

November 1, 2005

The Honorable Dennis Kucinich
United States House of Representatives
Washington, D.C. 20515

Dear Congressman Kucinich:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your letter of September 20, 2005, concerning the effectiveness of radiological emergency response plans for nuclear power plants. You specifically requested the technical basis for sheltering in place, the complete radiological emergency response plan for the Davis-Besse Nuclear Power Plant, and portions of the radiological emergency response plans that relate to adverse weather for each nuclear power plant that is located on the Great Lakes.

The final decision regarding which protective action to implement during a radiological emergency is made by State and local decision makers. This decision is based on multiple factors, including the goal of dose reduction. Licensees and Federal agencies are responsible for providing appropriate recommendations to assist the State and local decision makers in making this decision.

NRC regulations require the development of a range of protective actions for the plume exposure pathway Emergency Planning Zone for emergency workers and the public. The regulations require licensees to consider sheltering and evacuation, along with the use of potassium iodide as appropriate in developing this range of actions. The Environmental Protection Agency (EPA) Protective Action Guidelines (PAGs) provide additional guidance on the implementation of sheltering as a protective action. The EPA PAGs reflect EPA's judgment concerning levels of risk to public health from radiation exposure. Evacuation, full or partial, is usually the preferred protective action. Sheltering may be appropriate during severe weather conditions, for releases of a short duration, and when local physical factors impede evacuation. Each NRC licensed nuclear power plant has a site specific process for determining the appropriate protective action to recommend to the State and local decision makers that takes into consideration the plant condition, duration of the radiological release, the projected evacuation time, and other factors, including meteorological conditions and the condition of roads and major traffic ways.

The complete radiological emergency response plan for the Davis-Besse Nuclear Power Plant and portions of the radiological emergency response plans that relate to adverse weather for each nuclear power plant that is located on the Great Lakes are provided as enclosures to this letter.

If you have further questions related to this matter, please contact me.

Sincerely,

/RA/

Nils J. Diaz

Enclosures: See next page

Enclosures:

- A. Davis-Besse Nuclear Power Station Emergency Plan, dated February 23, 2004.

Davis-Besse Nuclear Power Station Emergency Plan Implementing Procedure RA-EP-02245, effective June 8, 2005.

Davis-Besse Nuclear Power Station Emergency Plan Offnormal Occurrence Procedure RA-EP-02870, effective November 13, 2002.

Section 8 of the Davis-Besse Nuclear Power Station Evacuation Time Estimate Study.

- B. Section 6.0, Emergency Measures, of the Perry Emergency Plan.

Page 6-3 of the Perry Evacuation Time Estimate Study.

Perry Operations Manual Emergency Plan Implementing Instruction, Protective Actions and Guides, dated December 8, 2004.

Perry Operations Manual Emergency Plan Implementing Instruction, Personnel Accountability/site Evacuation, dated December 3, 2004.

- C. Section J, Protective Response, of the Fermi II Radiological Emergency Response Plan.

Fermi 2 RERP Plan Implementing Procedure, Protective Action Recommendations.

Fermi 2 RERP Plan Implementing Procedure, Assembly and Accountability and Onsite Protective Actions.

- D. Appendix C, Population Distribution and Evacuation Time Estimates, of the Palisades Nuclear Plant Site Emergency Plan.

Palisades Nuclear Plant Emergency Implementing Procedure, Protective Action Recommendations for Offsite Populations, dated September 19, 2005.

- E. Section J, Protective Response, of the D.C. Cook Emergency Plan.

Emergency Response Procedure PMP-2080-EPP-100, effective June 30, 2005.

- F. Part 6, Emergency Measures, of the Point Beach Nuclear Plant Emergency Plan Manual, dated March 4, 2004.

Appendix J, Evacuation Time Estimates for the Area Surrounding the Point Beach Nuclear Plant, of the Point Beach Nuclear Plant Emergency Plan Manual, dated August 12, 2005.

Letter dated August 29, 2005, Revision To Emergency Plan Implementing Procedures, and Point Beach Nuclear Plant Emergency Plan Implementing Procedures Dose Assessment and Protective Action Recommendations, effective July 29, 2005.

G. Section 6, Emergency Measures, of the Kewaunee Emergency Plan.

Appendix H, Evacuation Time Estimates, of the Kewaunee Emergency Plan.

Kewaunee Nuclear Power Plant Emergency Plan Implementing Procedure, Determining Protective Action Recommendations, dated January 13, 2005.

H. Pages 45-50 of the Ginna Station Emergency Plan.

Appendix G, Analysis of Evacuation Travel Times, of the Ginna Station Emergency Plan.

Ginna Station Discretionary Actions for Emergency Conditions, effective April 28, 2005.

Ginna Station Planning for Adverse Weather, effective March 11, 2005.

Ginna Station Protective Action Recommendations, effective January 21, 2005.

Letter of Agreement Between the Ginna Station and National Weather Service, dated January 14, 2005.

I. Appendix F Evacuation Time Estimates for the James A. FitzPatrick/Nine Mile Point Emergency Planning Zone (Nine Mile Point Nuclear Station and James A. FitzPatrick Nuclear Station are collocated therefore, this evaluation is identical for both stations and to conserve resources only one evaluation is provided), and Section 6, Demand Estimation For Evacuation Scenarios.

Nine Mile Point Nuclear Station Emergency Plan Implementing Procedure, Off-Site Dose Assessment and Protective Action Recommendation, effective December 19, 2003.

Nine Mile Point Nuclear Station Emergency Plan Implementing Procedure, Natural Hazard Preparation and Recovery, effective November 27, 2000.

Pages 6-16 and 6-17 of the Nine Mile Point Nuclear Station Emergency Plan.

J. Entergy Nuclear Operations, Inc., James A. FitzPatrick Nuclear Power Plant Emergency Plan Implementing Procedure, Dose Assessment Calculations EAP-4, effective December 3, 2003.

DAVIS-BESSE
NUCLEAR POWER STATION
EMERGENCY PLAN

FOREWORD

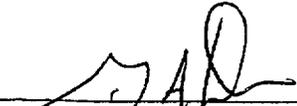
In accordance with the conditions of the Nuclear Regulatory Commission operating license for the Davis-Besse Nuclear Power Station, the management of the Company recognizes its responsibility and authority to operate and maintain the Davis-Besse Nuclear Power Station in such a manner as to provide for the safety of the public. The importance of Emergency Planning and Preparedness in contributing to this safety as well as contributing to Station reliability is also recognized.

In accordance with this philosophy, this Emergency Plan has been prepared. It establishes the procedures and practices for management control over unplanned or emergency events that may occur at the Davis-Besse Nuclear Power Station.

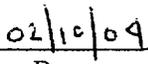
Revision 23 of the Emergency Plan meets the requirements of 10 CFR 50.54(q). Changes made in Revision 23 of the Emergency Plan do not decrease its effectiveness.

The issuance and control of this Emergency Plan and activities associated with Emergency Preparedness at the Davis-Besse Nuclear Power Station are the responsibility of the Vice President - Nuclear. Additions, deletions, or modifications to the Emergency Plan shall be approved by the Manager - Regulatory Affairs and the Plant Manager. It is intended that this Emergency Plan and the Emergency Plan Procedures be fully compatible with the applicable requirements for quality assurance set forth in the FENOC Nuclear Quality Assurance Program Manual.

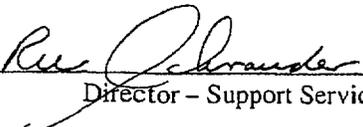
The Manager - Regulatory Affairs is hereby assigned the responsibility for emergency planning operations with authority as established in this Emergency Plan and outlined above. Day-to-day maintenance and implementation of the Emergency Preparedness Program is the responsibility of the Supervisor - Emergency Preparedness and the Emergency Preparedness Unit.



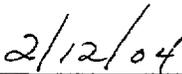
GAD
Manager - Regulatory Affairs



Date



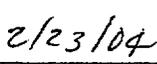
Director - Support Services



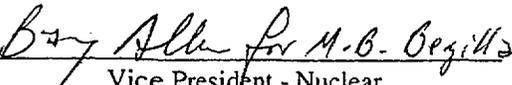
Date



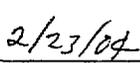
Plant Manager



Date



Vice President - Nuclear



Date

Davis-Besse Nuclear Power Station
Emergency Plan
Revision 23

Summary of Plan Changes

Revision 23 of the DBNPS Emergency Plan represents the changes to the DBNPS Emergency Preparedness Program which have occurred since Revision 22.

All Sections	In order to allow the future adoption of the facility title "Emergency Operations Facility," the following changes are being made throughout Revision 23 of the DBNPS Emergency Plan: "Emergency Control Center" and "ECC" are replaced by "Emergency Operations Facility" and "EOF" respectively.
All Sections	The following Operations Section position titles have been changed to correspond to titles currently in use in the station: "Shift Manager" is now "Shift Engineer" "Shift Supervisor" is now "Shift Manager" "Assistant Shift Supervisor" is now "Unit/Field Supervisor"
1.3	Alternate Emergency Operations Facility definition added
1.35	Media Release definition added
1.37	News Release definition added
1.38	News Statement definition added
1.54	Public Information Hotline Operator definition added
1.61	Rumor Control definition added
1.17, 1.58	Emergency Control Center changed to Emergency Operations Facility
1.62	Shift Manager title change
1.68, 1.69	Added Vital Area and Vital Equipment definitions from 10 CFR 73.2
Table 1-1	Added AEOF, EOF, and OSHP to the acronym listing
Table 2-1	ECC changed to EOF

Summary of Plan Changes Cont'd

- 2.1 Figure numbers updated as needed to reflect the removal of Figure 2-2
- 2.2 Updated population numbers as needed
- 2.3 Figure numbers updated to reflect the removal of Figure 2-2
- Former Figure 2-2 Site Arrangement – deleted as a security consideration
- New Figure 2-2 Updated the wind rose with the current one
- 3.2 Shift Manager/Shift Engineer/Unit Supervisor/Field Supervisor title changed; ECC changed to EOF
 - 3.2.1 ECC changed to EOF
 - 3.2.2 ECC changed to EOF
 - 3.2.3 ECC changed to EOF
- 4.1 Shift Manager title change
- 4.3.3 ECC changed to EOF
- Table 4-1 Section 7 “Site specific credible threat” added
Section 9 ECC changed to EOF
- 5.1.3 Shift Manager/Shift Engineer/Unit Supervisor/Field Supervisor title changes
- 5.2.1.a ECC changed to EOF
- 5.7.1.a Shift Manager/Shift Engineer/Unit Supervisor/Field Supervisor title changes
- 5.2.2 ECC changed to EOF
- 5.3.1,2,3, and 5 Shift Manager/Shift Engineer/Unit Supervisor/Field Supervisor title changes
- 5.4.1 Shift Manager Title change
- 5.4.1.b ECC changed to EOF
- 5.4.4.a Added “The Emergency Assistant Plant Manager interfaces with the Emergency Plant Manager...”



Summary of Plan Changes Cont'd

- 5.4.5.a Added "The OSC Manager reports to and interfaces directly with..."
- 5.4.5.d "RE" changed to "area radiation" to clarify what data is being transmitted
- 5.4.5.e "...adequate warehouse staff is available..." changed to "...the warehouse is staffed..." for clarity
- 5.4.6 ECC changed to EOF
- 5.4.6.c.3 "...TSC/ECC emergency complex." Changed to "DBAB emergency complex." For clarity
- 5.4.6.c.4 "A Radiation Monitoring Team..." changed to "Each Radiation Monitoring Team..." for better grammar
- 5.4.6.d ECC changed to EOF
- 5.6 "...located at an unaffected FirstEnergy nuclear station." added for clarity
- 5.7.2.b.5 Site tours removed
- 5.7.2.c "...within the limits of 10CFR20..." changed to "...outside acceptable limits of 10CFR20..." to correct an error in wording
- 5.7.3.b.4 Shift Manager title change
- 5.7.3.d.2.c Changed "Department of Welfare" to "Department of Jobs and Family Services" to reflect the current agency nomenclature
- 5.7.3.d.4.f(4) Potassium Iodide (KI) added
- 5.7.3.e.1 The sample letter of agreement has been deleted at the direction of the Department of Energy (DOE) as requests for assistance must come from the State of Ohio; not Davis-Besse. The sentence describing the Emergency Offsite Manager requesting DOE assistance was removed for the same reason.
- 5.7.4.b Several changes made in this section to reflect the current insurance carriers, and the notification requirements.
- Table 5-1 ECC changed to EOF
Shift Manager/Shift Engineer/Unit Supervisor/Field Supervisor title changes
OSC RP & Chemistry Technicians clarified
- Figure 5-1 Title Changes: Shift Manager/Shift Engineer/Unit Supervisor/Field Supervisor

Summary of Plan Changes Cont'd

- Figure 5-2 Title Changes: Shift Manager/Shift Engineer/TSC Engineering Lead/TSC Operations Lead/EOF Administrative Assistant/EOF Operations Advisor/ EOF Communicator Equipment Operator/Technical Liaison – EOF Communicator/Media Release Coordinator/Public Inquiry Hotline Operator
- 6.1 Shift Manager title change
- 6.1.1 Shift Manager/Shift Engineer title changes
- 6.1.2.a Shift Manager title change
- 6.1.2.d ECC changed to EOF
- 6.2.1 Shift Manager title change
“Load Dispatcher” changed to “System Dispatcher”
- 6.4.1. References to Figures 6-4 and 6-5 deleted as these figures were removed due to security considerations
- 6.4.1.a Shift Manager title change
- 6.4.1.b “...or vehicle PA system.” deleted
Bullhorns have replaced vehicle-mounted PA systems
- 6.5.2 Potassium Iodide (KI) information added
- 6.5.3 & 6.5.5 St. Charles Hospital is now St. Charles Mercy Hospital
- Former (Site Evacuation Routes) deleted due to security considerations
Figures 6-3
& Figure 6-4
- 7.1.1 Shift Manager/Unit Supervisor/Field Supervisor title changes
- 7.1.2 The location of the OSC was changed to reflect the current location
- 7.2 Reference to Figure 7-2 removed as the figure was deleted due to security considerations
- 7.2.1 ECC changed to EOF
- 7.2.2 Removed reference to closed Circuit Television (CCTV) The need for the system has been eliminated due to improvements in facility technologies.
- 7.2.3 ECC changed to EOF; The RTL location is now accurately described It has never been inside the “restricted portion” of the DBAB

