: _____ Date ____ / ____ / ____

NOTE: After this form is completed it shall be submitted to the Health Physics Group Leader for filing.

ATTACHMENT 1

ATTACHMENT 2

COLD WEATHER USAGE OF INSTRUMENTS

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

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

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

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

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

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

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: [signature] Date 3-10-81
Reviewed by: [signature] Q.A. Review: [signature] Date 3-10-81
Operations Committee Final Review: Meeting Number: 942 Date 12 March 81
Approved by: [signature] Date 13 MAR 81
Op. Com. Results Review: Not Req'd Mtg. # 942 Date 12 March 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.

PRECAUTIONS

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

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

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

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

E. Minnesota has severe weather conditions which can seriously effect instrument readings. If operating conditions are below 32°F (0°C) check guidelines for "Cold Weather Usage of Instrument", Attachment 8.

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 Field Air Sampling Procedure - Attachment 6

7. Liquid Release Sampling and Analysis - Attachment 7

8. Cold Weather Usage of Instruments - Attachment 8

9. Emergency Sample and Measurement Considerations - Attachment 9

PROCEDURE

STEP 1: Go to Attachments 1 through 7, depending upon the type of sample requested.

STEP 2: Report all results and submit documentation to the Radiological Emergency Coordinator.

NOTE: The attachments 1 through 9 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
3. Maps of Radiological Sampling Points from Minnesota Nuclear Power Plant Emergency Plan

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 Field Air Sampling Procedure
7. Liquid Release Sampling and Analysis
8. Cold Weather Usage of Instruments
9. Emergency Sample and Measurement Considerations

Attachment 1
Page 1 of 3

REACTOR COOLANT SAMPLING AND ANALYSIS

Remarks

Prior to sampling notify the Control Room of your intentions.

PREREQUISITES

CAUTION: The following steps shall only be performed when specified by the Emergency Director. Refer to Attachment 9 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

1 - Survey Meter
3 - 1 liter poly bottles
1 - 1 ml. pipet and pipet bulb
Lead Apron and Lead Gloves are available
Reactor Coolant Emergency Sample Kit - consisting of:

   2 - 4 ml. Counting Vials
   1 - Shielded Sample Container
   1 - 30 ml. beaker

PROCEDURE

NOTE: 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 into the 30 ml. beaker at the hood. (If the reactor recirc sample point is inoperable, purge and obtain the sample from an RHR sample point.) Note coolant conductivity or RHR conductivity as applicable.

STEP 4: Fill a 4 ml. counting vial one-half full with sample from the sample point. Note the time of the sample. 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 the sample time and conductivity in the Hot Lab Weight Book.

STEP 6: Pipet 1 ml. of sample into a 4 ml. counting vial.

STEP 7: Measure the dose rate from the sample. If $\leq$ 10 mR/hr proceed to STEP 9.

STEP 8: If > 10 mR/hr, dilute the sample by a factor of 100 and repeat STEP 7.

STEP 9: 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 Hot Lab Weight Log. Check 1 liter sample to be sure it is $\leq$ 10 mR/hr.

STEP 10: Place the labeled 1 liter poly bottle in a poly bag and count on the GeLi System for $\leq$ 1000 seconds.

STEP 11: When the count is complete, run the GAMMAK program on the resulting spectrum.

STEP 12: Transcribe the conductivity data (if applicable) and dilution data, to the resulting computer printout sheet. Calculate the µCi/cc depending on the dilution factors required.

STEP 13: Place the sample into the shielded container in the Hot Lab.

STEP 14: Provide the sample results to the Radiological Emergency Coordinator and submit checklist to the Emergency Record Keeper.

Form 5790-404-1, Rev. 0, 03/12/81
Attachment 1
Page 3 of 3

Example of
REACTOR COOLANT SAMPLING AND ANALYSIS 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 ran.	_____
5.	GAMMAK Program ran.	_____
6.	Activity calculated, results reported to Radiological Emergency Coordinator (_____ μCi/cc).	_____

After this checklist is completed it should be submitted to the Emergency Record Keeper.

Performed by: _____ Date: _____

Reviewed by: _____ Date: _____

Emergency Record Keeper: _____ Date: _____

Attachment 2
Page 1 of 4

REACTOR BUILDING VENTS CHARCOAL - PARTICULATE SAMPLING AND ANALYSIS

Remarks

Prior to sampling, notify the control room of your intentions. Refer to Attachment 9 prior to proceeding.

Equipment Required

Pb gloves
Pb apron
1 - Survey Meter
R.B. Vents Sample Kit
Consisting of:

1 - Charcoal and Particulate Filter Holder with filters installed
1 - Shielded filter holder container
1 - pair of tongs (or other remote handling device as appropriate)

Procedure

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 R.B. 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.

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 lead bricks.

STEP 9: Measure the contact dose rate from the charcoal filter. If ≤ 10 mR/hr proceed to STEP 12.

STEP 10: If > 10 mR/hr allow the filter to decay about 1 hour. Measure the dose rate at contact. If ≤ 10 mR/hr, proceed to STEP 12. If > 10 mR/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 unless the flow indicators on 1027' Rx Bldg are accessible, 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 ≤ 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 accessible, in which case the flow rate based on actual readings should be used.

STEP 13: Place the charcoal filter into the shielded container in the Hot Lab.

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 ≤ 10 mR/hr proceed to STEP 17.

STEP 16: If the measured dose rate is > 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 accessible, in which case the flow rate based on actual readings should be used.

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 accessible, in which case the flow rate based on actual readings should be used.

STEP 19: Place the sample into the shielded container in the Hot Lab.

STEP 20: Provide the release rate information to the Radiation Emergency Coordinator and submit check list to the Emergency Record Keeper.

Form 5790-404-2, Rev. C 03/12/81
Attachment 2
Page 4 of 4

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 ≤ 10 mR/hr; ran spectrum.	_____
	If > 10 mR/hr after one hour (calculated activity = _____ µCi/cc) (= dose rate x 420 µCi/mR/hr).	_____
6.	Run GAMMAK and SAVCAL Programs. (Iodine release rate _____ µCi/sec.)	_____
7.	If particulate filter ≤ 10 mr/hr; collect spectrum. If ≥ 10 mr/hr, (calculated activity = _____ µCi/cc) (= dose rate x 610 µCi/mr/hr)	_____
8.	Particulate Spectrum ran.	_____
9.	Ran GAMMAK and PART Programs. (Particulate release rate _____ µCi/sec.)	_____
10.	Provided results to Radiological Emergency Coordinator.	_____

After this checklist is completed it should be submitted to the Emergency Record Keeper.

Performed by: _____ Date: _____

Reviewed by: _____ Date: _____

Emergency Record Keeper: _____ Date: _____

Attachment 3
Page 1 of 4

STACK CHARCOAL - PARTICULATE SAMPLING AND ANALYSIS

Remarks

Prior to sampling, notify the Control Room of our intentions. Refer to Attachment 9 prior to proceeding.

Equipment Required

Pb gloves
Pb apron
1 - Survey Meter
Stack Emergency Sample Kit (stored in Access Control Emergency Locker)
Consisting of:

1 - Charcoal and particulate filter holder with filters installed
1 - Shielded filter holder container
1 - pair of tongs (or other remote handling device as appropriate)

Procedure

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 stack sample area as directed by the Emergency Director or his designee while observing Health Physics precautions.

STEP 4: Shut valve OG-31, remove the installed charcoal and particulate filter holder using the quick disconnects. Place in shielded container.

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 5: Install the fresh filter holder and open valve OG-31 (note time).

STEP 6: Proceed to the hot lab and place the filter set and shielded container 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.

STEP 8: Remove the charcoal filter from the charcoal filter holder from behind lead bricks.

STEP 9: Measure the contact dose rate from the charcoal filter. If $\leq$ 10 mR/hr proceed to STEP 11.

STEP 10: If > 10 mR/hr allow the filter to decay about 1 hour. Measure the dose rate at contact. If $\leq$ 10 mR/hr, proceed to STEP 11. If > 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 12.

STEP 11: 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 12: Run the SAVCAL Program to get iodine release rate via the stack of I-131 using a sample flow of 0.6 cfm and a process flow of 4200 cfm.

STEP 13: Place the charcoal filter into the shielded container in the Hot Lab.

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 > 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 using a sample flow of 0.6 cfm and a process flow of 4200 cfm. Proceed to STEP 18.

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 a GAMMAK Program on the resulting spectrum.

STEP 18: Run the PART Program to obtain the release rate for particulates from the stack.

STEP 19: Place the sample into the shielded container in the Hot Lab.

STEP 20: Provide the release rate information to the Radiation Emergency Coordinator and submit the check list to the Emergency Record Keeper.

Form 5790-404-3, Rev. 0, 03/12/81
Attachment 3
Page 4 of 4

Example of
STACK 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 after one hour, calculated activity (_____ µCi/cc) (= dose rate x 420 µCi/mR/hr).	_____
6.	Ran GAMMAK and SAVCAL Programs. (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.	Ran Spectrum on particulate filter.	_____
9.	Ran GAMMAK and PART Programs. (Particulate release rate _____ µCi/sec.)	
10.	Provided results for Radiological Emergency Coordinator.	_____

After this checklist is completed it should be submitted to the Emergency Record Keeper.

Performed by: _____ Date _____

Reviewed by: _____ Date _____

Emergency Record Keeper: _____ Date _____

Attachment 4
Page 1 of 4

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.

CAUTION

Refer to Attachment 9 prior to proceeding.

The following steps shall only be performed when specified by the Emergency Director.

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

CV-3305	CV-3309	CV-3313
CV-3306	CV-3310	CV-3314
CV-3307	CV-3311	
CV-3308	CV-3312	

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/X - 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 Control Room of your intention.

Equipment Required

Pb gloves
Pb apron
Containment Emergency Sampling Kit (stored in Access Control)
Consisting of:
- 5 - 15 cc sample vials with septums
- 1 - 0-1 cc gas syringe with needle
- 1 - piece surgical tubing (1 foot)
- 1 - shielded sample holder

PROCEDURE

NOTE: Purge sample line for ≥ 15 minutes. This is especially important if the line has been isolated prior to sampling.

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 and adjust rotameter flow to 2 cfm. If there is a loss of power to the pump evacuate the area immediately.

STEP 7: 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 in the Hot Lab Weight Log.

STEP 12: Measure the dose rate of the sample vial at contact. If ≤ 10 mR/hr proceed to STEP 14.

STEP 13: If the dose rate is > 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.

STEP 14: Place the sample in a poly bag and count on the Ge(Li) System for ≥ 1000 seconds. Note any dilution factors in the Hot Lab Weight Log.

STEP 15: When the count is complete, run the GAMMAK Program on the resulting spectrum. Calculate the μCi/cc depending on the dilution factors required.

STEP 16: Transcribe all pertinent sample data from the Hot Lab Weight Log to the spectrum analysis computer printout sheet.

STEP 17: Place the sample(s) into the shielded container in the Hot Lab.

STEP 18: Provide sample results to Radiological Emergency Coordinator, and submit check list to Emergency Record Keeper.

Form 5790-404-4, Rev. 0, 03/12/81
Attachment 4
Page 4 of 4

Example of
CONTAINMENT ATMOSPHERE ANALYSIS CHECKLIST

		Initial
1.	Evacuated sample vial.	_____
2.	Protective clothing and dosimetry.	_____
3.	Opened valves, started pump at 2 CFM.	_____
4.	One cc sample taken, time noted. (_____ hours, Date ____ / ____ / ____)	_____
5.	Stop pump, close valves.	_____
6.	If sample vial $\leq$ 10 mR/hr, ran spectrum.	_____
	If > 10 mR/hr, diluted sample (dilution factor = 1 X _____), ran spectrum.	_____
7.	Ran GAMMAK Program (_____ μCi/cc).	_____
8.	Provided results to Radiological Emergency Coordinator.	_____

After this checklist is completed it should be submitted to the Emergency Record Keeper.

Performed by: _____ Date: _____

Reviewed by: _____ Date: _____

Emergency Record Keeper: _____ Date: _____

Attachment 5
Page 1 of 3

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.

RWP established for this work.

PERSONNEL REQUIRED

2 Radiation Protection Specialists (RPS)
Radiological Emergency Coordinator

EQUIPMENT REQUIRED

Radgun
0-10R dosimeter
Radeco portable battery powered air sampler
Charcoal or 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/charcoal sample will be too "hot" 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 as to whether or not both types of samples should be taken.

STEP 2: Load the sampler with a charcoal 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 (RWP).

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 charcoal sample.

STEP 12: If the dose rate is $\leq$ 10 mR/hr, bag the sample and count it on the Ge(Li) System (top shelf) using normal count room procedures for counting air samples.

NOTE: If the charcoal sample dose rate is > 10 mR/hr, purging the sample with bottled air may remove enough noble gases so that the sample can be counted on the GeLi System.

STEP 13: If the charcoal filter dose rate is $\nearrow$ 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	9×10^{-9}
I-132	2×10^{-7}
I-133	3×10^{-8}
I-134	5×10^{-7}
I-135	1×10^{-7}

STEP 15: Report results to Radiological Emergency Coordinator and submit checklist to the Emergency Record Keeper.

STEP 16: Save the particulate, charcoal and gas vial samples, in case later analysis is desired.

Form 5790-404-5, Rev. 0, 03/12/81
Attachment 5
Page 3 of 3

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 ≤ 10 mR/hr, ran spectrum (MPRAIR) (Activity _____ μCi/cc).	_____
4.	If charcoal sample > 10 mR/hr. GAMMAK Program ran on vial, and ratios calculated for:	
	(I-131 _____)	
	(I-132 _____)	
	(I-133 _____)	
	(I-134 _____)	
	(I-135 _____)	_____

After this checklist is completed it should be submitted to the Emergency Record Keeper.

