PRAIRIE ISLAND NUCLEAR GENERATING PLANT
NORTHERN STATES POWER COMPANY

EMERGENCY PLAN IMPLEMENTING PROCEDURES

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Supt. Rad Protection
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TITLE:
EMERGENCY PLAN
IMPLEMENTING PROCEDURES
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PRAIRIE ISLAND NUCLEAR GENERATING PLANT
NORTHERN STATES POWER COMPANY

EMERGENCY PLAN IMPLEMENTING PROCEDURES

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Supt. Rad Protection

Approved By:
Plant Manager

OC#: 8-26-82

TITLE:
ONSITE EMERGENCY ORGANIZATION

1.0 PURPOSE

The purpose of this instruction is to:

(1) Specify the onsite emergency organization during normal and off normal hours.

(2) Specify primary designates and alternates for key emergency organization positions, and

(3) Establish individual responsibilities and duties.

The onsite emergency organization is illustrated in Figure 2, and is comprised of personnel from the normal plant organization (Figure 1). The detailed organization discussed in this procedure may be further augmented or decreased as the needs of the emergency condition dictate. Various responsibilities assigned to emergency organization personnel are shown in Figure 3.

2.0 PRECAUTIONS

(1) Prairie Island plant staff shall not make any information releases to members of the news media or the public. All inquiries by the news media shall be directed to the NSP Communications Department at NSP Headquarters or to the Joint Public Information Center (JPIC) located at the Minnesota State Capitol in St. Paul.

(2) In order to provide a sufficient number of alternates to fill the various Prairie Island emergency organization positions, some individuals (by title) are listed in more than one emergency organization position. In the event that an individual is assigned to more than one emergency organization position, the position required to implement immediate actions by the onsite emergency organization shall take precedence over all other positions.

3.0 APPLICABILITY

This procedure is applicable to all plant personnel.

4.0 RESPONSIBILITIES

4.1 DIRECTION AND CONTROL

4.1.1 Emergency Director (ED)

During the initial stages of an emergency condition, the Emergency Director has overall coordinating authority for NSP. The Emergency Director has the authority and responsibility to immediately initiate any emergency actions including providing protective action recommendations to offsite authorities responsible for implementing offsite emergency measures. Following activation of the corporate emergency organization, the Emergency Manager shall assume the offsite coordinating authority and the Emergency Director shall retain the responsibility for onsite operations.

During an emergency, the Duty Shift Supervisor of the unaffected unit assumes the responsibility of the Emergency Director.

The Shift Supervisor of the unaffected unit shall be relieved of the Emergency Director responsibilities when the designated Emergency Director arrives onsite. The Plant Manager shall be the designated Emergency Director and will be available with a pager on a twenty-four (24) hour basis. When he is unavailable, (e.g., out of town), the designated Emergency Director responsibility and pager will be passed down to the next individual in the line of succession.

Any of the individuals above the Shift Supervisor in the line of succession may take over the responsibilty of the Emergency Director until the designated Emergency Director arrives onsite.

A. The line of succession for the Emergency Director position is as follows:

(1) Plant Manager
(2) Plant Supt. Engr. and Rad Prot.
(3) Plant Supt. Operations & Maintenance
(4) Supt. Radiation Protection
(5) Duty Shift Supervisor of Unaffected Unit

NOTE: (a) The duty Shift Supervisor of the affected unit, until relieved, shall remain in the Control Room at all times during accident situations to direct the activities of the Control Room operators.

(b) Exceptions to the line of succession for the Emergency Director position are individuals serving as STA. The STA shall not assume other emergency organization positions until he is formally relieved by an alternate STA.

B. The responsibilities of the Emergency Director are:

(1) Coordinate response of the plant onsite emergency organization;

(2) Notify offsite authorities;

(3) Recommend offsite protective actions (this responsibility may not be delegated;

(4) Direct the activation of all onsite emergency response centers, delegate coordinators for all onsite emergency response centers, and ensure that the emergency response center's environment is being monitored for habitability

(5) Direct onsite protective actions as necessary;

(6) Insure twenty-four (24) hour coverage for key positions in the onsite emergency organization;

(7) During plant evacuations, initiate and ensure that personnel accountability is completed within thirty (30) minutes of declaration of emergency and maintained throughout the emergency condition;

(8) Authorize radiation exposure in excess of normal limits;

(9) Ensure that radiological monitoring (onsite and offsite) is initiated (when required).

4.1.2 Emergency Manager (EM)

During an Alert, Site Area or General Emergency, the Corporate Nuclear Emergency Organization will be activated. It is expected that the Corporate Organization can be fully activated within approximately 2 hours of notification. The Corporate Organization will base their operations at the Near-Site EOF, under the direction of the Emergency Manager (EM). A designated EOF Coordinator will be available at the EOF within 1 hour and may assume the Emergency Manager responsiblities until the designated Emergency Manager arrives.

The Emergency Manager will assume, from the Emergency Director, responsibility for overall management off all offsite support efforts. This includes efforts performed to enhance control of the plant and efforts performed to determine the potential or actual radiological impact in the environs of the plant.

A. Emergency Manager - alternates

The Emergency Manager position should normally be staffed by the General Manager, Nuclear Plants. In his absence the position shall be filled in a timely fashion by use of a call List. A designated EOF Coordinator may fill the role of Emergency Manager until one of the following arrives at the EOF.

(1) General Manager Nuclear Plants
(2) General Manager Headquarters Nuclear Group
(3) General Supt. Technical Services
(4) Manager Production Training

B. The responsibilities of the Emergency Manager are:

(1) Determine the extent of the offsite response.
(2) Make recommendations for the potential need for protective actions.
(3) Supervise the operation of the EOF.

(4) Direct personnel to provide the necessary offsite support for the plant as requested by the Emergency Director.
(5) Provide technical support as necessary.
(6) Provide direction to personnel performing offsite radiation surveys and dose estimates as to the desired types of samples and sample location.
(7) Direct the activation of the Emergency Radiological Environmental Monitoring Program (EREMP) as needed.
(8) Direct personnel to provide the necessary logistics support for the plant and EOF operation.
(9) Provide information to the Power Production Management, as necessary, to assist in development of news releases.
(10) Provide a direct interface with NRC representatives assigned to the EOF.
(11) Provide overall guidance to the corporate staff operating the HQEC in the event that the Power Production Management is not available to assume control of HQEC operations.

4.2 EMERGENCY ORGANIZATION COORDINATORS

4.2.1 Technical Support Center Coordinator

The Technical Support Center Coordinator shall be responsible for the general activation, operation and coordination of activities in the Technical Support Center (TSC).

A. The Technical Support Center Coordinator alternates are as follows:

(1) Supt. Operations Engineering
(2) Supt. Technical Engineering
(3) Supt. Nuclear Engineering
(4) Supt. QA Engineering
(5) Senior Operations Engineer

B. The responsibilities of the TSC Coordinator are:

(1) Establish and verify radiological monitoring for the TSC;

(2) Assist personnel performing the accountability check by completing the TSC personnel accountability sheet;

(3) Maintain or designate individuals to maintain records throughout the emergency condition.

(4) Coordinate activities of plant and non-plant personnel located in the TSC;

(5) Establish or ensure that communications are established between all onsite emergency facilities and the EOF;

(6) Periodically update personnel located in the TSC with appropriate information;

(7) Maintain any necessary status boards;

(8) Control the use of equipment located in the emergency locker;

(9) Provide technical guidance to the Emergency Director and Control Room operators on plant operations;

(10) Obtain technical assistance as required to support the Control Room operations.

4.2.2 Operational Support Center Coordinator

The Operational Support Center Coordinator shall be responsible for the general activation, operation, and coordination of activities in the Operational Support Center (OSC).

A. The Operational Support Center Coordinator alternates are as follows:

(1) Maintenance Supervisor
(2) Chief Station Electrician
(3) I & C Supervisor
(4) I & C Coordinators

B. The responsibilities of the OSC Coordinator are:

(1) Establish and verify radiological monitoring for the OSC and the Control Room;

(2) Coordinate activities of plant personnel located in the OSC to support plant operations as requested by the Control Room and TSC.

(3) Assist personnel performing the accountability check by completing the OSC accountability sheet.

(4) Maintain the communications systems in the OSC. A person may be designated to act as a communicator.

(5) Periodically update personnel located in the OSC with appropriate information.

(6) Control the use of equipment located in the emergency locker.

4.2.3 Assembly Point Coordinator

The Assembly Point Coordinator shall be responsible for the general operation of the assembly area.

A. The Assembly Point Coordinator alternates are as follows:

(1) Radiation Protection Specialists
(2) As directed by the Emergency Director

B. The responsibilities of the Assembly Point Coordinator are:

(1) Verify that radiological monitoring has been established for the Assembly Point.

(2) Coordinate activities of all personnel (plant and non-plant) located at the Assembly Point.

(3) Assist the Emergency Director in performing the accountability check, as necessary.

(4) Maintain the communication systems. A person may be designated as the communicator, if necessary.

(5) Control the use of equipment located in the Emergency Locker.

(6) Update all personnel with appropriate information when directed by the Emergency Director.

(7) Provide instructions to personnel when they are released from the assembly point for reentry or transport offsite.

4.2.4 Radiological Emergency Coordinator

The Radiological Emergency Coordinator (REC) shall be responsible for radiological accident assessment, onsite and offsite. The REC shall report to the Technical Support Center when the TSC is activated. Upon activation of the Near-Site EOF, the Radiation Protection Support Supervisor will assume responsibility for the offsite surveys. The offsite survey teams will be comprised of individuals from the Monticello Nuclear Generating Plant. The REC shall maintain the responsibility for offsite dose projections and shall transmit all dose projection information to the Radiation Protection Support Supervisor at the Near-Site EOF.

A. The Radiological Emergency Coordinator (REC) alternates are as follows:

(1) Supt. Rad Protection
(2) Senior Prod Engr - Rad Prot Section
(3) Rad Protection Supervisor
(4) Radio-Chemistry Supervisor

B. The responsibilities of the REC are:

(1) Offsite dose assessment
(2) Formulating offsite protective action recommendations
(3) Offsite surveys
(4) Onsite surveys
(5) Chemistry
(6) Radiochemistry
(7) Onsite Radiation Protection for:

(a) access control
(b) damage control and repair
(c) search and rescue
(d) first-aid
(e) fire fighting
(f) personnel monitoring & decontamination
(g) dosimetry

4.3 SHIFT ORGANIZATION

4.3.1 Operations Group

The Operations Group consist of the Supt. Operations, Shift Supervisors, and all operators.

A. Group Leader - Line of Sucession

(1) Supt. Operations
(2) Duty Shift Supervisor
(3) Senior Shift Supervisor present
(4) Senior Lead or Reactor operator present

B. Responsibilities

The Operations Group shall have responsibility for:

(1) Plant Operations and assessment of operational aspects of the emergency.

(2) Rad Waste equipment operation

(3) Emergency radiation surveys

(4) Short term damage control and repair for electrical, mechanical, and I & C equipment

4.3.2 Security Group

The Security Group consists of the Supervisor, Security and Services, the Shift Security Supervisor and the contract Guard Force.

A. Group Leader - Line of Succession

(1) Supervisor Security and Services
(2) Shift Security Supervisor
(3) Guard Force

B. Responsibilities

The Guard Force shall:

(1) Carry out the plant security and Access Control program.

(2) Maintain strict personnel accountability onsite.

(3) Assist communications efforts when necessary.

4.3.3 Shift Technical Advisor (STA)

The Shift Technical Advisor (STA) shall be onsite continuously. The STA acts as an advisor to the Shift Supervisor when on shift.

A. STA - Line of Succession

STA duty roster

B. Responsibilities

(1) Provide technical support to the Shift Supervisor in the area of operational event evaluation.

(2) Provide the Shift Supervisor technical and engineering support in the area of accident assessment.

NOTE: The Shift Technical Advisor shall not be assigned or assume duties which could in any way inhibit his accident assessment advisory function during an emergency, until properly relieved of his STA duties by another Shift Technical Advisor.

4.3.4 Shift Emergency Communicator (SEC)

The Shift Emergency Communicator (SEC) shall be onsite continuously. The SEC is responsible for initial notification and maintaining communications during emergency conditions.

A. SEC - Line of Succession

SEC duty roster

B. Responsibilities

(1) Initial notification of offsite agencies and personnel.

NOTE: When the Corporate Emergency Organization is activated and the Near-Site EOF is functional, the communications with the off-site agencies and personnel will be maintained by the EOF personnel.

(2) Augmentation of the plant staff.

(3) Maintain communication systems throughout the emergency situation.

NOTE: As the emergency organization is activated, addition communicators on the SEC duty roster personnel will augment the plant staff to assist in the communication efforts.

4.3.5 Fire Brigade

The Fire Brigade should consist of:

(1) Brigade Chief - Unit 2 Shift Supervisor

(2) Assistant Chief - Turbine or Auxiliary Building APEO

NOTE: Usually the APEO from the affected building shall fulfill the duties of the Brigade Chief in his absence.

(3) Fire Fighters - BOP Operators and Excess CR Operators (two operators per unit shall remain in the Control Room.

(4) Runner - As designated to accompany fire department or operate equipment.

During normal work hours, emergency assistance shall be provided by maintenance and plant helpers. During backshifts, or at the discretion of the Brigade Chief, the Red Wing Fire Department shall provide Emergency assistance and shall be called immediately on report of any fire requiring Fire Brigade Action.

A. Fire Brigade Chief - Line of Succession

(1) Unit 2 Shift Supervisor
(2) Turbine or Auxiliary Building APEO

B. Responsibilities

(1) The Fire Brigade shall be responsible for fire fighting.

4.3.6 Shift Radiation Protection Specialist

The Shift Radiation Protection Organization consist of one Radiation Protection Specialist onsite at all times. The RPS are normally responsible for conducting routine and special surveys, chemistry, radiochemistry, maintaining Access Control, writing RWP's and providing job coverage as required.

A. Shift RPS - Line of Succession

(1) Shift RPS
(2) Control Room licensed operators are trained to perform emergency radiation surveys.

B. Responsibilities

During emergency conditions, the shift Radiation Protection Specialist shall be responsible for:

(1) In-Plant surveys
(2) Chemistry
(3) Radiochemistry

4.4 Emergency Staff Augmentation Groups

4.4.1 Maintenance Group

The Maintenance Group consists of all maintenance crew personnel, all plant electricians, and plant helpers. The onsite Emergency Organization includes, the Plant Supt. Operations and Maintenance, and the Supt. Maintenance, who shall report to the Technical Support Center (TSC); and the Maintenance Supervisors, Chief Station Electrician, and designated back-up Electricians who shall report to the Operational Support Center (OSC). The mechanical and electrical maintenance staff in the OSC can be further augmented or decreased as emergency conditions dictate.

A. Group Leader - Line of Succession

(1) Supt. Maintenance
(2) Maintenance Supervisors
(3) Chief Station Electrician

B. Responsibilities

The Mechanical and Electrical Maintenance Group shall have responsibility for:

(1) Supporting the repair and corrective actions for the mechanical and electrical systems in support of emergency response and recovery actions.

(2) Supporting the Search and Rescue effort.

4.4.2 Instrument and Control Group

The Instrument and Control Group consists of all I & C Specialists including I & C Coordinators and the I & C Supervisor. The onsite emergency organization includes the Supt, Technical Engineering, who shall report to the Technical Support Center; and the I& C Supervisor and Coordinators who report to Operational Support Center. The I & C Group can be further augmented or decreased as emergency conditions dictate.

A. Group Leader - Line of Sucession

(1) Supt. Technical Engineer
(2) I & C Supervisor
(3) I & C Coordinators

B. Responsibilities

The I & C Group shall be responsible for:

(1) Supporting the repair and corrective actions for the instrument and control systems in support of emergency response and recovery actions.

(2) Supporting the search and rescue effort.

4.4.3 Radiation Protection Group

The Radiation Protection Group consists of the Supt. Radiation Protection and all members of the Radiation Protection Group.

A. Group Leader - Line of Succession

(1) Supt. Radiation Protection
(2) Senior Prod Engr - Rad Prot Section
(3) Radiation Protection Supervisor
(4) Radiochemistry Supervisor
(5) Rad Protection Coordinator

B. Responsibilities

The responsibilities of the Radiation Protection Group are:

(1) Offsite Dose Assessment
(2) Offsite Surveys
(3) Onsite Surveys
(4) Chemistry
(5) Radiochemistry
(6) Radiation Protection for:

(a) Access Control
(b) Damage control and Repair
(c) Search and rescue
(d) First aid
(e) Fire fighting
(f) Personnel monitoring and decontamination
(g) Dosimetry

4.4.4 Engineering Group

The Engineering Group consists of the Operation Engineers, the Nuclear Engineers, the Radiation Protection Engineers, the Technical Engineers, and Quality Assurance Engineers.

Upon activation of the onsite emergency organization, all Engineering Superintendents shall report to the Technical Support Center. Designated engineers may be requested to further augment engineering support in the TSC.

A. Group Leader - Line of Succession

(1) Plant Supt. Engineering and Rad Protection
(2) Supt. Operations Engineering
(3) Supt. Technical Engineering
(4) Supt. Nuclear Engineering
(5) Supt. Quality Assurance Engineering

B. Responsibilities

The Engineering Group shall have responsibility for:

(1) Providing technical support for emergency repairs and corrective actions on electrical/mechanical systems.

(2) Providing technical support for plant system engineering on electrical/mechanical systems.

(3) Providing technical support for operating radioactive waste control systems.

(4) Providing core parameter analysis to determine current core status.

4.4.5 Logistics Support Group

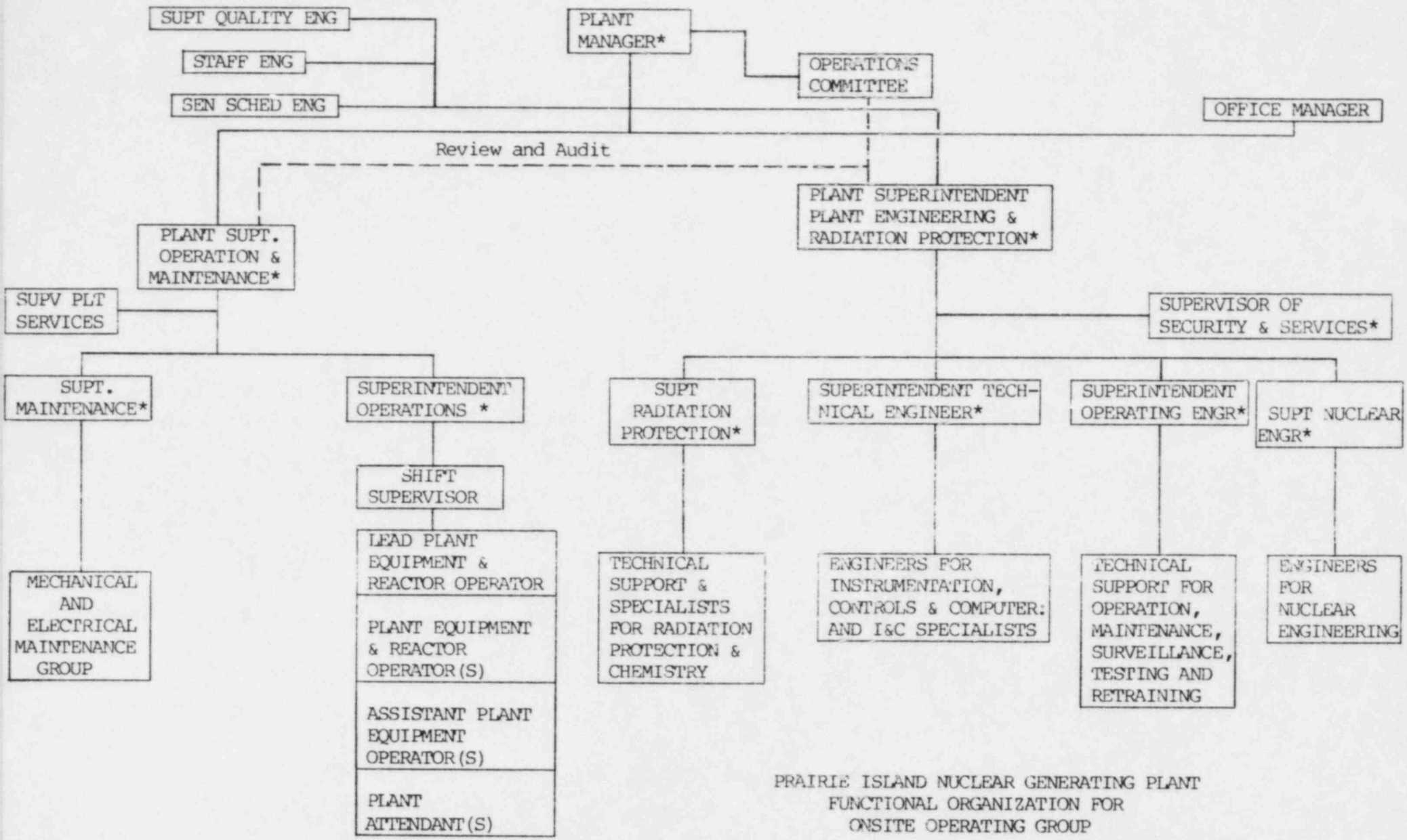
The Support Group consists of the Purchasing and Inventory Control Group, the Administrative Services Group, and the Document Control Group.

A. Group Leader - Line of Succession

(1) Plant Office Manager
(2) Administrative Services Supervisor

B. Responsibilities

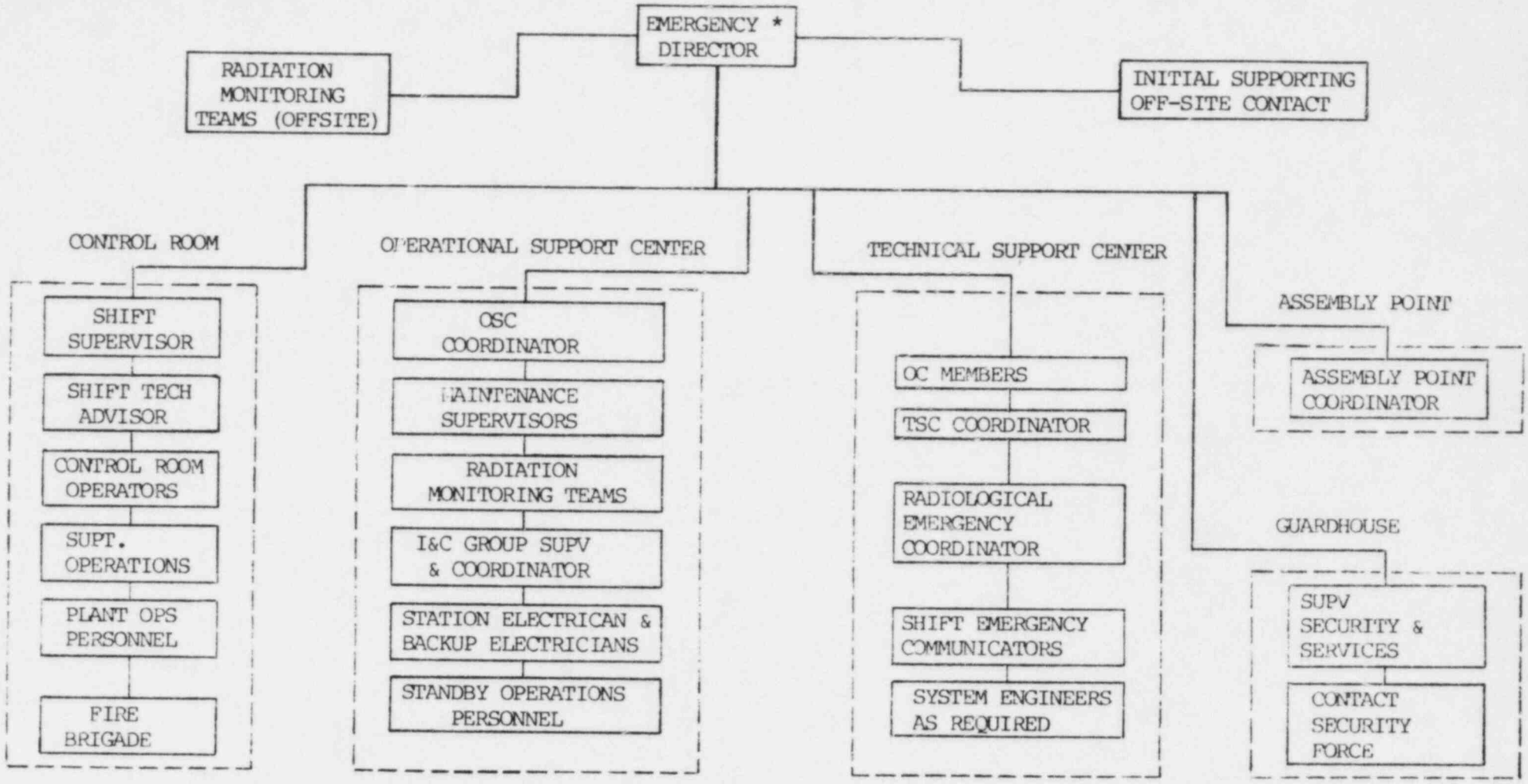
The Support Group shall supply logistical support in their area of expertise. Personnel in these will be called in to provide support for emergency response on an as needed basis.



PRAIRIE ISLAND NUCLEAR GENERATING PLANT
FUNCTIONAL ORGANIZATION FOR
ONSITE OPERATING GROUP

CODE: * - Key Supervisor

FIGURE 1



* The ED may coordinate activities from either the Control Room or the Tech Support Center

ON-SITE EMERGENCY ORGANIZATION
FIGURE 2

FIGURE 3
PRIMARY AND SECONDARY RESPONSIBILITIES

	Emergency Director	Shift Supervisor	Shift Technical Advisor	Control Room Operators	Duty Engineer	Plant Manager	Supt. Rad Protection	Senior Oper. Personnel	Security Guards	Radiation Monitoring Teams	Emergency Manager	Recovery Manager
NOTIFICATION (State & Local)	P			S							P	
NOTIFICATION (Plant Supervisors)	P	S		S								
Mobilization (Plant Staff)	P	S		S								
Classification on Condition		P	S	S	S	S	S			S		
Protective Actions (On-site)	P			S			S			S		
Personnel Accountability	P							S	S			
Accident Assessment	P	S		S			S			S	P	
Command and Control	P	P		S		S					P	
Off-site Dose Projection	P	S		S			S			S	P	
Contamination & Radiation Control	P						S		S	S		
Damage Control	P	S		S				S		S		
Procedure Review & Approval	P	S				S	S				P	P
Search and Rescue	P	S					S			S		
System Operations		P	S	S	S							
Protective Actions Off-site (Recommendations)	P						S			S	P	
Recovery Actions						S	S					P

PRAIRIE ISLAND NUCLEAR GENERATING PLANT NORTHERN STATES POWER COMPANY	EMERGENCY PLAN IMPLEMENTING PROCEDURES Number: F3-2 Rev: 2 Retention Time: History Copy Lifetime
Reviewed By: D. A. Schuelke Supt. Rad Protection Approved By: Plant Manager OC#: 8-26-87	TITLE: CLASSIFICATIONS OF EMERGENCIES

1.0 PURPOSE

The purpose of this procedure is to specify the Emergency Action Levels that indicate that an emergency condition exists and to properly classify the emergency into one of the four graded levels of emergency classifications.

2.0 APPLICABILITY

This instruction SHALL apply to all Shift Supervisors, Control Room Operators, Shift Technical Advisors and Emergency Directors.

3.0 PRECAUTIONS

3.1 The operator should believe his indications and take action based on those indications, however, he shall attempt to verify his indications by checking secondary or coincident indicators.

3.2 Continuously monitor the control room instrumentation, radiation monitors, or any other developments which would be indicative of further system degradation. Be prepared to escalate to a more severe emergency classification.

4.0 DISCUSSION

4.1 Definitions

4.1.1 Notification of Unusual Event - events that are in progress or have occurred which indicate a potential degradation of the level of safety of the plant.

No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

4.1.2 Alert - events are in progress or have occurred which involve actual or potential substantial degradation of the level of safety of the plant. It is the lowest level of emergency classification when some necessity for emergency planning and offsite response is necessary.

Any releases expected are limited to small fractions of the EPA Protective Action Guideline exposure levels.

4.1.3 Site Emergency - events are in progress or have occurred which involve actual or likely major failure of plant functions needed for protection of the public.

Any releases are not expected to exceed the EPA Protective Action Guideline exposure levels except near the site boundary.

4.1.4 General Emergency - events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with a potential for loss of containment integrity.

Releases during a General Emergency can be reasonably expected to exceed the EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

4.1.5 Emergency Action Levels (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.

4.2 Summary

Attached to this procedure is a Summary of Emergency Action Levels. This table identifies the four emergency classifications, the initiating conditions(s), emergency actions levels for each classification, and, where applicable, specific instruments and indications to be used to detect and classify an emergency.

The emergency action levels for each classification and the instrument readings and indications listed do not reflect a complete list of instrumentation that will show abnormal indications but does list those key parameters useful in classifying the event.

The Summary of Emergency Action levels lists all the initiating conditions as required by Appendix 1 of NUREG-0654 and some accidents analyzed in the Prairie Island FSAR.

5.0 PROCEDURE

5.1 Any significant event that may be classified as an emergency condition shall be reported to the Shift Supervisor immediately.

NOTE: The events may be instrumentation readings or visual observations made by plant personnel.

5.2 Attempt to verify the initial indication by comparing the indication to redundant instrument channels or to other related parameters, visual observations, and field reports as applicable.

5.3 Assess the situation and determine the emergency classification, using the guidelines of Attachment 1.

NOTE: Personnel should become familiar with Attachment 1 during training sessions.

5.4 Take immediate actions, using applicable plant operating procedures, Sections C and E of the Operations Manual, to return the plant to normal (or cold shutdown, if determined to be necessary).

5.5 Declare the appropriate emergency classification and perform actions as specified in the appropriate responsibility procedure applicable to emergency classification:

5.5.1 For a Notification of Unusual Event, proceed to F3-3

5.5.2 For an Alert, Site or General Emergency, proceed to F3-4.

5.6 Continue to assess and respond to the emergency condition.

NOTE: Watch for changing parameters or visual indication of further system degradation and be prepared to escalate to a more severe emergency classification as indicated by the Emergency Action Levels in Attachment 1.

5.7 As plant conditions stabilize, downgrade or terminate the emergency classification, as appropriate, as per the guidelines of Attachment 1.

NOTE: Depending upon the severity of the accident, it may not be possible to downgrade the emergency classification following the guidelines of Attachment 1. Therefore, once the plant is in a stable mode and long-term cooling has commenced, the emergency condition may be reclassified and/or terminated and long-term recovery initiated. The Emergency Director should consult the Emergency Manager prior to reclassification and/or termination and initiation of the long-term recovery.

Attachment 1

SUMMARY

OF

EMERGENCY ACTION LEVELS

ATTACHMENT 1

INITIATING CONDITION INDEX

Attachment 1

CONDITION #1

SAFETY SYSTEM FUNCTIONS

Initiating Condition	Indication Used	Classification
ECCS initiated and discharge to vessel. NOTE: FSAR Sections 14.2.4 14.2.5 14.2.6 14.3	1. First out on reactor trip panel: a. Containment High Pressure SI-Reactor Trip; or b. A Steam Generator Lo-Lo Pressure SI; or c. B Steam Generator Lo-Lo Pressure SI; or d. Pressurizer Lo Pressure SI and 2. Confirmation from indicators: a. 2/3 High Containment Pressure (4psig) PI-945, PI-947, PI-949; or b. 2/3 Lo Steam Line Press. Loop A (500 psig) PI-468, PI-469, PI-482A; or c. 2/3 Lo Steam Line Press. Loop B (500 psig) PI-478, PI-479, PI-483A; or d. Lo Prz. Press (1815 psig) PI-429, PI-430, PI-431 and 3. Confirmation of SI Flow indicated by FI-925 and FI-924. or 4. Manual SI-Reactor Trip initiated if Auto SI did not occur at confirmed indicator setpoints (#2 above) or when pressurizer level is off scale low on at least 2/3 channels, LI-426, LI-427, LI-428.	Alert
Loss of Containment integrity requiring shutdown by technical specification	Loss of Containment Integrity, defined by Technical Specification 3.8, which requires a unit shutdown, as determined by the Shift Supervisor.	Notification of Unusual Event

Attachment 1

CONDITION #1 (Cont'd)

SAFETY SYSTEM FUNCTIONS

Initiating Condition	Indication Used	Classification
Loss of engineered safety feature requiring shutdown by Technical Specification	Engineered Safety Feature found inoperable, as defined by Technical Specification 3.3, which requires a unit shutdown, as determined by the Shift Supervisor.	Notification of Unusual Event
Loss of fire protection system function requiring shutdown by Technical Specification	Loss of fire protection systems, defined by Technical Specification 3.14, which requires a unit shutdown, as determined by the Shift Supervisor.	Notification of Unusual Event
Failure of a safety or relief valve in a safety related system to close following reduction of applicable pressure.	Pressurizer safety or relief valve opens and then fails to reset, as indicated by: 1. (a) Annunciator "Pressurizer Safety/Relief Valve Flow"; and (b) Annunciators; (1) "Pressurizer Power Relief line High Temp; or (2) "Pressurizer Safety Valve line A or B High Temp" or (c) Safety/Relief line high Temperature indicated by (1) Pressurizer safety valve outlet temperature, TI-436 > 225°F; or (2) Pressurizer safety valve outlet temperature, TI-437 > 225°F; or (3) Pressurizer relief valve outlet temperature, TI-438 > 225°F.	Notification of Unusual Event

Attachment 1

CONDITION #1 (Cont'd)

SAFETY SYSTEM FUNCTIONS

Initiating Condition	Indication Used	Classification
	Steam Generator safety or relief valve opens and then fails to reset, as indicated by: 1. Visual and/or audible indication at vent stacks of open steam generator safety or relief valve; and 2. Shift Supervisor's opinion	

Attachment 1

CONDITION #2

ABNORMAL PRIMARY LEAK RATE

Initiating Condition	Indication Used	Classification
Primary system leak rate from unidentified or uncontrolled sources exceeding Technical Specifications	1. Primary system leak rate, other than controlled leakage sources, exceeds Technical Specification 3.1.c; and 2. Requires a unit shutdown, as determined by the Shift Supervisor.	Notification of Unusual Event
Primary coolant leak rate greater than 50 gpm	1. (a) Decreasing pressurizer level, as indicated by LI-426, LI-427, LI-428; or (b) High radiation levels in containment, as indicated by: R2 High Alarm - 50mR/hr; or R7 High Alarm - 50mR/hr; or R-11 (Containment Position) High Alarm - 5×10^4 cpm, or R-12 (Containment Position) High Alarm - 6×10^3 cpm; and 2. Annunciator "Charging Pump in Auto High/Low Speed"; and 3. Charging line flow (FI-128B) greater than 50 gpm more than Letdown Flow (FI-134). NOTE: Rapid Temperature decrease in RCS results in same indications however no primary coolant leak rate.	Alert

Attachment 1

CONDITION #2 (Cont'd)

ABNORMAL PRIMARY LEAK RATE

Initiating Condition	Indication Used	Classification
Loss of coolant accident with leak rate in excess of available pump capacity (Charging, High Head Injection, and Low Head Injection).	1. No Pressurizer Level indicated by LI-426, LI-427, LI-428 and 2. All available pumps running as indicated by the red light at the switch.	Site Area Emergency
Small LOCA and initially successful ECCS. Subsequent failure of containment heat removal systems over several hours could lead to core melt and likely failure of containment.	1. LOCA has occurred; and 2. Inadequate containment cooling exists, as indicated by: (a) Containment temperature has become excessive, > 300°F, and is still rising; or (b) Containment pressure > 23 psig with minimum containment pressure suppression equipment not available: (1) No fan cooler units operating and less than two spray pumps; or (2) No spray pumps operating and less than four fan cooler units; or (3) Less than two fan cooler units running with one spray pump.	General Emergency
Small and large LOCA's with failure of ECCS to perform leading to severe core degradation or melt in from minutes to hours. Ultimate failure of containment likely for melt sequences.	1. Loss of coolant indicated by: (a) (1) Pressurizer low pressure trip (1900 psig); or RCS pressure decreasing uncontrollably; and	General Emergency

Attachment 1

CONDITION #2 (Cont'd)

ABNORMAL PRIMARY LEAK RATE

Initiating Condition	Indication Used	Classification
	(2) High containment pressure; or High containment humidity; or High containment sump levels; or High containment radiation levels and (3) Steam Generator's A and B pressures equal or (b) (1) Decreasing RCS pressure; and (2) Loss of subcooling margin (<10°F) and 2. Fuel Damage indicated by: a. R48 High Alarm - 200 R/hr; or R49 High Alarm - 200 R/hr or b. High RCS activity, > 1000 μCi/cc iodine equivalent, as determined by sample anaylsis and 3. Loss of ECCS indicated by (a) High head SI failure; or (b) Low head SI failure.	

Attachment 1

CONDITION #3

ABNORMAL COOLANT TEMPERATURE/PRESSURE

Initiating Condition	Indication Used	Classification
Abnormal coolant temperature and/or pressure or abnormal fuel temperatures outside of Technical Specification limits.	At Steady State Power Operations; 1. T_{avg} > 564°F; or 2. RCS pressure > 2385 psig; or 3. RCS pressure < 2205 psig, and core exit temperature > 620°F, as indicated by a valid thermocouple; or 4. Core Subcooling Margin < 10°F.	Notification of Unusual Event

Attachment 1

CONDITION #4

ABNORMAL PRIMARY/SECONDARY LEAK

Initiating Condition	Indication Used	Classification
Primary/Secondary leak rate exeeding Technical Specification of 1.0 gpm requiring a unit shutdown	When shutdown commences, as determined by the Shift Supervisor and Duty Engineer	Notification of Unusual Event
Failure of steam generator tube(s) resulting in ECCS initiation	1. First out on reactor trip panel: "Pressurizer Low Press SI" and 2. Confirmation from Prz. Press indicators, PI-429, PI-420, PI-431, (2/3 Low pressure, 1815 psig). and 3. Annunciators: a. "A SG High Water Level" or b. "B SG High Water Level" and 4. Confirmation from SG level indicators: a. LI-461, LI-462, LI-463 (2/3 greater than 67%) or b. LI-471, LI-472, LI-473 (2/3 greater than 67%) 5. Safety injection flow indicated by FI-925 and FI-924 and pump discharge pressure corresponding to flow	Alert
Failure of steam generator tube(s) resulting in ECCS initiation and loss of offsite power	1. First out on reactor trip panel: "Pressurizer low pressure SI" and	Site Area Emergency

Attachment 1

CONDITION #4 (Cont'd)

ABNORMAL PRIMARY/SECONDARY LEAK

Initiating Condition	Indication Used	Classification
	2. Confirmation from Prz. Press indicators: PI-429, PI-430, PI-431 (2/3 low pressure, 1815 psig) and 3. Annunciators: a. "A SG Water Level High" or b. "B SG Water Level High" and 4. Confirmation from SG level indicators: a. LI-461, LI-462, LI-463 (2/3 greater than 67%) or b. LI-471, LI-472, LI-473 (2/3 greater than 67%) and 5. Safety injection flow indicated by FI-626 and FI-928 and 6. All of the following indicators: a. 4.16 KV bus voltage (0 Volts) Buses 11-14 and 21-24 and b. D1 and D2 generators running and closed in on safeguard buses: (1) D1 & D2 Tach, (~ 900 rpm) (2) D1 & D2 Volts, (4260-4380 Volts) (3) Safeguard breakers closed Bus 15, Breaker 15-2 Bus 26, Breaker 26-2 Bus 16, Breaker 25-6 Bus 25, Breaker 16-7	

Attachment 1

CONDITION #5

CORE FUEL DAMAGE

Initiating Condition	Indication Used	Classification
Fuel Damage Indication	1. Hi Alarm on letdown line radiation monitor, R-9, indicating greater than 1 R/hr and confirmed by portable instrumentation or 2. High coolant activity sample: a. exceeding Technical Specification for total specific activity in primary coolant or b. exceeding Technical Specification limit on primary coolant iodine activity which requires a unit shutdown.	Notification of Unusual Event
Severe loss of fuel cladding	1. Very high coolant activity sample; 1000 µCi/cc iodine equivalent, as determined by chemical analysis or 2. Letdown line radiation monitor R-9 in alarm mode and indicating greater than 10 R/hr, as confirmed by portable instrumentation	Alert
Degraded core with possible loss of coolable geometry	1. Degraded core, indicated by: (a) High primary coolant activity, > 1000 µCi/cc; or (b) High core exit temperature, indicated by exit thermocouples, > 700°F; or (c) Inadequate subcooling margin, < 10°F; or (d) Indication of core uncovered (Shift Supervisor's opinion) and 2. Loss of coolable geometry, indicated by: (a) Core ΔT increasing; or (b) No core ΔT; or (c) Shift Supervisor's opinion	Site Area Emergency

Attachment 1

CONDITION #5 (Cont'd)

CORE FUEL DAMAGE

Initiating Condition	Indication Used	Classification
Loss of 2 of 3 fission product barriers with a potential loss of 3rd barrier (e.g., loss of primary coolant boundary, clad failure, and high potential for loss of containment).	The first two of the Initiating Conditions exist and the third is possible. 1. (a) Very high coolant activity sample, 1000 µCi/cc Iodine equivalent as determined by chemical analysis; and (b) Primary system leak in excess of 1000 gpm as indicated by safety injection flow greater than 1000 gpm (FI-924 and FI-925) and pump discharge pressure corresponding to flow or 2. Valid high radiation levels in containment, as indicated by: (a) R-48 High Alarm - 200 R/hr; or (b) R-49 High Alarm - 200 R/hr; and 3. Minimum containment pressure suppression equipment is not available: a. No fan cooler units operating and less than two spray pumps or b. No spray pumps operating and less than four fan cooler units or c. Less than two fan cooler units running with one spray pump with (1) Annunciator "High Containment Pressure" with 2/3 greater than 4 psig, PI-945, PI-947, PI-949 and containment pressure increasing and	General Emergency

Attachment 1

CONDITION #5 (Cont'd)

CORE FUEL DAMAGE

Initiating Condition	Indication Used	Classification
	(2) Annunciator "Containment Spray Activated", with 2/3 greater than 23 psig PI-945, PI-947, PI-946, PI-948, PI-950	

Attachment 1

CONDITION #6

SECONDARY COOLANT ANOMALY

Initiating Condition	Indication Used	Classification
Rapid depressurization of Secondary Side	1. (a) Steam General A/B Pressure Differential, $\geq$ 100 psig; and (b) High Containment Pressure, 4 psig; or 2.(a) Hi Steam Flow, .745 x 10^6 lb/hr; and (b) Lo-Lo T_{avg}, 540°F or 3. Steam line pressure Safety Injection Signal; or 4. Failed Open Steam Dump, Relief, or Safety Valve; or 5. Shift Supervisors Opinion	Notification of Unusual Event
Rapid depressurization of secondary side (any Steam Line Break with 0-50 gpm primary to secondary leak rate) Note: FSAR 14.2.5	1. First out on reactor trip panel: a. "A Steam Generator Lo-Lo pressure SI" or b. "B Steam Generator Lo-Lo Pressure SI" and 2. Confirmation from Steam Generator pressure indicators: a. PI-468, PI-469, PI-482 (2/3 less than 500 psig), or b. PI-478, PI-479, PI-483 (2/3 less than 500 psig)	Alert

Attachment 1

CONDITION #6 (Cont'd)

SECONDARY COOLANT ANOMALY

Initiating Condition	Indication Used	Classification
	and, if primary to secondary leak rate is occurring: 3. Hi radiation on: a. R-15 Air Ejector Rad Monitor in alarm mode reading greater than 5×10^4 cpm; and 4. Leak rate as calculated	
Steam line break with greater than 50 gpm primary to secondary leakage and indication of fuel damage	1. First out on reactor trip panel: a. "A Steam Generator Lo-Lo Pressure SI" b. "B Steam Generator Lo-Lo Pressure SI" and 2. Confirmation from Steam Generator pressure indicators: a. PI-468, PI-469, PI-482 (2/3 less than 500 psig), or b. PI-478, PI-479, PI-483, (2/3 less than 500 psig) and 3. Primary to secondary leakage indicated by: a. R-15 Air Ejector Rad Monitor, in alarm mode reading $> 5 \times 10^4$ cpm; and b. leak rate calculation > 50 gpm; and 4. Indication of fuel damage: a. Primary sample > 1000 µCi/cc Iodine 131 equivalent; or b. Steam Line Monitor in valid high alarm mode: R-51, > 100 mR/hr; or R-52, > 100 mR/hr.	Site Area Emergency

Attachment 1

CONDITION #6 (Cont'd)

SECONDARY COOLANT ANOMALY

Initiating Condition	Indication Used	Classification
	or c. High Containment Radiation levels indicated by: R48 High Alarm - 200 R/hr; or R49 High Alarm - 200 R/hr;	
Transient initiated by loss of feedwater and condensate systems (principal heat removal system) followed by failure of emergency feedwater system for extended period. Core melting possible in several hours. Ultimate failure of containment likely if core melts.	1. a. Loss of main condenser which includes all Condensate and Main Feed Pumps; and b. Loss of all Aux Feedwater; and c. No High Head Safety Injection or 2. a. Successful High Head Safety injection with (1) Loss of main condenser which includes all Condensate and Main Feed Pumps; and (2) Loss of all Aux Feedwater and b. Either of the following not established within 30 minutes: (1) Aux Feedwater; or (2) Normal RHR Cooling	General Emergency

Attachment 1

CONDITION #7

RADIOLOGICAL EFFLUENTS

Initiating Condition	Indication Used	Classification
Airborne Radiological effluent Technical Specification limits exceeded Note: FSAR Section 14.2.2	Any of the following gaseous effluent monitors in valid alarm mode reading greater than: 1. 1R-22 (5×10^3 cpm) 2. 2R-22 (5×10^3 cpm) Due to release rate of radioactive gases (except halogen and particulates with T 1/2 > 8 days) averaged over 1 hour exceed $\Sigma \frac{Qi}{(MPC)_i} = 1.1 \times 10^5$ m^3/sec per Technical Specification 3.9.B.1.b	Notification of Unusual Event
Liquid Radiological effluent Technical Specification limits exceeded Note: FSAR Section 14.2.2	Any of the following valid liquid effluent monitor readings which exceed: (1) R-18 High alarm setpoint and isolation valve fails to close. (2) R-19 High alarm setpoint (while blowdown is directed to river) and isolation valve fails to close. Due to release rate of radioactive liquids exceeding values listed in 10CFR20, Appendix B, Table II, Column 2, per Technical Specification 3.9.A.1.b.	Notification of Unusual Event
Airborne Radiological effluents greater than ten times Technical Specification instantaneous limits (an instantaneous rate which, if continued for over two hours, would result in about 1 mR at the site boundary under average meterological conditions)	Any of the following valid gaseous effluent monitor readings: 1. 1R-22 Hi-Hi Alarm (> 5×10^4 cpm) 2. 2R-22 Hi-Hi Alarm (> 5×10^4 cpm) 3. 1R-50 Greater Than 1.2 mR/hr 4. 2R-50 Greater Than 1.2 mR/hr Due to release rate of gases exceeding Technical Specification 3.9.B.1.b by a factor of 10.	Alert

Attachment 1

CONDITION #7 (Cont'd)

RADIOLOGICAL EFFLUENTS

Initiating Condition	Indication Used	Classification
Airborne Effluent monitors detect levels corresponding to greater than: 1. 50 mR/hr whole body for one-half hour or 2. 250 mR/hr for one-half hour for the thyroid, or 3. 500 mR/hr whole body for two minutes, or 4. 2500 mR/hr to the thyroid for two minutes at the site boundary for adverse meterology	1. Any of the following valid gaseous effluent monitor readings: (a) 1R-50 Hi Alarm (70 mR/hr) (b) 2R-50 Hi Alarm (70 mR/hr) or 2. Offsite dose projection calculations result in the following dose projections at the site boundary, greater than: (a) 50 mR/hr whole body for 1/2 hour; or (b) 250 mR/hr thyroid for 1/2 hour; or (c) 500 mR/hr whole body for 2 minutes; or (d) 2500 mR/hr thyroid for 2 minutes or, 3. Radiation Survey Teams measure dose rates greater than 50 mR/hr for 1/2 hour or greater than 500 mR/hr for 2 minutes (beta + gamma) at the site boundary; or 4. Radiation Survey Teams measure thyroid dose rates (equivalent I-131 Concentrations), at the site boundary, which are greater than: (a) 250 mR/hr for 1/2 hour, or (b) 2500 mR/hr for 2 minutes.	Site Area Emergency