Summary of Plan Changes Cont'd

- 7.5.1.f Reworded to reflect actual configuration of the CANS.
- 7.5.2.b.1.c ECC changed to EOF
- 7.5.3 Changed Manager – Regulatory Affairs to Supervisor – Emergency Preparedness
- 7.8.1 Substituted “USAR Tables 11.4-1 and 12.1-3” for the former Table 7-1. The two USAR tables contain the same information.
- 7.8.3 “...refueling...” changed to “...maintenance...” to reflect that these monitors are used for more than refueling activities
- 7.8.6 Capacity of the Fire Water Storage Tank and the distance between the fire hydrants was deleted. This level of detail is not required.
- 7.8.8 ECC changed to EOF
“Port Clinton Water Works” replaced by “Marblehead Coast Guard Station” for backup lake level indication
Port Clinton no longer operates a waterworks, and the Regional Water Treatment Plant has no indication of lake level
- 7.8.10.a ECC changed to EOF
- 7.8.11 ECC changed to EOF
- Former Table 7-1 Deleted and replaced in Section 7.8.1 text by two USAR tables.
- New Table 7-1 Nameplate flow rates have been removed from the Portable Air Sampling Equipment data. Flow rates are dependent on sample media and calibration. The four field monitoring 12 VDC air samplers were added to the table.
- Figure 7-1 Locations of the JPIC, AEOF, and OSC changed to reflect current locations of these facilities; ECC changed to EOF
- Former Figure 7-2 Deleted due to security considerations
- 8.1.1.f Wording changed to “may include an invitation for a site/plant tour.” Security considerations currently limit tours of the site/plant.
- 8.1.2.a Reworded discussion related to conduct of drill instruction and coaching to provide greater clarity.
- 8.3 Evacuation Time Estimate (ETE) added

Summary of Plan Changes Cont'd

- 8.3.2 Wording changed at the request of Nuclear Quality Assessment to clearly reflect the audit function.
- Table 8-1 Shift Manager/Unit Supervisor/Field Supervisor title change
Fire Protection Advisor title deleted. This function is now performed by the Fire Captains.
- Appendix A All older procedures with a designation of "HS-EP- " now have the designation "RA-EP-..."
Added RA-EP-00420, Response to Prompt Notification System Malfunction
Created the classification of "Public Information Emergency Response Procedures" and moved RA-EP-02950 to that classification
- Appendix C St. Charles Hospital is now St. Charles Mercy Hospital
- Appendix D Added "FirstEnergy Corporate Emergency Response Plan"

References

- 3.1 Davis-Besse Nuclear Power Station, Unit 1, Updated Safety Analysis Report.
- 3.2 Davis-Besse Nuclear Power Station, Unit 1, Technical Specifications.
- 3.3 NUREG-0654/FEMA REP-1, Rev. 1, Supplement 3.
- 3.4 NRC Branch Position on Acceptable Deviations to Appendix 1 to NUREG-0654/FEMA-REP-1, dated July 11, 1994.
- 3.5 10CFR50, Appendix E.

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1.0 DEFINITIONS

Listed below are terms and their definitions as used in the Emergency Plan. Terms capitalized in the text of the definitions indicate that they are defined in this section.

- 1.1 Affected Person - Individual who has been physically injured and/or radiologically exposed to a degree requiring special attention, as a result of an accident (e.g., first aid, or decontamination).
- 1.2 Alert - Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of Davis-Besse Nuclear Power Station. Any releases of radioactive material are expected to be limited to small fractions of the Environmental Protection Agency Protective Action Guideline exposure levels.
- 1.3 Alternate Emergency Operations Facility (AEOF) - A conference area outside the 10-mile Emergency Planning Zone (EPZ), which is available to hold meetings between Davis-Besse senior emergency management personnel and offsite agency management personnel.
- 1.4 Assembly - A process during which personnel report to predetermined locations for the purposes of communication and crowd control. Assembly can occur within the protected area, the owner-controlled area, or at an offsite location.
- 1.5 Assessment Actions - Those actions taken during or after the accident to obtain and process information necessary to make decisions to implement specific emergency measures.
- 1.6 Assessment Facility - A facility utilized for evaluation of instrumentation data, and other information, to assess the scope and severity of an emergency condition.
- 1.7 Available Personnel - Personnel who have not been assigned specific responsibilities or duties during an emergency situation.
- 1.8 Company - Licensee as described in the DBNPS NRC Operating License No. NPF-3.
- 1.9 Controlled Release - Any release of radioactive material from Davis-Besse Nuclear Power Station to the environment, which is planned, deliberate, monitored and regulated.
- 1.10 Control Room - The Davis-Besse Nuclear Power Station Control Room, located in the Auxiliary Building on elevation 623', is the area from which the reactor and its auxiliary systems are controlled.
- 1.11 Contaminated Area - An area where beta-gamma loose surface contamination levels are 1000 dpm/100cm² or greater, or alpha contamination levels are 100 dpm/100cm² or greater.
- 1.12 Corrective Actions - Emergency measures taken to mitigate or terminate a potential or uncontrolled release of radioactive material or to minimize the consequences of such a release (e.g., shutting down equipment, fighting fire, repair, or damage control).

- 1.13 Design Basis Accident - The maximum credible accident values that can be anticipated given specific physical parameters and which provides the basis for the design of a component or system.
- 1.14 Dose Projection - The calculated estimate of a radiation dose to individuals at a given distance from a potential or actual release (usually OFFSITE), determined from the quantity and type of radioactive material released, and the meteorological transport and dispersion parameters.
- 1.15 Drill - A supervised instruction period aimed at testing, developing, and maintaining skills in a particular operation.
- 1.16 Emergency Action Levels - Radiological dose rates; specific contamination levels of airborne, waterborne, or surface-deposited concentrations of radioactive materials; or specific instrument readings and indications (including their rate of change) that may be used as thresholds for initiating such specific emergency measures as designating a particular classification of emergency, initiating a notification procedure, or initiating a particular PROTECTIVE ACTION.
- 1.17 Emergency Operations Facility (EOF) - An area located on the first floor of the Davis-Besse Administration Building, which is equipped to facilitate the control and coordination of emergency activities and assessments.
- 1.18 Emergency Core Cooling System - Engineered safety features system comprised of the Low Pressure Injection, High Pressure Injection, and Core Flood Systems.
- 1.19 Emergency Operations Center - An OFFSITE location used by State, County and other government agencies and organizations to perform radiological assessment and to coordinate OFFSITE activities.
- 1.20 Emergency Plan - The document, which describes the Company philosophy and organization for implementing of regulations dealing with a response to a radiological accident at the Davis-Besse Nuclear Power Station.
- 1.21 Emergency Plan Procedures - Those procedures which implement the Emergency Plan and are maintained by the Emergency Preparedness Unit. They include the Emergency Plan Implementing, Off-Normal Occurrence, and Administrative Procedures.
- 1.22 Emergency Planning Zones - Two zones established around a nuclear power station in which predetermined protective action plans are needed. One zone, with a radius of 10 miles (16090 meters) for a PLUME EXPOSURE PATHWAY; and the other, with a radius of 50 miles (80,450 meters) for an INGESTION EXPOSURE PATHWAY. In these zones, predetermined PROTECTIVE ACTION plans are needed.
- 1.23 Essential Personnel - Those assigned specific Emergency Response Duties as identified in the Emergency Plan.

- 1.24 Exclusion Area - The area surrounding the plant in which the licensee has the authority to determine all activities including the exclusion or removal of persons and property. At Davis-Besse Nuclear Power Station this area corresponds to the site boundary, a distance varying from 720 meters (approximately 1/2 mile) to approximately 1 mile.
- 1.25 Exercise - An event that tests the integrated capability and a major portion of the basic elements within the Emergency Plan.
- 1.26 Full Participation - when used in conjunction with emergency preparedness exercises for a particular site means appropriate offsite local and State authorities and licensee personnel physically and actively take part in testing their integrated capability to adequately assess and respond to an accident at a commercial nuclear power plant. "Full Participation" includes testing major observable portions of the onsite and offsite emergency plans and mobilization of state, local and licensee personnel and other resources in sufficient numbers to verify the capability to respond to the accident scenario. (10CFR50 Appendix E, IV.F.2.a)
- 1.27 Functional - A system, subsystem, train, component or device, though degraded in condition or configuration is FUNCTIONAL if it is capable of maintaining respective system parameters within acceptable design limits.
- 1.28 General Emergency - Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with the potential for loss of containment integrity. Releases of radioactive material can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.
- 1.29 High Radiation Area - Any area, accessible to individuals, in which radiation levels could result in an individual receiving in excess of 0.1 rem in one hour at 30 cm from the radiation source or from any surface the radiation penetrates.
- 1.30 Ingestion Exposure Pathway - The means by which contaminated water or foodstuffs can expose the POPULATION-AT-RISK to radiation. The time of potential exposure could range from hours to months. The principal exposure sources from this pathway are:
- 1.30.1 Ingestion of contaminated drinking supplies, such as water or milk
- 1.30.2 Ingestion of contaminated food, such as fresh vegetables or aquatic foodstuffs
- 1.31 International Great Lakes Datum - A place of reference datum set up for use on the Great Lakes. This datum refers to the mean water level at Father Point, Quebec as established in 1955. In 1988, the reference datum was revised upward by 0.57 feet.
- 1.32 Joint Public Information Center - A location for coordinating news releases and providing joint briefings to the news media during an emergency. It provides a central point for information to be disseminated to the public by the utility, and federal, state and local officials.
- 1.33 Low Population Zone - The unrestricted area outside the OWNER-CONTROLLED AREA, encompassed within a radius of 2 miles (approximately 3200 meters) from the site.

- 1.34 Loss - A state of inoperability in which FUNCTIONAL and OPERABLE status cannot be maintained.
- 1.35 Media Release – *SEE NEWS STATEMENT*
- 1.36 Modes of Discharge - Discharge of radioactivity to the ground surface, surface water, atmosphere, or any combination thereof.
- 1.37 News Release – *SEE NEWS STATEMENT*
- 1.38 News Statement – A detailed statement in printed format intended for public knowledge containing an announcement, supporting information, and usually some background information.
- 1.39 Non-essential Personnel - Personnel who are not preassigned specific Emergency Response Duties.
- 1.40 Nuclear Group - The functional area of the Company which operates and maintains all nuclear generating facilities owned by or licensed to the Company.
- 1.41 Offsite - Any area outside the OWNER-CONTROLLED AREA.
- 1.42 Onsite - The area within the OWNER-CONTROLLED AREA.
- 1.43 Operable/Operability - A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electric power sources, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its function(s), are also capable of performing their related support function(s).
- 1.44 Operations Support Center - A location within the PROTECTED AREA where emergency response teams are assembled, briefed and coordinated during an emergency.
- 1.45 Owner-Controlled Area - The area contiguous with the PROTECTED AREA, designated by the owner organization to be patrolled for security purposes.
- 1.46 Partial Participation - when used in conjunction with emergency preparedness exercises for a particular site means appropriate offsite authorities shall actively take part in the exercise sufficient to test direction and control functions: i.e., (a) protective action decision making related to emergency action levels, and (b) communication capabilities among affected State and local authorities and the licensee. (10CFR50 Appendix E, IV.F.2.c)
- 1.47 Personnel Dosimetry - Devices designed to be worn or carried by an individual for the purpose of measuring the radiation dose received (e.g., pocket dosimeters, electronic alarming dosimeters (EADs), thermoluminescent dosimeters (TLDs), etc.).

- 1.48 Plume Exposure Pathway - The means by which a radioactive cloud (plume) can expose the POPULATION-AT-RISK to radiation. The time of potential exposure could range from hours to days. The principal exposure sources for this pathway are:
- 1.48.1 Whole body external exposure to gamma radiation from the radioactive plume and from deposited material
 - 1.48.2 Inhalation exposure from the passing radioactive plume.
- 1.49 Population At Risk - Those persons for whom PROTECTIVE ACTIONS are being or would be taken.
- 1.50 Projected Exposure Time - The estimated period of time that the population in the area surrounding Davis-Besse Nuclear Power Station may be exposed to radiation as a result of an uncontrolled airborne release. Projected Exposure Time starts when the airborne release is estimated to cross the OWNER-CONTROLLED AREA, and ends when the radiation levels OFFSITE are expected to return to normal.
- 1.51 Protected Area - An area within the OWNER-CONTROLLED AREA encompassed by physical barriers, and to which access is controlled for security purposes.
- 1.52 Protective Actions - Those emergency measures taken after an uncontrolled release has occurred, for the purpose of preventing or minimizing radiological dose to persons that would likely be exposed if the actions were not taken.
- 1.53 Protective Action Guide - A projected radiological dose or dose commitment value to individuals in the general population that warrants protective action.
- 1.54 Public Information Hotline - A telephone number provided to the public which is available to answer specific questions regarding an emergency. Public Information Hotlines are maintained by Davis-Besse, the State of Ohio, and both Ottawa and Lucas Counties, and are activated at a Site Area Emergency declaration.
- 1.55 Radiologically Restricted Area (RRA) - Any area to which access is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials.
- 1.56 Radiation Area (RA) - Any area accessible to individuals in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.005 rem in 1 hour at 30 cm from the radiation source or from any surface the radiation penetrates.
- 1.57 Radiation Work Permit - A document which gives radiation protection requirements, authorization to enter the radiologically restricted area, and permission to receive radiation dose.
- 1.58 Radiological Testing Laboratory - A facility near the Technical Support Center and Emergency Operations Facility in the Davis-Besse Administration Building which serves as a staging location for Radiation Monitoring Teams, and where a limited amount of radiological counting and analysis of low-level environmental samples may be performed.

- 1.59 Recovery Actions - Those actions taken after an emergency to restore the station as nearly as possible to pre-emergency conditions.
- 1.60 Release - Any emission of radioactive material, airborne or liquid, including emissions within and in excess of Technical Specifications.
- 1.61 Rumor Control - - SEE PUBLIC INFORMATION HOTLINE.
- 1.62 Shift Manager's Office - A facility that is located within the Control Room envelope and is used by the Emergency Assistant Plant Manager during emergency conditions to observe and provide guidance to the Shift Manager for direction and control of in-plant activities.
- 1.63 Site Area Emergency - Events are in progress or have occurred which involve actual or likely major failures of Davis-Besse Nuclear Power Station functions needed for the protection of the public. Any releases of radioactive material are not expected to exceed Environmental Protection Agency Protective Action Guideline exposure levels except near the site boundary.
- 1.64 State - The State of Ohio.
- 1.65 Technical Support Center - An area within the OWNER-CONTROLLED AREA, which has the capability to display and transmit plant status information to individuals who are knowledgeable of, and responsible for engineering and management support of reactor operations in the event of an emergency situation.
- 1.66 Uncontrolled Release - Any RELEASE of radioactivity from DBNPS to the surrounding environs which can be described by any one or combination of the following terms: unplanned, unintentional, and unregulated.
- 1.67 Unusual Event - Event(s) are in progress or have occurred which indicate a potential degradation of the level of safety of DBNPS. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.
- 1.68 Vital Area - Is any area which contains vital equipment.
- 1.69 Vital Equipment - Is any equipment, system, device and material, the failure, destruction or release of which could directly or indirectly endanger the public health and safety by exposure to radiation. Equipment or systems which would be required to function to protect the public health and safety following such failure, destruction or release are also considered to be vital.