Performed by: _____ Date: _____

Reviewed by: _____ Date: _____

Emergency Record Keeper: _____ Date: _____

Attachment 6
Page 1 of 4

EMERGENCY FIELD AIR SAMPLING PROCEDURE

Equipment Required

1. Radeco battery powered air sampler with charcoal filter holder
2. Fiberglass particulate filters
3. Scott charcoal filter cartridge or silver zeolite (as directed by the Radiological Emergency Coordinator)
4. Thyac III or RM-14
5. G-M tube type probe or HP-210 pancake probe
6. Power supply (12 VDC)
7. Watch or other time piece
8. Small plastic bags

Procedure

STEP 1: Install charcoal and particulate filters in air sampler.

STEP 2: Check time and start sampler. Write down start time for future reference on Emergency Field Air Sampling Log Sheet.

STEP 3: After a suitable period of time, 10 minutes minimum, stop the sampler and write down the stop time.

STEP 4: Remove the filters from the sampler, being careful not to contaminate or otherwise damage the sample. Mark the samples for future identification.

NOTE: When recording air sample data, the following information should be included:

1. Location of sampler
2. Average flow rate
3. Sampling time and date
4. Wind direction and weather conditions

STEP 5: If an HP-210 probe is available, go to STEP 8.

STEP 6: Determine the sample count rates by placing the tube type probe flat across the middle of the particulate and charcoal filters. Subtract the background count rate and record the net cpm for each filter.

STEP 7: Compute the net dpm by applying a factor of 50 (efficiency 2%). Go to STEP 10.

STEP 8: Determine the sample count rates by placing the HP-210 probe flat against the center of the particulate and charcoal filters. Subtract the background count rate and record the net cpm for each filter.

STEP 9: Compute the net dpm by applying a factor of 10 (efficiency 10%).

STEP 10: Estimate the particulate concentration by use of the following equation:

$$\text{Particulate } \frac{\mu Ci}{cc} = \frac{\text{net dpm} \times 1.05\ ^{*}}{\text{sx minutes} \times 2.22 \times 10^{6} \frac{dpm}{\mu Ci} \times \frac{\text{cu. ft}}{\text{min.}} \times 28320 \frac{cc}{\text{cu. ft.}}}$$

Equation with constants combined:

$$\frac{\text{net dpm} \times 1.7 \times 10^{-11}}{\text{sx minutes} \times \text{CFM}}$$

STEP 11: Estimate the gaseous concentration by use of the following equation:

$$\text{Gaseous } \frac{\mu Ci}{cc} = \frac{\text{net dpm} \times 1.4^{*}}{\text{sx minutes} \times 2.22 \times 10^{6} \frac{dpm}{\mu Ci} \times \frac{\text{cu. ft.}}{\text{min.}} \times 28320 \frac{cc}{\text{cu. ft.}}}$$

Equation with constants combined:

$$\frac{\text{net dpm} \times 2.2 \times 10^{-11}}{\text{sx minutes} \times \text{CFM}}$$

STEP 12: Preserve the samples and necessary data for future analysis.

STEP 13: Report results to Radiological Emergency Coordinator and submit checklist and Emergency Field Air Sampling Log Sheet to the Emergency Record Keeper.

* $\left(\frac{\text{sx filtered}}{\text{sx collected}}\right)$ represents both the collection efficiency and the self absorption properties of the filter and has no units

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Page 3 of 4

Example of
EMERGENCY FIELD AIR SAMPLING PROCEDURE CHECKLIST

		Initial
1.	10 minute sample (at least) taken. (Started _____ hrs; Stopped _____ hrs.) (Flow Rate for Sampler _____ CFM)	_____
2.	Calculated Concentration Part. _____ µCi/cc.	_____
3.	Calculated Concentration Gas _____ µCi/cc.	_____
4.	Report results to Radiological Emergency Coordinator.	_____

After this checklist is completed it should be submitted to the Emergency Record Keeper.

Performed by: _____ Date: _____

Reviewed by: _____ Date: _____

Emergency Record Keeper: _____ Date: _____

EXAMPLE

SAMPLE NUMBER	LOCATION	DATE	TIME	(MIN) SAMPLING TIME	FLOW RATE (CFM)	SAMPLE TYPE	GROSS CPM	BKG CPM	(1) EFFICIENCY	(2) NET D/M	(3) uCi/cc
						PART					
						GAS					
						PART					
						GAS					
						PART					
						GAS					
						PART					
						GAS					
						PART					
						GAS					
						PART					
						GAS					
						PART					
						GAS					
						PART					
						GAS					

1. Tube type GM efficiency = use 2% (multiply by 50); Pancake probe (HP-210) = use 10% (multiply by 10)

2. Net d/m = (Gross CPM - Bkg CPM) x efficiency

3. Particulate uCi/cc = (Net dpm x 1.7×10^{-11}) ÷ (Sx minutes x CFM)
   Gaseous uCi/cc = (Net dpm x 2.2×10^{-11}) ÷ (Sx minutes x CFM)

Survey Inst. Type _____ S/N _____ Cal. Due _____

Technician _____ Date _____

Reviewed by Radiological Emergency Coordinator: _____ Date: _____

Submit Form to Emergency Record Keeper when completed.

OFFICIAL COPY

Attachment 7
Page 1 of 3

Liquid Release Sampling and Analysis

Equipment Required

One liter sample bottles
River Sampling Apparatus (weighted bottle with retrieval line)
Marker for labeling sample bottles
Plastic bags
Survey instrument
Radio communication to Radiological Emergency Coordinator or Control Room

NOTE: Although the offsite surveys will normally be a corporate function, in the event of an accident, they will be performed by plant personnel until relieved by corporate personnel.

PROCEDURE

Three monitoring teams will be dispatched in the following manner:

Radiation Monitoring Team #1

STEP 1: Proceed to the discharge canal and obtain two one liter samples at points downstream. (Cast a weighted polyethylene bottle, out into center of flowing water, if possible by using river sampling apparatus.)

STEP 2: Note time and location of each sample and label sample for later identification.

STEP 3: Survey the sample with a beta-gamma instrument with beta window both open and closed. (A concentration of 5×10^{-3} µCi/ml in a one liter bottle will give a slight indication on a survey instrument.)

NOTE: If temperature is below 32°F (0°C) check guidelines for "Cold Weather Usage of Instruments".

STEP 4: Report results to Radiological Emergency Coodinator and return to Counting Lab with samples.

STEP 5: Place the labeled 1 liter poly bottle in a poly bag and count on the GeLi System for ≥ 1000 seconds.

STEP 6: When the count is complete, run the GAMMAK Program on the resulting spectrum.

STEP 7: Transcribe the sample data to the resulting computer printout sheet. Calculate the µCi/cc.

STEP 8: Provide results to Radiological Emergency Coordinator and submit checklist to the Emergency Record Keeper.

STEP 9: Await further instructions.

Radiation Monitoring Team #2

STEP 1: Proceed to the Monticello bridge in a vehicle equipped with communications, if available. Obtain a one liter sample every five (5) minutes. One member will bring samples back to counting lab while the other member samples and labels bottles. Proceed with STEP 2 under Radiation Monitoring Team #1.

Radiation Monitoring Team #3

STEP 1: Will standby to assist Radiation Monitoring Team #2 or if required, will proceed to one of the following locations to assist the Minnesota Department of Health in further sampling:

(a) Elk River Bridge
(b) Anoka Bridge
(c) Minneapolis and St. Paul drinking water intakes

Once the activity peak has passed the above points, additional surveys downstream will be determined by the Minnesota Department of Health.

Form 5790-404-8, Rev. 0, 03/12/81
Attachment 7
Page 3 of 3

Example of
LIQUID RELEASE SAMPLING AND ANALYSIS CHECKLIST

		Initials
1.	Samples secured, labeled and surveyed.	_____
2.	Results of survey to Radiological Emergency Coordinator.	_____
3.	Samples to counting lab.	_____
4.	Ran spectrum and GAMMAK Program.	_____
5.	Results to Radiological Emergency Coordinator.	_____

After this checklist is completed it should be submitted to the Emergency Record Keeper.

Performed by: _____ Date: _____

Reviewed by: _____ Date : _____

Emergency Records Keeper: _____ Date: _____

Attachment 8

COLD WEATHER USAGE OF INSTRUMENTS

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

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

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

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

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

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

Attachment 9
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 9
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.

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: L. Lacey/Quadrex ALARA Review: C.D. Mathiesen Date 3/28/81
Reviewed by: J.B. Peterson Q.A. Review: R.L. Scheimann Date 3/29/81
Operations Committee Final Review: Meeting Number 949 Date 3/26/81
Approved by: T.J. Foley Date 30MAR81
Op. Com. Results Review: not req'd 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 three parts based on the point of release: Main Exhaust Plenum, Stack or Discharge Canal (Liquid Release).

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 $\leq$ 10,000 cps
Process Computer available.

a. Call for computer point T534. This is the calculated release rate in µCi/sec.

b. Complete Release Rate Determination: Airborne Release Checklist, Form 5790-405-1, (Attachment 1) and submit to the Radiological Emergency Coordinator for review.

STEP 2: Case 2

Plenum Gas CAM $\leq$ 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:

$$\text{Release Rate } (\mu\text{Ci/sec}) = \text{cps} \times \text{cfm} \times 472 \frac{\text{cc-min}}{\text{ft}^3\text{-sec}} \times 6 \times 10^{-7} \frac{\mu\text{Ci/cc}}{\text{cps}}$$

d. Complete Release Rate Determination: Airborne Release Checklist, Form 5790-405-1, (Attachment 1) and submit to the Radiological Emergency Coordinator for review.

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:

Release Rate (μCi/sec) = R/ x (Conversion factor*) x cfm x 472 $\frac{\text{cc-min}}{\text{ft}^3\text{-sec}}$

* See Plenum Exhaust Conversion Factor Table - Attachment 1.

d. Complete Release Rate Determination: Airborne Release Checklist, Form 5790-405-1, (Attachment 1) and submit to the Radiological Emergency Coordinator for review.

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 5).

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:

Release Rate (μCi/sec) = R/hr x (conversion factor*) x cfm x 472 $\frac{\text{cc-min}}{\text{ft}^3\text{-sec}}$

* See Plenum Exhaust Conversion Factor Table - Attachment 1.

d Complete Release Rate Determination: Airborne Release Checklist, Form 5790-405-1, (Attachment 1) and submit to the Radiological Emergency Coordinator for review.

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 four cases:

STEP 1: Case A

Stack Gas Monitor $\leq 10^6$ cps
Process Computer available.

a. Call for computer point T533. This is the calculated release rate in μCi/sec.

b. Complete Release Rate Determination: Airborne Release Checklist, Form 5790-405-1, (Attachment 1) and submit to the Radiological Emergency Coordinator for review.

STEP 2: Case 2

Stack Gas Monitor $\leq 10^6$ cps
Process Computer not available.

a. Read stack gas front panel meter. Choose the highest of the two readings as the basis for determining the release rate.

b. Determine flow rate from stack (cfm).

NOTE: Use 4200 ± 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:

$$\text{Release Rate } (\mu Ci/sec) = cps \times 10^{-6} \ \mu Ci/cc \times cfm \times 472 \ \frac{cc\text{-}min}{ft^3\text{-}sec}$$

d. Complete Release Rate Determination: Airborne Release Checklist, Form 5790-405-1, (Attachment 1) and submit to the Radiological Emergency Coordinator for review.

STEP 3: Case 3

Stack Gas Monitor $> 10^6$ cps
Stack High Range Monitor operable.

CAUTION: Stack could be a high radiation area.

a. Read the Stack High Range Monitor readout (located in the sample room on the second level of the stack) or the associated recorder (panel C-252D in the Control Room).

b. Determine the flow rate from the stack (cfm).

NOTE: Use 4200 ± 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.

d. Complete Release Rate Determination: Airborne Release Checklist, Form 5790-405-1, (Attachment 1) and submit to the Radiological Emergency Coordinator for review.

STEP 4: Case 4

Stack Gas Monitor > 10^6 cps
Stack High Range Monitor not operable.

CAUTION: Stack could be a high radiation area (see Attachment 5).

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 4200 ± 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:

$$\text{Release Rate } (\mu\text{Ci/sec}) = \text{R/hr} \times (\text{factor}^{*}) \times \text{cfm} \times 472 \ \frac{\text{cc-min}}{\text{ft}^3\text{-sec}}$$

d. Complete Release Rate Determination: Airborne Release Checklist, Form 5790-405-1, (Attachment 1) and submit to the Radiological Emergency Coordinator for review.

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 1.58×10^{-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.

STEP 5: Complete Release Rate Determination: Liquid Release, Form 5790-405-2, (Attachment 2) and submit to Radiological Emergency Coordinator for review.

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 Release Rate Determination: Airborne Release Checklist

2. Example of Release Rate Determination: Liquid Release Checklist

3. Plenum Exhaust Conversion Factor Table

4. Stack Exhaust Conversion Factor Table

5. Emergency Sample and Measurement Considerations

ATTACHMENT 1

Form 5790-405-1, Rev. 0, 03/12/81
Page 1 of 1

Example of
RELEASE RATE DETERMINATION: AIRBORNE RELEASE CHECKLIST
(For Use With Procedure A.2-405 - Complete For Pertinent Case)

CASE 1 — Initials

1. Used appropriate computer point to obtain release rate (Plenum release, T534, Stack T533).

   Release Rate _____ µCi/sec. _____

CASE 2

1. Obtained monitor reading from control room (monitor reading-cps). _____

2. Determined flow rate. _____ CFM _____

3. Calculated release rate. _____ µCi/sec _____

CASE 3

1. Obtained High Range Monitor Reading from Control Room
   High Range Monitor reading _____ cps. _____

2. Determined flow. _____ CFM _____

3. Used appropriate conversion factor for time of release _____ = CF. _____

CASE 4

1. Obtained direct radiation reading from release point.

   Reading _____ Units _____ _____

2. Determined flow _____ CFM _____

3. Used appropriate conversion factor for time of release CF = _____ _____

4. Calculated release rate _____ µCi/sec. _____

Performed by: _____

Completed by: _____ hrs, Date _____

Reviewed by Radiological Emergency Coordinator: _____ 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.

