ENCLOSURE 2

MONTICELLO EMERGENCY PLAN, REVISION 25

141 pages follow

MONTICELLO NUCLEAR GENERATING PLANT		February 2004
TITLE:	EMERGENCY PLAN	Revision 25

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OC Mtg No.: 2402	Date: 2/17/04
Approved By Site Vice President:	Date: 3/4/2004

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3087 (DOCUMENT CHANGE, HOLD, AND COMMENT FORM) incorporated: 04-0354

Resp Supv: EP	Assoc Ref: A.2	SR: N	Freq: 1 yrs
ARMS: E-Plan	Doc Type: ~~1500~~ 1060	Admin Initials:	Date: 3/5/04

I/mab

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1.0 DEFINITIONS AND ABBREVIATIONS

1.1 Assessment Action - Actions taken during or after an accident to obtain and process information necessary to make decisions regarding emergency measures.

1.2 Committed Dose Equivalent (CDE) refers to the dose received over the 50 year period following an intake of radioactive materials.

1.3 Committed Effective Dose Equivalent (CEDE) is the sum of the products of the weighted factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to these organs or tissue.

1.4 Corrective Actions - Emergency measures taken to terminate an emergency situation at or near the source in order to prevent or minimize a radioactive release, e.g., shutting down equipment, firefighting, repair and damage control, etc.

1.5 Effective dose equivalent (EDE) is the sum of the product of the absorbed dose in tissue, quality factors, and all other necessary modifying factors at the location of interest.

1.6 Emergency Action Level (EAL) - Specific instrument readings, surface or airborne contamination levels or radiation dose rates that designate a specific emergency class requiring emergency measures for that class.

1.7 Emergency Director (ED) - The Plant Manager or his designee. This individual has overall responsibility and authority for managing the emergency effort within the plant. The ED will also manage efforts external to the plant until relieved of those responsibilities by the Emergency Manager.

1.8 Emergency Manager (EM) - This person is responsible to direct the overall MNGP emergency response effort. The EM will assume control of the Emergency Operations Facility and direct NMC Emergency response efforts.

1.9 EOF - Emergency Operations Facility

1.10 Emergency Planning Zones - A defined area around the plant to facilitate emergency planning by state and local authorities, to assure that prompt and effective actions are taken to protect the public in the event of a release of radioactive material. It is defined for:

A. Plume Exposure Pathway - A 10 mile radius around the plant where the principal exposure source is: (1) whole body exposure to gamma radiation from the plume and from deposited material; and (2) inhalation exposure from the passing radioactive plume (Short Term Exposure).

B. Ingestion Exposure Pathway - A 50 mile radius around the plant where the principal exposure would be from the ingestion of contaminated water or foods such as milk or fresh vegetables (Long Term Exposure).

1.11 ERDS - Emergency Response Data System

1.12 Emergency Worker - Any individual who has an essential mission within or outside the plume exposure pathway emergency planning zone to protect the health and safety of the public who could be exposed to ionizing radiation from the plume or from its deposition. Some examples of emergency workers are: radiation monitoring personnel; traffic control personnel; evacuation vehicle drivers; fire and rescue personnel, including ambulance crews; medical facilities personnel; emergency operations center personnel; personnel carrying out backup alerting procedures; and essential services or utility personnel.

1.13 FTS - Federal Telephone System

1.14 Nuclear Management Company (NMC) is the operator of the Monticello Nuclear Generating Plant.

1.15 OSC - Operational Support Center

1.16 PASS - Post-Accident Sampling System

1.17 Protective Actions - Emergency measures taken before or after a release of radioactive materials in order to prevent or minimize radiological exposures to the population.

1.18 Protective Action Guides (PAG) - Projected dose to individuals, that warrants protective action prior to and/or following a radioactive release.

1.19 REC - Radiological Emergency Coordinator

1.20 Recovery Actions - Actions taken after an emergency to restore the plant to normal.

1.21 SEC - Shift Emergency Communicator

1.22 TSC - Technical Support Center

1.23 Total Effective Dose Equivalent (TEDE) is the sum of EDE and CEDE.

1.24 Xcel Energy is the contracting owner of the Monticello Nuclear Generating Plant.

2.0 SCOPE AND APPLICABILITY

In accordance with license conditions, 10CFR Part 50, and NRC Regulatory guidance, the Nuclear Management Company (NMC) has developed and implemented an emergency response plan for the Monticello Nuclear Generating Plant (MNGP) and a joint off-site plan for the MNGP and the Prairie Island Nuclear Generating Plant. Xcel Energy has contracted with the NMC to operate the Monticello Nuclear Generating Plant. As asset owner, Xcel Energy retains all owner obligations.

In any emergency situation at Monticello, the initial response would be made by the site staff and, if needed, by local support agencies. It is expected that the initial response would have to extend for a period of hours, by which time the site staff would be augmented by other segments of the overall NMC emergency response organization. Once all centers are activated and the emergency organization is at full strength, the scope of the plant staff response will be reduced to the immediate plant site activities. This plan covers the actions and responsibilities of the Monticello plant staff and the local off-site support agencies.

The plan is directed toward the following areas:

1. Organization and actions within the plant to control and limit the consequences of an accident.

2. Organization and actions controlling site and initial off-site activities in the event of an uncontrolled release of radioactive material. This includes notification of and coordination with required off-site support agencies.

3. Identifying and evaluating the consequences of accidents that may occur and affect the safety of public and plant personnel.

4. Describing the protective action levels and actions that are required to protect the public and plant personnel in the event of an accident.

5. Considerations necessary for the purposes of re-entry and recovery.

6. Arrangements required for medical support in the event of injury.

7. The training necessary to assure adequate response to emergencies.

8. Notification systems used to notify the public in the event of an incident involving or potential of involving an off-site release.

The Emergency Plan is dependent upon the Emergency Plan Implementing Procedures for implementation. The procedures are the activating mechanism for the State Plan, which in turn activates the local government and service support agencies. Finally, the procedures reference standing plant operating, radiological control and security procedures in defining the plant's response to the spectrum of emergency situations.

3.0 SUMMARY OF EMERGENCY PLAN

Abnormal events, both realized and potential, requiring emergency preparedness response are classified into four classes of Emergency Action Levels. The four levels of emergency classes, in increasing order of severity are:

(5) Notification of Unusual Event

(6) Alert

(7) Site Area Emergency

(8) General Emergency

Each class requires specific immediate actions on the part of the plant staff in order to protect the public, plant personnel and property. As the severity level of the emergency increases, so does the response of the off-site agencies, in order to protect the public.

The lowest class (least severe) is the Notification of Unusual Event. This classification will be handled by plant personnel, with advisory notification to local and state authorities. The Alert Classification requires prompt notification of local and state authorities, which will place their various organizations in the standby mode. In both the Notification of Unusual Event and the Alert Classification, the plant staff is expected to restore the situation to normal without further or minimum involvement of off-site authorities. The two higher severity classes, the Site Area and the General Emergency, (the General Emergency being the most severe), require prompt notification of off-site authorities with immediate involvement of those organizations to assess the emergency situation and to implement the required protective actions for the general public.

4.0 EMERGENCY CLASSIFICATION SYSTEM

Emergency situations are classified according to severity, taking into consideration potential as well as actual events in process. The four standardized classifications are as follows:

1. Notification of Unusual Event (NUE)
2. Alert
3. Site Area Emergency
4. General Emergency

The rationale connecting the four action levels is to provide a mechanism for timely notification of events which could lead to significant consequences given subsequent operator error or equipment failure or which might be indicative of more serious conditions which are not yet fully realized. It should be noted that various events could require a graded scale of response. A minor incident could increase in severity and advance to the next class of emergency. In the case of an event that rapidly escalates then de-escalates in emergency classification or is initiated at a higher emergency class then rapidly de-escalates, the initial off-site notifications includes the current emergency classification and the highest emergency classification reached during the course of the event. This framework is constructed to provide for smooth transition from one class to another.

The process of assessing and classifying an event as a specific type of emergency requires a broad knowledge of integrated plant instrumentation and response to various transients. The specific instruments, annunciators, parameters or equipment status for the various initiating conditions for each emergency class are specified in the following four sections.

4.1 Notification of Unusual Event

Unusual events, as used for emergency planning purposes, generally characterize off-normal plant conditions that may or may not in themselves be particularly significant from an emergency preparedness standpoint, but could reasonably have the potential to increase in significance if proper action is not taken or if circumstances beyond the control of the operating staff render the situation more serious from a safety standpoint.

The purpose of the Unusual Event emergency class is to (1) have the operating staff come to a state of readiness from the standpoint of emergency response in the event the handling of the initiating condition needs to be escalated to a more severe emergency class, and (2) provide for systematic handling of Unusual Events information and its related decision-making.

4.2 Example Initiating Conditions and EALs: Notification of Unusual Event

4.2.1 RADIOLOGICAL EFFLUENT OFF-SITE DOSE CALCULATION MANUAL (ODCM) LIMITS EXCEEDED

EALs

1a. Discharge Canal Monitor exceeds 400 cps indicated by annunciator 4-A-22 (DISCHARGE CANAL HI RADIATION) and recorder C02-17.358.

OR

1b. Sampling identifies a liquid release to river which exceeds ODCM-02.01 limits,

OR

1c. Stack Effluent Monitor (Channel A or B) exceeds 90,000 μCi/sec indicated by annunciator C259-A-1 (STACK EFFLUENT HI HI RADIATION) and RECORDERS RR-7801A and RR-7801B on C-257/C258, and computer point PRM011 (STACK NOBLE GAS RELEASE RATE ALARM).

OR

1d. Reactor Building Vent Effluent Monitor (Ch A or B) exceeds 4,500 μCi/sec indicated by annunciator C259-A-2 (RBV EFFLUENT HI HI RADIATION) and RECORDERS RR-7801A and RR-7801B on C-257/C-258.

OR

1e. Unmonitored gaseous release to the atmosphere which is estimated or suspected to exceed ODCM-03.01 limits (4,500 μCi/sec).

4.2.2 PRIMARY SYSTEM LEAK RATE EXCEEDS TECHNICAL SPECIFICATIONS

EALs

1a. Unidentified leakage exceeds 5 gpm as indicated by computer point PCT 509 (DW FLOOR DRAIN SUMP RATE OF CHANGE) or calculated from indicator LR-7409 on Panel C-04 in the Control Room.

OR

1b. Total drywell leakage exceeds 25 gpm as indicated by computer point PCT 507 (DW TOTAL LEAKAGE) or calculated from indicator LR-7409 on Panel C-04 in the Control Room.

OR

1c. Unidentified leakage rate increases 2 gpm within any 24 hour period as determined from Test 0381 (PRIMARY CONTAINMENT LEAKAGE RATE RECORDING).

4.2.3 FUEL DAMAGE INDICATION

EALs

1a. Off-Gas Pretreatment Monitor exceeds 20,000 (2×10^4) mrem/hr as indicated on Recorder RR-4902 or RM-17-150A and RM-17-150B.

OR

1b. Off-Gas Pretreatment Monitor increases by 4,000 mrem/hr within 30 minutes at steady power as indicated by Recorder RR-4902 or RM-17-150A and RM-17-150B.

OR

1c. Reactor coolant I-131 dose equivalent exceeds 5 μCi/gram as determined by sample and analysis.

4.2.4 FAILURE OF A SAFETY RELIEF VALVE TO CLOSE FOLLOWING REDUCTION OF APPLICABLE PRESSURE

EALs

1a. Annunciator 3-A-09 (AUTO BLOWDOWN RELIEF VALVE LEAKAGE).

OR

1b. Annunciator 5-A-46 (SRV OPEN ALARM).

4.2.5 INDICATIONS OR ALARMS ON PROCESS OR EFFLUENT PARAMETERS NOT FUNCTIONAL IN THE CONTROL ROOM TO AN EXTENT REQUIRING PLANT SHUTDOWN

4.2.6 NEAR OR ON-SITE TOXIC OR FLAMMABLE GAS RELEASE

EAL

Gaseous hazards being experienced or projected on-site (out-of-plant) as indicated by visual observation, physical measurement or notification.

4.2.7 SECURITY THREAT OR ATTEMPTED ENTRY OR ATTEMPTED SABOTAGE

EALs

1a. Security determines the threat to be credible.

OR

1b. Security discovers an unauthorized attempted entry by force or stealth (secret) into the protected area.

OR

1c. Security confirms that an act of attempted sabotage did occur to vital plant equipment or security equipment.

OR

1d. Low Credible Security Threat notification received.

4.2.8 LOSS OF OFF-SITE POWER OR LOSS OF ON-SITE AC POWER CAPABILITY

EALs

1a. Verified zero voltage on bus voltage meters or breaker indicators for Bus 11, Bus 12, Bus 13, Bus 14, and 1AR transformer on Panel C-08.

OR

1b. Loss of 11 and 12 Emergency Diesel Generators when they are required to be operable by Technical Specifications and inoperability is not due to surveillance testing.

4.2.9 TORNADO ON-SITE

EALs

1a. Tornado observed to touch down within the site boundary,

OR

1b. Sustained winds above 75 MPH for greater than 10 minutes at the site.

4.2.10 RIVER WATER LEVEL IN EXCESS OF 918 FEET OR RIVER FLOW BELOW 240 CFS (APPROXIMATELY 902.4 FT RIVER LEVEL)

4.2.11 ANY EARTHQUAKE FELT IN-PLANT OR DETECTED ON STATION SEISMIC INSTRUMENTATION AND SUBSEQUENTLY CONFIRMED BY ONE OR MORE OFF-SITE SOURCES

EALs

1a. On annunciator 6-C-8 (EARTHQUAKE ALARM).

OR

1b. Shift Manager's judgement.

4.2.12 FIRE WITHIN THE PLANT NOT EXTINGUISHED WITHIN 15 MINUTES OF DETECTION.

EAL

NOTE: Verification of the alarm in this context means those actions taken in the Control Room to determine that the Control Room alarm is not spurious.

1. Fire in buildings or areas contiguous to any of the following areas not extinguished within 15 minutes of Control Room notification or verification of a Control Room alarm: Reactor, Turbine, Radwaste, Plant Administrative, Intake Structure, Diesel Generator, Heating Boiler, Recombiner, EFT, Condensate Storage Tanks.

4.2.13 NEAR OR ON-SITE EXPLOSION

EALs

1. Visual observation or notification received,

AND

2. Shift Manager's judgement.

4.2.14 AIRCRAFT CRASH ON-SITE OR SUSPICIOUS AIRCRAFT ACTIVITY OVER THE FACILITY

EAL

1. Visual observation or notification is received.

4.2.15 TRAIN DERAILMENT ON-SITE

OR

TURBINE ROTATING COMPONENT FAILURE CAUSING RAPID PLANT SHUTDOWN

EALs

1a Visual Observation

OR

1b. Shift Manager's judgement.

4.2.16 PLANT CONDITIONS EXIST REQUIRING SHUTDOWN UNDER TECHNICAL SPECIFICATION REQUIREMENTS AND INABILITY TO REACH REQUIRED OPERATING MODE WITHIN TECHNICAL SPECIFICATION TIME LIMITS.

OR

PLANT CONDITIONS EXIST THAT WARRANT INCREASE AWARENESS ON THE PART OF PLANT OPERATING STAFF OR STATE AND/OR LOCAL OFF-SITE AUTHORITIES.

OR

OTHER CONDITIONS EXIST WHICH IN THE JUDGEMENT OF THE SHIFT MANAGER OR EMERGENCY DIRECTOR INDICATE A POTENTIAL DEGRADATION OF THE LEVEL OF SAFETY OF THE PLANT.

4.3 Alert

At the Alert classification, events are in process or have occurred which involve an actual or potential substantial degradation of the level of plant safety. It is the lowest level where emergency off-site response may be anticipated. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

The purpose of the alert emergency class is to (1) assure emergency personnel are readily available to respond if the situation becomes more serious or to perform confirmatory radiation monitoring if required, (2) provide off-site authorities current status information, and (3) provide for activation of the TSC, OSC, and EOF or backup EOF.

4.4 Example Initiating Conditions and EALs: Alert

4.4.1 RADIOLOGICAL EFFLUENTS GREATER THAN 10 TIMES OFF-SITE DOSE CALCULATION MANUAL (ODCM) LIMITS

EALs

1a. Discharge Canal monitor exceeds 4000 cps

OR

1b. Sampling identifies a liquid release to river which is 10 times ODCM-02.01 limits

OR

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

OR

1d. Reactor Building Vent Effluent Monitor (Ch A or B) exceeds 4.5E+4 μCi/sec

OR

1e. Unmonitored gaseous release to the atmosphere which is estimated or expected to exceed 10 times ODCM-03.01 limits, (4.5E+4 μCi/sec).

4.4.2 SEVERE DEGRADATION IN THE CONTROL OF RADIOACTIVE MATERIALS

EAL

1a. Increase by a factor of 1000 in plant radiation levels as indicated by Area Radiation Monitoring System.

NOTE: **EALs shown as FULL SCALE indicate that an increase by a factor of 1000 is beyond the range of the particular monitor. In these cases, a full scale reading combined with the Shift Manager's concurrence, *SHALL* meet the criteria for the ALERT classification.**

Panel	Description	Normal	EAL
C-11	A-1 1027 RB NE Low	10	Full Scale
C-11	A-2 1027 RB N High	5	5000
C-11	A-3 1027 RB W Stairway	1	1000
C-11	A-4 1001 Source Storage	20	Full Scale
C-11	A-5 Fuel Pool Skimmer Tk Area	20	Full Scale
C-11	A-6 1001 Decon Area	3	Full Scale
C-11	A-7 985 Sample Hood	5	Full Scale
C-11	A-8 RX Cleanup System Access	0.25	250
C-11	A-9 962 RX East	0.8	800
C-11	A-10 East CRD HCU	3	Full Scale
C-11	A-11 West CRD HCU	3	Full Scale
C-11	A-12 TIP Drive Area	2	Full Scale
C-11	A-13 TIP Cubicle	30	Full Scale
C-11	A-14 HPCI Turbine Area	2	Full Scale
C-11	A-15 RX Bldg Drain Tk Area	25	Full Scale
C-11	A-16 RCIC Pump Area	1	1000
C-11	A-17 East CS and RHR Area	20	Full Scale

Panel	Description	Normal	EAL
C-11	A-18 West CS and RHR Area	8	Full Scale
C-11	A-19 Hot Chemistry Lab	.25	250
C-11	A-20 Control Room Low Range	0.02	20
C-11	A-21 Control Room High Range	3	3000
C-11	B-1 Turbine Operating Floor	90	Full Scale
C-11	B-2 Turbine Front Standard	70	Full Scale
C-11	B-3 Cond Demin Operating Area	3	1000
C-11	B-4 Mechanical Vacuum Pump Room	9	Full Scale
C-11	B-5 Feedwater Pump Area	1	1000
C-11	C-1 Radwaste Control Room	0.2	200
C-11	C-2 Sample Tank Area	3	Full Scale
C-11	C-3 Conveyer Operating Area	0.2	200
C-11	D-1 Hot Machine Shop	0.2	200
C-252	E-1 Recombiner Instrument Room	1	Full Scale
C-252	E-2 Recombiner Pump Room	3	Full Scale
C-252	F-1 Off-Gas Storage Foyer	.3	100
C-11	F-2 OG Strg Foyer High Range	<100	100
C-257/ C-258	Containment Rad Monitor	3-5	50 Rem/hr

OR

1b. Direct measurement of radiation levels corresponding to an increase by a factor of 1000.

4.4.3 PRIMARY COOLANT LEAK RATE GREATER THAN 50 GPM

EAL

1a. Total leakage exceeds 50 gpm as indicated by computer point PCT 509 (DW FLOOR DRAIN SUMP RATE OF CHANGE) or computer point PCT 507 (DW TOTAL LEAKAGE) or as calculated from indicators LR-7409 on Panel C-04 in the Control Room.

OR

1b. Unisolable primary system leakage outside the drywell as indicated by area temperatures or ARM levels ≥ maximum safe values in at least one area.

OR

1c. Shift Manager's judgement.

4.4.4 MAIN STEAM LINE BREAK WITH MSIV MALFUNCTION CAUSING LEAKAGE TO SECONDARY CONTAINMENT

EALs

1. Shift Manager's judgement that MSIV is malfunctioning or continuing steam flow with evidence that the steam line break is outside primary containment (e.g., visual observation, radiation or temperature),

AND

2a. Annunciators 5-A-25/26 (MAIN STEAM LINE HIGH FLOW A/B ALARM) and 5-B-24 (RX WATER LEVEL HI/LO ALARM),

OR

2b. Annunciators 5-A-17/18 (MAIN STEAM TUNNEL HIGH TEMPERATURE A/B ALARM),

OR

2c. Annunciator 5-B-32 (MAIN STEAM LINE LEAKAGE ALARM).

4.4.5 SEVERE LOSS OF FUEL CLADDING INDICATED BY HIGH OFF-GAS AT PRETREATMENT MONITOR (GREATER THAN 5 CI/SEC CORRESPONDING TO 16 ISOTOPES DECAYED 30 MINUTES) OR VERY HIGH COOLANT ACTIVITY SAMPLE (E.G., >300 μCI/GM I-131 DOSE EQUIVALENT)

EALS

NOTE: Resin intrusion or excessive hydrogen injection rates may cause high radiation without fuel cladding damage.

1a. Off-Gas Pretreatment Monitor exceeds 200,000 (2×10^5) mrem/hr indicated on Recorder RR-4902 or RM-17-150A and RM-17-150B.

OR

1b. Main Steam Line Monitor indicates 6000 mrem/hour due to high radiation.

OR

1c. Reactor Coolant >300 μCi/gm I-131 dose equivalent as determined by sample and analysis.

OR

1d Containment Radiation Monitor reading exceeds the Containment Monitor Response to Contained Source Curve.

4.4.6 FAILURE OF THE REACTOR PROTECTION SYSTEM TO INITIATE AND COMPLETE A SCRAM WHICH BRINGS THE REACTOR SUBCRITICAL

EALS

1. Valid Scram Signal,

AND

2. Neutron count rate indicates reactor critical.

4.4.7 COMPLETE LOSS OF ABILITY TO ACHIEVE OR MAINTAIN PLANT COLD SHUTDOWN

EALS

1a. Loss of core cooling capabilities needed to achieve plant cold shutdown.

OR

1b. Loss of core cooling capabilities required to maintain the Reactor Coolant Temperature < (less than) 212°F,

AND

2. Shift Manager's judgement that the plant cannot reach or maintain cold shutdown.

4.4.8 LOSS OF MOST OR ALL ANNUNCIATORS WHILE OPERATING ABOVE COLD SHUTDOWN.

EALS

1. Unplanned loss of most or all of annunciators on Panels C-03, C-04, C-05, C-08.

AND

2. Loss of plant computer alarm display, alarm typer and SPDS display.

4.4.9 EVACUATION OF THE CONTROL ROOM IS REQUIRED OR ANTICIPATED AND CONTROL OF SHUTDOWN SYSTEMS HAS BEEN ESTABLISHED AT LOCAL STATIONS. (IF LOCAL CONTROL HAS NOT BEEN ESTABLISHED IN 15 MINUTES, GO TO SITE AREA EMERGENCY)

EAL

1. As determined by Shift Manager.

4.4.10 ENTRY INTO FACILITY ENVIRONS OF UNCONTROLLED TOXIC OR FLAMMABLE GASES

EAL

1a. Gaseous hazards being experienced or projected within the plant as indicated by measured concentrations equal to or greater than:

(a) 50 ppm Ammonia

(b) 3 ppm Chlorine

(c) 5 ppm Vinyl Chloride

(d) 2000 ppm Butadiene

(e) 50 ppm Ethylene Dichloride

(f) 500 ppm Gasoline

(g) 2100 ppm Propane

(h) 2000 ppm L.P.G.

(i) IDLH for any toxic gas

NOTE: IDLH = Immediately Dangerous to Life or Health. IDLH Reference: NIOSH Pocket Guide to Chemical Hazards.

OR

1b. Explosive levels (as indicated by explosive meter).

4.4.11 ON-GOING SECURITY COMPROMISE

EAL

1a. Security safeguards contingency event that results in unauthorized personnel commandeering an area within the protected area but not controlling shutdown capability or any vital areas.

OR

1b. Bomb device discovered within plant protected area and outside of any vital area.

OR

1c. High Credible Security Threat notification received.

4.4.12 LOSS OF OFF-SITE POWER AND LOSS OF ON-SITE AC POWER (STATION BLACKOUT (SEE SITE AREA EMERGENCY FOR EXTENDED LOSS)

EALS

1. Verified zero voltage on bus voltage meters or breaker indicators for Bus 11, Bus 12, Bus 13, Bus 14, Bus 15, Bus 16, and 1AR transformer on Panel C-08.

AND

2. Loss of 11 and 12 Emergency Diesel Generators when they are required to be operable by Technical Specifications.

4.4.13 LOSS OF ALL VITAL DC POWER (see Site Area Emergency for extended loss)

EALs

1. Loss of both 125 Vdc power sources, and loss of both 250 Vdc power sources as indicated by annunciators:

   8-A-20 (DIV I 250 VDC HI-LO VOLTAGE); and

   20-B-09 (DIV II 125 & 250 VDC TROUBLE); and

   8-B-13 (NO. 12 125VDC BUS VOLTAGE HIGH/LOW); and

   8-C-14 (NO. 11 125VDC BUS VOLTAGE HIGH/LOW),

AND

2. Shift Manager's judgement that all vital DC power is lost or degraded voltages are measured at battery terminals.

4.4.14 TORNADO STRIKING THE FACILITY

EALS

1a. Tornado strikes a vital plant structure,

OR

1b. Sustained winds above 90 MPH for greater than 10 minutes at the site.

4.4.15 RIVER WATER LEVEL BETWEEN 921 AND 930 FEET, OR RIVER FLOW BELOW 220CFS (ABOUT 902.3 FT).

4.4.16 CONFIRMED EARTHQUAKE GREATER THAN OBE LEVELS

EAL

1. Annunciator 6-C-13 (OPERATIONAL BASIS EARTHQUAKE ALARM).

4.4.17 FIRE POTENTIALLY AFFECTING SAFETY SYSTEM

EALS

1. Observation that fire could affect a safety system,

<u>AND</u>

2. Shift Manager's judgement.

4.4.18 KNOWN EXPLOSION DAMAGE TO THE FACILITY AFFECTING PLANT OPERATIONS

EAL

1. Shift Manager's judgement.

4.4.19 AIRCRAFT CRASH ON THE FACILITY OR MISSILE IMPACT ON FACILITY

EAL

1. Visual observation

4.4.20 TURBINE FAILURE CAUSING CASING PENETRATION

EALS

1a. Visual observation,

<u>OR</u>

1b. Shift Manager's judgement.

4.4.21 PLANT CONDITIONS EXIST THAT WARRANT PRECAUTIONARY ACTIVATION OF THE TECHNICAL SUPPORT CENTER AND PLACEMENT OF THE EMERGENCY OPERATIONS FACILITY AND OTHER KEY EMERGENCY PERSONNEL ON STANDBY

4.4.22 FUEL DAMAGE ACCIDENT WITH RELEASE OF RADIOACTIVITY TO CONTAINMENT

EALS

1. Dropping, bumping or otherwise rough handling of a spent fuel bundle or individual fuel rods,

AND

2. Annunciator 5-A-1 OR 5-A-2 (FUEL POOL RADIATION MONITOR (CH A or B)) exceeds 50 mrem/hr.

4.5 Site Area Emergency

The Site Area Emergency classification reflects conditions where there is a clear potential for significant releases. Events are in process or have occurred which involve actual or likely major failures of plant functions needed for the protection of the public. Any releases are not expected to exceed EPA Protective Action Guideline exposure levels except near site boundary.

The purpose of the site area emergency classification is to (1) assure that response centers are manned; (2) assure that monitoring teams are dispatched; (3) assure that personnel required for evacuation of near-site areas are at duty stations if the situation becomes more serious, and (4) provide current information for and consultation with off-site authorities and public.