TABLE 1-1**ACRONYMS**

AEOF	Alternate Emergency Operations Facility
ALARA	As low as is Reasonably Achievable
ARM	Area Radiation Monitor
CAM	Continuous Air Monitor
CANS	Computerized Automated Notification System
CAS	Central Alarm Station
CEI	Cleveland Electric Illuminating Company
CFR	Code of Federal Regulations
CNRB	Company Nuclear Review Board
CRA	Control Rod Assembly
CTRM	Control Room
CERO	Corporate Emergency Response Organization
cpm	counts per minute
DBAB	Davis-Besse Administration Building
DBABA	Davis-Besse Administration Building Annex
DBNPS	Davis-Besse Nuclear Power Station
DBTC	Davis-Besse Training Center
DOE	Department of Energy
DPM	Decades Per Minute
dpm	disintegration's per minute
E&C	Electrical and Controls
EAL	Emergency Action Level
EAS	Emergency Alert System
ECC	Emergency Control Center (see EOF)
ECCS	Emergency Core Cooling System
EEC	Energy Education Center
EMA	Emergency Management Agency
ENS	Emergency Notification System (NRC "red phone")
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EPA	Environmental Protection Agency
EPZ	Emergency Planning Zone
ERO	Emergency Response Organization
FE	FirstEnergy Corporation
FENOC	FirstEnergy Nuclear Operating Company
FSAR	Final Safety Analysis Report
HPN	Health Physics Network
I&C	Instrument and Control
IGLD	International Great Lakes Datum
JPIC	Joint Public Information Center
LCEMA	Lucas County Emergency Management Agency
LDE	Lens Dose Equivalent
LOCA	Loss of Coolant Accident
LPZ	Low Population Zone
MSSV	Main Steam Safety Valve

TABLE 1-1 (Cont.)**ACRONYMS** (Cont.)

MWe	Megawatt electric
MWt	Megawatt thermal
NOAA	National Oceanographic and Atmospheric Administration
NRC	Nuclear Regulatory Commission
OCA	Owner Controlled Area
OCEMA	Ottawa County Emergency Management Agency
OEMA	Ohio Emergency Management Agency
OSHP	Ohio State Highway Patrol
OSC	Operations Support Center
OTSG/SG	Steam Generator
PA	Protected Area
PAG	Protective Action Guide
PASS	Post Accident Sampling System
PNS	Prompt Notification System (siren system)
PPF	Personnel Processing Facility
RO	Reactor Operator
RP	Radiation Protection
RRA	Radiologically Restricted Area
REMP	Radiological Environmental Monitoring Program
RMT	Radiation Monitoring Team
RTL	Radiological Testing Lab
RWP	Radiation Work Permit
SAM	Severe Accident Management
SAS	Secondary Alarm Station
SDE	Shallow Dose Equivalent
SRO	Senior Reactor Operator
STA	Shift Technical Advisor
TE	Toledo Edison Company
TEDE	Total Effective Dose Equivalent
TSC	Technical Support Center
VPF	Visitor Processing Facility
USAR	Updated Safety Analysis Report

TABLE 1-2

COMMUNICATIONS TEST FREQUENCIES

Monthly - At least once per 31 days

Quarterly - At least once per 92 days

Semi-annual - At least once per 6 months

Annual - At least once per 12 months

2.0 SCOPE AND APPLICABILITY

The Davis-Besse Nuclear Power Station Emergency Plan has been developed to provide a description of the station's response during emergencies. The description includes organizational control, equipment, supplies, facilities, and protective actions that may be used in mitigating the consequences of an emergency. Emergency Preparedness exists to provide direction for emergencies varying in severity from relatively minor ones with no health and safety implications to events presenting an actual or potential offsite radiological hazard.

This Emergency Plan is a detailed expansion of the Updated Safety Analysis Report, Section 13.3. It is intended to satisfy the requirements of Title 10 Code of Federal Regulations, Section 50, Appendix E, Emergency Planning and Preparedness for Production and Utilization Facilities.

Furthermore, this document satisfies the requirements of NUREG 0654/FEMA REP. 1, Rev. 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.

This Emergency Plan is not the primary working document to be used during an emergency. The purpose of the Emergency Plan is to describe the program established at DBNPS to satisfy regulatory requirements and to safeguard the public and plant personnel in the event of an emergency.

2.1 Site Description

The DBNPS is located on the southwestern shore of Lake Erie in Ottawa County, Ohio, approximately six (6) miles northeast of Oak Harbor, Ohio.

DBNPS employs a pressurized light water reactor steam supply system furnished by the Babcock & Wilcox Co. (now Framatome Technologies, Inc.) to generate approximately 930 MWe. The reactor design core power is 2772 MWt.

The Station encompasses 954 acres, of which more than 700 acres is marsh land leased to the U.S. Government as a natural wildlife refuge. The land area surrounding the site is generally agricultural, with no major industry in the vicinity of the site. The topography in the vicinity of DBNPS is flat, with marsh areas bordering the lake and the upland area rising to only 10-15 feet above the lake low water datum level. The site itself varies in elevation from marsh bottom, below Lake Level, to approximately six feet above the lake low water datum level.

The site has been built up from 6 to 14 feet above the existing grade elevation to an elevation of 584 feet International Great Lakes Datum (IGLD). This provides flood protection from the maximum credible water level conditions of Lake Erie. The three sides of the station with exposure to the lake are provided with a dike to an elevation of 591 feet IGLD to protect the facility from wave effects during maximum credible water level conditions.

The Station structures are located approximately in the center of the site, 3000 feet from the shoreline. This provides a minimum exclusion distance of 2400 feet from any point of the site boundary.

Ohio Route 2 approaches the site from the city of Port Clinton, Ohio, to the southeast, and forms the west boundary of the site. At the north boundary of the site, Ohio Route 2 turns west and proceeds towards Oregon and Toledo, Ohio. Two (2) all-weather roads, the main access road and the Administration Building access road, provide access to the site from Ohio Route 2. Figure 2-1 shows the general site location.

Site meteorological data for 2000 through 2002 indicate that the prevailing winds at 10 meters above ground level are equally from the southwest and south southwest. The mean velocity at this level is 9.5 miles per hour (4.2 meters per second). At 75 meters above the ground the predominant winds are from the west southwest. The mean velocity at this level is 15.0 miles per hour (6.7 meters per second). Figure 2-2 shows the average wind distribution.

The primary source of potable water in the area is Lake Erie. The nearest offsite public potable water intake serves Camp Perry, the Erie Industrial Park, and surrounding residences; and is located approximately 2.8 miles from the site. Another potable water intake, which serves residents of Carroll Township, including Davis-Besse, is located approximately four miles west-northwest of the site. The Ottawa County Regional Water System's potable water intake is eight miles east of the site. This system serves Port Clinton, Oak Harbor and the eastern end of Ottawa County. The Toledo and Oregon intakes are 13 miles west of the site. Most of the residents in the vicinity of the site not serviced by the municipal water suppliers, either have their water trucked in, or utilize well water which is periodically tested for potability by local authorities. DBNPS personnel periodically test local water sources for radioactivity.

2.2 Population Distribution

NOTE: The following information regarding population distribution is for historical purposes only. For current population estimates refer to Development of Evacuation Time Estimates for the Davis-Besse Nuclear Power Station, Revision 5, which has been prepared in accordance with NUREG 0654/FEMA Rev.-1, Appendix 4.

The near-site population is distributed from the southeast to the west northwest. The total permanent population in the 10-mile area surrounding DBNPS, based on 2000 Census information is 20,807 people. Approximately 97% of these people live 5 to 10 miles from the site. The population varies seasonally due to tourism in the area and the summer home residents. Figures indicating the permanent and seasonal population distribution projections in the 0 to 2 mile, 2 to 10 mile, and 10 to 50 mile radii are included in Development of Evacuation Time Estimates for the Davis-Besse Nuclear Power Station, Revision 5, which has been prepared in accordance with NUREG 0654/FEMA Rev.-1, Appendix 4.

The nearest population center of 25,000 or more is Toledo, Ohio, 20 miles west-northwest of the site. Other population centers within a 50-mile radius in excess of 25,000 include Bowling Green (33 miles), Findlay (45 miles), Lorain (46 miles), and Sandusky (20 miles) in Ohio; Allen Park (40 miles), Dearborn (40 miles), Detroit (40 miles), Inkster (40 miles), Lincoln Park (40 miles), Monroe (26 miles), Southgate (40 miles), Westland (40 miles), and Wyandotte (41 miles), in Michigan; and Windsor (50 miles) in Ontario, Canada.

2.3 Emergency Planning Zones

In defining the Emergency Planning Zones (EPZs) for the DBNPS, factors such as organizational capabilities, method of implementing the emergency plan, and the availability of onsite and offsite emergency facilities and equipment have been taken into consideration.

Two primary zones have been identified for development of emergency planning and implementation of the Plan. One zone has a 10-mile radius. This EPZ is referred to as the Plume Exposure Planning Zone. Within this zone, evacuation may be recommended for the general public. The principal concern in the 10-mile EPZ is direct exposure from a passing plume and/or inhalation of radionuclides from the plume. This 10-mile EPZ is comprised of part of Ottawa County and part of Lucas County.

The second zone, the Ingestion Exposure Planning Zone, extends to a 50-mile radius. The principal concern in the 50-mile EPZ, or Ingestion Pathway EPZ, is long-term exposure from ingested material. Within the Ingestion Pathway EPZ, close monitoring of water, crops, dairy cows and farm animals may be necessary. It may also be necessary to segregate and/or remove contaminated items from the food chain (e.g., milk, fresh vegetables, etc.). This 50-mile EPZ is comprised of all of Ottawa, Lucas, Wood, Sandusky, Erie, Seneca, Huron, Lorain, Fulton, Henry, Crawford, Hancock, and Wyandot Counties in Ohio; and all of Monroe, Lenawee, Washtenaw and Wayne Counties in Michigan. Essex County and part of Kent County within the province of Ontario, Canada are also contained within this 50-mile Emergency Planning Zone.

Figures 2-3 and 2-4 show the 10-mile and 50-mile EPZs.

2.4 Regulatory Requirements

2.4.1 The Code of Federal Regulations contains requirements for emergency planning in the following sections:

- a. 10 CFR 50.34 Contents of applications; technical information.
- b. 10 CFR 50.33 Contents of applications; general information.
- c. 10 CFR 50.47 Emergency Plans.
- d. 10 CFR 50.54 Conditions of Licensee.
- e. 10 CFR 50 Appendix E, Emergency Planning and Preparedness for Production and Utilization Facilities.

- 2.4.2 Supplemental guidance has been provided by the Nuclear Regulatory Commission (NRC) and the Federal Emergency Management Agency (FEMA) in NUREG-0654/FEMA-REP-1, REV. 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.

These documents describe methods acceptable for compliance with regulations regarding nuclear power plant emergency plans.

2.5 Objectives of Emergency Preparedness

- 2.5.1 The objective of the Emergency Preparedness Unit is to provide for public protection in the event of an emergency at DBNPS by establishing a well-trained and technically competent emergency organization, and to provide that organization with the necessary facilities, equipment, supplies and communication links.

2.5.2 Objectives of the Emergency Plan

- a. To outline the most effective course of action required to safeguard the public and station personnel in an emergency.
- b. To establish an emergency organization.
- c. To assign responsibilities for directing the response to an emergency condition or radiological incident.
- d. To provide for procedures that will limit the consequences of the incident.
- e. To provide for procedures that will terminate or mitigate the radiological consequences of an emergency, both onsite and offsite.
- f. To control onsite and offsite surveillance activities.
- g. To establish procedures to identify and classify the emergency condition.
- h. To stipulate the necessity for public protection actions.
- i. To establish procedures to implement any protective actions deemed appropriate.
- j. To provide for the training of all emergency response personnel.
- k. To describe emergency facilities and their use.
- l. To describe emergency communication systems and their use.

2.6 Emergency Plan Interrelationships

Interrelationships of this plan with procedures, other plans, and emergency arrangements are summarized as follows:

- 2.6.1 Detailed actions to be taken by individuals in response to onsite emergency conditions are described in the Emergency Plan Implementing Procedures. These procedures provide the mechanisms for response as outlined in this plan.

- 2.6.2 The DBNPS Nuclear Security Plan and Procedures and this plan are coordinated to ensure that appropriate emergency actions can be taken. For example, the Nuclear Security Plan and Procedures contain provisions for emergency response personnel and vehicle access when required by the Emergency Plan Procedures.
- 2.6.3 Davis-Besse site contractors/vendors that develop emergency procedures for their personnel are tasked with coordinating their procedures and this plan.
- 2.6.4 The DBNPS Radiation Protection Administrative Procedures define administrative controls and procedures such as radiological control limits and precautions, use of personnel monitoring devices, use of protective clothing and equipment, personnel decontamination, etc. Additionally, Chemistry Procedures and Radiation Protection Procedures provide instructions for conducting surveys, analyzing samples, operating health physics/radiation protection equipment, etc. Information and details provided in these documents have either been incorporated into the Plan and/or Emergency Plan Procedures, or have been appropriately referenced.
- 2.6.5 The DBNPS has established Off Normal Occurrence Procedures, which discuss generic emergencies such as floods, icing, and severe weather conditions. The methods and equipment developed for such emergencies are available for use in responding to emergencies covered by this plan.
- 2.6.6 Formal agreements have been negotiated to define the coordination and interface with offsite organizations and agencies having related radiological emergency planning responsibilities. Continuing liaison with the offsite organizations ensures compatibility and proper interfacing with this plan. Refer to Table 2-1, "Functional Interrelationships of Response Organizations", for functional interrelationships of emergency response organizations.
- 2.6.7 Other offsite organizations, not within the immediate area, may also be requested to offer technical assistance (i.e., Institute of Nuclear Power Operations, Framatome, Bechtel, etc.).