EMPROC3C

ATTACHMENT 2

Form 5790-405-2, Rev. 0, 03/12/81
Page 1 of 1

Example of
RELEASE RATE DETERMINATION: LIQUID RELEASE
(For Use With Procedure A.2-405)

		Initials
1.	Obtained reading from Discharge Canal Monitors _____ cps.	_____
2.	Multipled by 1.58×10^{-7} μCi/cc/cps and river flow rate. River flow rate _____ cfm.	_____
3.	Divided by 28,320 cc/ft^3 for release rate. Release rate _____ μCi/min.	_____

Performed by: _____

Completed: _____ hrs, Date: _____

Reviewed by: Radiological Emergency Coordinator _____ 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.

EMPROC3C

ATTACHMENT 3

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

ATTACHMENT 4

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

ATTACHMENT 5

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.

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 however, 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: L. Lacey/Quadrex ALARA Review: C S Mathiason Date 3/29/81

Reviewed by: [signature] Q.A. Review: RL Schemont Date 3/29/81

Operations Committee Final Review: Meeting Number 949 Date 3/26/81

Approved by: [signature] Date 30MAR81

Op. Com. Results Review: not req'd 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 when it is required, 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).

RESPONSIBLE INDIVIDUAL

Radiation Protection Specialist

DISCUSSION

A. General Applicability

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

boundary, the nearest receptor and the Low Population Zone (L.P.Z.) outer boundary. The site boundary and the nearest receptor locations differ for each sector. The L.P.Z. outer boundary locations coincide with the one mile distance from the plant.

B. Dose Projection Methods

This procedure provides 3 different calculational 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 a Digital Equipment Corporation PDP-11/05 computer system which is located at the plant site. The software system uses methodology similiar to that prescribed in U.S. NRC Regulatory Guide 1.145, August, 1979 for the calculation of the atmospheric dispersion parameters.

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 and iodines for the plant stack and Reactor Building ventilation release points. Whole body, skin, 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 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 or 15, 20, 30, 40 and 50 miles.

The dose rate values are reported in mrem/hour. The dose rate values are multiplied by 0.25 to convert them to an accumulated dose for that 15 minute period. The dose values are then stored according to sector for the whole body, skin, 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 adult thyroid.

Subprogram CALDOS (Option 1): The CALDOS subprogram accepts meteorological tower data and effluents release data and calculates dose rates at various locations. Radioactive effluents release data are automatically corrected for decay during the course of an accident, but not for the time spent traveling in a plume after leaving the plant site.

Subprogram LSTSEC (Option 2): The LSTSEC subprogram extracts data from computer mass storage and reports accumulated dose values in any sector desired. The accumulated dose values are reported in mrem.

Subprogram FINDHI (Option 3): The subprogram FINDHI searches the computer mass storage files and reports which sector contains the highest whole body dose, the highest skin dose, and the highest thyroid dose. FINDHI also compares all the sector dose values to predetermined limits and reports in which sectors the maximum dose exceeded the predetermined limit for whole body doses and thyroid doses.

2. Dose Projection By Hand Calculation Based On Known Release Rate

This method projects whole body and thyroid doses resulting from a known release rate. Correction factors are provided for noble gases and iodines to adjust for elapsed time.

3. Dose Projection By Hand Calculation Based On FSAR Accident Analysis

This method calculates the whole body and thyroid doses in the event that no specific release data is readily available. The method is based upon FSAR Accident Analysis. Since it is unlikely that the actual accident parameters will be the same as the accident analysis assumptions, this method is, at best, conservative.

PROCEDURE

STEP 1: In the event of a known or suspected release of airborne radioactive materials, greater than MNGP Technical Specifications, immediately take actions to ascertain if a release did in fact take place (or will take place imminently). If a release did or will take place proceed with the remaining steps of this procedure.

STEP 2: Determine the appropriate magnitude of the release using available monitors or procedure A.2-405 (Release Rate Determinations). Further dose projection should be performed based on this preliminary estimate and the following criteria:

a. For all monitored releases in the NUE classification, dose projections in accordance with this procedure need not be performed as a general rule, due to the minimal off-site significance of such releases. Post-event evaluation of off-site doses for releases in the NUE classification may be

necessary to comply with environmental technical specifications. In such cases, the off-site doses may be calculated using the methodology contained in the MNGP Off-Site Dose Calculation Manual (ODCM).

b. For all other releases, dose projection shall be performed.

STEP 3: Based on the known parameters about the incident and the availability of data and time, choose the most advantageous dose projection method. Use the "Discussion" section of this procedure for guidance as necessary. Go to the appropriate attachment of this procedure.

STEP 4: Ensure that all calculations are documented on supplied worksheets and/or computer printout. Ensure that the date and time appear on all worksheets.

STEP 5: Discontinue dose projection activities with the concurrence of the Radiological Emergency Coordinator when:

a. The release has been terminated and no further release is expected, and

b. The emergency condition has been terminated or downgraded by the Emergency Director.

STEP 6: Complete Form 5790-406-3, OFF-SITE DOSE PROJECTION CHECKLIST (Attachment 6).

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Monticello Nuclear Generating Plant Offsite Dose Calculations 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. Dose Projection by Computer (MODCOM)
2. Dose Projection by Hand Calculation Based on Known Release Rate
3. Example of Off-Site Dose Rate Projection Worksheet-Know Release Rate
4. Dose Projection by Hand Calculation Based on FSAR Accident Analysis
5. Example of Off-Site Dose Projection Worksheet-FSAR Accident Analysis
6. Example of Off-Site Dose Projection Checklist

ATTACHMENT 1

Page 1 of 4

DOSE PROJECTION BY COMPUTER (MODCOM)

PREREQUISITES

Move the LA-36 terminal from the Body Burden Analyzer Room as follows:

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. Disconnect the cable labeled "LA-36" from the cable labeled "computer".

   b. Connect the cable labeled "computer" to the cable labeled "Tech. Supp. Center".

   c. Unplug the LA-36 terminal from the 120 VAC line.

3. Carry the LA-36 terminal to a predesignated position in the Technical Support Center.

4. Connect the cable labeled "LA-36" to the cable labeled "computer" and plug the LA-36 terminal into the 120 VAC line.

5. 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 printer and depress the "300 BAUD" button. Ensure that the terminal is on line. 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 ? :

ATTACHMENT 1 (Cont'd.)

Page 2 of 4

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 DESIRED:

STEP 5: Select one of the following options:

OPTION	DESCRIPTION
1	PERFORM TYPICAL 15 MIN. DOSE RATE CALCULATION
2	LIST ACCUMULATED DOSES FOR ANY SECTOR (A-R)
3	SEARCH ALL SECTORS FOR HIGHEST DOSE AND REPORT DOSE DATA

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 15 MIN. 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:

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. 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.

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 50 miles. Communicate this information to the Radiological Emergency Coordinator.

c. The terminal will then print:

PLEASE ENTER THE OPTION YOU DESIRE:

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

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

STEP 7: LIST ACCUMULATED DOSES FOR ANY SECTOR

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

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

SECTOR:

b. Type in the sector letter (A-R). The terminal will respond with a printout of the accumulated doses for the affected sector from the Site Boundary to a distance of 50 miles. Communicate this information to the Radiological Emergency Coordinator.

c. The terminal will then print:

PLEASE ENTER THE OPTION YOU DESIRE:

ATTACHMENT 1 (Cont'd.)

Page 4 of 4

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 "8" 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. Return to STEP 4 of the main procedure.

ATTACHMENT 2

Page 1 of 3

DOSE PROJECTION BY HAND CALCULATION BASED ON KNOWN RELEASE RATE

EQUIPMENT REQUIRED

1. X/Q Catalog (TSC)
2. Calculator (with scientific notation capability)
3. Supply of OFF-SITE DOSE RATE PROJECTION WORKSHEET-KNOWN RELEASE RATE Forms (TSC), Form 5790-406-1 (Attachment 3)

PROCEDURE

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

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

STEP 3: Determine the necessary meteorological parameters and record as indicated on the worksheet. This data should be taken from the meteorological tower printer in the Technical Support Center. If the printer in unavailable, an individual may be stationed at the meteorological tower to relay the information via the telephone.

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.)

If meteorological tower data is unavailable, windspeed and wind direction data can be obtained from Control Room instrumentation, and the stability class can be determined using the Stability Class Indicator in the Control Room. (NOTE: Stability Class Indicator is not operable as of 4/1/81 but is expected to be operable in near future.)

ATTACHMENT 2 (Cont'd.)

TABLE I

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

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

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

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

TABLE II

Wind Direction (degrees from)	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 2 (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	1.14E-05
0.50	1.00	5.48E-01	1.29E-05
1.00	2.00	4.06E-01	1.43E-05
2.00	4.00	3.43E-01	1.66E-05
4.00	8.00	2.93E-01	1.97E-05
8.00	16.00	1.65E-01	2.37E-05
16.00	24.00	8.70E-02	2.92E-05
24.00	48.00	6.10E-02	3.36E-05
48.00	96.00	3.90E-02	4.34E-05
96.00	168.00	3.30E-02	5.39E-05
168.00	336.00	3.30E-02	5.79E-05
336.00	720.00	3.20E-02	5.87E-05
720.00	1440.00	2.60E-02	5.87E-05
1440.00	Beyond	3.60E-03	5.87E-05

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.2-425 (Release Rate Determination). The iodine portions will be determined by Radiation Protection Group personnel through actual samples. If sample analysis data is not available, record "not available".

STEP 8: Using the values recorded in the INPUT DATA section, complete calculations for the Site Boundary, Nearest Receptor, and 1 mile, as required.

NOTE: If actual data is not available for iodine release rate, estimate dose rates to the thyroid by applying a factor of 6E-07 to the whole-body dose rate as calculated by this procedure.[1]

STEP 9: If calculations for additional locations are required, select the appropriate X/Q values and complete the calculations in the spaces provided for LOCATION OF INTEREST.

STEP 10 Upon receiving instructions from the Radiological Emergency Coordinator to secure from dose projection activities, return to STEP 4 of the main procedure.

1/ This factor is taken from EPA-520/1-75-001. The calculation is based assumption that the ratio of iodines to noble gases in the mixture available for release is 0.4.

ATTACHMENT 3

Form 5790-406-1, Rev. 6, 03/12/81
Page 1 of 2

Example of
OFF-SITE DOSE RATE PROJECTION WORKSHEET - KNOWN RELEASE RATE
(For Use With Procedure A.2-406, Attachment 2)

INPUT DATA

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

X/Q Values: RB Vent - Site Boundary _____ (AA)
- Nearest Receptor _____ (BB)
- LPZ Outer Boundary _____ (CC)

Stack - Site Boundary _____ (DD)
- Nearest Receptor _____ (EE)
- LPZ Outer Boundary (1 mile) _____ (FF)

- Noble Gases Factor _____ (GG)
- Iodines Factor _____ (HH)

Release Rates: RB Vent - Gas _____ (JJ)
(μCi/sec) - Iodines _____ (KK)

Stack - Gas _____ (LL)
- Iodines _____ (MM)

FORMAT OF DATA FROM MET TOWER

DAYTIME	33' WS	140' WS	330' WS	33' WD	140' WD	330' WD	33' TEMP	DT1 140	DT2 330	DEW PNT	RAIN	RN	ACOF	DVI

ATTACHMENT 3 (Cont'd.)

Form 5790-406-1, Rev. 0, 03/12/81
Page 2 of 2

Example of
OFF-SITE DOSE RATE PROJECTION WORKSHEET - KNOWN RELEASE RATE (Cont'd.)

CALCULATIONS

1. Site Boundary

GG x [(AA x JJ) + (DD x LL)] = _____ Whole Body-mrem/hour
HH x [(AA x KK) + (DD x MM)] = _____ Thyroid-mrem/hour (adult)

2. Nearest Receptor

GG x [(BB x JJ) + (EE x LL)] = _____ Whole Body-mrem/hour
HH x [(BB x KK) + (EE x MM)] = _____ Thyroid-mrem/hour (adult)

3. LPZ Outer Boundary (1 mile)

GG x [(CC x JJ) + (FF x LL)] = _____ Whole Body-mrem/hour
HH x [(CC x KK) + (FF x MM)] = _____ Thyroid-mrem/hour (adult)

4. Location of Interest

RB Vent X/Q at Location of Interest _____ (NN)
Stack X/Z at Location of Interest _____ (PP)
GG x [(NN x JJ) + (PP x LL)] = _____ Whole Body-mrem/hour
HH x [(NN x KK) + (PP x MM)] = _____ Thyroid-mrem/hour (adult)

5. Location of Interest

RB Vent X/Q at Location of Interest _____ (NN)
Stack X/Q at Location of Interest _____ (PP)
GG x [(NN x JJ) + (PP x LL)] = _____ Whole Body-mrem/hour
HH x [(NN x KK) + (PP x MM)] = _____ Thyroid-mrem/hour (adult)

6. Location of Interest

RB Vent X/Q at Location of Interest _____ (NN)
Stack X/Q at Location of Interest _____ (PP)
GG x [(NN x JJ) + (PP x LL)] = _____ Whole Body-mrem/hour
HH x [(NN x KK) + (PP x MM)] = _____ Thyroid-mrem/hour (adult)

REVIEW AND APPROVAL

Completed by: _____ / _____ Date: _____

Reviewed by: _____ Date: _____
Rad. Emerg. 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.