Attachment 1

CONDITION #7 (Cont'd)

RADIOLOGICAL EFFLUENTS

Initiating Condition	Indication Used	Classification
Effluent monitors detect levels corresponding to: 1. 1R/hr whole body, or 2. 5R/hr thyroid at the site boundary under actual meteorological conditions	1. Any of the following valid gaseous effluent monitor readings in alarm mode, reading greater than: (a) 1R-50 (1000 mR/hr) (b) 2R-50 (1000 mR/hr) or, 2. Offsite dose projection calculations result in the following dose projections at the site boundary, greater than: (a) 1R/hr whole body; or (b) 5R/hr thyroid; or or, 3. Radiation Survey Teams measure dose rates greater than 1R/hr whole body or 4. Radiation Survey Teams measure thyroid dose rates (equivalent I-131 Concentrations), at the site boundary, which are greater than 5R/hr.	General Emergency
Radiation levels or airborne contamination which indicate a severe degradation in the control of radioactive materials (e.g., increase of factor of 1000 in direct radiation readings within facility).	1. Unexpected radiation levels above 1000 mR/hr or 2. Widespread contamination above 10,000 dpm/100 cm^2 beta-gamma or 500 dpm/100 cm^2 alpha activity	Alert

Attachment 1

CONDITION #8

MAJOR ELECTRICAL FAILURES

Initiating Condition	Indication Used	Classification
Loss of Offsite Power Note: FSAR Section 14.1.9	All of the following indicators: 1. 4.16 KV Bus Voltage (0 Volts) a. Bus 11(21), 4119304 (4172804) b. Bus 12(22), 4119305 (4172805) c. Bus 13(23), 4119306 (4172806) d. Bus 14(24), 4119307 (4172807) and 2. D1 & D2 Generators up to Speed and Voltage and Supplying Safeguard buses: a. D1 (D2) Tach (900 rpm) b. D1 (D2) Gen. Volts (4260 4380 Volts) c. Safeguard bus breakers closed: Bus 15, Breaker 15-2 Bus 26, Breaker 26-2 Bus 16, Breaker 25-6 Bus 25, Breaker 16-7	Notification of Unusual Event
Loss of onsite AC Power Capability	Loss of both diesel generators	Notification of Unusual Event
Loss of offsite power and loss of all onsite AC power (See Site Area Emergency for extended loss). Note: FSAR Section 14.1.11	All of the following indicators: 1. 4.16 KV Bus Voltage (0 Volts) a. Bus 11(21), 4119304 (4172804) b. Bus 12(22), 4119305 (4172805) c. Bus 13(23), 4119306 (4172806) d. Bus 14(24), 4119307 (4172807) and 2. Loss of both diesel generators	Alert
Loss of offsite power and loss of onsite AC power for more than 15 minutes	All of the following indicators: 1. 4.16 KV Bus Voltage (0 Volts) a. Bus 11(21), 4119304 (4172804) b. Bus 12(22), 4119305 (4172805)	Site Area Emergency

Attachment 1

CONDITION #8 (Cont'd)

MAJOR ELECTRICAL FAILURES

Initiating Condition	Indication Used	Classification
	c. Bus 13(23), 4119306 (4172806) d. Bus 14(24), 4119307 (4172807) and 2. Loss of both diesel generators and 3. Blackout has occured for more than 15 minutes.	
Failure of offsite and onsite power along with total loss of emergency feedwater makeup capability for several hours. This would lead to eventual core melt and likely failure of containment.	1. Loss of AC power, (offsite & onsite) indicated by: a. 4.16 KV Bus Voltage (0 Volts) (1) Bus 11(21), 4119304 (4172804) (2) Bus 12(22), 4119305 (4172805) (3) Bus 13(23), 4119306 (4172806) (4) Bus 14(24), 4119307 (4172807) and b. Loss of both diesel generators and 2. Turbine driven Aux Feedwater pumps inoperable for several hours.	General Emergency
Loss of all onsite DC power (See Site Area Emergency for extended loss).	All of the following annunciators received: 1. "Safeguard Train A DC Control Power Supply Failure" and 2. "Safeguard Train B DC Control Power Supply Failure"	Alert

Attachment 1

CONDITION #8 (Cont'd)

MAJOR ELECTRICAL FAILURES

Initiating Condition	Indication Used	Classification
	NOTE: 4 annunciators numbered: 47018-0501 47018-0502 47518-0501 47518-0502	
Loss of all vital onsite DC power for more than 15 minutes.	All of the following annunciators received: 1. "Safeguard Train A DC Control Power Supply Failure" and 2. "Safeguard Train B DC Control Power Supply Failure" NOTE: 4 annunciators numbered: 47018-0501 47018-0502 47518-0501 47518-0502 and 3. Loss of DC Power has lasted more than 15 minutes.	Site Area Emergency

Attachment 1

CONDITION #9

CONTROL ROOM EVACUATIONS

Initiating Condition	Indication Used	Classification
Evacuation of the control room anticipated or required with control of shutdown systems established from Hot Shutdown Panels and local stations	As required by the Shift Supervisor	Alert
Evacuation of the control room and control of shutdown systems not established from hot shutdown panel and local stations within 15 minutes	As required by the Shift Supervisor	Site Area Emergency

Attachment 1

CONDITION #10

FIRES

Initiating Condition	Indication Used	Classification
Fire within the plant lasting more than 10 minutes after initial use of fire extinguishing equipment	As reported by Fire Brigade Chief	Notification of Unusual Event
Fire potentially affecting safety systems	1. Observation that fire could affect safety systems; and 2. Shift Supervisor's opinion	Alert
Fire comprising the functions of safety systems.	1. Observation of major fire that defeats safety systems or functions; and 2. Shift Supervisor's opinion	Site Area Emergency

Attachment 1

CONDITION #11

PLANT SHUTDOWN FUNCTIONS

Initiating Condition	Indication Used	Classification
Nonfunctional indications or alarms in the Control Room requiring a plant shutdown	1. Annunciators: a. "NSSS Annunciator System Power Failure" or b. "BOP Annunciator System Power Failure" and 2. Failed indication as determined by the Shift Supervisor	Notification of Unusual Event
All alarm (annunciators) lost	Annunciators received: 1. "NSSS Annunciator System Power Failure" and 2. "BOP Annunciator System Power Failure"	Alert
Most or all alarms (annunciators) lost while unit is not in cold shutdown or during plant transient	Annunciators received: 1. "NSSS Annunciator System Power Failure" or 2. "BOP Annunciator System Power Failure" during a transient, as determined by the Shift Supervisor	Site Area Emergency
Complete loss of any function needed for plant cold shutdown	As determined by Shift Supervisor	Alert
Complete loss of any function needed for plant hot shutdown	As determined by Shift Supervisor	Site Area Emergency

Attachment 1

CONDITION #11 (Cont'd)

PLANT SHUTDOWN FUNCTIONS

Initiating Condition	Indication Used	Classification
Turbine Failure requiring a reactor/turbine trip	1. High Vibration (7 mils) and 2. High-High Vibration (14 mils) as indicated by Control Room recorder and alarms	Notification of Unusual Event
Turbine Failure causing casing penetration	1. High Vibration (7 mils) and 2. High-High Vibration (14 mils) as indicated by Control Room recorder and alarms and 3. As determined by Visual Inspection	Alert
Failure of the reactor protection system to initiate and complete a trip which brings the reactor subcritical	1. Any Reactor Trip Setpoint and redundancy requiring a reactor trip has been exceeded and 2. Intermediate range detector output not decaying	Alert
Transient requiring operation of shutdown systems with failure to scram (continued power generation but no core damage immediately evident).	1. Failure to bring reactor subcritical with control rods; and 2. No indication of core damage; and 3. Shift Supervisor's opinion that a transient is in progress	Site Area Emergency

Attachment 1

CONDITION #11 (Cont'd)

PLANT SHUTDOWN FUNCTIONS

Initiating Condition	Indication Used	Classification
Transient requiring operation of shutdown systems with failure to scram which results in core damage or additional failure of core cooling and makeup systems (which could lead to core melt)	1. Reactor remains critical after trip; and 2. Indication of overpressurization of RCS because of inability to remove heat, as indicated by: (a) RCS pressure greater than safety valve setpoint (2485 psig); or (b) Rapidly increasing containment pressure and temperature	General Emergency

Attachment 1

CONDITION #12

FUEL HANDLING ACCIDENTS

Initiating Condition	Indication Used	Classification
Fuel damage accident with release of radioactivity to containment Note: FSAR Section 14.2.1	1. Any of the following containment rad monitors in valid alarm mode and reading greater than: (a) R2 - 350 mR/hr; or (b) R7 - 350 mR/hr or 2. The containment vent monitor in valid alarm mode, reading greater than: (a) R11 - 10^{6}_{5} cpm; or (b) R12 - 10^{5} cpm and 3. Shift Supervisor's opinion	Alert
Fuel damage accident with release of radioactivity to the fuel handling building Note: FSAR Section 14.2.1	1. Any of the following valid radiation monitor readings: (a) R-22 HiHi Alarm, > 5 x 10^{4} cpm; or (b) R-50, > 1.2 mR/hr and 2. Spent Fuel Pool Area Monitor R-5 in valid alarm mode reading > 350 mR/hr and 3. Shift Supervisor's opinion	Alert

Attachment 1

CONDITION #2 (Cont'd)

FUEL HANDLING ACCIDENTS

Initiating Condition	Indication Used	Classification
Major damage to spent fuel in containment or fuel handling building (e.g., large object damages fuel or water loss below fuel level)	1. For fuel damage in containment: (a) Any of the following valid radiation monitor readings: (1) R48 Hi Alarm - 200 R/hr; or (2) R49 Hi Alarm - 200 R/hr and (b) Shift Supervisor's opinion or 2. For fuel damage in the Spent Fuel Pool: (a) Valid Radiation Monitor readings on: (1) R50 Hi Alarm, > 70 mR/hr; or (2) R5, in alarm mode reading > 1R/hr and (b) Shift Supervisor's opinion	Site Area Emergency

Attachment 1

CONDITION #13

COOLANT PUMP

Initiating Condition	Indication Used	Classification
Coolant pump seizure leading to fuel failure Note: FSAR Section 14.1.8	1. RCP Trip (over current 86 lock-out); and 2. Primary sample analysis indicating fuel failure (> 1000 μCi/cc iodine 131 equivalent)	Alert

Attachment 1

CONDITION #14

SERIOUS OR FATAL INJURY

Initiating Condition	Indication Used	Classification
Transportation of a seriously or fatally injured (may or may not involve contamination) individual from site to hospital for treatment	As determined by the Shift Supervisor NOTE: Serious injury is considered to be one that will require admission for treatment or observation for an extended period of time (greater than 48 hours)	Notification of Unusual Event

Attachment 1

CONDITION #15

SECURITY THREATS

Initiating Condition	Indication Used	Classification
Security threat or attempted sabotage	Per security plan	Notification of Unusual Event
Ongoing security compromise	Per security plan	Alert
Imminent loss of physical control of plant	Per security plan	Site Area Emergency
Loss of physical control of plant	Per security plan	General Emergency

Attachment 1

CONDITION #16

HAZARDS TO PLANT OPERATIONS

Initiating Condition	Indication Used	Classification
Aircraft crash onsite or unusual aircraft activity over facility	1. Visual observation by plant personnel and/or plant security personnel; and 2. Reported to the Shift Supervisor	Notification of Unusual Event
Aircraft crash in the protected area	Visual observation by plant personnel and/or plant security personnel	Alert
Aircraft crash within protected area and affecting vital structures by impact or fires with plant not in cold shutdown	Visual observation by plant personnel and/or plant security personnel	Site Area Emergency
Near or onsite explosion	1. Visual observation by plant personnel and/or plant security personnel; and 2. Reported to the Shift Supervisor	Notification of Unusual Event
Known explosion damage to facility affecting plant operation	Visual observation by plant personnel	Alert
Severe damage to engineered safety system equipment from explosions with plant not in cold shutdown	Visual observation by plant personnel	Site Area Emergency
Near or onsite toxic or flammable gas release	Gaseous hazards being experienced or projected, onsite (out of plant), as detected by portable instrumentation, which exists in concentrations greater than:	Notification of Unusual Event

Attachment 1

CONDITION #16 (Cont'd)

HAZARDS TO PLANT OPERATIONS

Initiating Condition	Indication Used	Classification
	(1) 80 ppm hydrazine; or (2) 25 ppm chlorine; or (3) 500 ppm ammonia; or (4) explosive limits as detected by explosive meter, and, reported to the Shift Supervisor	
Entry into the plant environs of toxic or flammable gases	Gaseous hazads being experienced or projected, within the plant, as detected by portable instrumentation, which exists in concentrations greater than: (1) 80 ppm hydrazine; or (2) 25 ppm chlorine; or (3) 500 ppm ammonia; or (4) explosive limits as detected by explosive meter, and, reported to the Shift Supervisor	Alert
Entry of toxic or flammable gases into vital areas with plant not in cold shutdown	Gaseous hazards being experienced or projected within vital areas of the plant, as detected by portable instrumentation, which exists in concentrations greater than: (1) 80 ppm hydrazine; or (2) 25 ppm chlorine; or (3) 500 ppm ammonia; or (4) explosive limits as detected by explosive meter, and, reported to the Shift Supervisor	Site Area Emergency
Missible impacts from whatever source on facility	Visual observation by plant personnel and/or plant security personnel	Alert

Attachment 1

CONDITION #16 (Cont'd)

HAZARDS TO PLANT OPERATIONS

Initiating Condition	Indication Used	Classification
Severe damage to engineered safety system from missiles with plant not in cold shutdown	Visual observation by plant personnel	Site Area Emergency

Attachment 1

CONDITION #17

NATURAL EVENTS

Initiating Condition	Indication Used	Classification
Any earthquake	Annunciator "Seismic Event" received on the seismograph	Notification of Unusual Event
Earthquake greater than Operational Basis Earthquake	Annunciator "Operational Earthquake" received on the seismograph	Alert
Earthquake greater than Design Basis Earthquake with plant not in cold shutdown	Annunciator "Design Basis Earthquake" received on the seismograph	Site Area Emergency
Any tornado visible from site	Visual observation by plant personnel and/or plant security and reported to the Shift Supervisor.	Notification of Unusual Event
Any tornado striking the facility	Visual observation by plant personnel and/or plant security and reported to the Shift Supervisor.	Alert
50 year flood	686' elevation	Notification of Unusual Event
Flood levels approaching design levels	692' elevation - requires both units to be shut down	Alert
Flood levels exceeding design levels with plant not in cold shutdown	698' elevation - highest level transformers will function	Site Area Emergency
Low water levels being experienced or projected beyond usual levels	672.5' elevation - (At 672.5' elevation, both 11 and 21 cooling water pumps trip)	Notification of Unusual Event

Attachment 1

CONDITION #17 (Cont'd)

NATURAL EVENTS

Initiating Condition	Indication Used	Classification
Low water levels being experienced or projected to be near design levels	Approximately 669.5' elevation	Alert
Low water levels being experienced or projected to be greater than design levels or failure of vital equipment with plant not in cold shutdown.	1. Approximately 666.5' elevation corresponding to loss of set of miter gates or loss of one spillway gate or 2. Major vital equipment failure at low water level	Site Area Emergency
Sustained winds being experienced or projected near design levels	Sustained wind speed indicated by met tower in excess of 90 mph	Alert
Sustained winds being in excess of design levels being experienced or projected with plant not in cold shutdown	Sustained wind speed indicated by met tower, in excess of 100 mph	Site Area Emergency
Any major internal or external events (e.g., fires, earthquake, substantially beyond design levels) which could or has caused massive damage to plant systems resulting or potential for resulting in large releases to the offsite environment in excess of the EPA Protective Action Guides	As determined by the Shift Supervisor and/or Emergency Director	General Emergency

Attachment 1

CONDITION #18

OTHER

Initiating Conditions	Indication Used	Classification
Conditions that warrant increased awareness on the part of a plant operating staff or state and/or local offsite authorities	Duty Engineer and Shift Supervisor concurrence	Notification of Unusual Event
Conditions that require plant shutdown under Technical Specification requirements or involve other than normal controlled shutdown	Duty Engineer and Shift Supervisor concurrence	Notification of Unusual Event
Conditions that warrant activation of Technical Support Center and near-site Emergency Operating Facility	Duty Engineer and Shift Supervisor concurrence	Alert
Other plant conditions that warrant activation of emergency operating centers and monitoring teams or a precautionary notification to the public near the site	Shift Supervisor opinion	Site Area Emergency
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.	Shift Supervisor's opinion	General Emergency

PRAIRIE ISLAND NUCLEAR GENERATING PLANT NORTHERN STATES POWER COMPANY	EMERGENCY PLAN IMPLEMENTING PROCEDURES
	Number: F3-4 Rev: 6
	Retention Time: History Copy Lifetime
Reviewed By: D A Schuelke Supt. Rad Protection	TITLE: RESPONSIBILITIES DURING AN ALERT, SITE AREA OR GENERAL EMERGENCY
Approved By: Plant Manager	
OC#: 8-26-82	

1.0 PURPOSE

The purpose of this instruction is to delineate the responsibilities of various emergency organization personnel and onsite organizations required to respond to an Alert, a Site Area Emergency or a General Emergency.

2.0 SUMMARY

A graded scale of response is provided for the different classes of emergencies, each requiring a specific response by emergency organization personnel for the protection of the public health and safety.

2.1 Alert

A. Definition

The Alert Conditions are events which are in progress or have occurred which involve actual or potential substantial degradation of the level of safety of the plant.

Some releases of radioactive material to offsite areas are probable. Hence there is some necessity for emergency planning and response by offsite agencies. Any radioactive release will be limited to a small fraction of the EPA Protective Action Guideline exposure levels.

B. Purpose of Alert Class

The purpose of the Alert Emergency classification is to (1) assure that emergency personnel are readily available to respond if the situation becomes more serious or to perform confirmatory radiation monitoring, if required; (2) provide offsite authorities current status information.

C. Plant Actions and Responsibilities:

1. Promptly inform State and/or local authorities of Alert status and reason for Alert as soon as discovered.

2. Augment resources by activating onsite Technical Support Center, onsite Operational Support Center and Near-Site Emergency Operations Facility (EOF).

3. Assess and respond to the Alert condition.

4. Dispatch onsite or offsite survey teams and associated communications (if needed).

5. Provide periodic plant status updates to offsite authorities.

6. Provide periodic meteorological assessments to offsite authorities and, if any releases are occurring, dose estimates for actual releases.

7. Close out by verbal summary to offsite authorities.

or

8. Escalate to a more severe class.

D. State and/or Local Offsite Authority Actions:

1. Provide fire or security assistance, if required.

2. Augment resouces by activating Emergency Operating Centers and EBS to standby status.

3. Alert to standby status key emergency personnel including monitoring teams and associated communications.

4. Provide confirmatory offsite radiation monitoring and ingestion pathway dose projections if actual releases substantially exceed technical specification limits.

5. Maintain alert status until verbal closeout.

or

6. Escalate to a more severe class.

2.2 Site Area Emergency

A. Definition

The Site Area Emergency describes events which are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public.

Significant offsite releases are likely to occur or are occurring but where a core melt situation is not expected although severe fuel damage may have occurred.

Any radioactive releases are not expected to exceed the EPA Protective Action Guideline exposure levels except near the site boundary.

B. Purpose of Site Area Emergency Class

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; (4) provide current information for and consultation with offsite authorities, and (5) provide updates for the public through offsite authorities.

C. Plant Actions and Responsibilities:

1. Promptly inform State and/or local offsite authorities of Site Area Emergency status and reason for emergency as soon as discovered.

2. Augment resources by activating onsite Technical Support Center, onsite Operational Support Center and the Near-Site Emergency Operations Facility (EOF).

3. Assess and respond to the Site Area Emergency.

4. Dispatch onsite and offsite survey teams and associated communications (if needed).

5. Provide a dedicated individual for plant status updates to offsite authorities.

6. Make senior technical and management staff onsite available for consultation with NRC and State on a periodic basis.

7. Provide meteorological and dose estimates to offsite authorities for actual releases via a dedicated individual.

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

9. Close out or recommend reduction in emergency class by contacting offsite authorities.

or

10. Escalate to General Emergency class.

D. State and/or Local Offsite Authority Action:

1. Provide any assistance requested.

2. If sheltering near the site is desirable, activate the Public Notification System within at least 2 miles of the plant.

3. Provide public within at least 10 miles, periodic updates on emergency status.

4. Augment resources by activating Emergency Operating Centers and EBS to standby status.

5. Dispatch key emergency personnel including monitoring teams and associated communications.

6. Alert to standby status other emergency personnel (e.g., those needed for evacuation) and dispatch personnel to Near-Site duty stations.

7. Provide offsite monitoring results to licensee and others and jointly assess them.

8. Continuously assess information from licensee and offsite monitoring with regard to changes to protective actions already initiated for public and mobilizing evacuation resources.

9. Recommend placing milk animals within 2 miles on stored feed and assess need to extend distance.

10. Provide press briefings, perhaps with licensee.

11. Maintain Site Area Emergency status until closeout or reduction of emergency class.

or

12. Escalate to General Emergency class.

2.3 General Emergency

A. Definition

The General Emergency describes events in progress or which have occurred which involve actual or imminent substantial core degradation or melting with the potential for loss of containment integrity. Radioactive releases can be reasonably expected to exceed the EPA Protective Action Guideline exposure levels offsite for more than the immediate site area, hence, Protective Actions may have to be taken for protection of the general public.

B. Purpose of General Emergency Class

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 offsite measurements; (3) initiate additional measures as indicated by actual or potential releases; (4) provide current information for the public and consultation with offsite authorities, and (5) provide updates for the public through offsite authorities.

C. Plant Actions and Responsibilities

1. Promptly inform state and local offsite authorities of General Emergency status and reason for emergency as soon as discovered.

2. Augment resources by activating onsite Technical Support Center, onsite Operational Support Center and Near-Site Emergency Operations Facility (EOF).

3. Assess and respond to General Emergency.

4. Dispatch onsite and offsite survey teams and associated communications.

5. Provide a dedicated individual for plant status updates to offsite authorities.

6. Make senior technical and management staff onsite available for consultation with NRC and State on a periodic basis.

7. Provide meteorological and dose estimates to offsite authorities for actual releases via a dedicated individual.

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

9. Close out or recommend reduction of emergency class by briefing of offsite authorities at EOC by phone.

D. State and/or Local Offsite Authority Actions

1. Provide any assistance requested.

2. Activate immediate public notification of emergency status and provide public periodic updates.

3. Recommend sheltering for 2 mile radius and 5 miles downwind and assess need to extend distances. Consider advisability of evacuation (projected time available vs estimated evacuation times).

4. Augment resources by activating Near-Site EOC and any other primary response centers.

5. Dispatch key emergency personnel including monitoring teams and associated communications.

6. Dispatch other emergency personnel to duty stations within 5 mile radius and alert all others to standby status.

7. Provide offsite monitoring results to licensee and others and jointly assess these.

8. Continuously assess information from licensee and offsite monitoring with regard to changes to protective actions already initiated for public and mobilizing evacuation resources.

9. Recommend placing milk animals within 10 miles on stored feed and assess need to extend distance.

10. Provide press briefings, perhaps with licensee.

11. Maintain General Emergency status until closeout or reduction of emergency class.

3.0 PRECAUTIONS

(1) All personnel shall stay clear of any areas as announced over the public address system.

(2) All personnel shall refrain from using the public address system or telephone system during an emergency.

(3) When the evacuation alarm is sounded, listen for instructions over the public address system before evacuating.

(4) Anyone working in a contaminated area when the evacuation alarm sounds should remove as much protective clothing as time permits, especially gloves, booties or rubbers. If wearing a double suit, removal of outside clothing would only be necessary. Proceed to the designated assembly area. If unable to remove all protective clothing, inform personnel in charge at the assembly area of your condition.

NOTE: When the evacuation alarm sounds during a DRILL, remove ALL protective clothing prior to evacuating.

(5) When exiting the Protected Area via the Guard House, proceed through the portal monitor quickly. Step through without stopping. All I.D. cards (badges) shall be collected and checked out by the Guard Force, so an early printout of all personnel within the Protected Area can be obtained.

(6) Everyone shall remain at assembly area for monitoring and accountability checks until released by the Emergency Director or directed for reassignment for duty within the plant. Follow instructions from the Assembly Point Coordinator. When departing the site property, obey all instructions from traffic control personnel.

4.0 APPLICABILITY

This instruction shall apply to all plant personnel.

5.0 ORGANIZATIONAL CONTROL

5.1 Overall Responsibility - Emergency Director

5.2 In-Charge, Control Room - Shift Supervisor

Technical Support Center - TSC Coordinator

Operational Support Center - OSC Coordinator

Assembly Point - Assembly Point Coordinator

5.3 Assistance, Control Room - Control Room Operators
- Shift Technical Advisor
- Supt Operations

TSC - Operations Committee
- Shift Emergency Communicator
- Radiological Emergency Coordinator
- Engineering support as needed (i.e., systems experts)

OSC - Extra Operators
- Rad Survey Teams
- Maintenance Supervisors
- I & C Supv & Coordinators
- Chief Station Electrician and Alternates
- Additional Support as needed

6.0 RESPONSIBILITIES

6.1 Shift Supervisor of the affected unit.

(1) Proceed to the Control Room (if not already there)

NOTE: The Shift Supervisor of the affected unit shall remain in the Control Room at all times during accident conditions until properly relieved.

(2) Implement the appropriate Emergency Operating Procedures and respond to the emergency condition with the objective of returning the plant to a normal safe condition (or cold shutdown, if determined to be necessary).

(3) Monitor plant conditions to determine when the threat to plant safety has passed. Be prepared to escalate to a more severe emergency class, if required.

(4) Coordinate, with the Emergency Director, all plant operations which may impact on radioactivity releases.

6.2 Shift Supervisor of the unaffected unit:

(1) Assume the position as Emergency Director.

(2) Start the duties and responsibilities as assigned to the Emergency Director as specified in Section 6.3. Use Attachment A, Emergency Director's Checklist.

(3) When the designated Emergency Director arrives onsite, update him on the current plant status and formally transfer the Emergency Director responsibilities over to that individual.

(4) Assist the Shift Supervisor of the affected unit, as required in section 6.1.

6.3 Emergency Director

(1) Assume the role as Emergency Director. Use Attachment A, Emergency Director's Checklist.

(2) Determine the plant status. Report to the Control Room and become familiarized with the situation and sequence of events preceeding and propagating the Emergency Condition.

(3) Announce, or ensure that the following message is announced over the public address system:

ATTENTION ALL PLANT PERSONNEL:

A (N) (pick correct class):

ALERT, or
SITE AREA EMERGENCY, or
GENERAL EMERGENCY

HAS BEEN DECLARED.

ALL MEMBERS OF THE ONSITE EMERGENCY ORGANIZATION REPORT TO YOUR EMERGENCY DUTY STATIONS. ALL OTHER PERSONNEL STANDBY FOR FURTHER INSTRUCTIONS.

Repeat announcement.

NOTE: A plant evacuation will normally be initiated during an Alert, a Site Area Emergency, or a General Emergency, however, the Emergency Director must consider special conditions, (e.g., high winds or tornado) where an evacuation is not feasible or when the onsite assembly point is not habitable. See procedure F3-9, "Emergency Evacuation", for specific evacuation criteria.

(4) Contact the STA and SEC (if not already done so), and have them report to the Control Room immediately.

(5) Assist the SEC in completing the Notification Report Form, Figure 1, F3-5.

(6) Designate the SEC to complete the notification of state, local, and NSP personnel, in accordance with F3-5, "Emergency Notifications".

NOTE: State and local authorities shall be notified within 15 minutes of the declaration of the emergency class.

(7) Direct the SEC to activate the onsite emergency organization, in accordance with F3-5, "Emergency Notifications", and to notify any other appropriate plant personnel, as deemed necessary.

(8) Notify any other offsite support agencies required to provide assistance to respond to the emergency condition, e.g., local support services, such as fire fighting, ambulance, hospital, etc. See F3-5, "Emergency Notifications for local support services phone numbers.

NOTE: These contacts should be coordinated with the SEC and the Control Room to ensure that the contacts required are made in a timely manner.

(9) Direct the Shift RPS to:

a) perform the appropriate sampling and analysis as necessary, e.g., primary system, containment air, steam generator liquid, shield building stack, etc., and/or

b) perform offsite dose calculations, if the high range effluent stack monitors (R-50) are in valid alarm mode.

(10) Direct the RPS and/or operator to conduct onsite and in-plant radiation surveys, as necessary.

(11) If the first notification of an emergency is a General Emergency, call the County Sheriff and make the initial Protective Action recommendation:

(a) Recommend activation of the public notification system, and

(b) Recommend sheltering of the public within a two mile radius of the plant.

(12) Ensure that the NRC has been notified and designate an individual to maintain communications with the NRC via the ENS phone, as necessary.

NOTE: Notification of the NRC via the ENS required within 1 hour.

(13) During plant evacuations, direct the evacuation of all non-essential personnel from the plant site to the designated assembly point (per F3-9).

(a) Normally the Construction Office Building will be the designated assembly point. However, the Screenhouse can be used if conditions make the Construction Office Building uninhabitable.

(b) Direct the Security Force to warn all personnel within the Owner Controlled Area and outside the Protected Area.

(14) Account for all personnel (Plant personnel, visitors and construction personnel) onsite, within 30 minutes following the evacuation. (This responsibility may be delegated). See Procedure F3-9.

(15) Determine if the assembly point and guardhouse are safe and watch for changing conditions which would require further evacuation.

(16) Complete a turnover of Emergency Director responsibilities from the Shift Supervisor of the unaffected unit to the designated Emergency Director when that individual arrives onsite. The Shift Supervisor of the unaffected unit shall continue with the Emergency Responsibilities until a formal turnover occurs.

(17) During plant evacuations, direct monitoring of all personnel for contamination (adequate instrumentation is available at both assembly points for this task).

(18) Direct the activation of the Technical Support Center and Operational Support Center per procedure F3-6, and F3-7, and ensure that coordinators are assigned to the emergency response centers.

(19) Verify that communications have been established between all the onsite emergency operating centers. (Control Room, OSC, and TSC).

(20) If necessary, based on plant conditions, initiate monitoring of onsite and offsite areas. This responsibility may be delegated to the Radiation Protection Group.

(21) If offsite releases may or are occurring, direct the calculation of projected offsite dose rates as per F3-13. This responsibility may be delegated to the Radiological Emergency Coordinator.

(22) Make appropriate protective action recommendations to the offsite authorities. (See F3-8, "Recommendations for Offsite Protection Actions").

(23) Ensure that continuous updates (approximately every half-hour) are provided to the State EOC's (Wisc and Minn) which were activated by the intial notification. (See F3-5)

NOTE: When the EOF is activated, communications with the offsite authorities will be transferred to the EOF.

(24) Authorize overexposures in accordance with F3-12, "Emergency Exposure Control".

(25) Direct operations at the assembly point via the Assembly Point Coordinator and arrange for any assistance required at the assembly area.

(26) If conditions indicate that further system degradation has occurred, escalate to a more severe emergency classification and direct the notification of all offsite agencies and personnel of such action, per F3-5. Announce, or have announced, the re-classification and escalation to a higher emergency classification, over the public address system.

(27) As conditions permit, terminate the emergency condition or downgrade the emergency classification to a lower classification. Direct the notification of all offsite agencies and personnel, per F3-5. Announce or have announced the downgrading or termination of the emergency condition over the public address system.

(28) When the Near-Site EOF has been activated, the Emergency Manager will inform the Emergency Director. The Emergency Director will then transfer control of all offsite activities over to the Emergency Manager.

(29) Coordinate with all group Superintendents to insure that plant manpower requirements for all subsequent workshifts are determined and that the necessary personnel are scheduled.

(30) When the emergency condition is terminated, ensure that all offsite and onsite personnel are notified of the termination of the emergency condition and initiation of recovery operations.

6.4 Operations Group

(1) Utilize applicable operations manual procedures to respond to the Emergency Condition as appropriate, with the objective of returning the plant to a normal safe status (or cold shutdown, if necessary).

(2) Assist the Shift Supervisor as requested.

(3) Announce the location and nature of the Emergency over the public address system. When an evacuation is declared, sound the evacuation alarm and direct all non-essential personnel to evacuate to the designated assembly point. Direct all personnel to remain clear of the affected area (if applicable). See F3-9, "Emergency Evacuation."

(4) Assist in the activation of onsite emergency centers and organization.

(5) Assist individual performing the personnel accountability check as necessary, per F3-10, "Personnel Accountability".

(6) Continuously monitor the Control Room instrumentation, radiation monitors, or any other developments which could be indicative of further system degradation. Inform the Shift Supervisor immediately of any changes in plant status.

(7) Operators shall remain at their watch stations and perform required operations. If necessary, they will be given instructions for evacuation and/or the use of protective clothing and respiratory protection.

NOTE: If High Radiation levels exist in the Auxiliary Building/Turbine Building, operators shall be evacuated to the OSC, as instructed by the Emergency Director.

(8) Perform the necessary onsite and in-plant radiation surveys as requested by the Shift Supervisor.

(9) Relief Shift and Training Operators should proceed to the Operational Support Center for further instructions to support operations in the Control Room.

(10) The Superintendent, Operations, if on site, should report to the Control Room and provide assistance where necessary.

6.5 Shift Technical Advisor

(1) Report to the Control Room immediately upon notification of the Emergency Condition.

(2) Assist the Shift Supervisor and Emergency Director in assessing the emergency condition and safety related aspects of the plant.

6.6 Shift Emergency Communicator

(1) Report to the Control Room immediately upon notification.

(2) Complete the Notification Report Form, Figure 1, F3-5, with assistance from the Emergency Director/Shift Supervisor of the unaffected unit.

(3) Complete the required notification of state and local authorities, and NSP personnel in accordance with F3-5, "Emergency Notifications".

NOTE: State and local authorities shall be notified within 15 minutes of the declaration of the emergency classification.

(4) Notify applicable offsite authorities if conditions escalate to a more severe emergency class or whenever the emergency class is downgraded in accordance with F3-5, "Emergency Notifications".

(5) When the emergency classification has been terminated, close-out the emergency classification, by notifying the state, local, and NSP personnel in accordance with F3-5, "Emergency Notifications".

NOTE: If the EOF has been activated, notifications of offsite agencies for an escalation, downgrade or termination of the emergency condition will be completed by EOF personnel.

6.7 Technical Support Center Coordinator

The Technical Support Center Coordinator shall be responsible for the general activation, operation and coordination of activities in the Technical Support Center (TSC).

The TSC Coordinator shall:

(1) Report to the TSC and assume the position as TSC Coordinator. Use Attachment C, Technical Support Center Coordinator Checklist.

(2) Coordinate activities of plant and non-plant personnel located in the TSC.

(3) Designate an individual to maintain the Emergency Directors Log.

(4) Establish and verify radiological monitoring for the TSC, in accordance with F3-6.

(5) Ensure that the TSC doors are closed and initiate the TSC cleanup system.

(6) Assist personnel performing the accountability check by completing the TSC personnel accountability sheet, as per F3-10.

(7) Establish or ensure that communications are established with all onsite emergency operating facilities (Control Room, OSC and assembly area).

(8) Periodically update personnel located in the TSC with appropriate information.

(9) Maintain any necessary status boards.

(10) Control the use of equipment located in the emergency locker.

(11) Provide technical guidance to the Emergency Director and Control Room operators on plant operations.

(12) Obtain and provide technical assistance as required to support the Technical Support Center and Control Room operations.

(13) When the Near-Site EOF has been activated, establish communications between the TSC and the EOF.

6.8 Operational Support Center Coordinator

The Operational Support Center Coordinator shall be responsible for the general activation, operation, and coordination of activities in the Operational Support Center (OSC).

The OSC Coordinator shall:

(1) Report to the OSC and assume the role as OSC Coordinator. Use Attachment D, Operational Support Center Coordinator Checklist.

(2) Coordinate activities of plant personnel located in the OSC to support plant operations as requested by the Control Room and TSC.

NOTE: The REC shall be responsible for control and direction for the Radiation Protection Specialists located in the OSC.

(3) Establish and verify radiological monitoring for the OSC and the Control Room, as per F3-7.

(4) Assist personnel performing the accountability check by completing the OSC accountability sheet, as per F3-10.

(5) Establish communications between the OSC, the TSC and the Control Room.

(6) Periodically update personnel located in the OSC with appropriate plant status information.

(7) Control the use of equipment located in the emergency locker.

6.9 Assembly Point Coordinator

The Assembly Point Coordinator shall be responsible for the general operation of the assembly area.

The Assembly Point Coordinator shall:

(1) Verify that radiological monitoring has been established for the Assembly Point.

(2) Coordinate activities of all personnel (plant and non-plant) located at the Assembly Point.

(3) Assist the Emergency Director in performing the accountability check, as necessary, per F3-10.

(4) Maintain the communication systems. A person may be designated as the communicator, if necessary.

(5) Control the use of equipment located in the Emergency Locker.

(6) Update all personnel with appropriate information when directed by the Emergency Director.

(7) Provide instructions to personnel when they are released from the assembly point for reentry or transport offsite.

6.10 Radiological Emergency Coordinator (REC)

The Radiological Emergency Coordinator (REC) shall be responsible for accident assessment, onsite and offsite. The REC shall:

(1) Report to the Technical Support Center and assume responsibility for the Radiological Emergency Coordinator position. Use Attachment B, Radiological Emergency Coordinator Checklist.

(2) Determine the current plant status.

(3) If radiological releases are occurring, airborne or liquid, verify that the Radiation Survey teams have been dispatched in accordance with F3-15 or F3-16.

(4) If radiological airborne releases may or are occurring, initiate offsite dose projections in accordance with F3-13.

(5) Assist the Emergency Director in performing the personnel accountability check of the Radiation Survey Teams, as per F3-10 "Personnel Accountability".

(6) Designate or ensure that an RPS is designated to proceed to the EOF Count Room to perform any required analysis in the backup countroom, as necessary.

(7) Maintain communications with the offsite survey teams. Based on current meteorological data, release data and survey team results, dispatch the survey teams in the affected areas of the plume.

(8) Ensure that all Radiation Survey Team Members (onsite & offsite) are informed of the current plant status and are informed of any emergency condition changes.

(9) When the Radiation Survey Teams forward survey results to the TSC, log the data and supervise the development of the plume map.

(10) If the wind is from the East or West such that the plume is traveling towards the Minnesota or Wisconsin bluffs, consider that plume diversion is likely to occur. Deploy the survey teams to conduct a plume search both beyond the bluffs and up and down the valley, where plume diversion is likely to occur.

(11) Direct the activities of the onsite radiation survey teams, (i.e., samples required, surveys required, analysis, etc.).

(12) Based on the meteorological data, release data, and surveys (onsite and offsite), determine the necessary radiation protection for the various segments of the plant emergency organization.

(13) Verify that the Radiation Protection Status Board is periodically updated.

(14) Based on offsite dose projections and offsite survey results, provide the Emergency Director with recommendations for Protective Actions in accordance with F3-8, "Recommendations For Offsite Protective Actions".

(15) Periodically update the Minnesota Department of Health and the Wisconsin Section of Radiation Protection with information required by Figure 6 (F3-5) "Emergency Notification Followup Message".

NOTE: When the EOF is activated, this responsibility will be transferred to the Radiation Protection Support Supervisor (RPSS).

(16) When the Near-Site EOF is activated, transfer control of the offsite survey teams to the Radiation Protection Support Supervisor (RPSS).

NOTE: Dose projections will still be a responsibility of the REC and dose projection information will be forwarded to the Radiation Protection Support Supervisor (RPSS).

(17) Acknowledge the Health Physics Network HPN) phone when it rings and update the NRC with release data, dose projections and meteorological data, as required by Figure 6 (F3-5) "Emergency Notification Followup Message" or as requested.

6.11 Radiation Protection Group

(1) The Shift Radiation Protection Specialist shall provide assistance (e.g., sampling, chemistry, radio-chemistry, surveys, etc.) as requested by the Shift Supervisor.

(2) The Radiation Survey Teams shall be dispatched to initiate offsite surveys as directed per F3-15 and/or F3-16.

(3) All other Radiation Survey Team members shall report to the plant site for further instructions. The Radiation Survey Team members reporting to the plant site shall:

(a) Unless directed by the Emergency Director or Radiological Emergency Coordinator, proceed to the Operational Support Center and wait for further instructions.

(b) Supervise any checks for personnel contamination and direct decontamination at the assembly point.

(c) Provide recommendations to the Emergency Director regarding radiation exposure control to ensure that applicable limits are not exceeded.

(d) Provide radiation protection coverage for:

(1) Damage control and repair teams
(2) First aid
(3) Search and Rescue Teams
(4) Reentry Teams

(e) Perform emergency sampling (air and liquid), chemistry, radio-chemistry, surveys, etc., as directed by the Emergency Director or the Radiological Emergency Coordinator.

6.12 Security Force

(1) Continue with normal duties unless otherwise notified.

(2) When the evacuation alarm sounds, all guards, with the exception of the SAS guard, evacuate to the guardhouse for further instructions.

NOTE: The SAS guard will evacuate when directed by the Emergency Director.

(3) Assist with the evacuation of personnel to the designated assembly point which will normally be the Construction Office Building, in accordance with F3-29, "Emergency Security Procedures".

NOTE: (1) It will be necessary for personnel to exit quickly thru the portal monitor and turnstile. Collect all I.D.'s and process badges so an Employee Onsite List of personnel inside Protected Area can be obtained.

(2) To speed evacuation from the Protected Area, it may be beneficial to open the vehicle gates and allow personnel to exit there.

(3) The Security Force shall ensure that all personnel onsite, within the protected area, have heard the evacuation alarm.

(4) Perform a check of all areas immediately surrounding the Protected Area so that all personnel are notified of the evacuation in progress.

NOTE: The owner Controlled Area will be checked when directed by the Emergency Director.

(5) Control access to Protected Area per instructions from the Emergency Director. Be prepared to obtain a printout for an accountability check in accordance with F3-10, "Personnel Accountability".

(6) Assist the Radiation Protection Group in establishing a secondary access control point when directed by the Emergency Director.

(7) Station a guard, with dosimetry, at the plant entrance, if conditions permit, to control access to the plant site.

6.13 Logistic Support Group

The Logistic Support Group includes the Administrative Services Group, Purchasing & Inventory Control Group and the Document Control Group.
During emergency conditions, the Logistics Support Group shall:

(1) Continue with normal duties unless directed otherwise.

(2) Immediately vacate any emergency operating center (Control Room, OSC, or TSC) when an emergency is declared.

(3) Remain clear of any areas, as announced over the public address system.

(4) When requested by the Shift Emergency Communicator (SEC), transfer control of the telephone switchboard to the TSC.

NOTE: The switchboard operator should report to the TSC to control the switchboard from the TSC until relieved by an alternate communicator.

(5) When the evacuation alarm sounds, proceed to the designated assembly point.

(6) Follow instructions from the Assembly Point Coordinator for either reentry into the plant or departure from the site property.

6.14 Instrument & Control Group

(1) The I&C Supervisor and Coordinators shall report to the Operational Support Center (OSC) to provide support for:

(a) Repair and corrective actions for instrument and control systems, and;

(b) Search and rescue efforts.

(2) The I&C Specialists shall:

(a) Continue with normal duties unless directed otherwise.

(b) Immediately vacate any emergency operating center (Control Room, OSC or TSC) when an emergency is declared.

(c) Remain clear of any areas, as announced over the public address system.

(d) When the evacuation alarm sounds, proceed to the designated assembly point.

(e) Follow instructions from the Assembly Point Coordinator for either reentry into the plant or departure from the site property.

6.15 Maintenance Group

The maintenance group consists of all maintenance personnel, plant electricians and plant helpers.

(1) The Maintenance Supervisors, Chief Station Electrician, and designated station electrician alternates shall report to the OSC to provide support for:

(a) Repair and corrective actions for mechanical and electrical systems and;

(b) Search and rescue efforts.

(2) All other maintenance personnel, electricians and plant helpers shall:

(a) Continue with normal duties unless directed otherwise.

(b) Immediately vacate any emergency operating center (Control Room, OSC, or TSC) when an emergency is declared.

(c) Remain clear of any areas, as announced over the public address system.

(d) When the evacuation alarm sounds, proceed to the designated assembly point.

(e) Follow instructions from the Assembly Point Coordinator for either reentry into the plant or departure from the site property.

6.16 Engineering Group

(1) All Superintendents, lead engineers and system experts (as requested by their supervisor) shall report to the Technical Support Center (TSC). The Engineering Group shall:

(a) Provide technical support for emergency repairs and corrective action on electrical and mechanical systems.

(b) Provide technical & engineering support for plant systems.

(c) Provide technical & engineering support for operating radioactive waste systems.

(d) Provide technical & engineering support on core parameter analysis.

(2) All other engineers (unless specifically requested to remain in the TSC) shall:

(a) Continue with normal duties unless directed otherwise.

(b) Immediately vacate any emergency operating center (Control Room, OSC, or TSC) when an emergency is declared.

(c) Remain clear of any areas, as announced over the public address system.

(d) When the evacuation alarm sounds, proceed to the designated assembly point.

(e) Follow instructions from the Assembly Point Coordinator for either reentry into the plant or departure from the site property.

6.17 Contact, Temporary Personnel and Visitors

(1) Continue with normal duties unless directed otherwise.

(2) Immediately vacate any emergency operating center (Control Room, OSC, or TSC) when an emergency is declared.

(3) Remain clear of any areas, as announced over the public address system.

(4) When the evacuation alarm sounds, proceed to the designated assembly point.

(5) Follow instructions from the Assembly Point Coordinator for either reentry into the plant or departure from the site property.

ATTACHMENT A

EMERGENCY DIRECTOR CHECKLIST

INIT

_____ (1) Determine Plant Status

_____ (2) Announce Emergency Class over PA System

_____ (3) Contact STA & SEC to report to Control Room

_____ (4) Assist SEC & sign notification report. Direct SEC to:

(a) Notify offsite authorities (F3-5)
(b) Augment onsite emergency organization (F3-5)

_____ (5) If the first notification of an emergency is a General Emergency, call the County Sheriff immediately and recommend:

(a) Activation of Public Notification System, and;
(b) Sheltering within 2 mile radius of plant

_____ (6) Assure communications established & maintained with NRC.

_____ (7) Direct Shift RPS to:

a) conduct onsite sampling, as necessary.
b) perform dose calculations, if R-50 in alarm mode.

_____ (8) Direct RPS/Plant Operations to conduct onsite/in-plant surveys, as necessary.

_____ (9) Determine need to evacuate nonessential personnel (F3-9)

_____ (10) If evacuation is necessary, designate assembly point.

(a) Designate assembly point coordinator
(b) Complete accountability within 30 minutes after evacuation (F3-10)
(c) Determine habitability of assembly area

_____ (11) The Shift Supervisor of the unaffected unit should complete a turnover to the designated Emergency Director at this point. If the designated Emergency Director is not available, proceed with the checklist.

_____ (12) Direct activation of TSC & OSC (F3-6 & F3-7) and assign the responsibility for TSC Coordinator, OSC Coordinator and REC to appropriate individuals.

ATTACHMENT A (Cont'd)

EMERGENCY DIRECTOR CHECKLIST

_____ (13) Establish communication links between onsite emergency centers

_____ (14) Dispatch offsite survey teams as necessary (F3-15 & F3-16)

_____ (15) Direct offsite dose assessment activities (F3-13)

_____ (16) Make protective action recommendations (F3-8)

_____ (17) Provide continuing updates to State EOC's

_____ (18) Authorize overexposures as necessary (F3-12)

_____ (19) Establish communications with EOF

_____ (20) Transfer offsite responsibilities to EOF

_____ (21) Determine long-term manning requirements

_____ (22) Escalate/downgrade emergency class, as appropriate

_____ (23) Review Emergency Director's responsibilities to ensure all required actions are complete.

_____ _____
Emergency Director Date/Time

ATTACHMENT B

RADIOLOGICAL EMERGENCY COORDINATOR CHECKLIST

INIT

_____ (1) Determine Plant Status

_____ (2) Determine additional TSC support required for accident assessment functions & assign, as necessary.

_____ (3) Designate Rad Protection Coordinator for OSC

_____ (4) Determine if releases are occurring

_____ (5) Obtain meteorological data & radiation monitor readings

_____ (6) Direct offsite dose projection calculations (F3-13)

_____ (7) Recommend protective action recommendations for Emergency Director (F3-8)

_____ (8) Instruct, dispatch & coordinate offsite radiation survey teams, as necessary (F3-15 & F3-16)

_____ (9) Ensure an RPS is designated to operate the EOF countroom facility and perform the required analysis, as necessary.