2.7 Emergency Plan Procedures and Station Procedures

Detailed Emergency Plan Procedures direct the implementation of this Emergency Plan. Detailed Station procedures prescribe appropriate courses of action necessary to place the plant in a safe condition and limit the consequences for each classification of incident and/or emergency. Other Emergency Plan Procedures detail maintenance of the Emergency Preparedness Program, Off Normal Occurrence Procedures (i.e. floods, tornadoes, etc.), Corporate Emergency Response, and Public Relations. An index of these procedures is attached as Appendix A to this plan.

2.8 Participating Governmental Agencies

Participating governmental agencies whose emergency plans are interrelated with this plan for action include the following:

- 2.8.1 State of Ohio, The Ohio Plan for Response to Radiation Emergencies at Licensed Nuclear Facilities
- 2.8.2 Ottawa County, The Ottawa County Plan for Response to Radiation Emergencies at Licensed Nuclear Facilities
- 2.8.3 Lucas County, The Lucas County Radiological Emergency Response Plan
- 2.8.4 Erie County, Radiological Emergency Response Procedures Document
- 2.8.5 Sandusky County, Radiological Emergency Response Procedures Document
- 2.8.6 U.S. Department of Energy, Chicago Operations Office, Argonne, IL., Emergency Planning and Preparedness and Response Program
- 2.8.7 U.S. Nuclear Regulatory Commission, Region III, Lisle, IL
- 2.8.8 State of Michigan, Michigan Emergency Preparedness Plan
- 2.8.9 Federal Emergency Management Agency (FEMA) Plan, Region V.

The development of the State and County Plans and the DBNPS Emergency Plan have been closely coordinated. In addition, specific State requirements for reporting of emergencies, providing information and data, recommending protective actions, etc., have been integrated directly into the Emergency Plan Procedures.

Table 2-1
FUNCTIONAL INTERRELATIONSHIPS OF RESPONSE ORGANIZATIONS

RESPONSE FUNCTION	OTHER SUPPORT	LOCAL SUPPORT	STATE SUPPORT	FEDERAL SUPPORT	ENGINEERING SUPPORT	DAVIS-BESSE RESPONSE ORGANIZATION(S)
Plant Operation Control					R	Control Room / Technical Support Center
Engineering Assessment					R	Technical Support Center
Meteorological Data				A		Emergency Operations Facility
Protective Response		A	R	A		Emergency Operations Facility
Command & Control of Emergency Response		R	A			Emergency Operations Facility
Warning		R	A	A		Control Room
Notification & Communication	A	R	A	A		Control Room/EOF
Public Information		R	A	A		Joint Public Information Center
Accident Assessment				A	R	Technical Support Center
Public Health & Sanitation		A	R	A		Emergency Operations Facility
Social Services		R	A	A		Emergency Operations Facility
Fire & Rescue		R				Control Room
Emergency Medical Services	A	R				Control Room.
Traffic Control		R	A			Nuclear Security
Law Enforcement		R	A	A		Nuclear Security
Transportation			R			Emergency Operations Facility
Radiological Exposure Control		A	R	A		Emergency Operations Facility

LEGEND: R=Task Responsibility
A=Task Assistance

LOCAL

Ottawa County EMA
Ottawa County Sheriff
Ottawa County Health Department
Ottawa County Engineer
Carroll Township Fire & EMS
Lucas County EMA
Lucas County Sheriff
Lucas County Health Department
Lucas County Engineer
H.B.Magruder Hospital
Fremont Memorial Hospital
St.Charles Hospital

STATE

Ohio EMA
Ohio Department of
Transportation
Ohio EPA
Ohio State Highway Patrol
Ohio National Guard
Ohio Department of Health
Ohio Department of
Natural Resources

FEDERAL

US NRC Region III
US DOE
US EPA
FEMA
US Coast Guard
National Weather
Service
Federal Radiological
Monitoring and
Assessment Center

ENGINEERING SUPPORT

Framatome Technologies Inc.
Bechtel Power Corp.

OTHER SUPPORT

American Nuclear Insurers
Nuclear Mutual Limited

Figure 2-1

General Site Location

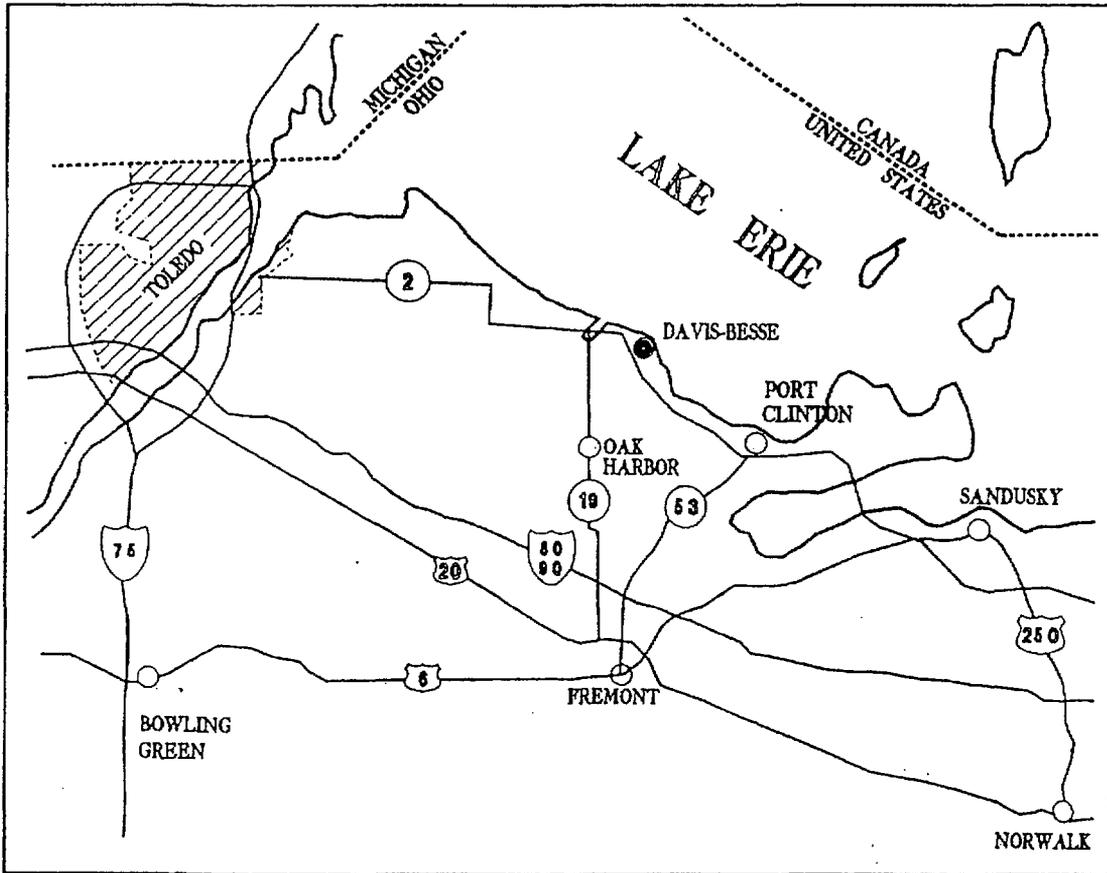
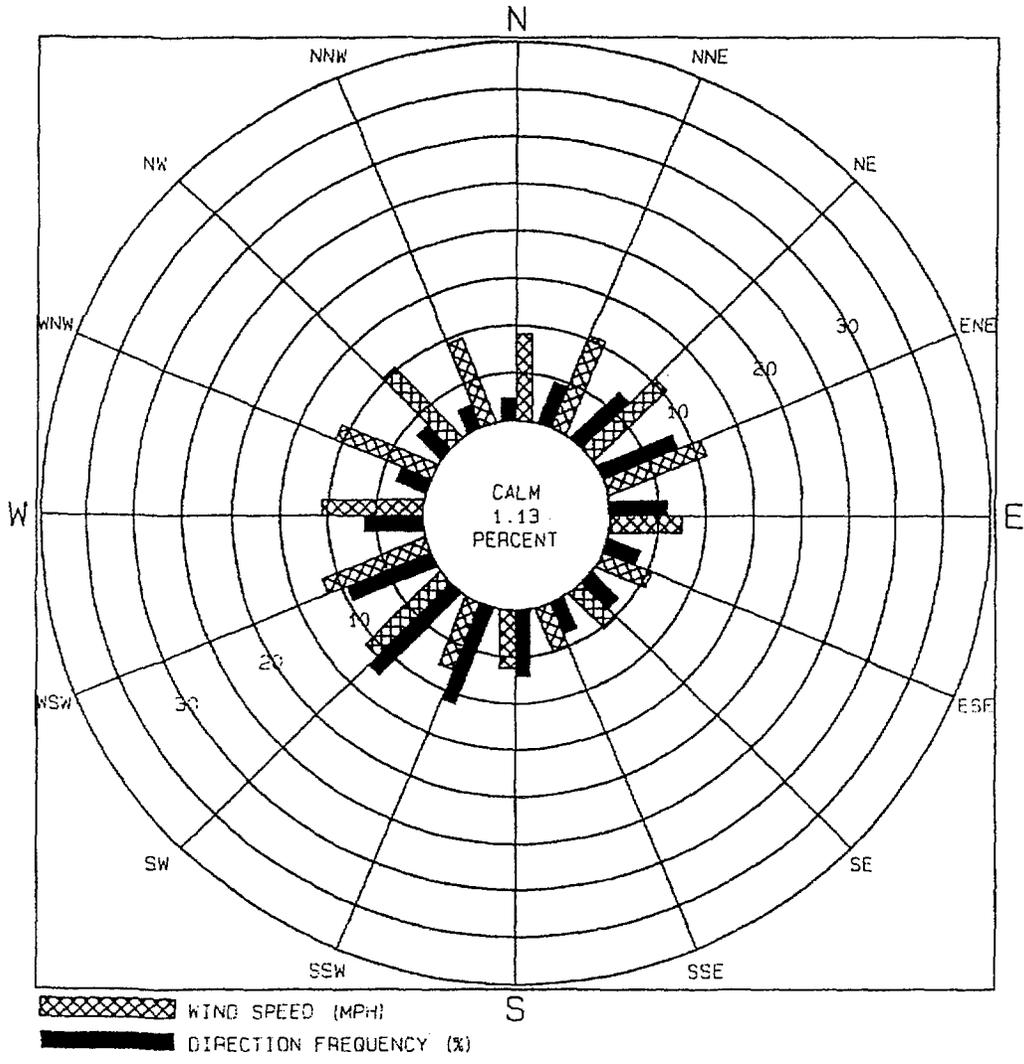


Figure 2-2
DBNPS Site
Annual Wind Distributions
At the 10 Meter Level



DAVIS-BESSE
ANNUAL 2003
10 M LEVEL

Figure 2-3

DBNPS 10-Mile Emergency Planning Zone

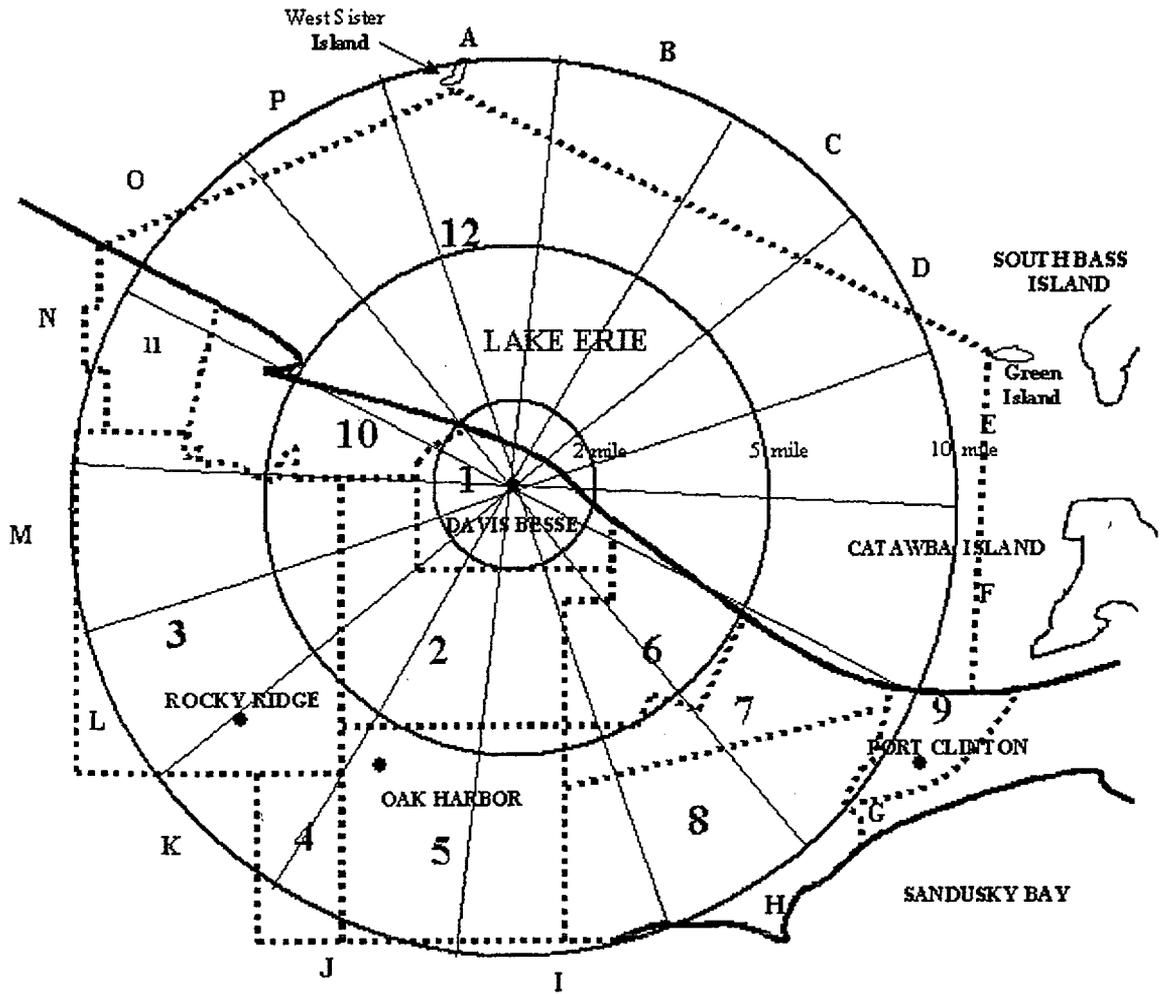
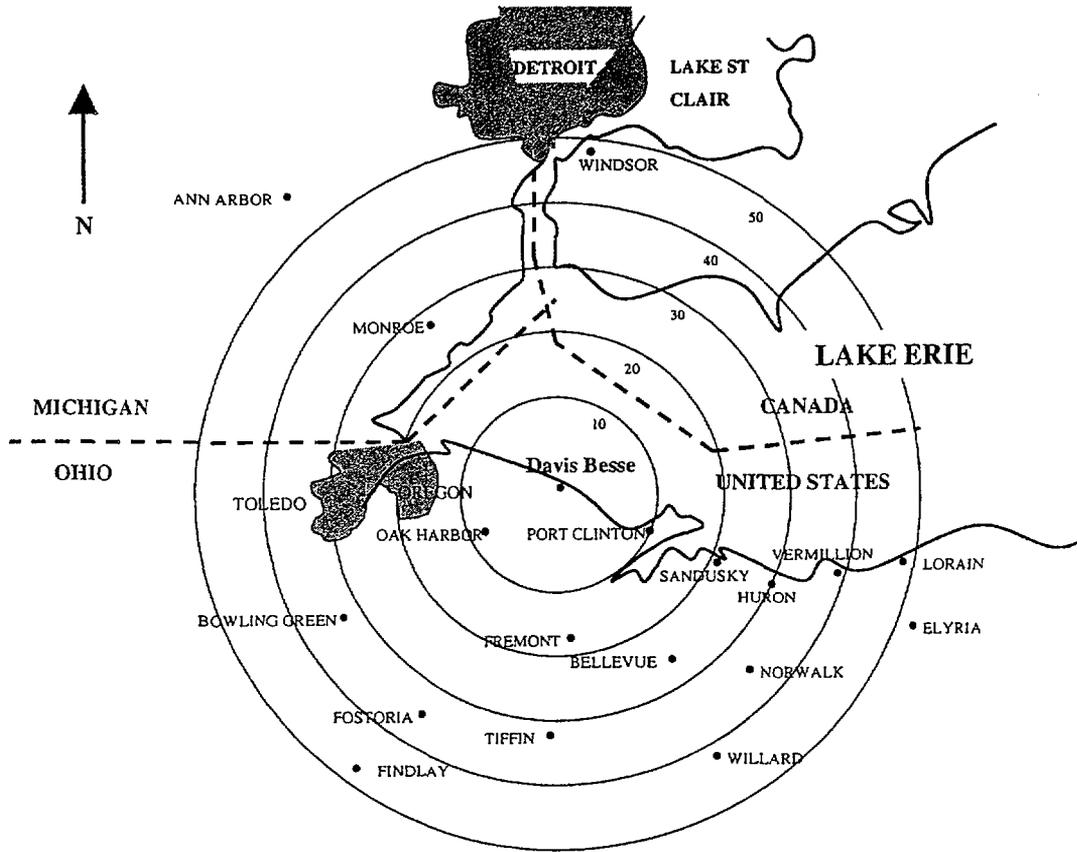