4.6 Example Initiating Conditions and EALs: Site Area Emergency

4.6.1 EFFLUENT MONITORS DETECT LEVELS CORRESPONDING TO GREATER THAN 50 MREM/HR FOR 1/2 HOUR OR GREATER THAN 500 MREM/HR (WHOLE BODY) FOR 2 MINUTES (or five times these levels for thyroid) AT THE SITE BOUNDARY FOR ADVERSE METEOROLOGY, OR THESE DOSE RATES ARE PROJECTED BASED ON OTHER PLANT PARAMETERS (e.g., radiation level in containment with leak rate appropriate for existing containment pressure) OR ARE MEASURED IN THE ENVIRONS, OR EPA PROTECTIVE ACTION GUIDELINES ARE PROJECTED TO BE EXCEEDED OUTSIDE THE SITE BOUNDARY

EALs

1a. Stack Effluent Monitor (Ch A or B) exceeds 5.7E+6 μCi/sec for 30 minutes,

OR

1b. Stack Effluent Monitor (Ch A or B) exceeds 5.7E+7 μCi/sec for 2 minutes,

OR

1c. Stack release rate of radioiodines exceeds 5.7E+3 μCi/sec for 30 minutes,

OR

1d. Stack release rate of radioiodines exceeds 5.7E+4 μCi/sec for 2 minutes,

OR

1e. RB Vent Effluent Monitor (Ch A or B) exceeds 2.1E+6 μCi/sec for 30 minutes,

OR

1f. RB Vent Effluent Monitor (Ch A or B) exceeds 2.1E+7 μCi/sec for 2 minutes,

OR

1g. RB Vent release rate of radioiodines exceeds 3600 μCi/sec for 30 minutes,

OR

1h. RB Vent release rate of radioiodines exceeds 3.6E+4 μCi/sec for 2 minutes,

OR

1i. Whole body doses (TEDE) greater than 1000 mrem or thyroid doses (CDE) of greater than 5000 mrem are projected beyond the site boundary,

OR

1j. Containment Radiation Monitor reading indicates above the .01% curve when plotted versus time after shutdown IAW A.2-208 (CORE DAMAGE ASSESSMENT) Section 6.2 and associated Figure 7.0-1.

OR

1k. Measured Whole Body dose rates at the site boundary or beyond exceed 50 mrem/hr for 30 minutes or 500 mrem/hr for 2 minutes,

OR

1l. Radioiodine concentrations measured at site boundary or beyond exceed 7.0E-8 μCi/cc for 30 minutes or 7.0E-7 μCi/cc for 2 minutes,

4.6.2 KNOWN LOSS OF COOLANT ACCIDENT GREATER THAN MAKEUP CAPACITY

EAL

1a. Total leakage exceeds 50 gpm as indicated by computer point PCT 509 (DW FLOOR DRAIN SUMP RATE OF CHANGE) or computer point PCT 507 (DW TOTAL LEAKAGE) or as calculated from indicator LR-7409 on Panel C-04 in the Control Room.

OR

1b. Unisolable primary system leakage outside the drywell as indicated by area temperatures or ARM levels ≥ maximum safe values in at least one area.

AND

2. Reactor water level decreasing below 1 foot above active fuel (-114 inches) indicated by FUEL ZONE LEVEL INDICATOR (LI-2-3-91A/B) as a result of insufficient makeup capacity.

4.6.3 MAIN STEAM LINE BREAK WITH FAILURE OF MSIVS TO ISOLATE THE LEAK AND CAUSING LEAKAGE OUTSIDE SECONDARY CONTAINMENT

EALS

1. Shift Manager or Emergency Director's judgement that MSIV is malfunctioning or continuing steam flow with evidence that steam line break is outside of primary containment,

AND

2a. Annunciator 5-A-25/26 (MAIN STEAM LINE HI FLOW A/B ALARM) and 5-B-24 (RX WATER LEVEL HI/LO ALARM),

OR

2b. Annunciator 5-A-17/18 (MAIN STEAM TUNNEL HIGH TEMPERATURE ALARM),

OR

2c. Annunciator 5-B-32 (MAIN STEAM LINE LEAKAGE ALARM),

AND

3a. On annunciator 4-A-21 (TURBINE BUILDING HIGH RADIATION ALARM).

OR

3b. High airborne radioactivity levels in the Turbine Building indicated by Continuous Air Monitors (CAMs) or direct measurement.

OR

3c. Visual observation that blow-out panels between the Steam Chase and Turbine Building have been ruptured.

4.6.4 DEGRADED CORE WITH POSSIBLE LOSS OF COOLABLE GEOMETRY

EALS

1. More than 1/3 of core uncovered as indicated by reactor water level below -174 inches.

AND

2a. Reactor coolant >3,000 μCi/gm I-131 dose equivalent as determined by sampling and analysis.

OR

2b. Inability to insert control rods fully.

OR

2c. Inability to position SRMs or IRMs within core.

4.6.5 TRANSIENT REQUIRING OPERATION OF SHUTDOWN SYSTEMS WITH FAILURE TO SCRAM (CONTINUED POWER OPERATION BUT NO CORE DAMAGE IMMEDIATELY EVIDENT)

EALS

1. Failure to bring reactor subcritical with control rods,

AND

2. Failure of the Standby Liquid Control system,

AND

3. Shift Manager or Emergency Director's judgement that a transient is in progress,

AND

4. No indication of core damage (if core damage is indicated declare a GENERAL EMERGENCY).

4.6.6 COMPLETE LOSS OF ABILITY TO ACHIEVE OR MAINTAIN HOT SHUTDOWN

EALS

1. Inability to SCRAM and inoperable Standby Liquid Control System,

AND

2a. Loss of all Safety Relief Valve capability,

OR

2b. Inoperable RHR System,

OR

2c. Inoperable RHR heat sink,

AND

3a. Loss of main condenser cooling,

OR

3b. No makeup capability from either HPCI or RCIC Systems,

AND/OR

4. Shift Manager or Emergency Director's judgement that plant cannot reach or maintain hot shutdown.

4.6.7 LOSS OF MOST OR ALL ANNUNCIATORS AND PLANT TRANSIENT INITIATED OR IN PROGRESS

EALS

1. Unplanned loss of most or all of annunciators on Panels C-03, C-04, C-05, C-08.

AND

2. Loss of plant computer alarm display, alarm typer and SPDS display.

AND

3. Shift Manager or Emergency Director's judgement that a transient has been initiated or is in progress.

4.6.8 EVACUATION OF THE CONTROL ROOM AND CONTROL OF SHUTDOWN SYSTEMS NOT ESTABLISHED FROM LOCAL STATIONS IN 15 MINUTES

EAL

1. As determined by Shift Manager or Emergency Director.

4.6.9 ENTRY OF UNCONTROLLED FLAMMABLE GASES INTO VITAL AREAS OR ENTRY OF UNCONTROLLED TOXIC GASES INTO VITAL AREAS WHERE LACK OF ACCESS TO THE AREA CONSTITUTES A SAFETY PROBLEM AND THE PLANT IS NOT IN COLD SHUTDOWN

EALS

1a. Gaseous hazards being experienced or projected within the vital areas of the plant as indicated by measured concentration equal to or greater than:

(a) 50 ppm Ammonia

(b) 3 ppm Chlorine

(c) 5 ppm Vinyl Chloride

(d) 2000 ppm Butadiene

(e) 50 ppm Ethylene Dichloride

(f) 500 ppm Gasoline

(g) 2100 ppm Propane

(h) 2000 ppm L.P.G.

(i) IDLH for any toxic gas

NOTE: IDLH = Immediately Dangerous to Life or Health. IDLH Reference: NIOSH Pocket Guide to Chemical Hazards.

OR

1b. Explosive levels (as indicated by explosive meter).

AND

2. Plant **IS NOT** in cold shutdown.

4.6.10 IMMINENT LOSS OF PHYSICAL CONTROL OF THE PLANT

EAL

1a. Physical attack on the plant involving imminent occupancy of the Control Room, auxiliary shutdown panels, and any other vital areas.

OR

1b. Bomb device discovered within a vital area.

4.6.11 LOSS OF OFF-SITE POWER AND LOSS OF ON-SITE AC POWER FOR MORE THAN 15 MINUTES

EALS

1. Verified zero voltage on bus voltage meters or breaker indicators for Bus 11, Bus 12, Bus 13, Bus 14, Bus 15, Bus 16 and 1AR transformer on Panel C-08.

AND

2. Loss of 11 and 12 Emergency Diesel Generators when they are required to be operable by Technical Specifications.

AND

3. Failure to restore power to at least one emergency bus within 15 minutes from the time of loss of both off-site and on-site AC power.

4.6.12 LOSS OF ALL VITAL ON-SITE DC POWER FOR MORE THAN 15 MINUTES

EALS

1. Loss of both 125 Vdc power sources and loss of both 250 Vdc power source as indicated by annunciators:

   DIV I 250 VDC BUS HI/LO VOLTAGE (8-A-20); and
   DIV II 125 & 250 VDC TROUBLE (20-B-09); and
   NO. 12 125 VDC BUS VOLTAGE HIGH/LOW (8-B-13); and
   NO. 11 125 VDC BUS VOLTAGE HIGH/LOW (8-C-14),

AND

2. Shift Manager or Emergency Director's judgement that all vital DC power is lost or degraded voltages are measured at battery terminals,

AND

3. 15 minute time lapse.

4.6.13 SUSTAINED WINDS OR TORNADO IN EXCESS OF DESIGN LEVELS

EALS

1a. Tornado causes damage to vital plant equipment or plant structures,

OR

1b. Sustained winds above 100 MPH for greater than 10 minutes at the site.

4.6.14 RIVER WATER LEVEL EXCEEDS 930 FT OR RIVER WATER LEVEL BELOW 899 FT OR FLOOD OR LOW WATER CAUSES DAMAGE TO VITAL EQUIPMENT

4.6.15 CONFIRMED EARTHQUAKE GREATER THAN DBE LEVELS AND PLANT NOT IN COLD SHUTDOWN

EALS

1. Annunciator DESIGN BASIS EARTHQUAKE ALARM (6-C-18).

AND

2. Plant not in cold shutdown.

4.6.16 FIRE COMPROMISING THE FUNCTIONS OF A SAFETY SYSTEM

EALS

1. Observation of fire that affects safety systems or functions,

AND

2. Shift Manager or Emergency Director's judgement.

4.6.17 SEVERE DAMAGE TO SAFE SHUTDOWN EQUIPMENT FROM MISSILES OR EXPLOSION

EALS

1. Plant not in cold shutdown,

AND

2. Shift Manager or Emergency Director's judgement.

4.6.18 AIRCRAFT CRASH AFFECTING VITAL STRUCTURES BY IMPACT OR FIRE, OR SEVERE DAMAGE TO SAFE SHUTDOWN EQUIPMENT FROM MISSILES OR EXPLOSION

EAL

1. As determined by Shift Manager or Emergency Director with plant not in cold shutdown.

4.6.19 OTHER PLANT CONDITIONS EXIST THAT WARRANT ACTIVATION OF EMERGENCY CENTERS AND MONITORING TEAMS OR A PRECAUTIONARY NOTIFICATION TO NEAR SITE PUBLIC.

4.6.20 MAJOR DAMAGE TO SPENT FUEL IN CONTAINMENT (E.g., Large Object Damages Fuel Or Water Loss Below Fuel Level)

EALS

1a. Decrease in fuel pool level below 36'9" indicated by LS-2787 (SPENT FUEL POOL LEVEL HIGH/LOW ALARM) on Panel C-65, OR

1b. Dropping a heavy object onto spent fuel confirmed by direct observation,

AND

2. Annunciator 5-A-1 OR 5-A-2 (FUEL POOL RADIATION MONITOR (CH A or B)) exceeds 50 mrem/hr.

4.7 General Emergency

The General Emergency classification reflects accident situations involving actual or imminent substantial core degradation or melting, with the 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.

The purpose of the general emergency classification is to (1) initiate predetermined protective actions for the public, (2) provide continuous assessment of information from licensee and off-site measurements, (3) initiate additional measures as indicated by actual or potential releases, and (4) provide current information for and consultation with off-site authorities and public.

4.8 Example Initiating Conditions and EALs: General Emergency

4.8.1 EFFLUENT MONITORS DETECT LEVELS CORRESPONDING TO 1000 mrem/hr (Whole Body) or 5000 mrem/hr (Thyroid) AT THE SITE BOUNDARY UNDER ACTUAL METEOROLOGICAL CONDITIONS. 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

EALs

1a. Stack Effluent Monitor (Ch A or B) exceeds 2.4E+8 μCi/sec,

OR

1b. RB Vent Effluent Monitor (Ch A or B) exceeds 9.3+7 μCi/sec,

OR

1c. Stack radioiodine release rate, as determined by sampling and analysis, exceeds 1.95E+5 μCi/sec,

OR

1d. RB Vent radioiodine release rate, as determined by sampling and analysis, rate exceeds 2.0E+5 μCi/sec,

OR

NOTE: MIDAS User Manual - 06 (CONTAINMENT RELEASE RATE CALCULATIONS) provides instruction for using MIDAS to perform release rate projections based on containment radiation monitor readings.

1e. Release rate projection based on Containment Radiation Monitor or containment sampling exceeds any of the values in 1a, 1b, 1c, or 1d above,

OR

1f. Dose rates of 1000 mrem/hr (whole body) are measured at the site boundary or beyond,

OR

1g. Radioiodine concentrations measured at the site boundary or beyond exceed 7.OE-6 μCi/cc,

OR

1h. Dose projection calculations, based on actual or expected meteorological conditions and source term, indicates dose rates equal to or exceeding 1000 mrem/hr (whole body) or 5000 mrem/hr (thyroid) at the site boundary or beyond.

4.8.2 LOSS OF 2 OF 3 FISSION PRODUCT BARRIERS WITH A POTENTIAL LOSS OF 3RD BARRIER

CLAD/COOLANT BOUNDARY FAILURE, POTENTIAL CONTAINMENT LOSS

EALS

NOTE: Failure of MSIVs to isolate constitutes a loss of both primary coolant boundary and containment. When this is combined with cladding failure, all three barriers have been lost.

1. Evidence of Fuel Cladding Degradation per Guideline 6, Alert or Site Area Emergency level.

AND

2. Failure of primary coolant boundary as evidenced by:
   - High Drywell pressure; or
   - High Drywell temperature; or
   - Failure of MSIVs to isolate; or
   - Safety Relief Valve stuck open; or
   - GAP activity in primary containment atmosphere, or
   - Failure of Scram Discharge Volume valves to isolate.

AND

3. Potential loss of containment as evidenced by:
   - Containment temperature or pressure approaching design limits (281°F and 56 psig) and increasing; or
   - Loss of containment cooling; or
   - Failure of MSIVs to isolate; or
   - Failure of Scram Discharge Volume valves to isolate: or
   - Shift Manager or Emergency Director's judgement that loss of containment is likely.

OR

4.8.3 LOSS OF 2 OF 3 FISSION PRODUCT BARRIERS WITH A POTENTIAL LOSS OF 3RD BARRIER

CLAD/CONTAINMENT FAILURE, POTENTIAL COOLANT BOUNDARY LOSS

EALS

NOTE: In either of the following situations loss of containment should be judged to be likely:

- **Small or large LOCA with failure of ECCS to perform, or**
- **Loss of requisite decay heat removal systems (RHR and other heat sinks) following shutdown.**

EALS

1. Evidence of Fuel Cladding Degradation per Guideline 6, Alert or Site Area Emergency level.

AND

2a. Failure of containment as evidenced by all containment penetrations required for isolation not valved off or closed,

OR

2b. Shift Manager or Emergency Director's judgement that containment has failed,

3. Potential loss of primary coolant boundary as evidenced by reactor pressure near design limits (1210 psig measured in the steam dome @ 575°F) and increasing or loss of all ECCS.

OR

4.8.4 LOSS OF 2 OF 3 FISSION PRODUCT BARRIERS WITH A POTENTIAL LOSS OF 3RD BARRIER

CONTAINMENT/COOLANT BOUNDARY FAILURE, POTENTIAL CLAD FAILURE

EALS

NOTE: Failure of MSIVs to isolate constitutes a loss of both primary coolant boundary and containment. When this is combined with cladding failure, all three barriers have been lost.

1a. Failure of containment as evidenced by all containment penetrations required for isolation not valved off or closed,

OR

1b. Shift Manager or Emergency Director's judgement that containment has failed,

AND

2. Failure of primary coolant boundary as evidenced by:
   - High Drywell pressure; **or**
   - High Drywell temperature; **or**
   - Failure of MSIVs to isolate; **or**
   - Safety Relief Valve stuck open; **or**
   - GAP activity in primary containment atmosphere, **or**
   - Failure of Scram Discharge Volume valves to isolate.

AND

3a. Potential loss of cladding as evidenced by loss of all ECCS.

OR

3b. Reactor water level < TAF (-126") and decreasing.

4.8.5 LOSS OF PHYSICAL CONTROL OF THE PLANT

4.8.6 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 example BWR sequences)

4.8.6.1 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.

4.8.6.2 Small or large LOCAs with failure of ECCS to perform, leading to core degradation or melt in minutes to hours. Loss of containment integrity may be imminent.

4.8.6.3 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.

4.8.6.4 Shutdown occurs but requisite decay heat removal systems (e.g., RHR) or non-safety systems heat removal means are rendered unavailable. Core degradation or melt could occur in about ten hours with subsequent containment failure.

4.8.7 ANY MAJOR INTERNAL OR EXTERNAL EVENTS (E.G., FIRES, EARTHQUAKES, SUBSTANTIALLY BEYOND DESIGN BASIS) WHICH COULD CAUSE MASSIVE COMMON DAMAGE TO PLANT SYSTEMS RESULTING IN ANY OF THE ABOVE

5.0 ORGANIZATIONAL CONTROL OF EMERGENCIES

5.1 Normal Site Organization

5.1.1 Site Management Organization

The site management organization at Monticello is divided into four functional areas reporting directly to the Site Vice President:

A. Plant (including Operations, Production Planning, Maintenance, Radiation Protection/Chemistry, and Safety & Health).

B. Experience Assessment

C. Business Support

D. Training

The following organizations have reporting responsibilities to NMC departments other than the Monticello Nuclear Site, but provide on-site functional support to the Site Vice President:

A. Nuclear Security

B. Nuclear Oversight

C. Computer and Information Systems

D. Supply Chain

E. Finance

F. Licensing

G. Engineering

H. Human Resources

Responsibilities and authority of the various functional groups and individual positions are delineated in MNGP Administrative Directives.

5.1.2 Shift Organization

5.1.2.1 Operations

The Shift Manager holds a Senior Reactor Operator license and is the senior member of the Operations shift organization. The Shift Manager has the responsibility and authority to direct operating activities of the plant IAW applicable regulations and procedures. The Shift Manager maintains the broadest perspective of operational conditions affecting plant safety and serves as a technical advisor to the Control Room Supervisor and Control Room operations crew.

The Control Room Supervisor holds a Senior Reactor Operator license and reports to the Shift Manager. The Control Room Supervisor has the responsibility to supervise operating activities of the plant IAW applicable regulations and procedures under the direction of the Shift Manager.

Licensed Operators assigned to the Control Room perform plant manipulations and take direction from the Control Room Supervisor.

Auxiliary Operators outside the Control Room manipulate plant equipment and generally take direction from the Lead Plant Equipment and Control Room Operator or the Control Room Supervisor.

5.1.2.2 Fire Brigade

The plant Fire Brigade is staffed by qualified Operators, Chemistry and Radiation Protection Technicians. The Fire Brigade is maintained in accordance with 4 AWI-08.01.01 (FIRE PREVENTION PRACTICES).

5.1.2.3 Radiation Protection

One Radiation Protection Technician is assigned to each operating shift. The normal responsibilities of the shift Radiation Protection Technician is conducting routine and special radiological surveys, operation of plant Count Room equipment, access control and Radiation Work Permit preparation. The Radiation Protection Technician is also trained for Shift Emergency Communication responsibilities.

5.1.2.4 Chemistry

One Chemistry Technician is assigned to each operating shift. The normal responsibilities of the shift Chemistry Technician is conducting routine and special chemistry sampling and analysis and operation of the plant Chemistry Lab. The Chemistry Technician is also trained for Shift Emergency Communicator responsibilities.

5.1.2.5 Security (Shift Emergency Communicator)

Security personnel perform duties in accordance with the Security Plan. In addition, Security Officers on each shift are also assigned the responsibility of primary Shift Emergency Communicator (SEC). As SEC, the Security Officer performs emergency and non-emergency communications as directed by the Shift Manager.

5.1.3 Minimum Shift Staffing

Minimum shift staffing ***SHALL*** be as indicated in Table 5.0-1, Minimum Shift Staffing And Capability For Additions For Nuclear Power Plant Emergencies.

5.2 Emergency Organization and Responsibilities

Under emergency conditions the organization of the site staff is altered to simplify communications channels and make more efficient use of personnel resources (refer to Figure 5.0-1, Monticello Plant Emergency Organization). The Monticello Emergency Response Organization (ERO) consists of various groups which staff the site Emergency Response Facilities including the Technical Support Center, Operational Support Center and Emergency Operations Facility (or backup EOF if necessary). Functional responsibilities of the various groups are described in this section. A detailed description of individual position responsibilities and leadership designations for the various groups is contained in Emergency Plan Implementing Procedure A.2-001 (EMERGENCY ORGANIZATION). A detailed description of personnel assignments is found in Form 5790-001-01 (EMERGENCY RESPONSE ORGANIZATION).

5.2.1 Technical Support Center Emergency Organization

The Technical Support Center ERO consists of a Coordination and Direction Group and six subordinate groups. Each group is represented at the command table in the Technical Support Center.

When a transition point (Primary Containment flooding is required) in the Emergency Operating Procedures (EOPs) is reached, the duty Shift Manager and Operations Group Leader will make a joint decision to transition from the EOPs to the Severe Accident Management Guidelines (SAMGs). At this point, the Operations Group Leader would inform the TSC that they have relieved the duty Shift Manager as the

Decision Maker. The Decision Maker is designated to assess and select the strategies to be implemented. When using the SAMGs, the Operations Group Leader will act as the Decision Maker.

At the same time an Accident Management Team (AMT) is formed to utilize the SAMGs. The AMT is comprised of the following ERO positions; Operations Group Leader, Assistant Operations Group Leader, Engineering Coordinator, Nuclear Engineer, SPDS Operator(s), Trending Individual(s). AMT members are the Decision Maker and Evaluators. Evaluators are responsible for assessing control parameters, plant status, system status and EOP/SAMG actions and develop potential strategies that may be utilized to mitigate an event.

5.2.1.1 Direction and Control

The Direction and Control Group consists of the Plant Manager and other senior plant management personnel designated by the Plant Manager. Designated members of this group staff the Emergency Director position in the TSC. Qualified Shift Managers are also included in this group and function as the interim Emergency Director during the initial stages of an emergency until relieved by a designated Emergency Director.

The Emergency Director is responsible for overall emergency direction and control until relieved of that responsibility by the Emergency Manager at the EOF. Initially, the Shift Manager assumes the role of Emergency Director until relieved by a designated Emergency Director. The Emergency Director has the authority and responsibility to unilaterally initiate emergency response actions including making off-site protective action recommendations to authorities responsible for implementing off-site emergency measures.

Functional responsibilities of the Emergency Director include:

A. Recommend off-site protective measures (this responsibility may not be delegated and is relinquished to the Emergency Manager when the EOF is activated and staffed).

B. Overall direction and control of the Technical Support Center personnel and activities.

C. Ensure 24 hour coverage of key Emergency Response Organization positions in the TSC and OSC and continuity of personnel and material resources.

D. Make decisions regarding plant emergency response facility habitability including on-site protective actions (including KI use), personnel monitoring and evacuations.

E. Approval of emergency radiation exposures in excess of normal limits.

F. Communications with utility and off-site Emergency Response Organizations (EOF assumes responsibility for communications with off-site agencies when activated and staffed)

When the EOF is activated and the Emergency Manager position is staffed the overall direction and control responsibility is transferred from the Emergency Director to the Emergency Manager. The Emergency Director retains authority and responsibility for decisions immediately affecting the plant including direction of plant emergency response and on-site protective measures.

5.2.1.2 Radiation Protection and Chemistry Groups

The Radiation Protection and Chemistry Groups consists of the Radiological Emergency Coordinator (REC) and members of the Radiation Protection and Chemistry Groups. The REC reports to the Emergency Director and is staffed by Radiation Protection-Chemistry Manager designees. The group is divided into three sections:

A. Monitoring Section

B. Chemistry Section

C. Off-site Dose Projection

The Radiological Emergency Coordinator is the group leader and responsible for coordination of all on-site Radiation Protection and Chemistry emergency response activities.

The Monitoring Section consists of the Monitoring Section Leader and members of the plant Radiation Protection staff. Responsibilities of the Monitoring Section include on-site radiological surveys, in-plant surveys, personnel exposure control, access control, and initial off-site radiological monitoring.

The Chemistry Section consists of the Chemistry Section Leader and members of the plant Chemistry staff. Responsibilities of the Chemistry Section include chemistry sampling and analysis, plant and EOF Count Room operation, PASS sampling and core damage assessment, if necessary. Chemistry personnel also function as off-site dose projection system operators.

Off-site dose projection consists of a Meteorological Information and Dose Assessment System (MIDAS) operator. The MIDAS operator positions are staffed by qualified personnel trained in off-site dose projection. The MIDAS operator responsibilities include off-site dose projections, monitoring current and forecast meteorological information and providing off-site dose projection results to the REC or RPSS.

5.2.1.3 Support Group

The Support Group is staffed by members of the site Business Support Group, Supply Chain, and others designated by site management. The Support Group Leader reports to the Emergency Director and is responsible for on-site logistics support, emergency document control, print and drawing retrieval, administrative services, emergency procurement and warehouse support. The Support Group Leader is also responsible to coordinate the establishment of 24-hour ERO shift schedules as requested by the Emergency Director.

5.2.1.4 Operations Group

The Operations Group consists of the Operations Group Leader and all members of the Operations staff including the duty operating crew, off-duty Shift Managers, Control Room Supervisors and all Operators. The Operations Group Leader is staffed by Shift Operation Manager designees and includes off-duty Shift Managers and Control Room Supervisors that report to the Emergency Director. The Operations Group Leader serves as the primary link between the TSC and Control Room for the purpose of providing technical and operational advice and support to the duty Control Room operating staff.

When a transition point (Primary Containment flooding is required) in the EOPs is reached, the duty Shift Manager and Operations Group Leader will make a joint decision to transition from the EOPs to the Severe Accident Management Guidelines (SAMGs). At this point, the Operations Group Leader would inform the TSC that they have relieved the duty Shift Manager as the Decision Maker. The Decision Maker is designated to assess and select the strategies to be implemented. When using the SAMGs, the Operations Group Leader will act as the Decision Maker and directs actions as specified in the SAMGs. The Assistant Operations Group Leader is a member of the Accident Management Team (AMT). The Assistant Operations Group Leaders primary responsibility is to recommend actions to the Operations Group Leader based on the SAMGs.

The Assistant Operations Group Leader is an off-duty Shift Manager or Control Room Supervisor.

In addition, the Operations Group provides off-duty personnel to staff and support the Operational Support Center (OSC).

5.2.1.5 Engineering Group

The Engineering Group consists of the Engineering Group Leader and members of the site Engineering Group. The Engineering Group Leader position is staffed by Director, Site Engineering designees and reports to the Emergency Director. The Engineering Group Leader is responsible for overall direction of Engineering Group activities and assessment. The Engineering Coordinator reports to the Engineering Group Leader until the SAMGs are entered. When using the SAMGs the Engineering Coordinator becomes a member of the Accident Management Team (AMT) and reports to the Operations Group Leader. Responsibilities of the Engineering Coordinator include engineering evaluation of the event, assessment of inoperable systems or system components, development of accident mitigation strategies and parameter trending and analysis.

5.2.1.6 Maintenance Group

The Maintenance Group consists of the Maintenance Group Leader and members of the Mechanical and Electrical Maintenance Groups including Instrument and Control and designated personnel capable of performing emergency tasks. The Maintenance Group Leader position is staffed by Maintenance Manager designees and reports to the Emergency Director. The Maintenance Group Leader is responsible for the overall direction of corrective actions including damage control and emergency repairs to systems, components or equipment. The OSC Coordinator reports to the Maintenance Group Leader and is responsible for the coordination of emergency repair activities initiated out of the OSC.