EMPROC3G

ATTACHMENT 4

Page 1 of 6

DOSE PROJECTION BY HAND CALCULATION BASED ON FSAR ACCIDENT ANALYSIS

EQUIPMENT REQUIRED

1. Calculator - if available
2. Supply of OFF-SITE DOSE PROJECTION WORKSHEET - FSAR ACCIDENT ANALYSIS FORMS (TSC)

PROCEDURE

STEP 1: Enter the date and time for which this projection is being made.

STEP 2: 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, an individual may be stationed at the meteorological tower to relay the information via telephone.

a. 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.

b. Stack Windspeed - Record the windspeed at the 330 feet level (use 1 mph when indication is zero). Convert to meters per second as indicated on the worksheet.

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

If meteorological tower data is unavailable, windspeed and wind direction data can be obtained from Control Room instrumentation, and the stability class can be determined using the Stability Class Indicator in the Control Room. (As of 4/1/81, the Stability Class Indicator is not operable, but is expected to be in near future.)

TABLE I

Stability Class	Stack (DT2/100)
A*	Less than -1.71
B	-1.71 to -1.53
C	-1.52 to -1.35
D	-1.34 to -0.45
E	-0.44 to +1.35
F	+1.36 to +3.60
G**	Greater than +3.60

* Use Stability Class B (A not analyzed)
** Use Stability Class F (Ref: Letter of 3/9/81 from certified consulting meteorologist to Bert Clark.)

ATTACHMENT 4 (Cont'd.)

Page 2 of 6

STEP 3: 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 4: After the Stability Class has been determined, use the appropriate table (Tables III through VI) for dose projections. Note that four accidents are analyzed. If the accident is unknown or not one of the four, use Table VI (Steam Line Break Accident). Enter the dose projections on the worksheet. Note the Table used.

STEP 5: Upon receiving instructions from the Radiological Emergency Coordinator to secure from dose projection activities, return to STEP 4 of the main procedure.

ATTACHMENT 4 (Cont'd.)

TABLE III

RADIOLOGICAL EFFECTS OF THE CONTROL ROD DROP ACCIDENT

First 2-Hour Dose

Distance Miles	G	F	E	D	C	B
1/3	7.2×10^{-3}	4.8×10^{-3}	4.8×10^{-3}	1.4×10^{-3}	4.8×10^{-3}	1.5×10^{-3}
1	4.4×10^{-3}	2.4×10^{-3}	2.8×10^{-3}	1.1×10^{-3}	1.7×10^{-3}	6.8×10^{-4}
3	2.0×10^{-3}	1.2×10^{-3}	1.1×10^{-3}	4.2×10^{-4}	3.8×10^{-4}	1.6×10^{-4}
5	1.2×10^{-3}	8.4×10^{-4}	5.9×10^{-4}	2.2×10^{-4}	1.6×10^{-4}	7.9×10^{-5}
10	6.2×10^{-4}	4.4×10^{-4}	1.7×10^{-4}	8.6×10^{-5}	4.2×10^{-5}	2.8×10^{-5}
Lifetime Thyroid Dose (rem)						
1/3	a	a	3.4×10^{-7}	1.7×10^{-9}	9.4×10^{-5}	2.8×10^{-5}
1	a	2.0×10^{-7}	7.4×10^{-5}	2.0×10^{-5}	5.6×10^{5}	2.2×10^{-5}
3	a	9.8×10^{-6}	3.6×10^{-5}	1.4×10^{-5}	1.2×10^{-5}	5.0×10^{-6}
5	a	1.8×10^{-5}	1.9×10^{-5}	7.9×10^{-6}	6.2×10^{-6}	2.4×10^{-6}
10	3.2×10^{-9}	2.2×10^{-5}	7.4×10^{-6}	3.0×10^{-6}	2.2×10^{-6}	8.6×10^{-7}

Total Dose

Distance Miles	G	F	E	D	C	B
Passing Cloud Whole Body Dose (rem)						
1/3	7.4×10^{-3}	5.0×10^{-3}	5.2×10^{-3}	1.5×10^{-3}	5.0×10^{-3}	1.6×10^{-3}
1	4.6×10^{-3}	2.6×10^{-3}	3.0×10^{-3}	1.1×10^{-3}	1.8×10^{-3}	7.2×10^{-4}
3	2.2×10^{-3}	1.3×10^{-3}	1.2×10^{-3}	4.6×10^{-4}	4.0×10^{-4}	1.7×10^{-4}
5	1.3×10^{-3}	9.0×10^{-4}	6.0×10^{-4}	2.4×10^{-4}	1.6×10^{-4}	8.2×10^{-5}
10	6.6×10^{-4}	4.6×10^{-4}	1.8×10^{-4}	9.0×10^{-5}	4.6×10^{-5}	2.8×10^{-5}
Lifetime Thyroid Dose (rem)						
1/3	a	a	1.2×10^{-6}	6.2×10^{-9}	3.4×10^{-4}	1.0×10^{-4}
1	a	7.4×10^{-7}	2.8×10^{-4}	7.4×10^{-5}	2.0×10^{-4}	8.2×10^{-5}
3	a	3.6×10^{-5}	1.3×10^{-4}	5.4×10^{-5}	4.6×10^{-5}	1.8×10^{-5}
5	a	6.6×10^{-5}	7.0×10^{-5}	2.8×10^{-5}	2.2×10^{-5}	8.6×10^{-6}
10	1.1×10^{-8}	7.6×10^{-5}	2.6×10^{-5}	1.1×10^{-6}	8.2×10^{-6}	3.0×10^{-6}

The symbol "a" means less than 1×10^{-10}.

ATTACHMENT 4 (Cont'd.)

Page 4 of 6

TABLE IV

RADIOLOGICAL EFFECTS OF THE LOSS OF COOLANT ACCIDENT

First 2-Hour Dose

Distance Miles	G	F	E	D	C	B
Passing Cloud Whole Body Dose (rem)						
1/3	1.7×10^{-5}	1.1×10^{-5}	1.1×10^{-5}	3.4×10^{-6}	1.1×10^{-5}	3.8×10^{-6}
1	1.0×10^{-5}	5.8×10^{-6}	6.8×10^{-6}	2.6×10^{-6}	4.0×10^{-6}	1.6×10^{-6}
3	4.8×10^{-6}	3.0×10^{-6}	2.8×10^{-6}	1.0×10^{-6}	8.8×10^{-7}	4.0×10^{-7}
5	3.0×10^{-6}	2.0×10^{-6}	1.3×10^{-6}	5.4×10^{-7}	3.8×10^{-7}	1.8×10^{-7}
10	1.5×10^{-6}	1.0×10^{-6}	4.2×10^{-7}	2.0×10^{-7}	1.0×10^{-7}	6.4×10^{-8}
Lifetime Thyroid Dose (Rem)						
1/3	a	a	4.4×10^{-9}	a	1.3×10^{-6}	4.0×10^{-7}
1	a	2.8×10^{-9}	1.0×10^{-6}	2.8×10^{-7}	8.2×10^{-7}	3.4×10^{-7}
3	a	1.3×10^{-7}	5.2×10^{-7}	2.0×10^{-7}	1.8×10^{-7}	7.0×10^{-8}
5	a	2.4×10^{-7}	2.6×10^{-7}	1.1×10^{-7}	8.6×10^{-8}	3.2×10^{-8}
10	4.4×10^{-9}	3.0×10^{-7}	1.0×10^{-7}	4.2×10^{-8}	3.2×10^{-8}	1.1×10^{-8}

Total Dose

Distance Miles	G	F	E	D	C	B
Passing Cloud Whole Body Dose (Rem)						
1/3	5.8×10^{-4}	4.0×10^{-4}	4.0×10^{-4}	2.2×10^{-4}	4.0×10^{-4}	1.3×10^{-4}
1	3.6×10^{-4}	2.0×10^{-4}	2.4×10^{-4}	9.0×10^{-5}	1.4×10^{-4}	5.6×10^{-5}
3	1.6×10^{-4}	9.6×10^{-5}	1.0×10^{-4}	3.6×10^{-5}	3.2×10^{-5}	1.3×10^{-5}
5	1.0×10^{-4}	6.6×10^{-5}	4.8×10^{-5}	1.9×10^{-5}	1.3×10^{-5}	6.6×10^{-6}
10	5.0×10^{-5}	3.8×10^{-5}	1.4×10^{-5}	7.0×10^{-6}	3.6×10^{-6}	2.2×10^{-6}
Lifetime Thyroid Dose (Rem)						
1/3	a	a	1.8×10^{-7}	9.0×10^{-10}	5.2×10^{-5}	1.5×10^{-5}
1	a	1.1×10^{-7}	4.2×10^{-5}	1.1×10^{-5}	3.2×10^{-5}	1.3×10^{-5}
3	a	5.2×10^{-6}	2.0×10^{-5}	8.6×10^{-6}	7.0×10^{-6}	2.8×10^{-6}
5	a	1.0×10^{-5}	1.0×10^{-5}	4.4×10^{-6}	3.4×10^{-6}	1.3×10^{-6}
10	1.7×10^{-9}	1.1×10^{-5}	4.0×10^{-6}	1.6×10^{-6}	1.2×10^{-6}	4.6×10^{-7}

The symbol "a" means less than 1×10^{-10}

EMPROC3G

ATTACHMENT 4 (Cont'd.)

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TABLE V

RADIOLOGICAL EFFECTS OF THE REFUELING ACCIDENT

First 2-Hour Dose

Distance Miles	G	F	E	D	C	B
Passing Cloud Whole Body Dose (rem)						
1/3	1.4×10^{-3}	9.8×10^{-4}	1.0×10^{-3}	3.0×10^{-4}	9.8×10^{-4}	3.2×10^{-4}
1	9.0×10^{-4}	5.0×10^{-4}	6.0×10^{-4}	2.2×10^{-4}	3.4×10^{-4}	1.4×10^{-4}
3	4.0×10^{-4}	2.6×10^{-4}	2.4×10^{-4}	8.8×10^{-5}	7.6×10^{-5}	3.4×10^{-5}
5	2.6×10^{-4}	1.7×10^{-4}	1.2×10^{-4}	4.6×10^{-5}	3.2×10^{-5}	1.6×10^{-5}
10	1.3×10^{-4}	8.8×10^{-5}	3.6×10^{-5}	1.7×10^{-5}	8.8×10^{-6}	5.6×10^{-6}
Lifetime Thyroid Dose (rem)						
1/3	a	a	2.2×10^{-6}	1.0×10^{-8}	6.0×10^{-4}	1.7×10^{-4}
1	a	1.3×10^{-6}	4.8×10^{-4}	1.2×10^{-4}	3.6×10^{-4}	1.4×10^{-4}
3	a	6.2×10^{-5}	3.2×10^{-4}	9.4×10^{-5}	8.2×10^{-5}	3.2×10^{-5}
5	a	1.1×10^{-4}	1.2×10^{-4}	5.0×10^{-5}	4.0×10^{-5}	1.4×10^{-5}
10	2.0×10^{-8}	1.3×10^{-4}	4.6×10^{-5}	1.9×10^{-5}	1.4×10^{-5}	5.4×10^{-6}

Total Dose

	G	F	E	D	C	B
Passing Cloud Whole Body Dose (rem)						
1/3	7.0×10^{-3}	4.6×10^{-3}	4.8×10^{-3}	1.4×10^{-3}	4.6×10^{-3}	1.5×10^{-4}
1	4.4×10^{-3}	2.4×10^{-3}	2.8×10^{-3}	1.0×10^{-3}	1.6×10^{-3}	6.6×10^{-4}
3	1.9×10^{-3}	1.2×10^{-3}	1.2×10^{-3}	4.2×10^{-4}	3.6×10^{-4}	1.6×10^{-4}
5	1.2×10^{-3}	8.2×10^{-4}	5.6×10^{-4}	2.2×10^{-4}	1.5×10^{-4}	7.6×10^{-5}
10	6.0×10^{-4}	4.2×10^{-4}	1.7×10^{-4}	8.2×10^{-5}	4.2×10^{-5}	2.6×10^{-5}
Lifetime Thyroid Dose (rem)						
1/3	a	4.8×10^{-10}	1.4×10^{-5}	7.0×10^{-8}	3.8×10^{-3}	1.1×10^{-3}
1	a	8.4×10^{-6}	3.0×10^{-3}	8.4×10^{-4}	2.4×10^{-3}	9.2×10^{-4}
3	a	4.0×10^{-4}	1.5×10^{-3}	6.0×10^{-4}	5.2×10^{-4}	2.0×10^{-4}
5	a	7.4×10^{-4}	7.8×10^{-4}	3.2×10^{-4}	2.6×10^{-4}	9.6×10^{-5}
10	1.3×10^{-7}	8.6×10^{-4}	5.0×10^{-4}	1.2×10^{-4}	9.4×10^{-5}	3.4×10^{-5}

The symbol "a" means less than 1×10^{-10}.

ATTACHMENT 4 (Cont'd.)