Figure 2-4

DBNPS 50-Mile Emergency Planning Zone



3.0 SUMMARY OF THE EMERGENCY PLAN

The DBNPS Emergency Plan has been established in accordance with the requirements of 10 CFR 50.47 and Appendix E to 10 CFR 50, supplemented by the guidance issued by the Nuclear Regulatory Commission in NUREG-0654/ FEMA-REP-1 and other documents.

The Emergency Plan will be put into effect whenever a radiological emergency or other potentially hazardous situation is identified. The details of the Emergency Plan Procedures are not included herein, but a description of the scope of the procedures demonstrates that appropriate actions can be taken by DBNPS and other support agencies to protect station personnel and the general public during emergencies.

The Emergency Plan establishes the concepts, evaluation and assessment criteria, and protective actions that are necessary in order to mitigate the consequences of radiological emergencies. The plan provides for the necessary prearrangements, directions, and organization needed to safeguard station personnel, and the property and safety of the general public.

3.1 Emergency Plan Steps

In general, the Emergency Plan encompasses the following basic steps:

- a) Recognition of the emergency
- b) Classification of the emergency
- c) Required notifications and activation of the responding organization(s)
- d) Ongoing assessment of the situation
- e) Periodic dissemination of updated information
- f) Determination and initiation of protective actions
- g) Determination and initiation of corrective actions
- h) Aid to affected persons
- i) Reentry and Recovery

During response to an emergency, several of the steps may be performed concurrently.

3.2 Emergency Organizations

This document establishes an organization capable of responding to the complete range of incidents covered herein.

Provisions are made for rapid mobilization of the response organization and for expanding the response organization if the situation dictates.

An individual with the authority and responsibility to initiate any emergency actions under the provisions of this Emergency Plan, including the release of information to the public/media, is onsite at all times. The Shift Manager assumes this authority by becoming the Emergency Director upon initial classification of an emergency. If the Shift Manager cannot assume these duties, authority is delegated to the Unit/Field Supervisor or Shift Engineer (Shift Technical Advisor) in that order. The Emergency Plant Manager or Emergency Assistant Plant Manager may assume the Emergency Director position upon arrival in the Control Room. The Emergency Plant Manager

may also assume the Emergency Director duties from the Technical Support Center. The designated Emergency Director, upon arrival in the Emergency Operations Facility (EOF) or Technical Support Center (TSC), will assume this authority.

The operating shift crew is responsible for implementing emergency procedures in accordance with assigned response functions. Emergency response functions are also assigned to off-shift plant staff personnel who can be rapidly alerted and mobilized, to augment or relieve the operating shift personnel of emergency duties.

If required, additional support is provided by the Corporate Emergency Response Organization. Corporate management and their staff may provide technical, administrative, and logistical support to the onsite Emergency Organization. They may authorize emergency expenditures, coordinate the efforts of offsite support organizations, and maintain the flow of information to the public.

In addition, this plan includes the use of offsite agencies and organizations that have signed letters of agreement with the DBNPS. Their designated response functions include implementation of offsite protective actions, transportation and treatment of personnel, control of access to the station, fire fighting support, radiological sampling and assessment, technical consultation, and testing. These offsite agencies and organizations include the following:

3.2.1 State of Ohio

The Ohio Emergency Management Agency (OEMA), Department of Public Safety, State of Ohio, is the lead planning agency for developing state nuclear incident plans for licensed nuclear facilities contiguous to and within the State.

The specific tasks and responsibilities assigned to several departments and agencies of the State of Ohio are specified in The Ohio Plan for Response to Radiation Emergencies at Licensed Nuclear Facilities.

The OEMA is notified at the declaration of an emergency via dedicated telephone from the Control Room or EOF. Once notified, the OEMA will implement its Nuclear Incident Accident Call List as specified in the State of Ohio Plan.

3.2.2 Ottawa County, Ohio

The lead agency for county-wide emergency planning is the Ottawa County Emergency Management Agency. Responsibilities for various county agencies and organizations are described in Section II, The Ottawa County Plan for Response to Radiation Emergencies at Licensed Nuclear Facilities.

The Ottawa County EMA is notified at the declaration of an emergency via dedicated telephone in the Control Room or EOF. Once notified, Ottawa County will implement its emergency plan as appropriate.

3.2.3 Lucas County, Ohio

The lead agency for county-wide emergency planning is the Lucas County Emergency Management Agency. Responsibilities for various municipal and county agencies and organizations are delineated in The Lucas County Radiological Emergency Response Plan.

The Lucas County EMA is notified at the declaration of an emergency via dedicated telephone in the Control Room or EOF. Once notified, Lucas County will implement its emergency plan as appropriate.

3.2.4 Erie County, Ohio

The Erie County Emergency Management Agency acts as the lead agency within Erie County for evacuees from Ottawa County. Responsibilities for the individual agencies are contained in the Erie County Radiological Emergency Response Procedures Document.

The Erie County EMA is notified of an emergency by the Ottawa County EMA, and/or the Ottawa County Sheriff. Once notified, Erie County will implement its Standard Operating Procedures as appropriate.

3.2.5 Sandusky County, Ohio

The Sandusky County Emergency Management Agency acts as the lead agency within Sandusky County for evacuees from Ottawa County. Responsibilities for the individual agencies are contained in the Sandusky County Radiological Emergency Response Procedures Document.

The Sandusky County EMA is notified of an emergency by the Ottawa County EMA, and/or the Ottawa County Sheriff. Once notified, Sandusky County will implement its Standard Operating Procedures as appropriate.

3.2.6 State of Michigan

In Michigan, the Emergency Services Branch of the Department of State Police is the lead agency for the preparation, coordination, and implementation of the Michigan Emergency Preparedness Plan. As such, they are prepared to mitigate the effects of an incident at Davis-Besse, which may extend to the State of Michigan through the ingestion exposure pathway (50-mile EPZ).

The Ohio EMA will notify the State of Michigan should the need arise. Michigan, under conditions specified in a letter of agreement with the State of Ohio, will provide necessary emergency response within the State of Michigan.

3.2.7 Federal Agencies

- a. U.S. Nuclear Regulatory Commission (NRC), Region III, Lisle, Illinois.
- b. U.S. Department of Energy, Chicago Operations Office, Argonne, Illinois.
- c. Federal Emergency Management Agency (FEMA), Region V, Main Office - Chicago, Illinois.

3.3 Emergency Categories

Emergencies are grouped into four categories. From least to most severe they are:

- 3.3.1 UNUSUAL EVENT
- 3.3.2 ALERT
- 3.3.3 SITE AREA EMERGENCY
- 3.3.4 GENERAL EMERGENCY

Section 4.0, Emergency Conditions, contains a more detailed discussion of the categories of emergencies. Table 3-1, depicts participation by onsite and offsite organizations for each category of emergency.

TABLE 3-1
EMERGENCY CATEGORIES AND THE DEGREE OF PARTICIPATION
BY VARIOUS GROUPS

Emergency Category	Protective Actions		Necessity for Corrective Actions ¹	Participation By Various Organizations		
	Onsite	Offsite		DBNPS Onsite	Corporate	Offsite Agencies
Unusual Event	Possible	None	Possible	Notification Status ²	Notification Status	Notification Status
Alert	Possible	Possible	Possible	Action	Standby Status ³	Standby Status
Site Area Emergency	Required	Possible	Probable	Action	Action	Action
General Emergency	Required	Required	Required	Action	Action	Action

¹Action might include local fire support, ambulance service, medical assistance, or radiological assessment.

²Notification Status: Organization informed of situation onsite.

³Standby Status: Organization staffs preplanned centers, establishes communications, and assembles emergency teams, as required.

4.0 EMERGENCY CONDITIONS

4.1 DBNPS Classification System

The Emergency Plan provides four possible classifications for an emergency. These mutually exclusive emergency classifications cover the spectrum of emergency situations. Each emergency classification is associated with a particular set of immediate actions to be taken. Section 6.0, Emergency Measures, details these actions.

Classification of emergencies is based on potential or actual hazards present to the general public. Accidents may be classified at a lower category first, and then escalated to higher classification if the situation deteriorates.

Each emergency classification starts with the recognition, by the operating shift, that a potentially classifiable situation exists. The Shift Manager then determines, based upon procedural guidance, whether an emergency classification should be declared. Upon declaration of the emergency classification, the Shift Manager assumes the role of Emergency Director and implements the appropriate Emergency Plan Procedure(s). Among the initial activities performed are notification of offsite authorities, and notification/possible mobilization of the onsite emergency response organization. Section 6.0 summarizes the emergency measures to be taken by both the Onsite and Corporate emergency response organizations.

Each of the four emergency classifications is characterized by Emergency Action Levels (EALs). The EALs consist of specific plant parameters (e.g., instrument indications, system status, etc.) that indicate the need to declare one of the emergency classifications. EALs are used to ensure that the emergency classification is declared correctly and in a timely manner, so that emergency responders can assess the situation and determine any appropriate protective actions. Data used in deciding to recommend protective actions is forwarded to offsite authorities to assist in their decision to implement the recommendations.

A conservative philosophy for emergency classification is used to declare the highest category for which an EAL has been exceeded. For example, a SITE AREA EMERGENCY would be declared directly if a Site Area Emergency EAL is exceeded. This would be done without having first declared the UNUSUAL EVENT or ALERT emergency classifications.

The specific EALs described in this section are not intended to be all inclusive. The Emergency Director will declare an appropriate emergency classification when, in his judgment, plant status warrants such a declaration. Additional guidance is found for emergency classification within the Emergency Plan Procedures. In addition, the EALs described are not applicable in every operational mode, such as during maintenance and/or testing situations where abnormal temperature, pressure, equipment status, etc. is expected. The Emergency Plan Procedure provides specific guidance on EAL applicability and the classification of emergencies.

4.1.1 UNUSUAL EVENT

This classification is the least severe of the four emergency classification as defined by this plan.

The UNUSUAL EVENT Classification:

- a. Assures that the first step has been carried out in any response that may be necessary at a later time if conditions worsen.
- b. Brings the operating staff to a heightened state of readiness.
- c. Provides systematic handling of UNUSUAL EVENT information and decision making.

An incident is classified as an UNUSUAL EVENT only if the incident is a minor one and has a potential to degenerate to a more severe situation. State and local authorities are notified in the event of any UNUSUAL EVENT.

4.1.2 ALERT

The ALERT Classification:

- a. Assures that emergency personnel are readily available to respond if the situation becomes more serious or to perform confirmatory radiation monitoring if required.
- b. Provides offsite authorities current status information.

As in the case of the UNUSUAL EVENT, the ALERT classification includes emergency situations that are expected to be minor, but where it has been deemed prudent to alert the offsite emergency participants and mobilize a large portion of the emergency response organization.

Broader assessment than necessary at the UNUSUAL EVENT level actions are initiated because of the nature of the ALERT classification (releases of radioactive material are possible).

A situation shall only be classified at the ALERT level if none of the EALs for a higher classification has been exceeded or is expected to be exceeded in the near term.

4.1.3 SITE AREA EMERGENCY

The SITE AREA EMERGENCY classification includes events in which actual or likely major failures of plant functions needed for protection of the public have occurred. Releases, if they occur, are not expected to exceed Environmental Protection Agency (EPA) Protective Action Guideline (PAG) dose levels except near the site boundary.