5.2.1.7 Security Group

The Security Group consists of the Security Group Leader, Security Lieutenant/SEC and members of the plant Security force. The Security Group Leader position is staffed by the Security Manager or designee and reports to the Emergency Director. The Security Group Leader is responsible for the direction and coordination of security emergency activities including personnel accountability, evacuation of on-site areas and site traffic control and access. The duty Security

Lieutenant/SEC reports to the Emergency Director (Shift Manager) and is responsible for making or assisting with initial off-site notification.

5.2.1.8 Emergency Communications Group

The Communications Group consists of the Lead Emergency Communicator and qualified Emergency Communicators from various site groups. Designated personnel are qualified to man emergency communicator positions in the TSC, OSC, EOF and Control Room. Responsibilities of the Emergency Communicators include emergency notifications to off-site authorities, transmission of Emergency Followup Messages and other required information to off-site authorities, intra-utility communications and communications links between site emergency response facilities.

5.2.2 Operational Support Center Emergency Organization

The OSC Emergency Response Organization includes personnel from Maintenance, Operations, Production Planning, Radiation Protection and Chemistry.

5.2.2.1 Coordination and Direction

The OSC Coordinator is responsible for coordination of all OSC activities including dispatching repair teams, personnel accountability in the OSC and OSC habitability. The OSC Coordinator position is staffed by experienced Maintenance, Production Planning, or Operations personnel and reports to the Maintenance Group Leader.

5.2.2.2 Mechanical Maintenance

The Mechanical Maintenance Group consists of Machinists, Steamfitter - Welders, Riggers and Repairmen from the plant Maintenance Department, as well as designated personnel capable of performing emergency tasks. They are responsible for emergency repair activities under the direction of the OSC Coordinator.

5.2.2.3 Electrical Maintenance

The Electrical Maintenance Group consists of the Electrical Maintenance Supervisor and Station Electricians from the plant Maintenance Department, as well as designated personnel capable of performing emergency tasks. They are responsible for emergency repair activities under the direction of the OSC Coordinator.

5.2.2.4 Instrument & Control

The I&C Group consists of the I&C Maintenance Supervisor and I&C Specialists from the plant Maintenance Department, as well as designated personnel capable of performing emergency tasks. They are responsible for emergency repairs under the direction of the OSC Coordinator.

5.2.2.5 Radiation Protection

The Radiation Protection Group consists of the Radiation Protection Coordinator, Radiation Protection Technicians, Chemistry Technicians, and other NMC personnel with radiation protection/chemistry experience and personnel designated and trained to perform on-site, out of plant and off-site radiological monitoring surveys. Radiation protection responsibilities include: OSC RP support, manning Main Access Control, in-plant emergency team support, in-plant and out-plant radiological surveys, Emergency Response Center habitability, off-site environmental monitoring, Assembly Point staffing and Fire Brigade support (as necessary).

5.2.2.6 Operations

The Operations Group consists of available non-duty Shift Managers, Control Room Supervisors, Operators and other personnel reporting to the Operations Manager. Their responsibilities include OSC operations support, in-plant emergency teams, augment the duty Control Room staff (as necessary) and Fire Brigade support (as necessary).

5.2.3 <u>EOF Emergency Organization</u>

The EOF Emergency Organization consists of a Direction and Control Group and four subordinate groups. The EOF Emergency Organization is staffed by personnel from the NMC organization.

5.2.3.1 Direction and Control

The Direction and Control Group consists of Site Senior Management personnel. Designated members of this group staff the Emergency Manager position in the EOF. The Emergency Manager is responsible for overall direction and control of the utilities emergency response effort. The Emergency Manager relieves the Emergency Director of the following responsibilities:

A. Off-site dose projections and coordination and direction of off-site radiological monitoring teams.

B. Declaration of new emergency classifications (the Control Room and Emergency Director retain the primary responsibility for re-classification and make recommendations to the Emergency Manager who has the responsibility to declare the new emergency class).

C. Communications with off-site authorities including Federal, State, and local authorities and Xcel Energy/NMC executive management.

In addition, the Emergency Manager assumes the authority and responsibility to provide protective action recommendations to authorities responsible for implementing off-site emergency measures. Other responsibilities of the Emergency Manager include:

A. Coordinate the emergency response efforts of other utility personnel assisting the site organization.

B. Obtain and coordinate the services of outside consultants and vendors.

C. Advise Xcel Energy/NMC executive management on matters related to emergency response efforts and needed resources to support the effort.

5.2.3.2 Technical Support Group

The EOF Technical Support Group consists of select personnel from various site groups. The Technical Support Supervisor is staffed by senior site personnel and reports to the Emergency Manager. The Technical Support Group is responsible for trending critical parameters, engineering evaluation in support of the TSC Engineering Group, technical assessment and advising the Emergency Manager on technical matters related to the event.

5.2.3.3 Radiation Protection Support Group

The Radiation Protection Support Group is staffed by Radiation Protection Technicians, Chemistry Technicians, and other NMC personnel with radiation protection (chemistry) experience and personnel designated and trained to perform on-site, out of plant and off-site radiological monitoring surveys. The Radiation Protection Support Supervisor position is staffed by NMC personnel with demonstrated experience in radiation protection and reports to the Emergency Manager. The Radiation Protection Support Group includes plant Chemistry personnel for off-site dose projection and EOF Count Room operation and designated personnel who function as sample couriers and drivers for

off-site radiological monitoring teams. Radiation Protection Support Group responsibilities include:

A. Direction and coordination of the utility off-site radiological monitoring teams.

B. Off-site dose projection.

C. EOF Count Room activation and operation.

D. EOF habitability, personnel monitoring and decontamination (as necessary).

E. Communications with State Emergency Operation Center personnel on matters related to dose projections and off-site protective action recommendations.

F. Manning the Health Physics Network (HPN) and communications with the NRC (as necessary).

The Radiation Protection Support Supervisor advises the Emergency Manager on matters related to actual or potential radiological impact on the environment, off-site protective action recommendations, and EOF habitability.

5.2.3.4 EOF General Staff, Logistics, and Support Group

The EOF general staff consists of the EOF Coordinator, off-site communicators, administrative and logistics support personnel. The EOF Coordinator position is staffed by designated NMC personnel and reports to the Emergency Manager. The EOF Coordinator is responsible for activation and operation of the EOF and assists the Emergency Manager with administrative duties. The off-site communicators, EOF Security Coordinator, Agency Liaison and Administrative Staff report to the EOF Coordinator. The off-site communicators are responsible for communications with Federal, State and Local authorities as directed by the Emergency Manager. The Administrative Staff is responsible for emergency document control, recording and document distribution in the EOF. The off-site Agency Liaison is responsible to serve as the initial interface with off-site (Non-MNGP/NMC) Emergency Organizations (e.g. NRC Incident Response Team) responding to the EOF.

The EOF Security Group is staffed by personnel from the Site Security Group. The EOF Security Coordinator reports to the EOF Coordinator. Responsibilities of EOF Security include EOF access, dosimetry issuance to EOF personnel and Fitness-for-duty assessment (if required during off-hours activations).

5.3 Emergency Response Organization Augmentation

The Emergency Response Organization augmentation goals are outlined in Figure 5.0-1. The augmentation of each functional area and the methods used to accomplish ERO augmentation are described in this section.

5.3.1 ERO Augmentation Description and Goals

5.3.1.1 Plant Operations and Operational Assessment

The duty Operations crew retains the responsibility for plant operation throughout an emergency situation. When in SAMGs the duty operations staff implements the actions as directed by the SAMGs. Non-duty Operations personnel in the TSC and OSC will augment the duty Operations staff. Included in this augmentation is the addition of one Operator, qualified in radioactive waste system operations, within approximately 60 minutes.

The responsibilities of the non-duty Operations personnel include operational assessment, under the direction of the Emergency Director in the TSC, and support of emergency repair and corrective action efforts in the OSC including Fire Brigade support.

When a transition point (Primary Containment flooding is required) in the EOPs is reached, the duty Shift Manager and Operations Group Leader will make a joint decision to transition from the EOPs to the Severe Accident Management Guidelines (SAMGs). At this point, the Operations Group Leader would inform the TSC that they have relieved the duty Shift Manager as the Decision Maker. The Decision Maker is designated to assess and select the strategies to be implemented. When using the SAMGs, the Operations group Leader will act as the Decision Maker and direct control room response as specified in the SAMGs. The Assistant Operations Group Leader is a member of the Accident Management Team (AMT).

5.3.1.2 Emergency Direction and Control

The duty Shift Manager initially assumes the duties and responsibilities of the Emergency Director until relieved by a designated Emergency Director. Once relieved, the duty Shift Manager's primary focus returns to overall coordination of emergency response activities of the duty Operations crew. The Emergency Director assumes overall responsibility for the utility emergency response activities until relieved by the Emergency Manager. For non-security related events, the Emergency Manager should take over responsibilities in about 60 minutes from the declaration of an emergency, at

the Primary EOF. Once relieved, the Emergency Director's primary focus is on plant operation and overall direction of plant emergency response activities in plant emergency response facilities including the on-site Assembly Point. The Emergency Manager assumes overall authority and responsibility for the utility's emergency response activities from the Emergency Director and retains this authority until the event is terminated or the transition to recovery is complete.

5.3.1.3 Notification and Communications

The Shift Security Lieutenant/Shift Emergency Communicator (SEC) is responsible for the performance of initial emergency notifications to the State, counties, NRC and other off-site and utility support organizations. The Shift Radiation Protection Technician and/or Shift Chemistry Technician may also be assigned the responsibility of initial notifications. The duty SEC will be augmented within approximately 30 minutes with one additional Emergency Communicator and within 60 minutes with two more Emergency Communicators. In about 60 minutes, the EOF should assume responsibility for communications with off-site authorities.

5.3.1.4 Radiological Assessment and Protective Actions

The Shift Radiation Protection Technician is responsible for initial radiological assessment including in-plant radiological surveys. The shift Chemistry Technician is responsible for initial chemistry sampling, sample analysis, and off-site dose projection operation (MIDAS) if required.

The Shift Radiation Protection Technician will be augmented by four additional Radiation Protection personnel within approximately 30 minutes and four more Radiation Protection personnel within approximately 60 minutes. The responsibilities of these additional Radiation Protection personnel include in-plant surveys, access control, and off-site radiological monitoring.

In addition, a qualified Radiological Emergency Coordinator (REC) will augment the shift RP staff within approximately 30 minutes. The REC is responsible for overall coordination of the Radiation Protection and Chemistry Group's emergency response activities.

The Shift Chemistry Technician will be augmented with one additional Chemist within approximately 60 minutes.

The plant Radiation Protection staff will be augmented by Radiation Protection Technicians from the Prairie Island Nuclear Plant within approximately three hours. Responsibilities of sister plant Rad Prot Technicians include off-site radiological monitoring and sampling under the direction of the Radiation Protection Support Supervisor and Emergency Manager at the EOF.

5.3.1.5 Engineering and Technical Support

Technical support for the shift Operations staff is initially provided by the duty Shift Manager. The plant Engineering staff will provide additional technical support personnel, knowledgeable in the areas of nuclear, electrical, and mechanical engineering. Augmentation in this area includes the addition of one member of the TSC Engineering Staff within about 30 minutes and two more members of the TSC Engineering Staff within approximately one hour. The TSC Engineering Staff is responsible to provide technical support to the Control Room staff under the direction of the Emergency Director.

Specific individuals from the TSC Engineering Staff are also members of an Accident Management Team (AMT). They will evaluate parameters used within the SAMGs.

5.3.1.6 Repair and Corrective Actions

The duty Operations crew is initially responsible for any emergency repair and corrective actions that may be immediately required prior to ERO augmentation. After augmentation, repair and corrective actions are the responsibility of the Maintenance Group under the direction of the Emergency Director. The Maintenance Group consists of mechanical and electrical maintenance personnel including instrument and control technicians, as well as designated personnel capable of performing emergency tasks. Personnel from these groups report to the OSC where they are assigned corrective actions tasks by the OSC Coordinator.

Augmentation in the maintenance area includes the addition of one mechanical maintenance person within about 60 minutes, one I&C Group member within about 30 minutes and two electrical maintenance personnel, one within about 30 minutes and the other within 60 minutes.

5.3.1.7 Firefighting

A shift fire brigade trained and equipped for fire fighting ensures adequate manual fire fighting capability for all areas of the plant containing structures, systems or components important to safety.

Firefighting is the responsibility of the shift Fire Brigade. The shift Fire Brigade may be augmented by non-duty, Fire Brigade qualified, personnel available from the OSC. Additional support for the Fire Brigade is also available from the local Fire Departments upon request.

5.3.1.8 Rescue Operations and First Aid

The shift Fire Brigade is initially responsible for any immediate search and rescue operations or medical emergency response that may be required. After ERO augmentation, additional support for search and rescue and medical emergency response is available from the OSC staff under the direction of the OSC Coordinator.

5.3.1.9 Site Access Control, Accountability and Security

Site access, personnel accountability, coordination of evacuees and on-site traffic control are the responsibilities of the site Security Group. Augmentation of the on-duty, shift Security Force will be as directed by the Emergency Director and Security Group Leader.

5.3.1.10 Administrative and Logistics Support

The Support Group is responsible for administrative support, document control and logistics in the on-site emergency response facilities.

5.3.1.11 Environmental Monitoring Support

The site Radiation Protection/Chemistry Group is responsible to coordinate post-accident environs monitoring with the REMP contractor.

5.3.2 Augmentation Methods

In order to ensure the goals of Table 5.0-1 (Minimum Shift Staffing and Capability for Additions for Nuclear Power Plant Emergencies) can be achieved, two methods have been developed for the notification of site emergency response personnel. The methods include an Emergency Response Organization (ERO) Pager Network and ERO Call-Lists for select site groups such as Business Support, Operations, Maintenance, Radiation Protection, and Chemistry.

The ERO Pager Network consists of a commercial pager system which provides coverage to an area of approximately 75 mile radius of Minneapolis. This area includes both the Monticello and Prairie Island nuclear sites. The system may be accessed via commercial telephone and has primary and backup telephone numbers. Designated ERO personnel carry ERO pagers. This group includes:

A. Emergency Directors

B. TSC Group Leaders

C. TSC Engineering Staff

D. Emergency Communicators

E. Radiation Protection/Chemistry personnel

F. Operations Shift Managers

G. Maintenance Supervision and Engineers

H. Support Group personnel

I. Emergency Managers

J. EOF Technical Engineering personnel

K. EOF Radiation Protection Support personnel

Each pager in the network may be activated individually and all pagers in the network may be activated by one telephone (group) call.

To supplement the Pager Network, ERO Call-Lists are utilized for select site groups, including Operations, Maintenance, Support Group, Radiation Protection/Chemistry. The ERO Call-Lists are contained in the Monticello and Prairie Island Nuclear Emergency Telephone Directory and updated on a quarterly basis. Each ERO Call-List is divided into several groups, consisting of one to five individuals, and each group is assigned a group leader. ERO Call-List Group Leaders carry pagers and are notified of an emergency via the ERO Pager Network. The group leaders, in turn, contact the personnel in their assigned group via commercial telephone and then respond to their respective facility.

Whether contacted by pager, call-list group leader, or other means, ERO personnel are instructed to respond immediately to the event.

If an emergency has been declared based on a security event or security threat, MNGP EOF personnel are instructed to report to the back-up EOF and assume their emergency response duties there.

Other facility ERO personnel (TSC, OSC staff) are instructed to standby for potential later activation of their respective facility and will not be instructed to report until it is safe to do so.

5.4 Augmentation of On-Site Emergency Organization

5.4.1 Licensee Headquarters Support

This augmentation capability is completely described in the Monticello and Prairie Island Off-site Nuclear Emergency Plan. The purpose of this capability is to support the plant and EOF in as many areas as is practical. Such areas include: Government Agency Interface, Logistics Support, Technical Analysis, News Media Interface, Xcel Energy and NMC Executive Management Interface.

5.4.2 Local Support Services

5.4.2.1 Monticello Fire Department

The Monticello Fire Department will provide assistance upon request in the event of a fire at the plant.

5.4.2.2 Monticello-Big Lake Community Hospital

The Monticello-Big Lake Community Hospital serves as the principal off-site medical facility for initial treatment of radiation complicated injury or illness. In addition, North Memorial Hospital (in Minneapolis) has been designated as the definitive care center for injuries or illness that require services/facilities that the local hospital is unable to provide. Emergency procedures have been established at both hospitals and training of hospital personnel is accomplished periodically.

A complete description of local medical support services may be found in the Monticello and Prairie Island Off-site Nuclear Emergency Plan.

5.4.2.3 Burlington-Northern Railway

The Burlington-Northern Railroad Dispatcher will stop and re-route trains away from the plant site, if necessary.

5.4.2.4 Ambulance Service

There are two ambulance services that are available to provide service to the Monticello Nuclear Generating Plant.

A complete description of response capabilities, organizational resources, activation plans, designations of emergency operations centers and letters of agreement for the organizations mentioned above are available in the Minnesota Emergency Operations Plan.

5.5 Coordination with Participating Government Agencies

Appropriate State and Local government emergency plans have been developed in support of the Monticello emergency preparedness effort. Figure 5.0-2, Interface Between Functional Areas of Emergency Activity, shows the interface relationships between functional areas of emergency activity.

5.5.1 Minnesota Department of Public Safety

The Minnesota Department of Public Safety has the responsibility for notification and coordination of state agencies in the event of a major emergency at Monticello. In the event of an emergency situation at the plant, the State Emergency Operations Center is activated and the Minnesota Duty Officer will immediately call the Department of Health, Governor's Office, and other state agencies with emergency assignments to coordinate the implementation of any emergency procedures. The state agencies responsible for emergency procedures have established a system of 24-hour communications.

5.5.2 Minnesota Health Department

The Minnesota Department of Health (MDH) is responsible for providing radiological expertise in the State Emergency Operations Center in conjunction with the Department of Public Safety.

The Minnesota Department of Health will interpret data and participate in recommending protective actions to the Governor's Authorized Representative.

5.5.3 Wright County Sheriff

In the event of an accident the Sheriff of Wright County will notify all necessary civil support groups in Wright County. He is also responsible for protection of the general public and can provide personnel and equipment for evacuation, relocation and isolation of affected areas.

5.5.4 Monticello Civil Defense

The Monticello Civil Defense has the responsibility for coordination of city populace in the event of a major emergency that affects the city of Monticello.

5.5.5 U.S. Department of Energy

Protection for the general public is provided through the Federal Radiological Emergency Response Plan. Under this plan, individual DOE officers are assigned geographic responsibilities for incidents occurring in their region. Their immediate objective is to rapidly dispatch a team of specialists to the incident site and assist the state in evaluating the hazard. The DOE will then provide the materials and equipment to counteract and control any acute hazard, and establish communications with local authorities.

5.5.6 Sherburne County Sheriff

In the event of an accident, the Sheriff of Sherburne County will notify all necessary civil support groups in Sherburne County. He is also responsible for protection of the general public and can provide personnel and equipment for evacuation, relocation and isolation of affected areas.

5.5.7 Minnesota State Patrol

The State Patrol may assist with the protection of the general public by providing personnel and equipment to re-route traffic in the event of a general emergency. Plans have been made for re-routing federal and state highways. Signs and equipment required for re-routing will be stored in the areas where they would be needed to facilitate highway closings.

5.5.8 Area Civil Defense Groups

Responsible for protecting the general public and providing logistical support such as food, temporary quarters, water and sanitary facilities in the event that evacuation and isolation is required. The Civil Defense consists of a permanent staff plus a pool of reserve personnel, vehicles and radiological monitoring equipment, located throughout the State Emergency Services Mobile Support Area VI, in which Monticello is located.

5.5.9 Minnesota Department of Transportation

Assist the State Patrol in blocking and re-routing traffic around the plant site. In addition to the necessary personnel, vehicles, signals, barriers for setting up and maintaining detour routes. They also have some radiation monitoring instruments available at each truck stop.

5.5.10 City of Minneapolis Water Department

The Water Department can shut off water intakes, if necessary.

5.5.11 City of St. Paul Water Department

The Water Department can shut off water intakes, if necessary.

A complete description of response capabilities, organizational resources, activation plans, designations of emergency operations centers and letters of agreement for the organizations mentioned above are available in the Minnesota Emergency Operations Plan.

Table 5.0-1 Minimum Shift Staffing and Capability for Additions for Nuclear Power Plant Emergencies

Major Functional Area	Major Tasks	Position Title or Expertise	On Shift	Capability for Additions 30 Min	60 Min
Plant Operations and Assessment of Operational Aspects		Shift Manager (SRO)	1	--	--
		Control Room Supv (SRO)	1	--	--
		Nuclear Lead PE&RO (RO)	1	--	--
		Nuclear PE&RO (RO)	2	--	--
		Nuclear Asst. PEO	2	--	--
Emergency Direction and Control		Emergency Director (Shift Manager until relieved)	1*	--	--
Notification/ Communication	Notify licensee, Local, State, and Federal personnel & agencies	Shift Emerg Communicator	1	--	--
	Maintain Communications	Emergency Communicators	--	1	2
Radiological Accident Assessment and Support of Operational Accident Assessment	Emergency Operations Facility	Emergency Manager	--	--	1
	Coordinate EOF prior to arrival of Emergency Manager	EOF Coord	--	1	--
	Off-Site Dose Assessment	Radiological Emergency Coord	--	1	--
	Off-Site Surveys On-Site (out-of-plant) In-Plant Surveys	Radiation Protection	--	1	1
				1	1
			1	1	1
	Chemistry/Radio-Chemistry	Chemistry	1		1

Table 5.0-1 Minimum Shift Staffing and Capability for Additions for Nuclear Power Plant Emergencies

Major Functional Area	Major Tasks	Position Title or Expertise	On Shift	Capability for Additions 30 Min	60 Min
Plant System Engineering, Repair and Corrective Actions	Technical Support	Technical Advisor	1*	--	--
		Core/Thermal Hyd.	--	1	--
		Electrical	--	--	1
		Mechanical	--	--	1
	Repair & Corrective Actions	Mech Maint	1*	--	1
		Radwaste Oper	--	--	1
		Elec Maint	1*	1	1
		I&C	--	1	--
Protective Actions (In-Plant)	Radiation Prot.: a. Access Control b. HP Coverage for response actions c. Personnel monitoring d. Dosimetry	Radiation Protection	2*	1	1
Fire Fighting		Fire Brigade per 4AWI-08.01.01		Local Support	
Resue Operations and First Aid			2*	Local Support	
Site Access Control and Personnel Accountability	Security, Communications, Personnel Accountability	Security Force	All per Security Plan		
			10	10	13

* May be provided by shift personnel assigned other functions.

Table 5.0-2 Monticello Plant ERO Responsibility Matrix

P – PRIMARY RESPONSIBILITY

S – SECONDARY RESPONSIBILITY

* – PRIOR TO EOF ACTIVATION

	EMERGENCY DIRECTOR	SHIFT MANAGER	CONTROL ROOM SUPERVISOR	OPERATIONS GROUP	SHIFT EMERGENCY COMMUNICATOR	SUPPORT GROUP	RADIOLOGICAL EMERGENCY COORDINATOR	SECURITY GROUP	HEALTH PHYSICS GROUP	EMERGENCY TEAMS	EMERGENCY MANAGER / RECOVERY MANAGER	FIRE BRIGADE	MAINTENANCE GROUP	ENGINEERING GROUP
COMMAND/ CONTROL	P	P												
NOTIFICATION/ COMMUNICATION	S	S			P		S							
PLANT OPERATIONS	P	S	P	P										S
TECHNICAL SUPPORT	S	P					S							P
PROTECTIVE ACTIONS ON-SITE	S	S					P		P					
PERSONNEL ACCOUNTABILITY	S	S						P						
ACCIDENT ASSESSMENT	P*	S	P	S			S		S		P			S
OFF-SITE DOSE PROJECTION	S						P		P					
CONTAMINATION/ RADIATION CONTROL	S						P		P					
DAMAGE CONTROL	S			P						S			P	S
PROTECTIVE ACTIONS OFF-SITE RECOMMENDATIONS	P*						P*				P			
SEARCH & RESCUE/ FIRST AID	S	S	P						S	P				
ACCESS CONTROL	S						P	P	P					
RECOVERY OPERATIONS	S			S		S	S				P		S	S
CHEMISTRY/ RADIOCHEMISTRY	S						P		P					
LOGISTICS SUPPORT	S					P					P			
FIRE FIGHTING	S		P							S		P	S	