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TABLE VI

RADIOLOGICAL EFFECTS OF STEAM LINE BREAK ACCIDENT (TOTAL DOSE)

Distance Miles	G	F	E	D	C	B
Passing Cloud Whole Body Dose (rem)						
1/3	4.3×10^{-3}	4.5×10^{-3}	4.3×10^{-3}	8.5×10^{-4}	2.0×10^{-3}	4.6×10^{-4}
1	3.0×10^{-3}	2.8×10^{-3}	1.9×10^{-3}	3.6×10^{-4}	4.5×10^{-4}	1.2×10^{-4}
3	1.6×10^{-3}	1.3×10^{-3}	4.9×10^{-4}	9.8×10^{-5}	6.7×10^{-5}	2.1×10^{-5}
5	9.8×10^{-4}	7.4×10^{-4}	2.1×10^{-4}	4.5×10^{-5}	2.4×10^{-5}	8.2×10^{-6}
10	4.3×10^{-4}	2.8×10^{-4}	4.9×10^{-5}	1.4×10^{-5}	4.8×10^{-6}	2.2×10^{-6}
Lifetime Thyroid Dose (rem)						
1/3	1.3×10^{-3}	1.6×10^{0}	2.0×10^{0}	4.1×10^{-1}	6.6×10^{-1}	1.7×10^{-1}
1	1.5×10^{-2}	1.0×10^{0}	4.8×10^{-1}	1.42×10^{-1}	8.9×10^{-2}	2.3×10^{-2}
3	9.9×10^{-2}	3.8×10^{-1}	7.3×10^{-2}	2.2×10^{-2}	1.2×10^{-2}	3.1×10^{-3}
5	1.4×10^{-1}	2.0×10^{-1}	2.9×10^{-2}	9.0×10^{-3}	4.7×10^{-3}	1.2×10^{-3}
10	1.3×10^{-1}	7.6×10^{-2}	8.4×10^{-3}	2.6×10^{-3}	1.3×10^{-3}	3.4×10^{-4}

ATTACHMENT 5

Form 5790-406-2, Rev. 0, 03/12/81
Page 1 of 2

Example of
OFF-SITE DOSE PROJECTION WORKSHEET-FSAR ACCIDENT ANALYSIS
(For Use With Procedure A.2-406, Attachment 4)

DATA

Time _____

Date _____

Stack Windspeed _____ mph x 0.447 = _____ m/s

Stack Stability Class _____

Wind Direction _____

Affected Sector(s) _____

DOSE PROJECTIONS

From Table: _____:

WHOLE BODY DOSE

Distance Miles	First 2 Hour Dose (Rem)	Total Dose (Rem)
1/3	_____	_____
1	_____	_____
3	_____	_____
5	_____	_____
10	_____	_____

ATTACHMENT 5 (Cont'd.)

Form 5790-406-2, Rev. 0, 03/12/81
Page 2 of 2

Example of
OFF-SITE DOSE PROJECTION WORKSHEET - FSAR ACCIDENT ANALYSIS (Cont'd.)

LIFETIME THYROID DOSE

Distance Miles	First 2 Hour Dose (Rem)	Total Dose (Rem)
1/3	_____	_____
1	_____	_____
3	_____	_____
5	_____	_____
10	_____	_____

REVIEW AND APPROVAL

Completed by: _____ / _____ Date: _____

Reviewed by: Rad. Emerg. Coord. _____ 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 6

Form 5790-406-3, Rev. 0, 03/12/81
Page 1 of 1

Example of
OFF-SITE DOSE PROJECTION CHECKLIST
(For Use With Procedure A.2-406)

1. Release confirmed to have occurred or be imminent.
Source of release: _____ _____ _____ _____
Time Date Initial

2. Estimated magnitude of release: _____

_____ _____ _____ _____
Time Date Initial

3. Dose projection initiated? (YES / NO) Method selected:
(Computer/know release rate/FSAR Accident Analysis). _____ _____ _____
Time Date Initial

4. Dose projection discontinued: _____ _____; Reason: _____
Time Date

_____. _____
Initial

Performed by: _____

Completed: Time: _____ Date _____

Reviewed: _____ 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.

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

A.2-407

Prepared by: L. Lacey/Quadrex ALARA Review: CDMathias Date 3/28/81
Reviewed by: JWinkelhake Q.A. Review: RL Schmidt Date 3/29/81
Operations Committee Final Review: Meeting Number 949 Date 3/26/81
Approved by: FLFay Date 30MAR81
Op. Com. Results Review: not req'd 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.

CONDITIONS AND PREREQUISITES

A. An evacuation is underway as per A.2-301, "Emergency Evacuation".

B. The Radiological Emergency Coordinator or other senior radiation protection individual has directed that appropriate sections of this procedure be implemented.

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

Radiation Protection Specialist - procedure implementation
Radiological Emergency Coordinator - in charge

DISCUSSION

Evacuation may be grouped into three general types of procedures: Local, Plant and Site Evacuations, as per A.2-301, "Emergency Evacuation". These procedures address personnel and vehicle monitoring for each of these types of evacuations.

PROCEDURE

LOCAL EVACUATION/PLANT EVACUATION

NOTE: If the reasons for a Local Evacuation are radiological in nature, evacuated personnel should be directed to the decontamination facilities in the basement of the Administration Building. If these facilities are not accessible, evacuated personnel should be directed to an appropriate alternate location.

STEP 1: Personnel should be frisked for contamination.

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 background any contamination detected on the person of an individual as per the MNGP Operations Manual, Section E.1.5.

NOTE: The guideline for fixed skin contamination is 100 cpm above background when measured with an RM-14 with HP-210 probe. The guideline for smearable contamination is 100 dpm/100 cm^2.

If decontamination efforts do not result in decontamination to the limits stated above, the case will be referred to the Health Physics Group Leader. If contamination is coincident with injury, the procedures outlined in MNGP Operations Manual Hospital Assistance Plan (E.3.2) will be followed.

Contaminations of personal clothing and shoes will be reduced to the limits stated above for skin contamination. If these levels cannot be obtained after reasonable efforts have been made to do so, the items will be disposed of as contaminated waste as per the MNGP Operations Manual (E.1.5).

STEP 3: Dose estimates should be made.

(a) Self-reading dosimeter should be read.

(b) If self-reading dosimeter was not worn, immediate TLD processing should be considered.

NOTE: Document all survey data on appropriate forms.

STEP 4: Personnel who may have been exposed to high concentrations of airborne radionuclides (greater than MPC) should have a nasal smear. If the nasal smear is above background, Body Burden Analysis should be conducted.

STEP 5: The Personnel Contamination Record, Form 5790-407-1 (Attachment 1), should be used only for individuals upon whom contamination is found. A list of all personnel surveyed with the survey results and self-reading dosimeter readings should be compiled, signed and dated by the surveyor.

STEP 6: Submit all data forms to Health Physics Group Leader for filing.

SITE EVACUATION

NOTE: Personnel evacuated from the site under these conditions may not have adequate time for contamination survey 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.

Dose estimates should not be considered during a Site Evacuation. Subsequent TLD processing/dose evaluations will determine dose.

STEP 1: Contamination Survey: The survey point should be near the inner fence on NSP property.

NOTE: The survey point should have as many personnel friskers (RM-14) and GM counters as are available. The surveyors should each survey one side of the vehicle. This would allow traffic to flow faster. The release limits should be 100 cpm above background. Vehicle tires and surfaces should be checked.

STEP 2: Contaminated vehicles must be held for later decontamination. The Vehicle Survey Form, Form 5790-407-2 (Attachment 2), should be filled out for contaminated vehicles only. If only a few cars are not contaminated, arrangements should be made to transport as many personnel in these cars as is possible. Off-site support organizations may also provide evacuation vehicles.

STEP 3: Personnel should also be surveyed for contamination. The release level should be the detection limit 100 cpm above background); if circumstances warrant, higher limits may be acceptable if evacuation is important enough. The Emergency Director may make this determination.

STEP 4: If any personnel are found contaminated they should be decontaminated on NSP property consistent with personnel safety.

NOTE: For this class of evacuation, a survey for inhaled radionuclides should not be performed until a safe offsite assembly area has been reached.

STEP 5: The Vehicle Survey Record, Form 5790-407-3 (Attachment 3), should be filled out for all vehicles.

STEP 6: Submit all data forms to Health Physics Group Leader for filing.

REFERENCES

1. MNGP Operations Manual, Section E.1

2. Monticello Nuclear Generating Plant Emergency Plan

ATTACHMENTS

1. Example of Personnel Contamination Record

2. Example of Vehicle Survey Form

3. Example of Vehicle Survey Record

ATTACHMENT 1

Form 5790-407-1, Rev. 0, 03/12/81
Page 1 of 1

Example of
PERSONNEL CONTAMINATION RECORD

Name _____ Comments: _____

Employer _____

Job Title _____

Date	Time	Part of Body	Before Decon		After Decon		Initials
			Smearable dpm	Fixed cpm	Smearable dpm	Fixed cpm	

EMPROC4D

ATTACHMENT 2

Form 5790-407-2, Rev. 0, 03/12/81
Page 1 of 1

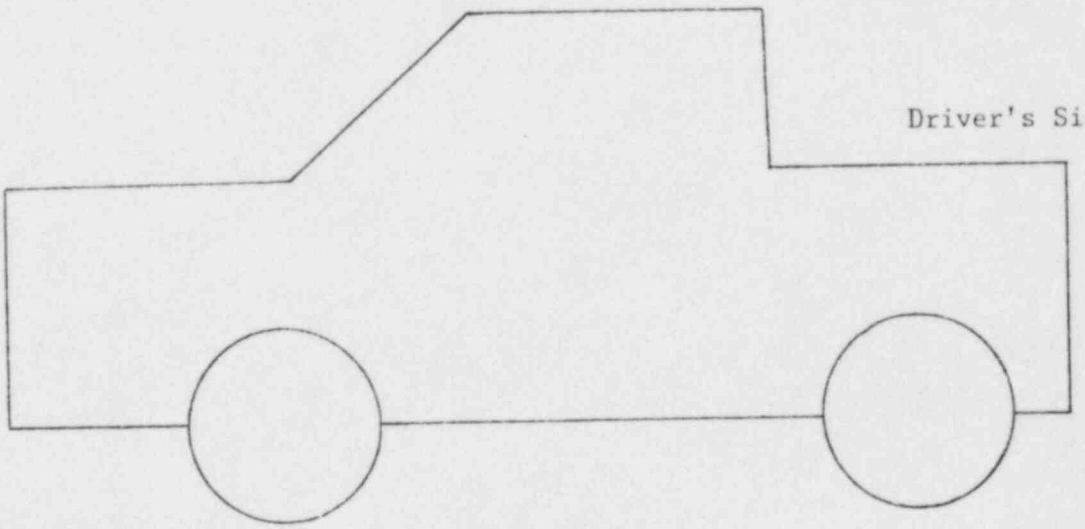
Example of

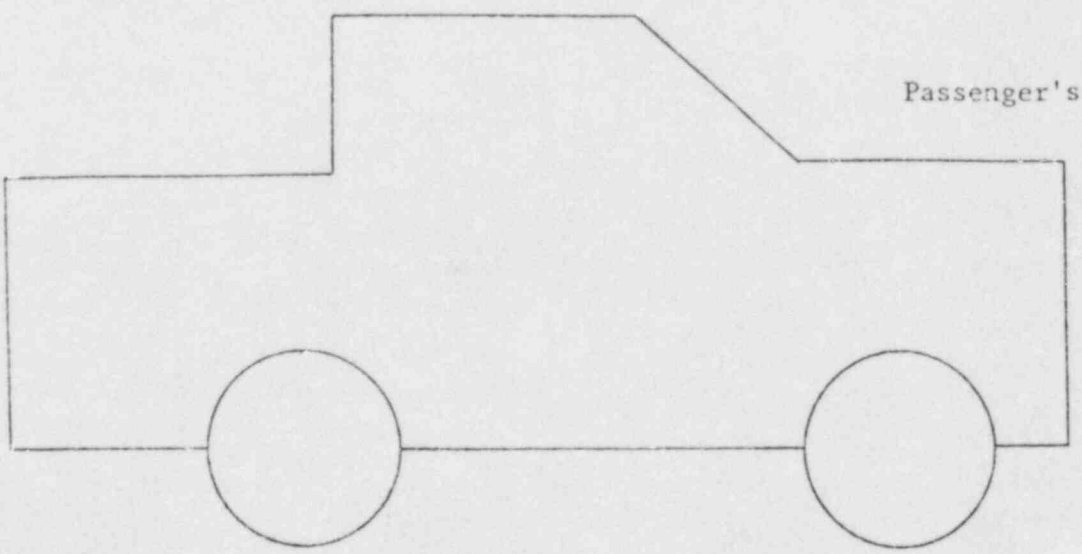
PERSONNEL AND VEHICLE MONITORING

VEHICLE SURVEY FORM

1. This form should only be filled out for contaminated vehicles.

2. Ensure that all tag numbers and names are recorded on the Vehicle Survey Record.





ATTACHMENT 3

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Example of
VEHICLE SURVEY RECORD

Circle tag numbers of vehicles needing decontamination.

Get owner's address and inform him that his car may not be taken off-site until decontaminated by NSP.

NSP Personnel			Contract Personnel and Visitors
Name/License No.	Name/License No.	Name/License No.	Name/License No.

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: L. Lacey/Quadrex ALARA Review: C D Mathiason Date 3/24/81
Reviewed by: [signature] Q.A. Review: R L Schauert Date 3/29/81
Operations Committee Final Review: Meeting Number 949 Date 3/26/81
Approved by: [signature] Date 30MAR81
Op. Com. Results Review: not req'd 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 and may be sent to various 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 probable existence of multiple 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 2) and ensure that all samples and analytical results are properly logged.