The SITE AREA EMERGENCY Classification:

- a. Assures that response centers are manned.
- b. Assures that Radiation Monitoring Teams (RMTs) are available for immediate dispatch.
- c. Assures accountability for all personnel inside the Protected Area.
- d. Assures that personnel required for evacuation of near-site areas are in position if the situation becomes more serious.
- e. Provides current information to, and consultation with, offsite authorities and the public.
- f. Provides updates for the public through offsite authorities.

Many of the events included in this classification have the potential for degradation to the GENERAL EMERGENCY classification. Although the EALs for this classification have been selected at values well below the EPA PAGs, offsite monitoring team reports and continuing assessment actions will influence any final decision on protective actions to be taken.

4.1.4 GENERAL EMERGENCY

This is the most severe emergency classification defined by this Emergency Plan. The GENERAL EMERGENCY classification includes accidents that involve actual or imminent substantial core degradation or melting with the potential for loss of containment integrity. Releases can reasonably be expected to exceed EPA Protective Action Guideline dose levels offsite.

The GENERAL EMERGENCY Classification:

- a. Initiates predetermined protective actions for the public.
- b. Provides continuous assessment of information from licensee and offsite monitoring groups.
- c. Initiates additional measures as indicated by event releases or potential releases.
- d. Provides current information for and consultation with offsite authorities and the public.
- e. Provides updates for the public through offsite authorities.

Some preplanned protective actions will automatically be recommended upon declaration of the GENERAL EMERGENCY. EALs have been selected so that time should be available to make some confirmatory measurements in the field

prior to implementation of the more extensive protective action (i.e., evacuation). Some of the GENERAL EMERGENCY action levels require a dose projection calculation using actual meteorology. This assures that this most severe emergency classification will only be declared if warranted.

4.1.5 Table 4-1 summarizes the emergency action levels used to determine the four emergency classifications.

4.2 State and County Classification System

The Ohio Emergency Management Agency, Department of Public Safety, State of Ohio, has the responsibility to classify offsite emergencies that affect the general public. The Ohio Plan for Response to Radiation Emergencies at Licensed Nuclear Facilities, has adopted a system based upon NUREG-0654, Appendix 1, and in accordance with EPA recommended PAGs.

There is a correlation between Protective Action Guidelines (PAGs) and Emergency Action Levels (EALs). PAGs apply to protective actions due to radiological conditions offsite, in serious emergencies (defined in the GENERAL EMERGENCY classification). EALs are actions based on abnormal plant conditions that may degrade, requiring actions from personnel and/or agencies offsite.

4.3 Spectrum of Postulated Accidents

This section of the DBNPS Emergency Plan contains a summary of events that have been postulated for the station and shows that each is encompassed within the preceding emergency classifications.

4.3.1 Classification of Postulated Accidents

The events postulated in Chapter 15, Davis-Besse Nuclear Power Station Updated Safety Analysis Report (USAR) may be categorized into one of the four emergency classifications. Table 4-2 lists each of these events and the emergency classification that most likely relates to the event.

Occurrence of some of the events may result in emergency classifications different than those noted. This would depend on circumstances existent at the time of occurrence. Additionally, the detection equipment and operational components assumed to be operable in the USAR have been assumed to be operable for this evaluation. Failures of any of the required detectors and equipment in any of these event scenarios may result in a higher emergency classification. A complete discussion of these events may be found in the USAR.

4.3.2 Instrumentation and Capability for Detection

Table 7.5-1 of the Updated Safety Analysis Report lists instrumentation that is utilized in the decision to classify the accidents.

4.3.3 Manpower and Timing Considerations

The manpower response and timing considerations for the four emergency classifications are discussed in Section 5.0, Organizational Control of Emergencies.

Shift personnel are considered to be immediately available to respond to the emergency by manning the Control Room and the Operations Support Center (OSC). Other station personnel, or their alternates, who are assigned to emergency response positions, may be offsite at the time of notification. The timing considerations noted reflect their anticipated reporting times.

The TSC and the EOF are manned by qualified individuals who may be offsite at the time of notification. These personnel are expected to arrive onsite within the times specified in Section 5.0, Organizational Control of Emergencies.

During normal working hours, most emergency response personnel would be onsite and able to staff the TSC, EOF, and OSC within approximately 30 minutes.

During adverse weather conditions, personnel who are required to respond to the emergency are expected to do so as quickly as possible (consistent with safety). Approved procedures are available which anticipate personnel transportation during adverse weather conditions.

The Joint Public Information Center (JPIC) is activated by the Public Information Emergency Response Procedure. Personnel requirements for the JPIC are contained in this procedure. Minimum staffing of positions for the JPIC are expected to be filled within approximately two hours.

The Corporate Emergency Response Plan contains information regarding the activation of the Corporate Emergency Response Organization (CERO) during a declared emergency at DBNPS. The corporate plan identifies personnel in the CERO who would be contacted and utilized to support the Davis-Besse onsite emergency organization.

NRC personnel, other than the Resident Inspectors, may arrive at Davis-Besse from various remote locations. Their arrival times will vary depending upon distance from the plant and availability of transportation.

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

This table summarizes the specific occurrences which will lead to an emergency classification. Specific values for the indications listed are contained in the appropriate Emergency Plan Procedure. Operational modes are as follows, and as defined in Davis-Besse Technical Specifications.

<u>Mode</u>	<u>Condition</u>	
1	Power Operations	
2	Startup	
3	Hot Standby	
4	Hot Shutdown	
5	Cold Shutdown	
6	Refueling	

<u>Condition</u>	<u>Indication(s) Requiring Declaration of the Listed Classification</u>	<u>Emergency Classifications</u>
1. Primary System Events	<p><u>Failure of Safety Related Safety Valve or Relief Valve to Close Following a Pressure Reduction</u></p> <p>Indication of flow through Pressurizer reliefs, and a continuing drop in reactor coolant system pressure</p>	Unusual Event All Modes
	<p><u>High Reactor Coolant Activity Sample Requiring Plant Shutdown per Technical Specifications</u></p> <p>Confirmed sample results indicate activity greater than that allowed by Technical Specifications, and requiring a plant shutdown.</p>	Unusual Event Modes 1 & 2
	<p><u>Very High Coolant Activity:</u></p> <p>Confirmed sample results indicate >300 $\mu\text{Ci}/\text{gram}$ dose equivalent I-131.</p>	Alert All Modes

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
1. Primary System Events (Cont.)	<u>Core Damage with Inadequate Core Cooling Determined</u>	Site Area Emergency All Modes
	<ol style="list-style-type: none"> 1. Primary Coolant sample results indicate: <ol style="list-style-type: none"> a. Dose equivalent I-131 greater than allowed by Technical Specifications, <u>OR</u> b. >100/E μCi/gram specific activity, <u>AND</u> 2. The incore thermocouples indicate superheated conditions the core. 	
	<u>Core Damage with Other Plant Conditions Making a Release of Large Amounts of Radioactivity Possible</u>	General Emergency All Modes
	<ol style="list-style-type: none"> 1. Confirmed Primary Coolant sample results indicate >300 μCi/gram dose equivalent I-131, <u>AND</u> 2. Excessive incore thermocouple temperatures, <u>AND</u> 3. <ol style="list-style-type: none"> a. Containment radiation level is >10⁴ rad/hr, <u>OR</u> b. Containment high pressure condition. 	
	<u>Core Melt Situations</u>	General Emergency All Modes
	<ol style="list-style-type: none"> 1. Any sequence of events has occurred in which severe core damage (such as core melting) has taken place, <u>AND</u> 2. A failure of containment is about to take place (imminent). 	

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
1. Primary System Events (Cont.)	<u>Loss of 2 of 3 Fission Product Barriers with a Potential Loss of the 3rd Barrier</u> 1. Fuel clad is ruptured. 2. A rupture of the RCS has occurred. 3. Containment integrity has been breached and cannot be restored.	General Emergency All Modes
	<u>Abnormal Containment Radiation, Pressure and Temperature</u> 1. Containment radiation level correlates to an Alert, <u>AND</u> 2. High containment average air temperature.	Alert All Modes
	<u>High Containment Radiation, Pressure and Temperature</u> 1. Containment radiation level correlates to a Site Area Emergency, <u>AND</u> a. High Containment average air temperature indicated, <u>OR</u> b. Safety Features Actuation System (SFAS) functions have activated.	Site Area Emergency All Modes
	<u>Very High Containment Radiation and Pressure</u> 1. Containment radiation level correlates to a General Emergency, <u>AND</u> 2. Very High Containment pressure indicated.	General Emergency All Modes

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
2. Abnormal Reactor Coolant System Leak Rate	<u>Reactor Coolant System Leak Rate Requiring Plant Shutdown per Technical Specifications</u> Reactor Coolant System water inventory balance indicates excessive leakage.	Unusual Event Modes 1, 2, 3 & 4
	<u>Reactor Coolant System Leak Rate >50 gpm But Within High Pressure Injection Capacity</u> 1. Makeup Tank level is decreasing at a rate greater than 2 inches per minute while RCS temperature remains steady, <u>OR</u> 2. RCS water inventory balance indicates >50 gpm leakage.	Alert All Modes
	<u>Reactor Coolant System Leak Rate >50 gpm But Within High Pressure Injection Capacity AND a Loss of Offsite Power</u> 1. a. Makeup Tank level is decreasing at a rate greater than 2 inches per minute while RCS temperature remains steady, <u>OR</u> b. RCS water inventory balance indicates >50 gpm leakage, <u>AND</u> 2. Loss of offsite power.	Site Area Emergency All Modes

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
2. Abnormal Reactor Coolant System Leak Rate (Cont.)	<u>Loss of Coolant Accident > High Pressure Injection Capacity</u> 1. HPI system running, <u>AND</u> 2. a. RCS pressure/pressurizer level continues to decrease, <u>OR</u> b. RCS temperature/pressure reach saturation.	Site Area Emergency All Modes
3. Safety System Functions	<u>Uncontrolled Control Rod Withdrawal from a Subcritical Reactor</u> 1. Outward control rod motion without a command, <u>AND</u> 2. Reactor initially shutdown.	Unusual Event Modes 2, 3, 4 & 5
	<u>Failure of Reactor Protection System to Initiate and Complete a Trip Which Brings the Reactor Subcritical</u>	Alert Modes 1 & 2
	<u>Transient Requiring Operation of Shutdown Systems with Failure to Trip the Reactor</u> (Continued power generation but no core damage immediately evident.)	Site Area Emergency Modes 1 & 2
	<u>Complete Loss of Any Functions Needed for Plant Cold Shutdown</u>	Alert Modes 1, 2, 3 & 4
	<u>Inability to Maintain Plant in Cold Shutdown</u>	Alert Modes 5 & 6

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
3. Safety System Functions (Cont)	<u>Complete Loss of Any Function Needed for Plant Hot Shutdown</u>	Site Area Emergency Modes 1, 2, 3 & 4
	<u>Loss of Water Level in the Reactor Vessel That Has or Will Uncover Fuel in the Reactor Vessel</u>	Site Area Emergency Modes 5 & 6
	<u>Communication Capability Lost to an Extent Requiring Plant Shutdown or Other Significant Loss of Assessment</u>	Unusual Event All Modes
	<u>Most or All Alarms (Annunciator) Lost</u>	Alert Modes 1 & 2
	<u>Most or All Alarms (Annunciator) Lost and Plant Transient Initiated or In Progress</u>	Site Area Emergency Modes 1 & 2
4. Electrical Failures	<u>Loss of Offsite Power or Loss of Onsite AC Power Capability</u>	Unusual Event All Modes
	<u>AC Power Capability to Vital Busses Reduced to a Single Power Source for Greater than 15 Minutes such that any Additional Failure Would Result in a Station Blackout</u>	Alert Modes 1, 2, 3 & 4
	<u>Loss of Offsite Power AND Loss of All Onsite AC Power</u>	Alert All Modes

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
4. Electrical Failures (Cont.)	<u>Loss of Offsite Power AND Loss of Onsite AC Power for More Than 15 Minutes</u>	Site Area Emergency All Modes
	<u>Prolonged Loss of all Offsite Power AND Prolonged Loss of all Onsite AC Power</u>	General Emergency Modes 1, 2, 3 & 4
	<u>Loss of All Onsite DC Power</u>	Alert All Modes
	<u>Loss of All Vital Onsite DC Power for More Than 15 Minutes</u>	Site Area Emergency All Modes
5. Secondary System Events	<u>Rapid Depressurization of the Secondary Side</u>	Unusual Event Modes 1, 2, 3 & 4
	<ol style="list-style-type: none"> 1. Increasing Containment pressure (if leak is inside containment) or unusually loud noise or visual sighting outside Containment, <u>AND</u> 2. Valid Steam and Feedwater Rupture Control System (SFRCS) initiation automatically or manually on low Main Steam Line pressure. 	
	<u>Steam Line Break With >10 gpm Primary to Secondary Leak Rate</u>	Alert Modes 1, 2, 3 & 4
	<ol style="list-style-type: none"> 1. Indication of a major steam leak, <u>AND</u> 2. Main Steam line radiation monitor(s) indicating increased activity, <u>AND</u> 3. RCS leak rate >10 gpm primary to secondary leakage. 	