_____ (10) Consider plume diversion along valley if plume is traveling towards Minnesota or Wisconsin bluffs and instruct Survey Teams appropriately.

_____ (11) Instruct, dispatch & coordinate onsite radiation survey teams, as necessary (F3-14)

_____ (12) Determine RPS sampling priorities per F3-23 (number in order)

☐ Primary Sample - Pressurized/Unpressurized

☐ Secondary Sample

☐ Shield Building Stack Sample

☐ Containment Air Sample

☐ Liquid

☐ Filtered Gas

ATTACHMENT B (Cont'd)

RADIOLOGICAL EMERGENCY COORDINATOR CHECKLIST

[ ] Unfiltered Gas

[ ] Iodine/Particulate

[ ] Other

INIT

_____ (13) Establish/Maintain communications with offsite survey teams

_____ (14) Evaluate survey data and develop plume map

_____ (15) Request alternate Meteorological data and weather forecast information as necessary

_____ (16) Recommend overexposure limits to Emergency Director (F3-12)

_____ (17) Update the Radiation Protection Status Board

_____ (18) Provide periodic updates to the Emergency Director & TSC Staff

_____ (19) Update the State Health Departments (Minn & Wisc)

_____ (20) Establish/Maintain communications with the RPSS

_____ (21) Turnover the offsite survey responsibilities to the RPSS

_____ (22) Acknowledge the HPN phone and update the NRC as appropriate.

_____ (23) Review the REC responsiblities to ensure all required actions are complete

_____ _____

Radiological Emergency Coordinator Date/Time

ATTACHMENT C

TECHNICAL SUPPORT CENTER COORDINATOR CHECKLIST

INIT

_____ (1) Shut TSC Door and Start TSC Clean Up System

_____ (2) Designate an individual(s) to establish communication between TSC, OSC & Control Room.

_____ (3) Designate an individual to maintain the Emergency Director's Log.

_____ (4) Designate an individual(s) to perform a TSC personnel accountability and assist E.D. in overall plant accountability. (F3-10)

_____ (5) Activate & verify proper operation of Vamp. (F3-6 Section 4.2.1)

_____ (6) Activate & verify proper operation of CAM (F3-6, Section 4.2.2)

_____ (7) Designate an individual to operate the Data Recall System

_____ (8) Evacuate all unnecessary personnel

_____ (9) Up-date Status Boards & Personnel

_____ (10) Control use of equipment located in Emergency Locker

_____ (11) Review F3-4 & F3-6

_____ (12) Establish routine sampling & monitoring as necessary

_____ (13) Establish appropriate office space for Emergency Personnel

_____ _____
TSC Coordinator Date/Time

ATTACHMENT D

OPERATION SUPPORT CENTER COORDINATOR CHECKLIST

INIT

_____ (1) Designate an individual(s) to establish communication between OSC, TSC and Control Room.

_____ (2) Designate an individual(s) to perform an OSC personnel accountability and report results to Emergency Director.

_____ (3) Activate and verify proper operation of Vamp (F3-7, Section 4.2.1)

_____ (4) Activate & verify proper operation of the Control Room CAM (F3-7, Section 4.2.2)

_____ (5) Designate an individual(s) to control use of equipment in Emergency Lockers.

_____ (6) Evacuate all unnecessary personnel.

_____ (7) Control use of food in OSC until directed by Radiation Protection Group.

_____ (8) Establish a routine sampling and monitoring of OSC and Control Room as necessary.

_____ (9) Review F3-4 & F3-7.

_____ (10) Periodically update Status Board and Personnel.

_____ _____
OSC Coordinator Date/Time

PRAIRIE ISLAND NUCLEAR GENERATING PLANT NORTHERN STATES POWER COMPANY	EMERGENCY PLAN IMPLEMENTING PROCEDURES Number: F3-7 Rev: 3 Retention Time: History Copy Lifetime
Reviewed By: D A Schuelke Supt. Rad Protection Approved By: Plant Manager OC#: 8-26-82	TITLE: ACTIVATION AND OPERATION OF OPERATIONAL SUPPORT CENTER

1.0 PURPOSE

The Operational Support Center (OSC) is located in the Plant Operating Records Room adjacent to the Control Room. The OSC provides a central location to assemble the necessary operators, Radiation Survey Teams, I & C Supervisor and Coordinators, Chief Station Electrician, and back electricians, and Maintenance Supervisors, to support the operations of the plant during emergency conditions, without causing undue congestion in the Control Room. The Operational Support Center SHALL be activated whenever an Alert, Site Area or General Emergency is declared.

The purpose of this instruction is to describe the activation, staffing and monitoring requirements of the Operational Support Center.

2.0 APPLICABILITY

This Instruction SHALL apply to all plant personnel.

3.0 PRECAUTIONS

(a) Only those personnel designated by this Instruction or as requested by plant Supervisors, shall assemble in the Operational Support Center. All other personnel in Records Room SHALL evacuate the Records Room when the OSC is activated.

(b) All personnel assigned to the OSC SHALL remain in the OSC unless specifically directed to report elsewhere. DO NOT congregate in the Control Room.

(c) Monitoring of the Operational Support Center for direct radiation levels SHALL be performed to ensure continued habitability of the Operational Support Center.

4.0 PROCEDURE

4.1 Activation and Operation of the OSC

4.1.1 The Operational Support Center shall be activated

whenever an Alert, Site Area or General Emergency is declared. Activation may occur during normal work hours or during off-normal work hours:

(a) During normal work hours, the following personnel SHALL immediately report to the Operational Support Center, whenever an Alert, Site Area or General Emergency is announced over the Public Address System.

(1) Operations personnel onsite, but not assigned to the on-shift crew.

(2) Maintenance Supervisors

(3) Chief Station Electrician and backup electricians

(4) I & C Supervisor and Coordinators

(5) Radiation Survey Teams (unless directed otherwise by the Emergency Director or Radiological Emergency Coordinator).

(6) Anyone as requested by their supervisor or the Emergency Director.

(b) If activation occurs during off-normal work hours, the Shift Supervisor or Emergency Director shall direct the Shift Emergency Communicator (SEC) to notify and activate the onsite emergency organization in accordance with F3-5. The following personnel shall report to the OSC to establish an initial compliment of support personnel to assist in the emergency:

(1) Maintenance Supervisors

(2) I & C Supervisor and I & C Coordinators

(3) Chief Electrician and backup Electricians

(4) Radiation Survey Team Members

(5) Extra operations personnel considered necessary by the Shift Supervisor to respond to the emergency condition.

4.1.2 All non-essential personnel SHALL evacuate the Records Room when the OSC is activated.

4.1.3 Additional personnel may augment the Operational Support Center staff as deemed necessary.

4.1.4 The Operational Support Center SHALL remain activated until the emergency situation has been terminated or as otherwise directed by the Emergency Director.

4.1.5 The Operational Support Center Coordinator shall:

(a) Designate an individual to establish monitoring of OSC environment for direct radiation and operation of the Control Room CAM and take protective actions as specified in Section 4.2.

(b) Designate an individual to act as communications person for the Operational Support Center and ensure that communications have been established between the Control Room and the Technical Support Center.

(c) Perform or designate an individual to perform an OSC personnel accountability check and inform the Emergency Director of all personnel present for overall plant personnel accountability. (See procedure F3-10)

(d) Inform the Radiation Protection Group or the Radiological Emergency Coordinator (REC) of any significant changes in radiation levels.

(e) Ensure that the Radiation Protection Group has established a routine sampling and monitoring program for the OSC and the Control Room, as conditions permit.

NOTE: (1) Air Sampling for the OSC shall be completed with portable air samplers.
(2) Air Sampling for the Control Room should be completed with the Control Room CAM initially and later, backed up with portable air samples by the Radiation Protection Group.

(f) Control the use of equipment stored in the emergency locker (protective clothing, respiratory equipment, dosimeters, etc.).

(g) Conduct periodic briefings to update all personnel in the OSC of the current plant status.

(h) Control the use of food preparation in the OSC until directed by the Radiation Protection Group.

(i) Designate an individual to issue dosimetry to all individuals in the OSC and the Control Room.

4.2 Radiological Monitoring

4.2.1 Verify or establish radiological monitoring in the Operational Support Center (OSC) as follows:

(a) Direction Radiation:

1. Obtain the VAMP from the OSC Emergency Locker.

2. Plug the VAMP in and verify the white power light is on.

3. If the VAMP fails (power loss, incorrect reading, etc.) contact the Radiation Protection Group for additional radiation monitors.

4. At about 15 mR/hr, consider evacuating all non-essential personnel to a low dose rate area, such as I & C shop.

(b) Airborne Activity:

1. Ensure that air samples are being taken by the Radiation Protection Group.

2. Take the following protection action based on the particulate activity in the OSC:

$< 1 \times 10^{-9}$ µCi/cc - no protective action necessary

$> 1 \times 10^{-9}$ but $< 1 \times 10^{-6}$ µCi/cc - consider use of respiratory protection and evacuation of unnecessary personnel.

$> 1 \times 10^{-6}$ µCi/cc - evacuation to the Control Room is recommended.

3. Take the following protective action based on the iodine activity in the OSC:

at about 40 MPC hours - consider evacuation of unnecessary personnel

at 200 MPC hours - consider evacuation to the Control Room

at about 3000 MPC hours - consider use of potassium iodide pills (thyroid blocking agent)

NOTE: The Radiological Emergency Coordinator (REC) will recommend the use of potassium iodide pills (thyroid blocking agent) if the project thyroid exposure approaches 10 Rem, which is equivalent to approximately 3000 MPC hours.

4.2.2 Establish operation of the Control Room CAM.

(a) The CAM is in a hot standby condition in the back of the Control Room, with the electronics energized and the blower, chart, and filter paper off. Perform the following:

(1) Turn the blower switch (located next to the recorder) to the ON position to start the blower, strip chart recorder, and the filter paper.

(2) Adjust the blower flow rate to 3 SCFM using the toggle switch located on the right side of the CAM.

(3) Verify the CAM is in operation (i.e., verify the blower, filter, and strip charts are operating, meters are on scale, etc.).

(4) If the CAM fails to operate properly contact the Radiation Protection Group for additional sampling.

(b) Periodically monitor the Control Room CAM for airborne particulate and iodine activity.

(c) Recommend the following Protective Actions for Control Room personnel, based on reading from the CAM.

(1) CAM - Particulate

$<1x10^{-9}$ µCi/cc - no protective action necessary.

$>1x10^{-9}$ but $<1x10^{-6}$ µCi/cc - consider use of respiratory protection and evacuation of unnecessary personnel.

$>1x10^{-6}$ µCi/cc - respiratory protection required

(2) CAM - iodine (See Figure 1)

at about 40 MPC hours - consider evacuation of unecessary personnel.

at 200 MPC hours - evacuation of unnecessary personnel required.

at about 3000 MPC hours - consider use of potassium iodide pills (thyroid blocking agent).

NOTE: The Radiological Emergency Coordinator (REC) will recommend the use of potassium iodide pills (thyroid blocking agent) if the project thyroid exposure approaches 10 Rem, which is equivalent to approximately 3000 MPC hours.

4.3 Dosimetry Issue

4.3.1 An RPS should read and record dosimeter readings for each individual issued a dosimeter in the OSC and the Control Room.

4.3.2 An RP-112 (Figure 2) should be issued for each Individual issued a dosimeter.

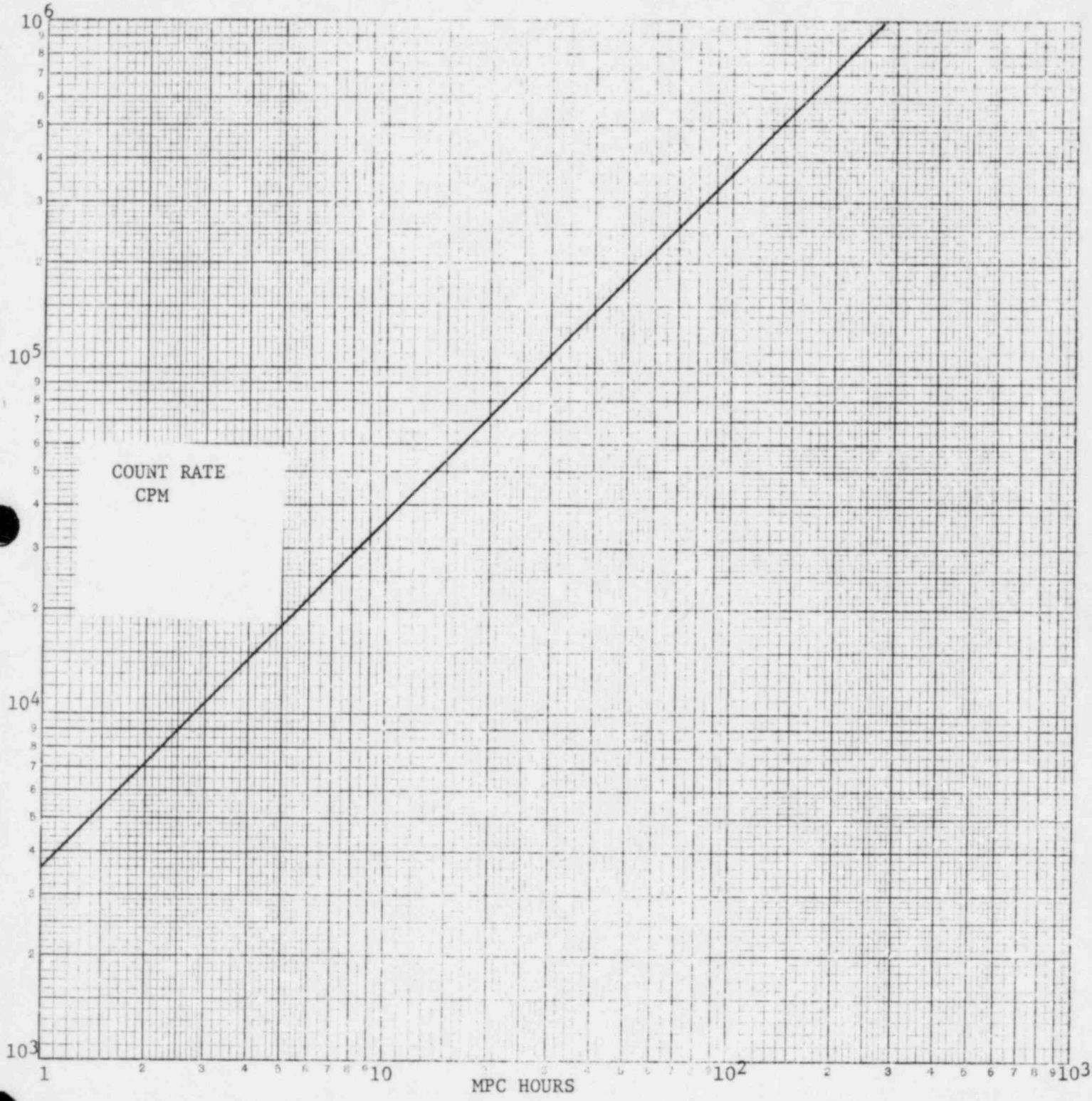
4.3.3 Dosimeters should be issued for the exposure that is to be expected.

NOTE: Radiation Protection personnel, out plant operators and other individuals expected to be involved in high exposure tasks should be issued high range dosimeters and be equipped with a dose rate instrument.

FIGURE 1

DETERMINATION OF MPC HOURS VS. INTEGRATED

COUNT RATE



NOTES: (1) Based on I-131, MPC = 9×10^{-9} µCi/cc.
(2) Curve valid only for initial period following CAM startup (0-6 hours).
(3) Curve is <u>not</u> valid for silver zeolite absorber is changed.

TIMEKEEPERS WORKSHEET RP-112 A PINGP 275 Rev. 4

Qualified to wear following respirators: ☐ CLEARVUE ☐ CLEARVUE W/AIR ☐ ULTRAVUE ☐ ULTRAVUE W/AIR ☐ NORTON ☐ HOOD

DOSE RATE (mR/Min): ________

NAME: ____________________ TLD: ____________

LOCATION: ____________________________________

PAGE: ______ OF ______

DATE	AVAIL EXP	TIME LIMIT (MIN)	TIME IN	TIME OUT		TOTAL TIME IN	DOSIM LOCATION		DOSIM IN	DOSIM OUT	EXP THIS ENTRY	AVAIL EXP	RPS INIT
							HEAD	0-1R					
								0-5R					
							CHEST	0-200					
								0-1R					
								0-5R					
							HEAD	0-1R					
								0-5R					
							CHEST	0-200					
								0-1R					
								0-5R					
							HEAD	0-1R					
								0-5R					
							CHEST	0-200					
								0-1R					
								0-5R					
							HEAD	0-1R					
								0-5R					
							CHEST	0-200					
								0-1R					
								0-5R					

EXAMPLE ONLY

USE CURRENT REVISION

The highest exposure for each entry will be used for calculating the available exposure for the next entry.

FIGURE 2

PRAIRIE ISLAND NUCLEAR GENERATING PLANT NORTHERN STATES POWER COMPANY	EMERGENCY PLAN IMPLEMENTING PROCEDURES Number: F3-9 Rev: 1 Retention Time: History Copy Lifetime
Reviewed By: D. A. Schuelke Supt, Rad Protection Approved By: Plant Manager OC#: 8-26-82	TITLE: EMERGENCY EVACUATION

1.0 PURPOSE

This procedure provides instructions for implementing an emergency evacuation of affected areas within the plant buildings or areas within the site boundaries. This procedure does not apply to evacuation of the general public located in aftected areas beyond the site boundaries.

This instruction shall apply to evacuations caused by radiological hazards, fire, toxic gas, etc.

The Emergency Director has three options for evacuation determined by the type of emergency condition and/or magnitude of the release. The options are:

1. Local Evacuation

   This is an evacuation of a specific area of a plant building to a safe area within the building.

2. Plant Evacuation

   This is an evacuation of plant buildings to a designated assembly point onsite.

3. Site Evacuation

   This is an evacuation of the plant site to a designated area offsite.

The Emergency Director (Shift Supervisor until relieved) is responsible for ensuring that an appropriate evacuation (local, plant or site) is implemented when radiological or other conditions warrant such action.

The Emergency Director shall, based on the best information available, determine that evacuation is the protective action that will result in the lowest personnel exposure.

2.0 APPLICABILITY

This instruction shall apply to all plant personnel.

3.0 PRECAUTIONS

3.1 This procedure does not apply to the evacuation of the general public located in affected areas beyond the site boundary.

3.2 The Emergency Director shall consider radiation shine from the containments as well as natural hazards when determining the habitability requirements of the assembly areas.

4.0 PROCEDURES

4.1 Local Evacuation

A local evacuation of a specific area of the plant may be necessary because of local hazards. A local evacuation shall proceed as follows:

4.1.1 Alarms/indications or visual observations indicate unacceptable conditions in an area of the plant.

4.1.2 The Emergency Director/Shift Supervisor shall direct the Control Room operator to announce over the public address system the location of the problem and any evacuation instructions, as follows:

"ATTENTION, ALL PLANT PERSONNEL. THERE IS A (hazard) OCCURRING IN (specify area). ALL PERSONNEL SHOULD EVACUATE FROM THE (specify area) AND STAY CLEAR OF THAT AREA UNTIL FURTHER NOTIFIED.

Repeat the message several times to ensure that all personnel are warned.

NOTE: During a local evacuation, the evacuation alarm should not be sounded.

4.1.3 The Emergency Director/Shift Supervisor shall ensure that all personnel have exited the specified area by completing or directing the completion of a brief search of the area.

4.1.4 The Radiation Protection Group shall assume control of entry into the area for exposure control purposes.

4.1.5 The Radiation Protection Group shall complete surveys in the area and when conditions are returned to normal, the Radiation Protection Group shall recommend to the Emergency Director or Shift Supervisor that the area be returned to normal use or relax access control to that area.

4.2 Plant Evacuation

A plant evacuation during an Alert, Site Area, or General Emergency may occur because radiological or other conditions make or potentially make large areas of the plant buildings uninhabitable. All non-essential personnel shall evacuate to a designated onsite assembly area for monitoring, accountability, and dose assessment while emergency response personnel proceed to their respective emergency operating centers.

A plant evacuation shall proceed as follows:

4.2.1 When an emergency is classified as an Alert, Site Area, or General Emergency and when conditions make large areas of the plant site uninhabitable, the Emergency Director shall order a plant evacuation.

4.2.2 The Emergency Director shall determine the wind direction and possible habitability problems at the onsite assembly areas.

NOTE: When considering the habitability requirements of the Construction Office Building, the Emergency Director should consider the radiation levels resulting from direct shine from the containments.

4.2.3 If conditions are acceptable, the Emergency Director shall inform the Control Room operator of the designated assembly area and direct the operator to sound the plant evacuation alarm.

4.2.4 Upon sounding the alarm, the operator shall announce the evacuation instructions over the public address system, as follows:

"ATTENTION ALL PLANT PERSONNEL. AN EVACUATION HAS BEEN DECLARED. ALL PERSONNEL SHALL EVACUATE TO THE (specify assembly area). ALL EMERGENCY ORGANIZATION PERSONNEL SHOULD REMAIN AT YOUR EMERGENCY OPERATING CENTERS."

Repeat the message several times to ensure that all personnel are warned.

4.2.5 The Emergency Director shall activate the onsite emergency operating centers in accordance with F3-6, "Activation of TSC" and F3-7, "Activation of OSC".

4.2.6 The Emergency Director shall implement F3-10, "Personnel Accountability". Personnel accountability shall be completed within 30 minutes.

4.2.7 The Emergency Director shall designate the Radiation Protection Group responsible for supervising any required monitoring or decontamination at the assembly point in accordance with F3-14.

4.2.8 The Emergency Director shall designate an Assembly Point Coordinator who will control operations at the Assembly point.

4.2.9 If the completion of the accountability check results in missing persons, the Emergency Director shall direct a search of the plant buildings in accordance with F3-11, "Search and Rescue" and F3-12, "Emergency Exposure Control".

4.2.10 The Emergency Director shall continuously monitor conditions at the assembly point and take action if conditions deteriorate. The Radiation Protection Group shall be responsible for establishment of a sampling program.

4.2.11 When plant conditions have stabilized, the Emergency Director shall direct a reentry into selected areas of the plant in accordance with F3-5, "Reentry".

4.2.12 The Emergency Director shall release all personnel at the assembly area when conditions allow. The Radiation Protection Group shall monitor all vehicles departing the site if contamination is highly likely in accordance with F3-14.

NOTE: Key personnel may be authorized reentry into the plant to augment the TSC and/or OSC staff when requested.

4.3 Site Evacuation

A Site Evacuation of non-essential personnal shall be required when unacceptable conditions extend outside the plant buildings to areas offsite making the normal assembly areas uninhabitable. Personnel shall be directed to evacuate to the parking lot and then using personal cars or NSP vehicles, proceed to an upwind remote assembly area which should be selected in cooperation with the Emergency Manager.

NOTE: Monitoring of personnel and equipment prior to departure from site is not necessary because of probable offsite contamination.

A site evacuation is highly unlikely but may be necessary in cases of Site Area or General Emergency when conditions worsen.

A Site Evacuation shall proceed as follows:

4.3.1 An Alert, Site Area or General Emergency condition exists and the Emergency Director has ordered an evacuation of non-essential personnel from the plant site, and the primary onsite assembly points are uninhabitable.

4.3.2 When conditions indicate that the onsite assembly areas are not habitable, the Emergency Director shall designate an area offsite for congregating non-essential personnel evacuated from the plant site. A site should be chosen in cooperation with the Emergency Manager at the Near-site EOF. (Possible upwind assembly areas are the NSP Red Wing Service Center or the Prairie Island Near-site EOF).

4.3.3 The Emergency Director shall inform the Control Room operator of the designated assembly area and the traffic routes to use and direct the operator to sound the evacuation alarm.

4.3.4 The operator shall sound the alarm and announce over the public address system:

"ATTENTION, ALL PLANT PERSONNEL. ALL PERSONNEL WITHOUT EMERGENCY ASSIGNMENTS SHALL EVACUATE THE PLANT SITE IMMEDIATELY. EVACUATE TO THE PARKING LOT AND YOUR CAR OR NSP VEHICLES AND PROCEED TO THE (specify assembly area) VIA (designated traffic route) FOR PERSONNEL MONITORING. ALL EMERGENCY PERSONNEL SHOULD REMAIN AT YOUR EMERGENCY OPERATING CENTERS".

Repeat the message several times to ensure that all personnel are warned.

4.3.5 The Emergency Director shall provide additional instructions to Guard Force personnel who will be able to advise the people as they exit the guardhouse on the proper traffic route and assembly area locations. Instruct the Guard Force to hand out evacuation instructions, Figure 1, to all personnel.

4.3.6 The Emergency Director shall implement F3-10, Personnel Accountability and direct any required follow-up actions in accordance with applicable procedures.

4.3.7 The Emergency Director shall ensure that the Guard Force has warned all personnel within the owner controlled area, including all trailers, warehouses and construction sites.

4.3.8 The Emergency Director shall direct the Radiation Protection Group responsible for personnel monitoring and decontamination at the assembly area.

4.3.9 The Emergency Director shall coordinate arrival of the evacuated personnel at the assembly area.

4.3.10 The Radiation Protection Group shall supervise all monitoring and decontamination per the guidelines of F3-19, "Personnel and Equipment Monitoring and Decontamination".

4.3.11 When conditions allow, release personnel from the assembly area or issue further instructions. Key personnel may be authorized reentry to the plant site upon request from the site emergency organization.

FIGURE 1

SITE EVACUATION INSTRUCTIONS

EVACUATION ROUTES

To Near-site EOF

1. Exit Plant Parking Lot
2. Turn left on County 18
3. Proceed to PI Training Center
4. Use West Entrance

To NSP Red Wing Service Center

1. Exit Plant Parking Lot via County 18 to Hwy 61.
2. Turn Left on Hwy 61.
3. Proceed to Red Wing
4. Turn left on Cannon River Road.
5. Turn Left on Pepin St. to NSP Service Center.

INSTRUCTIONS

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

PRAIRIE ISLAND NUCLEAR GENERATING PLANT NORTHERN STATES POWER COMPANY	EMERGENCY PLAN IMPLEMENTING PROCEDURES Number: F3-10 Rev: 2 Retention Time: History Copy Lifetime
Reviewed By: D.A. Schuelke Supt. Rad Protection Approved By: E.J. Watt Plant Manager OC#: 8-26-82	TITLE: PERSONNEL ACCOUNTABILITY

1.0 PURPOSE

The Instruction SHALL delineate the procedure to perform the personnel accountability check within the Protected Area, following a plant evacuation.

2.0 SUMMARY

In the event of a plant evacuation, the personnel accountability check within the Protected Area SHALL be completed within thirty (30) minutes following the evacuation to allow an orderly search for missing personnel. The Emergency Director is responsible for the completion of this personnel accountability and may delegate this authority to the Guard Force and the respective Coordinators at each of the emergency operating centers. All personnel accountability results SHALL be forwarded to the Emergency Director.

When the evacuation alarm sounds, the Guard Force will immediately obtain an employee onsite list from the Guardhouse Computer. All individuals evacuating the plant will have their ID badges collected by the Guard Force. If the Construction Building is the designated assembly area, the Guard Force will collect all ID badges at the Guardhouse as the personnel exit the plant site. All badges will then be inserted into the Card Readers, thus producing a Computer Printout of all remaining individuals on-site. If the Screenhouse is the Assembly Point, the Guard Force will collect all ID badges at the Screenhouse and manually check off individuals from the employee onsite list, thereby producing a roster of all remaining individuals onsite. Each coordinator at each onsite emergency operating center, including the Radiological Emergency Coordinators, will be responsible for compiling a roster of personnel remaining onsite in their respective area. Each of these rosters will then be compared to the computer printout obtained by the Guard Force, thereby either indicating all personnel accounted for or indicating missing personnel. The status of missing personnel SHALL be rechecked and appropriate searches for missing personnel initiated.

3.0 APPLICABILITY

The Instruction SHALL apply to all Emergency Directors and all Emergency Organization Coordinators.

4.0 PRECAUTIONS

(1) All individuals remaining in the Protected area following a plant evacuation SHALL be verified by a direct contact (either in person or verbally) and their location, name and TLD # recorded on the personnel accountability sheet, Figure 1.

(2) The Emergency Director SHALL ensure that this instruction is completed.

(3) When the initial accountability is completed, access to the Protected Area shall require Coordination between the Emergency Director, Radiation Protection Group, and the Guard Force to ensure an ongoing personnel accountability throughout the duration of the emergency situation.

(4) An accountability check SHALL be completed once per shift (every 8 hours) to ensure a continuous personnel accountability, or when requested by the Emergency Director.

5.0 PROCEDURE

5.1 During an evacuation, all nonessential personnel SHALL proceed to the designated assembly area.

NOTE: The designated assembly area may be either the Screenhouse or the Construction Office Building. Listen for instructions over the public address address system prior to evacuating.

5.2 When the evacuation alarm sounds, the Guard Force will immediately obtain an employee onsite list from the Security Computer.

5.3 The Guard Force SHALL collect all ID badges from personnel evacuating the plant as follows:

(a) If the Screenhouse is the designated assembly point, Security personnel SHALL proceed to the Screenhouse and collect all ID badges from personnel as they enter the Screenhouse.

(b) If the Construction Office Building is the designated assembly point, the Guard Force SHALL collect all ID badges from personnel as they pass through the Guard House.

NOTE: Evacuating personnel need not stop at the Portal Monitor in the Guard House or at Access Control.

5.4 When all ID badges have been collected, the Guards SHALL obtain a personnel accountability sheet as follows:

(a) If the Screenhouse is the designated assembly point, the Guard Force SHALL manually account for personnel by checking off the collected ID badges from the employee on-site list initially obtained when the evacuation alarm sounded. When all ID badges have been checked off, the employee onsite list should reflect only those personnel remaining within the protected area.

(b) If the Construction Office Building is the designated assembly area, the Guard Force SHALL insert all collected ID badges into the card reader, and then obtain an updated employee onsite list from the Security computer, which will list all personnel remaining within the protected area.

NOTE: The Guard Force SHALL update the computer printout indicating any personnel who may have been allowed entry or who may have exited the Protected Area after the printout was obtained.

5.5 Emergency Operating Center Coordinators, which includes:

(a) Control Room (includes Aux Bldg & Turb Bldg Operators)
(b) Technical Support Center
(c) Operational Support Center

SHALL complete a roster of personnel in their designated area. Use Figure 1, "Emergency Operating Center Personnel Accountability Check Sheet".

NOTE: The Radiological Emergency Coordinator should use this checksheet to account for all members of the Radiation Protection Group (onsite and offsite).

5.6 After all non-essential personnel at the assembly point have been checked off the Employee Onsite list, the updated Employee onsite list obtained, and the Emergency Operating Center Checksheets SHALL be brought to the Emergency Director or his designee, in the Technical Support Center.

5.7 The Emergency Director or his designee SHALL compare the Emergency Operating Center Checksheets against the Computer Printout to account for all remaining personnel onsite.

5.8 All emergency operating centers and the assembly point SHALL be rechecked for missing personnel.

5.9 If all personnel cannot be accounted for, the Emergency Director SHALL initiate a search for missing personnel, in accordance with F3-11, "Search and Rescue".

5.10 Once each shift (every 8 hours) or when requested by the Emergency Director, a personnel accountability check onsite shall be conducted as follows:

(a) Request the Guard Force to obtain current Employee onsite list from the Security computer.

(b) Request all emergency operating center coordinators, which includes:

(1) Control Room
(2) Technical Support Center
(3) Operational Support Center
(4) Radiation Protection Group

to complete a roster of personnel in their designated areas. Use Figure 1, "Emergency Operating Center Personnel Accountability Check Sheet".

(c) The Emergency Director or designee SHALL compare the Emergency Operating Checksheet against the Employee onsite list to account for all personnel onsite.

(d) Initiate a search for missing personnel in accordance with F3-11, "Search and Rescue."

FIGURE 1

EMERGENCY OPERATING CENTER PERSONNEL ACCOUNTABILITY CHECK

LOCATION: Control Room ☐ Technical Support Center ☐

Operational Support Center ☐

Radiation Protection Group ☐

Date: _____ Time: _____

NAME	TLD#	NAME	TLD#

Completed by : _____

PRAIRIE ISLAND NUCLEAR GENERATING PLANT NORTHERN STATES POWER COMPANY	EMERGENCY PLAN IMPLEMENTING PROCEDURES
	Number: F3-12 Rev: 2
	Retention Time: History Copy Lifetime
Reviewed By: D.A. Schuelke Supt. Rad Protection Approved By: [signature] Plant Manager OC#: 8-26-82	TITLE: EMERGENCY EXPOSURE CONTROL

1.0 PURPOSE

This procedure provides guidance and criteria for the authorization of personnel exposures in excess of the 10 CFR 20 limits or administrative limits during an emergency. It also delineates the procedures for follow up action following a planned or unplanned excessive exposure.

This instruction will delinate the responsibilities of the Emergency Director and Radiation Protection Group in carrying out a program of exposure control under adverse conditions.

> NOTE: The radiological controls specified in this procedure are applicable only when there are indications of fuel damage. Normal radiological control practices should be used if there is no fuel damage.

2.0 APPLICABILITY

This instruction shall apply to the Emergency Director, Shift Supervisors, and the Radiation Protection Group.

3.0 PRECAUTIONS

(1) Appropriate dosimetry equipment, which is capable of measuring the anticipated maximum exposure, shall be worn.

(2) Extremity exposure shall be controlled through the use of extremity TLD badges.

(3) An individual shall be allowed only one excessive exposure in a lifetime.

(4) Women of children bearing age shall be advised not to receive an excessive exposure.

(5) Internal exposure should be controlled through the use of respiratory equipment to every extent practical.

(6) All personnel who may exceed or have exceeded the normal exposure limits shall be made aware of the effects of significant radiation exposure and must undergo a medical evaluation of the exposure.

(7) The Emergency Director is the sole individual allowed to authorize radiation exposure in excess of normal guidelines. The Radiological Emergency Coordinator shall make recommendations to the Emergency Director.

(8) Whole body exposure should be limited to about 75 Rem for life saving activities.

(9) Volunteers above the age of 45 are recommended.

(10) Extremity Exposure should be limited to 300 Rems for life saving activities.

4.0 GENERAL DISCUSSION

The exposure of all personnel during emergency conditions shall be maintained as low as reasonably achievable (ALARA), and should be maintained less than the administrative limits of the Operations Manual, Section F2, Radiation Safety, and/or less than the 10 CFR 20 exposure limits.

During emergency conditions, normal exposure practices may have to be waived to protect equipment and/or life. The Emergency Director has the authority to authorize exposure above the normal exposure guidelines. The Radiation Protection Group shall assist the Emergency Director in exposure control.

5.0 PROCEDURE

In the event of a planned exposure in excess of the normal limits, the following procedure shall be followed. If necessary, the Emergency Director may verbally authorize increased exposure when time is a limiting factor and documentation shall be completed as a follow up.
The Emergency Director shall authorize all exposure in excess of 10 CFR 20 limits. Whole body exposure should be limited to 25 Rem for search and rescue missions and vital plant operation. Whole body exposures for life savings missions should be limited to 75 Rem.

5.1 The Emergency Director (or his designee) should complete Part I of the Emergency Exposure Authorization Form (Figure 2).

5.2 The individual (s) should complete Part II of the Exposure Authorization Form (Figure 2).

5.3 The individual (s) shall be briefed on the expected radiation levels to be encountered based on actual measured readings or expected values. Use procedure F3-25, Reentry if necessary.

5.4 The individual (s) should be briefed on the expected effects of high exposure. See Figure 2.

5.5 The individual (s) shall be instructed to use all ALARA concepts available.

5.6 The Radiation Protection Group shall issue dosimetry (TLD's, dosimeters, extremity badges) and survey meters (as applicable) to all individuals as necessary.

5.7 The Radiation Protection Group shall designate the required protective clothing and respiratory protection.

NOTE: If the use of SCBA lengthens the time required to complete the mission, it may be ALARA to not wear the respiratory protection and thereby accept a higher internal exposure, and keep the overall exposure lower. Thyroid Blocking Agents may be considered.

5.8 When the mission (emergency exposure) is completed, the Radiation Protection Group shall:

(1) Restrict the individual (s) from further exposure until the exposure evaluation is completed.

(2) Complete an exposure evaluation of each individual based on dosimetry results, measured dose rates, airborne activity measurements, whole body counts, and stay times in the area.

(3) Complete Part III of the Exposure Authorization Form.

5.9 If the dose equivalent exceeds 12 Rem whole body, 60 Rem skin, or 150 Rem extremity, the details of the exposure shall be evaluated by a physician.

5.10 If the dose equivalent exceeds 24 Rem whole body, 150 Rem skin, or 300 Rem extremity, the individual shall be examined by a physician and appropriate tests completed.

NOTE: For purposes of this procedure, the dose equivalent is exposure received from external and internal sources.

5.11 The Emergency Director shall be informed of all results including the medical evaluation if necessary.

5.12 The Radiological Emergency Coordinator should complete Part IV of the Exposure Authorization Form.

NOTE: 10CFR 20 requires NRC notification of all overexposures.

5.13 A Secondary Access Control Point should be established in accordance with F3-21 "Establishment of a Secondary Access Control Point" whenever a site evacuation is necessary.

5.14 All entries into the Aux Building should be controlled by the Radiation Protection Group through the Operational Support Center (OSC).

5.15 The Radiation Protection Specialist (RPS) stationed at the Secondary Access Control Point should write Radiation Work Permits (RWP) for all entries made beyond the Secondary Access Control Point except for Aux. Building RWP's, which should be written by the RPS in the OSC. RWP numbers should start at 5000 for the Secondary Access Control Point and 6000 for the RWP's issued in the OSC.

5.16 An RPS should accompany all entries made into areas where the radiological conditions are unknown.

5.17 All normal dosimetry should be issued at the Secondary Access Point with the exception of initial accident dosimetry.

5.18 Initial accident dosimetry should be issued in the TSC for all personnel if the dose rate exceeds about 15mR/hr. Dosimeter readings are recorded on the Emergency Center Activation Exposure Record and forwarded to the Secondary Access Control Point.

5.19 Initial accident dosimetry should be issued to all personnel in the OSC and the Control Room, whenever the OSC is activated.

5.20 When an individual approaches his maximum allowable exposure limit, his Access Control Card (RP-133) should be marked "NO FURTHER EXPOSURE". Only the Emergency Director can authorize additional exposure.

6.0 DOCUMENTATION OF EXPOSURE

6.1 Issuing TLD's.

(1) The RPS should have temporary personnel complete a NRC-4 and NRC-5 forms.

(2) The RPS should issue consecutively numbered TLD's starting at number 1100.

(3) The RPS should put the assigned number on the TLD and the Access Control Card and complete the appropriate sections of the TLD Assignments Sheets (RP-100).

(4) The RPS should calculate the individuals available quarterly exposure and record on the top line of the Access Control Card.

(a) When calculating the available quarterly exposure, the RPS should ensure the individual will not exceed 5 (N-18).

(b) An individual should be limited to 300 mRem if he doesn't have quarterly exposure history available.

(c) An individual should be limited to 1000 mRem if his quarterly exposure history is available but his lifetime exposure is unavailable.

(d) An individual should be limited to 2250 mRem in the quarter if all exposure history is available.

NOTE: The Emergency Director may authorize individuals to receive greater exposures in accordance with Section 5.0.

(5) If the individual is reporting to the OSC, the RPS at Secondary Access Control should complete a Timekeepers Worksheet (RP-112) and have the individual take it with him to the OSC.

(6) The RPS in the OSC should issue a Timekeepers Worksheet for each individual who enters the Aux Building.

(7) If the NSP Computer is available, the individual's personal and exposure data should be added to the computer exposure system as per the Radiation Protection Manual.

(8) If the computer is not available, the individual's data should be added to the Emergency Exposure Record as per Attachment A.

(9) An "X" should be placed behind the TLD number, on the TLD of anyone who is issued a TLD who has already been issued a TLD for the month when the original TLD is unavailable.

6.2 Recording Exposure

(1) After each entry into the controlled area, the RPS should read and record the dosimeter readings. The lowest range dosimeter on scale should be the reading for exposure records. The RPS should then calculate the new available quarterly exposure and record on the next line of the Access Control Card.

(2) Low range dosimeter readings should be logged in mR and high range dosimeters in R. The lowest range dosimeter should be logged on the top and the highest range on the bottom.

(3) At the end of each shift, the RPS should record the exposures from the cards, and enter in the computer as per the Radiation Protection Manual.

(4) If the computer is not available, the RPS should add the exposure to the Emergency Weekly Exposure Record as per Attachment A.

(5) The RPS should limit each individuals exposure to 3 Rems and lifetime exposure to 5 (N-18) unless the Emergency Director authorizes higher exposure.

(6) The RPS should add the exposures from the Emergency Center Activation Exposure Records to the computer system or the manual system of Attachment A.

(7) If an individual has received his maximum allowable exposure, the RPS should mark the individuals Access Control Card "NO FURTHER EXPOSURE" and place the card in the normal card use file. Authorization by the Emergency Director should be issued prior to allowing any further exposure.

ATTACHMENT A

A. Adding Individuals

(1) The RPS should record the following information on the Emergency Weekly Exposure Record (Figure 3).

(a) The individual's name, TLD number, lifetime permissible exposure and accumulated quarterly exposure.

(b) The lifetime permissible exposure is equal to 5(N-18) minus lifetime exposure. This number should be equal to the number in block 13C of the NRC-4 form.

B. Adding Daily Exposure

(1) The exposure total for the day is placed in the upper half of the block for the day.

(2) The exposure for the day is added to the previous quarterly exposure (lower half of previous days column number 3) to give the new accumulated quarterly exposure which is recorded in the lower half of the daily column number 3.

(3) New forms are started at the beginning of each week. The quarterly exposure total from column number 4 is placed in column number 2 for new week. The previous weeks total exposure is subtracted from the previous weeks lifetime permissible - column no 1 - and the resultant place in column number 1 for the new week. The weekly total can also be added to the previous weeks dose for the quarter - column number 2 - to yield the accumulated for quarter, which should be equal to the number in column number 4.

(4) The RPS shall save all exposure work for further reference and microfilming.

FIGURE 1

CRITERIA FOR EMERGENCY EXPOSURES

	WHOLE BODY	EXTREMITY	THYROID
Saving Human Life	75 Rem	300 Rem	NO LIMIT*
Protection of Health and Safety of Public (Secure vital equipment)	25 Rem	100 Rem	125 Rem
Medical Treatment, First Aid, Ambulance Service and Decon. Personnel	3 Rem		7.5 Rem

*No upper thyroid is specified for life saving activities since complete loss of thyroid function may be considered an acceptable risk for saving life. However, thyroid exposure should be minimized to the extent feasible by the use of respiratory protection and/or thyroid blocking agents.

FIGURE 2
EMERGENCY EXPOSURE AUTHORIZATION FORM

PART I

1. Name of Individual to Receive Exposure: _____
   _____
   Soc. Sec. No: _____
2. Individual TLD Number: _____
   Employer/Department: _____
3. Task(s) to be Performed: _____
   _____
4. Date of Authorization: _____
   Authorized Limit: _____
5. Conditions:
   _____ Individual is a volunteer or professional rescue person
   _____ Individual is broadly familiar with radiological consequences of exposure
   _____ Woman capable of reproduction has been advised not to take part. (Req. Guide 8.13)
   _____ Individual has not received an emergency exposure before
   _____ Dose rates in area known/measureable
   _____ Saving Human Life
   _____ Protection of Health and Safety of the Public
   _____ Protection of Property or Medical/Decontamination

6. Emergency Director: _____
   (Signature)

PART II

EFFECTS OF ACUTE EXPOSURE

Acute Dose (Rem)	Probable Effect
0-25	(a) No detectable clinical effects (b) Some reduced fertility at upper range
25-100	(a) Slight transient blood changes (b) Fatigue but no serious disability (c) Reduced to marked reduction in fertility across the range
100-200	(a) Vomiting and nausea in 25% (b) Marked changes in blood (c) Sterility for period of time (weeks)
200-300	(a) Nausea and vomiting for one day in all cases (b) Fatigue and malaise for 2 weeks (c) Full recovery in 3 months (d) Sterility for approximately one year

FIGURE 2 (CON'T)
EMERGENCY EXPOSURE AUTHORIZATION FORM

PART II (CON'T)

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

7. Signature: _____
   Date: _____

PART III (Attach exposure evaluation)

1. Dose equivalent assigned for entry: _____
   _____
   _____
2. TLD/Dosimeter Results: _____
   _____
3. Bioassay Results: _____
   _____
   _____
4. Medical Evaluation/Action: _____
   _____
   _____
   Doctor Report Attached: YES/NO
5. Rad Prot. Specialist _____
   Date: _____

PART IV

1. Disposition (Allow additional exposure, restricted access, etc.) _____
   _____
   _____
   _____
   _____
   _____
2. Radiological Emergency Coordinator: _____
   Date: _____

NOTE: 10CFR 20 requires notification of all overexposures.

FIGURE 3

EMERGENCY WEEKLY EXPOSURE RECORD

DATE:_____ TO:_____

NAME	TLD#	1 Permissible 5(n-18)-Lifetime Accumulated	2 Dose for Qtr.	3 Daily/Accumulated for Quarter							4 QTR. TOT.
				S	M	T	W	T	F	S	

The quarterly exposure limit is 3000 mRem in accident situations.

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
NORTHERN STATES POWER COMPANY

EMERGENCY PLAN IMPLEMENTING PROCEDURES

Number: F3-13 Rev: 3

Retention Time: History Copy Lifetime

Reviewed By: D. A. Schuelke
Supt. Rad Protection

Approved By: E. Watt
Plant Manager

OC#: 8-26-82

TITLE:

OFFSITE DOSE CALCULATION

1.0 PURPOSE

The projected offsite dose rates at various distances from the plant SHALL be calculated during an emergency involving a release or a potential release to the environment.

The offsite dose projections will be used by plant management and offsite officials as a basis for determining protective actions such as sheltering or evacuation when the Protective Action Guides (PAG's) are exceeded.

This Instruction SHALL describe the method to obtain the required information and to calculate the offsite dose projections at various distances from the plant, by two methods:

a. computer method, and

b. hand calculation method when the computer is unavailable.

2.0 APPLICABILITY

This Instruction SHALL apply to the Radiation Protection Group and all Radiological Emergency Coordinators.

3.0 REQUIRED EQUIPMENT

(1) Radiation Monitoring System
(2) Meteorological Equipment
(3) Apple Computer System

4.0 PRECAUTIONS

(1) Use care when reading log scales on the radiation monitors and their calibration curves.

(2) Use care when working with exponents.

(3) Use a calculator whenever possible and check all calculations.

(4) Inform the Emergency Director of all projected dose rate calculations.

5.0 PROCEDURE

5.1 Computer Method

5.1.1 When it has been determined that a release to the atmosphere has occurred or there is a potential for a release to the atmosphere, the Emergency Director SHALL designate the Radiation Protection Group responsible for projecting offsite dose rates.

5.1.2 Determine the exact flow path and the release rate from the plant.

Aux Bldg Special	8000	cfm/stack
Containment Purge	32,250	cfm
Containment In-Service Purge	4000	cfm
SFP Special	5000	cfm/stack
Steam Dump	4000	cfm
Shield Building Vent	200	cfm per train (400 cfm/stack)
PORV's	2500	cfm
SG Safeties	5500	cfm

5.1.3 Determine the concentration of activity being released from the plant by either of the following methods:

(1) Radiation Monitors: The release concentration may be determined by obtaining the count rate or dose rate from the affected radiation monitor on the release path (e.g. R-22, R-50, etc.).

NOTE: Input the Radiation Monitor reading in CPM or mR/hr into the computer. The computer will calculate the release concentration in µCi/cc.

(2) Manual Determination: The activity being released via the steam headers, the air ejectors, or the shield building vent may be determined manually, in accordance with procedure, F3-20, "Manual Determination of Radioactive Release Concentrations".

(3) Sample Analysis: Sample analysis on the release path may be used to determine the isotopes for noble gas, iodines, and particulates being released.

NOTE: See Figure 1 for complete list of Isotopes contained in the dose assessment computer library.

5.1.4 Obtain the meteorological data from the following locations:

(a) New Met Tower - (Prints out 15 minute average data on met tower printer in TSC)

(b) Alternate meteorological sources as delineated in Figure 4.