MONTI CAD DWG
ero matrix DWG

Figure 5.0-1 Monticello Plant Emergency Organization

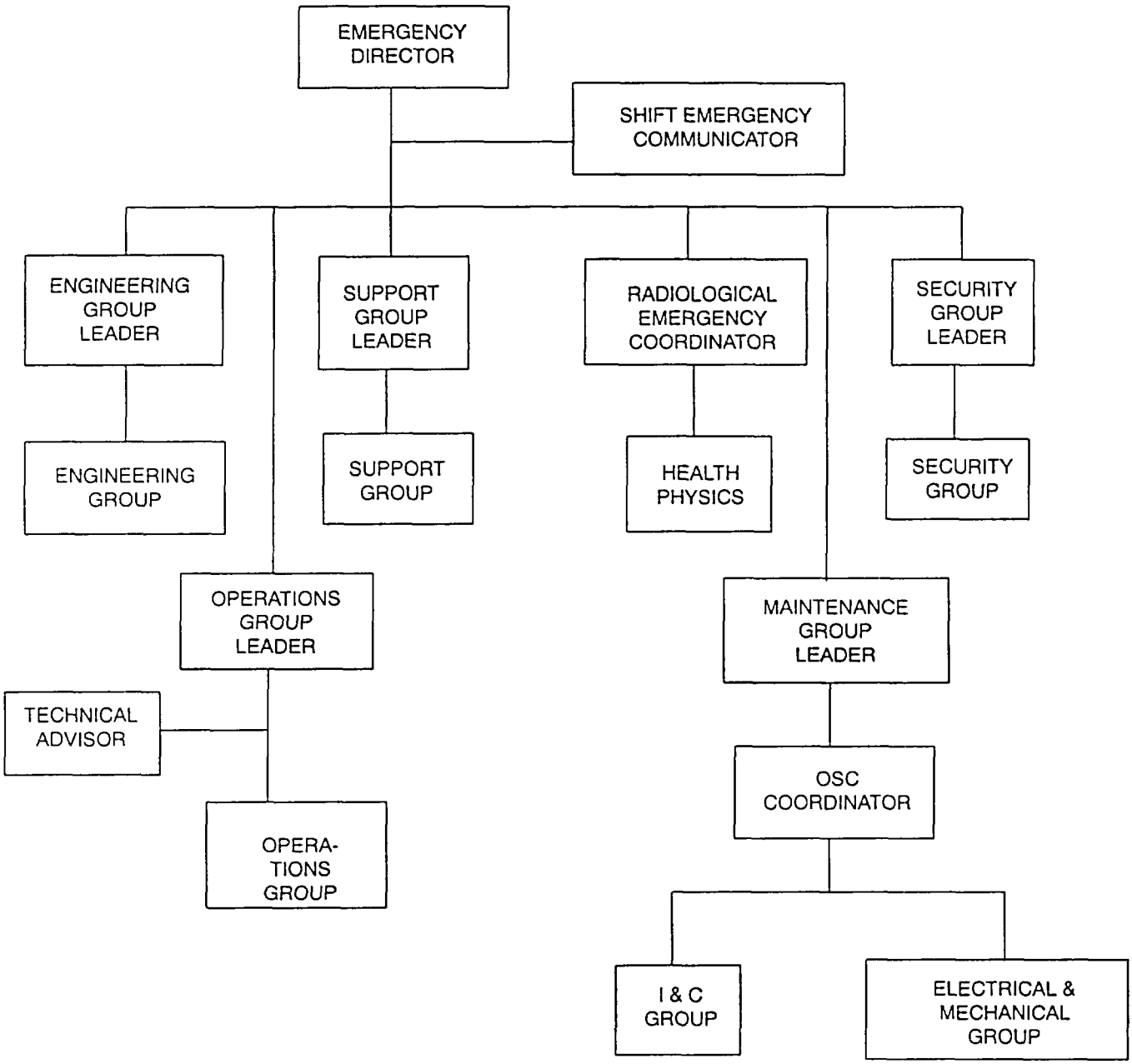


Figure 5.0-2 Interface Between Functional Areas of Emergency Activity

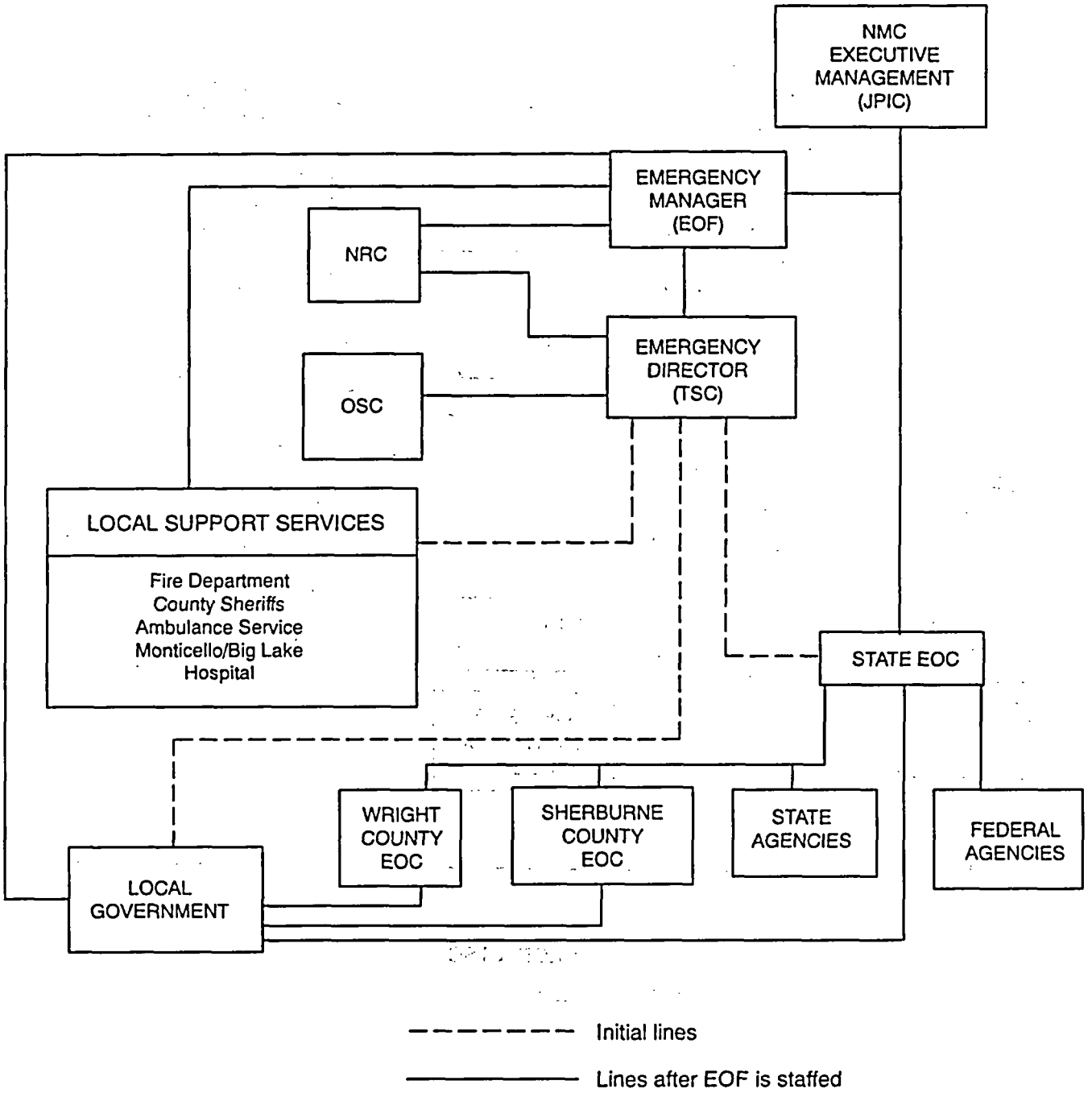
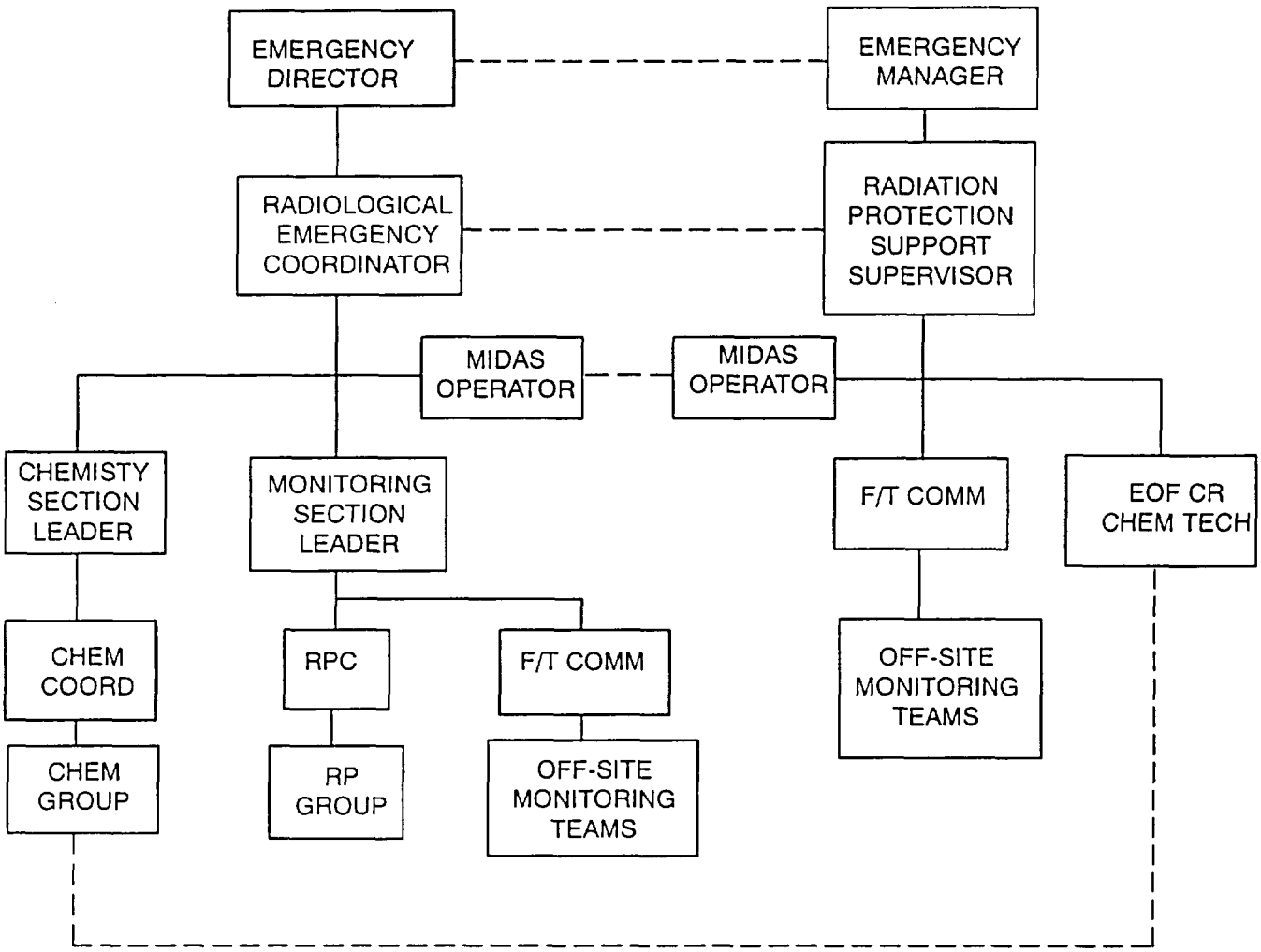


Figure 5.0-3 Health Physics Group Organization



- - - - Continuous interface between EOF & TSC

——— Command chain for TSC and EOF

6.0 EMERGENCY MEASURES

6.1 Summary of Responses

For each of the four emergency classifications discussed in Section 4.0 certain generic emergency response actions are required to be taken by the site Emergency Response Organization. These generic emergency response actions are in addition to those actions specific to the type of emergency. This section summarizes the generic emergency response actions.

6.1.1 Notification of Unusual Event

6.1.1.1 Promptly inform State and Local off-site authorities of the nature of the emergency condition.

6.1.1.2 Inform the NRC of the Unusual Event.

6.1.1.3 Augment on-shift resources as necessary.

6.1.1.4 Assess and respond to the off-normal condition.

6.1.1.5 Terminate the Unusual Event with notification to the State and Local off-site authorities and the NRC.

OR

6.1.1.6 Escalate to a more severe emergency class.

6.1.2 Alert

6.1.2.1 Promptly inform the State and Local off-site authorities of the Alert and the nature of the emergency condition.

6.1.2.2 Augment on-shift resources by activating the Technical Support Center (TSC), Operational Support Center (OSC), and Emergency Operations Facility (EOF) or Back-up EOF

6.1.2.3 Notify the NRC of the Alert.

6.1.2.4 Establish the Emergency Response Data System (ERDS) communication link with the NRC.

6.1.2.5 Assess and respond to the emergency condition.

6.1.2.6 Dispatch on-site and off-site radiological survey teams and associated communications as necessary.

6.1.2.7 Provide periodic plant status updates to off-site authorities (Follow-up Messages).

6.1.2.8 Provide periodic meteorological assessments to off-site authorities and, if releases are occurring, estimates for actual releases.

6.1.2.9 Terminate the Alert with notification to the State and Local off-site authorities and the NRC.

OR

6.1.2.10 Escalate to a more severe emergency class.

6.1.3 Site Area Emergency

6.1.3.1 Promptly inform the State and Local off-site authorities of the Site Area Emergency and the nature of the emergency condition.

6.1.3.2 Augment on-shift resources by activating the Technical Support Center (TSC), Operational Support Center (OSC) and Emergency Operations Facility (EOF) or Back-up EOF.

6.1.3.3 Notify the NRC of the Site Area Emergency.

6.1.3.4 Establish the ERDS communication link with the NRC.

6.1.3.5 Assess and respond to the emergency condition.

6.1.3.6 If radiological and environmental conditions permit evacuate on-site, non-essential personnel.

6.1.3.7 Dispatch on-site and off-site radiological survey teams and associated communications as necessary.

6.1.3.8 Provide a dedicated individual for plant status updates to off-site authorities.

6.1.3.9 Make utility senior technical and management staff available for consultation with the NRC and State on a periodic basis.

6.1.3.10 Provide meteorological data and dose estimates to off-site authorities for actual releases via a dedicated individual or automated transmission.

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

6.1.3.12 Terminate the Site Area Emergency with notification to the State and Local off-site authorities and the NRC.

OR

6.1.3.13 Enter Recovery with notification to the State and Local off-site authorities and the NRC.

OR

6.1.3.14 Escalate to a General Emergency.

6.1.4 General Emergency

6.1.4.1 Promptly inform the State and Local off-site authorities of the General Emergency and the nature of the emergency condition.

6.1.4.2 Make off-site protective action recommendations to State and Local authorities based on actual or potential plant conditions and radiological releases.

6.1.4.3 Augment on-shift resources by activating the Technical Support Center (TSC), Operational Support Center (OSC) and Emergency Operations Facility (EOF) or Back-up EOF.

6.1.4.4 Notify the NRC of the General Emergency.

6.1.4.5 Establish the ERDS communication link with the NRC.

6.1.4.6 Assess and respond to the emergency condition.

6.1.4.7 If radiological and environmental conditions permit evacuate on-site, non-essential personnel.

6.1.4.8 Dispatch on-site and off-site radiological survey teams and associated communications.

6.1.4.9 Provide a dedicated individual for plant status updates to off-site authorities.

6.1.4.10 Make utility senior technical and management staff available for consultation with the NRC and State on a periodic basis.

6.1.4.11 Provide meteorological data and dose estimates to off-site authorities for actual releases via a dedicated individual or automated transmission.

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

6.1.4.13 Enter Recovery with notification to the State and Local off-site authorities and the NRC.

6.2 Emergency Response Activation

6.2.1 Notification Scheme

In the event an emergency classification is declared procedures and systems are in place to facilitate timely activation of the site Emergency Response Organization and notification of State and Local authorities, Federal agencies and the general public within the 10 mile EPZ. This section describes the notification methods and processes used to activate on-site and off-site emergency response.

6.2.1.1 Activation of the On-Site ERO

When an abnormal condition is identified by the shift operating staff the duty Control Room Supervisor and Shift Manager are notified. An assessment of the safety significance of the event is performed and a determination of the emergency classification made using the Emergency Action Levels (EALs) contained in the Emergency Plan Implementing Procedures.

Upon declaring an emergency condition, the duty Shift Manager is responsible for implementation of the Emergency Plan and assumes the role of Emergency Director. The Shift Manager directs the completion of the necessary emergency notifications including the on-site Emergency Response Organization.

When directed, the Shift Emergency Communicator notifies the site Emergency Response Organization. During normal working hours, ERO notification is made using the plant public address system. During non-working hours, ERO notification is made using the ERO Pager Network and ERO Call-Lists and/or automated dialing system. The detailed instructions for ERO notification are contained in the implementing procedures and associated forms and call-lists.

6.2.1.2 State and Local Authorities and NRC

Under the direction of the Shift Manager (Emergency Director) the Shift Emergency Communicator will notify State and Local authorities and the NRC using commercial telephone and the FTS Emergency Notification System (ENS) respectively. Notification procedures are contained in the Emergency Plan Implementing Procedures and associated forms.

In addition to the initial notifications, provisions are included in the Emergency Plan Implementing Procedures for followup notifications to State authorities which contain the following information (if it is known and appropriate):

A. Location of the incident, name and telephone number of the caller;

B. Date and time of the incident;

C. Emergency classification;

D. Type of actual or potential release and estimated release duration/impact times;

E. Estimate of quantity of radioactive material released or being released and the release point;

F. Estimates of relative quantities and concentration of noble gases, iodines and particulates;

G. Meteorological conditions;

H. Actual or projected dose rates at the site boundary and integrated dose at the site boundary;

I. Projected dose rates and integrated dose at projected peak and at about 2, 5 and 10 miles, including affected sectors;

J. Estimates of any surface radioactive contamination on-site or off-site;

K. Licensee emergency response actions underway;

L. Recommended emergency actions including protective measures;

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

N. Prognosis for worsening or termination of the event based on plant information.

6.2.1.3 Monticello and Prairie Island Off-site Nuclear Emergency Response Organization

Notification and activation of the Monticello and Prairie Island Off-site Nuclear Emergency Response Organization is accomplished by the Shift Emergency Communicator and the Xcel Energy System Control Center staff. The SEC notifies the System Dispatcher in the System Control Center by dedicated hotline, commercial telephone or low band radio. The System Control Center staff notifies select Xcel Energy/NMC management and technical personnel who staff the Joint Public Information Center (JPIC).

6.2.1.4 General Public

The decision to notify the general public will be made by State and/or Local authorities based on information and recommendations provided by the MNGP. The Emergency Director is initially responsible for recommendations involving notification of the general public and is relieved of this responsibility by the Emergency Manager.

Notification of the general public is accomplished through Local Authorities use of the Public Alert and Notification System (PANS) and Emergency Alert System (EAS). The State and/or Local authorities are responsible for activation of these systems and the information provided to the public.

F. 0-5 Mile PANS Coverage

Notification capabilities within the 0-5 mile EPZ include 37 sirens with a designed output of 127 dBC. This represents essentially 100% coverage of the population within the 0-5 mile portion of the EPZ.

G. 5-10 Mile PANS Coverage

Notification capabilities within the 5-10 mile EPZ include 54 sirens with a designed output of 127 dBC. In addition, to notify persons in low population density areas, the State and County Emergency Plans have provisions for route alerting by local law enforcement. This notification method involves the use of emergency vehicles being driven on pre-designated routes by law enforcement personnel.

H. Supplemental Notification Capabilities

To further ensure prompt notification of the public, commercial alert radios are installed in select facilities, within 10 mile EPZ, which could contain large groups of people during all or part of the day. The number and location of these radios is determined by the local County Emergency Management Directors. These include commercial, institutional and educational facilities which may also be covered by State and County emergency warning plans. Provisions for transient population notification are also included in State and County plans.

6.2.2 Emergency Action Levels (EALs)

The Emergency Action Levels (EALs) for each of the four emergency classifications are outlined in the example initiating conditions in Section 4.0. Emergency Action Levels for various process and instrument readings are specified for each generic category in the Emergency Plan Implementing Procedures. State and Local authorities are notified for all four emergency classifications and will activate the appropriate elements of their respective emergency plans based on information provided in the notification from the utility.

6.2.3 Authentication

Communications made for the purpose of notifying off-site authorities of an emergency will be authenticated before the initiation of their emergency response actions. The method used for authentication are developed and mutually agreed to by the utility and off-site authorities.

6.3 Assessment Actions

6.3.1 Determining Magnitude of Release

The magnitude of releases and release rates from normal pathways (e.g., Stack and Reactor Building vent) are determined using installed plant instrumentation. Installed side-stream isokinetic samplers and wide-range radiation monitors normally monitor plant effluent releases, and would be the primary method used in an emergency. Portable hand held radiation instruments are used in the event the installed monitors become inoperable.

Releases from other than normal pathways (e.g., hard pipe containment vent) will be estimated either from installed plant instrumentation or from a determination of the amount of activity available for release plus the particulars of the release path. Field measurements will be used to assist in the assessment effort by making physical measurements of dose rates and airborne, liquid and surface contamination. Field measurements are primarily the responsibility of the Radiation Protection Support Group, headquartered at the EOF, and under the direction of the Emergency Manager.

6.3.2 Off-Site Dose Projection

The primary means of performing dose projections is the Meteorological Information and Dose Assessment System (MIDAS).

MIDAS is an automated system for calculation of off-site dose rates under routine or accident conditions. The system is designed to produce real time estimates of plume locations and dose intensity. This information establishes the basis for protective action recommendations which are communicated to off-site authorities.

Meteorological and effluent data are transmitted directly to MIDAS from process monitors and meteorological instruments located at the plant site. MIDAS samples, processes and stores these input data. As the data is collected, quality control checks are made to flag bad data and identify potential problems. Prior to use in calculations, prints and plots of each set of input data may be produced for inspection, thus providing another opportunity to check data quality and trends.

Dose rates are calculated for whole body, skin and thyroid using site specific dispersion models. Projected integrated doses are calculated by taking into account the projected duration of release. The projected dose rates are compared to EALs for emergency classification purposes. The projected integrated doses are compared to EPA PAGs for purposes of protective action recommendations.

After completion of the dose calculations, the resulting plume location and dose intensity are displayed graphically as color overlays on site maps. Hard copies can be produced from the CRT screen.

A backup MIDAS system is available on a redundant computer system at the Emergency Operations Facility and relies on a power supply different from the plant's system.

Dose calculations based on potential releases or theoretical conditions are accommodated using a manual input mode. Calculations can also be generated based on input of containment monitor readings or percentage of fuel damage.

The Radiological Emergency Coordinator has the capability to estimate the total off-site population dose (manrem) received during a release. The off-site dose assessment computer will supply the projected dose rates or doses (whole body and thyroid) at various distances. Field Team radiation survey results may also be used to determine the off-site dose rates. Population distribution charts comprised of the sectors and distances from the plant are available. The Radiological Emergency Coordinator will determine the applicable doses or dose rates in the sectors and calculate the estimated total population dose by referring to the population totals in the sectors of interest.

6.3.3 Field Radiation Surveys

The task of field radiation surveillance will be accomplished by several teams under the supervision of Emergency Operations Facility (EOF) personnel. Initially, plant staff personnel will be responsible for on-site as well as off-site monitoring. As the organization is augmented, plant personnel from Prairie Island Nuclear Generating Plant (PINGP) will take over the off-site surveys. The EOF will be the central point for receipt and analysis of all off-site field monitoring data.

Survey teams will normally be composed of 2 individuals each, at least one of whom ***SHALL*** be trained in radiological field monitoring. Each team ***SHALL*** be equipped with appropriate monitoring equipment, including dose rate instruments, air sampling equipment and sample collection media and containers. This equipment has the capability to detect and measure radioiodine concentrations in the air as low as 1×10^{-7} μCi/cc under field conditions. Monticello Nuclear Generating Plant monitoring teams ***SHALL*** perform necessary off-site monitoring until the PINGP off-site monitoring teams arrive and assume off-site monitoring responsibility. The estimated deployment time for monitoring teams composed of Monticello Nuclear Generating Plant personnel is 60 minutes.

6.4 Corrective Actions

6.4.1 Fire Control

The Fire Brigade, which is composed entirely of plant personnel, is fully equipped, trained and capable of dealing with fire emergencies. At the direction of the Emergency Director and the Brigade Leader, the Fire Brigade will be deployed as necessary.

6.4.2 Repair and Damage Control

The repair and damage control functions are assigned to the Maintenance Group. Personnel are assigned according to the skills they possess so that the team is capable of coping with the emergency situation. Repair and damage control team members are selected from available personnel.

6.5 Protective Actions

6.5.1 Protective Cover, Evacuation, Personnel Accountability

In the course of an emergency situation where there is an actual or potential release of radioactive material to the environs in excess of normal operating levels, an assessment of projected exposure to persons on-site and off-site will be made. The result of this assessment will be a determining factor for implementing protective actions.

6.5.1.1 Plant Site

During the course of an emergency, the REC is responsible for on-site monitoring operations. The on-site monitoring procedures contain criteria for initiating evacuations of various degrees. In all cases of elevated radiation levels or in potentially hazardous situations, non-essential personnel will be evacuated from affected areas of the plant. A plant evacuation is required at the Site Area Emergency level, radiological and environmental conditions permitting. The plant evacuation includes the owner-controlled area outside of the Protected Area.

A personnel accounting process is part of a plant or site evacuation. A system using the plant security computer and individual Security I.D. badges enables the Emergency Director to account for all personnel within the Protected Area in 30 minutes or less. Card readers are located at the TSC, Guard House, and Access Control to expedite the process. Backup methods are also available in case of a computer malfunction.

Personnel within the plant are notified of an evacuation by the plant Public Address (PA) system. A warning tone and voice instructions are part of the procedure. Time required for this process is less than 5 minutes from decision to evacuate.

Personnel outside of the plant buildings are notified by the plant evacuation siren, which is located atop the Reactor Building. The siren initiation is simultaneous with the PA system alarm.

After the accounting process is completed, Security personnel are dispatched to ensure that all personnel in the Owner-Controlled Area outside the Protected Area have been notified. This process should be completed within 60 minutes of the start of the evacuation.

In the event of a Site Area or General Emergency, the following actions will be taken:

A. All plant employees not having emergency assignments at the site and having been cleared of radioactive contamination, will be directed to proceed to the Emergency Operations Facility, a designated off-site assembly point or sent home;

B. All working and non-working visitors and contractor and construction personnel, having been cleared of radioactive contamination, will be directed to leave the site, unless requested otherwise by the Emergency Director;

C. Persons who may be within the restricted area but outside the security fence, will be directed to proceed to the conference room of the Security Building or the EOF for accountability and radioactive contamination check before being directed to leave the site. Persons who are not cleared of radioactive contamination following a plant evacuation will be decontaminated at a location on the plant site , at an off-site assembly point , or at a County Emergency Worker Monitoring and Decontamination Facility.

6.5.1.2 Off-Site Public

Actions planned to protect the off-site public and criteria for their implementation are described in the MINNESOTA EMERGENCY OPERATIONS PLAN.

Initiation of protective actions for off-site areas is the responsibility of the State of Minnesota. Prior to the EOF being activated, the Emergency Director will make recommendations for protective actions if it is determined that they are necessary. Recommendations will be directed to the State EOC and will come directly from the Emergency Director. If the State EOC is not activated and it is determined by MNGP that immediate protective actions should be initiated at the Local level, the recommendation will be made directly to the Local authorities. When the EOF is activated, the protective action recommendation function will normally be transferred to the Emergency Manager.

The current issue of the "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" (EPA 400-R-92) ***SHALL*** be used as a basis for recommendations for protective actions for the off-site public; however, more conservative protective actions based on discussions with the State may be recommended in the course of an emergency. Protective action recommendations ***SHALL*** also be consistent with the guidance of the U.S. Food and Drug Administration's, Department of Health and Human Services' document titled "Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies", August, 1998.

Tables 6.0-1 through 6.0-4 provide guidelines and action levels to be used in the formulation of protective action recommendations.

6.5.2 Routes for Site Evacuation

Evacuation of personnel from the site ***SHALL*** be accomplished in personal private vehicles and augmented by MNGP vehicles when necessary and available. Personnel are to proceed to the designated assembly area as directed by traffic control personnel.

Routes by which site personnel will proceed to the designated off-site assembly area in the event of an evacuation are as follows:

6.5.2.1 Monticello Service Center Assembly Area

Proceed off-site via the designated access road to the intersection of County Road 75. Turn left on County Road 75 and proceed to the intersection of 75 and State Highway 25. Turn right on Highway 25 and proceed to Chelsea Road. Turn left on Chelsea Road and proceed to Oakwood Drive. Turn right on Oakwood Drive and proceed to Dundas Road. Turn left on Dundas Road and proceed to the Monticello Service Center (on right) (118 Dundas Road).

6.5.2.2 Xcel Energy Sherburne County Generating Plant (Sherco) - Via Clearwater and Highway 24

Proceed off-site via the designated access road to the intersection of County Road 75. Turn right on County Road 75 and proceed northwest to State Road 24. Turn right on State Road 24 and proceed to County Road 8. Turn right on County Road 8 and proceed to U.S. Highway 10. Turn right on U.S. Highway 10 and proceed to Liberty Lane. Proceed to the Assembly Point. The Assembly Point is the first building on the right just past the Sherco Plant Gatehouse.

6.5.2.3 Xcel Energy Sherburne County Generating Plant (Sherco) via Monticello and Highway 25

Proceed off-site via the designated access road to the intersection of County Road 75. Turn left on County Road 75 and proceed to State Highway 25. Turn left on State Highway 25 and proceed to County Road 11. Turn left on County Road 11 and proceed to U.S. Highway 10. Turn left on U.S. Highway 10 and proceed to Liberty Lane. Turn left on Liberty Lane and proceed to the Assembly Point. The Assembly Point is the first building on the right just past the Sherco Plant Gatehouse.

6.5.3 Evacuation Time Estimates - Plume Exposure EPZ

Time estimates for evacuation of the plume exposure EPZ are in an appendix to the Monticello and Prairie Island Off-site Nuclear Emergency Plan and in the Plant Emergency Plan Implementing Procedure for making off-site protective action recommendations. The estimates will be used when recommending evacuation to ensure that evacuation is the correct protective action for the situation.

6.5.4 Use of On-Site Protective Equipment and Supplies

6.5.4.1 Respiratory Protection and Protective Clothing

In an emergency situation, the protection afforded by individual respiratory equipment must be weighed against the negative aspects of its use. In the case where a respirator may lead to additional external exposure because of the inherent difficulties of working while wearing a respirator, it may be prudent to forego the respirator in favor of a lower total dose to the individual.

In general the use of protective clothing and respiratory protection equipment will be governed by existing Radiation Protection Procedures. The Radiological Emergency Coordinator will make decisions on the use of this equipment during emergency situations.

A supply of protective clothing is stored immediately adjacent to the TSC.

A very limited supply of this equipment is stored at each assembly point. Large supplies of respiratory equipment are stored at the plant access control area and protective clothing will normally be available in the warehouse located outside the security fence.

6.5.4.2 Thyroid Prophylaxis

A supply of potassium iodide (KI) will be maintained at the Technical Support Center and the Emergency Operations Facility. Each of these locations will have a minimum of 100 bottles, each of which contain a 2 person-week supply of KI at recommended dosages. In the event that an individual is expected to receive a dose to the thyroid in excess of 25 Rem (due to radioiodine uptake), the use of KI as a blocking agent may be recommended. KI will not be made available to off-site personnel under this plan.