(b) The Sample Coordinator shall assign a sequential sample number and a numerical priority number to each sample (if not already assigned) in accordance with STEP 2 of this procedure.

(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

NOTE: Attachment 2 (Form 5790-408-1) of this procedure gives the format for the "Emergency Sample Log".

STEP 2: Sample Priority

The Sample Coordinator shall assign a priority number of 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 1 of this procedure, "Guidelines for Assignment of Sample 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 originator as expeditiously as possible.

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 Priority

2. Example of Emergency Sample Log Format

ATTACHMENT 1

GUIDELINES FOR ASSIGNMENT OF SAMPLE 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 priority numbers as conditions dictate; however, the Sample Coordinator should attempt to follow these guidelines if the priority has not already been assigned.

ATTACHMENT 2

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EMERGENCY SAMPLE LOG FORMAT

SAMPLE NO.	PRIORITY	SAMPLE RECEIVED		DESCRIPTION	INITIALS
		TIME	DATE		

SAMPLE XMIT TO	SAMPLE XMIT		INITIALS	RESULTS RECEIVED		RESULTS XMIT TO	RESULTS XMIT		INITIALS
	TIME	DATE		TIME	DATE		TIME	DATE	

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

EMPROC1E

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

COMMUNICATIONS DURING AN EMERGENCY

A.2-501

Prepared by: L. Lacey/Quadrex ALARA Review: C D Mathiason Date 3/28/81
Reviewed by: L Nolan Q.A. Review: R L Schmidt Date 3/29/81
Operations Committee Final Review: Meeting Number 949 Date 3/26/81
Approved by: T L Fey Date 30MAR81
Op. Com. Results Review: not req'd Mtg. # 949 Date 3/26/81

PURPOSE

This procedure describes the communications systems that are available for use during an emergency, their location, and their function. General communications instructions are also described, but specific equipment instructions are not included.

PRECAUTIONS

A. To the maximum extent possible, all communications regarding the existence or severity of the event, or recommendation of protective actions, will be made on communications circuits which cannot be readily intercepted by persons outside of the emergency organizations. Telephone circuits shall be used as the primary means with radio used only as a backup. This protocol will minimize the spread of rumors, minimize congestion of telephone circuits, and minimize undue public anxiety. In those cases where radio communications are necessary, the use of such equipment and the wording of transmissions shall be in keeping with this protocol.

B. Testing of the entire communications system will be conducted on a periodic basis according to NSP Corporate Implementing Procedures.

PERSONNEL REQUIREMENTS

Emergency Communicators

DISCUSSION

A. General

Reliable communications are essential for the timely implementation of the Emergency Plan. The ability to activate the plant emergency organization, the ability to notify off-site authorities and support organizations, and if necessary, the ability to communicate recommendations for appropriate offsite protective actions for the general public in affected sectors depend on prompt and accurate communications.

Provision is made for 1) 24-hour per day notification to and activation of the State/Local emergency response network, and 2) 24-hour per day manning of emergency communications links for initiating any emergency action. A table of communications locations and appropriate primary and alternate contacts is located in Attachment 2.

B. Onsite Communications

1. Normal onsite communications is provided by the plant telephone system of approximately 100 telephones. The system is powered by its own 48 volt DC battery and charger which are located in the Administration Building. If the charger fails, the battery will supply the system for about 12 hours. The battery charger is supplied by a 110 VAC auxiliary circuit with diesel operator backup.

2. The Plant PA System may also be used for in-plant communications. The PA System is powered by the uninterruptible power system, and also functions as a paging system.

3. The plant sound-powered system is also available and particularly useful for communications between the control room and areas in the plant.

4. Intercom units are installed at selected plant locations primarily for specific task-related activities.

5. The Control Room two-way radio system (described later) may be used for onsite communications with radio equipped trucks and portable radio transceivers.

6. Pocket radio pagers (beepers) are available for use.

7. The plant Alarm System provides a means of rapidly informing personnel of an emergency condition and initiates predetermined immediate actions.

C. Normal Offsite Communications

Normal offsite communications is provided by the following telephone circuits:

1. 6 - PABX circuits to the Bridgewater Telephone Company central exchange in the city of Monticello.

2. 2 - Business telephone circuits to the Bridgewater Telephone Company central exchange. These circuits are not part of the PABX system.

3. 1 - Leased circuit between the control room and the Control Center in Minneapolis. This circuit is direct and involves no dialing or switchboard equipment.

4. 3 - Interstate WATS lines.

5. 2 - Intrastate WATS lines.

D. Alternate Offsite Communications

1. Radio Receiver/Transmitter

An alternate method for communications is provided by an AC powered radio receiver/transmitter located in the Control Room. The radio is equipped with a switch that may be used to select five different channels of communications. From the Control Room, communications may be established with the NSP System Dispatcher in Minneapolis, the St. Cloud System Dispatcher, radio equipped trucks within range, portable handsets, Monticello City Hall, and the Wright County Sheriff.

2. ADAS Automatic Dialing Alerting System (not installed as of 4/1/81)

The ADAS System, when installed, will provide a means of automatic notification to key plant staff and certain offsite authorities and response agencies under emergency conditions. Upon initiation, ADAS dials pre-programmed telephone numbers appropriate to the situation. When the telephone is answered, ADAS delivers a predetermined message and asks for acknowledgement. ADAS can also be used with pocket pagers (beepers).

3. One-Way Radio Alert System

To facilitiate the initial notifications which are necessary in emergency situations, a one-way radio alert system is available. This system is considered a back-up to the ADAS System. Key personnel in the plant emergency organization and local agencies are supplied with radio receivers which are tuned to a transmitter at the plant site. To make the notifications, a tape with a pre-recorded message is transmitted to each person equipped with a receiver.

4. Direct Dedicated Telephone

a. An Automatic-ringing line exists between the Technical Support Center (TSC) and the Emergency Operations Facility (EOF).

b. Emergency Notification System - this dedicated telephone network connects the plant site with NRC offices at Bethesda (NRC Headquarters) and Glen Ellyn (Region III). Site extensions are located in the Control Room, TSC and Operations Support Center (OSC).

c. An automatic-ringing line exists between the Technical Support Center and the NSP Headquarters Emergency Center.

d. Health Physics Network - this dedicated telephone network connects the plant site with NRC offices at Bethesda and Glen Ellyn. Site extensions are located in the office of the Supt., Radiation Protection, TSC, and the EOF.

e. Radio-Telephone Links - radio-telephone links exist for communications between the State Division of Emergency Services and the Control Room, TSC and EOF at the plant site.

E. Communications Matrix

A matrix of locations versus communications capabilities is provided as Attachment 1.

F. Communications Techniques

1. Messages should be worded to avoid possible errors in transcription/interpretation in accordance with the following guidelines as applicable:

   a. To the extent possible, avoid the use of technical jargon, particularly in communications with offsite agencies.

   b. Ensure that message is complete. Do not assume that the message recipient can supply the proper missing words, etc., necessary to make the message complete.

   c. Avoid the use of abbreviations. For example, millirem--not "m-rem", or "m-R".

   d. Read numbers individually (e.g., 135 should be stated "one-three-five", not "one hundred and thirty-five").

   e. Do not use codes.

   f. Preface each communication with the title or name of the receiving party and your title or name. For example: "Monticello Technical Support Center, this is monitoring team number 1 ...".

   g. After the communication is complete, request the receiving party read the message back, if appropriate (particularly if numerical data was relayed).

   h. For radio communications, end message with an appropriate termination phrase. For example: "... monitoring team number 1, out.".

2. All communications from news media or from the public should be referred to the NSP Communications Department (telephone nos.).

3. When the Emergency Operations Facility (EOF) has been activated, authorize callers should be encouraged to contact the NSP representative at the EOF for information. This will minimize the number of communications and improve the accuracy of information dissemination.

G. NSP Communications Department

The NSP Communications Department is responsible to provide briefings and press releases to the news media. The Emergency Director will provide information on plant status as requested by Communications Department personnel. No information should be held back from the Communications Department by Monticello Nuclear Generating Plant personnel. The Emergency Director will ensure that the information provided the Communications Department is current and consistent with information provided to offsite emergency organizations.

PROCEDURE

STEP 1: Log all communications to and from the Control Room/TSC on the Emergency Call Log, Form 5790-501-3 (Attachment 3).

STEP 2: Provide the EOF with periodic situation reports. The frequency of these reports should be consistent with the rate of change of conditions.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan
2. Monticello Nuclear Generating Plant Operations Manual
3. Title 10 Code of Federal Regulations Part 50, Appendix E
4. 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. Monticello Nuclear Generating Plant Communications Matrix
2. Communications Contacts
3. Example of Emergency Call Log

ATTACHMENT 1

MONTICELLO NUCLEAR GENERATING PLANT COMMUNICATIONS MATRIX

	Plant Telephone System	Plant PA System	Plant Sound-Powered Sys.	Intercom	PABX	Bridgewater Tel. Co.	WATS	Two-Way Radio		One-Way Radio Alert	Dedicated Phones	Radio Telephone Links	USNRC OPX	USNRC NPN
Control Room	X	X	X	X	X	X	X	X				X	X	
EOF					X	X					X			X
TSC	X	X	X	X	X	X	X				X	X	X	X
OSC	X	X	X	X	X		X					X	X	
MN-Div. of Emerg. Serv.						X	X					X		
MN-D of H						X	X							
USNRC - HQ						X	X						X	X
USNRC - Reg. III						X	X						X	X
USNRC - Res. Insp.						X	X			X				
Key MNGP Pers. Offsite						X				X				
Wright Co. Sheriff						X		X		X				
Sherburne Co. Sheriff						X				X				
DOE-RAP, Chicago						X	X							
Civil Defense						X				X				
MN - Highway Patrol						X				X				
Monticello City Hall						X		X		X				
Monticello P.D.						X				X				
Monticello F.D.						X				X				
NSP - HQ					X	X	X				X			
NSP - Sys. Disp.					X	X	X	X						
Prairie Island NGP					X	X	X							
MNGP Plant Areas	X	X	X											
Monitoring Teams						X		X						

ATTACHMENT 2

COMMUNICATIONS CONTACTS

Location	Contact	
	Primary	Alternate
Control Room	Shift Supervisor	LPE&RO
EOF	Emergency Manager	Any member of the Advisory Support Group
Minnesota Division of Emergency Services	Duty Officer	Duty Officer
Minnesota Department of Health	State Emergency Plan Coordinator	Alternate State Emergency Plan Coordinator
Wright County Sheriff	Sheriff	Dispatcher
Sherburne County Sheriff	Sheriff	Dispatcher
Monticello Civil Defense	Monticello CD Director	Sheriff Dispatcher
Minnesota Highway Patrol (St. Cloud)	Captain	Dispatcher
Monticello City Hall	Mayor	City Administrator
Monticello F.D.	Sheriff	Dispatcher

ATTACHMENT 3

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Example of
EMERGENCY CALL LOG

Date: _____

TIME	CONTACTS		MESSAGE
	MNGP	OTHER PARTY	

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.

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

RECORD-KEEPING DURING AN EMERGENCY

A.2-502

Prepared by: L. Lacey/Quadrex ALARA Review: C. D Mathiasen Date 3/28/81
Reviewed by: [signature] Q.A. Review: R L Schemont Date 3/29/81
Operations Committee Final Review: Meeting Number 949 Date 3/26/81
Approved by: [signature] Date 30MAR81
Op. Com. Results Review: not req'd Mtg.# 949 Date 3/26/81

PURPOSE

To provide methods and guidelines for documenting events and important data during an emergency.

DISCUSSION

Record-keeping during an emergency is of vital importance. Emergency records serve the following purposes:

(1) Official documentation may be used to reconstruct the emergency for critique or analysis;

(2) Checklists ensure that necessary tasks are completed;

(3) Information and data collection during the emergency; and

(4) Documentation of required action for legal purposes.

A description of emergency logs for record-keeping purposes follows.

1. EMERGENCY LOG

The Emergency Log shall be official documentation of events during an emergency with one exception: the operations staff will log operational events in the Operations Log. The Operations Log will suffice for emergency documentation of operational events. All other important events should be logged in the Emergency Log.

The Emergency Log may subsequently be used to reconstruct events. Entries may be corrected and expanded by comparison with other logs covered in the procedure. The Emergency Director/Shift Supervisor should delegate the record-keeping task of this log to the Emergency Communicator or another available individual, as soon as practical. The individual keeping this log should be physically located near the Emergency Director to facilitate the flow of information.

The below listed items are examples of events and data that should be recorded in the Emergency Log:

a. Significant events and the times at which they occur.

b. Reports made to the Emergency Director (plant status, radiological conditions, etc.).

c. Notification made.

d. Hazard assessment.

(1) Operational (not operational documentation effort)

(2) Radiological

e. Radiological monitor alarms.

f. Survey results, area and personnel.

g. Evacuations (Attachment 2, "Evacuation Checklist").

h. Injuries and medical care.

i. Meteorological information.

j. Emergency teams dispatched (survey, first aid, repair, fire, etc.).

k. Re-entry efforts.

l. Recovery efforts.

m. Off-site dose projections.

n. Any other item deemed necessary or pertinent.

2. EMERGENCY DIRECTOR'S LOG

The Emergency Director's Log is an unofficial bound notebook maintained by the Emergency Director containing information which may be needed subsequently to reconstruct events. Entries are entirely at the discretion of the Emergency Director, but may include the bases for decisions and recommendations.

3. The remaining logs, listed below, are unofficial and are used to provide a bound book for the notes, calculations and recommendations of each of six groups in the plant Emergency Organization. The responsibility for maintaining the log and, ultimately, for deciding what information to log, belongs to the leader of each group.

a. Operations Group Log

b. Maintenance Group Log

c. Engineering Group Log

d. Health Physics Group Log

e. Support Group Log

f. Security Group Log

CAUTION: Although the use of logs and record-keeping in general is important, the protection of people is the prime concern. At no time should the completion of a log or data form delay the implementation of protective actions.