5.1.5 Perform all offsite dose rate calculations on the Apple computer in the Technical Support Center, as follows:

(1) Insert or insure that the floppy disk labeled "Met Twr Dose Calcs" is inserted into the Apple disk drive. Close the disk door.

NOTE: The computer is normally on. The monitor may or may not be on. If the computer is on and displaying met tower information in the monitor, proceed to Step (4).

(2) Insure that the computer and the monitor are plugged into 115 VAC.

(3) Turn the monitor "ON" (on-off pushbutton) and the Apple computer "ON" (rocker switch on rear, near AC cord receptacle).

(4) The computer may be in one of two modes, as denoted by the character to the left of the cursor. If there are no characters on the screen, or the cursor is not present, push "RESET". The two characters are:

a) Asterisk (*): This indicates that the computer is in machine language mode.

Then: push: "RESET"
type: "RUN DOSE"
push: "RETURN"

b) Square Bracket (]): This indicates that the computer has been loaded with basic language.

Then: type: "RUN DOSE"
push: "RETURN"

(5) If a printout of the offsite dose projections is required, verify the printer is plugged in and turned on.

(6) The computer will now display a series of questions on the monitor screen (with the required input format, such as mph, μCi/cc, CFM, etc.) which the operator must answer by inputting the data into the computer. The end of each response is signalled by pressing "RETURN".

NOTE: (a) The program is divided into several logical sections. At the conclusion of each section, the operator is asked to examine his responses and will be allowed to make corrections.

(b) Responses in any other units or form will yield invalid results. In most instances, no checking is done for input format other than a check for numeric information when requested.

(c) If a response is in alphanumeric notation or contains illegal characters, the computer will print the word "RE-ENTER" and allow the data to be re-inputed.

(7) The computer will ask for the isotopes and the concentration of each isotope being released. Enter the isotope in a format similar to the example for each of the isotopes identified. After the isotope is entered, a check is made to insure that data for that isotope has been previously stored. Upon completion of the isotope list, type "END".

NOTE: If the dose projections are based on either a potential release from containment or on radiation monitor readings, all dose projections will be based on Xe-133 equivalent.

(8) The computer will ask for iodine isotopes released and the amount of iodine (μCi) which has and is expected to be released. Enter all iodine isotopes and their respective activities. At the completion of the iodine list, type "END".

NOTE: If NO iodine analysis is available, type "NO" for the first iodine isotope. See Figure 1 for complete list of iodine isotopes.

(9) The computer will ask for the particulates released and the activity which has or is expected to be released. Enter all particulate isotopes and their respective activities. At the completion of the particulate list, type "END".

NOTE: If no particulate analysis is available, type "NO" for the first particulate isotope. See Figure 1 for complete list of particulate isotopes.

(10) The computer will compute and display projected plume centerline offsite whole body dose rates (mR/hr) due to noble gas releases at various distances from plant site (0.5 miles to 10 miles). The computer will also compute and display plume centerline doses (mR) to the thyroid when iodine is released, and a lung dose (mR) and whole body dose (mR) due to inhalation of particulates when particulates are being released. If particulates or iodines have been released, the dose assessment computer will calculate and display the projected ground deposition (dpm/100 sq. cm.) due to iodines or particulates.

(11) To repeat the projected offsite dose calculations, type "RUN DOSE" and "RETURN".

5.1.6 Report all results to the Emergency Director on a periodic basis. Inform the Emergency Director immediately of any significant projected offsite dose rates.

5.1.7 Continue to calculate the projected offsite dose rates at approximately 15 minute intervals, as per this Instruction, until the emergency situation is terminated or until such time as determined by the Emergency Director or his designee.

5.1.8 The Radiological Emergency Coordinator SHALL notify the offsite officials of all projected offsite dose rates on a periodic basis or when requested.

5.2 Hand Calculation Method

5.2.1 Centerline Whole Body Dose Rates, D_C

NOTE: Use Dose Rate Calculation Worksheets, Figure 2 and 3.

(1) Obtain the following meteorological data and insert on Figure 2:

(a) Wind Speed (mph @ Ground Elevation)
(b) Wind Direction (Degrees @ Ground Elevation)
(c) Stability Class

NOTE: Figure 4 lists various sources of meteorological data and methods of stability class determination.

(2) Using Figure 5, determine the values for $\chi U/Q$ for that Stability Class, at various distances from the plant, beginning at the site boundary (0.5 miles), out to the 10 mile boundary. List $\chi U/Q$ values on Figure 2.

(3) Determine each release path of gases and assume a release rate (R) of noble gases from the plant or estimate a potential release rate. Use the following known values. Insert those values on the calculation worksheet Attachment, Figure 3: (Use one (1) worksheet attachment for each known release path):

Aux Building Special	8,000 cfm per stack
Containment Purge	32,250 cfm
Containment In-Service Purge	4,000 cfm
SFP Special	5,000 cfm
Shield Building Vent	200 cfm per train (400 cfm/stack)
Steam Dump	4,000 cfm
PORV's	2,500 cfm
SG Safeties	5,500 cfm

(4) Determine the release concentration of Noble Gases being released from the plant for each release path, using either of the following methods, and insert those values on the appropriate calculation Worksheet Attachment, Figure 3:

(a) Obtain the count rate or dose rate from the applicable Rad Monitor. Refer to the applicable Calibration Curve to obtain the release concentration in $\mu Ci/cc$.

(b) If the applicable Rad Monitor is out of service, determine the release concentration in accordance with F3-20, "Manual Determination of Radioactive Release Concentrations".

(c) If Grab Samples have been obtained and analyzed for the Release Path, use the individual Isotopes obtained from the analysis.

NOTE: When using the Rad Monitor Reading or the Manual Determination Method (F3-20) to determine the release concentrations, the release concentration result is Xe-133 equivalent.

(5) For each Release Path, complete the calculation Worksheet Attachment Figure 3, as follows:

(a) Multiply each Isotope release concentration, C_i (μCi/cc) times its respective Whole Body dose factor, K_i.

(b) Sum the K_iC_i column.

(c) Multiply the ΣK_iC_i obtained in (b)

times the Released Rate (R) in CFM.

(d) Transfer $R\Sigma K_iC_i$ to the Dose Rate Calculation

Worksheet, Figure 2.

(6) When all the results from each Worksheet Attachment has been transferred to Figure 2, total the results to obtained $\sum_i [R_i \sum_i (K_iC_i)]$.

(7) Calculate the Centerline Whole Body Dose Rate as follows (use Calculation Worksheet, Figure 2):

$$D_C \text{ mRem/hr} = 0.12035 \frac{(\chi U/Q)}{U} \Sigma[R_i \Sigma(K_iC_i)]$$

NOTE: Complete the Dose Rate Calculation for each distance indicated, from the Plant Site (0.5 miles) out to the 10 mile boundary, or as otherwise directed by the REC.

5.2.2 Whole Body Dose Rates Off Centerline

(1) To calculate the Whole Body Dose Rate at any point off the Centerline, the Centerline Dose Rate must first be calculated in accordance with 5.2.1.

(2) Determine the Horizontal Dispersion Coefficient, σy (meters) from Figure 6, at the desired distance downwind from the Plant Site for the given Stability Class.

(3) Determine the crosswind distance, Y (meters), where the dose rate is to be determined.

| NOTE: 1 Mile = 1.6094 Km |

(4) Calculate the dose rate (mRem/hr) off the Centerline, as follows:

$$D_{point} = D_C \exp -1/2 \left(\frac{Y}{\sigma y}\right)^2$$

Where D_C = Centerline Dose Rate (mRem/hr) at a given Downwind Distance as determined by Section 5.2.1.

Y = Croswind Distance off the Centerline (meters).

σy = Horizontal Dispersion Coefficient at a given Downwind Distance for the particular Stability Class (meters). from Figure 6.

5.2.3 Calculating Thyroid Dose

(1) When sample analysis indicates that iodine has been released, determine the total amount of iodine released, in µCi.

(2) Using Figure 5, determine a value for $\chi U/Q$ (m^{-2}) based on a Downwind Distance and the applicable Stability Class.

(3) Obtain the ground level wind speed, U, in mph and convert wind speed to mps as follows:

mph x 0.447 = mps

(4) Determine the Thyroid Dose Factors, R_i, from the following table:

Nuclide	R_i mRem/yr / µCi/m
I-131	1.62 E07
I-132	5.87 E05
I-133	4.39 E06
I-134	2.50 E04
I-135	1.36 E06

(5) Calculate the Offsite Dose from Iodine (mRem) as follows:

$$D\ (mRem) = 3.17 \times 10^{-8} \frac{\chi U/Q}{U} \sum_i R_i q_i$$

Where: 3.17×10^{-8} = conversion factor (year/sec)

$\chi U/Q$ = (m^{-2} determined from Figure 5, as a function of Downwind Distance and Stability Class

U = Wind speed mps [mps = mph x 0.447]

R_i = Thyroid Dose factor ($mRem/yr/\mu Ci/m^3$]

q_i = quantity of Iodine released (μCi)

5.2.4 Off-Site Ground Deposition of Radioiodine and Particulates

(1) Determine mean wind direction. This determines applicable sectors.

(2) Determine distance in kilometers, from the plant site to point of interest. This is the R value. (Convert miles to km if necessary using 1.609 km/mile factor.)

(3) Determine deposition rate, D, from Figure 7 for R chosen.

(4) Determine fraction of release, F, from Figure 8 for R chosen.

(5) Determine amount of iodine and/or particulates released, Q, in microcuries.

(6) Find deposition of iodine and/or particulates in (dpm/100 sq. cm) at R using the following equations:

(a) Iodine: $d = 28.26[DFQ/R]$

(b) Particulates: $d = 76.52[DFQ/R]$

where d - is the deposition of radioiodine or particulates onto ground at location R (in km) from the release point. The deposition occurs in the mean wind direction downwind from the release point. The value of R determines the sector location. Equations (a) & (b) assume that the desposition in a given sector is uniform across the sector at a given R value. Units are dpm/100 sq. cm.

D - is the acceptable value of relative deposition rate (meters^{-1}) as a function of distance from the source. The relative deposition rate is the deposition rate per unit downwind distance (Ci/sec per meter) divided by the source strength (Ci/sec), and represents a plume depletion factor due to dry deposition of elemental radioiodines and other particulates. This factor is obtained from Figure 7.

F - is the acceptable value of the fraction of the release transported into the sector in question as located by the value for R and determined according to the distribution of wind direction. This factor is obtained from Figure 8.

Q - is the total radioiodine (elemental and non-elemental) or particulates released per event in units of microcuries.

R - is the distance in kilometers downwind from the release point where the deposition value is to be determined.

28.26 - is a factor which (1) accounts for only elemental radioiodine, (2) converts 22.5 degrees to radians, (3) allows R to be entered in equation (a) as km, and (4) converts $\mu Ci/m^2$ to dpm/100 cm^2.

56.52 - is a factor which (1) accounts for particulates, (2) converts 22.5 degrees to radians, (3) allows R to be entered in equation (b) as km, and (4) converts $\mu Ci/m^2$ to dpm/100 cm^2.

5.3 Total Population Exposure Estimate

(1) Obtain the Dose (D) to the Offsite Population.

(2) If sheltering is the recommended protective action in effect, obtain the sheltering factor (SF). See F3-8.

(3) From the Population Distribution Map, obtain the number of persons in the Plume Pathway (P).

(4) Calculate the Total Population Exposure (TPE) as follows:

$$TPE = D \times SF \times P$$

where TPE = Total Population Exposure
D = Dose to the Offsite Population (Rem)
SF = Sheltering Factor
P = Population in Plume Pathway

FIGURE 1

LIST OF ISOTOPES IN LIBRARY

Noble Gases	Iodine	Particulates
Kr-83m	I-131	Te-132
Kr-85m	I-132	Cs-134
Kr-85	I-133	Cs-137
Kr-87	I-134	Ru-106
Kr-88	I-135	
Kr-89		
Kr-90		
Xe-131m		
Xe-133m		
Xe-133		
Xe-135m		
Xe-135		
Xe-137		
Xe-138		
Ar-41		

FIGURE 2

DOSE RATE CALCULATION WORKSHEET

DATE _____ TIME _____

MET DATA: WIND SPEED U = _____ MPH

WIND DIRECTION _____ DEG. SECTOR _____

ΔT _____ °C STABILITY CLASS _____

DISTANCE	$\chi U/Q$	DISTANCE	$\chi U/Q$
0.5		5.0	
1.0		6.0	
1.5		7.0	
2.0		8.0	
3.0		9.0	
4.0		10.0	

$R_i \Sigma K_i C_i$ (TRANSFER RESULTS FROM WORKSHEET ATTACHMENTS)

$R_1 \Sigma K_i C_i$ = _____ $R_4 \Sigma K_i C_i$ = _____

$R_2 \Sigma K_i C_i$ = _____ $R_5 \Sigma K_i C_i$ = _____

$R_3 \Sigma K_i C_i$ = _____ $R_6 \Sigma K_i C_i$ = _____

TOTAL $\Sigma [R_i \Sigma K_i C_i]$ = _____

CALCULATE DOSE RATE AS FOLLOWS:

$$D_C = 0.12035 \frac{(\chi U/Q)}{U} \Sigma [R_i \Sigma (K_i C_i)]$$

$$D_C = 0.12035 \frac{(\quad)}{(\quad)} (\quad)$$

EXAMPLE ONLY
USE
CURRENT REVISION

DISTANCE	D_C (mR/hr)	DISTANCE	D_C (mR/hr)
0.5		5.0	
1.0		6.0	
1.5		7.0	
2.0		8.0	
3.0		9.0	
4.0		10.0	

CALCULATIONS:

COMPLETED BY

FIGURE 3

CALCULATION WORKSHEET ATTACHMENT

RELEASE PATH _____

RELEASE RATE R = _____ CFM

ISOTOPE	K_i WHOLE BODY DOSE FACTOR	C_i µCi/cc	$K_i C_i$
Kr-83m	7.56E-2		
Kr-85m	1.17E3		
Kr-85	1.61E1		
Kr-87	5.92E3		
Kr-88	1.47E4		
Kr-89	1.66E4		
Kr-90	1.56E4		
Xe-131m	9.15E1		
Xe-133m	2.51E2		
Xe-133	2.94E2		
Xe-135m	3.12E3		
Xe-135	1.81E3		
Xe-137	1.42E3		
Xe-138	8.83E3		
Ar-41	8.84E3		
		$\sum_i K_i C_i$ =	

$R \sum_i K_i C_i$ = _____

FIGURE 4

ALTERNATE METEOROLOGICAL DATA & STABILITY CLASS DETERMINATION

(1) New Met Tower (Micromet System)

ΔT (°C) 60m - 10m	σθ	Stability Class
<-.95	>23	A
-.95 to -0.85	18 - 23	B
-.84 to -.75	13 - 18	C
-.74 to -.25	8 - 13	D
-.24 to +.75	4 - 8	E
+.76 to +2.0	<4	F
>2.0		G

(2) Lock & Dam #3
Ground level wind speed and wind direction is available (24-hours/day, 365 days/year) from the Lockmaster at Lock and Dam #3.

Lockmaster - Phone # DELETED

NOTE: Stability Class is available from the National Weather Service. See Item # 4 below.

(3) Stability Class is available from the Minneapolis National Weather Service and can be obtained by either of the following methods:

(a) Weather Service Information Printer (See Attachment B)

(b) Telephone - DELETED

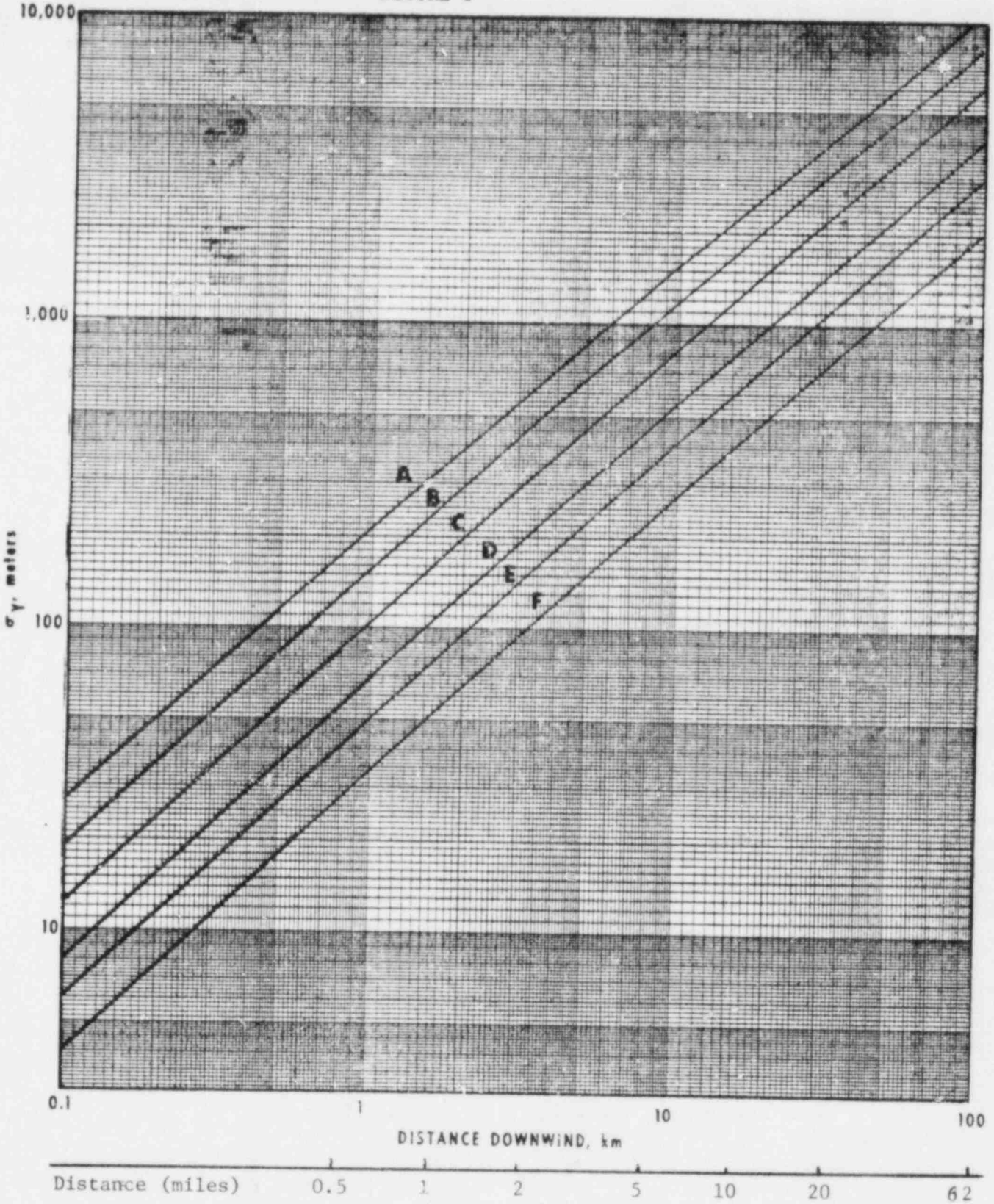
(4) GO Computer - If the Met Tower printers in the TSC are not functioning, the PI meteorological information may be retrieved from the GO Computer. See Attachment A for operating instructions.

FIGURE 5

TYPICAL VALUES FOR XU/Q AS A FUNCTION OF
ATMOSPHERIC STABILITY CLASS AND DOWNWIND DISTANCE

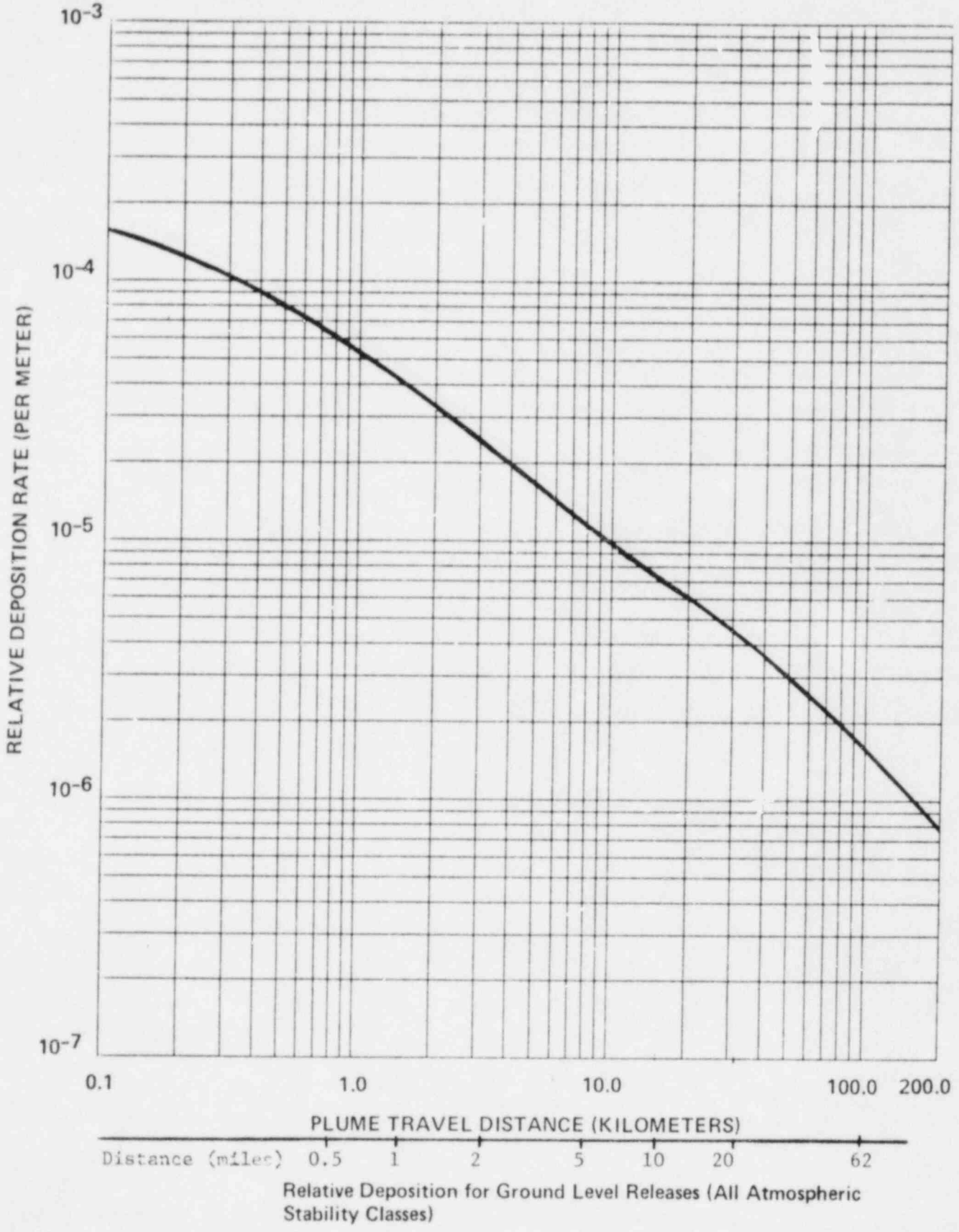
DOWNWIND DISTANCE	XU/Q (m^{-2}) AS PER STABILITY CLASS					
(Miles)	A	B	C	D	E	F
0.5	6.8E-6	2.6E-5	8E-5	2.2E-4	4E-4	9E-4
1.0	1.2E-6	5.4E-6	2.1E-5	6.8E-5	1.3E-4	2.8E-4
1.5	9.0E-7	2.9E-6	1.1E-5	4.0E-5	8.0E-5	1.7E-4
2.0	6.2E-7	1.5E-6	5.4E-6	2.2E-5	4.5E-5	9.5E-5
3.0	4.5E-7	7.5E-7	2.6E-6	1.2E-5	2.6E-5	5.5E-5
4.0	3.6E-7	4.9E-7	1.7E-6	8E-6	1.8E-5	3.8E-5
5.0	2.9E-7	3.8E-7	1.1E-6	5.9E-6	1.2E-5	2.9E-5
6.0	2.5E-7	3.1E-7	7.9E-7	4.2E-6	9.8E-6	2.2E-5
7.0	2.3E-7	2.8E-7	5.8E-7	3.3E-6	7.7E-6	1.9E-5
8.0	1.9E-7	2.5E-7	4.5E-7	2.8E-6	6.2E-6	1.7E-5
9.0	1.7E-7	2.3E-7	3.6E-7	2.2E-6	5.2E-6	1.4E-5
10.0	1.6E-7	2.1E-7	3.2E-7	1.9E-6	4.5E-6	1.2E-5

FIGURE 6



Horizontal dispersion coefficient as a function of downwind distance from the source.

FIGURE 7



Relative Deposition for Ground Level Releases (All Atmospheric Stability Classes)

FIGURE 8

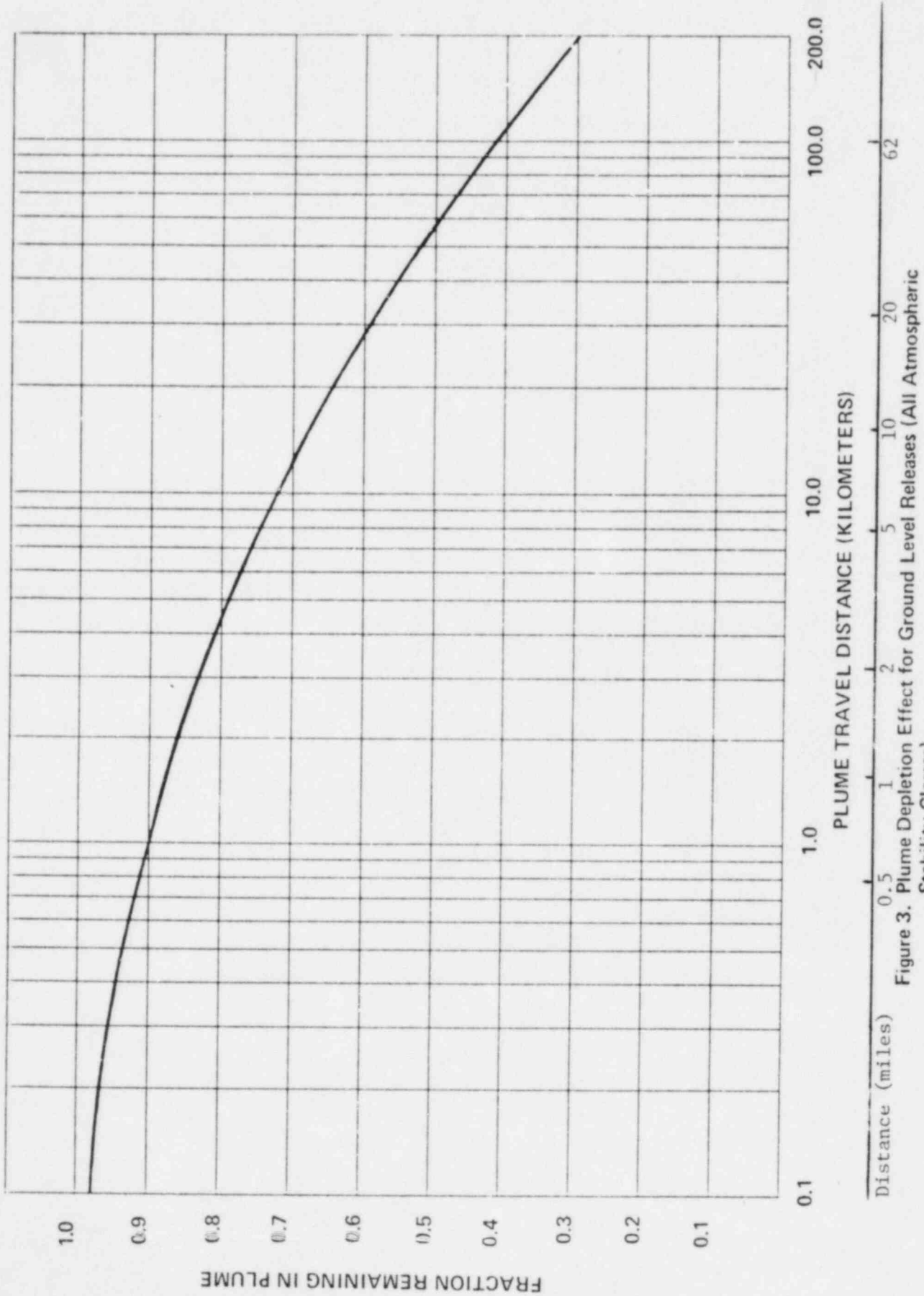


Figure 3. Plume Depletion Effect for Ground Level Releases (All Atmospheric Stability Classes)

ATTACHMENT A

MET DATA RETRIEVAL

1. Turn on TI printer. The printer "ON LINE" lite and the modem "DTR" lite should be lit.

2. Select TI printer speed:

   (a) Press "CMD" button and type "C".

   (b) Printer should respond with either:
   CONFIG: 13; 23; 32 (indicates 300 baud)
   CONFIG: 13; 25; 32 (indicates 1200 baud)

   (c) To change printer speed, type either 23 (for 300 baud) or 25 (for 1200 baud); Press "RETURN". Then press "ENTER".

3. Set modem to same speed as printer, with modem center switch:

   (a) Down = 300 baud
   (b) Up = 1200 baud

4. Modem right switch must be in VOice to dial.

5. Using plant ext. 331, dial 8-6850. When tone is heard, switch right toggle switch up to DAta and then back to center position. Hang up phone.

NOTE: No need to wait for tone change.

6. Type a "RETURN", observe printout.

7. Printer will print username. Type PRIS.SEDAR and press "RETURN".

8. Printer will print password. Type PRIS.SEDAR and press "RETURN". (Password will not print.)

9. System will display current time in JULIAN.

EXAMPLE: JULIAN Time of 81 3381042 44 is
1981
338 day
10 hour
42 minute
44 second

ATTACHMENT A (Cont'd)

MET DATA RETRIEVAL

10. Printer will now give system prompts for beginning time for report, and ending time for report. These are entered with NO SPACES in Julian time. Enter beginning time and ending time in Julian and press "RETURN".

NOTE:
Report is formatted by your input to these prompts. Therefore,
81DDDHHMM] to 81DDDHHMM] will give finest detail - 15 minutes samples
81DDDHH] to 81DDDHH] gives hourly summaries
81DDD] to 81DDD] gives daily summary
Data is normally available for a few days - could be as much as two weeks stored.

11. The General Office Computer will always call the Met Tower to retrieve latest data. This will take time with several meaningless printouts; depending upon the type of report, the time delay could be several minutes.

12. The requested report will be printed.

13. When completed, the modem will disconnect when the computer hangs up or whenever the printer is turned off.

14. Leave modem right switch in the center position.

ATTACHMENT B
WEATHER INFORMATION SERVICE

1. Turn on TI printer. The printer "ON LINE" lite and the modem "DTR" lite should be lit.

2. Select TI printer speed:

   (a) Press "CMD" button and type "C".

   (b) Printer should respond with either:
   CONFIG: 13; 23; 32 (indicates 300 baud)
   CONFIG: 13; 25; 32 (indicates 1200 baud)

   (c) To change printer speed, type either 23 (for 300 baud) or 25 (for 1200 baud); Press "RETURN". Then press "ENTER".

3. Set modem to same speed as printer, with modem center switch:

   (a) Down = 300 baud
   (b) Up = 1200 baud

4. Modem right switch must be in VOice to dial.

5. Using plant ext. 331, dial 8-9-341-2459. When tone is heard, switch right toggle switch up to DAta and then back to center position. Hang up phone.

NOTE: No need to wait for tone change.

6. Press return twice.
   Printer will print: Telenet
   Terminal =

7. Type: D1
   Press return
   Printer will print: @

8. Type: C 617133
   Press return
   Printer will print: 617 133B connected

9. Press return
   Printer will print: Please Log In

10. Type: LOGIN NSP
    Press return
    Printer will print: PASSWORD:
    XXXXXX

ATTACHMENT B (Con't)

WEATHER INFORMATION SERVICE

11. Type: POWER
Press return (Note: Password will not print)
Printer will print: Logged into weather service ____
_____
_____
+

NOTE: The + sign will always indicate that the computer is waiting for instructions.

12. Type command for desired weather information, as follows:

(a)	Wind speed & direction map	Type: MWQ A Press return
(b)	Weather-sky cover	Type: MWQ X Press return
(c)	Precipitation last 6 hours	Type: MWQ (Press return
(d)	Last hour radar map showing intensity of precipitation	Type: RADMAP MSP Press return
(e)	Forecast	Type: ZONES MN Press return
(f)	PASQUILL Stability Index	Type: -PASQ MSP Press return
(g)	SPECIAL LOG P.I.	Type: -REDW Press return

13. When finished:
Type: LOGOUT
Press return
Printer will print: Logged Out from WSI
------ Disconnected

14. Turn Printer Off

15. Leave modem right switch in the center position.

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
NORTHERN STATES POWER COMPANY

EMERGENCY PLAN IMPLEMENTING PROCEDURES

Number: F3-14.1 Rev: 2

Retention Time: History Copy Lifetime

Reviewed By: D. A. Schuelke
Supt. Rad Protection

Approved By: D J Wuhl
Plant Manager

OC#: 8-26-82

TITLE:

ONSITE RADIOLOGICAL MONITORING

1.0 PURPOSE

The purpose of this instruction is to delineate the responsibilities of the onsite Radiation Survey Team in radiation exposure control (inplant and out of plant), contamination control, respiratory protection control, and food and water control.

The Radiation Survey Team will be available onsite within 30 minutes after the emergency has been declared to augment the shift Radiation Protection Specialist. The Radiological Emergency Coordinator (REC) will direct the onsite response actions of the Radiation Survey Team. Additional Radiation Protection personnel will assume onsite responsibilities when they are relieved of offsite sampling responsibilities by sister plant personnel.

2.0 APPLICABILITY

This instruction is applicable to all Prairie Island Radiation Protection Group members.

3.0 PRECAUTIONS

3.1 The Radiological Emergency Coordinator shall control all radiological exposures (internal and external) occuring onsite as per F3-12 "EMERGENCY EXPOSURE CONTROL".

3.2 Radiological conditions may be such that a secondary access control point is necessary. See procedure F3-21, "ESTABLISHMENT OF A SECONDARY ACCESS CONTROL POINT".

4.0 PROCEDURE

The Emergency Director shall direct the Radiological Emergency Coordinator (REC) to assume responsibility for onsite radiological controls in the following areas:

4.1 Radiation Exposure Control

4.1.1 Upon activation of the onsite emergency organization, the onsite Radiation Survey Team shall perform radiation surveys (Beta and Gamma) in various onsite areas of the plant (in plant and off plant) on a routine basis or a job specific basis ensuring that no unexpected radiation levels are encountered by emergency response personnel.

NOTE: Calculated radiation levels following a design basis accident are contained in F3-25, "REENTRY".

4.1.2 The Radiation Survey Team shall perform Beta-Gamma radiation surveys (in plant and out of plant) as follows:

(1) Energize instrument, observing proper precautions for cold weather (Figure 2) when conducting out of plant surveys.

NOTE: All instruments should be response checked prior to use.

(2) Allow the instruments to stabilize and complete any specific instructions for the instrument.

(3) Turn the instrument to the highest range and scale down until a reading is observed.

(4) Open the probe window and scan the area for a Beta-Gamma reading. This is the "Window Open" reading.

(5) Close the probe window and scan the area for a Gamma reading. This is the "Window Closed" reading.

(6) Calculate the Gamma and Beta dose reading as follows:

Gamma (mRem/hr) = Window Closed Reading
Beta (mRem/hr) = CF times (window open reading-window closed reading)
Where CF = Beta correction factor for instrument. If none is available, use five (5).

NOTE: The Beta dose rate is reported in mRem/hr assuming a quality factor of 1.

4.1.3 Record survey results (Beta-Gamma) on survey maps and report results to REC. Use Figures 3 through Figures 11 or use the normal in plant survey maps.

NOTES: (1) β radiation levels indicate high level contamination or airborne activity. (2) β readings greater than 100 mRem/hr requires SCBA. (3) Use a PIC-6A or RO-2A while performing surveys onsite but out-of-plant. A β plus γ reading indicates the plume has been encountered. A γ reading with no β indicates the plume is elevated or displaced. DO NOT linger in the plume longer than necessary.

4.1.4 The REC shall review all survey results and advise the Emergency Director of significant radiation levels.

4.1.5 Survey results shall be reviewed prior to any entry into any areas of high radiation levels.

4.1.6 The REC shall control all radiation exposure in accordance with F3-12 "EMERGENCY EXPOSURE CONTROL".

4.1.7 The Radiation Survey Team should post all areas of high radiation and implement any further controls restricting entry to the area.

4.1.8 The Radiation Survey Team shall specify the dosimetry necessary for entry into high radiation areas of the plant and write RWP's for entry.

4.2 Contamination Control

4.2.1 Upon activation, the onsite Radiation Survey Team shall perform Beta-Gamma Contamination Surveys in various

areas of the plant on a routine basis or a job specific basis ensuring that contamination is controlled within the limits of Figure 1.

4.2.2 The Radiation Survey Team shall perform surveys for loose surface Contamination (Beta-Gamma) via smear samples on the suspected area. The smear samples shall be counted using the various equipment available.

4.2.3 Survey results shall be recorded on floor plans and routed to the REC for review.

4.2.4 The Radiation Survey Team should post all areas exceeding the limits of Figure 1 and implement any controls required to restrict entry into the area.

4.2.5 Survey results shall be reviewed prior to any entry into an area of high contamination.

4.2.6 The Secondary Access Control Point RPS should specify all protective clothing requirements for entry into highly contaminated areas of the plant.

4.2.7 The Secondary Access Control Point RPS shall ensure that all personnel are properly monitored prior to departure into an uncontrolled area of the plant. See F3-19 "PERSONNEL AND EQUIPMENT MONITORING AND DECONTAMINATION" for requirements.

4.2.8 All equipment and vehicles exiting the controlled area of the plant shall be surveyed by the Radiation Survey Team for loose and fixed surface contamination as determined by the REC. See F3-19, "PERSONNEL AND EQUIPMENT MONITORING AND DECONTAMINATION" for requirements.

4.2.9 Any necessary decontamination shall be performed in accordance with F3-19, "PERSONNEL AND EQUIPMENT MONITORING AND DECONTAMINATION".

4.3 Respiratory Protection Program

During an emergency situation, it may become necessary to expose personnel to airborne activity levels in excess of established limits resulting in some internal exposure. Communication difficulties, large numbers of people and possible large areas of high airborne activity may negate the use of respiratory protection equipment. In addition, personnel may be exposed to airborne activity from an unexpected source. The Radiological Emergency Coordinator

shall institute a whole body count/bioassay program for all personnel suspected as having been exposed to airborne activity significantly above MPC concentration. This may or may not be coordinated with a Thyro-Block distribution program.

4.3.1 The Radiation Survey Team should collect routine and/or job specific airborne samples (particulate, iodine, and gas) to determine respiratory equipment requirements.

4.3.2 The airborne samples should be collected and analyzed in accordance with F3-15, "RESPONSIBILITIES OF SURVEY TEAMS DURING AIRBORNE RELEASES", if the count room and mobile trailer are not available.

NOTE: In case of station blackout, the OSC locker contains a battery powered air sampler.

4.3.3 The secondary Access Control Point RPS should specify the respiratory protection requirements for entry into any area of high airborne activity.

NOTE: It may be such that a respirator would cause additional work time resulting in a higher whole body dose. It may be beneficial not to wear a respirator, thereby accepting a higher internal dose with a lower whole body dose. In coordination with this, Thyroid-blocking agents could be used as a dose reduction method.

4.3.4 The REC shall implement a whole body counting program for personnel who have or may have exceeded the normal MPC hour limits (40 in a week or 260 in a quarter).

NOTE: If the Prairie Island whole body counter is not available, the REC shall make arrangements for a mobile whole body counter or direct the use of Monticello facilities.

4.3.5 The REC should evaluate whole body count results and determine if any further evaluation is necessary such as urinalysis and/or fecal analysis.

4.3.6 All whole body count results shall be filed for future evaluation in cases where other followup actions are required.

NOTE: Whole body count results exceeding 25% body burden require the calculation of the resultant whole body exposure which shall be added to the individual's exposure history.

4.4 Food and Water Control

The Radiological Emergency Coordinator shall control the use of all food and water onsite, following a plant evacuation when large areas of the plant site could possibly be contaminated to significant levels.

4.4.1 Food

(1) Following a plant evacuation, the Radiation Survey Team should restrict entry into food storage and preparation areas of the plant. These areas (lunchrooms, records room, etc.) should be posted as such.

(2) The Radiation Survey Team should perform contamination surveys in these areas and ensure that the areas are free of detectable contamination, defined as:

(a) < 100 dpm/100cm^2 Beta-Gamma

(3) Additionally, some random items of food should be analyzed for low level contamination using the Gamma Spectrometer system.

(4) The REC should review the survey results and take the following appropriate action:

(a) release the food for use
(b) dispose of the foods as radioactive waste
(c) restrict entry into food storage areas until the area has been deconned to acceptable levels

4.4.2 Water

(1) The REC should control the use of all water supplies used for human consumption.

(2) The Radiation Survey Team should periodically sample and analyze the potable water system for contamination. Sample results shall be reported to the REC.

(3) In addition, the Radiation Survey Team should control the use of all drinking utensils and coffee pots.

(4) The REC should evaluate the plant conditions and sample results and release the potable water system for unrestricted use when it is deemed safe.

FIGURE 1

CONTAMINATION LIMITS

		EMERGENCY GUIDELINES		
	NORMAL	BODY	ITEMS DIRECTLY ASSOCIATED WITH BODY	ITEMS NOT DIRECTLY ASSOCIATED WITH BODY
REMOVABLE $dpm/100cm^2$				
β-γ	100	100	1100	2200
α	10	10	110	220
FIXED	100cpm	100cpm	0.75 mr/hr	1.5 mr/hr

NOTES: (1) "Items Not Directly with the Body" may include floors, roads, vehicles, truck, or trailer beds, or tires, etc.

(2) "Items Directly associated with the Body" may include desks, chairs, high traffic area floors, equipment being handled by hands.

FIGURE 2

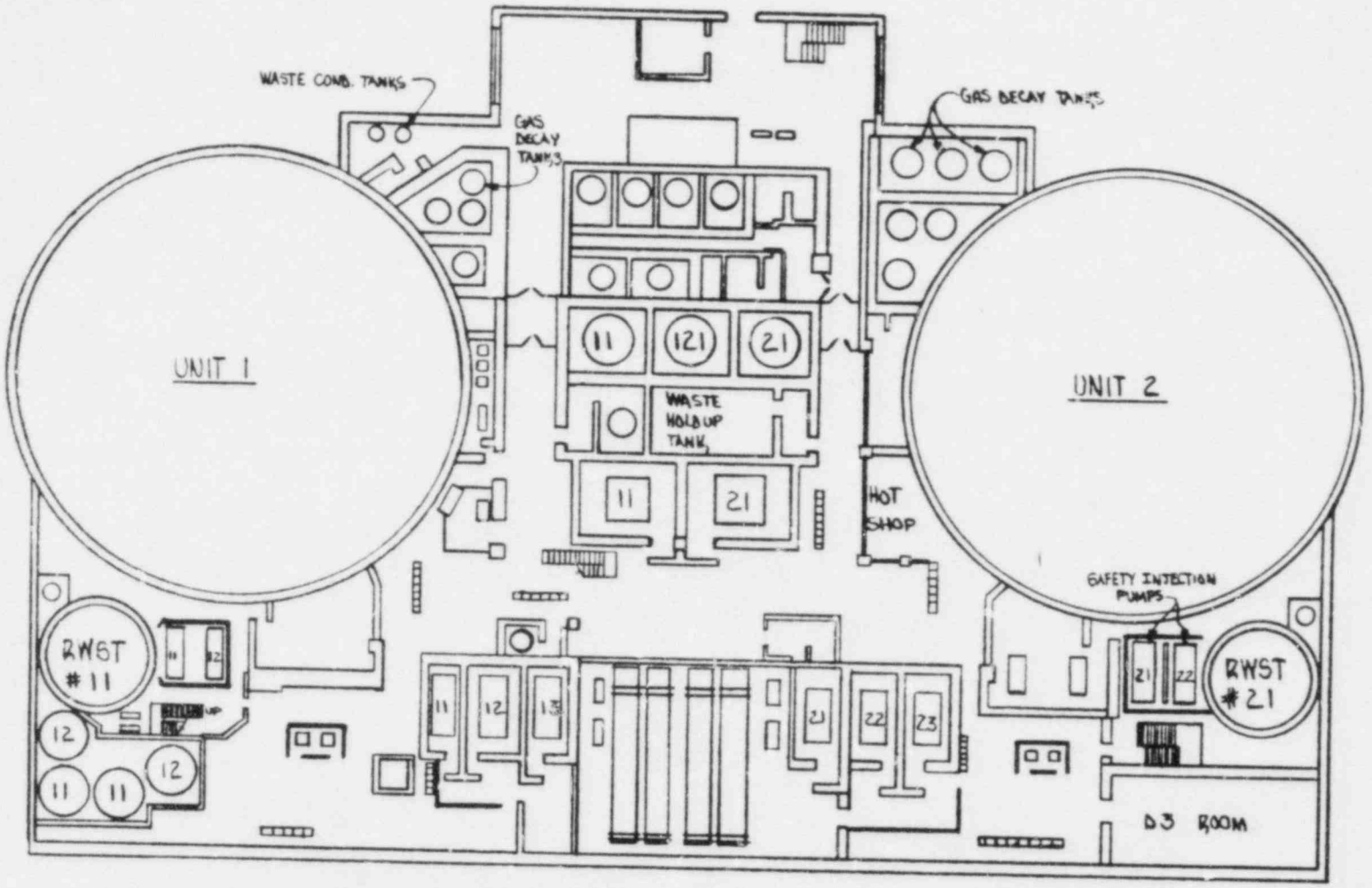
COLD WEATHER OPERATION

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

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

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

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



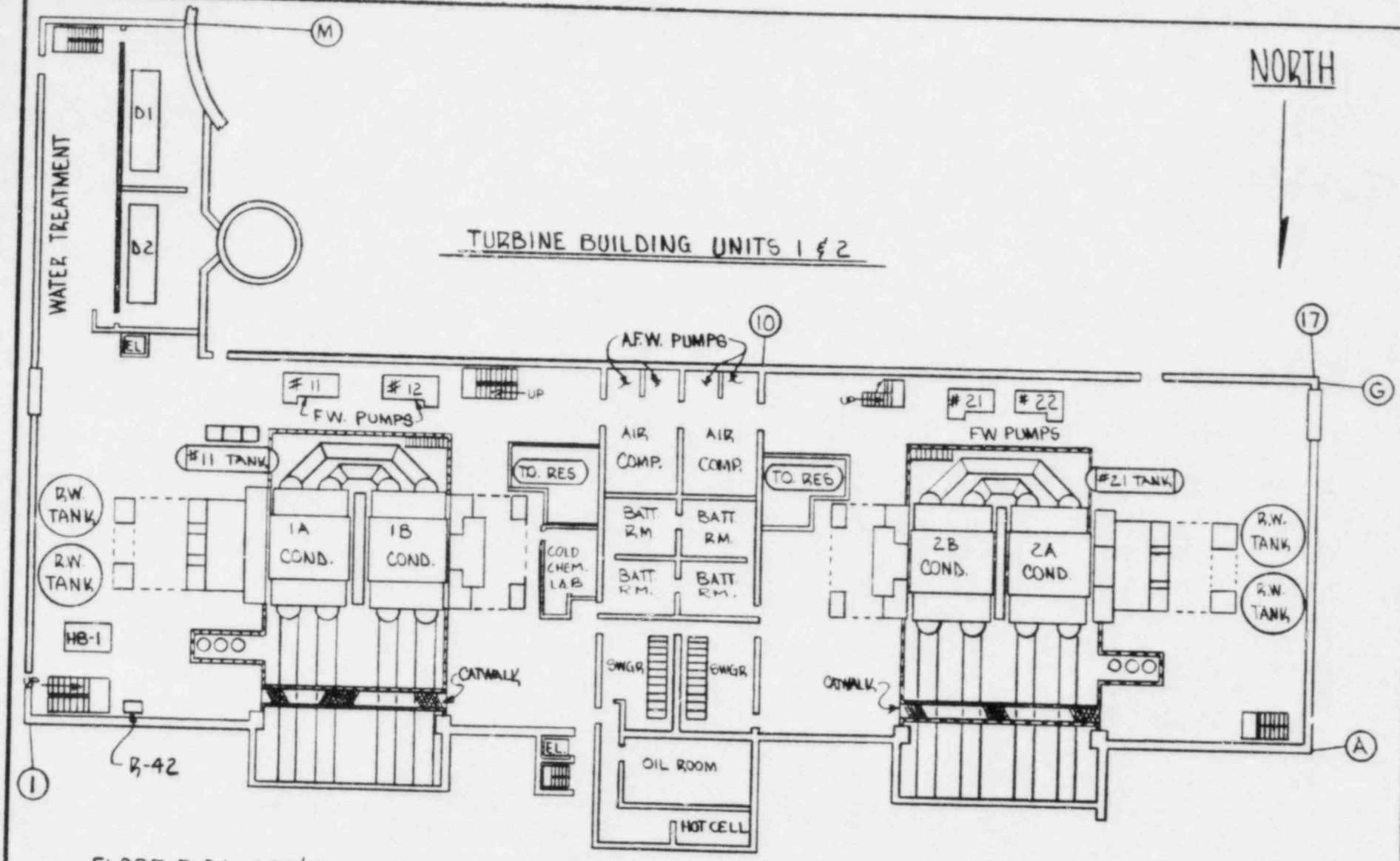
Date: _____ Time: _____

RPS _____

PRAIRIE ISLAND NUCLEAR GENERATING STATION
AUXILIARY BUILDING
GROUND FLOOR EL:695'-0"

SCALE	DWN. CDZ	DATE	DWG.No.
~	CHK.	5-6-82	

FIGURE 3



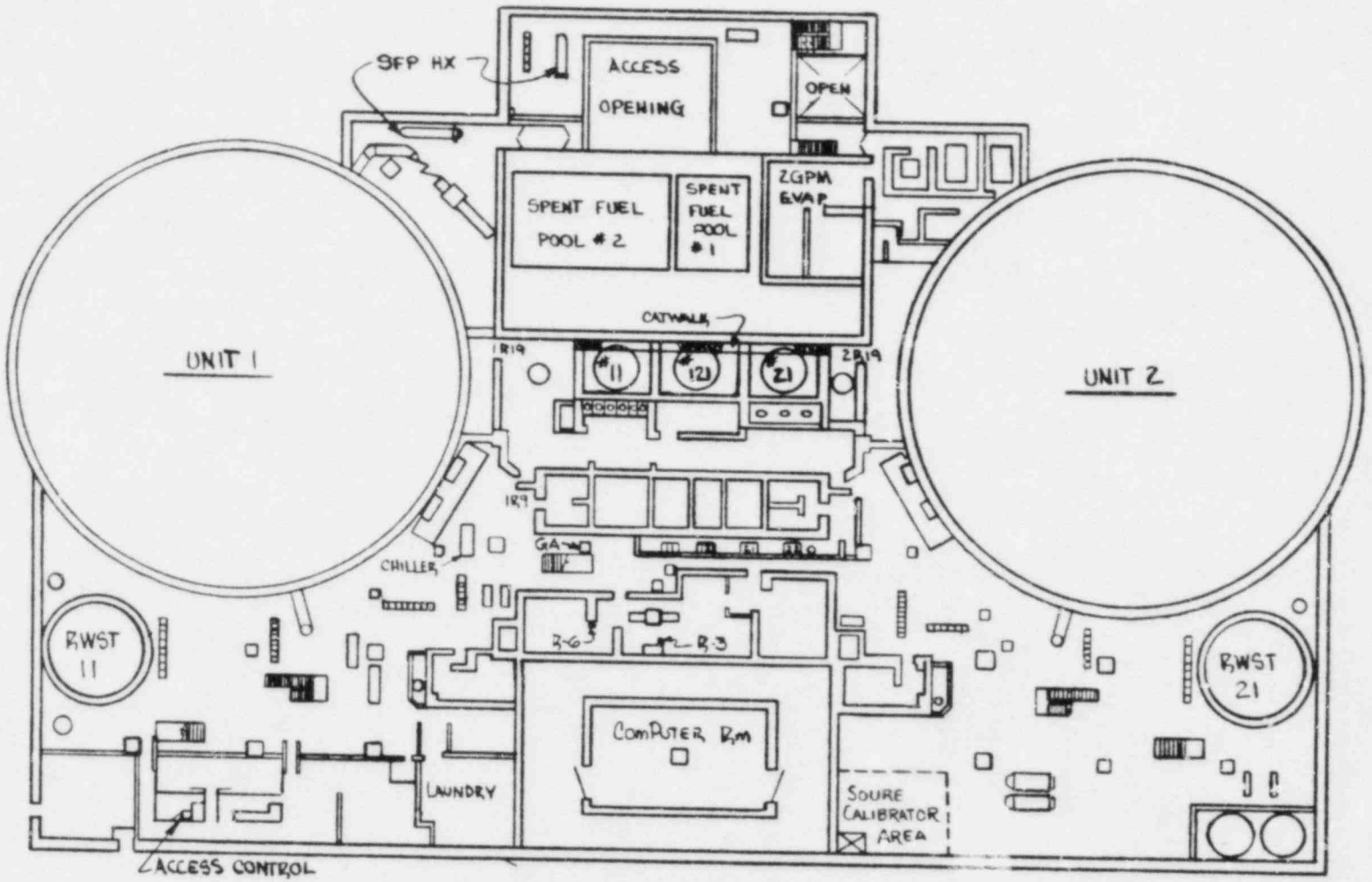
FLOOR ELEV. 695'-0

Date: _____ Time: _____

RPS _____

PRAIRIE ISLAND NUCLEAR GENERATING STATION TURBINE BUILDING UNITS 1 & 2 GROUND FLOOR EL. 695'-0"			
SCALE ~	DWN: COX CHK:	DATE 4-5-82	DWG. NO.