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
5. Secondary System Events (Cont.)	<p><u>Steam Line Break With >50 gpm Primary to Secondary Leak Rate AND Indication of Fuel Damage</u></p> <ol style="list-style-type: none"> 1. Indication of a major steam leak, <u>AND</u> 2. Main Steam line radiation monitor(s) indicating increased activity, <u>AND</u> 3. RCS leak rate indicates >50 gpm primary to secondary leakage, <u>AND</u> 4. Confirmed primary coolant sample results indicate activity above acceptable limits of Technical Specifications. 	Site Area Emergency Modes 1, 2, 3 & 4
	<p><u>Failure of Safety-Related Safety Valves or Relief Valves to Close Following a Pressure Reduction</u></p> <p>Main Steam System:</p> <ol style="list-style-type: none"> 1. Rapid and continuing decrease in Steam Generator pressure, <u>AND</u> 2. Visual or audible observation of a safety valve being open. 	Unusual Event Modes 1, 2, 3 & 4
6. Radiation Release Events	<p><u>Radiation Levels or Airborne Contamination Which Indicates a Severe Degradation in the Control of Radioactive Materials</u></p> <p>(such as an increase of a factor of 1000 in direct radiation readings)</p> <ol style="list-style-type: none"> 1. An airborne radioactivity sample or area radiation survey indicates activity levels >1000 times normal, <u>OR</u> 2. Local radiation monitoring reading indicate, radiation levels >1000 times normal 	Alert All Modes

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
6. Radiation Release Events (Cont.)	<u>Fuel Handling Accident Which Results in the Release of Radioactivity to Containment or Fuel Handling Area</u>	Alert All Modes
	<u>Major Damage to Spent Fuel in Containment or Fuel Handling Area</u> (e.g. large object damages fuel or water loss below fuel level)	Site Area Emergency All Modes
	<u>Effluent Release > Limits Allowed by Davis-Besse Offsite Dose Calculation Manual</u>	Unusual Event All Modes
	<u>Effluent Release >10 Times Limits Allowed by Davis-Besse Offsite Dose Calculation Manual</u>	Alert All Modes
	<u>Projected or Measured Site Boundary Radiation Levels that Indicate a Potential Dose of 1 mrem at the Site Boundary if Continued Over Two Hours, Using Average Meteorological Conditions</u>	Alert All Modes
	<u>Projected or Measured Site Boundary Radiation Levels of >50 mrem/hr TEDE rate for 1/2-hour Using Adverse Meteorology</u>	Site Area Emergency All Modes
	<u>Projected or Measured Site Boundary Radiation Levels of >500 mrem/hr TEDE rate for 2 minutes Using Adverse Meteorology</u>	Site Area Emergency All Modes

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
6. Radiation Release Events (Cont.)	<u>Projected or Measured Site Boundary Thyroid Dose Rate \geq 250 mrem/hr for ½ hour Using Adverse Meteorology</u>	Site Area Emergency All Modes
	<u>Projected or Measured Site Boundary Thyroid Dose Rate \geq 2500 mrem/hr for 2 minutes Using Adverse Meteorology</u>	Site Area Emergency All Modes
	<u>Projected or Measured Site Boundary Radiation Levels of \geq 1 rem/hr TEDE rate Using Adverse Meteorology</u>	General Emergency All Modes
	<u>Projected or Measured Site Boundary Thyroid Dose Rate \geq 5 rem/hr Using Adverse Meteorology</u>	General Emergency All Modes
7. Hazards to Station Operations	<u>Fire Within the Plant Lasting More Than 10 Minutes, or Any Fire Requiring Offsite Assistance</u>	Unusual Event All Modes
	<u>Fire Potentially Affecting Safety Systems</u>	Alert All Modes
	<u>Fire Resulting in the Loss of Redundant Trains of a Safety System</u>	Site Area Emergency All Modes

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
7. Hazards to Station Operations (Cont.)	<u>Aircraft Crash Onsite or Unusual Aircraft Activity Over Facility</u>	Unusual Event All Modes
	<u>Aircraft Crash Affecting Plant Structures</u>	Alert All Modes
	<u>Aircraft Crash Damaging Vital Plant Structures by Impact or Fire</u>	Site Area Emergency Modes 1, 2, 3, & 4
	<u>Train Derailment Onsite</u> 1. Control Room informed by Station personnel who have made a visual sighting, <u>AND</u> 2. Station Structures have been damaged, <u>OR</u> 3. Danger to Station personnel exists.	Unusual Event All Modes
	<u>Near or Onsite Explosion</u> Control Room informed by Station personnel who have made a visual sighting.	Unusual Event All Modes
	<u>Near or Onsite Explosion</u> Control Room informed by Station personnel who have made a visual sighting.	Unusual Event All Modes

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
7. Hazards to Station Operations (Cont.)	<u>Onsite Explosion Affecting Plant Operations</u> 1. Control Room informed by Station personnel who have made a visual sighting, <u>AND</u> 2. Instrumentation readings on plant systems indicate equipment problems.	Alert All Modes
	<u>Explosion Causing Severe Damage to Safe Shutdown Equipment</u>	Site Area Emergency Modes 1, 2, 3, & 4
	<u>Near or Onsite Toxic or Flammable Gas Release</u>	Unusual Event All Modes
	<u>Entry Into Facility Environs of Uncontrolled Toxic or Flammable Gas</u>	Alert All Modes
	<u>Entry of Uncontrolled Flammable Gas Into Vital Areas. Entry of Uncontrolled Toxic Gases into Vital Areas Where Lack of Access to the Area Constitutes a Safety Problem</u> (Plant NOT in cold shutdown.)	Site Area Emergency Modes 1, 2, 3 & 4
	<u>Turbine Rotating Component Failure Causing Rapid Plant Shutdown</u>	Unusual Event Modes 1 & 2
	<u>Turbine Failure Causing Casing Penetration</u>	Alert Modes 1 & 2
	<u>Missile Impact from Whatever Source on the Facility</u>	Alert All Modes

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
7. Hazards to Station Operations (Cont.)	<u>Missile Impact Causing Severe Damage to Safe Shutdown Equipment</u>	Site Area Emergency Modes 1, 2, 3 & 4
	<u>Evacuation of Control Room Anticipated or Required</u>	Alert All Modes
	<u>Evacuation of Control Room and Control of Shutdown Systems Not Established From Local Stations In 15 minutes</u>	Site Area Emergency All Modes
	<u>Security Threat or Attempted Entry or Attempted Sabotage or Site Specific Credible Threat</u>	Unusual Event All Modes
	<u>Ongoing Security Compromise</u>	Alert All Modes
	<u>Loss of Physical Control of the Plant is Ready to Take Place (imminent)</u>	Site Area Emergency All Modes
	<u>Loss of Physical Control of the Facility</u>	General Emergency All Modes
8. Natural Events (Within Ottawa County)	<u>Any Earthquake Felt In Plant or Detected on Station Seismic Instrumentation</u>	Unusual Event All Modes
	<u>Earthquake > Operating Basis Earthquake (OBE) Levels</u>	Alert All Modes
	<u>Earthquake > Safe Shutdown Earthquake (SSE) Levels</u>	Site Area Emergency Modes 1, 2, 3 & 4

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
8. Natural Events (Within Ottawa County)(Cont.)	<u>Any Tornado Onsite</u>	Unusual Event All Modes
	Control Room informed by Station personnel who have made visual sighting of a tornado crossing the site boundary.	
	<u>Any Tornado Striking the Facility</u>	Alert All Modes
	Control Room informed by Station personnel who have made a visual sighting.	
	<u>Hurricane Force Winds (> 74 mph)</u>	Unusual Event All Modes
	Control Room informed of hurricane force winds forecast for Ottawa County.	
<u>Hurricane Force Winds Near Design Basis Levels</u> (> 74 mph, but < 90 mph)	Alert All Modes	
<u>Hurricane Force Winds > Design Basis Levels (> 90 mph)</u>	Site Area Emergency Modes 1, 2, 3 & 4	
<u>50-Year Flood or Low Water, Surge or Seiche</u>	Unusual Event All Modes	
Lake levels >580 feet IGLD <u>OR</u> <562 feet IGLD		

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
8. Natural Events (Within Ottawa County)(Cont.)	<u>Flood, Low Water, Surge, or Seiche Near Design Levels</u> Lake levels at 584 feet IGLD OR <560 feet IGLD.	Alert All Modes
	<u>Flood, Low Water, Surge, or Seiche > Design Levels With Plant Not in Cold Shutdown</u> Lake levels >584 feet IGLD OR <558 feet IGLD.	Site Area Emergency Modes 1, 2, 3 & 4
9. Miscellaneous	<u>Miscellaneous</u> Plant is NOT brought to a required operating mode within Technical Specification Limiting Condition for Operation (LCO) Action Statement time limit.	Unusual Event Modes 1, 2, 3 & 4
	<u>Miscellaneous</u> Other plant conditions exist that warrant increased awareness on the part of the plant operations staff or State and/or local offsite authorities which are not covered under any other existing station procedures.	Unusual Event All Modes
	<u>Miscellaneous</u> Other plant conditions exist that warrant precautionary activation of the Technical Support Center and Emergency Operations Facility and placing other key emergency personnel on standby.	Alert All Modes

TABLE 4-1

SUMMARY OF EMERGENCY ACTION LEVELS

Condition	Indication(s) Requiring Declaration of the Listed Classification	Emergency Classifications
9. Miscellaneous (Cont.)	<u>Miscellaneous</u> Other plant conditions exist that warrant activation of emergency centers and monitoring teams or a precautionary notification to the public near the site.	Site Area Emergency All Modes
	<u>Miscellaneous</u> 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.	General Emergency All Modes

TABLE 4-2

CLASSIFICATION OF HYPOTHESIZED ACCIDENTS

These events are based upon the worst case conditions described in the DBNPS USAR, Chapter 15. To fully understand the event, the USAR must be consulted.

<u>EVENT</u>	<u>CLASSIFICATION</u>
1. Uncontrolled Control Rod Assembly Group withdrawal from a subcritical condition (Startup Accident)	Unusual Event
2. Uncontrolled Control Rod Assembly Group withdrawal at power	*
3. Control Rod Assembly misalignment (Stuck-out, stuck-in, or dropped CRA)	*
4. Makeup and Purification System malfunction	Unusual Event
5. Loss of forced Reactor Coolant flow	Unusual Event
6. Startup of inactive Reactor Coolant loop	*
7. Loss of external load and/or Main Turbine trip	*
8. Loss of normal Feedwater	*
9. Loss of all AC power to station auxiliaries	Unusual Event
10. Excessive heat removal due to Feedwater system malfunctions	*
11. Excessive load increases	*
12. Anticipated variations in the reactivity of the reactor	*
13. Failure of regulating instrumentation	Unusual Event
14. External causes (Natural disasters, etc.)	Unusual Event
15. Loss of Reactor Coolant from small ruptured pipes or from cracks in large pipes which actuate ECCS	Alert
16. Minor secondary pipe break	Unusual Event

*The results of these events do not meet the criteria for an Unusual Event.

TABLE 4-2

CLASSIFICATION OF HYPOTHESIZED ACCIDENTS

<u>EVENT</u>	<u>CLASSIFICATION</u>
17. Inadvertent loading of a fuel assembly into an improper position	Alert
18. Steam Generator tube rupture	Site Area Emergency
19. Control Rod Assembly ejection accident	Alert
20. Steam line break	Site Area Emergency
21. Break in instrument lines or lines from Reactor Coolant System that penetrate containment	Site Area Emergency
22. Loss of Coolant Accident	Site Area Emergency
23. Fuel Handling Accident	Site Area Emergency
24. Design Basis Accident	General Emergency
25. Waste Gas Tank Rupture	Alert
26. Effects of Toxic Material Releases on the Control Room (Note: Chlorine gas was the only toxic material onsite which could affect the Control Room. This material is no longer used onsite, and the chlorine tank has been removed.)	Alert

5.0 ORGANIZATIONAL CONTROL OF EMERGENCIES

In planning for emergencies the availability of the normally present operating staff, augmented by support from other utility personnel and offsite support agencies, is considered. The initial phase of an emergency at DBNPS will involve a relatively small number of individuals. These individuals will be capable of: (1) determining that an emergency exists, (2) providing initial classification and assessment, (3) promptly notifying other groups and individuals in the emergency organization, and (4) performing actions immediately necessary to protect site personnel and the public. The follow-on phases of an emergency situation may require an increasing augmentation of the emergency organization. In the case of a SITE AREA EMERGENCY or a GENERAL EMERGENCY, this will result in the mobilization of all personnel resources of the Company, under the direction of a Senior Company Officer.

This section of the Emergency Plan addresses the assignment of personnel and the establishment of responsibilities and authority for the:

- 5.1 DBNPS Organization
- 5.2 DBNPS Emergency Management
- 5.3 Onshift Emergency Response Organization
- 5.4 Onsite Emergency Response Organization
- 5.5 Joint Public Information Center (JPIC)
- 5.6 Corporate Emergency Response Organization (CERO)
- 5.7 Supporting Emergency Organizations

5.1 DBNPS Organization

Daily operating and engineering activities at DBNPS are under the control of the Vice President - Nuclear.

DBNPS has engineering service contracts with the Nuclear Steam Supply System (NSSS) supplier and the Architect-Engineer. Organizational structure and communication arrangements exist to assure that these services are available and can be obtained in a timely manner.

5.1.1 Plant Management and Administrative Organization

The Plant Manager directs and supervises all operating, administrative, technical and maintenance activities in connection with the continuous, efficient and safe operation of the DBNPS.

To support the Plant Manager, an administrative organization has been established. Responsibilities have been assigned for the various aspects of station operation.

5.1.2 Onshift Operations Group

The Normal Onshift Operations Group at the Davis-Besse Nuclear Power Station maintains the capability at all times to perform the emergency detection, classification, and notification functions required in the early phases of an incident. These capabilities are augmented, as required, by the Onsite Emergency Response Organization and the Corporate Emergency Response Organization.

The Onshift Operations Group conforms with ANSI N18.1, and includes both management and operating personnel. Figure 5-1, Onshift Emergency Organization, shows the functional levels. The Onshift Maintenance Support Organization maintains a 24-hour shift rotation. The shift includes persons from the Mechanical, Electrical, and Instrument and Control Maintenance Sections. These personnel form the initial nucleus staff of the OSC. Other continuous duty, 24 hours-per-day organizations include Plant Operations, Chemistry, Radiation Protection and Security. Additional Maintenance personnel and the various Engineering organizations are onsite during normal work hours, Monday through Friday, excluding holidays.

5.1.3 Normal Plant Shift Staffing

The plant's operating staff meets or exceeds the requirements of Technical Specifications:

MINIMUM SHIFT CREW COMPOSITION #
(Tech. Specs. Table 6.2-1, Amendment 175)

LICENSE CATEGORY	APPLICABLE MODES	
	1,2,3 & 4	5 & 6
Senior Reactor Operator License (SRO)	2**	1*
Reactor Operator License (RO)	2	1
Non-Licensed	2	1
Shift Engineer (Shift Technical Advisor) (STA)	1**	None

- # Shift crew composition may be less than the minimum requirements for a period of time not to exceed 2 hours in order to accommodate unexpected absences of on duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements.
- * Does not include the licensed Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling supervising CORE ALTERATIONS.
- ** One of the two required individuals filling the SRO positions may also assume the STA function provided the individual meets the qualifications for the combined SRO/STA position specified in Option 1 of the Commission's Policy Statement on Engineering Expertise on Shift. If the option is used for a shift, then the separate STA position may be eliminated for that shift.

In addition, the plant is continuously manned with a minimum shift complement consisting of the following:

- 1 Chemistry Tester
- 1 Radiation Protection Tester
- 5 Fire Brigade Members (may have other assignments)
- * Nuclear Security Force

*safeguards information

An established duty roster system provides access to plant management 24 hours a day.