STEP 1: Complete logs and records to document total response to emergency situation.

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"

NOTE: When logs or other records are completed and not required for immediate use, they shall be placed in the appropriate container provided for Emergency Records.

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

EMERGENCY REPORTS AND DOCUMENTATION

A.2-503

Prepared by: L. Lacey/Quadrex ALARA Review: C O Mathiason Date 3/28/81
Reviewed by: K Nolan Q.A. Review: RL Schaunat Date 3/28/81
Operations Committee Final Review: Meeting Number 949 Date 3/26/81
Approved by: E L Fay Date 3/28/81
Op. Com. Results Review: not req'd Mtg. # 949 Date 3/26/81

PURPOSE

The purpose of this procedure is to provide guidance regarding the reports and documentation to be completed following a declared emergency or other reportable event described in the Monticello Nuclear Generating Plant Emergency Plan and to ensure that all related regulatory requirements are satisfied. Notifications relating to such events are also covered as appropriate.

CONDITIONS AND PREREQUISITES

An emergency condition has been declared at the Monticello Nuclear Generating Plant as provided by the MNGP Emergency Plan. The emergency situation may have been subsequently corrected and the emergency terminated.

PRECAUTIONS

This procedure applies only to reports and documentation to be completed following an emergency and to notifications not already addressed in other procedures.

PERSONNEL REQUIREMENTS

Emergency Director - in charge
Designated Staff Person to carry out this procedure

DISCUSSION

Federal Regulations and MNGP Technical Specifications require notification and/or reports of specified events or incident at various time intervals as described below. Asterisked (*) items shall be reported in accordance with 4 ACD-3.9. This summary list of reporting requirements is intended to alert the possibility of a required report to the Emergency Director. In all cases, the appropriate regulation, technical specification or other reporting requirements must be reviewed to determine the reporting requirement.

A. Immediate Notifications/Reports

1. 10CFR20.403(a)

The following events require immediate notification of the Director, USNRC, Region III by telephone, telegraph, mailgram, or facsimile if they involve by product, source, or special material and may have caused or threaten to cause:

a. Exposure of the whole body of any individual to 25 rems or more of radiation; exposure of the skin of the whole body of any individual of 150 rems or more or radiation; or exposure of the feet, ankles, hands or forearms of any individual to 375 rems or more of radiation; or

b. The release of radioactive material in concentrations which, if averaged over 24 hours, would exceed 5,000 times the limits specified for such materials in Appendix B, Table II, 10CFR20; or

c. A loss of one working week or more of the operation of any facilities affected; or

d. Damage to property in excess of $200,000.

* 2. 10CFR70.52(a)

Any case of accidental criticality and any loss, other than normal operating loss, of special nuclear material shall be reported immediately to the Director, USNRC, Region III by telephone, telegraph, mailgram or facsimile.

* 3. 10CFR73.71(b)

Any incident in which an attempt has been made, or is believed to have been made, to commit a theft or unlawful diversion of licensed special nuclear material, or to commit an act of radiological sabotage against the plant shall be reported immediately to the Director, USNRC, Region III by telephone.

*B. Prompt Notification (Technical Specifications)

The types of events listed in MNGP Technical Specification 6.7.B.1 shall be reported as expeditiously as possible, but within 24 hours by telephone and confirmed by telegraph, mailgram or facsimile transmission no later than the first working day following the event.

C. Eight Hour Notification (NUREG 0654, Appendix I)

A summary of a close out or recommended reduction in emergency class for an Alert, Site Area or General Emergency, to off-site authorities within 8 hours of the close out or class reduction.

D. 24 Hour Notification [10CFR20.403(b)]

The following events require notification of the Director, USNRC, Region III by telephone, telegraph, mailgram or facsimile within 24 hours if they involve licensed material which may have caused or threatens to cause:

1. Exposure of the whole body of any individual to 5 rems or more of radiation; exposure of the skin of the whole body of any individual to 30 rems or more of radiation; or exposure of the feet, ankles, hands or forearms to 75 rems or more of radiation; or

2. The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 500 times the limits specified for such materials in Appendix B, Table II, 10CFR20; or,

3. A loss of one day or more of the operation of any facilities affected; or

4. Damage to property in excess of $2,000.

In the event that close-out of a Notification of Unusual Event (NUE) occurs, off-site authorities shall be notified by a summary within 24 hours following its close-out (NUREG 0654, Appendix I).

*E. Two Week Written Report (Technical Specification 6.7.B.1.)

Events requiring prompt notification in Tech Spec 6.7.B.1. (and Step B. of this discussion) shall require a written followup report within two weeks.

The written followup report shall include, as a minimum, a completed copy of a licensee event report form. Information provided on the licensee event report form shall be supplemented, as needed, by additional narrative material to provide explanation of the circumstances surrounding the event.

F. 15 Day Written Report [10CFR73.71 (b)]

Any incident reported immediately under Step A.3 of this discussion shall be followed up within a period of 15 days by a written report submitted to the USNRC, Region III setting forth the details of the incident. Copies shall be sent to the Director of Inspection and Enforcement, USNRC, Washington, D.C. Any additional substantive information which becomes available subsequent to the submission of the report shall be reported in writing immediately to the above mentioned addresses.

G. 30 Day Written Reports

1. 10CFR20.405

In addition to any notification made in accordance with 10CFR20.403 and/or Step A.1 of this discussion, a written report must be made to the USNRC, Region III (copy to the Director of Inspection and Enforcement, USNRC, Washington, D.C.) of:

a. Each exposure of an individual to radiation in excess of the applicable limits in 10CFR20.103 (a) (1), 20.103 (a) (2), 20.104 (b), or the license.

b. Each exposure of an individual to radioactive limits in 10CFR20.103 (a) (1), 20.103 (a) (2), 20.104 (b), or the license.

c. Levels of radiation or concentrations of radioactive material in a restricted area in excess of any other applicable limit in the license.

d. Any incident for which notification is required by 10CFR20.403 (Step A.1 of this procedure).

e. Levels of radiation or concentrations of radioactive materials (whether or not involving excessive exposure of any individual) in an unrestricted area in excess of ten times any applicable limit set forth in 10CFR20 or in the license.

Each report required under this paragraph shall describe the extent of exposure of individuals to radiation or to radioactive material; levels of radiation and concentrations of radioactive material involved; cause of the exposure, levels of concentrations; and corrective steps taken or planned to assure against a reoccurrence.

Any report filed with the Commission pursuant to 10CFR20.405 shall include, for each individual exposed, his name, social security number, date of birth and an estimate of the individual's exposure. The report shall be prepared so that this information is stated in a separate part of the report.

2. 10CFR50, Appendix I, Section IV.A

If the quantity of radioactive material released in effluents to unrestricted areas during any calendar quarter is such that the resulting radiation exposure, calculated on the same basis as the respective design objective exposure, would exceed one-half the design objective annual exposure derived pursuant to 10CFR50, Appendix I, Section II and III, a written report must be made to the USNRC, Region III identifying the causes for such release rates and defining a program of corrective action. Such reports shall be made within 30 days from the end of the quarter during which the release occurred.

* 3. MNGP Technical Specification 6.7.B.2

The reportable occurrences specified in Tech Spec 6.7.B.2 shall be the subject of written reports to the Director, USNRC, Region III, within 30 days of the occurrence of the event. The written report shall include, as a minimum, a completed copy of a licensee event report form. Information provided on the licensee event report form shall be supplemented, as needed, by additional narrative material to provide complete explanation of the circumstances surrounding the event.

G. Chronology of Events

When deemed appropriate by the Plant Manager or senior responsible NSP official, a chronology of events shall be developed as part of the written report requirements. Such a chronology should include the following types of information:

- Declaration, upgrading, downgrading or termination of emergency classification.
- Significant events and the times at which they occur.
- Reports made to the Emergency Director (plant status, radiological conditions, etc.).
- Notification made.
- Hazard assessment.

  (1) Operational (not operational documentation effort)
  (2) Radiological

- Radiological monitor alarms.
- Survey results, area and personnel.
- Evacuations.
- Injuries and medical care.
- Meteorological information.
- Emergency teams dispatched (survey, first aid, repair, fire, etc.).
- Re-entry efforts.
- Recovery efforts.
- Off-site dose projections.
- Any other item deemed necessary or pertinent.

Sources of such information are maintained in an Emergency Log as referenced in A.2-502, "Recordkeeping During an Emergency".

PROCEDURE

STEP 1: The Emergency Director will designate a qualified staff person to review the events and their procedure to identify potentially reportable items.

STEP 2: The Emergency Director will review the potentially reportable items and determine their reportability.

STEP 3: The Emergency Director will assign a qualified individual to prepare the report and submit in accordance with the reporting requirements.

STEP 4: Copies of all written reports will be placed in the appropriate container provided for Emergency Records.

REFERENCES

A. Monticello Nuclear Generating Plant Emergency Plan

B. Monticello Nuclear Generating Plant Technical Specifications

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

D. 10CFR20

E. 10CFR50, Appendix I

F. 10CFR70

G. 10CFR73

ATTACHMENTS

None

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

RE-ENTRY

A.2-601

Prepared by: L. Lacey/Quadrex ALARA Review: GDMathiasen Date 3/29/81
Reviewed by: JWindschill Q.A. Review: RL Scheinost Date 3/29/81
Operations Committee Final Review: Meeting Number 950 Date 3/27/81
Approved by: FL Fey Date 30MAR81
Op. Com. Results Review: not req'd Mtg. # 950 Date 3/27/81

PURPOSE

This procedure provides instructions for re-entry to the site or to affected areas within plant buildings when the radiological conditions are largely unknown.

CONDITIONS AND PREREQUISITES

A. An emergency condition at Monticello Nuclear Generating Plant has resulted in the evacuation (and isolation, if applicable) of the site or affected areas of the plant.

B. The magnitude and/or nature of the radiological hazard on the site or in the affected area is unknown.

PRECAUTIONS

Because of the unknown conditions within the site or the affected area, appropriate precautions for personnel safety shall be implemented. These include, but are not limited to the precautions described below:

A. Re-entry team shall be composed of a minimum of two individuals. These individuals shall remain in visual/voice contact with each other at all times when in the affected area.

B. If the ventilation to the area has been isolated, and/or if there is reason to believe that the air within the area is toxic or an oxygen deficiency exists, appropriate self-contained breathing apparatus (SCBA) shall be used. In this case, in addition to the two man entry team, one or more additional individuals shall be assigned to remain outside of the affected area, in appropriate clothing and wearing SCBAs on standby, ready to enter the area to affect rescue.

C. Life-lines should be used in areas containing heavy smoke, or in areas where visual contact cannot be maintained with the re-entry team.

D. Personal air samplers and/or personal alarming dosimeters should be used if extreme conditions are suspected.

E. Protective clothing should be chosen on the basis of the suspected conditions, or if a reasonable estimation cannot be made, the protective clothing with the highest protection should be used.

F. If possible, areas should be ventilated prior to entry.

G. Exposures of re-entry personnel shall be in accordance with A.2-401, (Emergency Exposure Control).

PERSONNEL REQUIREMENTS

Radiological Emergency Coordinator - in charge (remote)
Re-entry Team and Team Leader

DISCUSSION

A. This procedure is divided into three sections:

1. Site re-entry;

2. Re-entry to affected areas within plant structures;

3. Follow-up actions.

B. This procedure may be implemented concurrently with A.2-403, "Emergency Surveys" and/or A.2-303 "Search and Rescue".

C. The Radiological Emergency Coordinator shall be responsible for the safe implementation of this procedure.

PROCEDURE

NOTE: Complete Re-Entry Checklist, Form 5790-601-2 (Attachment 2) and Re-Entry Team Equipment and Protective Gear, Form 5790-601-1 (Attachment 1).

STEP 1: Site Re-Entry

NOTE: This section of the procedure assumes that personnel have evacuated the site and have assembled at an off-site assembly area.

A. The Radiological Emergency Coordinator shall utilize all pertinent data available including survey data from adjacent areas, observations made by evacuated personel, and any other source to determine:

1. Which plant areas are affected.

2. Conditions in affected areas (hazards, radiological conditions, temperatures, etc.).

3. If personnel are trapped and/or disabled in affected areas.

4. If actions can be taken to reduce the potential hazards to re-entry personnel prior to or during re-entry.

5. If re-entry can be delayed without affecting plant or personnel safety to allow for radioactive decay.

6. Preferred route to survey area.

B. Form an appropriate re-entry team. The Radiological Emergency Coordinator (or designated senior radiation protection supervisor) should organize and direct re-entry surveys.

NOTE: When possible, re-entry teams should be composed of volunteers and shall include at least one radiation protection member.

C. The Radiological Emergency Coordinator shall direct each team member to obtain appropriate equipment and don appropriate protective clothing and respirators. Attachment 1 should be used as a guide for appropriate equipment and protective gear.

D. A vehicle should be obtained in which to approach the site. Note gas tank level. If the level is less than 1/2, consider use of another vehicle.

E. If available, plastic should be spreadon the floor of the vehicle and seats, in order to minimize contamination.

F. As appropriate to the radiological conditions and/or re-entry team assignment, the Radiological Emergency Coordinator should:

1. Ensure that the team turns on and checks the operation of survey instrument(s).

NOTE: If at any time the survey instrument appears to be malfunctioning, direct team to immediately retreat to a safe area. Be especially careful for unexpected low survey instrument readings. Some GM survey instruments will read "0" or a low value if the detector is saturated by extremely high radiation levels.