FIGURE 4



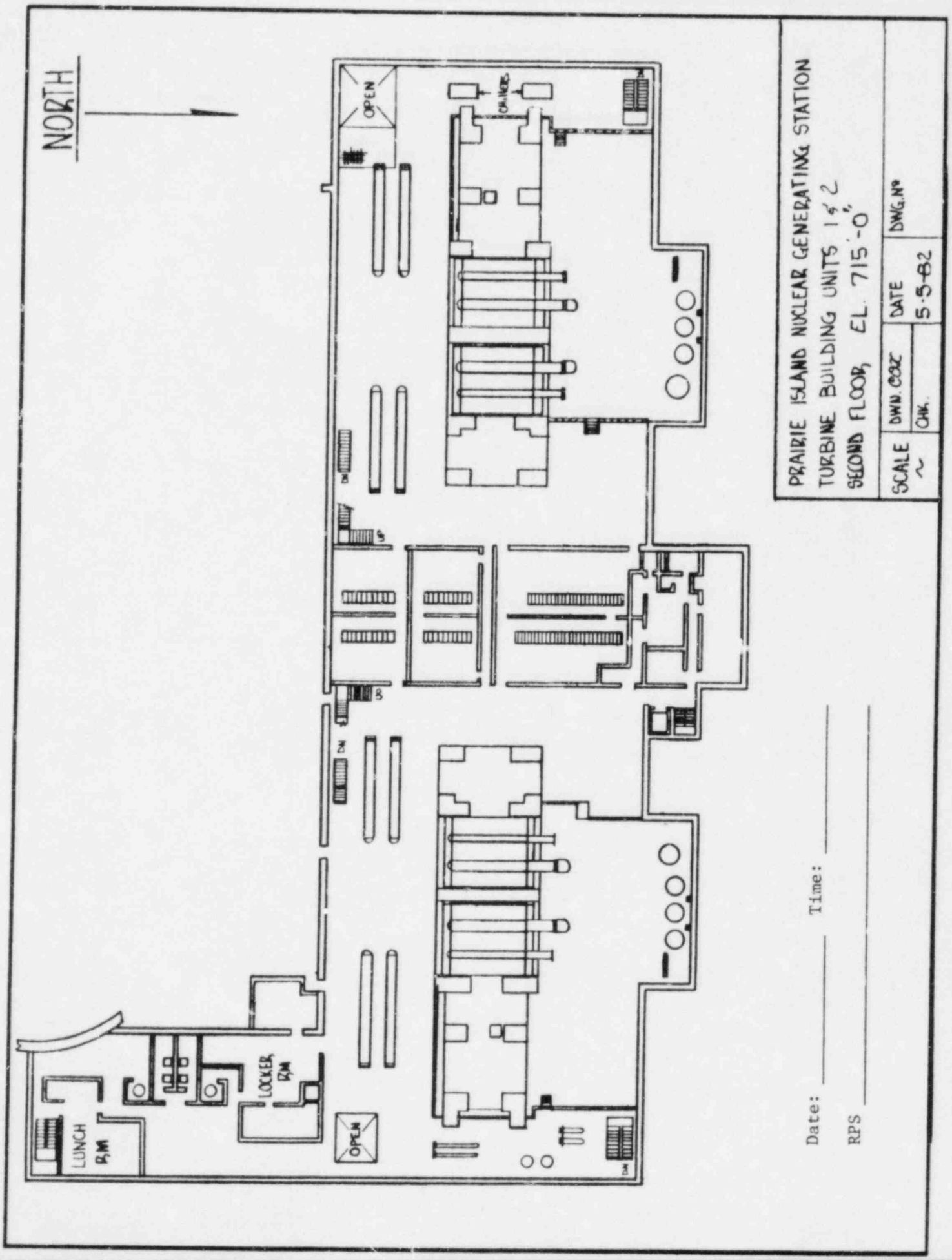
Date: _____ Time: _____

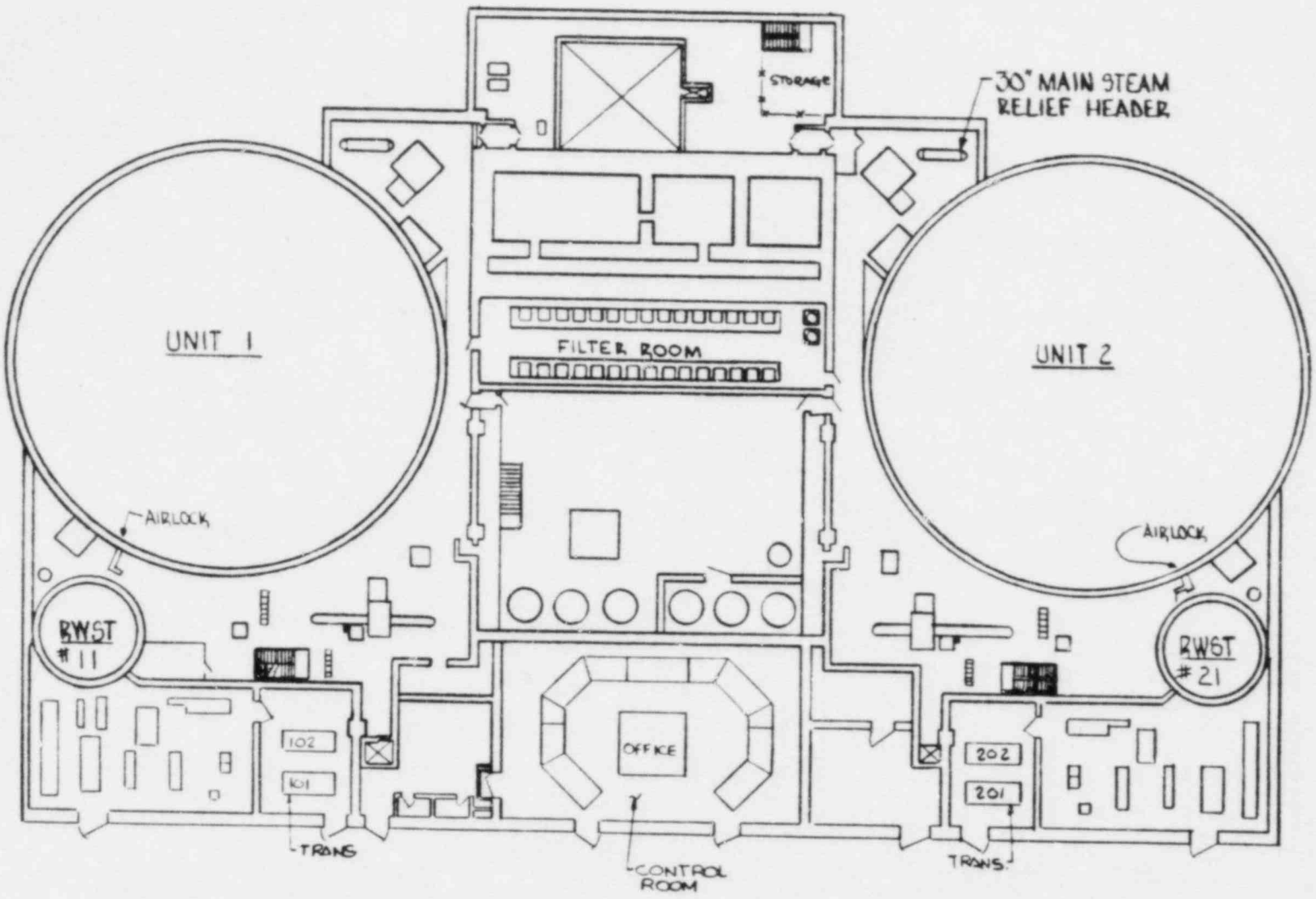
RPS _____

PRAIRIE ISLAND NUCLEAR GENERATING STATION AUXILIARY BUILDING SECOND FLOOR EL. 715'-0"			
SCALE ~	DWN COX CHK	DATE 5-7-82	DWG Nº

FIGURE 5

FIGURE 6


NORTH
OPEN
LUNCH RM
LOCKER RM
OPEN
PRAIRIE ISLAND NUCLEAR GENERATING STATION
TURBINE BUILDING UNITS 1 & 2
SECOND FLOOR, EL. 715'-0"
SCALE ~
DWN. CGZ
CHK.
DATE 5-5-82
DWG. NO
Date: _____ Time: _____
RPS _____



Date: _____ Time: _____

RPS _____

PRAIRIE ISLAND NUCLEAR GENERATING STATION AUXILIARY BUILDING THIRD FLOOR EL. 735'-0"			
SCALE ~	DWN. COX CHK.	DATE 5-7-82	DWG Nº

FIGURE 7

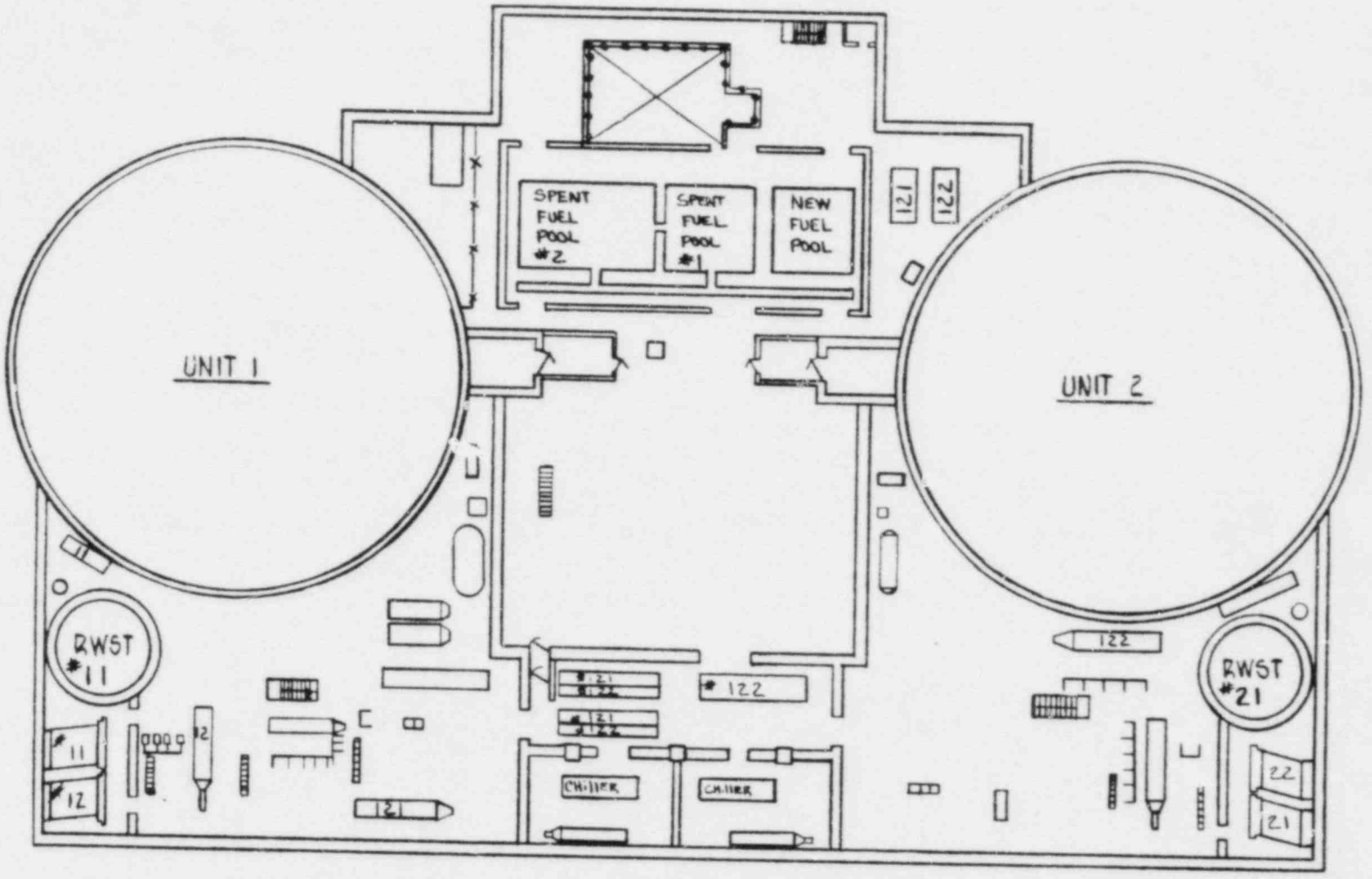


FIGURE 8

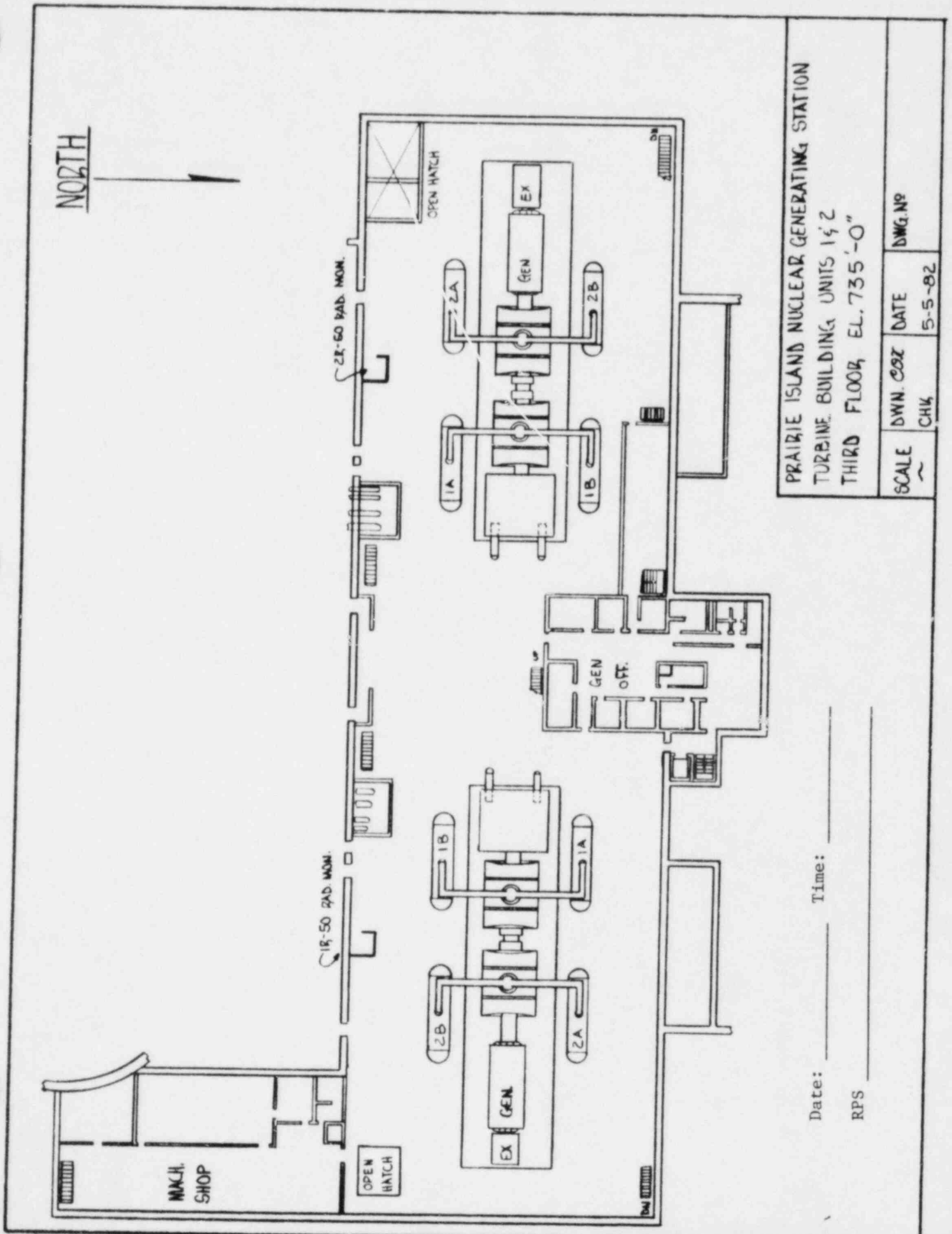
Date: _____ Time: _____

RPS _____

PRAIRIE ISLAND NUCLEAR GENERATION STATION
AUXILIARY BUILDING
FOURTH FLOOR EL. 755'-0"

SCALE	DWN. CGL	DATE	DWG Nº
~	CHK	5-7-82	

FIGURE 9


NORTH
PRAIRIE ISLAND NUCLEAR GENERATING STATION
TURBINE BUILDING UNITS 1 & 2
THIRD FLOOR EL. 735'-0"
SCALE
DWN. CBK
CHK
DATE
5-5-82
DWG. NO
Date:
Time:
RPS
OPEN HATCH
2R-60 RAD. MON.
EX
GEN
2A
2B
1A
1B
GEN OFF.
1R-50 RAD. MON.
1B
1A
2B
2A
EX
GEN
OPEN HATCH
MACH. SHOP

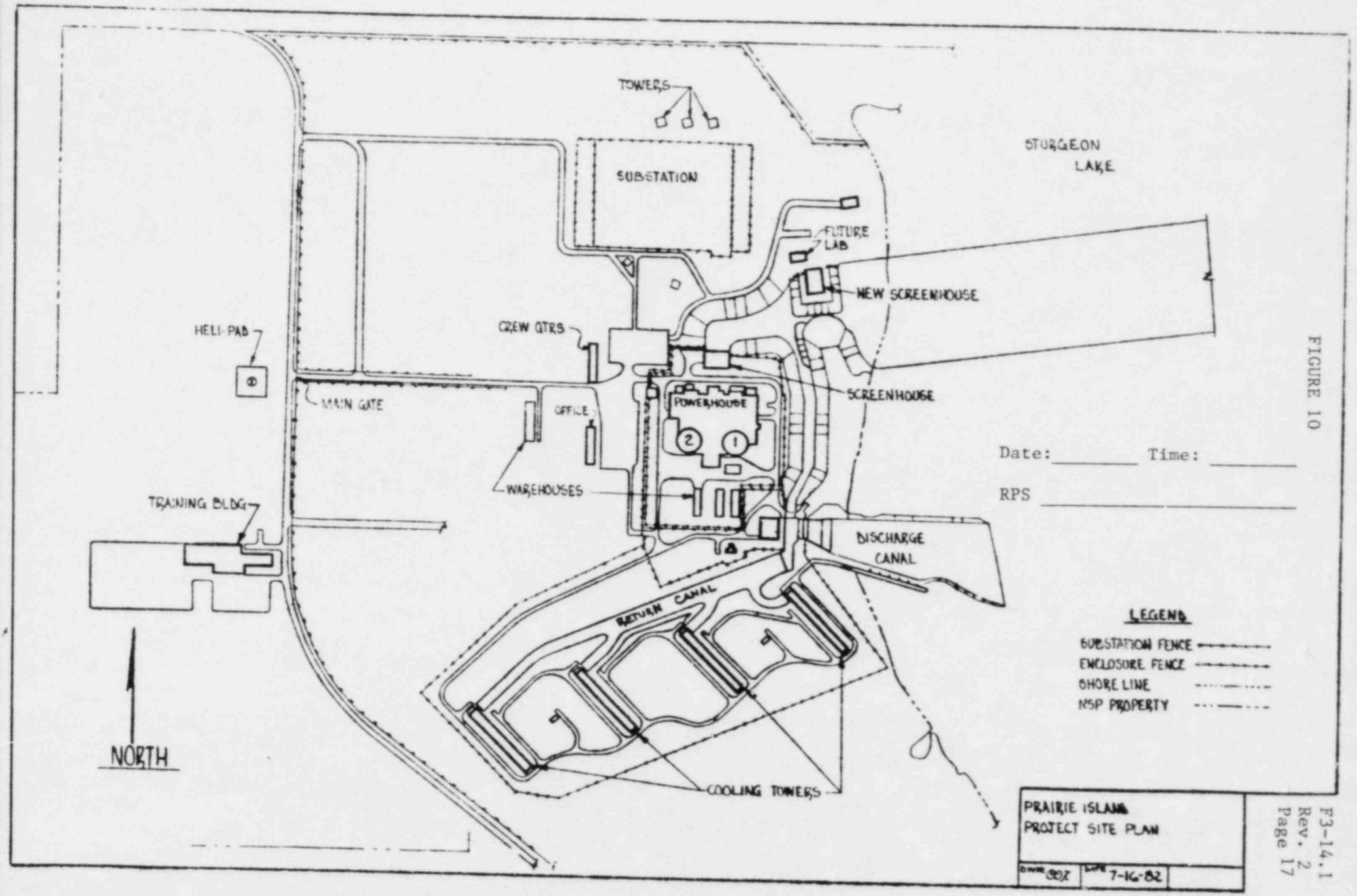

TOWERS
SUBSTATION
STURGEON LAKE
FUTURE LAB
NEW SCREENHOUSE
HELI-PAD
CREW QTRS
SCREENHOUSE
MAIN GATE
OFFICE
POWERHOUSE
2
1
WAREHOUSES
TRAINING BLDG
DISCHARGE CANAL
RETURN CANAL
NORTH
COOLING TOWERS
LEGEND
SUBSTATION FENCE
ENCLOSURE FENCE
SHORE LINE
NSP PROPERTY
Date: _____ Time: _____
RPS _____
PRAIRIE ISLAND
PROJECT SITE PLAN
DWN SDL
DATE 7-16-82

FIGURE 10

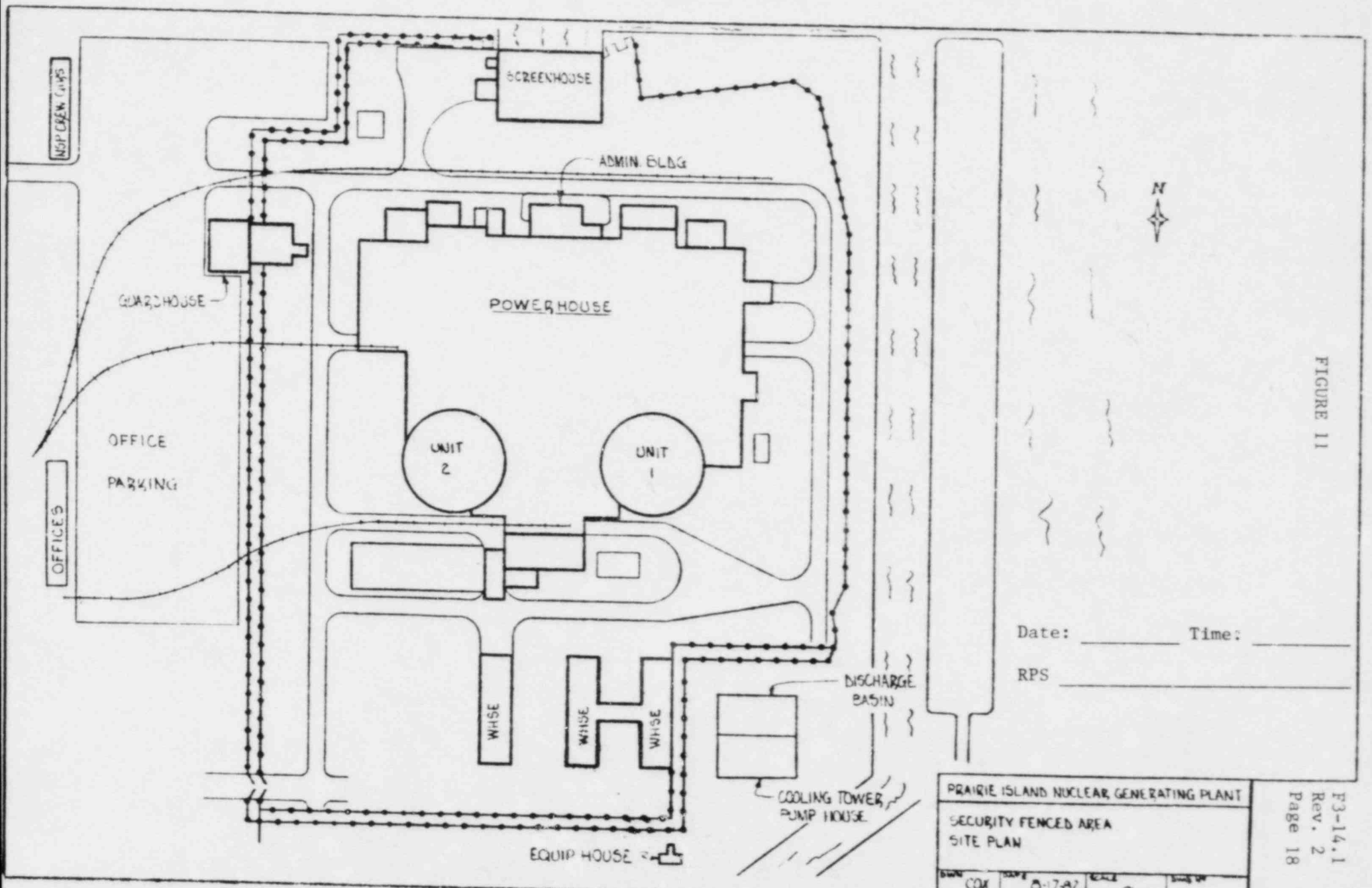

SCREENHOUSE
ADMIN. BLDG.
GUARDHOUSE
POWERHOUSE
OFFICE
PARKING
OFFICES
UNIT 2
UNIT 1
WHSE
WHSE
WHSE
DISCHARGE BASIN
COOLING TOWER PUMP HOUSE
EQUIP HOUSE
N
Date: _____ Time: _____
RPS _____
PRAIRIE ISLAND NUCLEAR GENERATING PLANT
SECURITY FENCED AREA
SITE PLAN
COX
8-17-82

FIGURE 11

PRAIRIE ISLAND NUCLEAR GENERATING PLANT NORTHERN STATES POWER COMPANY	EMERGENCY PLAN IMPLEMENTING PROCEDURES Number: F3-15 Rev: 5 Retention Time: History Copy Lifetime
Reviewed By: D. A. Schuelke Supt. Rad Protection Approved By: C. W. Way Plant Manager OC#: 8-26-82	TITLE: RESPONSIBILITIES OF THE RADIATION SURVEY TEAMS DURING A RADIOACTIVE AIRBORNE RELEASE

1.0 PURPOSE

The purpose of this instruction is to describe the responsibilities of the Radiation Survey Teams during an airborne radioactive release to the offsite environs.

2.0 SUMMARY

Three radiation survey teams exist, each consisting of a minimum of four Radiation Protection Specialists. One (1) Rad Protection Specialist is required per team (minimum) to perform the required offsite surveys; all other team members should report to the Radiological Emergency Coordinator (REC) onsite, for further assignments (e.g., onsite sampling, monitoring, analysis, exposure control, etc.).

In the event of an offsite airborne release, the Radiological Emergency Coordinator (REC) may request support for offsite surveys from the Monticello Radiation Protection Group. When the Monticello Radiation Protection Group arrives at the Prairie Island Near-Site EOF, they will accept the responsibility for offsite surveys from the Prairie Island Survey Teams. This allows the Prairie Island personnel, who have completed the initial offsite surveys to augment Radiation Survey Team #3 performing onsite surveys. All offsite surveys will then continue under the direction of the Emergency Manager at the Prairie Island Near-Site EOF.

3.0 APPLICABILITY

This Instruction SHALL apply to all members of the Prairie Island Radiation Protection Group.

4.0 PRECAUTIONS AND SPECIAL CONSIDERATIONS

(1) Each team shall obtain information pertaining to the magnitude and the direction of the release, either from the Control Room or the Radiological Emergency Coordinator.

(2) Radiation Survey Teams SHALL observe the respiratory protection requirements and the field dose rate precautions as stated in Attachment F.

(3) Report airborne activity sample results in round numbers, (i.e., microcuries per cc with no decimal places).

(4) Report all radiation levels in whole number millirem per hour, (i.e., three Rem per hour shall be reported as three thousand millirem per hour).

(5) Report all numbers individually (e.g., one hundred thirty-five SHALL be reported as one-three-five and 5×10^{-3} SHALL be reported as five times ten to the minus three).

(6) Preface each communication with the title or name of the receiving party and your title or name. For example: "Prairie Island TSC; Radiation Survey Team #1..."

After the communication is completed, request the receiving party to repeat the message, if numerical data was relayed.

End message transmission with an appropriate termination phrase. For example: "Radiation Survey Team #1, out".

(7) The normal means of transportation for survey teams during any emergency is NSP vehicles. Extreme environmental conditions (blocked roads, snow, bridges out, etc.) may preclude the use of these vehicles. The following alternate transportation is available:

NOTE: This does not prohibit the use of personal vehicles in cases where NSP vehicles are not available in sufficient numbers.

(a) Power Boats - Sheriff's Department, NSP environmental monitoring team, Red Wing Police.

(b) Four Wheel Drive Vehicle - at Prairie Island

(c) Amphibious Duck - at Prairie Island

(d) Helicopter - available during suitable weather conditions from charter services in Minneapolis and St. Paul. Arrangements to be made via the corporate Emergency Organization at the EOF.

(8) The normal communication channel for the survey teams is the portable radio stored in the lockers. The normal telephone system will serve as a backup communication system. Telephone numbers in the TSC for the Radiological Emergency Coordinator are:

DELETED

(9) Periodically check dosimeter readings and report results to the Radiological Emergency Coordinator (REC).

5.0 EQUIPMENT AND PERSONNEL REQUIRED

5.1 Team Members

Team I	Team II	Team III
Marotz	Pfeffer	DeLong
Hopkins	Ludwig	Nichols
Lemmerman	Joachim	Maurer
Derleth	McLeran	Payton
Propst	Early	Lundquist
		Secrist

NOTE: The Radiation Protection Coordinators SHALL report to the OSC and assume onsite responsibilities as directed by the Radiological Emergency Coordinator (REC).

5.2 Team Equipment Required

5.2.1 Team #1

(1) Vehicle (NSP or personal)
(2) Offsite sample kit (Attachment A)

5.2.2 Team #2

(1) Vehicle (NSP or personal)
(2) Offsite sample kit (Attachment A)

5.2.3 Team #3

(1) Normal counting room equipment, if available
(2) Back count room facility
(3) All available onsite radiation protection equipment

6.0 PROCEDURE

6.1 Team #1

6.1.1 All members of Radiation Survey Team #1 SHALL assemble at the appropriate location as follows, unless directed by the Emergency Director or the Radiological Emergency Coordinator (REC):

(1) During normal working hours, all Team #1 members SHALL assemble in the Operational Support Center (OSC).

(2) During off-normal working hours, all Team #1 members SHALL assemble at the NSP Red Wing Service Center.

NOTE: During off hours, the Shift Emergency Communicator (SEC) SHALL ensure that NSP personnel are contacted to unlock the NSP Red Wing District Service Center. If personnel are not available at the service center when the Radiation Survey teams arrive, attempt to call one of the following:

DELETED

6.1.2 Obtain the necessary information from the Control Room Operator or TSC personnel regarding the type and amount of release, wind direction, etc.

6.1.3 Designate two (2) members of Team #1 (if available) to perform offsite surveys. The other members of Team #1 SHALL report to the OSC and assume onsite responsibilities, as directed by the REC.

NOTE: Any available NSP personnel may be designated as the driver for a single team member.

6.1.4 Obtain the necessary equipment (Attachment A) from the Emergency Lockers, as follows:

(1) During normal work hours, proceed to the Construction Office Building Emergency Locker and obtain the Field Team Survey Kits;

(2) During off-normal work hours, obtain the Field Team Survey Kits from the NSP Red Wing Service Center Emergency Locker.

6.1.5 Obtain an NSP vehicle or personal vehicle.

6.1.6 Obtain TLD's and dosimeters from the emergency locker.

NOTE: Survey Team Members should keep their personal TLD's if departing from the plant site.

6.1.7 Zero and record dosimeter readings on locker signout sheet.

6.1.8 Operationally test the portable radios and response check all meters with source, prior to departing.

6.1.9 Proceed to perform offsite surveys depending on the wind direction and time of emergency:

(1) If the wind is from the north or west, proceed on the Emergency Route from the plant, or the NSP Red Wing Service Center, through Red Wing, to Diamond Bluff, to Prescott, to Hastings, and back to the plant as shown on Figure 1.

(2) If the wind is from the south or east, proceed on the Emergency Route from the plant, or the NSP Red Wing Service Center, to Hastings, to Prescott, to Diamond Bluff, to Red Wing, and back to the plant, as shown on Figure 1.

6.1.10 When departing the plant site or NSP Red Wing Service Center, conduct a search for the plume, in accordance with Attachment B.

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

6.1.12 At areas where the plume is encountered, or at each designated survey point, perform beta and gamma surveys in accordance with the applicable procedure, Attachment C, as directed by the Radiological Emergency Coordinator.

6.1.13 Identify survey locations using either:

(1) Predesignated survey location numbers, as shown on the applicable Radiological Sampling Points map; or

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

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

6.1.14 Report results to the Radiological Emergency Coordinator via the portable radio or telephone.

6.1.15 After completing the initial emergency route (Figure 1), report to the REC for further instructions.

6.1.16 When directed by the REC, assist Team #2 in conducting a plume search and air sampling.

6.1.17 Obtain airborne samples (particulate, iodine and gas), at locations requested by the REC, as per Attachments D & E.

6.1.18 Report results to the REC via portable radio or telephone.

6.2 Team #2

6.2.1 All members of Radiation Survey Team #2 SHALL assemble at the appropriate location as follows, unless directed by the Emergency Director or the Radiological Emergency Coordinator (REC):

(1) During normal working hours, all Team #2 members SHALL assemble in the Operational Support Center (OSC).

(2) During off-normal working hours, all Team #2 members SHALL assemble at the NSP Red Wing Service Center.

NOTE: During off hours, the Shift Emergency Communicator (SEC) SHALL ensure that NSP personnel are contacted to unlock the NSP Red Wing District Service Center. If personnel are not available at the service center when the Radiation Survey teams arrive, attempt to call one of the following:

DELETED

6.2.2 Obtain the necessary information from the Control Room Operator or TSC personnel regarding the type and amount of release, wind direction, etc.

6.2.3 Designate two (2) members of Team #2 (if available) to perform offsite surveys. The other members of Team #2 SHALL report to the OSC and assume onsite responsibilities, as directed by the REC.

NOTE: Any available NSP personnel may be designated as the driver for a single team member.

6.2.4 Obtain the necessary equipment (Attachment A) from the Emergency Lockers, as follows:

(1) During normal work hours, proceed to the Construction Office Building Emergency Locker and obtain the Field Team Survey Kits;

(2) During off-normal work hours, obtain the Field Team Survey Kits from the NSP Red Wing Service Center Emergency Locker.

6.2.5 Obtain an NSP vehicle or personal vehicle.

6.2.6 Obtain TLD's and dosimeters from the emergency locker.

NOTE: Survey Team Members should keep their personal TLD's if departing from the plant site.

6.2.7 Zero and record dosimeter readings on locker signout sheet.

6.2.8 Operationally test the portable radios and response check all meters with source, prior to departing.

6.2.9 Proceed to the affected sector per instructions from the REC.

6.2.10 When departing the plant site or Red Wing Service Center, conduct a search for the plume, in accordance with Attachment B.

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

6.2.12 At areas where the plume is encountered, or at each designated survey point, perform beta and gamma surveys in accordance with the applicable procedure, Attachment C, as directed by the Radiological Emergency Coordinator.

6.2.13 Collect airborne sample, (particulate, iodine and gas), in accordance with applicable procedures, Attachment D and E, when requested by the Radiological Emergency Coordinator.

6.2.14 Report results to the REC via the portable radio or telephone. Identify survey locations using either:

(1) Predesignated survey location numbers, as shown on the applicable Radiological Sampling Points map; or

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

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

6.2.15 Accurately document all survey data on the Emergency Results Log, Figure 2. Enter the date, time, name of surveyor, instrument serial number and model for each survey data.

6.2.16 Proceed to the next survey location as per instructions from the REC and take requested surveys and samples in accordance with applicable procedures.

6.2.17 Frequently check personal dosimeters and request relief if cumulative exposure approaches administrative limits.

6.2.18 When directed by the REC, deliver samples to designated location for pickup by member of Team #3.

6.3 Team #3

6.3.1 Report to the Operational Support Center when the emergency is declared, unless directed by the Emergency Director or the Radiological Emergency Coordinator (REC).

6.3.2 Perform all operations requested by the Emergency Director or REC.

6.3.3 Control radiation exposure onsite (internal and external).

6.3.4 One member of Team #3 shall proceed to the backup count room facility at the EOF and perform required analysis of offsite survey team samples and/or onsite samples as required. Store all samples for future analysis.

6.3.5 One member should be designated as a runner to pick up all samples at the designated location from Team #1 and Team #2 and deliver samples to the EOF count room for analysis.

6.3.6 Perform onsite surveys as requested by the Emergency Director and/or REC per F3-14, "Onsite Radiological Monitoring".

6.3.7 Perform required personnel monitoring at the emergency operating centers and supervise any necessary personnel decontamination per F3-19, "Personnel and Equipment Monitoring and Decontamination".

6.3.8 Obtain and process samples from the reactor coolant system, containment air, stack release, etc., as requested by the REC per F3-23, "Emergency Sampling" and F3-20, "Manual Determination of Release Rates".

6.3.9 Report all results to the REC via available communication system.

ATTACHMENT A

OFFSITE SURVEY TEAM EQUIPMENT PACKAGE

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

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

ATTACHMENT A
(Continued)

OFFSITE SURVEY TEAM EQUIPMENT PACKAGE

2. The Procedures Binder SHALL contain:

1	package of the following maps:
	(a) Prairie Island Radiological Sampling Points Map and related list of location descriptions
	(b) Monticello Radiological Sampling Points Map and related list of location descriptions
1	Copy of EPIP 1.1.10, "Offsite Surveys"
10	Emergency Sample Results Forms
1	Copy of EPIP 1.1.8, "Communications Equipment and Information"
1	Copy of F3-15, "Responsibilities of the Radiation Survey Teams During a Radioactive Airborne Release"
1	Copy of F3-16, "Responsibilities of the Radiation Survey Teams During a Radioactive Liquid Release"

ATTACHMENT B

PLUME SEARCH TECHNIQUE

I. Precautions

(1) Meter SHALL have been source response checked prior to use.

(2) Check batteries by switching to BATTERY CHECK position. Replace if necessary.

(3) Observe the cold weather operation restrictions (ATTACHMENT G).

(4) All surveys SHALL be taken at approximately one meter from ground level unless specifically directed by the REC.

(5) During inclement weather, the instrument may be placed against the inside vehicle window or on the dash.

II. Procedure

(1) When departing the plant site or NSP Red Wing Service Center:

a) Energize the instrument observing proper precautions for cold weather (ATTACHMENT G).

b) Allow meter to stabilize and zero meter if necessary.

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

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

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

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

b) Open the probe window for beta gamma reading

c) Record the "window open" reading (Figure 2)

d) Close the probe window

ATTACHMENT B
(Continued)

PLUME SEARCH TECHNIQUE

e) Record the "window closed" reading (Figure 2)

f) Determine the corrected beta reading

(4) Record the readings and calculate the beta and gamma dose (Figure-2)

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

(5) Report the results to the Radiological Emergency Coordinator as follows:

a) Location: _____

b) _____ millirem/hr gamma

c) _____ millirem/hr True Beta

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

ATTACHMENT C

BETA AND GAMMA SURVEY

I. Precautions

(1) Meter shall have been source response checked prior to use.

(2) Check batteries by switching to BATTERY CHECK position. Replace if necessary.

(3) Observe the cold weather operation restrictions (ATTACHMENT G).

(4) All surveys shall be taken at approximately one meter from ground level unless specifically directed by the REC.

II. Procedure

(1) Energize the instrument.

(2) Allow meter to stabilize and zero meter if necessary.

(3) Switch to the highest scale and scale down until a onscale reading is obtained.

(4) Hold the instrument approximately one meter from ground level and scan area for maximum reading.

(a) Open probe window for beta-gamma reading and record on Figure 2 as "Window Open" reading.
(b) Close the probe window for gamma reading and record on Figure 2 as "Window Closed" reading.

(5) Determine the beta and gamma dose rates as follows:

GAMMA (mRem/hr) = "Window Closed" reading

BETA (mRem/hr) = "Window Open" reading minus "Window Closed" reading times CF or (w/o - w/c) CF

Where 1. CF = beta correction factor for meter or assume 5.
2. Beta dose rate reported in mRem/hr assuming a quality factor of 1.

(6) Record results on Figure 2.

(7) Report results to REC.

ATTACHMENT D

PARTICULATE AND IODINE SAMPLING

I. PRECAUTIONS

1. The air sampler shall be placed in an area that will ensure a representative sample. DO NOT place the sampler on the ground or on contaminated surfaces.

2. Particulate filters and silver zeolite absorbers must be installed and removed carefully to prevent cross-contamination from foreign objects.

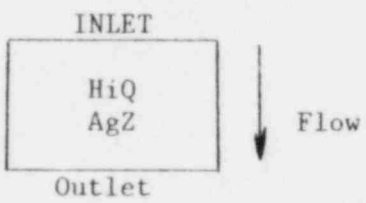
3. The sample should be a standard 25 cubic foot sample. Sample collection time may be affected if the activity is too high.

4. All samples SHALL be labeled properly with the required information and saved for further analysis.

II. PROCEDURE

1. Carefully install a particulate filter and silver zeolite absorber into the cartridge/filter paper holder.

NOTE: Install the silver zeolite absorber as follows:



2. Connect the air sampler (CF-18V) to the vehicle power supply as follows:

   (a) Connect to 12 Volt battery terminals. Insure there is a good connection.

NOTE: Engine should be running to maintain a steady battery voltage.

ATTACHMENT D
(Continued)

(b) Set the TIMER toggle switch to either the TIME or the MANUAL POSITION.

NOTE: (1) If in the TIME position, set the TIMER DIAL to selected time. When the timer times out, the sample pump will automatically stop.
(2) If in the MANUAL position, the sample pump must be stopped manually when a designated sampling time has elapsed.

(c) Set the FLOW TOGGLE switch to the VARIABLE position. The air sampler will now start. Record start time on Figure 2.

NOTE: (1) DO NOT use HIGH switch position tion (causes high flow and motor damage).
(2) If the sampler begins to run hot, (flow decreasing continuously) stop the air sampler to prevent damage to the unit.

(d) Adjust the flow, using the flow adjustment knob to 2 CFM.

(e) When the sample collection time is complete, stop the air sampler. Record time on Figure 2.

NOTE: If the TIMER was in the TIME position, the sampler will auto stop when the timer times out.

(f) If the TIMER was in the MANUAL position, the air sampler must be stopped manually by placing the FLOW toggle switch to the OFF position when the selected sample time has elapsed.

ATTACHMENT D
(Continued)

3. Average the initial sample flow rate and the final flow rate. Calculate the total sample volume and record results on Sample Results Log, Figure 2.

4. Carefully remove the particulate filter and silver zeolite absorber and place in a plastic sample bag.

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

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

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

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

NOTE:	(1)	Probe efficiency =0.1 for RM-14 with a 2" GM pancake probe.
	(2)	Place the 2" GM pancake probe about 1/8" from the filter, with filter outside poly bag.
	(3)	CF= Correction factor for sample. CF is .3 for 4 inch paper counted with a 2 inch probe.