6.5.5 Emergency Exposure Control

6.5.5.1 Exposure Limits

Although an emergency situation transcends the normal requirements of limiting exposure, there are suggested levels for exposure to be accepted in emergencies. Immediate re-entry may be necessary to account for missing personnel or to secure vital equipment. Additional exposure for this purpose must be approved by the Emergency Director based on the following criteria and the guidelines in Table 6.0-4:

A. In order to avoid restricting actions that may be necessary to save lives or protect the health and safety of the public, 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, the dose resulting from emergency exposure should be limited to 25 REM for life-saving activities and the protection of large populations. Individuals undertaking any emergency operation in which the dose will exceed 25 REM to the whole body should do so only on a voluntary basis and with full awareness of the risk involved (EPA-400).

B. In situations where protecting valuable property is involved, the dose resulting from emergency exposure should be limited to 10 REM (EPA-400).

6.5.5.2 Exposure Control

Under emergency conditions, exposure control would be implemented in accordance with the Emergency Plan Implementing Procedure A.2-401 (EMERGENCY EXPOSURE CONTROL).

Each person entering the controlled area would be required to wear a permanent record device (TLD) and a direct reading dosimeter or an electronic dosimeter.

The responsibility for maintaining exposure control for site activities rests with the Radiological Emergency Coordinator and the Radiation Protection Group. With this responsibility would be the option of establishing Access Control at alternate locations on site if the primary access control facility becomes uninhabitable. In this event, the access control function would be relocated to an alternate location within the Administration Building, Security Building or the EOF. In any case, strict exposure control of all individuals passing through the access point would be maintained on a 24 hour basis.

In order to enhance the exposure control process and to provide dosimetry for an expanded number of people, a dosimetry vendor would be called upon to expedite the shipment of extra dosimetry devices and to supply personnel and instrumentation for on-site appraisal of exposures.

It must be noted, however, that every effort will be made to keep the exposures of plant staff personnel and off-site emergency personnel below the limits for normal operations.

6.5.6 Contamination Control Measures

6.5.6.1 Plant Site

The Radiation Protection Group is responsible for preventing or minimizing direct or subsequent ingestion exposure to radioactive materials deposited on the ground or other surfaces. Personnel, material and equipment will be checked at the main access control point. Decontamination will be effected when needed and when practical. Equipment which cannot be decontaminated will remain within the Radiological Controlled Area or be controlled through a conditional release process.

The site guidelines for release of equipment to a clean area are no detectable licensed radioactive material above background, using the following criteria:

A. Using a counting system that meets a minimum detectable sensitivity of 100 dpm/100 cm^2 beta/gamma and 20 dpm/100 cm^2 alpha.

B. Using a frisker type instrument to conduct a direct frisk survey with no reproducible counts above background provided background is < 300 cpm.

Should any normally clean areas become contaminated in excess of 20 dpm/100 cm^2 alpha or 1000 dpm/100 cm^2 beta-gamma (as determined by smear tests), they ***SHALL*** be barricaded or roped and posted as a Contaminated Area, per normal plant procedures. Such areas ***SHALL*** be decontaminated as soon as practical. Access to such areas which lie outside the protected area will be controlled by plant security until properly decontaminated and cleared.

Under emergency conditions, the Radiological Emergency Coordinator has the option of implementing emergency guidelines for contamination control which are in excess of normal limits.

The Radiation Protection Group is responsible for controlling all food and water supplies at the plant during an emergency.

Whenever an evacuation due to radiological condition occurs, all food and water supplies within the evacuated area will be considered contaminated and measures will be taken to prevent their use.

Before any water or food may be consumed, the Radiation Protection Group must verify that the water/food is not contaminated and the area in which it is consumed is less than 100 dpm/100 cm^2. Random samples of water/food ***SHALL*** be analyzed for contamination on a periodic basis.

6.5.6.2 Off-Site Areas

Protective actions planned for persons in off-site areas and criteria for their implementation are described in the MINNESOTA EMERGENCY OPERATIONS PLAN.

6.6 Aid to Affected Personnel

In case of an accident or emergency, protection of personnel from radioactive contamination and exposure is the responsibility of the Radiation Protection Group. The highest priority for medical treatment of radiation injuries are personnel suspected of receiving 25 rem or more of penetrating radiation to the whole body.

The order of medical treatment will be:

A. Immediate care of serious injuries

B. Decontamination of personnel

C. Care of other injuries

D. Determining any internal contaminations through bioassays and whole body counts.

E. Follow-up treatment

6.6.1 Decontamination and First Aid

6.6.1.1 Decontamination

As soon as practical, attempts ***SHALL*** be made to decontaminate individuals found to be contaminated. First aid or removal from a hazardous environment, however, ***SHALL*** take precedence over decontamination actions. Precautions will be taken to prevent the spread of contamination to other parts of the body. Particular attention will be paid to open wounds in order to prevent internal contamination.

Contamination monitoring will be accomplished using thin-window GM pancake-type probes for maximum sensitivity. Each assembly area where decontamination may be conducted is equipped with one or more of these instruments.

The primary decontamination facility is located in the plant Access Control Area. Two showers and a large sink, plus various other supplies are provided for this express purpose. If the primary facility is not accessible, decontamination kits are also provided in the emergency supplies for the EOF and off-site Assembly Points. Decontamination operations at an Assembly Point would be on a small scale due to limited resources. If necessary, contaminated personnel at an Assembly Point will be placed in protective clothing and transported to an adequate facility.

The decontamination kits contain the equipment and materials necessary for small scale personnel decontamination operations. Decontamination materials are made available for use at Access Control, EOF, and Off-Site Assembly Points to deal with various skin contamination.

The waste generated in decontamination operations will be retained for proper disposal.

6.6.1.2 First Aid

Fire Brigade personnel receive first aid training (Red Cross Multi-Media or equivalent) on a periodic basis. The level of skills is sufficient for the time it takes for off-site medical personnel to arrive.

6.6.2 Medical Transportation

Arrangements for transportation of radiologically contaminated casualties have been made with the Big Lake-Monticello Community Ambulance Service. The personnel at the service receive radiological training from MNGP Training Staff members on a regular basis. The procedure for handling contaminated personnel includes protective measures for equipment as well as the ambulance service personnel.

6.6.3 Medical Treatment

The Monticello Nuclear Generating Plant has made arrangements for medical services with a local hospital located approximately five miles from the plant in Monticello. In addition, this hospital has established a transfer agreement with North Memorial Hospital for backup assistance should it be necessary for either radiological support or to care for large numbers of patients.

Injured personnel who must be moved to the Monticello-Big Lake Hospital while in a contaminated condition ***SHALL*** be accompanied by personnel who are qualified in radiological monitoring who will stay in attendance and maintain radiological control until decontamination is satisfactorily completed.

The person escorting the patient will take along survey instruments. In addition, TLD badges, pocket dosimeters, survey instruments and other supplies and protective equipment for hospital employees are available at the hospital.

The patient will be put in a separate room and this will be considered a Contaminated Area. Upon release of the patient from the room, it ***SHALL*** be sealed until decontaminated and cleared by Radiation Protection. All hospital equipment in the room will be surveyed and decontaminated to site guidelines for release of equipment to a clean area before being released.

If deemed necessary patients may be sent to the North Memorial Hospital for radiological studies, or other reasons. This arrangement is formalized in a transfer agreement between these two hospitals and outlined in the Monticello and Prairie Island Off-site Nuclear Emergency Plan, Section 13, entitled EMERGENCY MEDICAL PLAN.

Table 6.0-1 EPA Guidelines For Recommended Protective Actions (Whole Body And Thyroid Dose From Exposure To A Gaseous Plume)

Projected Dose (REM) to the Population	Recommended Actions	Comments
Whole Body <1 (TEDE) Thyroid <5 (CDE) Skin <50 (CDE)	No planned protective actions. Monitor environmental radiation levels.	
Whole Body >1 (TEDE) Thyroid >5 (CDE) Skin >50 (CDE)	Evacuate unless constraints make it impractical. Monitor environmental radiation levels. Control access.	Shelter if evacuation were not immediately possible.

Table 6.0-2 Recommended Derived Intervention Level (DIL) or Criterion for Each Radionuclide Group [(a), (b)]

All Components of the Diet		
Radionuclide Group	(Bq/kg)	(pCi/kg)
Sr-90	160	4300
I-131	170	4600
Cs-134 & Cs-137	1200	32,000
Pu-238 + Pu-239 + Am-241	2	54
Ru-103 + Ru-106 [(c)]	$\frac{C_3}{6800} + \frac{C_6}{450} < 1$	$\frac{C_3}{180,000} + \frac{C_6}{12,000} < 1$

Notes:

(a) The DIL for each radionuclide group (except for Ru-103 + Ru-106) is applied independently. Each DIL applies to the sum of the concentrations of the radionuclides in the group at the time of measurement.

(b) Applicable to foods as prepared for consumption. For dried or concentrated products such as powdered milk or concentrated juices, adjust by a factor appropriate to reconstitution, and assume the reconstitution water is not contaminated. For spices, which are consumed in very small quantities, use a dilution factor of 10.

(c) Due to the large difference in DILs for Ru-103 and Ru-106, the individual concentrations of Ru-103 and Ru-106 are divided by their respective DILs and then summed. The sum must be less than one. C_3 and C_6 are the concentrations, at the time of measurement, for Ru-103 and Ru-106, respectively.

(d) Reference U.S. Food and Drug Administration's, Department of Health and Human Services' document titled "Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies", August 1998, for further discussion of this table.

Table 6.0-3 Recommended Protective Actions

Accident Phase	Exposure Pathway	Examples of Actions to be Recommended
EARLY (EMERGENCY) PHASE (NOTE 1) (0 to 4 days)*	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 (NOTE 2)	Ingestion of Milk	Take cows off pasture, prevent cows from drinking surface water, discard contaminated milk, or divert to stored products such as cheese
	Ingestion of fruits and vegetables	Wash all produce, or impound produce, delay harvest until approved, substitute uncontaminated produce
	Ingestion of water	Cut off contaminated supplies, substitute from other sources, filter, demineralize
(24 hours to 30 days) *	Whole body exposure and inhalation	Relocation, decontamination, Access Control
LATE PHASE (NOTE 3)	Ingestion of food and water contaminated from the soil either by resuspension or uptake through roots	Decontamination, condemnation, or destruction of food; deep plowing, condemnation or alternate use of land
(over 30 days)*	Whole body exposure from deposition material or inhalation of resuspended material	Relocation, Access Control, decontamination, fixing of contamination, deep plowing
NOTE 1	Early Phase -	Time period from the onset of a major release and subsequent plume exposure periods up to 4 days.
NOTE 2	Intermediate Phase -	Time period of moderate continuous release with plume exposure and contamination of environment
NOTE 3	Late Phase -	Recovery Period

* "Typical" Post-Accident Time Periods

Table 6.0-4 Emergency Exposure Guidelines

EXPOSURE LIMIT[1]	EMERGENCY ACTIVITY[1]	COMMENTS
5 REM (TEDE)[(2)(3)]	All emergency activities	This dose limit applies when a lower dose is not practicable through application of ALARA practices.
10 REM (TEDE)[(2)(3)]	Protection of valuable property	This dose limit applies when a lower dose is not practicable through application of ALARA practices.
25 REM (TEDE)[(2)(3)]	Life saving or protection of large populations.	This dose limit applies when a lower dose is not practicable through application of ALARA practices.
> 25 REM (TEDE)[(2)(3)]	Life saving or protection of large populations	Doses in excess of 25 REM should be on a voluntary basis to persons fully aware of the risks involved.

NOTE 1: Dose limits for emergency workers and activities are based on EPA 400-R-92-001, May 1992.

NOTE 2: Sum of external effective dose equivalent and committed effective dose equivalent to non-pregnant adults from external exposure and intake during the duration of an emergency.

NOTE 3: Exposure to the lens of the eye should be limited to 3 times the value listed and doses to the skin and/or extremities should be limited to 10 times the value listed.

7.0 EMERGENCY FACILITIES AND EQUIPMENT

7.1 Emergency Response Centers

Plan views of the Technical Support Center, Back-up Operations Support Center, Control Room, Emergency Operations Facility (EOF) and Operations Support Center (OSC) as described below, are shown in Figures 7.0-1, 7.0-2, and 7.0-5.

7.1.1 Technical Support Center

The Technical Support Center (TSC) serves as a center outside of the Control Room that acts in support of the command and control function. Plant status and diagnostic information will be available at this location for use by technical and management personnel in support of reactor command and control functions. The Emergency Director resides in the TSC when activated.

The TSC is located in the northeast corner, second level of the Plant Administration Building (same level as the Control Room). The TSC has approximately 2000 sq ft of floor space and is within the controlled ventilation boundary of the Emergency Ventilation System (EVS). This system is independent of the Emergency Filtration Train System (EFT) which serves the Control Room.

An emergency equipment locker located in the TSC contains protective, anti-contamination clothing for TSC personnel.

7.1.2 Operations Support Center

The Operational Support Center (OSC) serves as the facility to which Mechanical, Electrical and I&C maintenance personnel report in an emergency. In addition to maintenance personnel, off-duty Operations personnel also report to the OSC. The OSC functions as the staging area from which emergency teams are dispatched, by the TSC or Control Room, to undertake emergency corrective actions.

The primary OSC is located on the first level of the Plant Administration Building within the Maintenance department offices and Plant Lunch Room. The primary OSC is a dedicated facility which serves as a maintenance support area and conference room during normal operation. The primary OSC is outside a filtered ventilation boundary.

The Back-up OSC is located on the second level of the Plant Administration Building immediately adjacent to the NRC Conference Room. During normal operation the facility serves as an office area and is converted to the OSC if needed. The Back-up OSC is located within the EVS controlled ventilation boundary. The Back-up OSC is activated if the primary OSC becomes uninhabitable.

Emergency equipment lockers, located in the primary OSC, contain protective anti-contamination clothing for OSC emergency team personnel. This equipment is transported to the Back-up OSC if the primary OSC becomes uninhabitable.

7.1.3 Emergency Operations Facility

In the event of an Alert, Site Area Emergency, or a General Emergency, the Emergency Operations Facility (EOF) will be activated. The EOF serves as a center for evaluation and coordination of off-site activities related to the emergency. Additionally, the facility will be the base of operations for environmental surveillance and communications with supporting operations. The Emergency Manager is in charge of the EOF.

The EOF is located within the site Training Center, 1.4 miles south of the plant (approximately 5 minutes driving time). It was designed primarily as a training facility and also in accordance with NUREG 0696. In the event the EOF is needed, it is capable of prompt conversion from a training facility to an Emergency Response Facility.

The EOF will be activated and staffed by Site ERO personnel. On activation, the first personnel will arrive within 30 minutes, with complete activation in approximately one hour . The Emergency Plan Implementing Procedures describe the functions, equipment and personnel responsibilities more fully.

The EOF will also provide office space, trailer space and communications hook-ups for NRC Incident Response Teams, vendors, media and technical support contractors.

7.1.4 Back-up EOF

In the event the primary EOF becomes uninhabitable during a real emergency, the functions of the EOF would be transferred to the Back-up EOF.

The Back-up EOF is located at the Xcel Energy corporate office in downtown Minneapolis, 45 miles southeast of plant.

7.1.5 Assembly Points

In the event of a plant evacuation, the On-Site Assembly Point (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.

The On-Site Assembly Point is located approximately 1000 feet south of the plant, within the Site Administration Building . The location of the Off-Site Assembly Point is dependent upon the nature of the emergency conditions. Its location will be announced over the public address system when announcement of evacuation is made.

7.1.6 Access Control

The Primary Access Control Point is located in the lower level of the Plant Administration Building. This is the primary entry/exit point from the Radiologically Controlled Area.

An alternate Access Control Point will be located in the Administration Building, Security Building, or at a point designated by the ED, if the Primary Access Control Point becomes uninhabitable due to high radiation or high airborne levels.

7.1.7 Tag Boards for ERO Assignments

The Tag Boards are used to make speedy personnel duty assignments during the initial stage of an emergency, to insure that qualified personnel fill the positions in the ERO, and insure that the more important positions in the ERO are filled first.

The Tag Boards consists of a board with a layout of the Emergency Response Organization. Under each position on the board is a list of the individuals who are qualified to fill that position, and a tag with the necessary instruction for filling that position. There is also a sign-in sheet that serves to indicate who has a specific tag from the Tag Board.

The Tag Boards are located in the TSC, OSC and EOF. Personnel who have key positions within those facilities have the responsibility of checking the Tag Boards when it is announced that ERO personnel are to report to their duty stations. The Tag Boards are reviewed and updated quarterly.

7.2 Communications Systems

7.2.1 Normal On-Site Communications

Normal on-site communications is provided by the plant telephone system which has a maximum capacity of 800 lines and 200 trunks. The system is powered by a highly reliable, UPS and diesel-backed power supply, with a different diesel-backed alternate power source also available.

The plant PA System may also be used for in-plant communications. The PA System is powered by normal plant power, backed up by uninterruptible power.

Portable radios are used for communications between individuals and base stations located in the Control Room, TSC, EOF, and Security Building.

There is also a plant intercom system. Intercom units are installed at selected plant locations primarily for specific task related activities.

7.2.2 Normal Off-Site Communications

Normal off-site communications is provided by the following telephone circuits:

a. 12 two-way central office lines (TDS Telecom).

b. 23 digital tie-lines to Minneapolis via fiber optic datalink.

c. 23 digital tie-lines to the Monticello Training Center (PBX).

d. 16 direct inward dial trunks (TDS Telecom)

7.2.3 Alternate Off-Site Communications

7.2.3.1 Radio Receiver/Transmitter

An alternate method for communications is provided by an AC powered radio transceiver with control consoles located in the TSC, Control Room and EOF.

From either console, communications may be established with the EOF, Sherburne and Wright County Sheriffs, Plant Security, Operations and Radiation Protection portable radios, and the Xcel Energy System Control Center.

7.2.3.2 Emergency Response Organization Pager Network

An ERO Pager Network is utilized for notification of site Emergency Response Organization members. The system consists of a commercial pager network with independent, transmitters. Transmitters are located in various areas from St. Cloud to Red Wing. Each pager group has a primary and back-up telephone number which are from separate trunk lines, which further increases accessibility. Each transmitter is installed with a back-up power supply (battery or diesel).

7.2.3.3 Direct Dedicated Telephones

Direct dedicated telephones as described below are diagrammed in Figure 7.0-3.

A. Three dedicated lines exist between the TSC and the EOF.

B. Site FTS System - this dedicated telephone network connects the plant site with the NRC Operations Center. Site extensions are located in the Control Room, TSC, Work Execution Center Office and Site NRC Office. Site extensions include ENS, HPN, ERDS and various other extensions connecting to the NRC Operations Center.

C. EOF FTS System - this dedicated telephone network connects the EOF with the NRC Operations Center. EOF extensions are located in the EOF and adjoining classrooms. EOF extensions include ENS, HPN and various other extensions connecting to the NRC Operations Center.

D. An automatic-ringing line exists between the TSC and the State EOC.

E. Two dedicated lines exists between the EOF and the Back-up EOF.

F. An auto ring line exists between the EOF and the State EOC.

G. Four dedicated Federal Telephone System (FTS) lines exists in both the EOF and TSC to connect the NRC incident response team with the NRC Operations Center.

H. Two dedicated ERDS communication lines, one FTS line and one commercial line, for data transfer to the NRC Operations Center.

I. Two dedicated cellular phones providing back-up communications for Field Teams.

7.2.3.4 Radio Links

Radio links exist for communications between the State Division of Emergency Management and the Control Room, TSC , EOF, and Back-up EOF at the plant site.

7.2.3.5 Emergency Response Data System

This dedicated computer/telephone network is a direct near real-time electronic data link between the plant's on-site computer system and the NRC Operations Center that provides for the automated transmission of a limited data set of selected parameters. The ERDS supplements the existing voice transmission over the FTS-ENS.

7.2.4 Emergency Communications Matrix

Tables 7.0-1 and 7.0-2 depict the different communications media by which emergency centers pass information, and give primary and alternate contacts for centers where appropriate.

7.2.5 Testing

Testing of the various communications links is accomplished in two ways.

7.2.5.1 Each month a communications test is conducted in accordance with a surveillance procedure (1225).

7.2.5.2 Drills involving communications equipment are conducted on a regular basis to assure operability.

7.3 Assessment Facilities

The plant instrumentation and monitors perform indicating, recording and protective functions. The regulating systems provide the ability to regulate the plant safely from shutdown to full power and to monitor and maintain key variables such as reactor power, flow, temperature and radioactivity levels within predetermined safe limits during both steady state and plant transients. Plant instrumentation and control systems also provide means to cope with abnormal operating conditions. The control and display of information of these various systems are centralized in the main Control Room. This instrumentation would provide the basis for initiation of protective systems.

7.3.1 On-Site Systems and Equipment

7.3.1.1 Safety Parameter Display System (SPDS)

The Safety Parameter Display System (SPDS) is designed to provide plant operators with a concise display of critical plant parameters as an aid in implementation of the plant Emergency Operating Procedures (EOPs). The Monticello SPDS System is based on plant Emergency Operating Procedures (EOPs) and General Electric (GE) generic Emergency Response Information System (ERIS). SPDS displays are available in the Work Execution Center Office, Technical Support Center (TSC), Emergency Operations Facility (EOF) and throughout the Control Room.

SPDS information is presented to the operator via color graphic computer systems. Operator interface to the color graphics computer system is via keyboards, color CRTs, printer/plotters, light pens and track balls. Input data from plant sensors is gathered via the Data Acquisition System (DAS) and independently transmitted to the VAX process

computer systems. Identical DAS data is maintained on both process computers for purposes of redundancy in the event one computer fails. Signals are processed through various algorithms such as signal range checking, limit checking, averaging, logical manipulations and validation. The results are then transmitted to the color graphic display computers where the data is transformed into the SPDS displays.

The SPDS displays can be classified into two categories, Top-Level and Lower-Level displays. In general, Top-Level displays provide information on several control parameters, both current and historical. The Lower-Level displays are designed to augment the Top-Level displays by providing more detail or background on specific items contained in the Top-Level displays. The overall SPDS display structure is as follows:

A. Top Level SPDS Displays

1. Critical Plant Variables

   The CPV display provides the status of all critical plant parameters including RPV level, pressure, reactor power, drywell pressure and temperature, torus pressure, temperature and level, and radioactive release rate information.

2. Reactor Pressure Vessel Control

   The RPV display provides detailed status and control parameter information including RPV water level, RPV pressure, reactor power and RPV temperature.

3. Containment Control

   This display provides specific information regarding containment control including drywell pressure and temperature and torus water level, temperature and pressure.

4. Radiation Control

   The Radiation Monitor displays provide detailed information on Reactor/Turbine and Radwaste Building area radiation monitors and plant process monitors.

B. Lower-Level SPDS Displays

1. Trend Plot Displays

   Trend plot displays support the RPV and Containment Control displays by providing detailed parameter trend plots of those displays.

2. Two Dimensional Plot Displays

   The 2-D plot displays provide plant specific two dimensional limits in an x-y format and are identical to the curves used in the EOPs.

3. Validation Displays

   The Validation displays are used to display how a parameter is determined.

In addition, Menu Displays are provided to assist the user in selection of individual displays from applicable display types. SPDS menus include, Main Menu, Trend Plot Menu, 2-D Menu and Validation Menu.

The SPDS displays are designed with common display characteristics for ease of understanding. Data is displayed according to defined conventions for use of color, shape, format, alarm and validation processing.

A display color coding scheme is used to aid the operator in prioritizing information and recognizing off-normal conditions. In addition, displays provide indication of both validated parameter and process limit status. Status windows are also provided to alert the operator when approaching or exceeding a critical parameter limit (EOP entry condition).

Two SPDS Terminals are available in the Technical Support Center for use during emergency conditions and for system development during normal operation. One terminal is utilized by the Radiation Protection Group for display of plant radiological conditions and process monitor status. The second terminal is located in the Technical Engineering area of the TSC and is used for plant parameter analysis and trending under the direction of the Engineering Group Leader.

7.3.1.2 Geophysical Phenomena Monitors

A. Seismic Monitoring System

The Seismic Monitoring System is made up of three independent sensing systems: the peak-recording accelerometers, the seismic-switch-activated annunciator system and the accelerograph recording system. The peak-recording accelerometers and the sensors for the accelerograph system (force-balance accelerometers) are located in the drywell, on the refueling floor and in the seismic shed (located to the north of the number 2 warehouse). Seismic switches for the annunciator system are also located in the seismic shed. The seismic trigger which initiates the accelerograph is located in the number 12 125 VDC Battery Room.

Each of the peak-recording accelerometers is a self-contained unit. The sensing mechanism is a permanent magnet stylus attached to the end of a torsional accelerometer. Low frequency accelerations cause the magnet to erase pre-recorded lines on a small (approximately 1/4 inch square) piece of magnetic tape. Each peak recording accelerometer unit contains three torsional accelerometers and magnetic tapes - one each for longitudinal, transverse, and vertical accelerations.

The magnetic tapes can be removed from the accelerometers, developed and evaluated by plant personnel for a rapid determination of the severity of a seismic disturbance.

The Control Room annunciator 6-C-08 (EARTHQUAKE) is initiated by either seismic switch of the Seismic Annunciator System or the seismic trigger of the accelerograph recording system. In addition to this, each of the seismic switches has its own alarm. The first of these is the alarm 6-C-13 (OPERATIONAL BASIS EARTHQUAKE (OBE)) which annunciates when its switch senses an acceleration $\geq$ .03 g. The second alarm is the 6-C-18 (DESIGN BASIS EARTHQUAKE (DBE)), which annunciates when its switch senses an acceleration >.06g. These two switches do not activate the accelerograph recording system.

The accelerograph recording system gives a more detailed record of a disturbance than the peak recording accelerometers - it records accelerations in three directions (longitudinal, transverse, and vertical, as above) from each of the three sensor locations on magnetic tape cartridges located in the Control Room. This system has five major components: a trigger, three sensors, and the recording and control units. When the trigger (located in the No. 12 125 VDC Battery Room) senses the beginning of a seismic disturbance, (an acceleration > .01 g), it will start the accelerograph recorders and also triggers the earthquake event alarm 6-C-08 in the Control Room.

A summary of the Seismic Monitoring Equipment is provided in Table 7.0-3.

B. Meteorological Monitoring System

The purpose of the meteorological monitoring system is to monitor and determine atmospheric dilution and dispersion parameters for the Monticello Plant site.

The meteorological monitoring system consists of two instrumented towers, associated signal transmission and processing equipment, two AC power sources, and battery backup power supplies.

The primary meteorological tower facility is located on the plant site east of the Reactor Building. It consists of a 100 meter guyed steel tower with a climate controlled instrument shelter at its base. The tower has a motor driven elevator which raises and lowers the three separate instrument platforms mounted on the tower.

The instrument platforms are located at 10, 43 and 100 meters. Each platform has two independent sets (trains) of instrumentation (A and B channels). Each instrument set includes one combination wind speed and direction sensor and one RTD temperature probe. Wind speed and direction transmitters are provided with heater elements to reduce the potential of becoming inoperable during low temperature conditions. The temperature sensors are housed in forced air, shielded aspirators which include air flow sensors. Insufficient air flow and motor inoperability indicator lights are provided in the instrument shelter. Signal transmission lines from the sensors to the instrument shelter junction box are provided with power surge protection and the tower is equipped with lightning rods and is grounded.

Both sets (trains) of sensors and related instrumentation normally receive power from one of two AC power sources. Transfer of power sources may be accomplished manually in the event of a loss of the normal AC power supply. In addition, a UPS is provided in the event manual transfer of the AC power supplies does not occur.

Signals from the 100 meter tower instrumentation are fed to the instrument processor rack located in the instrument shelter and provide the primary and secondary source of meteorological data.