2. Ensure that the team approaches the site from upwind as much as possible and continuously monitoring radiation levels by extending the instrument probe out the vehicle window.

3. Continuously apprise the EOF of the progress of the re-entry team, conditions observed, and dose rates.

4. Direct re-entry team members to check their pocket dosimeters periodically and report the results to the EOF. The frequency of these checks should be consistent with the observed dose rate.

5. If at any time during re-entry, observed dose rates exceed 1 rem/hr (or other predetermined level), or if the exposure of any member of the re-entry team exceeds 3 rem, (or other specified maximum allowable dose), direct the entire re-entry team to retreat to a safe area.

6. Direct the team to perform assigned surveys in accordance with A.2-202 "Off-Site Monitoring During an Emergency". Document all results in the Off-Site Emergency Survey Log.

7. Upon arrival of the team at the site boundary, direct them to site and perform an additional survey about halfway between the affected unit and the site boundary.

8. If instructed to re-enter the plant, direct the team to approach the guardhouse, continuously monitoring dose rate. Upon entry of the guardhouse, notify the EOF of the progress and dose rates observed.

9. If directed further, have the team re-enter the unit and continue as provided in the next section of this procedure.

STEP 2: Re-entry to Affected Areas Within Plant Structures

NOTE: This section of the procedure may be used without the preceeding section, if only certain areas within the plant have evacuated and isolated. Applicable steps may also be used subsequent to the implementation of the preceeding section, if a site evacuation has taken place.

A. The Radiological Emergency Coordinator shall utilize all pertinent data available including area and process monitoring channels, survey data from adjacent area, observations made by evacuated personnel, and any other source to determine:

1. Which plant areas are affected.

2. Conditions in affected areas (hazards, radiological conditions, temperatures, etc.).

3. If personnel are trapped and/or disabled in affected areas.

4. If actions can be taken to reduce the potential hazards to re-entry personnel prior to or during re-entry.

5. If re-entry can be delayed without affecting plant or personnel safety to allow for radioactive decay.

B. Form an appropriate re-entry team. The Radiological Emergency Coordinator (or designated senior radiation protection supervisor) should organize and direct re-entry surveys.

NOTE: When possible re-entry team should be composed of volunteers and include at least one radiation protection member.

C. The Radiological Emergency Coordinator shall direct each team member to obtain appropriate equipment and don appropriate protective clothing and respirators. Attachment 1 should be used as a guide for appropriate equipment and protective gear.

D. As appropriate to the radiological conditions, and/or the re-entry team assignment the Radiological Emergency Coordinator should:

1. Ensure that the team turns on and checks the operation of the survey instrument(s).

NOTE: If at any time the survey instrument appears to be malfunctioning, direct the team to immediately retreat to a safe area. Be especially careful for unexpected low survey instrument readings. Some GM survey instruments will read "0" or a low value if the detector is saturated by extremely high radiation levels.

2. Direct the team to approach the affected area, continuously monitoring dose rates.

3. Continuously apprise the TSC/EOF of the re-entry team exposures, conditions observed, and dose rates.

4. Direct re-entry team members to read their pocket dosimeters periodically and report the results to the TSC/EGF. The frequency of these checks should be consistent with the observed dose rate.

5. If at any time during re-entry observed dose rates exceed 1 rem/hr (or other pre-determined level), or if the exposure of any member of the re-entry team exceeds 3 rem, (or other specified maximum allowable dose), direct the entire re-entry team to retreat to a safe area.

6. Direct the team to perform surveys in accordance with Procedure A.2-201 (On-Site Monitoring During an Emergency).

7. Direct the team to perform appropriate inspections, repairs, and operations.

8. Direct team to perform appropriate rescue and first aid functions if trapped or disabled personnel are discovered in the area.

E. At the completion of assigned functions, direct the team to leave the affected area and return to the control point, and remove protective clothing and monitor prior to leaving the area.

STEP 3: Follow-Up Actions

1. Upon completion of re-entry, direct team members to report to the Health Physics Group.

2. Inform the Emergency Director of the results of the re-entry surveys and make recommendations for restoring access to affected areas.

3. Determine appropriate access control measures for entry to the affected area(s) to begin recovery operations.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Title 10, Code of Federal Regulations, Parts 20 and 50

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 Re-entry Team Equipment and Protective Gear

2. Example of Re-entry Checklist

ATTACHMENT 1

Form 5790-601-1, Rev. 0, 03/12/81
Page 1 of 1

Example of
RE-ENTRY TEAM EQUIPMENT AND PROTECTIVE GEAR

Radiological Emergency Coordinator (or qualified designee) Initial each applicable item below in the space provided as it is provided to the re-entry team(s). Do not initial items that are not provided.

INITIALS	ITEM
_____	High range self-reading pocket dosimeters (2 per individual)
_____	TLD badges (2 or more per individual)
_____	Extremity TLD's - as appropriate
_____	Portable radio transceiver
_____	High range survey instrument (preferably with telescoping probe) - as appropriate
_____	Intermediate range survey instrument
_____	G-M survey instrument
_____	Air samples and filters/cartridges
_____	Personnel air monitors - as appropriate
_____	Alarming dosimeters - as appropriate
_____	Area maps, survey forms, pencils
_____	Contamination swipes and envelopes
_____	First aid/rescue equipment - as appropriate
_____	Appropriate protective clothing - if in doubt, require full protective clothing
_____	Appropriate respiratory protective equipment
_____	Keys - as appropriate

NOTE: Only Self-Contained Breathing Apparatus (SCBA) should be used for re-entry and/or rescue purposes. Air-purifying respirators shall not be used if toxic gases or oxygen deficiency is present or suspected. Air hose respirators should not be used due to difficulties in handling hoses in confined areas during emergencies.

_____ _____
(Date) (Radiological Emergency Coordinator/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.

EMPROC2J

ATTACHMENT 2

Form 5790-601-2, Rev. 0, 03/12/81
Page 1 of 2

Example of
RE-ENTRY CHECKLIST
(For Use With Procedure A.2-601)

1. Affected areas evaluated, as applicable.

   _____ _____ _____
   REC Initials Time Date

2. Re-entry Team appropriated.

   _____ _____ _____
   REC Initials Time Date

3. Equipment and Protective Gear obtained.
   Vehicle obtained.

   _____ _____ _____
   REC Initials Time Date

4. Procedure A.2-202, "Off-Site Monitoring During an Emergency" implemented.

   _____ _____ _____
   REC Initials Time Date

5. Entered Site Area/performed survey.

   _____ _____ _____
   REC Initials Time Date

6. Entered Affected Area/performed survey.

   _____ _____ _____
   REC Initials Time Date

7. EOF apprised.

   _____ _____ _____
   REC Initials Time Date

ATTACHMENT 2 (Cont'd.)

Form 5790-601-2, Rev. 0, 03/12/81
Page 2 of 2

Example of

RE-ENTRY CHECKLIST (Cont'd.)

8. Returned to Control Point.

REC Initials	Time	Date

9. Exposure evaluated.

REC Initials	Time	Date

10. Emergency Director contacted.

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.

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

IMPLEMENTATION OF RECOVERY PLAN

A.2-602

Prepared by: L. Lacey/Quadrex ALARA Review: C O Mathiason Date 3/29/81
Reviewed by: D Nelson Q.A. Review: R L Scheimann Date 3/29/81
Operations Committee Final Review: Meeting Number 950 Date 3/27/81
Approved by: J L Fay Date 30MAR81
Op. Com. Results Review: not req'd Mtg. # 950 Date 3/27/81

PURPOSE

The purpose of this procedure is to provide criteria which warrant termination of the emergency response phase and to specify actions required to transfer control of operations in progress to the Recovery Manager. The Emergency Director is responsible for execution of this procedure.

CONDITIONS AND PREREQUISITES

A. If considerable plant damage has occurred and/or if severe radiological conditions exist as a result of the emergency, the NSP Recovery Plan will probably be implemented. Conversely, if these conditions are not very significant, the normal plant organization will continue with on-site operations. Senior NSP Management will direct that the recovery plan be implemented.

B. An emergency condition has been declared at the Monticello Nuclear Generating Plant in accordance with the Emergency Plan.

C. Conditions are stabilizing to the point that an emergency response effort may no longer be necessary and the emergency is apparently under control. The emergency may have been down-graded or terminated.

ORGANIZATION

Initial: Emergency Director - in charge of on-site response effort
Emergency Manager - in charge of off-site response effort

Final: Recovery Manager - in charge of recovery effort

PROCEDURE

STEP 1: Determine whether or not the emergency has been brought under control. An emergency should be considered under control when all of the following criteria are met:

a. Radiation levels and airborne concentrations in all areas are determined to be stable or decreasing.

b. Uncontrolled radioactive effluent releases from the plant are terminated.

c. Fires have been extinguished and flooding conditions are under control.

d. Plant and plant systems and equipment have been placed in a safe operating or shutdown mode.

e. Injured personnel have been removed from hazardous area and proper medical treatment is being administered.

If the emergency is not under control in accordance with the above criteria, terminate this procedure.

STEP 2: Inform the Emergency Manager that the plant condition is stable.

STEP 3: Conduct a briefing for the Recovery Manager.

STEP 4: Meet with NSP Management to begin phase-in of the recovery effort.

STEP 5: Establish documentation of implementation of the Recovery Plan as defined by this procedure and required by Company Management. Place copies in the Emergency Records.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. NSP Recovery Plan

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

None

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

RESPONSE TO AN EMERGENCY AT PRAIRIE ISLAND

A.2-702

Prepared by: L. Lacey/Quadrex ALARA Review: GD Mathias Date 3/29/81
Reviewed by: JW Widtsch Q.A. Review: RL Scheinost Date 3/29/81
Operations Committee Final Review: Meeting Number 950 Date 3/27/81
Approved by: JL Fay Date 30MAR81
Op. Com. Results Review: not req'd Mtg. # 950 Date 3/27/81

PURPOSE

The purpose of this procedure is to provide instructions for the Monticello Nuclear Generating Plant Radiation Protection Group when called upon to respond to an emergency at Prairie Island. Also included is a list of the equipment required and a "priority list" of qualified Radiation Protection Designees and their home telephone numbers.

CONDITIONS AND PREREQUISITES

A declared emergency exists at the Prairie Island site and conditions have made necessary a request for health physics support.

DISCUSSION

In an emergency situation which includes a release of radioactive materials to the environs, the process of off-site and environmental monitoring is limited by the personnel and equipment available for sampling, and to a lesser degree, by the facilities available for analysis. In an effort to enhance MNGP's capacity to handle this type of emergency, MNGP has made a reciprocal agreement w th Prairie Island whereby each plant would supply personnel, equipment and analysis facilities to the other upon request.

PERSONNEL REQUIRED

Radiation Protection Coordinator

Four (4) persons qualified in radiation protection, one of whom will be designated as Radiation Protection Support Supervisor.

PROCEDURE

NOTE: Upon notification that Prairie Island has requested assistance, the Radiation Protection Coordinator will organize a team of four people.

STEP 1: Refer to the "List of Qualified Radiation Protection Specialists/ Support Supervisors", Attachment 1. Arrange for three Specialists and one Supervisor to travel to Prairie Island.

NOTE 1: The Radiation Protection Designee must remain available at Monticello (within 30 miles).

NOTE 2: Persons who go must arrive at Prairie Island with the required equipment and with a minimum of delay.

NOTE 3: Inform Supt., Radiation Protection of situation after arrangements are made.

STEP 2. Individuals who agree to respond to the request for support will meet at the MNGP site to pick up vehicles and equipment as per Attachment 2, "Prairie Island Emergency Support Equipment List". (Other arrangements may be made if necessary, as long as all equipment and personnel arrive at Prairie Island with a minimum of delay.)

STEP 3: Proceed to Prairie Island.

STEP 4: Upon arrival determine if the Emergency Operation Facility (EOF) has been activiated. If so, report to the EOF to begin off-site monitoring.

STEP 5: If the EOF has not been activated or does not yet have the capability to direct the off-site monitoring effort, report to the Prairie Island Emergency Director for further instructions. (This may be accomplished by means of telephone or radio contact--it is not necessary to report in person.)

STEP 6: Obtain survey maps and procedures from Emergency Manager/Director. The Radiation Protection Support Supervisor will direct the off-site monitoring effort.

STEP 7: If the analysis facilities at Prairie Island are not sufficient or become unavailable, the facilities at Monticello will be available. Transportation of samples will be arranged by EOF or Prairie Island personnel.

REFERENCES

1. Prairie Island Nuclear Generating Plant Emergency Plan and Implementing Procedures

ATTACHMENTS

1. List of Qualified Radiation Protection Specialists/Support Supervisors

2. Prairie Island Emergency Support Equipment List

ATTACHMENT 1

QUALIFIED RADIATION PROTECTION SPECIALISTS

DELETE

QUALIFIED RADIATION PROTECTION SUPPORT SUPERVISORS

DELETE

ATTACHMENT 2

PRAIRIE ISLAND EMERGENCY
SUPPORT EQUIPMENT LIST

Personal TLD's; self-reading dosimeters (rezero)

Rain gear and umbrellas

2 Vehicles that can be used for off-site monitoring purposes

2 Portable 12/24 VDC air samplers with a supply of particulate filters, charcoal cartridges, and silver zeolite cartridges

4" x 6" plastic bags and masking tape

2 timing devices

2 portable radio transceivers (for communications within team)

2 dose rate measuring instruments (Radector III or equivalent)

2 count rate measuring instruments (Thyac III or equivalent)

2 flashlights/spare batteries

Stationary supplies - paper and pencils