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

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

NOTE: (1) µCi's on absorber = activity on absorber determined from Figure 3 using the corrected count rate.
(2) Place 2" GM pancake probe directly on absorber, with absorber inside poly bag.
(3) If background exceeds 1000 cpm, notify the REC and proceed to an area of lower background, <1000 cpm for counting, if so instructed by the REC.

7. Record the air sample results on the Sample Results Log (Figure 2) and report the results to the Radiological Emergency Coordinator.

8. Save all samples for future analysis.

ATTACHMENT E

GASEOUS ACTIVITY SAMPLING

I. Precautions

1. If hands are contaminated, handle chamber with cotton liners.

II. Procedure

1. Remove S.S. Gas chamber, suction bulb and filter assembly.

2. Install new filter in filter assembly.

3. Assemble kit so air passes through filter, gas chamber, then suction bulb.

4. Squeeze suction bulb 10 times to obtain representative sample.

5. Shut petcocks on gas chamber.

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

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

8. Determine the "Net CPM" by subtracting the "Background CPM" from the "Gross CPM".

9. Using Figure 4, apply the "Net CPM" obtained to determine the gross gas activity in μCi/cc Xe-133 equivalent.

10. Record the air sample results on the Emergency Sample Results Log, (Figure 2) and report the results to the Radiological Emergency Coordinator using the portable radio.

11. Save the sample for future analysis.

ATTACHMENT F

SURVEY TEAM RADIATION PROTECTION GUIDELINES

I. Respiratory Protection

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

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

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

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

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

(b) the Radiological Emergency Coordinator indicates that no significant iodine is or has been released from the plant.

II. Plume Dose Rates

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

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

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

ATTACHMENT G

COLD WEATHER OPERATION

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

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

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

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

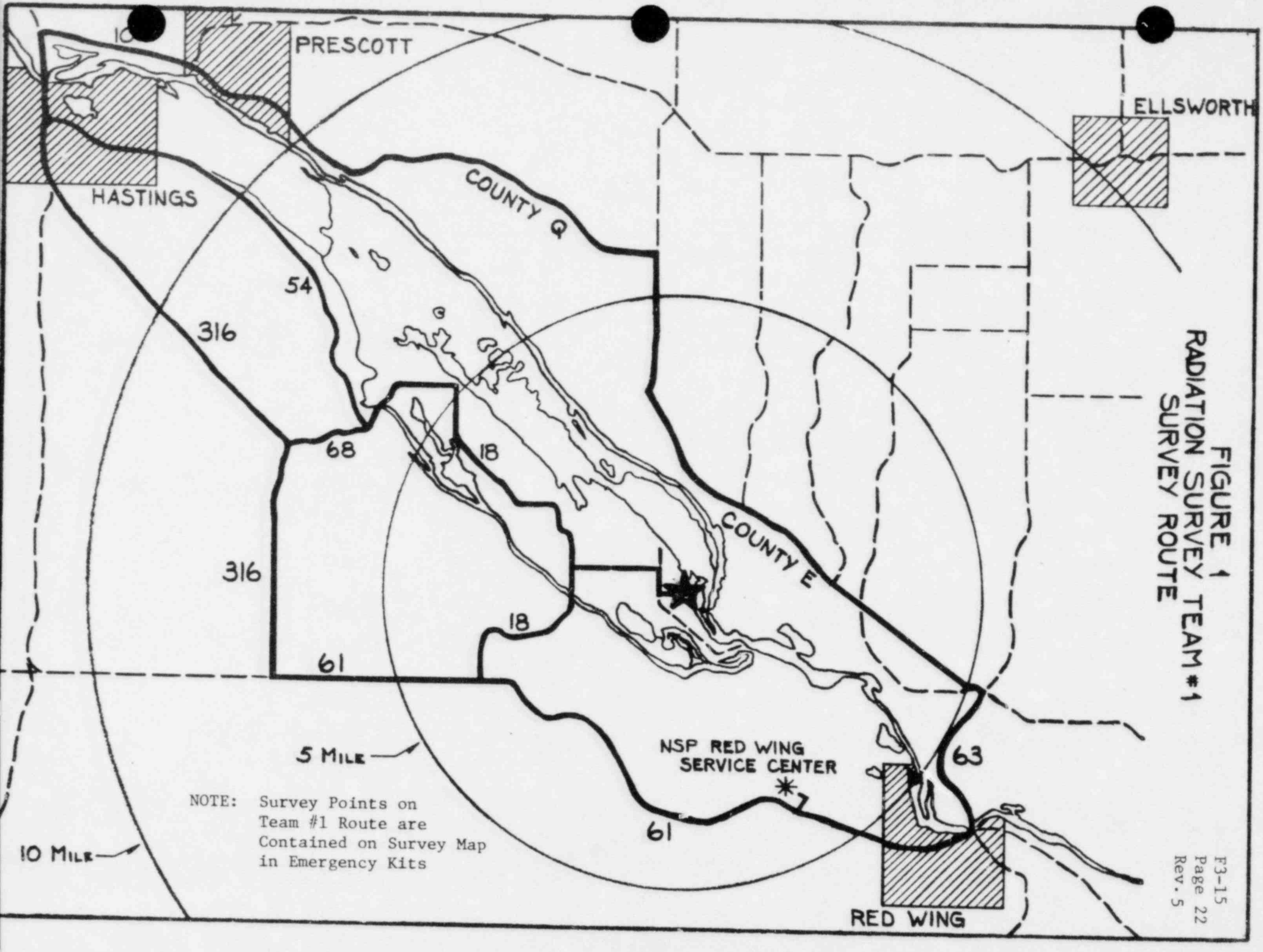


FIGURE 1
RADIATION SURVEY TEAM #1
SURVEY ROUTE

EMERGENCY SAMPLE RESULTS LOG

DATE _____

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

1. Formulas listed on back
2. Remarks: _____

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

_____
TECHNICIAN SIGNATURE

FIGURE 2

FIGURE 2 (CON'T)

Formulas:

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

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

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

   Ft^3 x 2.83E4 = cc's

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

   NOTE: See notes 2 & 4 below.

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

NOTES:

1. Assume 5.0 if correction factor is unknown.

2. Instrument efficiency depends on probes. If using 2" GM pancake probe, ASSUME 10% (0.10) efficiency; if using GM tube probe, ASSUME 2% (0.02) efficiency.

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

4. CF (Correction factor for air samples) = 0.3 for a 4 inch filter size paper counted with a 2 2 inch GM pancake probe

FIGURE 3
GROSS IODINE CURVE USING RM-14 WITH 2" GM
PANCAKE PROBE WITH SILVER ZEOLITE ABSORBER

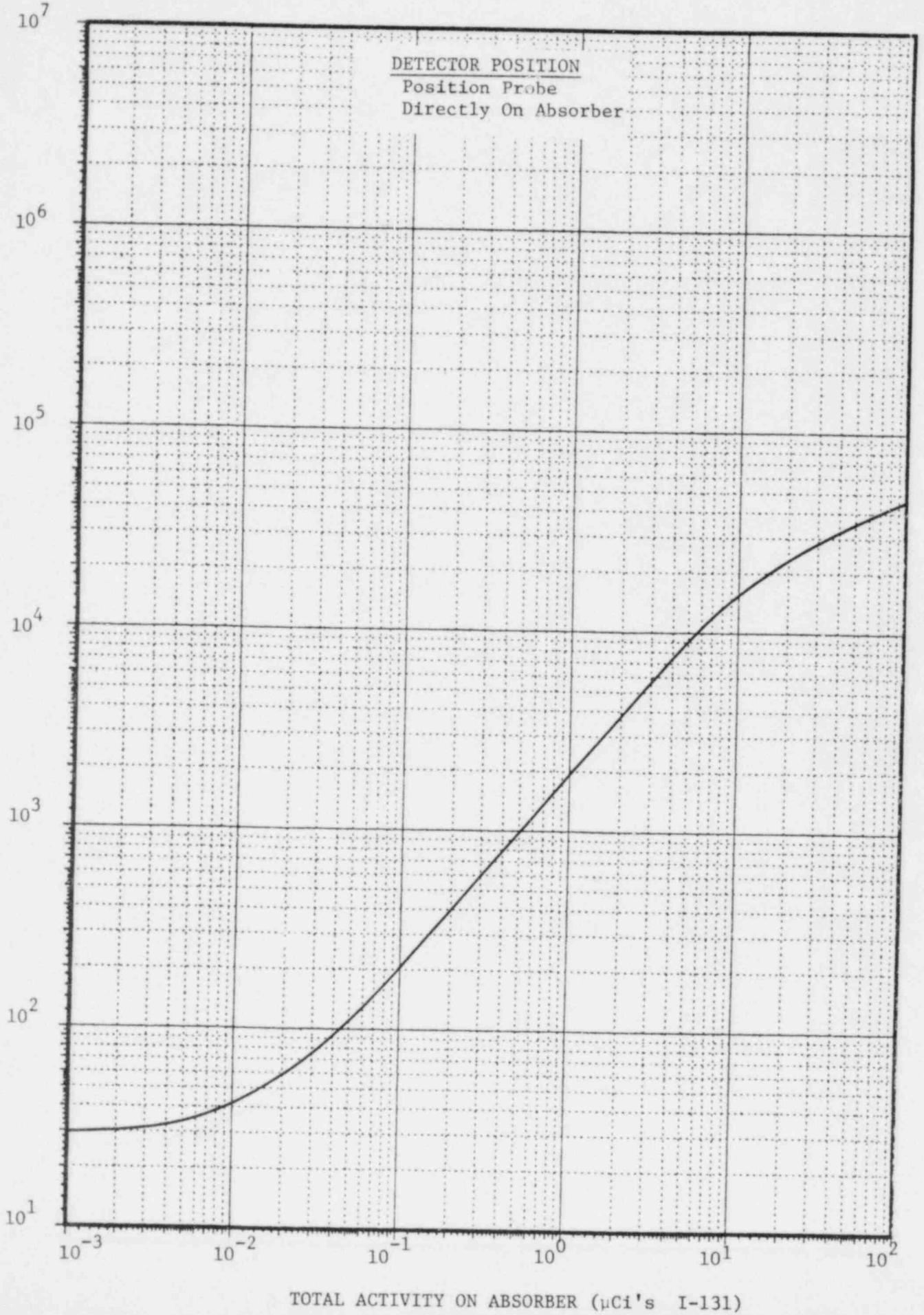
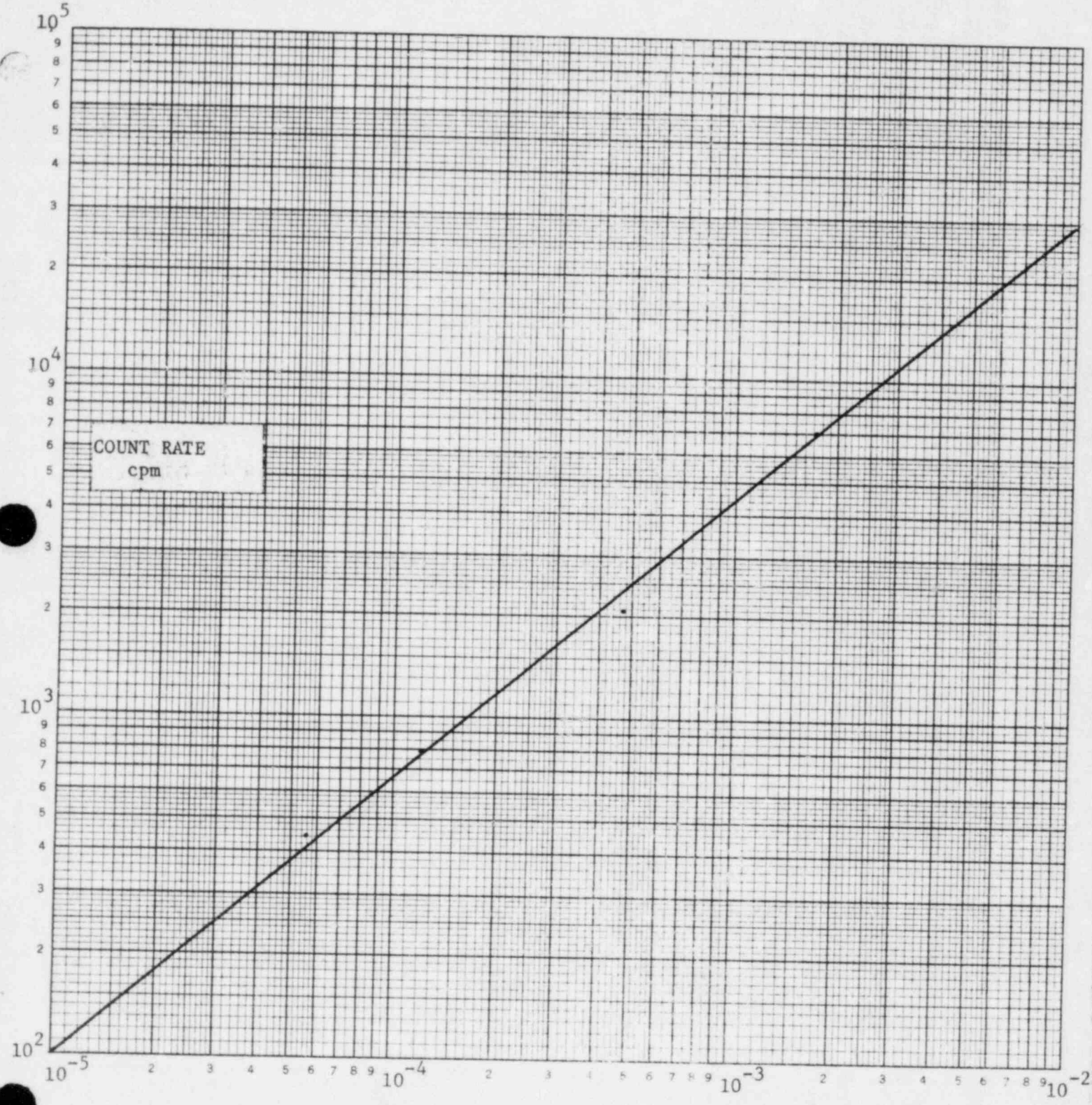


FIGURE 4

GAS CHAMBER CALIBRATION CURVE

(100 cc S.S.)



µCi/cc Xe-133 EQUIVALENT

PRAIRIE ISLAND NUCLEAR GENERATING PLANT NORTHERN STATES POWER COMPANY	EMERGENCY PLAN IMPLEMENTING PROCEDURES Number: F3-16 Rev: 3 Retention Time: History Copy Lifetime
Reviewed By: D. A. Schuelke Supt., Rad Protection Approved By: [signature] Plant Manager OC#: 8-26-82	TITLE: RESPONSIBILITIES OF THE RADIATION SURVEY TEAMS DURING A RADIOACTIVE LIQUID RELEASE

1.0 PURPOSE

The purpose of this instruction is to describe the responsibilities of the Radiation Survey Teams during a liquid radioactive release to the offsite environment.

2.0 SUMMARY

Three radiation survey teams exist, each consisting of a minimum of four Radiation Protection Specialists. One Radiation Protection Specialist is required per team (minimum) to perform the required offsite sampling; all other personnel should report to the Radiological Emergency Coordinator (REC) onsite, for further assignments and/or instructions for onsite sampling, monitoring, analysis, exposure control, etc.

In the event of an offsite liquid release, the Radiological Emergency Coordinator may request support for offsite sampling from the Monticello Radiation Protection Group. When the Monticello Radiation Protection Group arrives at the Prairie Island Near-Site EOF, they will accept the responsibility for offsite sampling from the Prairie Island Survey Teams. This allows the Prairie Island personnel, who have completed the initial offsite sampling to augment the onsite Radiation Survey Team. All offsite monitoring will continue under the direction of the Emergency manager at the Prairie Island Near-Site EOF.

3.0 APPLICABILITY

This Instruction SHALL apply to all members of the Prairie Island Radiation Protection Group.

4.0 PRECAUTIONS AND SPECIAL CONSIDERATIONS

(1) Each team shall obtain information pertaining to the

magnitude of the liquid release, either from the Control Room Operator or the Radiological Emergency Coordinator (REC).

(2) Report all liquid sample results to the REC in round numbers, (i.e., with no decimal places) microcuries per milliliter.

(3) Report all numbers individually (e.g. one hundred thirty-five shall be reported as one-three-five and 5×10^{-3} shall be reported as five times ten to the minus three).

(4) Preface each communication with the title or name of the receiving party and then your title or name. For example: "Prairie Island TSC; Radiation Survey Team #1...".

After the communication is complete, request the receiving party to repeat the message, if numerical data was relayed.

End message transmission with an appropriate termination phrase. For example: "Radiation Survey Team #1, out."

(5) The normal means of transporation for survey teams during any emergency is NSP vehicles. Extreme environmental conditions (blocked roads, snow, bridges out, etc.) may preclude the use of these vehicles. The following alternate transportation is available.

NOTE: This does not prohibit the use of personal vehicles in cases where NSP vehicles are not available in sufficient numbers.

(a) Power Boats - Sheriff's Department, NSP environmental monitoring team, Red Wing Police

(b) Four Wheel Drive Vehicle - at Prairie Island

(c) Amphibious Duck - at Prairie Island

(d) Helicopter - Available during suitable weather conditions from charter services in Minneapolis and St. Paul. Arrangements to be made via the Corporate Emergency organization at the EOF.

4.0 PRECAUTIONS AND SPECIAL CONSIDERATIONS (Con't)

(6) The normal means of communication for the survey teams is the portable radios stored in the lockers. The normal telephone system will serve as a backup communication system. Telephone numbers in the TSC for the Radiological Emergency Corrdinator (REC) are:

DELETED

5.0 EQUIPMENT AND PERSONNEL REQUIRED

5.1 Team Members

Team I	Team II	Team III
Marotz	Pfeifer	DeLong
Hopkins	Ludwig	Secrist
Lemmerman	Joachim	Payton
Derleth	McLeran	Maurer
Propst	Early	Lundquist
		Nichols

NOTE: Rad Protection Coordinators shall assume on-site responsibilities as directed by the Radiological Emergency Coordinator (REC).

5.2 Team Equipment Required

5.2.1 Team #1

(1) Two vehicles (NSP or personal)
(2) Offsite sample kit (Attachment A)

5.2.2 Team #2

(1) Two vehicles (NSP or personal)
(2) Offsite sample kit (Attachment A)

5.2.3 Team #3

(1) Normal counting room equipment, if available
(2) Back count room facility
(3) All available onsite radiation protection equipment

6.0 Procedure

6.1 Team #1

6.1.1 All members of Radiation Survey Team #1 SHALL assemble at the appropriate location as follows, unless directed by the Emergency Director or the Radiological Emergency Coordinator (REC):

(1) During normal working hours, all Team #1 members shall assemble in the Operational Support Center (OSC).

(2) During off-normal working hours, all Team #1 members shall assemble at the NSP Red Wing Service Center.

NOTE: During off hours, the Shift Emergency Communicator (SEC) shall ensure that NSP personal are contacted to unlock the NSP Red Wing Service Center. If personnel are not available at the service center when the Radiation Survey Team members arrive, attempt to call one of the following:
DELETED

6.1.2 Obtain the necessary information from the Control Room Operator or TSC personnel regarding the type and amount of release, etc.

6.1.3 Designate two (2) members of Team #1 (if available) to perform offsite sampling. The other members of Team #1 SHALL report to the OSC and assume onsite responsibilities as directed by the Radiological Emergency Coordinator.

NOTE: Any available NSP personnel may be designated as the driver for a single team member.

6.1.4 Obtain a vehicle, and a second vehicle (if necessary) for transporting samples back to the EOF count room for analysis.

6.1.5 Obtain the necessary equipment (Attachment A) from the NSP Red Wing District Service Center Emergency Locker.

6.1.6 Operationally test the portable radios and response check all meters with source, prior to departing from the NSP Red Wing Service Center.

6.1.7 Proceed to the Eisenhower Bridge and obtain a one liter sample from middle of the Minnesota channel, and then a one liter sample from the middle of the Wisconsin channel, in accordance with Attachment B. Obtain liquid samples at thirty minute intervals or as directed by the REC.

NOTE: (1) If the river is frozen and unable to sample the river; contact the Radiological Emergency Coordinator for further instructions.

(2) Traffic control assistance on the Eisenhower Bridge should be obtained from the Red Wing Police, if necessary.

6.1.8 Document all survey data on the Emergency Results Log, Figure 1.

6.1.9 Report all results to the Radiological Emergency Coordinator via the portable radio or telephone.

6.1.10 Label bottles correctly for further analysis and storage.

6.1.11 One team member shall continue the sampling schedule while the other member transports the samples to the location designated by REC for pick up and analysis by Team #3. Additional bottles may also be obtained at this time.

6.1.12 Continue sampling until directed by the Radiological Emergency Coordinator.

6.2 Team #2

6.2.1 All members of Radiation Survey Team #2 SHALL assemble at the appropriate location as follows, unless directed the Emergency Director or the Radiological Emergency Coordinator (REC):

(1) During normal working hours, all Team #2 members shall assemble in the Operational Support Center (OSC).

(2) During off-normal working hours, all Team #2 members shall assemble at the Construction Office Building.

6.2.2 Obtain the necessary information from the Control Room Operator or TSC personnel regarding the type and amount of release, etc.

6.2.3 Designate two (2) members of Team #2 (if available) to perform offsite sampling. The other members of Team #2 SHALL report to the OSC and assume onsite responsibilities as directed by the Radiological Emergency Coordinator.

NOTE: Any available NSP personnel may be designated as the driver for a single team member.

6.2.4 Obtain a vehicle for sampling, and a second vehicle (if necessary) for transport of samples to the EOF count room for analysis.

6.2.5 Obtain the necessary equipment (Attachment A) from the Construction Office Building Emergency Locker.

6.2.6 Operationally test the portable radios and response check all meters with source, prior to departing the Construction Office Building Emergency Locker.

6.2.7 Proceed to the outfall canal or point of discharge and obtain one liter samples of

water flowing from the plant in accordance with Attachment B.

6.2.8 Proceed to the intake canal barrier and obtain a one liter sample on the upstream side of the barrier for background activity determination as per Attachment B.

6.2.9 Document all survey data on the Emergency Results Log, Figure 1.

6.2.10 Report all results to Radiological Emergency Coordinator via portable radio or telephone.

6.2.11 Deliver samples to designated location for pickup by member of Team #3.

6.2.12 Proceed to Lock & Dam #3.

6.2.13 Obtain a one liter sample every 15 minutes from the roller gate area in accordance with Attachment B.

6.2.14 Document all survey data on the Emergency Results Log, Figure 1.

6.2.15 Report all results to Radiological Emergency Coordinator via portable radio or telephone.

6.2.16 Label all sample bottles properly for storage and further analysis.

6.2.17 When directed by REC, one team member shall deliver samples to the location designated by the REC for pickup and analysis by Team #3. Additional bottles may also be obtained at this time.

6.2.18 Additional samples may be required at the discharge canal. If possible, spare team #3 members can obtain these samples and allow Team #2 to stay at Lock and Dam #3.

6.2.19 Continue sampling until directed by the Radiological Emergency Coordinator.

6.3 Team #3

6.3.1 Report to the Operational Support Center unless directed by the Emergency Director or the Radiological Emergency Coordinator.

6.3.2 One member should be designated as a runner to pickup all samples at the designated location from Team #1 and Team #2, and deliver samples to the EOF count room for analysis.

6.3.3 One member of Team #3 shall proceed to the backup count room facility at the EOF to perform required analysis of offsite survey team samples and/or onsite samples as required. Store all samples for future analysis.

6.3.4 Assist plant operations in minimizing and controlling the release.

6.3.5 Obtain inplant samples and analyze as required by the Radiological Emergency Coordinator.

6.3.6 All results shall be reported to the Radiological Emergency Coordinator.

6.3.7 Store all sample bottles for further analysis.

EMERGENCY SAMPLE RESULTS LOG

DATE _____

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

EXAMPLE ONLY
USE
CURRENT REVISION

1. Formulas listed on back
2. Remarks: _____

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

_____ _____
TECHNICIAN SIGNATURE

FIGURE 1

FIGURE 1 (Con't)

FORMULAS:

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

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

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

   Ft^3 x 2.83E4= cc's

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

   NOTE: See notes 2 & 4 below

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

NOTES:

1. Assume 5.0 if correction factor is unknown.

2. Instrument efficiency depends on probes. If using 2" GM pancake probe, ASSUME 10% (0.10) efficiency; if using GM tube probe, ASSUME 2% (0.02) efficiency.

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

4. CF (Correction factor for air samples) = 0.3 for a 4 inch filter size paper counted with a 2 inch GM pancake probe.

ATTACHMENT A

OFFSITE SURVEY TEAM EQUIPMENT PACKAGE

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

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

ATTACHMENT A (Cont'd)

OFFSITE SURVEY TEAM EQUIPMENT PACKAGE

2. The Procedures Binder shall contain:

1 package of the following maps:
(a) Prairie Island Radiological Sampling Points Map and related list of location discriptions
(b) Monticello Radiological Sampling Points Map and related list of location discriptions

1 Copy of EPIP 1.1.10, "Offsite Surveys"
10 Emergency Sample Results Forms
1 Copy of EPIP 1.1.8, "Communications Equipmen and Information"

1 Copy of F3-15, "Responsibilities of the Radiation Survey Teams During a Radioactive Airborne Release"
1 Copy of F3-16 ,"Responsibilities of the Radiation Survey Teams During a Radioactive Liquid Release"

ATTACHMENT B

LIQUID SAMPLING

I. Precautions

1. Always collect full one liter bottles.

2. For samples at the outfall or point of discharge, assume that the bottle, weighted sampler and rope could possibly become slightly contaminated. Surgeons gloves should be worn at this sample point and bottles should be placed in a plastic bag.

3. Observe cold weather operation instructions (Attachment C).

4. Estimation of gross liquid activity must be made with probe in position shown on applicable calibration curves.

5. All meter readings shall be corrected count rates (subtract background).

II. Procedure

1. Obtain a one liter poly sample bottle of liquid from the desired sample location.

NOTE: Place poly bottle in sample rig in such a position that it will not float out.

2. Throw the weighted sampler into an area of water which will supply a representative sample.

3. Collect a FULL one liter sample of liquid.

4. Withdraw the weighted sampler and cap the sample bottle.

NOTE: Observe precautions as sampler may be contaminated.

5. Label bottle properly.

6. Estimate the gross liquid activity by the following methods:

ATTACHMENT B (Cont'd)

(a) RM-14 or equivalent with 2" GM Pancake

position the probe at midpoint on the one liter sample bottle as shown on Figure 2. Using the corrected count rate obtained on the instrument, the estimated gross activity in μCi/ml can be obtained from Figure 2.

(b) E120 with HP-177C Probe -

position the probe (shield open) in a vertical position, centered on the bottle, as shown in Figure 3. Using the corrected count rate obtained on the E120, the estimated gross activity in μCi/ml can be obtained from Figure 3.

7. Record results on Sample Results Log, Figure 1.

8. Report results to the Radiological Emergency Coordinator (REC).

9. All samples SHALL be saved for further analysis, using the backup count room facility at the EOF.

Figure 2

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

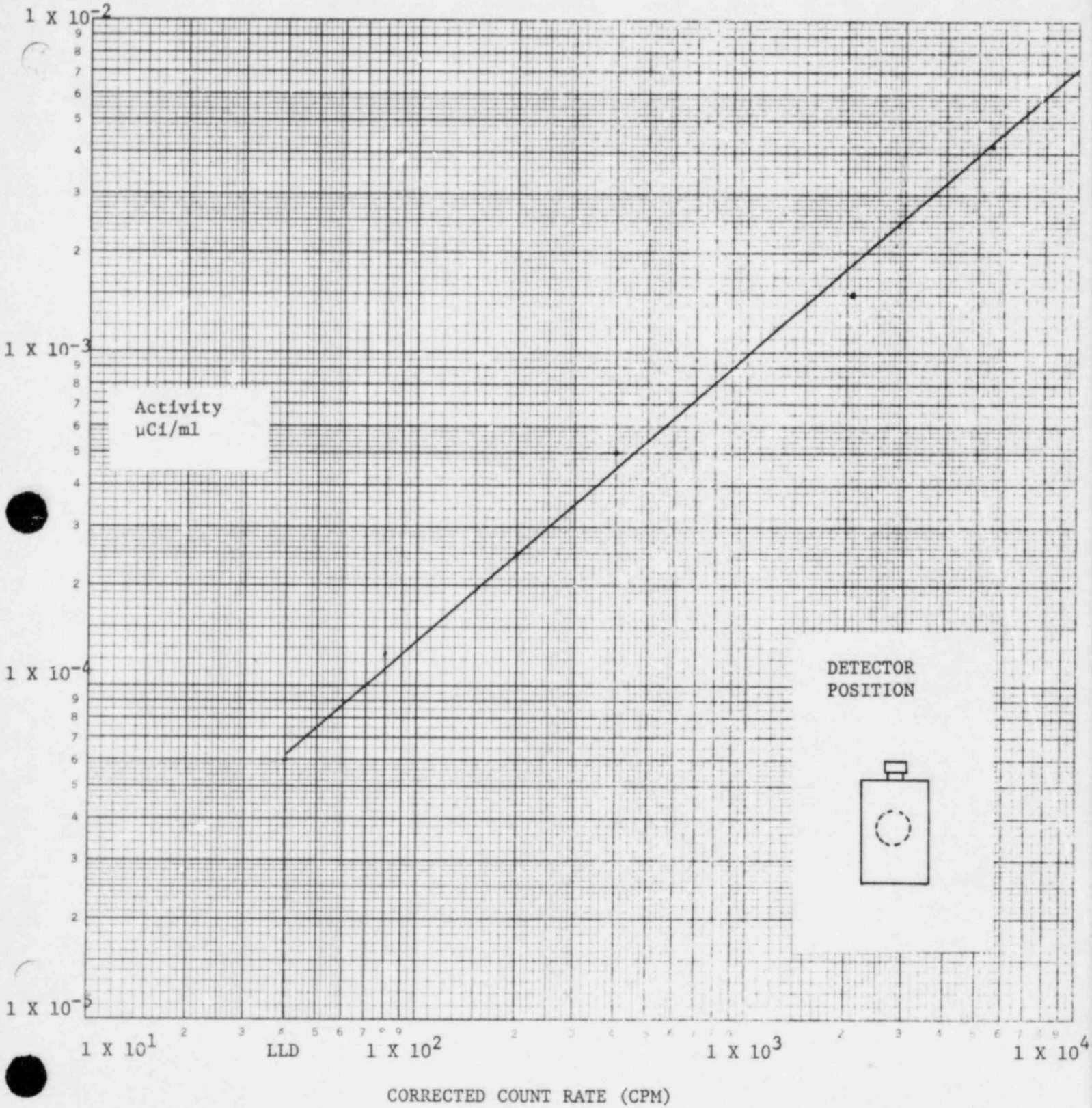
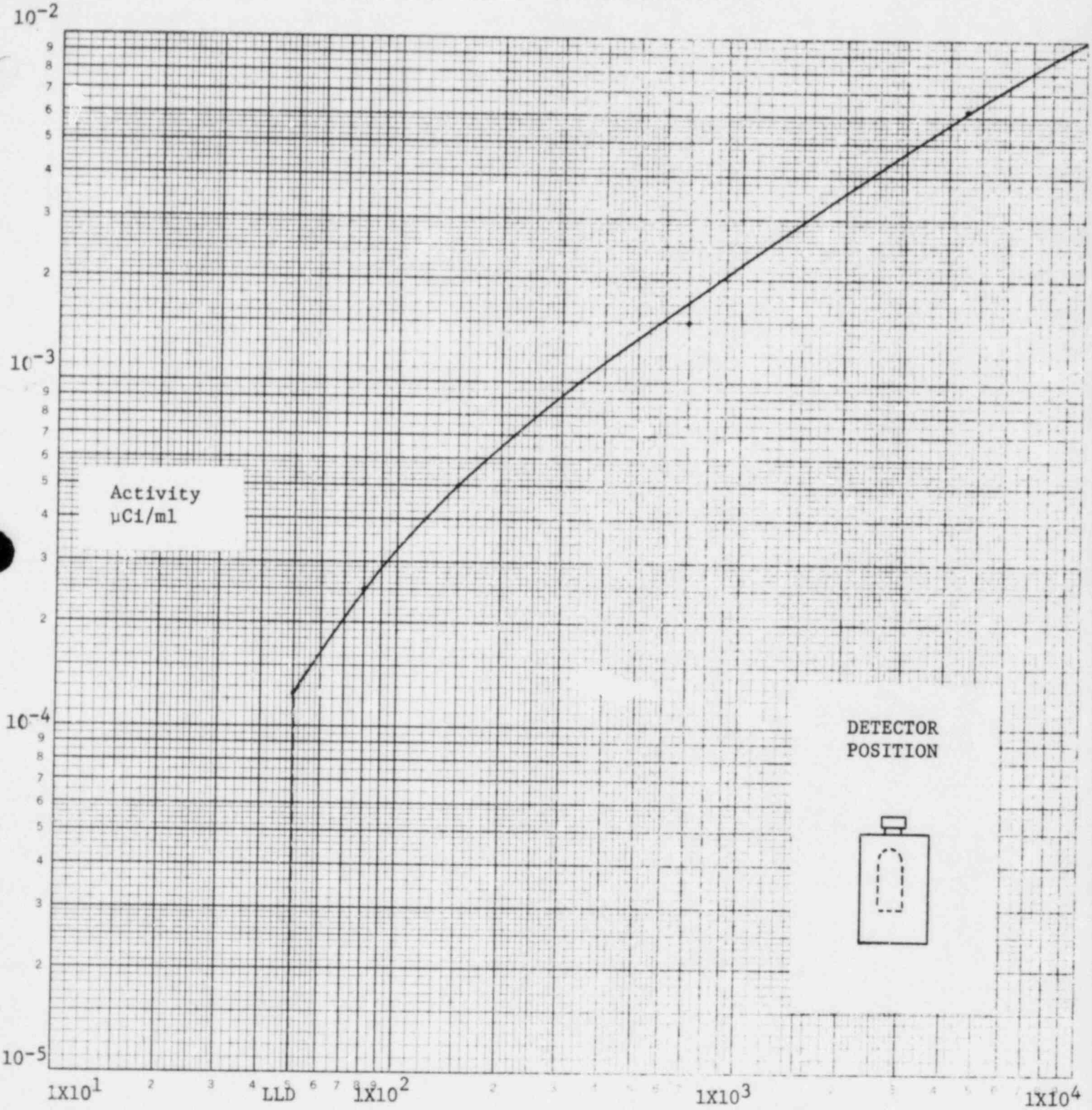


Figure 3

GROSS LIQUID ACTIVITY USING
RM-14 OR EQUIVALENT WITH HP-177C PROBE



ATTACHMENT C

COLD WEATHER OPERATION

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

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

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

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

PRAIRIE ISLAND NUCLEAR GENERATING PLANT NORTHERN STATES POWER COMPANY	EMERGENCY PLAN IMPLEMENTING PROCEDURES Number: F3-24 Rev: 1 Retention Time: History Copy Lifetime
Reviewed By: D.A. Schuelke Supt. Rad Protection Approved By: Plant Manager OC#: 8-26-82	TITLE: RECORD KEEPING DURING AN EMERGENCY

1.0 PURPOSE

This instruction will delineate the responsibilities for emergency personnel in maintaining a log of events and data affecting their specific area of interest.

The recordkeeping is necessary to provide:

(1) Documentation which may be used to reconstruct the emergency for critique or analysis.

(2) Checklists to ensure that necessary tasks are completed.

(3) Information and data collection during the emergency.

(4) Documentation of required action for legal purposes.

2.0 APPLICABILITY

This instruction is applicable to all emergency response personnel responsible for maintaining the assigned logs.

3.0 PRECAUTIONS

3.1 Although recordkeeping & form completion is important, the protection of personnel, onsite and offsite is the prime concern. At no time should the completion of logs or forms delay the implementation of protective actions.

4.0 PROCEDURE

4.1 The Emergency Director shall require the following logs to be maintained by emergency organization personnel during the course of emergency conditions at Prairie Island:

(a) Operations Reactor Log
(b) Contact Report Log
(c) Emergency Directors Narrative Log
(d) Survey Summary Log

4.2 The Emergency Director (Shift Supervisor until relieved) shall delegate the record-keeping task to qualified individuals in their respective emergency operations center.

4.3 All individuals responsible for record keeping should file the reports in a loose leaf binder (with the exception of the Reactor Log).

4.4 All Emergency Logs may subsequently be used to reconstruct events. Entries may be corrected and expanded by comparison with other logs covered in the procedure.

4.5 Various Emergency Log formats are shown in Figures 1 through 3.

4.6 The following is a description of the various logs and the information required to be logged in each.

(a) Operations Reactor Log

The operations staff will log operational events in the Operations Reactor Log Book, located in the Control Room.

(b) Contact Report Log

Shift Emergency Communicators responsible for contacting personnel and/or organizations shall maintain a Contact Report Log, Figure 1, to log miscellaneous contacts to and from offsite authorities or personnel.

NOTE: The Emergency Notification Call Lists shall be maintained by the SEC's for logging notification to offsite emergency organizations.

Information required on the Contact Report Log is:

(1) Time of contact & initials of communicator

(2) Contact - individual/organization contacted or individual/organization calling.

(3) Description - brief description of reason or purpose of contact.

(c) Emergency Directors Narrative Log

The Emergency Director shall maintain a narrative log (See Figure 2) of all significant events occuring during the course of an emergency.

The Emergency Director or the TSC Coordinator may designate an individual to maintain the Emergency Directors Log.

The individual keeping this log should locate himself near the Emergency Director to facilitate the flow of information in a timely & accurate manner.

The following items are examples of events and data that should be recorded in the Emergency Directors Narrative Log:

(1) Significant events and the times at which they occur.

(2) Reports made to the Emergency Director (plant status, radiological conditions, etc.)

(3) Notifications made.

(4) Hazard assessment (operational or radiological)

(5) Radiological monitor alarms.

(6) Survey results, area and personnel.

(7) Evacuations

(8) Injuries and medical care

(9) Meteorological information

(10) Emergency teams dispatched (Survey, first aid, repair, fire, etc.)

(11) Reentry efforts

(12) Recovery efforts

(13) Offsite dose projections

(14) Any other items deemed necessary or pertinent.

(d) Survey Summary Log

The Radiological Emergency Coordinator shall maintain a record of all significant events, both onsite and offsite.

The Log shall contain the following:

(1) Time - Time that the log entry is made.

(2) Description - description of entry, e.g. survey results, met data, etc.

(3) INIT - individuals making entries shall initial.

4.7 All records shall be maintained and consolidated (at conclusion of emergency condition) and filed to provide a permanent record of activities and events. These records shall be used to assist the Emergency Director in making decisions and to provide a history of events for final reports.

4.8 All the remaining checklists and forms listed throughout the Emergency Plan Implementing Procedures are unofficial & should be used to provide a source of notes, calculations, and recommendations of the various groups within the plant emergency organization. All completed forms & checklists should be forwarded to the Emergency Director at the termination of the Emergency condition or when directed by the Emergency Director.

FIGURE 1

CONTACT REPORT LOG

DATE: _____

TIME/INIT.	CONTACT	DESCRIPTION

FIGURE 2

EMERGENCY DIRECTORS NARRATIVE LOG

DATE:________

TIME	SUMMARY OF EVENT

EXAMPLE ONLY
USE
CURRENT REVISION

FIGURE 3

REC LOG

DATE: _____

TIME	DESCRIPTION	INIT

PRAIRIE ISLAND NUCLEAR GENERATING PLANT NORTHERN STATES POWER COMPANY	EMERGENCY PLAN IMPLEMENTING PROCEDURES
	Number: F3-25 Rev: 2
	History Copy Retention Time: Lifetime
Reviewed By: D.A. Schuelke Supt. Rad Protection	TITLE:
Approved By: [signature] Plant Manager	REENTRY
OC#: 8-26-82	

1.0 PURPOSE

This procedure provides instructions and guidelines for reentry into areas of the plant or plant site, where radiological and/or environmental conditions are largely unknown.

The reentry has been preceded by:

(1) An evacuation of the plant or affected areas of the plant,

and

(2) The magnitude and/or nature of the radiological hazards in the affected areas are not fully known.

2.0 PRECAUTIONS

Because of the unknown or unexpected conditions within the affected areas:

(1) Reentry teams shall be composed of a minimum of two individuals. Maximum number shall be determined by the volume of work assigned to the reentry team. The team members should remain in visual/ voice contact with each other at all times when in the affected areas.

(2) If there is reason to believe that the air within the area is toxic or an oxygen deficiency exists, the team members shall use self contained breathing apparatus which then limits the time available to the team. In this case, in addition to the original team, two or more individuals should be assigned outside of the affected area in standby (fully clothed and wearing SCBA) ready to enter the area if necessary.

(3) Lifelines should be used in areas containing heavy smoke or in areas where visual contact between team members is impossible or hampered.

(4) The Reentry team shall have radiation dose rate meters when radiological conditions are unknown, or likely to change unexpectedly. Two survey meters should be used when radiation levels are expected to exceed 10 R/hr.

(5) One team member shall be designated as the Team Leader.

(6) Radiation exposure for the reentry team personnel shall be controlled by the Radiation Protection Group in accordance with F3-12, "Emergency Exposure Control".

(7) All reentries into areas of high radiation areas (10R/hr general area) should be made with two dose rate meters.

3.0 APPLICABILITY

This procedure is applicable to all individuals directing, assisting, or assigned to a reentry team.

4.0 ROCEDURE

The Emergency Director shall utilize all pertinent data available including area and process radiation monitoring channels, survey data, visual observations, observations made by previous reentry teams and any other source of information applicable to determine:

(1) Which plant areas are affected.

(2) Conditions in affected areas (hazards, radiological, temperature, etc.).

(3) Actions which should be taken to reduce the potential hazards to the reentry team prior to or during the reentry.

4.1 The Emergency Director shall assemble the appropriate reentry team(s).

NOTE: If excessive radiation exposures are expected or possible, the teams shall be composed of volunteers. It is highly recommended that one team member should be a Radiation Protection Group member or an individual with extensive training in radiation protection practices.

4.2 The Radiological Emergency Coordinator shall ensure that preparation for the reentry teams(s) are complete, i.e., personnel are properly clothed, badged, respiratory protection is issued and exposure is controlled in accordance with F3-12 "Emergency Exposure Control".

NOTE: Dose rates for areas of the plant projected for the worst case accident assuming major safety system failure and significant core damage, are shown in Figures I-1 thru I-10 (for Unit 1 Accident) and II-1 thru II-10 (for Unit 2 Accident).

4.3 The reentry team shall carry portable communication gear allowing continuous contact with the Emergency Director and/or Radiological Emergency Coordinator.

4.4 The reentry team shall continuously observe the portable radiation instrument while approaching the affected area.

NOTE: (1) Two survey meters should be used if radiation levels are expected to exceed 10R/hr. (2) If at any time the survey instrument appears to malfunction, or go off scale high, immediately return to a safe area and contact the Emergency Director/REC.

4.5 A continuous dialogue should be maintained between the reentry team and the Emergency Director concerning observed dose rates and conditions observed.

4.6 Periodically, or when requested, the reentry team shall read and report dosimeter readings.

4.7 If at anytime during the reentry, observed dose rates exceed a predetermined level or if the exposure of team members approaches a predetermined amount, the Team Leader shall return the team to a safe area.

4.8 If exposure or dose rates are acceptable, the reentry team should complete the functions assigned to it (e.g. surveys, inspections, repairs, valve operations, etc.).

4.9 The Team Leader, upon completion of work, shall direct the team from the area to a safe area (control point).

4.10 The Radiation Protection Group should assist the team members at the control point assuring an accurate dose assessment and proper removal of protective clothing and respiratory protection equipment.

4.11 The Radiation Protection Group shall complete the dose assessment for team members in accordance with F3-12, "Emergency Exposure Control".

4.12 The Radiological Emergency Coordinator shall insure that all follow up actions are completed.

ATTACHMENT A

DOSE RATE CALCULATION DESCRIPTION

Floor plans have been developed to show the Design Basis Accident dose rates throughout the plant. The Design Basis Accident dose rates are a result of safety system failure leading to major core damage with release to the containment atmosphere of 100% of the core noble gas inventory, 50% of the core equilibrium Radioiodine inventory and 1% of all others. In all cases, the accident has been assumed to be instantaneous, and the release of the fission products from the core has occurred at time T = 0. The fission products are assumed to be uniformly mixed within the containment atmosphere.

Dose rates from the containment structure itself have been included in the dose rates to the vital and general areas of the plant. Dose rates in the Auxiliary Building have been calculated, taking credit for the floors and walls within the Auxiliary Building. Large shield penetrations have also been included in the analysis. The penetrations that have been analyzed include ventilation penetrations on the 755' level, and the Main Steam penetrations on the 715' level. Where appropriate, values shown include the sum of the dose rates from containment itself and from the shield wall portals. Feedwater penetrations were assumed to be filled with water, resulting in no portal effect.

Two floor plans for the 695' level are shown. One shows the dose rates at T = 0 assuming the recirculation mode is not in use. Dose rates on this floor plan are from the containment and the CVCS lines. The other floor plan of 695' level shows the dose rates at T = 0 assuming recirculation mode is in use. Dose rates shown here are the totals from the containment, CVCS lines, RHR, SI, and CS lines. The dose rates from the CVCS have been calculated assuming Letdown was isolated after a gap activity release accident. Dose rates in the plant from the RHR, SI and CS Systems have been calculated assuming 100% of the core equilibrium radioactive Noble Gas inventory and 50% of the core equilibrium radioactive Halogen inventory have been diluted into the combined volume of the Reactor Coolant System and the Refueling Water Storage Tank (RWST). This assumes that the water in the RWST has been injected and that the RHR recirculation mode is in use. These dose rate calculations are conservative because they are based on a T = 0 hours activity and no degassing of the recirculation water by the blowdown into containment. In reality, it would take at least 15 minutes before alignment of the recirculation mode would commence and the noble gases would be stripped when the liquid depressurizes.

Floor plans of the 715' and 735' levels are at T = 0 assuming the RHR recirculation mode is in progress.

ATTACHMENT A

(Continued)

Dose rates at T = 0 are shown for the 755' level. These dose rates are from the containment and include the shield wall portals. Dose rates on 755' level at T = 1/2 hour are also shown. These dose rates are from the containment and the Shield Building Vent System (SBVS) and Aux. Building Special Vent System (ABSVS) filters. Dose rates from the filters peak at approximately 1/2 hour after the event due to the build-up on the charcoal beds. The design criteria leakage of .25 w/o per day from the containment vessel to the shield building was used as the basis of the SBVS filter isotope build-up. The effect of Containment Spray has been included in the analysis. Dose rates from the ABSVS were also calculated. These dose rates are based on the RHR pump seal failure in combination with the design criteria of .1 w/o per day leakage which by-passes the SBVS and is deposited on the ABSVS filters. This is conservative because if the .1 w/o is deposited on the ABSVS filters only, .15% w/o would be deposited on the SBVS filters. It has been assumed that .25 w/o is deposited on the SBVS filters and .1 w/o is deposited on the ABSVS filters. In addition, the RHR seal failure has also been included as a source of build-up on the ABSVS filters.