A second meteorological tower is located approximately 3/4 mile from the Reactor Building and is adjacent to the EOF. This tower is a 30 meter self-supported tower with an instrument elevator which lifts single train wind speed and wind direction sensor to the 22 meter elevation. The 30 meter tower is equipped with lightning rods and is grounded. Signals from the tower are fed to an instrument processor rack located inside the EOF and provide the third source of wind speed and wind direction data.

Meteorological data from both the 100 meter and 30 meter towers are collected every 5 seconds, averaged every 15 minutes, and stored in raw data files as both 15 minute and hourly averages. Raw meteorological data may be copied to workspace files for editing, review and use in calculations.

Meteorological data from one train of sensors on the 100 meter tower is provided as digital averages in the Control Room. Displays of current and 15 minute running average meteorological data from both sensor trains on the 100 meter tower and 30 meter tower are simultaneously available on MIDAS terminals in both the TSC and EOF. In addition, data is available on any VAX computer terminal located throughout the facility by accessing the MIDAS system.

The MIDAS software includes data quality control tests which flag questionable or bad data to the user. Plant Chemistry personnel access hourly averaged data on a daily basis and review the data for reasonableness in accordance with plant Chemistry Department procedures. Plant I&C personnel perform monthly surveillance tests on both towers and annual instrument calibrations in accordance with the plant surveillance program. System problems are corrected through the plant Work Order process.

In addition to the site meteorological monitoring system, regional meteorological data is available through the National Weather Service by commercial telephone. National Oceanic and Atmospheric Administration (NOAA) Weather Alert radios are also installed in the Control Room, TSC and EOF to provide warning of adverse weather.

7.3.1.3 Radiological Monitors

A. Process Radiation Monitoring System

The function of the process radiation monitoring system is to provide a continuous monitoring and readout of the radioactivity of all process lines and vents that can release radioactivity directly to the environs. In addition, this system also continuously measures, indicates and records the radioactivity concentration levels of in-plant process streams and vents. A list of the plant process monitors is provided in Table 7.0-5.

B. Area Radiation Monitoring System

A list of the Area Radiation Monitors is provided in Table 7.0-6.

The functions of the Area Radiation Monitoring System are:

1. Warn of excessive gamma radiation levels in areas where nuclear fuel is stored or handled.

2. Providing operating personnel with a continuous indication in the main Control Room of gamma radiation levels at selected locations within the various plant buildings.

3. Contribute supervisory information to the Control Room so that correct decisions may be made with respect to deployment of personnel in the event of a radiation incident.

4. Assist in the detection of unauthorized or inadvertent movement of radioactive material in the plant including the radwaste area.

5. Supplement other systems including Process Radiation Monitoring, Leak Detection, etc., in detecting abnormal migrations of radioactive material in or from the process streams.

6. Provide local alarms at key points where a substantial change in radiation level might be of immediate importance to personnel frequenting the area.

7. Maintain a permanent record of the radiation levels in the areas being monitored.

7.3.1.4 Process Monitors

A. There are many instruments in the plant which may be used to assess the many potential conditions that the plant may experience. These instruments may be used individually or in groups of indicators to assess a certain situation. There is no specific indication that in itself can correctly identify an emergency condition 100% of the time. Therefore, the operators must utilize their general knowledge along with the guidelines provided in Emergency Plan Implementing Procedure A.2-101 (CLASSIFICATION OF EMERGENCIES) to analyze process indications. Specific process monitors of reactor systems which are used during various plant emergencies are discussed in Section 4, Emergency Classification System. In addition, a summary of the types of measured parameters in the Control Room is provided in Table 7.0-7, Instruments Available for Monitoring Major Systems.

B. Reactor Protection System

The Reactor Protection System is designed to prevent, in conjunction with the Primary Containment and Containment Isolation Systems, the release of radioactive materials in excess of the guidelines of 10CFR100, and to prevent fuel damage as a consequence of single operator error or single equipment failure. When specified limits have been exceeded, the Reactor Protection System initiates a reactor scram.

C. Primary Containment Isolation System

The purpose of the Primary Containment Isolation System is to prevent the release of radioactive materials in excess of the guidelines of 10CFR100 by isolating the reactor vessel and closing containment where required following an accident.

7.3.1.5 Containment Radiation Monitor

There are two containment radiation monitors which have ion chamber detectors and a response range of 10^0 to 10^8 R/hr. The detectors are located at approximately the midline of the drywell and separated to enhance the redundant feature of the system. As safety monitors, they satisfy 1E requirements and are qualified under LOCA conditions to IEEE 323-1974. The detectors are encased in steel to protect them from containment sprays and high temperatures.

In the event of a large release of radioactivity to the containment atmosphere, the containment monitors can be used to estimate the amount of activity available for release from containment. Figure 7.0-4 relates containment monitor readings to the approximate percentage of fuel inventory released as airborne and also provides a damage estimate.

7.3.1.6 Fire Detection Devices

A. Early Warning Fire Detectors

Fire detectors (smoke, heat, and flame) are located in most areas of the plant. The detectors in each area initiate an alarm locally and in the Control Room upon detecting either combustion or a failure in the detector system. Detectors in certain areas of the plant will activate their respective sprinkler systems.

B. HAD (Heat Activated Device)

The HAD System utilizes the heat from a fire to operate a pneumatic system to either sound alarms or automatically initiate a deluge or sprinkler system. The HAD System is used in conjunction with the transformer deluge, the building siding deluge, the cooling tower sprinklers, the recirculation MG set sprinklers, and the lube oil reservoir sprinklers can also be operated locally.

7.3.1.7 Post-Accident Sample System

The Post-Accident Sample System (PASS) was designed to provide a means of assessing core damage during and after a loss-of-coolant accident. The facility is located outside of secondary containment to enhance accessibility. Local shielding and area radiation monitoring are also provided to protect the operator.

The capabilities of the system include:

A. Large and small volume liquid coolant samples from jet pumps A and B and RHR pumps A and B;

B. Gas samples from drywell and torus.

7.3.2 Facilities and Equipment for Off-Site Monitoring

7.3.2.1 Geophysical Phenomena Monitors

In the event that a seismic disturbance is indicated by on-site detection equipment, plant procedures require the operator to confirm the validity and/or intensity of the disturbance by contacting one of several off-site sources. The list of off-site sources includes:

A. Prairie Island Nuclear Plant (Located near Red Wing, Minnesota);

B. University of Minnesota (Minneapolis Campus); and

C. National Earthquake Information Service (Golden, Colorado)

7.3.2.2 Radiological Monitors

The Monticello off-site radiation monitoring program includes TLD stations which are located in the general areas of the site boundary, in an outer ring, in special interest areas, and in control stations, many miles from the plant. Also included in the program is a group of air monitoring stations positioned on the site boundary and in the city of Monticello. The program, known as the Radiological Environmental Monitoring Program, is administered at the Site.

7.3.2.3 Laboratory Facilities

In the event that the lab facilities on-site become unusable or overloaded, back-up facilities are available. The chemistry labs at Prairie Island are available for chemical analysis work. For radiochemical analysis, the back-up countroom at the EOF is equipped with a computer-based multi-channel analyzer and gross beta counting equipment. The counting facilities at Prairie Island are also available, if needed.

7.4 Protective Facilities and Equipment

7.4.1 Assembly Points

In the event of a Site Area or General Emergency, the Site Administration Building (SAB) is designated as the assembly point for evacuated personnel. The SAB is located approximately 1000 feet south of the plant.

This structure offers cover from fallout, but does not have special ventilation or shielding properties. It has the capacity to handle the number of people expected to report there. An emergency equipment locker at the assembly point contains a supply of emergency equipment and protective clothing.

7.4.2 Emergency Operations Facility (EOF)

The EOF is located approximately 1.4 miles south of the plant and is activated at the Alert, Site Area or General Emergency classification. The EOF is contained within the site Training Center which houses the Training Staff, administrative offices and Control Room Simulator.

The EOF was designed and constructed IAW NUREG 0696 and is a concrete structure which contains sufficient shielding (for the EOF section of the building) to provide a protection factor of 5. The EOF portion of the building is served by two independent off-site power sources for reliability. The building ventilation system includes an "emergency" mode which provides filtered air to pressurize the EOF through a high efficiency particulate absolute (HEPA) filtration system. The layout of the building entrances and exits were also designed to facilitate emergency operations.

Radiological monitoring of the EOF is provided by air sampling and Dosimeter Area Radiation Monitor (DARM) which may be supplemented with radiological surveys by the EOF Radiation Protection Staff.

Extensive communications equipment is installed to provide primary and back-up methods of communicating with plant Emergency Response Facilities, utility headquarters, off-site agencies and utility Field Monitoring teams. Critical plant parameter data is available in the EOF through the plant Safety Parameter Display System (SPDS).

Meteorological data and off-site dose projection capabilities are provided through the MIDAS system.

7.4.3 Back-up EOF

The Back-up EOF is located at the Xcel Energy corporate office in downtown Minneapolis, 45 miles southeast of the plant.

In the event the primary EOF became uninhabitable during a real emergency, the functions of the EOF would be transferred to the Back-up EOF.

Extensive communications equipment is installed to provide primary and back-up methods of communicating with plant emergency Response Facilities, off-site agencies and utility Field Monitoring teams. Critical plant parameter data is available in the Back-up EOF through the plant Safety Parameter Display System (SPDS). Meteorological data and off-site dose projection capabilities are provided through the MIDAS System.

7.4.4 Emergency Kits

Table 7.0-8 lists the location and general contents of emergency kits to be used in response to an emergency at the Monticello Plant.

7.5 First Aid and Medical Supplies

7.5.1 First Aid Center

A decon shower and first aid supplies are located in the Main Access Control area in the lower level of the Plant Administration Building. Immediate and temporary care may be given to a victim in this area. If the injury involves contamination that cannot be removed without causing further injury, steps will be taken to minimize the spread of contamination until medical assistance arrives or until the victim has been transported to the hospital.

7.5.2 First Aid Kits

First Aid kits are located in the Fire Brigade Room at Main Access Control, Work Execution Center and various other areas on the plant site. Stretchers and shock blankets are located on each level of the Containment Building, Turbine Building and Main Access Control.

7.6 Damage Control Equipment and Supplies

7.6.1 Firefighting Equipment

A full line of fire fighting equipment and supplies is available for damage control operations. The equipment is stored in the Fire Brigade Room adjacent to the Main Access Control area in addition to various areas within the plant for easy access and quick response to fires.

7.6.2 Spill and Leak Control Equipment

Spill and leak control equipment includes electric and gas driven pumps, various patching supplies and welding equipment. This equipment is available in the warehouse along with machine shop facilities for response to a wide variety of problems.

7.7 Public Alert and Notification System (PANS)

Within the Plume Exposure Emergency Planning Zone (EPZ) there exists provisions for alerting and providing notification to the public. The state and/or local authorities are responsible for activation of this system.

The Monticello Nuclear Generating Plant has developed a 91 unit fixed siren system design for essentially 100% coverage of the population within 5 miles of the Site and population center coverage for the 5-10 mile zone. Sirens installed by MNGP have been sited according to a 70dB criteria to ensure the required coverage. To notify persons in low population density areas, the State and County Emergency Plans have provisions for route alerting by local law enforcement. This notification method involves the use of emergency vehicles being driven or pre-designated routes by law enforcement personnel. Provisions for transient population notification are also included in State and County plans.

7.8 Emergency Alert System Radios

To further ensure prompt notification, Emergency Alert System (EAS) radios have been installed in various commercial, institutional, and education facilities in the 10 mile zone. These locations may harbor large groups of people during all or part of a day. Emergency Alert System radios will be activated by the National Oceanic and Atmospheric Administration (NOAA) or local counties.

In the event of an emergency condition, alert and notification information will be relayed through established communication links described in the Minnesota Emergency Response Plan. Upon receiving notification of the emergency, state and local governments will, if necessary, activate public warning and information procedures which include the State Emergency Alert System (EAS). With this system, essentially 100% of the population in the 0-5 mile zone will be alerted within 15 minutes and route alerting by state, county and city emergency vehicles, equipped with sirens, will be carefully deployed in an effort to meet the 45 minute time interval specified for the 5-10 mile zone.

7.9 Mapping

10 mile EPZ maps are periodically updated to reflect population and geo-physical changes.

Table 7.0-1 Monticello Nuclear Generating Plant Communications Matrix

	PLANT TELEPHONE SYSTEM	PLANT PA SYSTEM	CELLULAR TELEPHONE	INTERCOM SYSTEM	ERDS	TDS TELECOM	FACSIMILE	TWO-WAY RADIO	PERSONAL PAGER	DEDICATED TELEPHONE	RADIO-TELEPHONE LINK	USNRC / ENS / FTS SYSTEM	USNRC / HPN / FTS SYSTEM	USNRC/FTS-EXTENSIONS
CONTROL ROOM	X	X		X		X		X			X	X		
EOF	X					X	X	X		X	X	X	X	X
TSC	X	X		X	X	X	X	X		X	X	X	X	X
OSC	X	X				X		X						
MN / D.E.M.						X	X			X	X			
MN / PLANNING & ASSESSMENT						X	X			X				
USNRC / HQ					X	X						X	X	X
USNRC / REG III						X						X	X	
USNRC / RES INSP						X			X			X		
KEY MNGP PERSONNEL						X			X					
WRIGHT CO. SHERIFF						X	X	X						
SHERBURNE CO. SHERIFF						X	X	X						
DOE / RAP (CHICAGO)						X								
CIVIL DEFENSE						X								
MN / STATE PATROL						X								
MONTICELLO CITY HALL						X								
MONTICELLO / PD & FD						X								
MAIN ACCESS CONTROL	X	X		X		X		X						
BACK-UP EOF						X	X	X		X				
Xcel ENERGY SYSTEM DISP						X		X		X	X			
PINGP						X	X							
MNGP AREAS	X	X												
MNGP-PINGP MONITORING TEAMS			X			X		X						
MONTICELLO HOSPITAL						X								

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Table 7.0-2 Communications Contacts

LOCATION	CONTACT	
	PRIMARY	ALTERNATE
Control Room	Shift Manager	Control Room Supervisor
EOF and Back-up EOF	Emergency Manager	EOF Coordinator
Minnesota Division of Emergency Management	Duty Officer	Duty Officer
Minnesota Planning and Assessment Center	Planning Chief	State Duty Officer
Wright County Sheriff	Sheriff	Dispatcher
Sherburne County Sheriff	Sheriff	Dispatcher
Monticello Civil Defense	Monticello CD Director	Sheriff Dispatcher
Minnesota State Patrol (St. Cloud)	Captain	Dispatcher
Monticello City Hall	Mayor	City Administrator
Monticello F.D.	Sheriff	Dispatcher
NRC HPN	NRC - Operations Center	Region III Lisle
NRC ENS	NRC - Operations Center	Region III Lisle

Table 7.0-3 Seismic Monitoring Instrumentation

LOCATION	DESCRIPTION	ACTUATING DEVICE	SETPOINT
6-C-08	Earthquake	Accelerograph Trigger OR OBE Alarm Module OR DBE Alarm Module	.01 g .03 g .06 g
6-C-13	Operational Basis Earthquake	OBE Alarm Module	.03 g
6-C-18	Design Basis Earthquake	DBE Alarm Module	.06 g

Table 7.0-4 On-Site Meteorological Monitoring Instrumentation

SYSTEM	PARAMETER	SENSOR LOCATION (METERS)	INDICATOR LOCATION
100 meter Tower	WIND SPEED	10 43 100	Single train (A or B) 5 minute average data available on the Met Recorder in the Control Room. 15 minute average data is available on MIDAS terminals in the TSC and EOF.
	WIND DIRECTION	10 43 100	
	TEMPERATURE	10 43 100	Current and 15 minute average data (both Channel A & B) from 100 meter tower and 30 meter tower available in the TSC and EOF on MIDAS terminals.
	ΔTEMPERATURE	43 100	
30 meter Tower	WIND SPEED WIND DIRECTION	22 22	Current data available on any plant VAX computer terminal via MIDAS display.

Back-up Sources of Meteorological Data		
Data Source	Location	Method
National Weather Service	Mpls/St. Paul Airport	Commercial Telephone
NOAA Weather Alert Radio	Regional	Alert Radio in TSC and EOF

Table 7.0-5 Process Radiation Monitors

MONITOR	NUMBER OF DETECTORS	INDICATOR LOCATIONS	INDICATOR RANGE
Main Steam Line Radiation Monitor	4	Panel C-02, C-10	1 - 10^5 mrem/hr
Off-gas Pretreatment Rad Monitor	2	Panel C-02, C-10	1 - 10^5 mrem/hr
Flux Tilt Monitor	1	Panel C-02, C-10	0 - 125 units
Stack WRGM	2	Panel C-257 Panel C-258	10^0 - 10^{12} Ci/Sec
Reactor Building Vent WRGM	2	Panel C-257 Panel C-258	10^0 - 10^{12} Ci/Sec
Fuel Pool Monitor	2	Panel C-10	0.1 - 1000 mrem/hr
Reactor Building Exhaust Plenum Monitor	2	Panel C-02, C-10	.01 - 100 mrem/hr
Process Liquid:			
Radwaste Liquid Effluent Monitor	1	Panel C-10	10^{-1} - 10^5 CPS
Service Water Effluent Monitor	1	Panel C-02, C-10	10^{-1} - 10^5 CPS
RBCCW Radiation Monitor	1	Panel C-02, C-10	10^{-1} - 10^5 CPS
Discharge Canal Rad Monitor	2	Panel C-02, C-10	10^{-1} - 10^5 CPD
Turbine Building Normal Waste Sump Radiation Monitor	2	Panel C-02, C-10	10 - 10^5 CPM
Drywell CAM Monitor	1	Panel C-02	10 - 10^5 CPM
Control Room Radiation	2	Panel C-257 Panel C-258	10^{-1} - 10^4 mrem/hr
Sewer Lift Station	1	Panel C-289	10 - 10^7 CPM
Hard Pipe Vent	1	Panel C-298B	10^{-1} - 10^4 mrem/hr

Continuous Air Monitors
1. PIOPS CAM - Primary OSC 2. PIOPS CAM - TSC 3. SJAE Room (Condensate Pump Area) 4. 951' Turbine Floor East 5. 1027' Reactor Building 6. Recombiner Building (TB RR Access) 7. Off-gas Storage Building 8. 962' Reactor Building (CUPR Vent) 9. 935' RX By airlock (Samples Stm Chase)

Table 7.0-6 Area Radiation Monitors

STA.	PANEL C-11 SENSOR LOCATION BUILDING	AREA	SENSOR RANGE (MR/HR)
A-1	Reactor	Refuel Floor	0.1 - 1000
A-2	Reactor	Refuel Floor (High Range)	1.0 - 10,000
A-3	Reactor	Refuel Floor West Stairway	0.1 - 1000
A-4	Reactor	1001′ Source Storage	0.1 - 1000
A-5	Reactor	1001′ Fuel Pool Room	0.1 - 1000
A-6	Reactor	1001′ Decon Equipment Area	0.1 - 1000
A-7	Reactor	985′ Chem Sample Area	0.1 - 1000
A-8	Reactor	962′ Cleanup System Access	0.1 - 1000
A-9	Reactor	962′ Reactor Building East	0.1 - 1000
A-10	Reactor	935′ East CRD Module Area	0.1 - 1000
A-11	Reactor	935′ West CRD Module Area	0.1 - 1000
A-12	Reactor	935′ TIP Drive Area	0.1 - 1000
A-13	Reactor	TIP Cubicle	1.0 - 10,000
A-14	Reactor	HPCI Turbine Area	0.1 - 1000
A-15	Reactor	896' Radwaste Drain Tank Room	0.1 - 1000
A-16	Reactor	RCIC Pump Area	0.1 - 1000
A-17	Reactor	A RHR Room	0.1 - 1000
A-18	Reactor	B RHR Room	0.1 - 1000
A-19	Office	Chemistry Lab	0.1 - 1000
A-20	Office	Control Room (Low Range)	0.01 - 100
A-21	Office	Control Room (High Range)	1.0 - 10,000
B-1	Turbine	Operating Floor (North Wall)	1.0 - 10,000
B-2	Turbine	Shield Wall	0.1 - 1000
B-3	Turbine	Condensate Demin Operating Area	0.1 - 1000
B-4	Turbine	MVP Room	0.1 - 1000
B-5	Turbine	Feedwater Pump Area	0.1 - 1000
C-1	Radwaste	Radwaste Control Room	0.1 - 1000

Table 7.0-6 Area Radiation Monitors (cont'd)

STA.	PANEL C-11 SENSOR LOCATION BUILDING	AREA	SENSOR RANGE (MR/HR)
C-3	Radwaste	Conveyor Operating Aisle	0.1 - 1000
D-1	Machine Shop	Hot Machine Shop	0.1 - 1000
STA.	PANEL C-252 & C-11 SENSOR LOCATION BUILDING	AREA	SENSOR RANGE (MR/HR)
E-1	Recombiner	Instrument Room	0.1 - 1000
E-2	Recombiner	Pump Room	0.1 - 1000
F-1	Gas Storage	Foyer (Low Range)	0.1 - 1000
F-2	Gas Storage	Foyer (High Range)	100 - 1,000,000
	PANEL C-257 & C-258 SENSOR LOCATION BUILDING	AREA	SENSOR RANGE (MR/HR)
	Reactor	Containment	10^0 - 10^8 R/HR

Table 7.0-7 Instruments Available for Monitoring Major Systems

Measured Parameter	Type of Readout	Range	Indicator Location
1. Source Range			
a. Neutron Level	Log Scale Indicator, Recorder, Annunciator	10^{-1} to 10^{6} CPS	System Cabinets Main Control Panels
b. Reactor Period	Linear Scale Indicator, Annunciator	-100 to 10 Sec	System Cabinets Main Control Panels
2. Intermediate Range			
a. Neutron Level	Linear Scale Indicator, Recorder, Annunciator	0 to 125 (units)	System Cabinets Main Control Panels
3. Power Range			
a. Neutron Level	Linear Scale Indicator, Recorder, Annunciator	0 to 125%	System Cabinets Main Control Panels
4. Reactor Coolant Range			
a. Recirc Loop Temperature	Linear Scale Indicator, Computer Printout	0 to 600°F	Main Control Panels
b. Reactor Pressure	Linear Indicator, Recorder, Computer Printout, Annunciator	0 to 1500 PSIG	Main Control Panels
c. Core Flow	Linear Scale	0 to 80 x 10^{6} LB/HR	Main Control Panels
d. Recirc Flow	Linear Scale Indicator, Recorder, Computer Printout	0 to 35 x 10^{3} GPM	Main Control Panels
e. Jet Pump Flow	Linear Scale Indicator, Computer Printout	0 to 44 x 10^{6} LB/HR	Main Control Panels

Table 7.0-7 Instruments Available for Monitoring Major Systems (cont'd)

Measured Parameter	Type of Readout	Range	Indicator Location
5. Main Steam			
a. Steam Line Flow	Linear Scale Indicator	0 to 2 x 10^6 LBS/HR	Main Control Panels
b. Total Steam Flow	Linear Scale Recorder	0 to 8 x 10^6 LBS/HR	Main Control Panels
c. Main Steam Line Pressure	Linear Scale Indicator Computer Printout	900 to 1000 psig (on C-07) 0 to 1200 psig (on C-03)	Main Control Panels
6. Containment			
a. Pressure	Linear Scale Recorder, Computer Printout, Annunciator	-2 to +3 psig recorder 0-80 psig recorder 0 to +250 psig recorder	Main Control Panels
b. Torus Pressure	Linear Scale Recorder	-2 to +3 psig	Main Control Panels
c. Torus Level	Linear Scale Indicator	-15" to 15" -8' to +14' recorder (in Linear Feet)	Main Control Panels
d. Torus Water Temperature	Digital Indicator Annunciator	30° - 240°F	Main Control Panels
e. N_2 Makeup Flow	Linear Scale Recorder Annunciator	0 - 2 SCFM	Main Control Panels
f. N_2 Purge Flow	Linear Scale Indicator	0 - 5000 SCFM	Main Control Panels
g. Drywell Sumps	Level Recorder	0" - 14"	Main Control Panels
h. Drywell Cooling Fans	Indicator Lights	Stby/Off/On	System Cabinet Control Panels

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Table 7.0-7 Instruments Available for Monitoring Major Systems (cont'd)

Measured Parameter		Type of Readout	Range	Indicator Location
7.	Station Electric			
a.	Bus Voltage	Linear Scale Indicator, Annunciators	0-5250 AC Volts	Main Control Panels
b.	Breaker Positions	Indicator Lights	Open/Closed	Main Control Panels
c.	Amperage	Linear Scale Indicators	Various	Main Control Panels
d.	Generator Output	Linear Scale Recorder, Indicator, Computer Printout	0 to 800 MW 0 to 700 MW	Main Control Panels
8.	Feedwater and Condensate			
a.	Feedwater Temperature	Linear Scale Recorder	0 to 400°F	Main Control Panels
b.	Condensate Header Pressure	Linear Scale Indicator	0 to 500 psig	Main Control Panels
c.	Feed Water Discharge Pres	Linear Scale Indicator and Recorder	0 to 2000 psig	Main Control Panels
d.	Feed Water Flow	Linear Scale Indicator	0 to 4×10^6 LB/HR	Main Control Panels
e.	Total Feedwater Flow	Linear Scale Recorder	0 to 8×10^6 LB/HR	Main Control Panels
9.	Condenser Systems			
a.	Condenser Vacuum	Linear Scale Recorder, Annunciator	0 to 30" HG Vac	Main Control Panels
b.	Hotwell Level	Linear Scale Recorder, Annunciator	-15 to +15"	Main Control Panels
c.	CST Level	Linear Scale Indicator	5' to 30'	Main Control Panels

Table 7.0-7 Instruments Available for Monitoring Major Systems (cont'd)

Measured Parameter	Type of Readout	Range	Indicator Location
10. ECCS System			
a. LPCI, Core Spray Pump Status	Indicator Light	--	
b. LPCI Flow	Square Root Scale Recorder, Indicator	0 to 10,000 GPM	Main Control Panels
c. Core Spray Flow	Square Root Scale Indicator	0 to 5000 GPM	Main Control Panels
d. LPCI Core Spray Valve Positions	Indicator Lights Computer Printout	--	Main Control Panels
e. ADS Valve Positions	Indicator Lights Annunciator	--	Main Control Panel
f. ADS Discharge Temperature	Linear Scale Recorder, Annunciator	0 to 600°F	System Temperature Recorder
g. HPCI Flow	Linear Scale Indicator	0 to 3500 GPM	Main Control Panel
11. Decay Heat Removal System			
a. RCIC Flow	Linear Scale Indicator/ Controller	0 to 500 GPM	Main Control Panel
b. LPCI Mode of RHR (see above)			

Table 7.0-8 Emergency Kits

LOCATION	GENERAL CONTENTS
Site Administration Building Assembly Point	Protective Clothing & Equipment Radiological Monitoring Equipment Emergency Supplies Personnel Decontamination Supplies First Aid Kit
Control Room & Work Execution Center	Protective Clothing & Equipment Radiological Monitoring Equipment Communications Equipment Toxic Chemical Monitoring Equipment Emergency Supplies First Aid Kit(s)
Access Control	Protective Clothing & Equipment Radiological Monitoring Equipment Personnel Decontamination Equipment First Aid Kit(s)
Technical Support Center	Radiological Monitoring Equipment Communications Equipment Emergency Supplies
Emergency Operations Facility	Protective Clothing & Equipment Radiological Monitoring Equipment Communications Equipment Personnel Decontamination Equipment Emergency Supplies First Aid Kit
Emergency Vehicle & Equipment Storage Facility	Vehicles for Emergency Use (2) Radiological Monitoring Equipment Protective Clothing & Equipment Communications Equipment Emergency Supplies
Monticello Plant Security Building (Ambulance/Fire E Kit)	Protective Clothing & Equipment Dosimetry
Monticello-Big Lake Hospital & North Memorial Hospital	Protective Clothing & Equipment Radiological Monitoring Equipment Personnel Decontamination Equipment Emergency Supplies

Figure 7.0-1 Plan View of Technical Support Center, Back-Up Operational Support Center, and Control Room

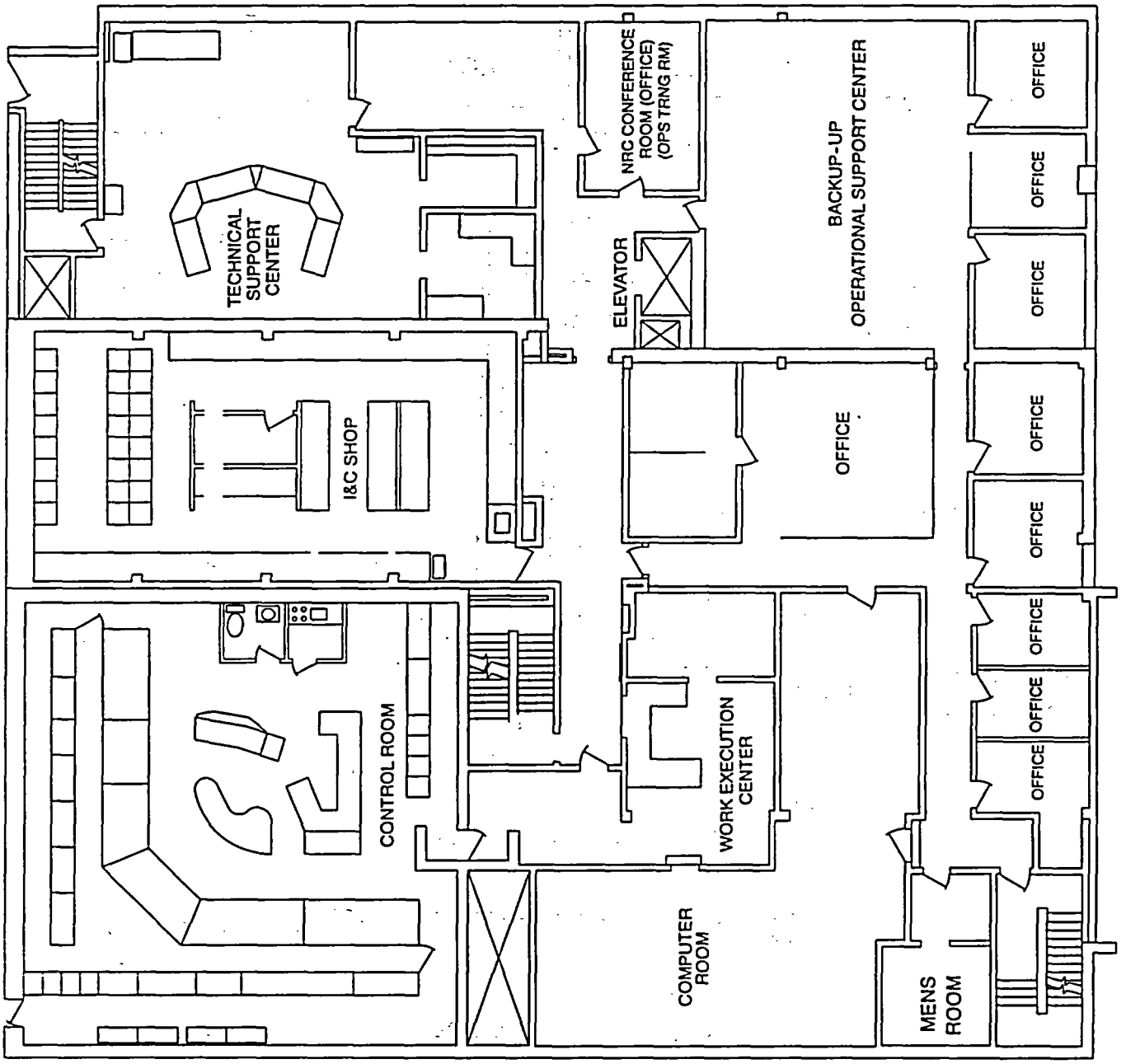

Figure 7.0-2 Plan View of the Emergency Operations Facility

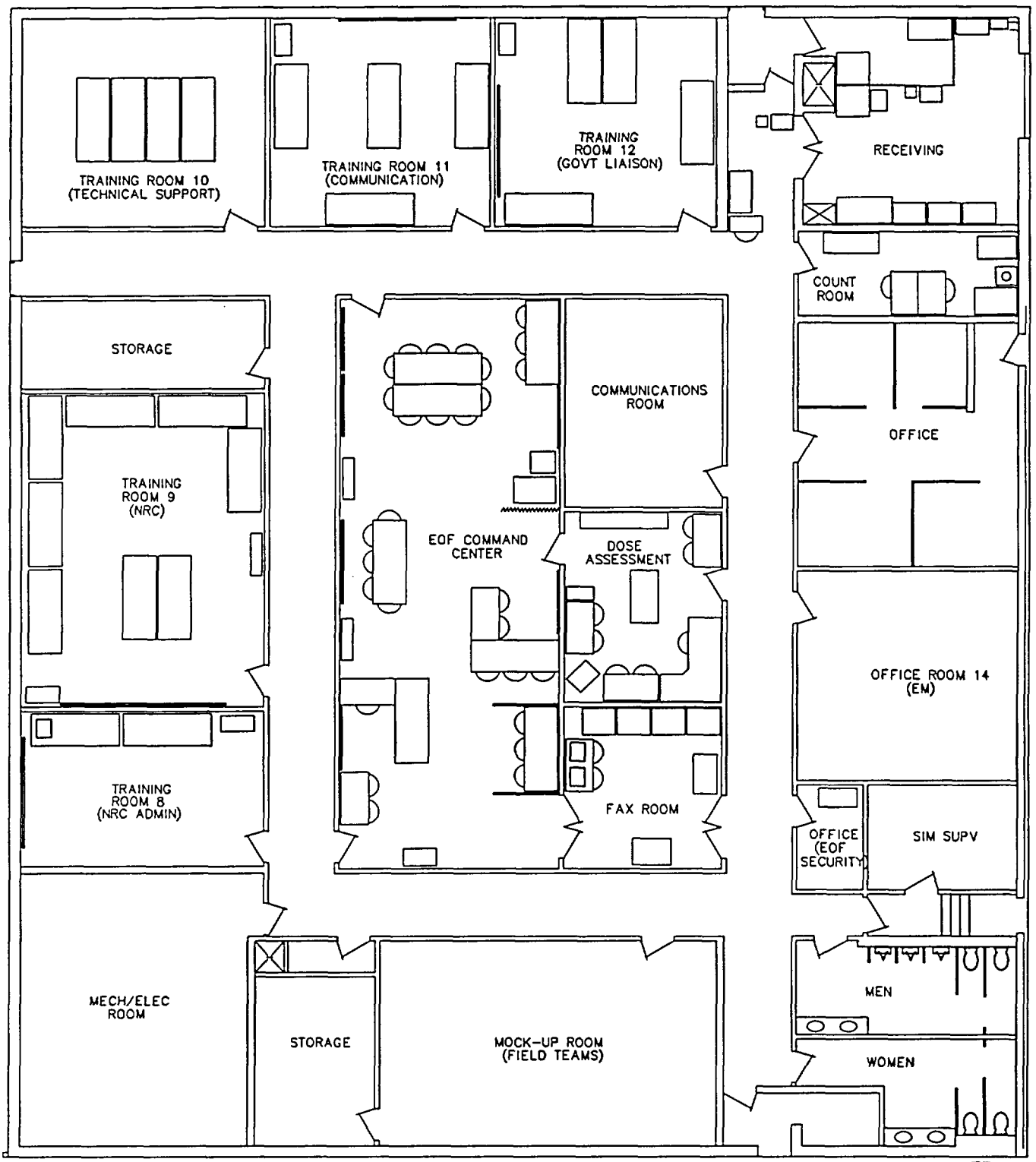

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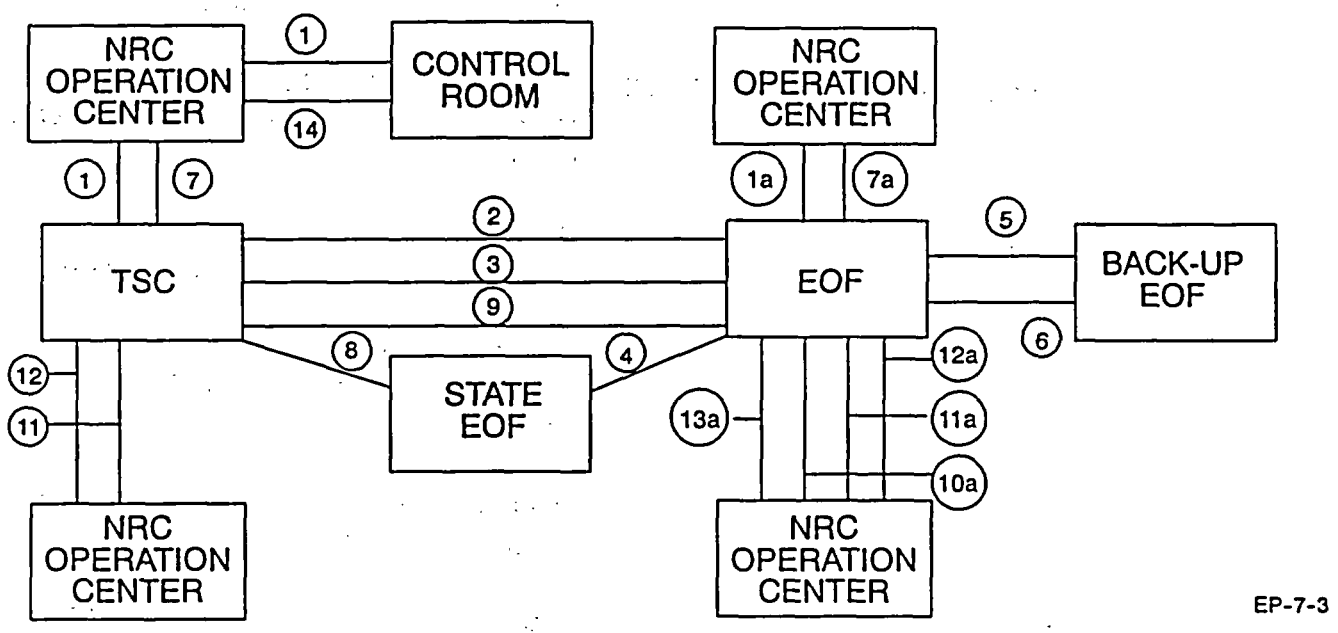
Figure 7.0-3 Direct Dedicated Telephones (Hot Lines)

MONTICELLO TELEPHONE NETWORK
(Primary Communications Link)



Number	Name	Stations
1	Emergency Notification System (ENS)	4 station FTS line between the Control Room, TSC, NRC Office, and NRC Operations Center.
1a	ENS (EOF)	3 station FTS line between the EOF, EOF NRC work area, and NRC Operations Center.
2	EOF - TSC 1 (EM-ED)	2 station line between the EOF (EM) and TSC (ED).
3	EOF TSC 2 (RPSS-REC)	2 station line between the EOF (RPSS) and TSC (REC).
4	EOF - MN. State EOC (1)	3 station auto ring hotline between the EOF and the Minnesota State EOC. Either station can activate the circuit.
5	EOF - Back-Up EOF 1	2 station line between the EOF and the Back-Up EOF.

Figure 7.0-3 Direct Dedicated Telephones (Cont'd)

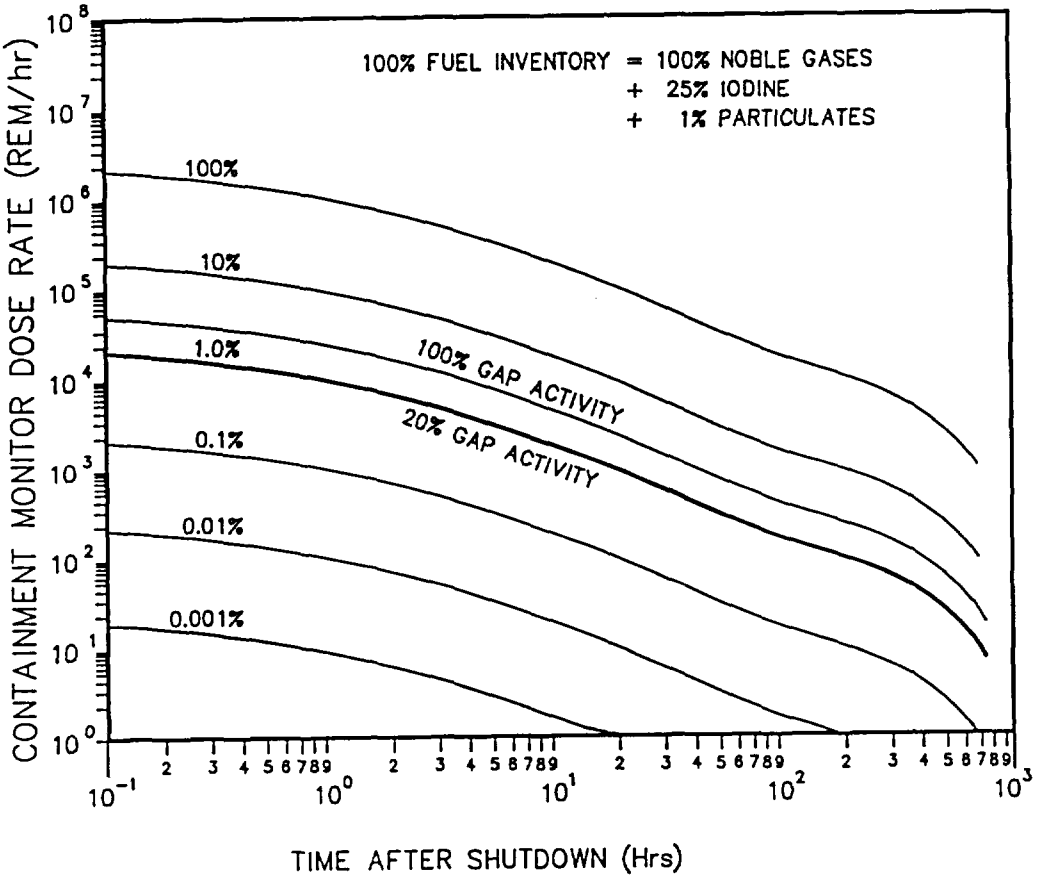
Number	Name	Stations
6	EOF - Back-Up EOF 2 (Tech Support)	2 station line between technical support groups at the EOF and the Back-Up EOF.
7	Health Physics Network (HPN)	3 station FTS line between TSC, TSC Health Physics Room, and NRC Operation Center.
7a	HPN	3 station FTS line between the EOF, EOF NRC work area and NRC Operation Center.
8	TSC - MN State EOC (1)	2 station auto ring hotline between the TSC and the Minnesota State EOC. Either station can activate the circuit.
9	EOF - TSC 3 (Tech Support)	2 station line between the Technical Support groups at the EOF and the TSC.
10a	Management Counterpart Link (DSO/STL)	2 Station FTS line between EOF and NRC Operations Center
11	Protective Measures Counterpart	2 station FTS line between NRC protective measures personnel at the site and NRC Operations Center.
11a	Protective Measures Counterpart Link (PMCL)	2 station FTS line at the EOF between NRC protective measures personnel at the EOF and NRC Operations Center.
12	Reactor Safety Counterpart Link (RSCL)	2 station FTS line between NRC reactor safety personnel at the site and NRC Operations Center.
12a	Reactor Safety Counterpart Link (RSCL)	2 station FTS line at the EOF between NRC reactor safety personnel at the EOF and NRC Operations Center.

Figure 7.0-3 Direct Dedicated Telephones (Cont'd)

Number	Name	Stations
13a	Local Area Network (LAN)	2 Station FTS line between EOF and NRC Operations Center
14	Emergency Response Data System (ERDS)	FTS communication link over which raw reactor parametric data is transmitted from the site.

(1) Auto-Ring Hotlines (Dedicated Private Lines). The interconnection of two or more telephones, which automatically ring the circuit when the telephone is removed from its cradle. This service can be provided intra-facility, intra-city, or inter-city. This is a full-period circuit which is available 24 hours a day with no limit to its use.

Figure 7.0-4 Containment Monitor Response Curves



% FUEL INVENTORY RELEASED	APPROXIMATE SOURCE AND DAMAGE ESTIMATE
100.	100% TID-14844, 100% FUEL DAMAGE, POTENTIAL CORE MELT.
50.	50% TID NOBLE GASES, TMI SOURCE
10.	10% TID, TOTAL CLAD FAILURE, PARTIAL CORE UNCOVERED.
3.	3% TID, MAJOR CLAD FAILURE.
1.	1% TID, MAX 10% CLAD FAILURE.
.1	.1% TID, 1% CLAD FAILURE, LOCAL HEATING OF 5-10 FUEL ASSEMBLIES.
.01	.01% TID, CLAD FAILURE OF 3/4 FUEL ELEMENT (36 RODS).
10^{-3}	CLAD FAILURE OF A FEW RODS.
10^{-4}	100% COOLANT RELEASE WITH SPIKING.
5×10^{-6}	100% COOLANT INVENTORY RELEASE.
10^{-6}	UPPER RANGE OF NORMAL AIRBORNE NOBLE GAS ACTIVITY IN CONTAINMENT.

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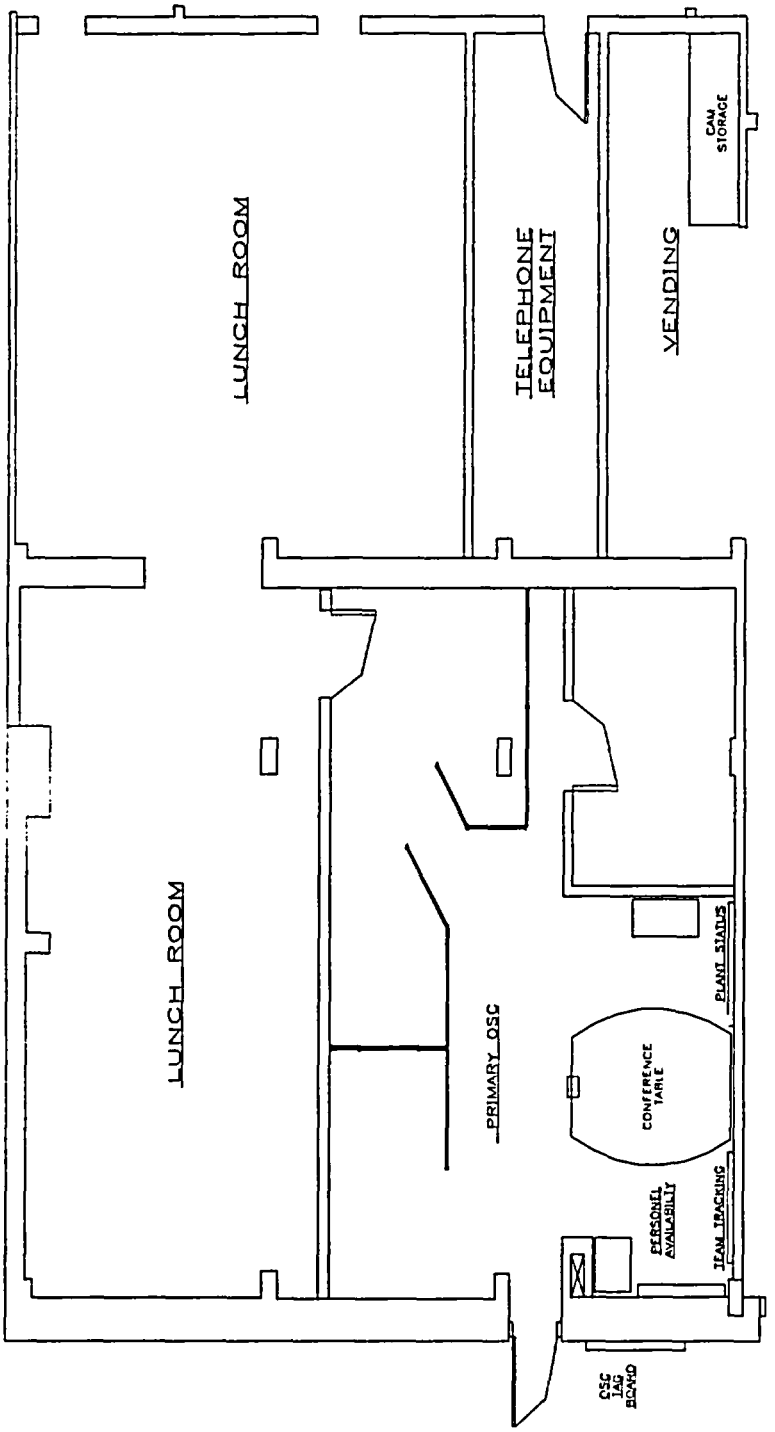
Figure 7.0-5 Plan View of Operational Support Center



8.0 MAINTAINING EMERGENCY PREPAREDNESS

8.1 Organizational Preparedness

8.1.1 Emergency Response Organization Training

To achieve and maintain an acceptable level of emergency preparedness, training ***SHALL*** be conducted annually for members of the on-site Emergency Response Organization.

Training for all on-site Emergency Response Organization members consists of a review of the Emergency Plan in the form of a general overview.

In addition to Emergency Plan overview training, personnel assigned key on-site emergency response positions ***SHALL*** receive training specific to their position on an annual basis. This training may be completed by participation in periodic drills and/or exercises.

Monticello and Prairie Island Off-site Nuclear Support will make provisions for the training of those off-site organizations who may be called upon to provide assistance in the event of an emergency.

8.1.2 Drills, Exercises and Tests

The Monticello and Prairie Island Off-site Nuclear Emergency Plan (Section 10) contains the specific requirements for the conduct of required drills and exercises.

The conduct of periodic drills and exercises are the responsibility of the Monticello Business Support Group in accordance with the Site Drill & Exercise Manual, which includes:

8.1.2.1 An exercise which tests the integrated capability and basic elements of the Emergency Plan ***SHALL*** be conducted every 2 years. This exercise may be included in the full participation biennial exercise which tests the off-site state and local emergency plans.

8.1.2.2 In order to ensure that adequate emergency response capabilities are maintained during the interval between biennial exercises, drills ***SHALL*** be conducted including at least one drill involving a combination of some of the principal functional areas of the on-site emergency response capabilities. The principal functional areas of emergency response include activities such as management and coordination of emergency response, accident assessment, protective action decision making, and plant system repair and corrective actions. During these drills, activation of all of the Emergency Plan's response facilities (TSC, OSC, and

EOF) is not necessary, opportunities to consider accident management strategies may be provided, supervised instruction is permitted, operating staff may have the opportunity to resolve problems (success paths) rather than have controllers intervene, and the drills may focus on on-site training objectives.

8.1.2.3 A medical emergency drill, involving response to and transport of a simulated contaminated, injured individual, which provides for off-site support agency participation, ***SHALL*** be conducted annually.

8.1.2.4 Health Physics Drills which involve response to and analysis of simulated elevated airborne and/or liquid samples and direct radiation measurements in the environment ***SHALL*** be conducted semi-annually. These drills may be performed as stand alone Health Physics Drills or included as part of other drills and/or exercises.

A. The analysis of in-plant liquid samples (with actual elevated radiation levels) including the use of the Post Accident Sampling System (PASS) will be included in biennial chemistry training/walkthroughs and may be performed in conjunction with full scale exercises/drills or Health Physics drills.

B. Radiological monitoring drills which include the collection and analysis of environmental samples for the purpose of ground deposition assessment ***SHALL*** be conducted annually and may be performed as stand alone Health Physics Drills or included as part of other drills and/or exercises.

8.1.2.5 Fire Drills ***SHALL*** be conducted in accordance with applicable Plant Administrative Control Directives.

8.1.2.6 In addition to drills and exercises, periodic tests are conducted to ensure an adequate state of emergency preparedness is maintained. These tests include:

A. Communications tests with State and Local government agencies, local law enforcement, and off-site facilities within the plume EPZ are conducted monthly in accordance with plant Surveillance 1225.

B. Communications tests with the NRC via the Emergency Notification System (ENS) and Health Physics Network (HPN) are conducted monthly in accordance with Surveillance 1225.

C. Emergency Response Organization Augmentation tests are conducted quarterly in accordance with plant Surveillance 1317.

D. The Public Alert Notification System (PANS) is tested weekly in accordance with plant Surveillance Test 1359 and monthly in accordance with plant Surveilance Test 1409.

E. The Annual Performance Review for the PANS is conducted in accordance with plant Surveillance 1408.

F. The Emergency Alert System receivers are tested on a semi-annual basis in accordance with plant Surveillance 1410.

G. The ERDS communication link is tested on a quarterly basis in accordance with plant Surveillance 1416.

8.2 Planning

8.2.1 Responsibility

The overall responsibility for radiological emergency response planning rests with NMC management.

At the site level the Site Vice President, Monticello Site has overall authority and responsibility for the Monticello Emergency Plan and Emergency Plan Implementing Procedures. The Site Emergency Planners are responsible for the development and updating of the Emergency Plan and coordination of the plan with off-site emergency response plans.

8.2.2 Review and Updating of the Emergency Plan

The Monticello Emergency Plan ***SHALL*** be reviewed and certified to be current on an annual basis in accordance with the Monticello and Prairie Island Off-site Nuclear Emergency Plan. Other reviews of the Emergency Plan and Implementing Procedures will be performed as required by Technical Specifications. Revisions to the Emergency Plan are conducted in accordance with Surveillance Procedure 1406 and may be based on the following:

A. Lessons learned during drills and exercises and industry lessons learned.

B. Changes in the normal plant or Emergency Response Organization structures.

C. Modifications to plant systems, components or instrumentation.

D. Changes in the functions or responsibilities of supporting agencies and organizations.

E. Lessons learned from real emergency plan activations.

F. Changes in State or Federal regulations.

Changes to the Emergency Plan ***SHALL*** be reviewed and approved in accordance with plant Technical Specifications and applicable Administrative Control Directives. Distribution of controlled copies of the Emergency Plan ***SHALL*** be performed in accordance with applicable MNGP document control procedures.

In addition to the annual review, all Emergency Plan Implementing Procedures containing telephone numbers are reviewed at least quarterly to verify the correct numbers in accordance with Surveillance Procedure 1240.

8.3 Maintenance and Inventory of Emergency Equipment and Supplies

8.3.1 Equipment and Supplies Inventory

Emergency Equipment and supplies ***SHALL*** be inventoried at least quarterly in accordance with plant Surveillance Procedure 1102.

8.3.2 Instrument and Facilities Functional Check

Key emergency response equipment and instrumentation located in the Technical Support Center and Emergency Operation Facility is tested monthly in accordance with plant Surveillance Test 1230.

9.0 RECOVERY

9.1 General Approach

In general, the site organization will be responsible for the short term recovery, that is recovery from an emergency condition in which no core damage or serious release of radioactivity to the environment has occurred.

If it is clear that a high potential exists for core damage and/or a serious release of radioactivity to the environment has occurred, a Recovery Phase will be activated to provide for the long-term recovery actions and for establishing support arrangements.

Before reoccupying buildings after an emergency, certain recovery criteria must be satisfied:

1. There must be assurance that the problem encountered is solved and that the same incident cannot immediately recur;
2. The normally occupied areas must be free of significant contamination;
3. Radiation areas and High Radiation areas must be properly defined;
4. Airborne radioactivity must be eliminated or controlled.

9.2 Investigation of Incidents

All incidents ***SHALL*** be investigated by qualified plant staff personnel and reported to the Operations Committee, Off-Site Review Committee and the NRC in accordance with guidelines for reportable events which are set forth in the Administrative Control Directives and the Technical Specifications.

9.3 Recovery Procedures

All recovery operations ***SHALL*** be performed in accordance with written procedures. These procedures ***SHALL*** include the following activities:

A. Investigation of the course of the incident.

B. Investigation of plant conditions following an accident.

C. Repair and restoration of facilities.

D. Testing and startup of restored facilities.

Methods for determining the extent of radioactive contamination and general protective measures to be taken for personnel performing recovery operations are established in site Radiation Protection Procedures.

Written procedures for recovery of the facility from the specific post accident conditions will be prepared by qualified plant staff members and submitted to the Operations Committee. Operations Committee approval of all such procedures is required prior to their initiation.