Dose rates at times later than T = 0 for all levels except 755' may be determined using Dose Rate vs Time Curves and the following formula:

$$D_t = \frac{\%D.R.}{100} \times D_o$$

Where D_t = Dose rate at some time, t

%D.R. = Percentage of T = 0 Dose Rate from Dose Rate vs Time Curves (Fig. 1 or 2)

D_o = Dose rate at T = 0

FIGURE 1

DESIGN BASIS ACCIDENT-OWNERS GROUP SOURCE TERMS

DOSE RATE % OF T = 0 VS. TIME

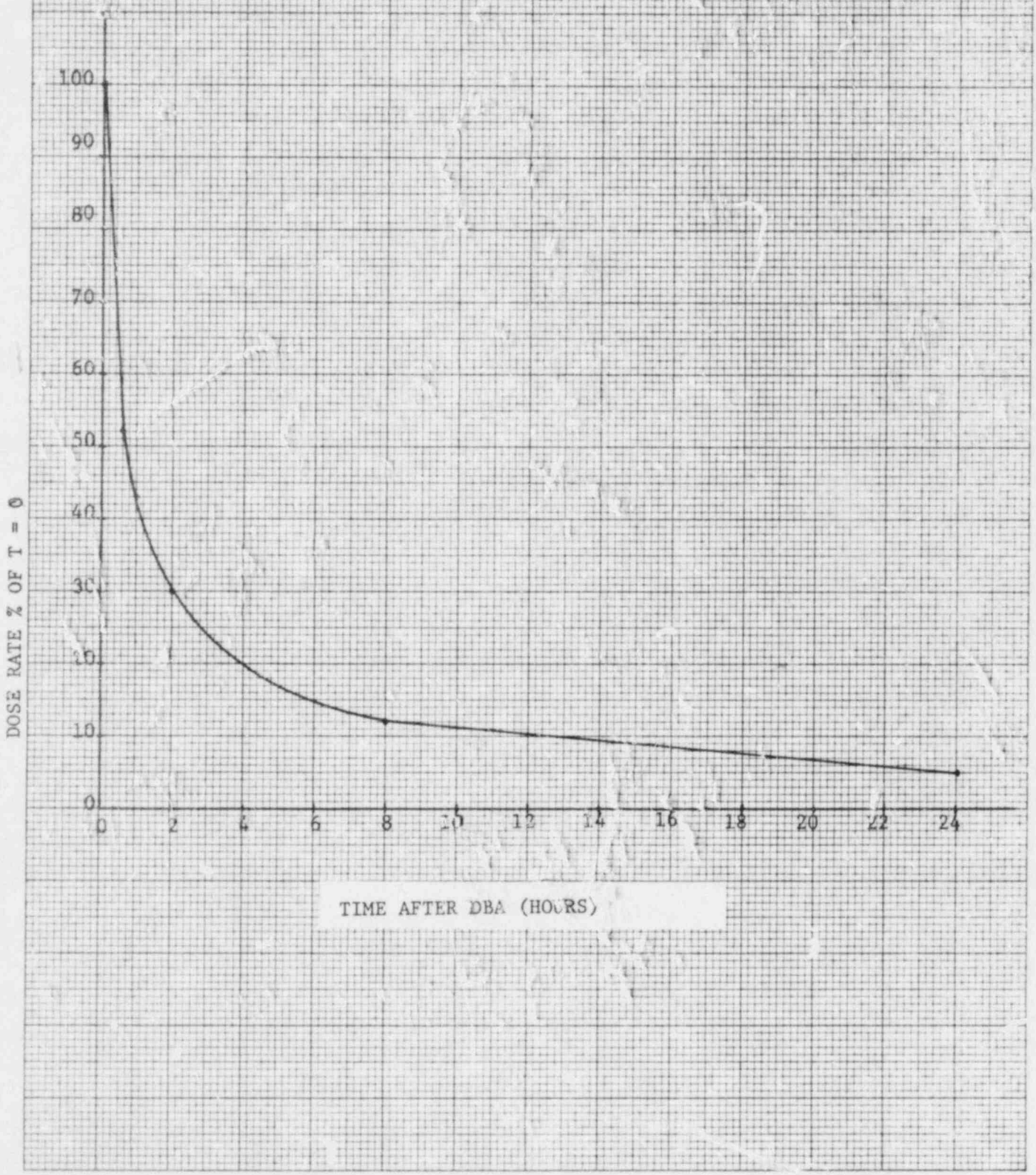
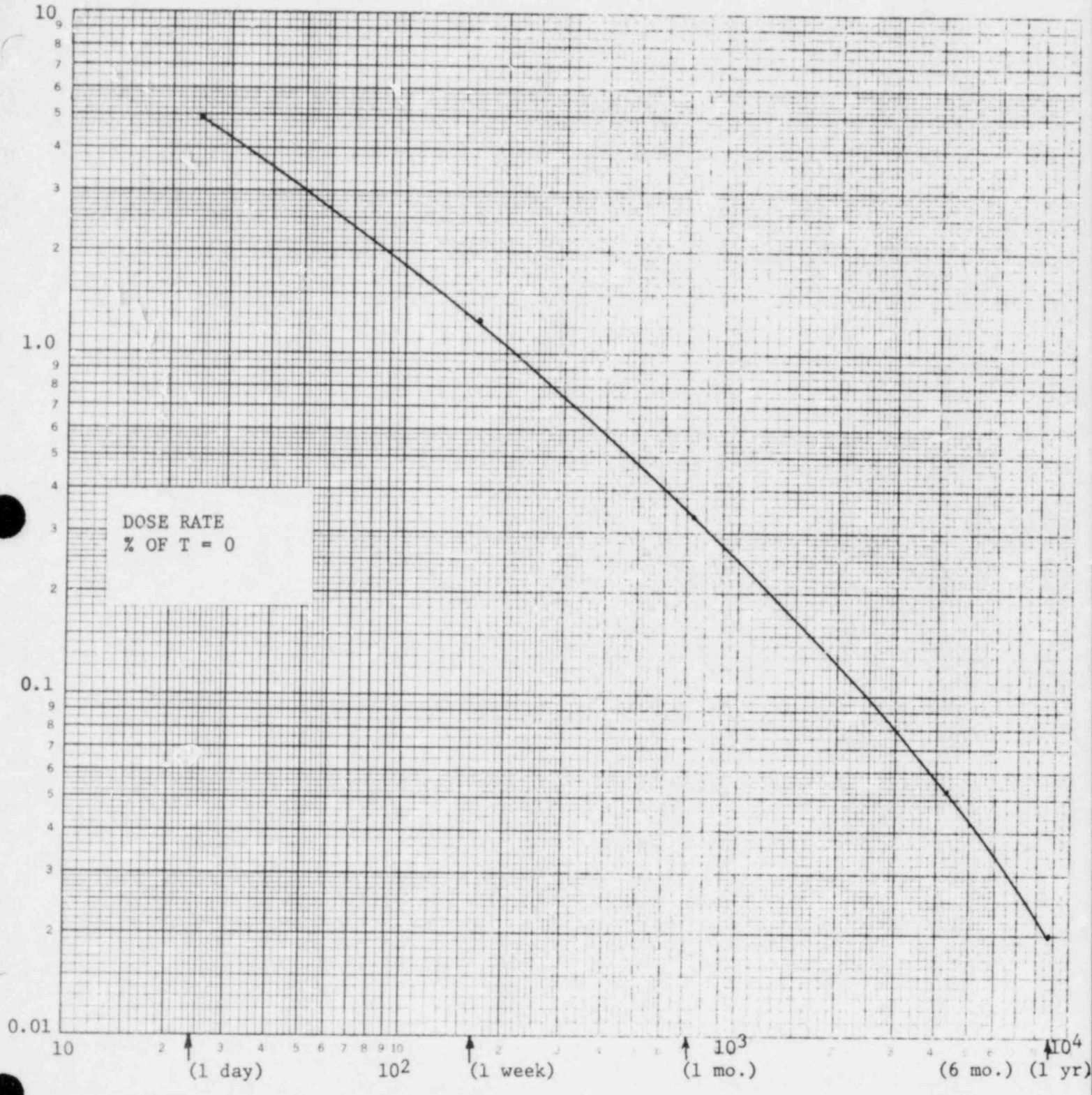


FIGURE 2

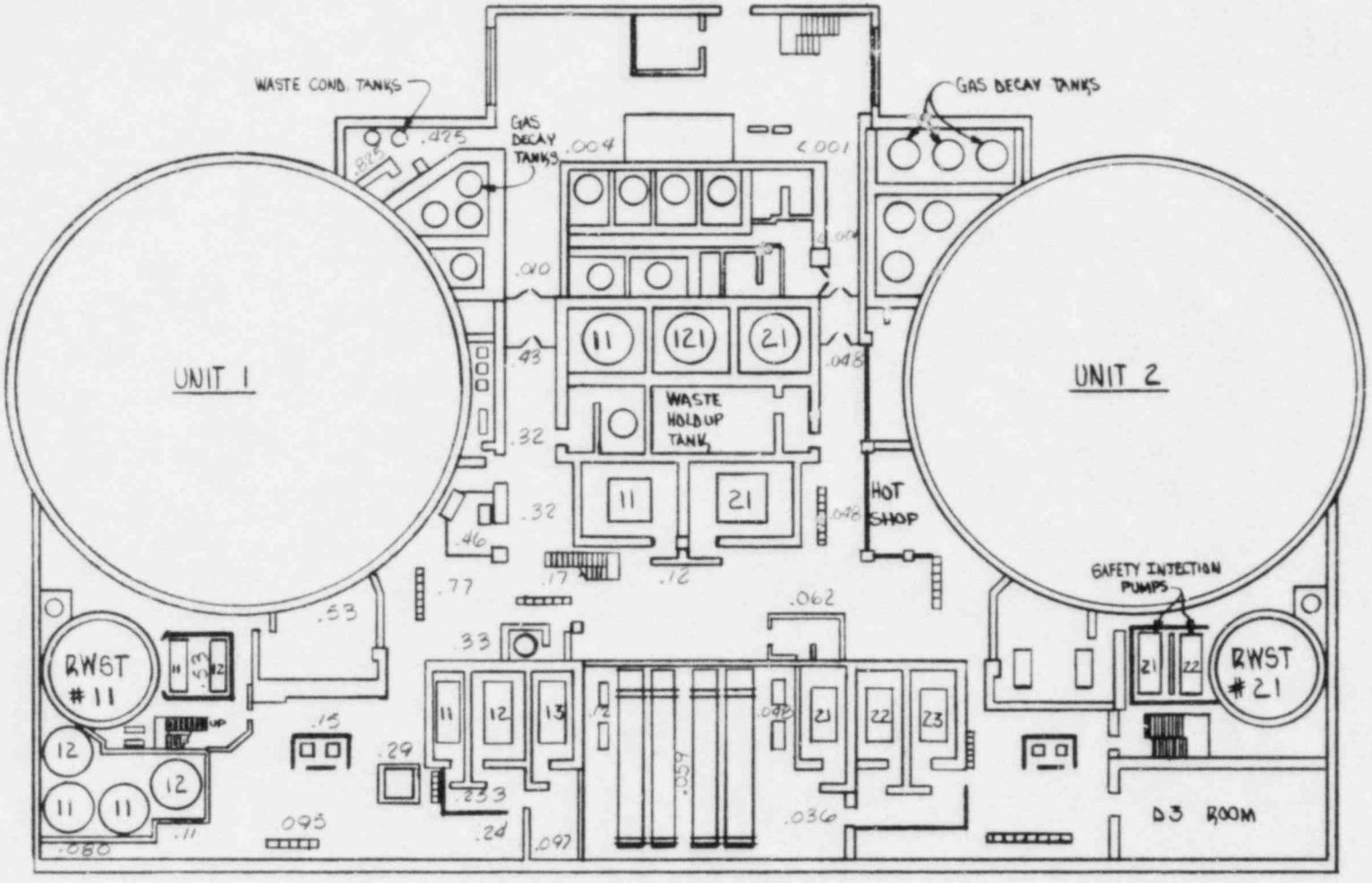
DESIGN BASIS ACCIDENT-OWNERS GROUP
SOURCE TERMS

DOSE RATE % OF T = 0 VS. TIME



FLOOR PLAN INDEX

Unit I Accident Dwg No.	Unit II Accident Dwg No.	Floor Plan
I-1	II-1	695' Aux Bldg No. Recirc.
I-2	II-2	695' Turb Bldg No Recirc.
I-3	II-3	695' Aux Bldg Recirc. In
I-4	II-4	695' Turb Bldg Recirc. In
I-5	II-5	715' Aux Bldg. Recirc. In
I-6	II-6	715' Turb Bldg Recirc. In
I-7	II-7	735' Aux Bldg Recirc. In
I-8	II-8	735' Turb Bldg Recirc. In
I-9	II-9	755' Aux Bldg T = 0 Recirc In
I-10	II-10	755' Aux Bldg T = 1/2 hr. Recirc. In



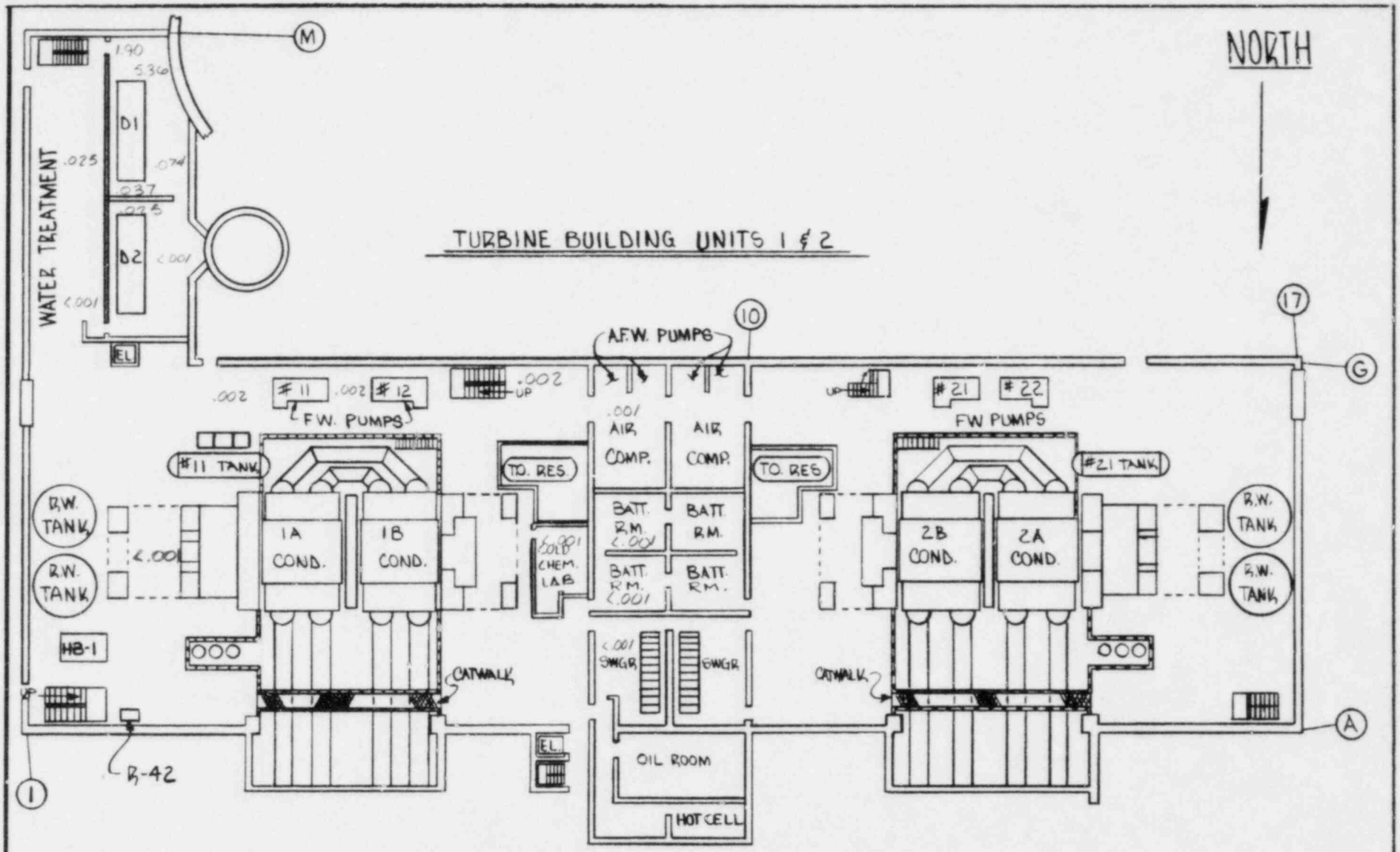
AUXILIARY BLDG. FLR EL. 695'-0"

UNIT-1 AFFECTED DBA
DOSE RATES AT T-0
RECIRCULATION MODE NOT IN PROGRESS

NOTE:
NUMBERS IN RED ARE R/HR

PRAIRIE ISLAND NUCLEAR GENERATING STATION
AUXILIARY BUILDING
GROUND FLOOR EL. 695'-0"

SCALE	DWN. CGR	DATE	DWG. NO.
~	CHK.	5-6-82	I-1



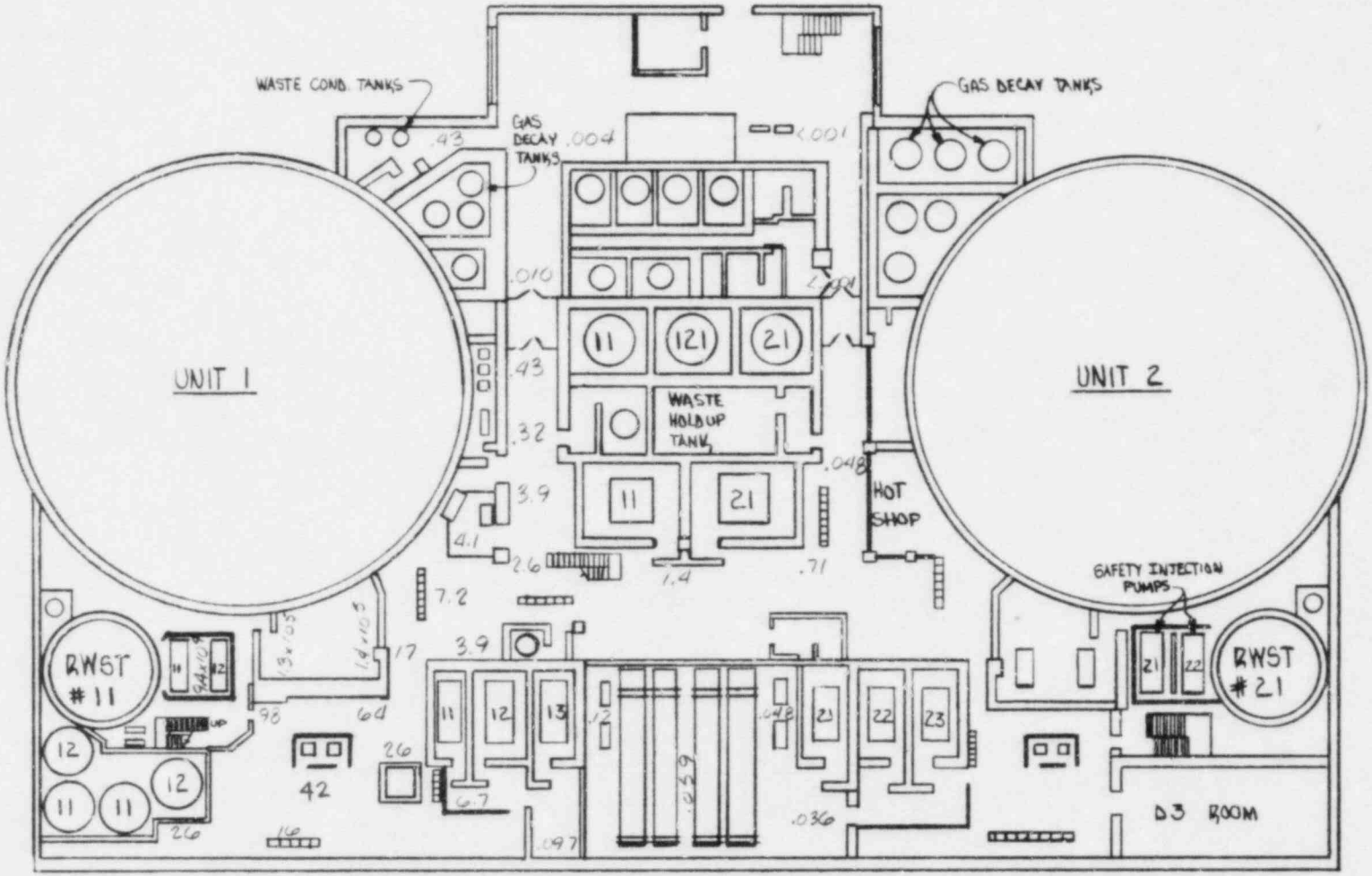
FLOOR ELEV. 695'-0

PRAIRIE ISLAND NUCLEAR GENERATING STATION
TURBINE BUILDING UNITS 1 & 2
GROUND FLOOR EL. 695'-0"

SCALE	DWN: COX	DATE	DWG. NO.
~	CHK:	4-5-82	I-2

UNIT-1 AFFECTED DBA
DOSE RATES AT T=0
RECIRCULATION MODE NOT IN PROGRESS

TURBINE BLDG. FLR. EL. 695'-0"
NOTE:
NUMBERS IN RED ARE R/hr.



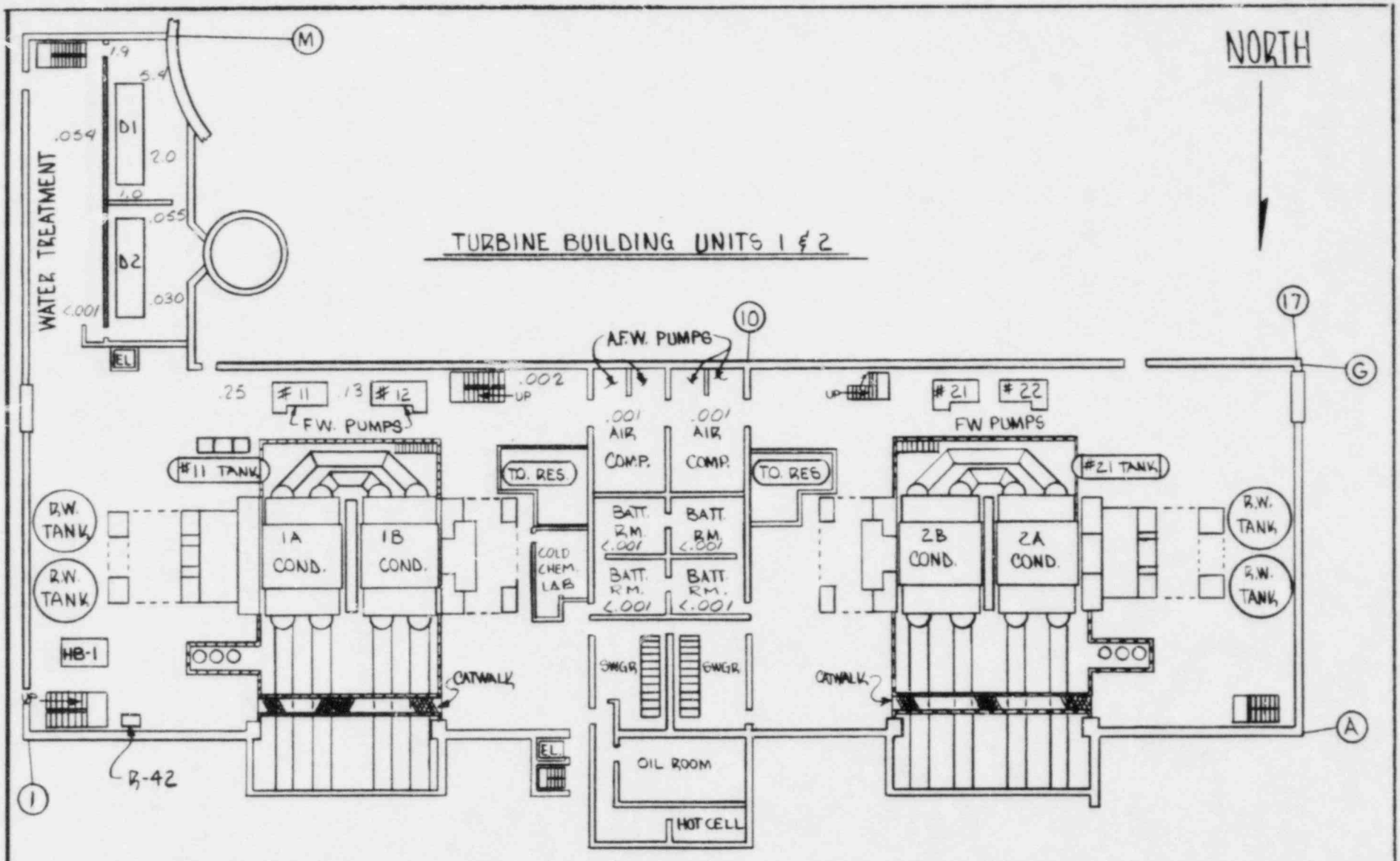
AUXILIARY BLDG. FLR EL. 695'-0"

UNIT-1 AFFECTED DBA
DOSE RATES AT T=0
RECIRCULATION MODE IN PROGRESS

NOTE:
NUMBERS IN ARE R/HR

PRAIRIE ISLAND NUCLEAR GENERATING STATION
AUXILIARY BUILDING
GROUND FLOOR EL: 695'-0"

SCALE	DWN. CSK	DATE	DWG. Nº.
~	CHK.	5-6-82	I-3



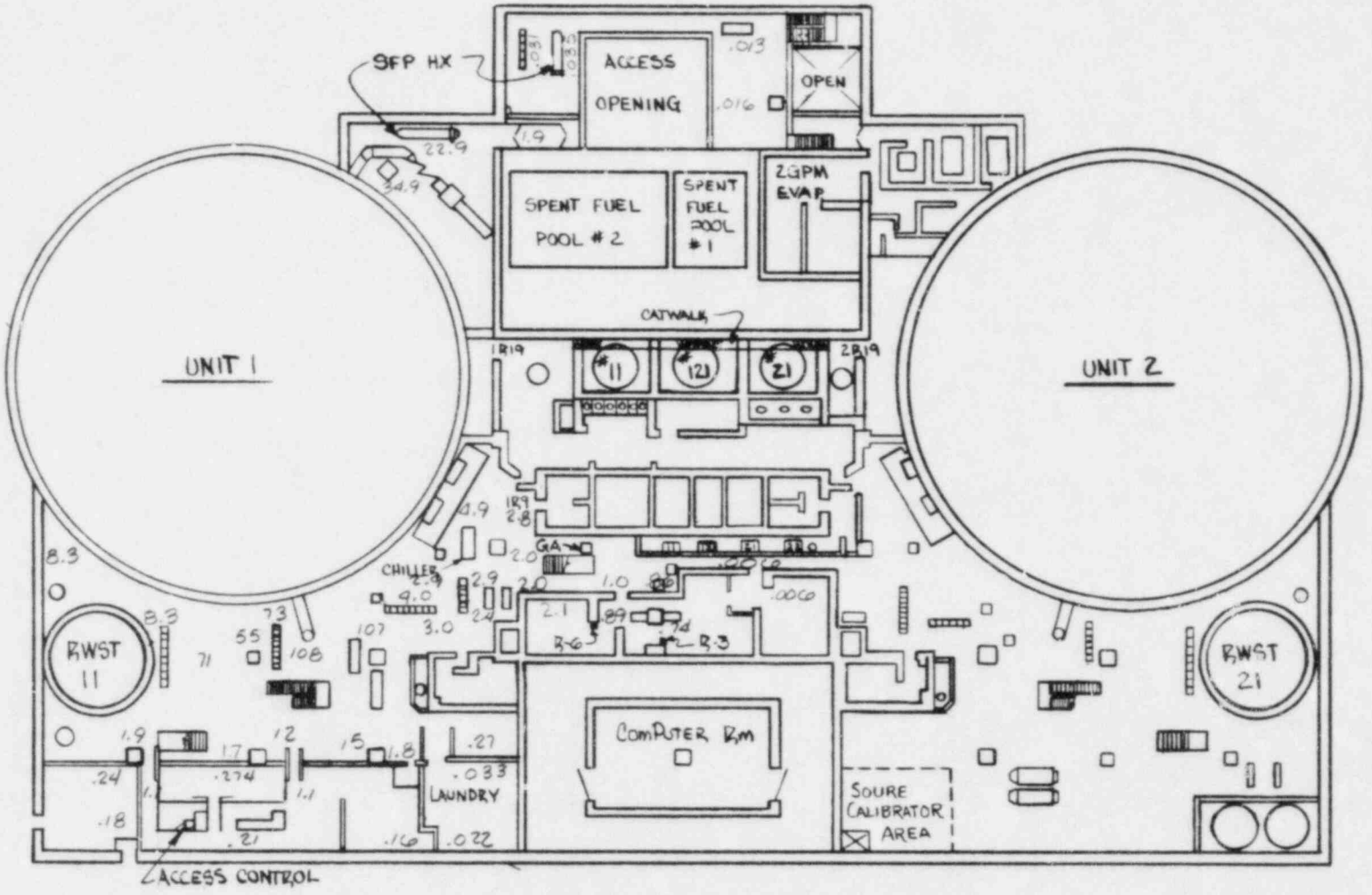
FLOOR ELEV. 695'-0

UNIT-1 AFFECTED DBA
DOSE RATES AT T=0
RECIRCULATION MODE IN PROGRESS

TURBINE BLDG.
FLOOR EL. 695'-0"

PRAIRIE ISLAND NUCLEAR GENERATING STATION
TURBINE BUILDING UNITS 1 & 2
GROUND FLOOR EL. 695'-0"

SCALE	DWN: COX	DATE	DWG. NO.
~	CHK:	4-5-82	I-4



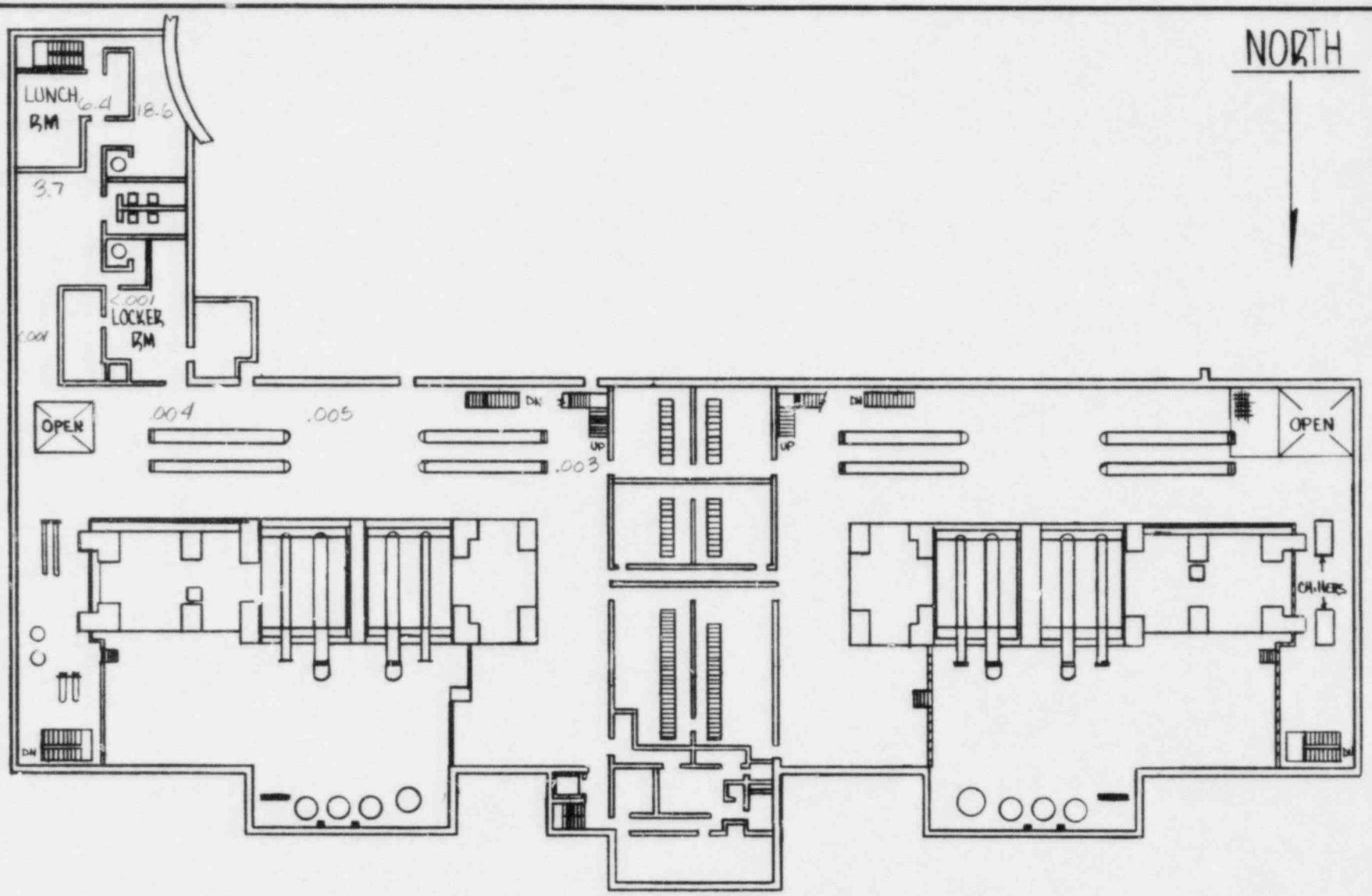
AUXILIARY BLDG. FLR. EL. 715'-0"

UNIT-1 AFFECTED DBA DOSE RATES AT T=0 RECIRCULATION MODE IN PROGRES

NOTE: NUMBERS IN RED ARE R/HR

PRAIRIE ISLAND NUCLEAR GENERATING STATION
AUXILIARY BUILDING
SECOND FLOOR EL. 715'-0"

SCALE	DWN COX	DATE	DWG Nº
~	CHK	5-7-82	I-5



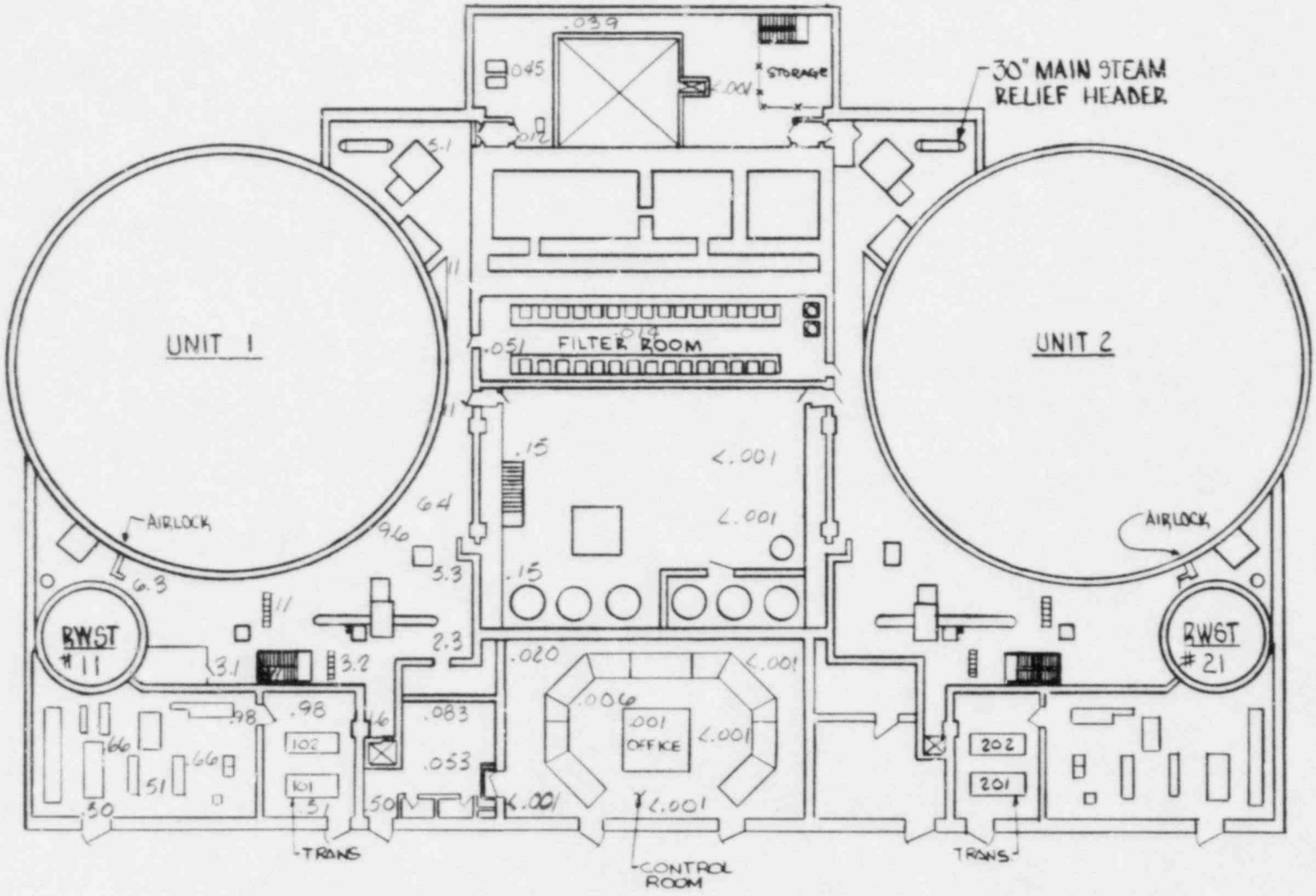
TURBINE BLDG. FLR. EL. 715'0"

UNIT-1 AFFECTED DBA
DOSE RATES AT T=0
RECIRCULATION MODE IN PROGRES

NOTE:
NUMBERS IN RED ARE R/HR

PRAIRIE ISLAND NUCLEAR GENERATING STATION
TURBINE BUILDING UNITS 1 & 2
SECOND FLOOR, EL. 715'-0"

SCALE	DWN. COZ	DATE	DWG. No
~	CHK.	5-5-82	I-6



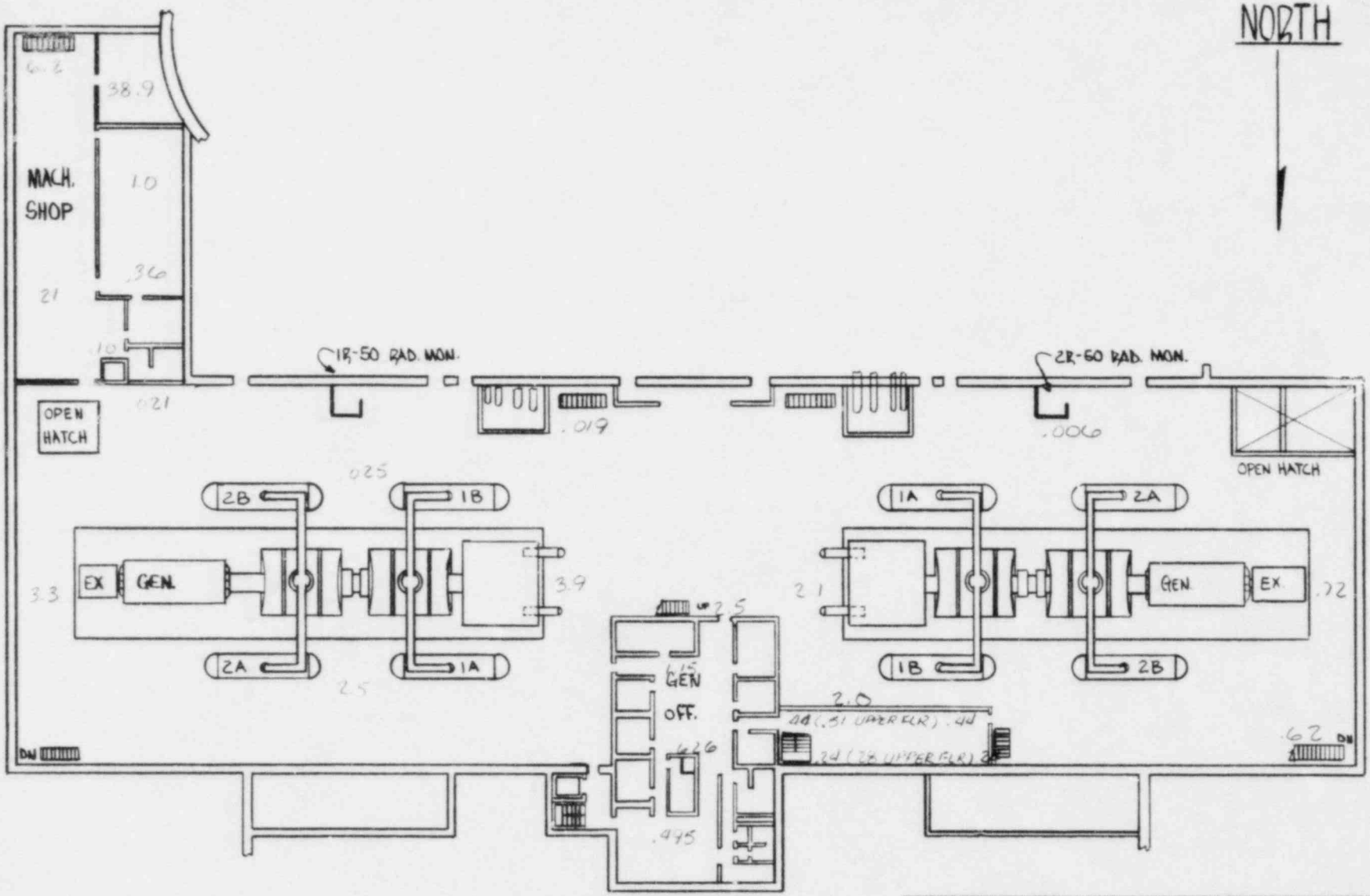
AUXILIARY BLDG. FLR. EL. 735'-0"

UNIT-1 AFFECTED DBA
DOSE RATES AT T=0
RECIRCULATION MODE IN PROGRESS

NOTE:
NUMBERS IN RED ARE R/HR

PRAIRIE ISLAND NUCLEAR GENERATING STATION
AUXILIARY BUILDING
THIRD FLOOR EL. 735'-0"

SCALE	DWN. COX	DATE	DWG. Nº
~	CHK.	5-7-82	I-7



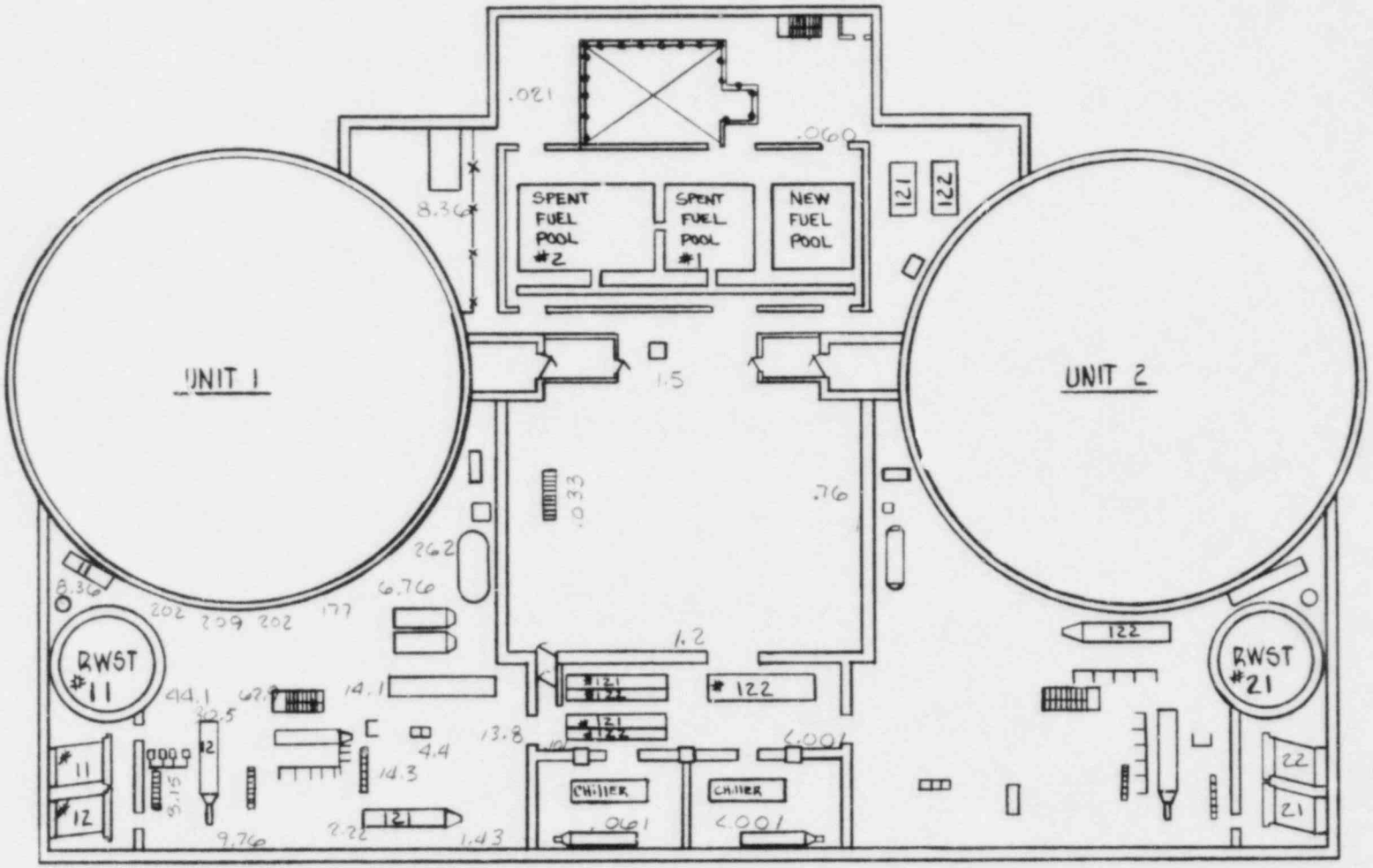
TURBINE BLDG. FLR EL 735'-0"

UNIT-1 AFFECTED DBA
DOSE RATES AT T=0
RE-IRCULATION MODE IN PROGRESS

NOTE.
NUMBERS IN RED ARE R/HR

PRAIRIE ISLAND NUCLEAR GENERATING STATION
TURBINE BUILDING UNITS 1 & 2
THIRD FLOOR EL. 735'-0"

SCALE	DWN. COZ CHK.	DATE 5-5-82	DWG. Nº I-8
~			



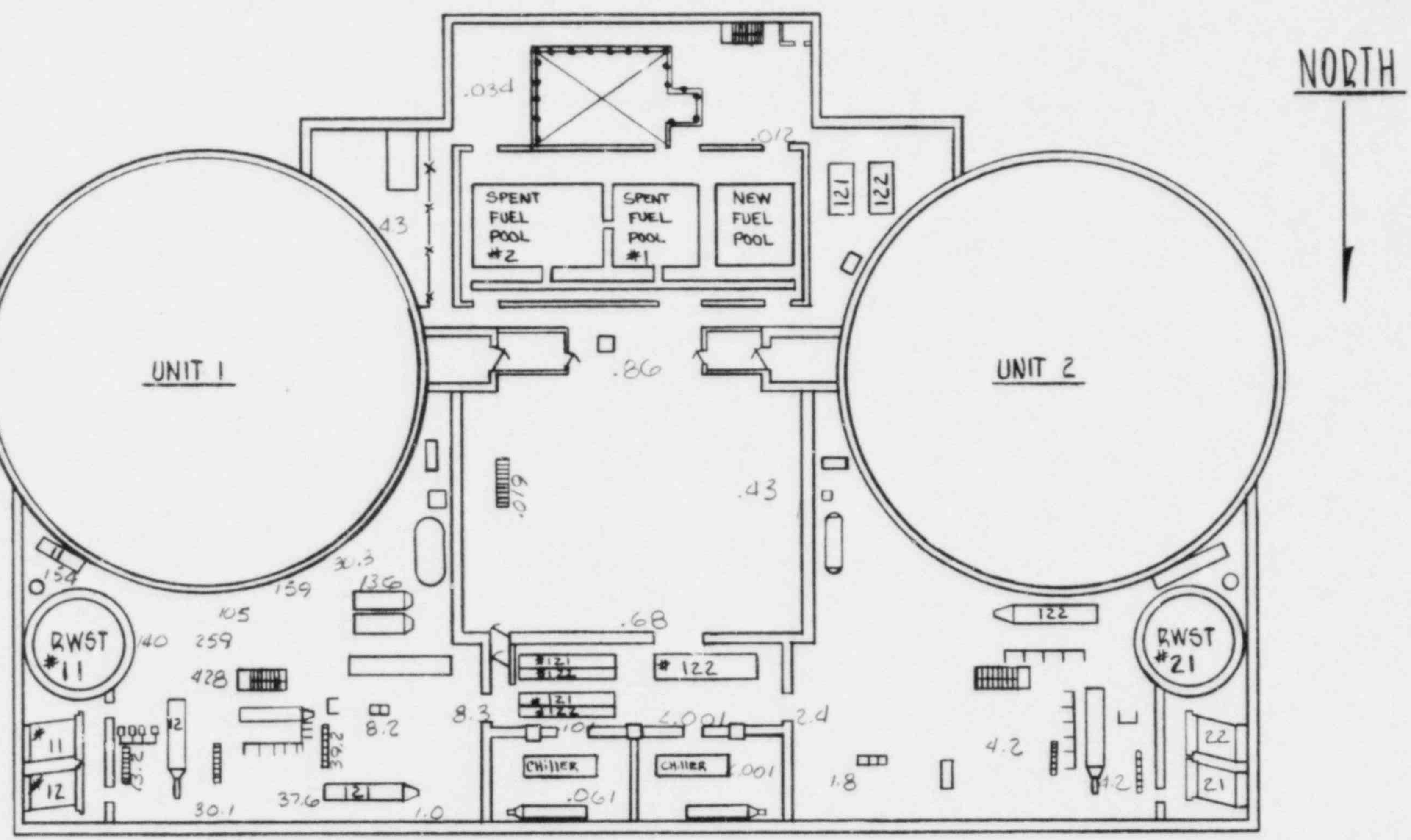
AUXILIARY BLDG. FLR EL. 755'0"

UNIT-1 AFFECTED DBA
DOSE RATES AT T-0
RECIRCULATION MODE IN PROGRESS

NOTE:
NUMBERS IN RED ARE R/HR.