9.4 Criteria for Resumption of Operation

If the plant is shutdown as the result of an emergency, it will be restarted only when:

A. The conditions which caused the emergency are corrected.

B. The cause of the emergency is understood.

C. Restoration, repair and testing is completed as required.

D. No unreviewed safety questions exist.

E. All conditions of the license and technical specifications are satisfied.

9.5 Long Term Recovery

If extensive plant damage exists and contamination of plant or site environs has occurred, then a Recovery Phase will be required.

Activation of the Recovery Phase will take place in an incremental manner as the functions change from operational to engineering/construction. The decision to activate the Recovery Phase will be made by Site Management. The Recovery Manager will be selected from several qualified designees who are members of the site organization. The Emergency Manager and the Emergency Director will share responsibility at least during the early part of the Recovery Phase.

If a transition to the Recovery Phase becomes necessary, the site engineering/construction oriented staff would provide the nucleus of the organization responsible to carry out the Recovery Phase.

The plant staff would be augmented as required by specialists from the site organization and the NMC/Xcel Energy corporate office. These speciality areas include Engineering Services, Licensing Administration, Maintenance, Quality Assurance, Communications and Security personnel. In addition, appropriate assistance would be secured from the Architect-Engineer and the Technical Support Services vendor organizations. This support could be broadened as required by consultant help from the several organizations familiar with the MNGP and organization. The overall organizations envisioned for a substantial Recovery Phase would be a blend of site staff and appropriate vendor and consultant personnel. On a prior basis it is counter productive to define in detail

the extensive organization that might be involved in a sizable Recovery Phase because of the unlimited variation of conditions that could result from plant emergencies. However, the nucleus organization has been identified together with guidelines on how the organization might be expanded to meet the requirements demanded at the time.

When the Emergency Manager and Emergency Director agree that the emergency condition has been terminated, a complete transfer of the responsibilities for off-site support may be made to the Recovery Organization. The EOF will then become the Recovery Center and will function as Command Center for the Recovery Organization activation and implementation in accordance with applicable Emergency Plan Implementing Procedures.

10.0 APPENDIX A

Procedure No.	Procedure Title	Plan Section Reference
000 Series	Organization	
A.2-001	Emergency Organization	5.1, 5.2, 5.3
100 Series	Activation	
A.2-101	Classification of Emergencies	4.0, 6.2.2
A.2-102	Notification of an Unusual Event	4.1, 4.2, 6.1.1
A.2-103	Alert	4.3, 4.4, 6.1.2
A.2-104	Site Area Emergency	4.5, 4.6, 6.1.3
A.2-105	General Emergency	4.7, 4.8, 6.1.4
A.2-106	Activation of Technical Support Center	5.2.1, 7.1.1
A.2-107	Activation of Operational Support Center	5.2.2, 7.1.2
A.2-108	Access Control During Emergencies	7.1.6
A.2-109	Activation and Operation of the Backup OSC	7.1.2
A.2-110	Response to a Security Threat	5.3.2
200 Series	Assessment	
A.2-201	On-Site Protective Actions	6.3.2, 6.5
A.2-202	Off-Site Monitoring During an Emergency	6.3
A.2-203	Radioactive Liquid Releases	6.3
A.2-204	Off-Site Protective Action Recommendations	6.5.1.2
A.2-205	Personnel Accountability	6.5.1, 7.1. 5
A.2-206	Work Control During Emergencies	5.3.1.6, 6.4.2

APPENDIX A (Cont'd)

Procedure No.	Procedure Title	Plan Section Reference
A.2-208	Core Damage Assessment	7.3.1.5
A.2-209	Responsibilities of Radiological Emergency Coordinator	5.2.1.2
A.2-210	Engineering Support in the TSC	5.2.1.5
A.2-213	Responsibilities of the Emergency Director	5.2.1.1
300 Series	Protective Actions	
A.2-301	Emergency Evacuation	6.5.1, 6.5.2
A.2-302	Assembly Point Activation	6.5.1, 7.1.5
A.2-303	Search and Rescue	5.3.1.8
A.2-304	Thyroid Prophylaxis	6.5.4.2
400 Series	Radiological Surveillance and Control	
A.2-401	Emergency Exposure Control	6.5.5
A.2-402	On-Site Radiological Monitoring	6.5.6, 6.3
A.2-404	Emergency Sampling and Analysis	6.3
A.2-405	Release Rate Determination	6.3.1
A.2-406	Off-Site Dose Projection	6.3.2
A.2-407	Personnel and Vehicle Monitoring	6.5.1
A.2-408	Sample Coordination During an Emergency	6.3
A.2-409	Self-Contained Breathing Apparatus (SCBA) Use During an Emergency	6.5.4.1
A.2-410	Out-of-Plant Surveys	6.3.3

APPENDIX A (Cont'd)

Procedure No.	Procedure Title	Plan Section Reference
A.2-411	Establishment of Secondary Access Control	7.1. 6
A.2-412	Reactor Coolant Sample Obtained from Reactor Sample Station	7.3.1.7
A.2-413	Small Volume Liquid Sample Obtained at the Post Accident Sampling System	7.3.1.7
A.2-414	Large Volume Liquid Sample Obtained at Post Accident Sampling System	7.3.1.7
A.2-415	Containment Gas Sample Obtained at Post Accident Sampling System	7.3.1.7
A.2-417	Draining the Trap, Sump and Collector of Post Accident Sampling System	7.3.1.7
A.2-418	Post Accident Sampling Station Demin Water Tank Fill Procedure	7.3.1.7
A.2-419	Containment Atmosphere Sample Obtained from Reactor Sample Station	7.3.1.7
A.2-420	Containment Atmosphere Radiochemical Analysis	7.3.1.7
A.2-422	Stack Iodine/Particulate Sampling and Analysis	6.3.1
A.2-423	Reactor Building Vents Iodine/Particulate Sampling and Analysis	6.3.1
A.2-424	EOF Count Room Counting Procedure	7.3.2.3
500 Series	Communications and Documentation	
A.2-501	Communications During an Emergency	7.2
A.2-502	Recordkeeping During an Emergency	--
A.2-504	Emergency Communicator Duties in the TSC	5.2.1.8

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APPENDIX A (Cont'd)

Procedure No.	Procedure Title	Plan Section Reference
600 Series	Re-Entry and Recovery	
A.2-601	Re-entry	9.1
A.2-602	Event Termination or Recovery	9.5
700 Series	Emergency Preparedness	
A.2-701	PANS System False Alarm Activation or Failure	--
A.2-702	Response to an Emergency at Prairie Island	--
A.2-703	Response to Off-Site Situation Involving Radioactive Material	--
800 Series	EOF Procedures	
A.2-801	Responsibilities of the Emergency Manager	5.2.3.1, 7.1.3
A.2-802	Activation and Operation of the EOF	5.2.3.4, 7.1.3
A.2-803	Emergency Communications at the EOF	5.2.3, 7.1.3
A.2-804	EOF Support and Logistics	5.2.3.4, 7.1.3
A.2-805	Technical Support in the EOF	5.2.3.2, 7.1.3
A.2-806	Radiation Protection Support in the EOF	5.2.3.3, 7.1.3
A.2-807	Off-site Dose Assessment and PARs	5.2.3.3, 7.1.3
A.2-808	Radiological Monitoring and Control at the EOF	5.2.3.3, 7.1.3
A.2-809	EOF Security	5.2.3.4, 7.1.3
A.2-810	Transfer to the Backup EOF	7.4.3
A.2-811	Event Termination or Recovery in the EOF	9.0
A.2-812	Off-site Agency Liaison	5.2.3.4, 7.1.3

APPENDIX B

NUREG-0654 CROSS REFERENCE

NUREG-0654 Section	Emergency Plan Section
A. Assignment of Responsibility	
1.a.	5.4 & 5.5
1.b.	5.4 & 5.5
1.c.	Figure 5.0-2
1.d.	5.2
1.e.	5.1 & 5.2
2.a.	State/Local Plans
2.b.	State/Local Plans
3.	Off-site Plan
4.	5.2, 5.2.1.3
B. On-Site Emergency Organization	
1.	5.1.2
2.	5.2.1.1, 5.3.1.2
3.	5.3.1.2
4.	Table 5.2, 5.2.1.1, 5.3.1.2
5.	5.2, 5.3.1 & 5.3.2, Table 5.0-1
6.	Figure 5.0-2
7.	5.2.3, Off-site Plan
7.a.	5.2.3, Off-site Plan
7.b.	5.2.3, Off-site Plan
7.c.	5.2.3, Off-site Plan
7.d.	5.2.3, Off-site Plan
8.	Off-site Plan & 5.4
9.	5.4.2 & Off-site Plan
C. Emergency Response Support and Resources	
1.a.	5.5.2
1.b.	Off-site Plan
1.c.	Off-site Plan
2.a.	State/Local Plans
2.b.	Off-site Plan
3.	7.3.2.3 Off-site Plan
4.	Off-site Plan
D. Emergency Classification System	
1.	Section 4.0
2.	Section 4.0
3.	State/Local Plans
4.	State/Local Plans

APPENDIX B (Cont'd)

NUREG-0654 Section	Emergency Plan Section
E. Notification Methods and Procedures	
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2.	6.2.1.1
3.	6.2.1.2
4.a.	6.2.1.2.A
4.b.	6.2.1.2.B
4.c.	6.2.1.2.C
4.d.	6.2.1.2.D
4.e.	6.2.1.2.E
4.f.	6.2.1.2.F
4.g.	6.2.1.2.G
4.h.	6.2.1.2.H
4.i.	6.2.1.2.I
4.j.	6.2.1.2.J
4.k.	6.2.1.2.K
4.l.	6.2.1.2.L
4.m.	6.2.1.2.M
4.n.	6.2.1.2.N
5.	State/Local Plans
6.	6.2.1.4
7.	6.5.1.2, State/Local Plans
F. Emergency Communications	
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1.b.	7.2
1.c.	7.2
1.d.	7.2, 7.2.3.3
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1.f.	7.2, 7.2.3.3
2.	7.2.2
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G. Public Education and Information	
1.	Off-site Plan
2.	Off-site Plan
3.a.	Off-site Plan
3.b.	7.1.3 Off-site Plan
4.a.	Off-site Plan
4.b.	Off-site Plan
4.c.	Off-site Plan
5.	Off-site Plan

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NUREG-0654 Section	Emergency Plan Section
H. Emergency Facilities and Equipment	
1.	7.1.1, 7.1.2
2.	7.1.3
3.	State/Local Plans
4.	6.2.1.1
5.	Table 7.0-3 through Table 7.0-7
5.a.	7.3.1.2, Table 7.0-3 and Table 7.0-4
5.b.	7.3.1.3, Table 7.0-5 and Table 7.0-6
5.c.	7.3.1.4, Table 7.0-7
5.d.	7.3.1.6
6.a.	7.3.2.1
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6.c.	7.3.2.3
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8.	7.3.1.2B
9.	7.1.2
10.	8.3.1
11.	Table 7.0-8
12.	7.3.2.3
I. Accident Assessment	
1.	4.0, Table 7.0-3 through Table 7.0-7
2.	6.3, 7.3
3.a.	6.3.1
3.b.	6.3.1
4.	6.3.2
5.	7.3.1.2.B, Table7.0-4
6.	6.3.1, 6.3.2
7.	6.3.3
8.	6.3.2, 6.3.3
9.	6.3.3
10.	6.3.2
11.	State Plan

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NUREG-0654 Section	Emergency Plan Section
J. Protective Response	
1.a.	6.5.1
1.b.	6.5.1
1.c.	6.5.1
1.d.	6.5.1.1
2.	6.5.2
3.	6.5.1.1
4.	6.5.1.1
5.	6.5.1.1
6.a.	6.5.4
6.b.	6.5.4
6.c.	6.5.4.2
7.	6.5.1.2
8.	6.5.3
9.	State/Local Plans
10.a.	Off-site Plan
10.b.	Off-site Plan
10.c.	7.7 and 7.8
10.d.	State/Local Plans
10.e.	State/Local Plans
10.f.	State/Local Plans
10.g.	State/Local Plans
10.h.	State/Local Plans
10.i.	State/Local Plans
10.j.	State/Local Plans
10.k.	State/Local Plans
10.l.	State/Local Plans
10.m.	6.5.1.2, Tables 6.0-1 thru 6.0-4, State/Local
11.	State/Local
12.	State/Local

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NUREG-0654 Section	Emergency Plan Section
K. Radiological Exposure Control	
1.a.	6.6 & Table 6.0-4
1.b.	6.6 & Table 6.0-4
1.c.	6.6 & Table 6.0-4
1.d.	6.6 & Table 6.0-4
1.e.	6.6 & Table 6.0-4
1.f.	6.6 & Table 6.0-4
1.g.	6.6 & Table 6.0-4
2.	6.5.5
3.a.	6.5.5.2
3.b.	6.5.5
4.	State/Local Plans
5.a.	6.6.1
5.b.	6.6.1
6.a.	6.5.6.1
6.b.	6.5.6.
6.c.	6.5.6.1
7.	6.6.1.1
L. Medical and Public Health Support	
1.	6.6.2, 6.6.3
2.	6.6.1.2
3.	State Plan
4.	5.4.2, 6.6.2
M. Recovery and Re-entry Planning and Post Accident Operations	
1.	9.0
2.	9.0 Off-site Plan
3.	9.0 Off-site Plan
4.	6.3.2
N. Exercises and Drills	
1.a.	8.1.2.1
1.b.	8.1.2
2.a.	8.1.2.6
2.b.	8.1.2.5
2.c.	8.1.2.3
2.d.	8.1.2.2
2.e.	8.1.2.4
3.a.	8.1.2
3.b.	8.1.2
3.c.	8.1.2
3.d.	8.1.2
3.e.	8.1.2
3.f.	8.1.2
4.	8.1.2
5.	8.1.2

APPENDIX B (Cont'd)

NUREG-0654 Section	Emergency Plan Section
O. Radiological Emergency Response Training	
1.	8.1.1 & Off-site Plan
1.a.	8.1.1 & Off-site Plan
1.b.	8.1.1 & State/Local Plans
2.	8.1.2
3.	6.6.1.2 & Off-site Plan
4.a.	8.1.1 & Off-site Plan
4.b.	8.1.1 & Off-site Plan
4.c.	8.1.1 & Off-site Plan
4.d.	8.1.1 & Off-site Plan
4.e.	8.1.1 & Off-site Plan
4.f.	8.1.1 & Off-site Plan
4.g.	8.1.1 & Off-site Plan
4.h.	8.1.1 & Off-site Plan
4.i.	8.1.1 & Off-site Plan
4.j.	8.1.1 & Off-site Plan
5.	8.1.1 & Off-site Plan
P. Responsibility for the Planning Effort: Development, Periodic Review and Distribution of Emergency Plans	
1.	Off-site Plan
2.	8.2.1
3.	8.2.1
4.	8.2.2
5.	8.2.2
6.	8.2.2
7.	Appendix A
8.	Appendix B, Table of Contents
9.	Off-site Plan
10.	8.2.2

ENCLOSURE 1

MONTICELLO EMERGENCY PLAN, REVISION 25
SUMMARY OF CHANGES / BASIS

The changes included in Revision 25 of the Monticello Nuclear Generating Plant (MNGP) Emergency Plan were developed in response to a review of Emergency Action Level (EAL) changes, which were performed since the latest NRC approved version of the MNGP Emergency Plan. For MNGP the last NRC approved version of the Emergency Plan is Revision 2, dated July 1982. NRC approval of this revision is dated January 20, 1983.

Affected Section: Section EP-4 (A.2-101 Guideline # in parenthesis)	**Summary of Changes / Basis**
4.2.1 1a. (A.2-101 GL-1)	Deleted *"and Shift Manager's judgment is the increase is due to release of radioactive byproduct material from the plant".* <u>BASIS (Justification of Deposition)</u> This condition was added to the EAL since Revision 2 of the Emergency Plan and was not approved by NRR for a decrease in effectiveness of the EAL. Additional indication adding an "AND" logic is a non-conservative change limiting entries into the EAL. Therefore, the indication is removed restoring the EAL to be consistent with Revision 2 of the Emergency Plan.
4.2.6 (A.2-101 GL-16)	<u>Changed EAL From:</u> *1a. Widespread toxic or flammable gaseous hazard being experienced or projected on-site (outside of plant) leading to the evacuation or sheltering of personnel outside the plant* *OR* *1b. Receipt of recommendation by Local, County, or State Officials to evacuate personnel from the site based on an off-site hazardous or flammable gaseous release event.* <u>To:</u> *Gaseous hazards being experienced or projected onsite (out-of-plant) as indicated by visual observation, physical measurement or notification.*

Affected Section: Section EP-4 (A.2-101 Guideline # in parenthesis)	Summary of Changes / Basis
4.2.6 (continued)	BASIS (Justification of Deposition) Limiting conditions added to this EAL since 1982 SER approved version were not approved by NRR for a decrease in effectiveness of the EAL. The changes made since 1982 incorrectly limited entries into the EAL by eliminating the potential to classify gaseous hazards meeting the following conditions: 1. Those that do not involve a widespread impact leading to the evacuation and sheltering of people outside the plant. 2. Those notifications of an offsite event that do not result in the evacuation of site personnel. This change restores the EAL to Revision 2 of the Emergency Plan.
4.2.7 1a. (A.2-101 GL-17)	Deleted *"and Shift Manager determines that the threat would have an adverse impact on the safe operation or shutdown capability of the plant."* BASIS (Justification of Deposition) This condition was added to the EAL since Revision 2 of the Emergency Plan and was not approved by NRR for a decrease in effectiveness of the EAL. Additional indication adding an "AND" logic is a non-conservative change limiting entries into the EAL. Therefore, the indication is removed restoring the EAL to be consistent with Revision 2 of the Emergency Plan.
4.4.2 1a. (A.2-101 GL-2)	Changed: 1. The EAL set point for declaration of ALERT based on Area Radiation Monitor F-2 (OG Strg Foyer High Range) from 1000 to 100. 2. Units for declaration of ALERT based on Containment Rad Monitor reading from mrem/hr to Rem/hr. BASIS (Justification of Deposition) 1. Revision to this EAL set point for F-2 (OG Strg Foyer High Range) since 1982 SER approved version was not approved by NRR for a decrease in effectiveness of the EAL. Increase in the set point excluded classifying an ALERT based on a lone F-2 reading between 100 mrem/hr and 1000 mrem/hr that met the ALERT conditions in the 1982 approved SER set point. While it is likely that an ALERT would still be declared for the above conditions using the F-1 (Off-Gas Storage Foyer) area radiation monitor having a 100 mrem/hr set point, this cannot be guaranteed for situations in which F-1 is inoperable. This change restores the EAL to Revision 2 of the Emergency Plan.

Affected Section: Section EP-4 (A.2-101 Guideline # in parenthesis)	Summary of Changes / Basis
4.4.2 1a. (continued)	2. This is an administrative change only with no reduction in effectiveness. The correction is consistent with Revision 2 of the Emergency Plan. The related reading in the Emergency Plan Implementing Procedure (A.2-101) reflects use of the correct units.
4.4.5	Corrected units from MCI/GM to μCI/GM. BASIS (Justification of Deposition) This is an administrative change only with no reduction in effectiveness. The correction is consistent with Revision 2 of the Emergency Plan. The related reading in the Emergency Plan Implementing Procedure (A.2-101) reflects use of the correct units.
4.4.8 (A.2-101 GL-14)	Deleted *"AND PLANT IN STABLE CONDITION"* from Alert description. Deleted *" AND 2. Shift Manager or Emergency Director's judgment that annunciators are nonfunctional" from the EALs."* BASIS (Justification of Deposition) The conditions were added to the event description and EAL since Revision 2 of the Emergency Plan and were not approved by NRR for a decrease in effectiveness of the EALs. Additional indication adding an "AND" logic is a non-conservative change limiting entries into the EAL. Therefore, the indications are removed restoring the EAL to be consistent with Revision 2 of the Emergency Plan.
4.4.10 (A.2-101 GL-16)	Changed 1a. From: *"Toxic gaseous concentrations being measured or projected within a large area of the plant at the breathing zone greater than:"* To: *"Gaseous hazards being experienced or projected within the plant as indicated by measured concentrations equal to or greater than:"* Changed *" (b) 10 ppm Chlorine"* To *" (b) 3 ppm Chlorine".*

Affected Section: Section EP-4 (A.2-101 Guideline # in parenthesis)	Summary of Changes / Basis
4.4.10 (continued)	Changed 1b. From: *"Flammable gas concentrations being measured within the plant at a distance of greater than 10 feet from the source exceeding the lower explosive limit."* To: *"Explosive levels (as indicated by explosive meter)."* BASIS (Justification of Deposition) Limiting conditions added to this EAL since 1982 SER approved version were not approved by NRR for a decrease in effectiveness of the EAL. The changes made since 1982 incorrectly limited entries into the EAL by eliminating the potential to classify toxic or flammable gas events not meeting the following conditions: 1. Those that did not include a "large area of the plant at the breathing zone". 2. Those that involved measured chlorine concentrations between 3 ppm and 10 ppm. 3. Those involving explosive concentrations being measure less than or equal to 10 feet from the source. These changes restore the EAL to meet the intent of Revision 2 of the Emergency Plan.
4.4.15 (A.2-101 GL-21)	Changed Alert description from: *"RIVER WATER LEVEL BETWEEN 921 AND 930 FEET, OR RIVER WATER LEVEL BELOW 900.5 FT"* To: *"RIVER WATER LEVEL BETWEEN 921 AND 930 FEET, OR RIVER FLOW BELOW 220 CFS (ABOUT 902.3 FT)"* BASIS (Justification of Deposition) Revision to this event description since 1982 SER approved version included a set point change that was not approved by NRR for a decrease in effectiveness of the EAL. The set point change resulted in excluding classifying an ALERT based on river water levels between 900.5 feet and 902.3 feet that met the ALERT conditions in the 1982 approved SER set point. This change restores the description to Revision 2 of the Emergency Plan.

Affected Section: Section EP-4 (A.2-101 Guideline # in parenthesis)	Summary of Changes / Basis
4.4.18 (A.2-101 GL-24)	Deleted *"1. Visually observed evidence of an unplanned explosion directly affecting plant safe operation. AND"* from EALs. BASIS (Justification of Deposition) This condition was added to the EAL since Revision 2 of the Emergency Plan and was not approved by NRR for a decrease in effectiveness of the EAL. Additional indication adding an "AND" logic is a non-conservative change limiting entries into the EAL. Therefore, the indication is removed restoring the EAL to be consistent with Revision 2 of the Emergency Plan.
4.6.4 (A.2-101 GL-6)	Deleted *" AND 2. Containment Radiation Monitor reading exceeds the Containment Monitor Response to Contained Source Curve"* from EALs. BASIS (Justification of Deposition) This condition was added to the EAL since Revision 2 of the Emergency Plan and was not approved by NRR for a decrease in effectiveness of the EAL. Additional indication adding an "AND" logic is a non-conservative change limiting entries into the EAL. Therefore, the indication is removed restoring the EAL to be consistent with Revision 2 of the Emergency Plan.
4.6.7 (A.2-101 GL-14)	Deleted *" AND 2. Shift Manager or Emergency Director's judgment that annunciators are nonfunctional"* from EALs. BASIS (Justification of Deposition) This condition was added to the EAL since Revision 2 of the Emergency Plan and was not approved by NRR for a decrease in effectiveness of the EAL. Additional indication adding an "AND" logic is a non-conservative change limiting entries into the EAL. Therefore, the indication is removed restoring the EAL to be consistent with Revision 2 of the Emergency Plan.
4.6.9 (A.2-101 GL-16)	Changed 1a. From: *"Toxic gaseous concentrations being measured or projected within a major portion of a vital area of the plant at the breathing zone greater than or equal to the following such that further access to the vital area is being prevented at a time when it is needed"* To: *"Gaseous hazards being experienced or projected within the vital areas of the plant as indicated by measured concentrations equal to or greater than:"*

Affected Section: Section EP-4 (A.2-101 Guideline # in parenthesis)	Summary of Changes / Basis
4.6.9 (continued)	<u>Changed</u> *" (b) 10 ppm Chlorine"* <u>To</u>: *" (b) 3 ppm Chlorine"* <u>Changed 1b. From:</u> *"Flammable gas concentrations being measured or projected within a major portion of a vital area of the plant from an unisolable source exceeding the lower explosive limit such that further access to the vital area is being prevented at a time when it is needed."* <u>To:</u> *"Explosive levels (as indicated by explosive meter)."* <u>BASIS (Justification of Deposition)</u> Limiting conditions added to this EAL since 1982 SER approved version were not approved by NRR for a decrease in effectiveness of the EAL. The changes made since 1982 incorrectly limited entries into the EAL by eliminating the potential to classify toxic or flammable gas events not meeting the following conditions: 1. Those that did not include a "major portion of a vital area at the breathing zone". 2. Those that involved measured chlorine concentrations between 3 ppm and 10 ppm. 3. Those involving explosive concentrations in a vital area that did not involve a major portion of the vital area and were from an isolable source and did not prevent entry to the area when needed. These changes restore the EAL to meet the intent of Revision 2 of the Emergency Plan.
4.6.12 1.	Added the word *"both"* preceding *"250 Vdc power source"*. <u>BASIS (Justification of Deposition)</u> This is clarification that the word *"both"* in front of *"125 Vdc power sources"* also applies to the 250 Vdc power sources. This is an administrative change only with no reduction in effectiveness. The clarification is consistent with the wording in the Emergency Plan Implementing Procedure (A.2-101) for this EAL.

Affected Section: Section EP-4 (A.2-101 Guideline # in parenthesis)	Summary of Changes / Basis
4.6.19 (A.2-101 GL-29)	Added *"or a precautionary notification to the near site public"* to the event description. <u>BASIS (Justification of Deposition)</u> This condition was removed from the EAL since Revision 2 of the Emergency Plan and was not approved by NRR for a decrease in effectiveness of the EAL. Removal of the condition is a non-conservative change limiting entries into the EAL. Therefore, the additional indication is restored. This change restores the EAL to Revision 2 of the Emergency Plan.
4.8.1 1e. (A.2-101 GL-28)	Added the following note preceding the EAL, *"Note: MIDAS User Manual - 06 (Containment Release Rate Calculations) provides instruction for using MIDAS to perform release rate projections based on containment radiation monitor readings."* <u>BASIS (Justification of Deposition)</u> The note provides clarification on the use of the containment radiation monitor reading in performing release rate projections. It is for informational purposes only and does not change the EAL. It addresses an issue identified during the 11/18/03 EP Exercise (ACC-03012240) and is an administrative enhancement with no decrease in effectiveness of the E-Plan.
4.8.2 3. (A.2-101 GL-28)	Added *"Failure of MSIVs to isolate; or"* as an additional indication. <u>BASIS (Justification of Deposition)</u> This condition was removed from the EAL since Revision 2 of the Emergency Plan and was not approved by NRR for a decrease in effectiveness of the EAL. Removal of the condition is a non-conservative change limiting entries into the EAL. Therefore, the additional indication is restored. This change restores the EAL to Revision 2 of the Emergency Plan.

Affected Section: Section EP-5	Summary of Changes / Basis
5.5.1 & 5.5.2	Updated to reflect the current organizational structure and titles of off-site agencies that support the Monticello emergency preparedness effort. BASIS (Justification of Deposition) Changes are made in accordance with section 8.2.2 of this plan.
5.5.7	Removed *"The State Highway Department would be notified by the State Patrol to erect signs".* BASIS (Justification of Deposition) Updated to remove no longer valid statement. Change made in accordance with section 8.2.2 of this plan.

Affected Section: Section EP-7	Summary of Changes / Basis
7.3.1.6	Updated to reflect current description and capability of fire detection equipment installed in the plant. BASIS (Justification of Deposition) Changes are made in accordance with section 8.2.2 of this plan.
Table 7.0-5	Updated list to reflect current placement of Continuous Air Monitors maintained in the plant. BASIS (Justification of Deposition) Changes are made in accordance with section 8.2.2 of this plan.
Table 7.0-7	Verified information and updated per operations personnel review. BASIS (Justification of Deposition) Changes are made in accordance with section 8.2.2 of this plan.