PRAIRIE ISLAND NUCLEAR GENERATION STATION
AUXILIARY BUILDING
FOURTH FLOOR EL. 755'-0"

SCALE	DWN. COR	DATE	DWG. Nº
~	CHK	5-7-82	I-9

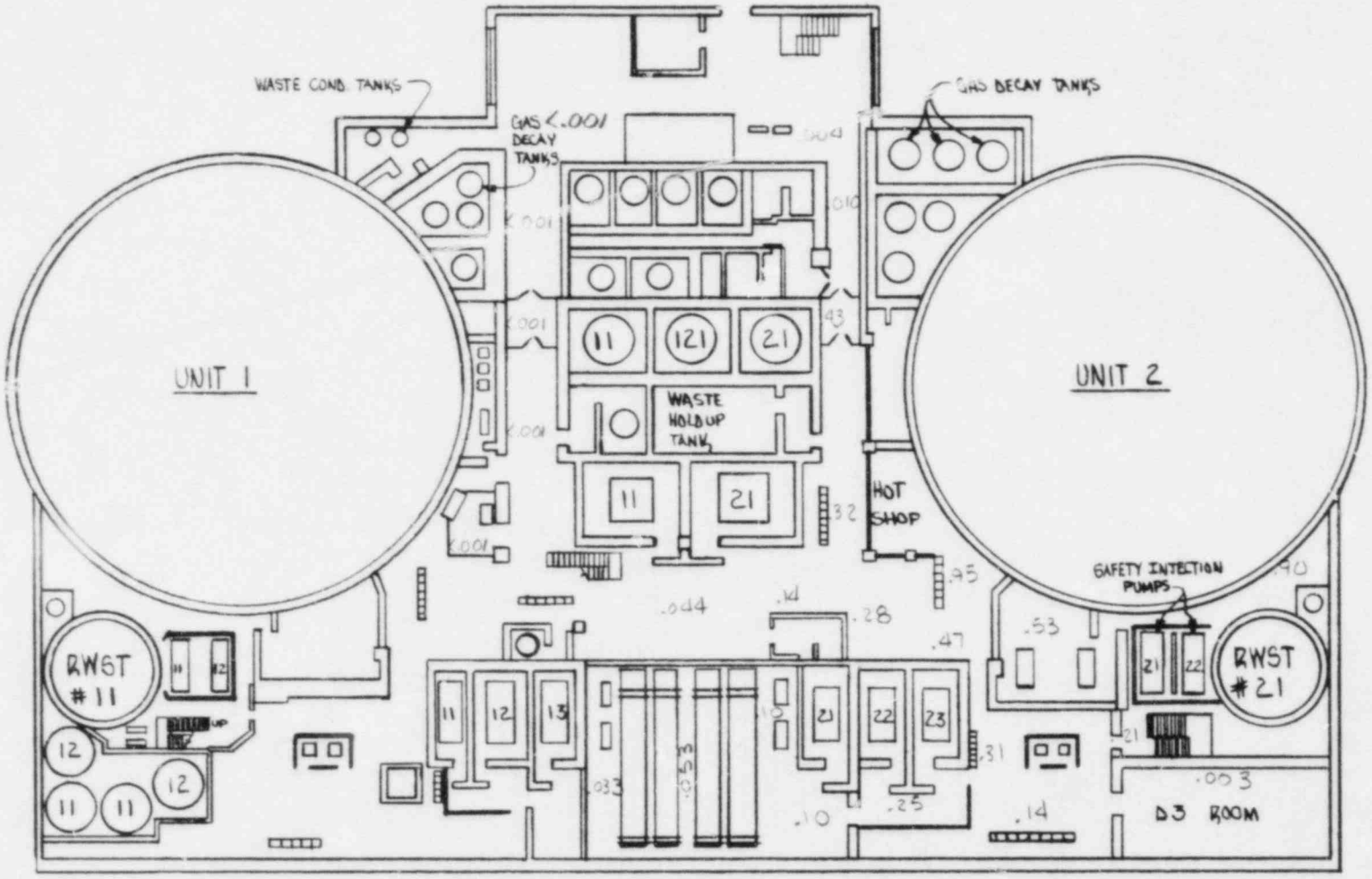


UNIT-1 AFFECTED DBA
DOSE RATE AT T=1/2 HR
RECIRCULATION MODE IN PROGRESS

AUXILARY BLDG FLR EL. 755'0"

NOTE:
NUMBERS IN RED ARE R/HR.

PRAIRIE ISLAND NUCLEAR GENERATION STATION AUXILIARY BUILDING FOURTH FLOOR EL. 755'-0"			
SCALE ~	DWN. COX CHK	DATE 5-7-82	DWG. № I-10



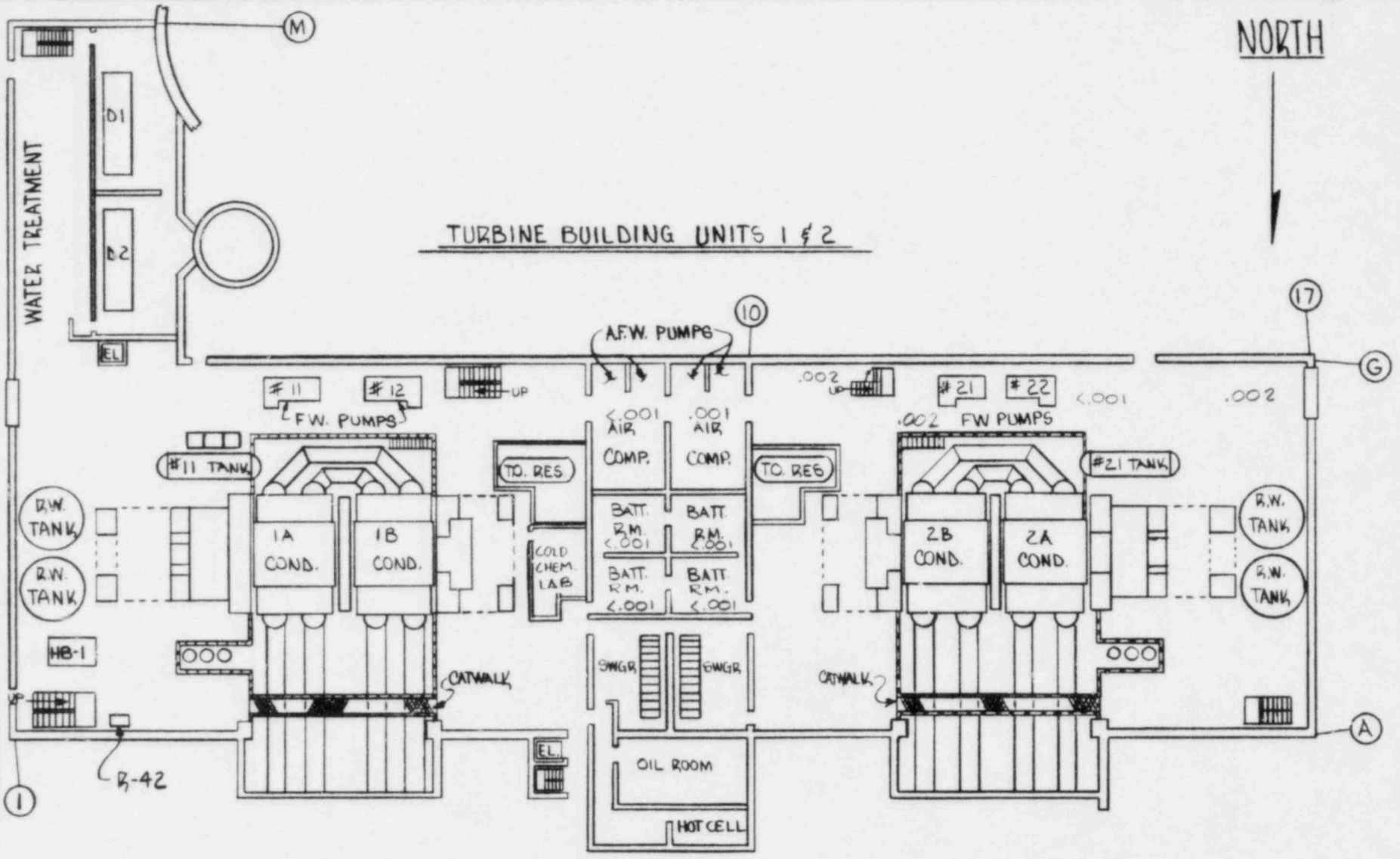
AUXILIARY BLDG. FLR. EL 695'-0"

UNIT-2 AFFECTED DBA
DOSE RATES AT T+0
RECIRCULATION MODE NOT IN PROGRESS

NOTE:
NUMBERS IN RED ARE R/HR

PRAIRIE ISLAND NUCLEAR GENERATING STATION
AUXILIARY BUILDING
GROUND FLOOR EL: 695'-0"

SCALE	DWN. CBT	DATE	DWG. NO.
~	CHK.	5-6-82	II-1



FLOOR ELEV. 695'-0

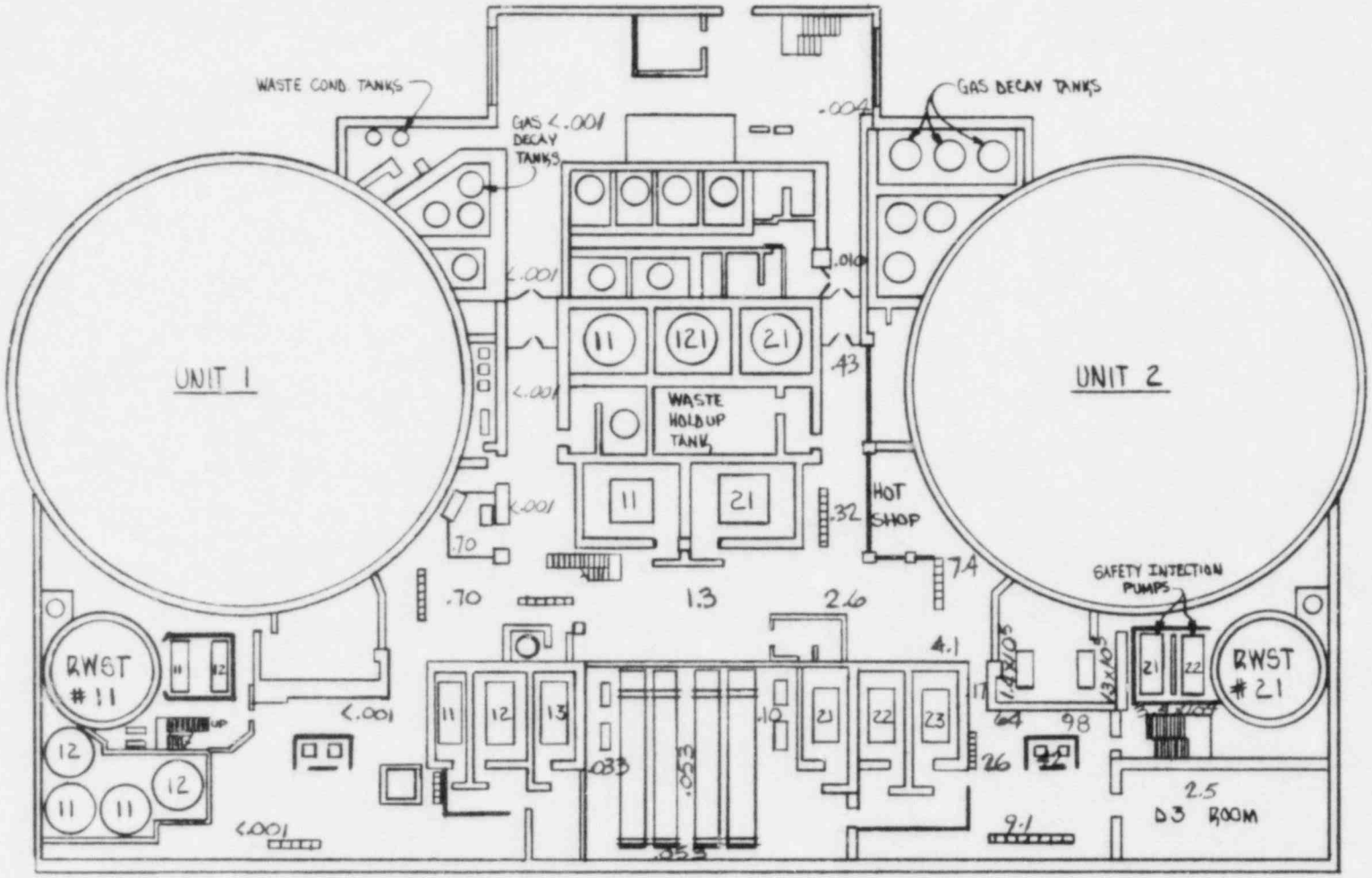
TURBINE BLDG FLR. EL. 695'-0"

NOTE:
NUMBER IN RED ARE R/hr.

- UNIT-2 AFFECTED DBA
DOSE RATES AT T=0
RECIRCULATION MODE NOT IN PROGRESS

PRAIRIE ISLAND NUCLEAR GENERATING STATION
TURBINE BUILDING UNITS 1 & 2
GROUND FLOOR EL. 695'-0"

SCALE	DWN: COX	DATE	DWG. NO.
~	CHK:	4-5-82	II-2



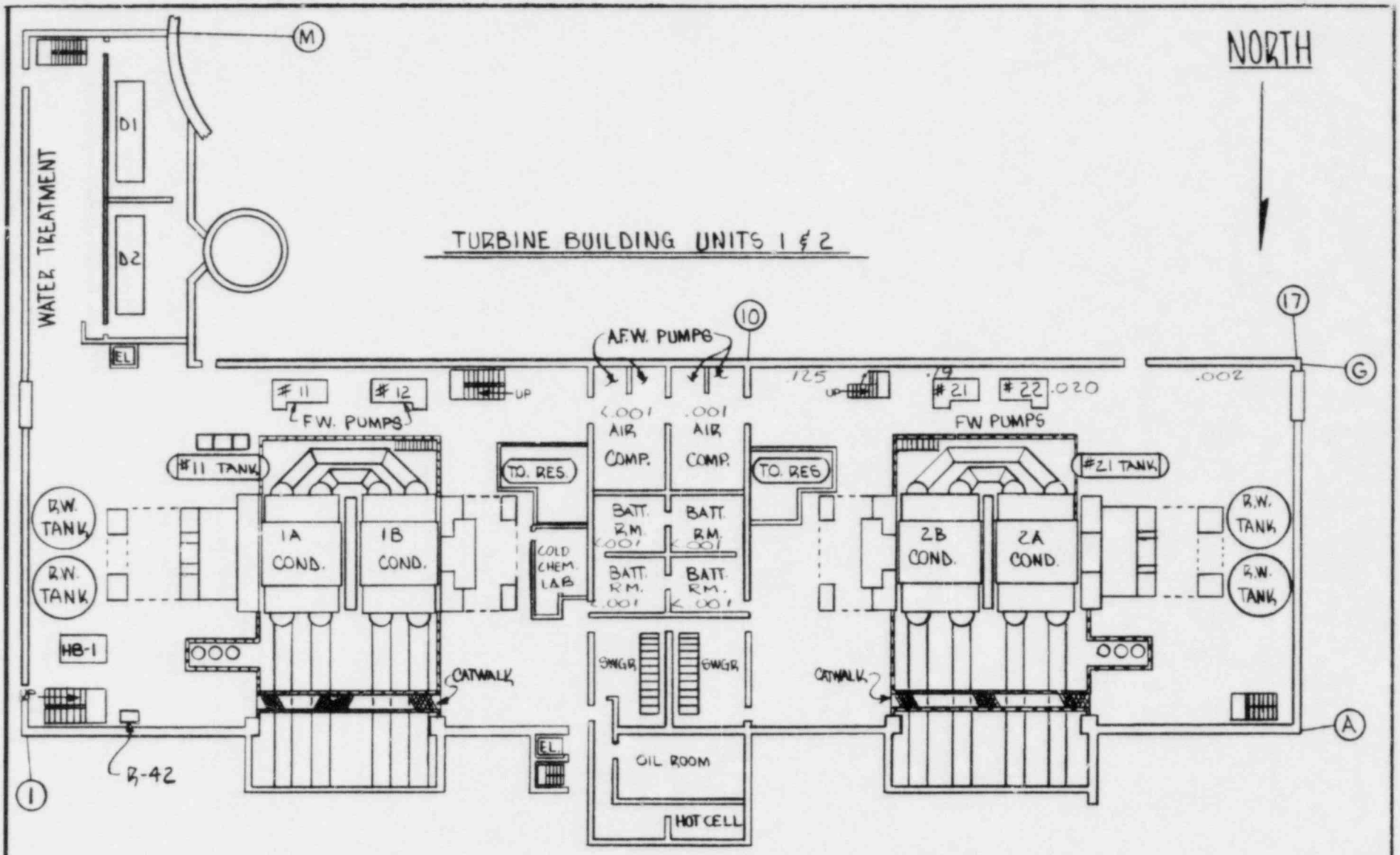
AUXILIARY BLDG. FLR EL. 695'-0"

UNIT-2 AFFECTED DBA DOSE RATES AT T=0 RECIRCULATION MODE IN PROGRESS

NOTE: NUMBERS IN RED ARE R/HR

PRAIRIE ISLAND NUCLEAR GENERATING STATION
AUXILIARY BUILDING
GROUND FLOOR EL. 695'-0"

SCALE	DWN. CGR	DATE	DWG. Nº.
~	CHK.	5-6-82	II-3



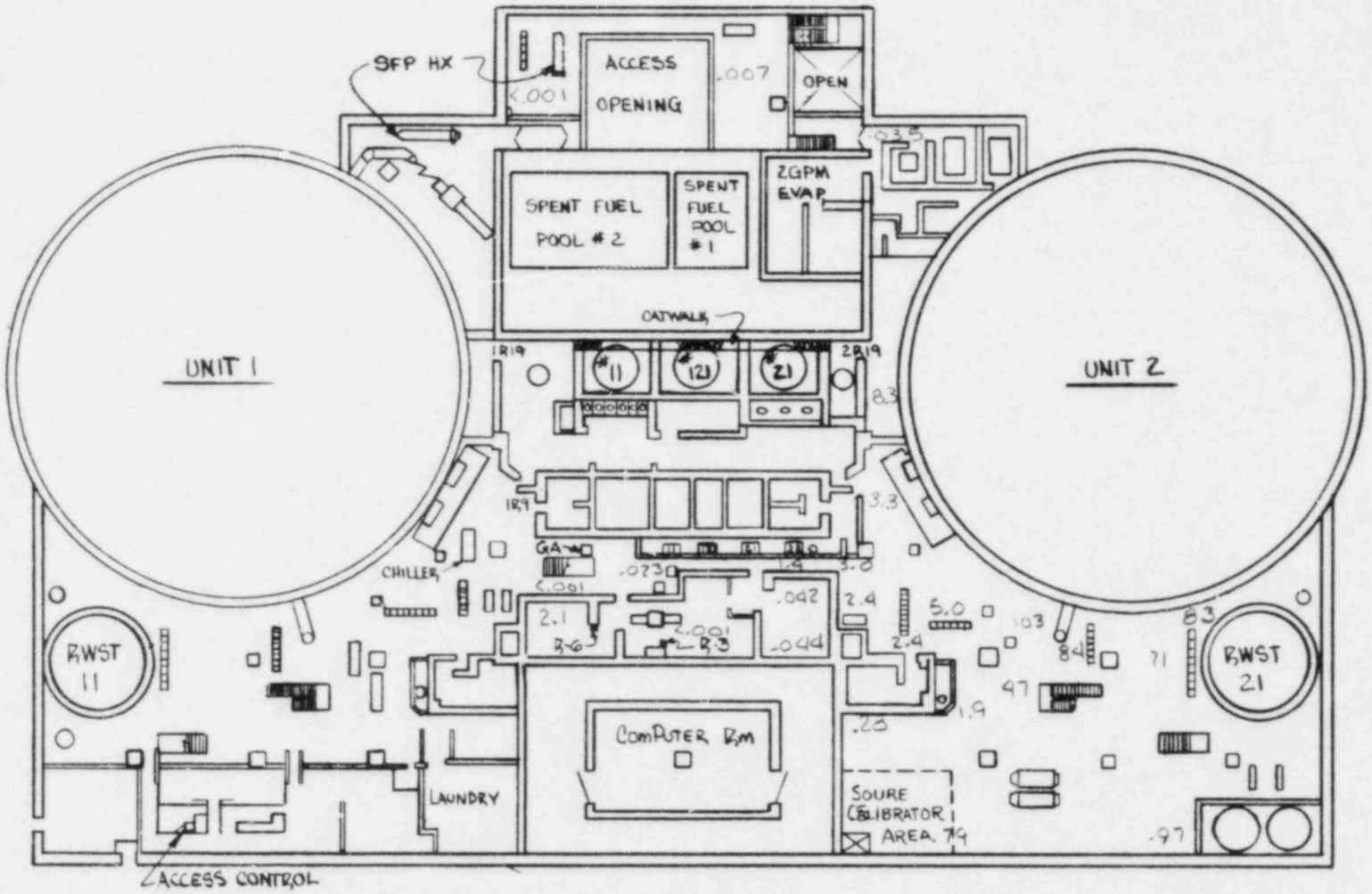
FLOOR ELEV. 695'-0

PRAIRIE ISLAND NUCLEAR GENERATING STATION
TURBINE BUILDING UNITS 1 & 2
GROUND FLOOR EL. 695'-0"

SCALE	DWN: COX	DATE	DWG. NO.
~	CHK:	4-5-82	II-4

UNIT-2 AFFECTED DBA
DOSE RATES AT T=0
RECIRCULATION MODE IN PROGRESS

TURBINE BLDG
FLR EL. 695'-0"



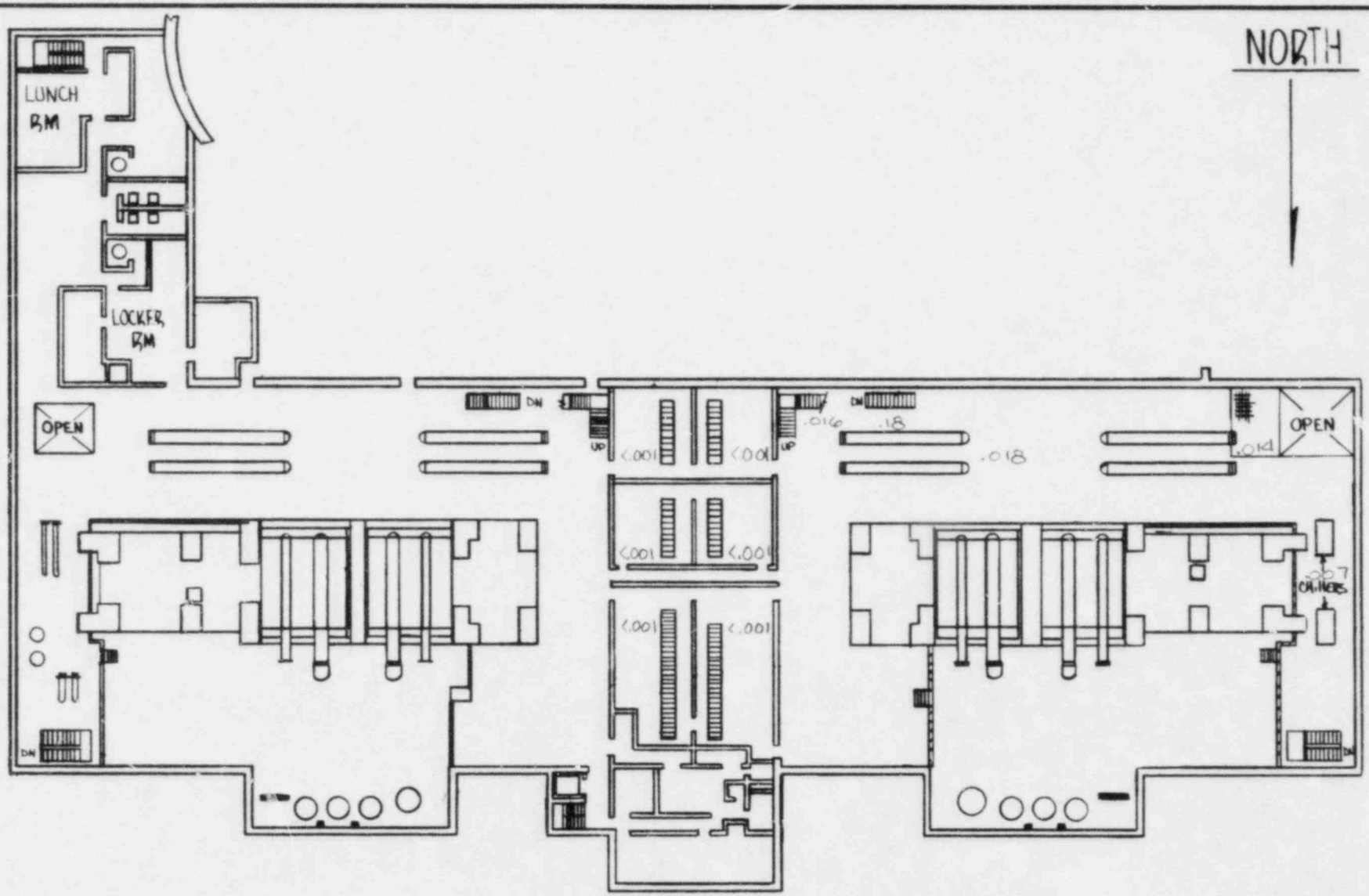
AUXILIARY BLDG. FLR. EL. 715'-0"

UNIT 2 AFFECTED DBA DOSE RATES AT T=0 RECIRCULATION MODE IN PROGRESS

NOTE: NUMBERS IN RED ARE R/HR

PRAIRIE ISLAND NUCLEAR GENERATING STATION
AUXILIARY BUILDING
SECOND FLOOR EL. 715'-0"

SCALE	DWN COX	DATE	DWG Nº
~	CHK	5-7-82	II-5



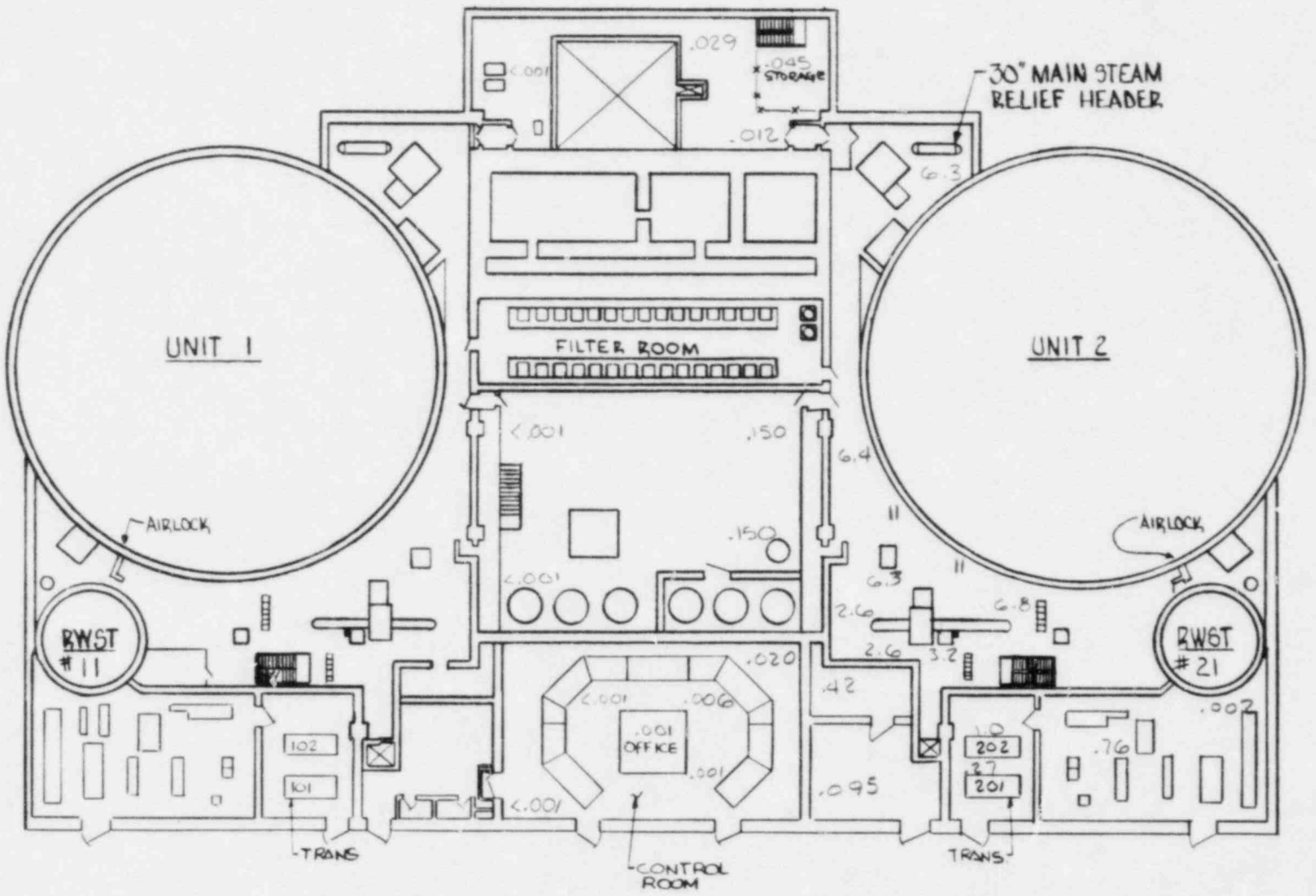
TURBINE BLDG. FLR. EL. 715'-0"

NOTE:
NUMBERS IN RED ARE R/HR

UNIT-2 AFFECTED DBA
DOSE RATES AT 7.0
RECIRCULATION MODE IN PROGRES

PRAIRIE ISLAND NUCLEAR GENERATING STATION
TURBINE BUILDING UNITS 1 & 2
SECOND FLOOR, EL 715'-0"

SCALE	DWN. COZ	DATE	DWG. NO
~	CHK.	5-5-82	II-6



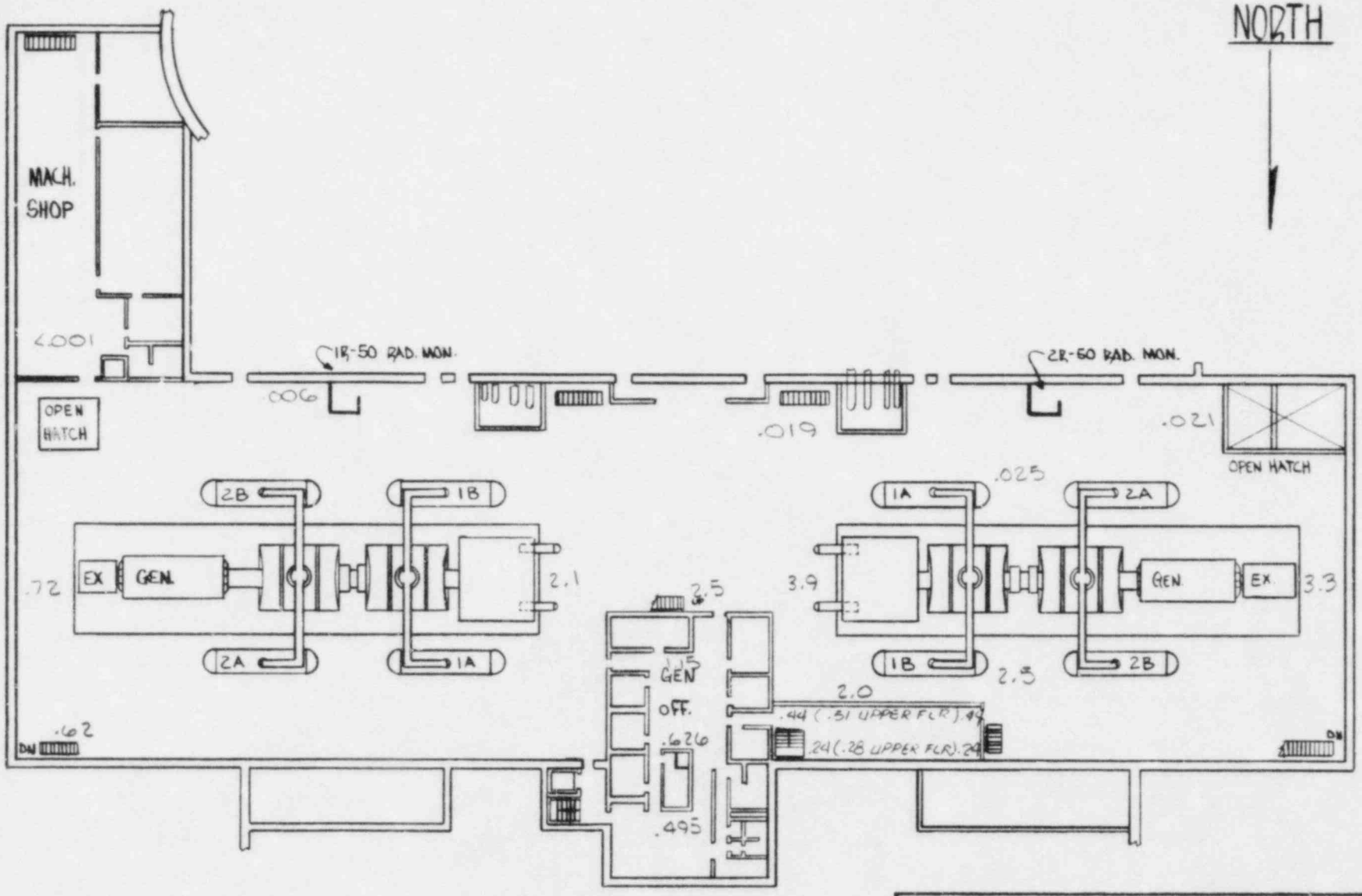
AUXILIARY BLDG. FLR. EL. 735'-0"

UNIT-2 AFFECTED DBA DOSE RATES AT T=0 RECIRCULATION MODE IN PROGRESS

NOTE: NUMBERS IN RED ARE R/HR

PRAIRIE ISLAND NUCLEAR GENERATING STATION
AUXILIARY BUILDING
THIRD FLOOR EL. 735'-0"

SCALE	DWN. COX	DATE	DWG. No
~	CHK.	5-7-82	II-7



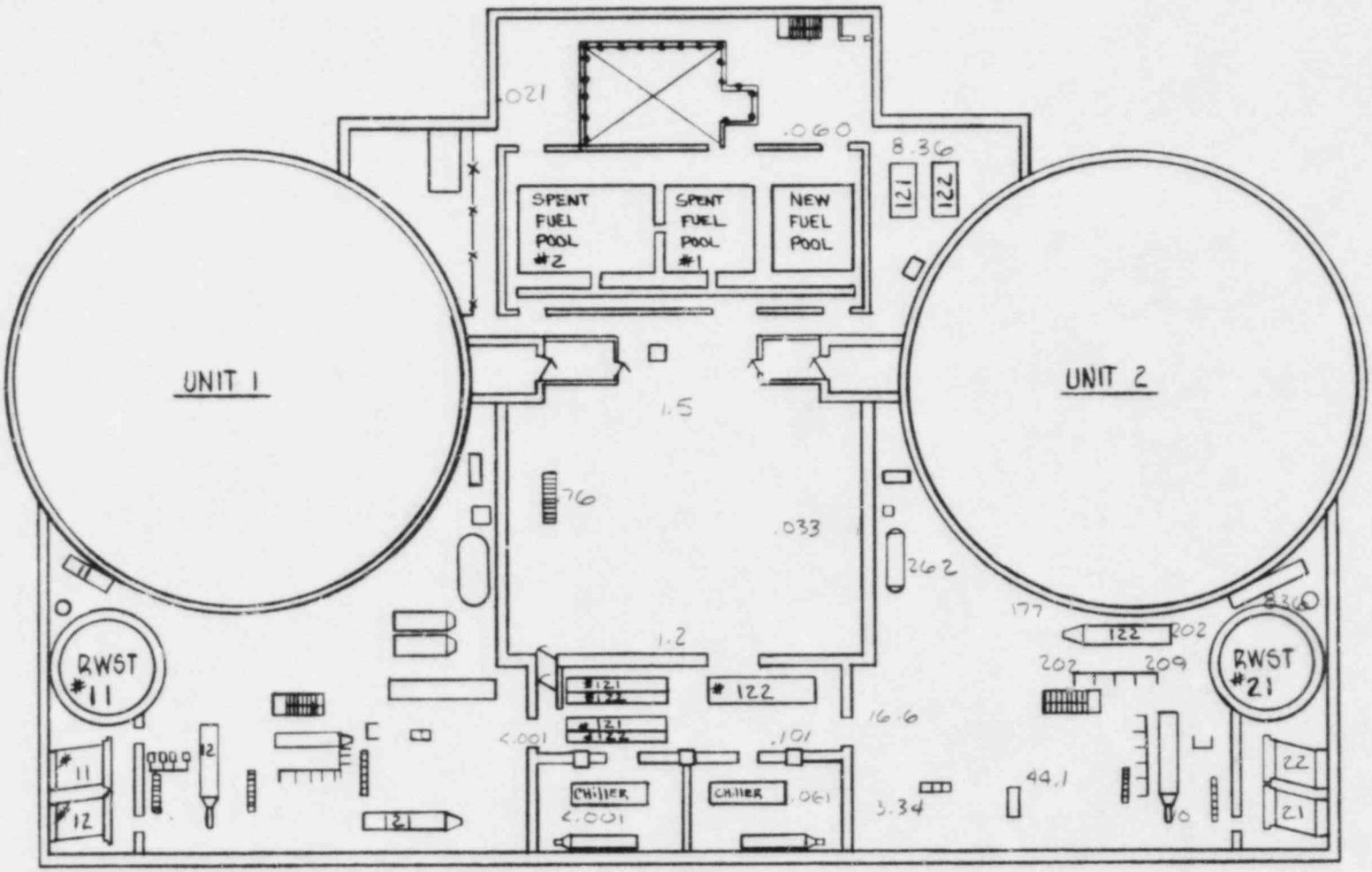
TURBINE BLDG FLR EL. 735'-0"

UNIT-2 AFFECTED DBA
DOSE RATES AT T+0
RECIRCULATION MODE IN PROGRESS

NOTE:
NUMBERS IN RED ARE R/HR

PRAIRIE ISLAND NUCLEAR GENERATING STATION
TURBINE BUILDING UNITS 1 & 2
THIRD FLOOR EL. 735'-0"

SCALE	DWN. COT CHK	DATE 5-5-82	DWG. NO II-8
~			



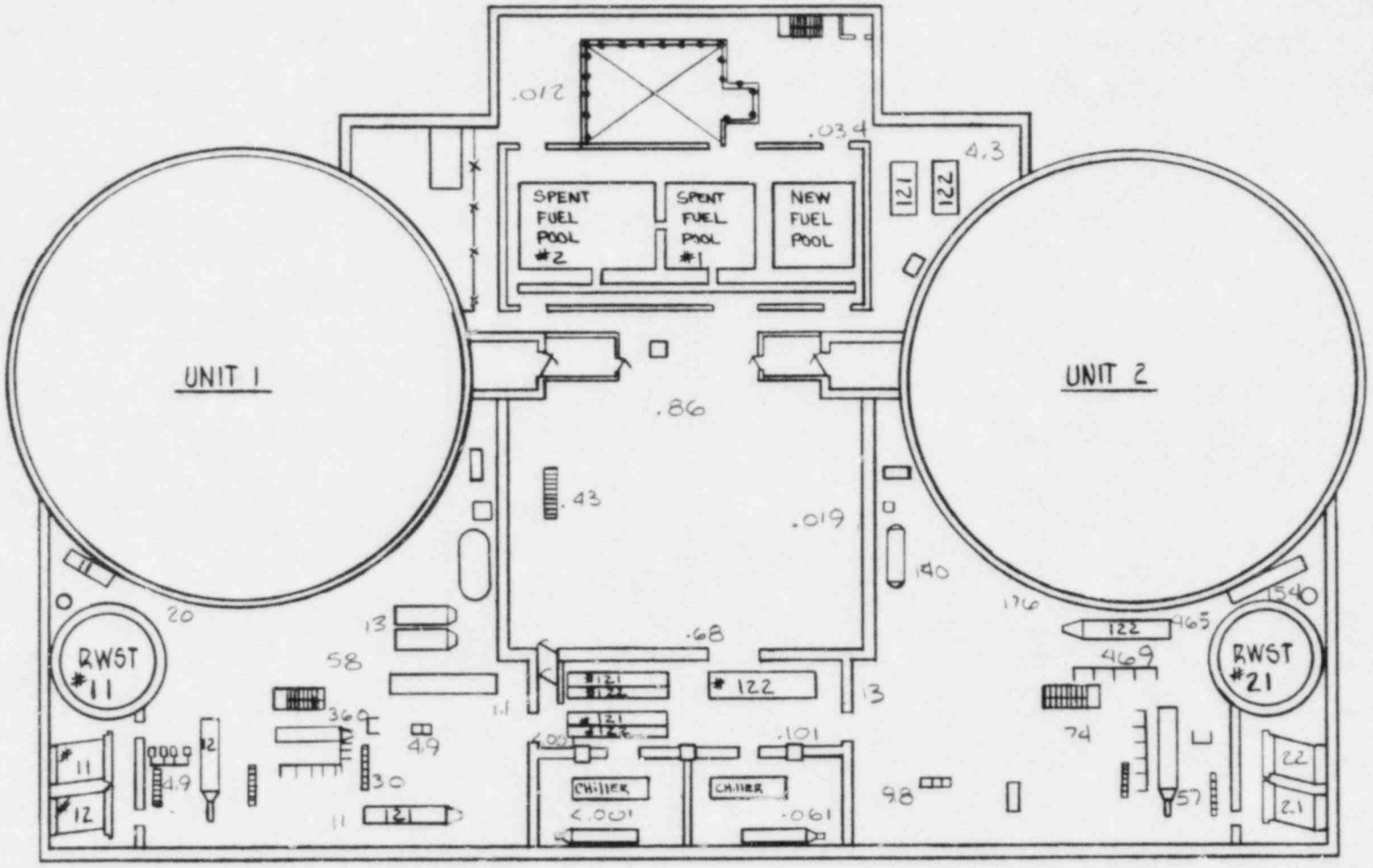
AUXILIARY BLDG. FLR EL. 755:0"

UNIT-2 AFFECTED DBA
DOSE RATES AT T=0
RECIRCULATION MODE IN PROGRESS

NOTE:
NUMBERS IN RED ARE R/HR

PRAIRIE ISLAND NUCLEAR GENERATION STATION
AUXILIARY BUILDING
FOURTH FLOOR EL. 755'-0"

SCALE	DWN. CGK / CHK	DATE	DWG. Nº
~		5-7-82	II-9



AUXILIARY BLDG. FLR EL. 755'-0"

UNIT 2 AFFECTED DBA
DOSE RATES AT T = ½ HR
RECIRCULATION MODE IN PROGRESS

NOTE:
NUMBERS IN RED ARE R/HR

PRAIRIE ISLAND NUCLEAR GENERATION STATION
AUXILIARY BUILDING
FOURTH FLOOR EL. 755'-0"

SCALE	DWN. COT	DATE	DWG Nº
~	CHK	5-7-82	II-10

PRAIRIE ISLAND NUCLEAR GENERATING PLANT NORTHERN STATES POWER COMPANY	EMERGENCY PLAN IMPLEMENTING PROCEDURES
	Number: F3-29 Rev: 1
	Retention Time: History Copy Lifetime
Reviewed By: D.A. Schuelke Supt. Rad Protection	TITLE: EMERGENCY SECURITY PROCEDURES
Approved By: Plant Manager	
OC#: 8-26-82	

1.0 PURPOSE

The purpose of this instruction is to delineate the responsibilities of the Guard Force during emergency conditions at Prairie Island.

2.0 APPLICABILITY

This instruction shall apply to all members of the plant Guard Force.

3.0 DISCUSSION

All security requirements shall be in accordance with the Prairie Island Nuclear Generating Plant Security Plan and the Guard Force Section Work Instructions.

4.0 PRECAUTIONS

4.1 Prairie Island security guards shall not make any information releases to members of the news media or the public. All inquiries by the news media shall be directed to the NSP Communications Department at NSP Headquarters or at the Joint Public Information Center (JPIC) located at the Minnesota State Capitol in St. Paul.

4.2 Various plant personnel are required to report to Onsite Emergency Operating Centers during plant emergencies. Due regard for plant conditions as well as maintaining security of the plant should be considered to expedite allowing these key personnel entrance to the Protected Area and Vital areas during emergencies.

4.3 All Guards shall obtain and zero a 0-1R dosimeter at the beginning of each shift. During emergency conditions, the guards shall periodically, or when requested, read their dosimeters.

5.0 PROCEDURE

5.1 During an emergency, all guards shall continue with their normal duties, unless directed otherwise.

5.2 When an emergency is announced, the SAS Guard, if controlling the telephone switchboard, shall transfer control of the switchboard to the TSC, upon request from the Shift Emergency Communicator (SEC). The SAS Guard or designee shall then report to the TSC to assist the SEC in controlling the switchboard until relieved by a backup communicator or the emergency situation is terminated.

5.3 When the evacuation alarm sounds:

5.3.1 All guards, with the exception of the SAS Guard, shall evacuate to the guardhouse for further instructions.

NOTE: The SAS Guard should evacuate when directed by the Emergency Director.

5.3.2 The guards shall assist in the evacuation of personnel to the designated assembly point, which will normally be the Construction Office Building.

NOTES: (1) To speed evacuation from the Protected Area, it may be beneficial to open the vehicle gates and allow personnel to exit there. (2) It will not be necessary to require personnel to stop at the portal monitors. Collect all ID badges and process badges so an early printout of personnel remaining within the Protected Area can be obtained.

5.3.3 If the evacuation of personnel is via some route other than through the guardhouse, instruct personnel of the designated evacuation point and control access via this exit as per the Guard Force Section Work Instructions.

5.3.4 Perform a check of all areas immediately surrounding the Protected Area so that all personnel are notified of the evacuation in progress by having the patrol guards:

(1) Make continuous inside rounds with the patrol vehicle, especially on the South and East side of the plant, using the loudspeaker in the patrol vehicle, if necessary, to ensure all people are following directions of the Emergency Director; and

(2) Survey all trailers, warehouses and out buildings, to ascertain that all persons are aware of and follow the directions of the Emergency Director.

5.4 The Guard Force shall assist in the personnel accountability, as per F3-10, "PERSONNEL ACCOUNTABILITY", and the Guard Force Section Work Instructions.

5.5 When the initial accountability is complete, access to the Protected Area shall require coordination between the Emergency Director, Radiation Protection Group and the Shift Security Supervisor to ensure an ongoing personnel accountability throughout the duration of the emergency condition.

5.6 An accountability check shall be completed once per shift (every 8 hours) to ensure a continuous personnel accountability, or when requested by the Emergency Director.

5.7 The Guard Force shall make all attempts to expedite entrance to the Protected Area by Emergency Organization personnel.

NOTE: The Guard Force shall consider plant conditions as well as plant security.

5.8 When requested by the Emergency Director or the Radiation Protection Group, the Guard Force should assist the Radiation Protection Group in establishing and controlling a Secondary Access Control Point, in accordance with F3-21, "Establishment of a Secondary Access Control Point".

5.9 The Guard Force should assist the Assembly Point Coordinator in personnel accountability, crowd control, and traffic control.

5.10 During an Alert, Site Area, or General Emergency, the patrol vehicle shall be positioned at the plant entrance, if conditions permit, or at an alternate location, to control access to the plant site.