Table 5-1 specifies minimum shift requirements as prescribed by NUREG-0654, Table B-1.

The Shift Manager directs the onshift personnel operating the station and verifies that their work is performed according to approved procedures. Ultimate authority for directing all phases of plant operations always lies with the Shift Manager. The Shift Manager becomes the Emergency Director upon classification of an emergency at DBNPS.

A Unit/Field Supervisor, who is assigned to each shift during power modes, assists the Shift Manager by following his directives in supervising employees engaged in controlling the operations of the Nuclear Steam Supply System, Turbine Generator, and other station equipment. During an emergency, the Unit/Field Supervisor may also direct employees to function as emergency maintenance personnel or to assist fire brigade team members. The Unit/Field Supervisor assumes the role of Shift Manager, including Emergency Director duties, should the Shift Manager become incapacitated.

A Shift Engineer (Shift Technical Advisor) is normally assigned to the shift to relieve the Shift Manager of administrative responsibilities, such as coordination of maintenance schedules, establishment of short term objectives for plant operation and review of documentation. In addition, the Shift Engineer (Shift Technical Advisor) also provides the additional technical and analytical capability needed in the Control Room, during all operating modes except refueling and cold shutdown, to support the diagnosis of off-normal events. If available, the Shift Engineer (Shift Technical Advisor) serves as the technical assistant to the Shift Manager in analyzing and mitigating such events, and may perform dose assessment calculations during emergencies. The Shift Engineer (Shift Technical Advisor) may serve as the Emergency Director if both the Shift Manager and the Unit/Field Supervisor are incapacitated. Under certain circumstances, the Shift Engineer (Shift Technical Advisor) position may be filled by an onshift Senior Reactor Operator assigned another function, such as Shift Manager.

The Supervisor - Security Shift is responsible for coordinating the functions of the station security forces, and the operation and testing of security-related equipment. A Supervisor - Security Shift will be onsite at all times.

5.2 DBNPS Emergency Management

In the event of a declared ALERT or higher level emergency, the Onsite Emergency Response Organization (ERO) shall be activated. The individuals responsible for managing the emergency are the Emergency Director, Emergency Offsite Manager, Emergency Plant Manager and the Company Spokesperson.

5.2.1 Emergency Director

- a. The Emergency Director is the senior individual in the onsite ERO responsible for the coordination of the overall response to any emergency at the DBNPS. During such an emergency, the Emergency Director will coordinate and direct the emergency response from the Control Room, the Technical Support Center (TSC), or the Emergency Operations Facility (EOF) in the Davis-Besse Administration Building (DBAB).

The following are non-delegable responsibilities of the Emergency Director:

1. Emergency Classification
2. Offsite Protective Action Recommendation
3. Compliance with station procedures
4. Safety and well being of station personnel
5. Ordering a station general evacuation

Responsibilities that the Emergency Director may delegate to the Emergency Plant Manager only are:

1. Emergency dose authorizations in excess of 10 CFR 20 limits, and
2. Onsite administration of Potassium Iodide (KI).

- b. Reporting directly to the Emergency Director are:

1. Emergency Offsite Manager
2. Emergency Plant Manager
3. Company Spokesperson
4. Emergency Director Advisor

- c. In the absence of the Emergency Director, one of the following positions will assume the duties and responsibilities of the Emergency Director:

1. Emergency Plant Manager
2. Emergency Assistant Plant Manager
3. Shift Manager
4. Unit/Field Supervisor
5. Shift Engineer (Shift Technical Advisor)

During the initial phase of the emergency, the Shift Manager will be the Emergency Director until relieved by the designated Emergency Director or the Emergency Plant Manager. The Emergency Plant Manager may assume

the Emergency Director duties from the TSC, in the absence of the designated Emergency Director. In the absence of the Emergency Plant Manager and the Emergency Director, the Shift Manager may be relieved by the Emergency Assistant Plant Manager upon arrival in the Control Room. However, to relieve the Shift Manager of the Emergency Director's duties, the Emergency Assistant Plant Manager must be in the Control Room.

5.2.2 Emergency Offsite Manager

The Emergency Offsite Manager reports directly to the Emergency Director. The Emergency Offsite Manager's primary responsibility is the overall operation of the EOF including:

- a. Coordination of radiological dose assessment activities and protective action recommendations.
- b. Control and coordination of communication and interface with corporate, offsite and regulatory agencies.
- c. Tracking parameters associated with EALs for radiological releases.
- d. Making recommendations to the Emergency Director concerning appropriate offsite protective actions, and/or changes to the emergency classification level.
- e. Interfacing with the Emergency Plant Manager, Company Spokesperson, and regulatory and governmental officials.

5.2.3 Emergency Plant Manager

The Emergency Plant Manager is the senior individual responsible for the coordination and conduct of all activities associated with plant operations, plant assessment, emergency classification associated with plant parameters, and onsite actions taken to mitigate the emergency situation. The Emergency Plant Manager reports to and advises the Emergency Director on plant status and provides recommendations for emergency reclassification based upon technical information and indications recorded in the TSC. The Emergency Director may delegate the responsibilities of authorizing the use of Potassium Iodide, and emergency doses in excess of 10 CFR 20-dose limits, to the Emergency Plant Manager. Once tasked with these responsibilities, the Emergency Plant Manager cannot delegate them.

The Emergency Plant Manager reports directly to the Emergency Director and interfaces with the Emergency Offsite Manager.

5.2.4 Company Spokesperson

The Company Spokesperson is responsible for the overall operation of the Joint Public Information Center (JPIC), conferring with the Emergency Director concerning plant status, reviewing news releases with the Emergency Director,

concerning plant status, reviewing news releases with the Emergency Director, conferring with the JPIC Manager concerning media response status, and acting as company spokesperson during media briefings.

The Company Spokesperson is normally located at the JPIC during an emergency.

5.2.5 Emergency Director Advisor

The Emergency Director Advisor is responsible for accompanying the Emergency Director during performance of emergency duties; and maintaining an awareness of the present emergency situation, while anticipating possible changes. Personal knowledge of the Emergency Plan and associated procedures enable the Emergency Director Advisor to respond to specific questions, as well as brief the Emergency Director on possible courses of action and required procedural responses.

5.3 Onshift Emergency Response Organization

Onshift Emergency Response Organization personnel are adequately trained to recognize, classify, notify, and take appropriate action to terminate or mitigate any emergency situation at the Davis-Besse Station, and shall do so until relieved by the Onsite Emergency Response Organization. The Onshift Emergency Response Organization is depicted in Figure 5-1. Key positions within the Onshift Emergency Response Organization are briefly outlined below.

5.3.1 Shift Manager

The Shift Manager is responsible for assuming the role of the Emergency Director. The Shift Manager supervises the following activities:

- a. The timely assessment of plant status.
- b. Recognition and appropriate classification of the given situation.
- c. Augmentation of the Onshift Emergency Response Organization, as appropriate.
- d. Initial notification of offsite agencies.
- e. Termination or mitigation of the emergency situation.
- f. Protective action recommendations for the general public and Station personnel.
- g. Authorization of emergency radiation doses.

5.3.2 Unit/Field Supervisor

During power operations, the Unit/Field Supervisor is responsible for assisting the Shift Manager in the supervision of Operations personnel.

The Unit/Field Supervisor will immediately assume the duties and authorities of the Shift Manager, including Emergency Director duties, if the Shift Manager becomes incapacitated.

5.3.3 Shift Engineer (Shift Technical Advisor)

During an emergency, the Shift Engineer (Shift Technical Advisor), if available, is primarily responsible for the assessment of reactor thermal dynamics. The Shift Engineer (Shift Technical Advisor) is trained to advise the Shift Manager as to level of emergency classification, and actions necessary to terminate or mitigate the consequences of the given situation.

The Shift Engineer (Shift Technical Advisor) will assume the role of Emergency Director if the Shift Manager and the Unit/Field Supervisor become incapacitated. The Shift Engineer (Shift Technical Advisor) is normally assigned to the onshift operating crew during operational modes 1, 2, 3, and 4. Under certain circumstances, this position may be filled by an onshift SRO assigned another function.

5.3.4 Supervisor - Security Shift

The Supervisor - Security Shift is responsible for the activities of the Nuclear Security Force in controlling access to the Protected Area, assisting during medical emergencies and conducting accountability, if necessary.

The Supervisor - Security Shift reports directly to the Emergency Security Manager and interfaces with the OSC Manager and the OSC RP Coordinator.

5.3.5 Onshift Maintenance Support

During normal power operations, the Onshift Maintenance personnel report to the Shift Engineer. Upon declaration of an emergency, the Onshift Maintenance personnel report directly to the Shift Manager and implement the functions of the OSC until the facility is fully activated by the Onsite Emergency Response Organization. During the initial stages of an emergency, the Onshift Maintenance personnel are responsible for performing Mechanical Maintenance, and Electrical and Controls Maintenance support functions.

5.4 Onsite Emergency Response Organization

5.4.1 Overview

During an emergency, an Onsite Emergency Response Organization will be activated. The assignment of responsibilities in the Onsite Emergency Response Organization is ultimately the responsibility of the Vice President, Nuclear. However, the Manager – Regulatory Affairs is responsible for establishing and maintaining a predefined Onsite Emergency Response Organization. Alternate assignments to various positions are specified to provide for timely, automatic, and unambiguous manning to satisfy emergency response requirements.

In general, the Onsite Emergency Response Organization will be housed in four onsite centers. These centers are briefly described below:

a. Control Room

Control Room staff will control the operation of the power plant during both normal and emergency operations.

b. Emergency Operations Facility (EOF)

The EOF will serve as the primary point of interface between the Company and outside organizations responsible for the protection of the general public. The EOF staff will also analyze and track parameters relating to the radiological EALs, and will advise the Emergency Director of the need to reclassify the emergency. The EOF staff will also conduct dose assessment operations and generate protective action recommendations for both Station personnel and the general public.

c. Technical Support Center (TSC)

TSC staff will assess plant conditions, and provide management and technical assistance to the Control Room, as required, to mitigate the effects of the emergency event. The TSC staff will analyze and track parameters relating to the technical EALs, and will advise the Emergency Director of the need to reclassify the emergency.

d. Operations Support Center (OSC)

OSC staff will provide emergency maintenance and radiation monitoring support, as requested by the Control Room; and provide emergency support, as required, for onsite material acquisition, fire fighting, and first aid.

5.4.2 Direction and Coordination

Procedurally, the Onsite Emergency Response Organization is activated when an emergency is classified at the ALERT level or higher. The response times for the various emergency positions within the organization are specified in Table 5-1. The primary function of the Onsite Emergency Response Organization is to relieve the Control Room staff of those duties and responsibilities not directly related to the operation of the primary and secondary plant systems.

5.4.3 Control Room

In the Control Room, the Onsite Emergency Response Organization is the same as the Onshift Emergency Response Organization. At the ALERT level or greater, additional operators will be assigned to assist in the OSC, under the direction of the OSC Manager.

5.4.4 Technical Support Center (TSC) Organization

The TSC Organization is composed of individuals housed in two separate and distinct facilities: the Technical Support Center, in the Davis-Besse Administration Building; or Shift Manager's office, which is in the Control Room envelope. Personnel and activities in these facilities are directed by the Emergency Plant Manager.

The following individuals report directly to the Emergency Plant Manager:

a. Emergency Assistant Plant Manager

The Emergency Assistant Plant Manager is the senior Company representative within the Control Room. The Emergency Assistant Plant Manager is responsible for coordination and interface between the TSC emergency organization and the plant. The Emergency Assistant Plant Manager advises the Emergency Plant Manager on plant status and trends, and their potential impact on protective action recommendations and emergency classification.

The Emergency Assistant Plant Manager interfaces with the Emergency Plant Manager, TSC Engineering Manager, Emergency Radiation Protection Manager, and the OSC Manager.

Reporting to the Emergency Assistant Plant Manager is the Shift Manager and the Operations staff, in the Control Room.

b. Emergency Radiation Protection Manager

The Emergency Radiation Protection Manager is located in the TSC and is responsible for ensuring radiological assessments, and surveys are conducted within the Protected Area. The Emergency Radiation Protection Manager coordinates plant protective action and health physics support for emergency activities, and interprets data to provide health physics and chemistry input to engineering assessments. The Emergency Radiation Protection Manager interfaces with the Dose Assessment Coordinator to provide data on plant radiological status and trends. In addition, the Emergency Radiation Protection Manager provides recommendations to the Emergency Plant Manager for emergency personnel doses, and the issuance of Potassium Iodide to plant personnel.

The Emergency Radiation Protection Manager interfaces with the TSC Engineering Manager, the Emergency Security Manager, the OSC Manager, the OSC RP Coordinator, the Dose Assessment Coordinator and staff.

c. Technical Support Center (TSC) Engineering Manager

The TSC Engineering Manager is responsible for the coordination and supervision of TSC engineering activities associated with development of emergency procedures to terminate or mitigate the emergency situation. The TSC Engineering Manager ensures that the Technical Support Center is operated with attention to such detail as timely updating, accurate record-keeping, and complete documentation of the event for historical purposes. The TSC Engineering Manager advises the Emergency Plant Manager on information pertinent to emergency classification, from the technical standpoint.

The TSC Engineering Manager interfaces with the Emergency Assistant Plant Manager, OSC Manager and the Emergency Radiation Protection Manager.

Reporting to the TSC Engineering Manager are the TSC Engineering Lead, and the TSC Operations Lead.

d. TSC Engineering Lead

The TSC Engineering Lead is responsible for coordinating the TSC Engineers.

The TSC Engineering Lead reports to the TSC Engineering Manager and interfaces with the TSC Operations Lead, and the Emergency Radiation Protection Manager.

Reporting to the TSC Engineering Lead are engineers with expertise in the following disciplines:

1. Core/Thermal Hydraulics
2. Electrical
3. Mechanical
4. Instrument and Control

e. TSC Operations Lead

The TSC Operations Lead is responsible for coordinating and supervising the TSC Operations Engineering group. The TSC Operations Lead coordinates engineering tasks assigned to the TSC and Operations Engineering staff.

The TSC Operations Lead reports to the TSC Engineering Manager, and interfaces with the TSC Engineering Lead and the Emergency Radiation Protection Manager.

Reporting to the TSC Operations Lead are personnel with expertise in various aspects of plant operations and computer technology.

f. Emergency Security Manager

The Emergency Security Manager is responsible for the overall direction of the Emergency Security Organization in controlling access to the site, assisting in medical emergencies, and assembly and accountability.

The Emergency Security Manager reports to the Emergency Plant Manager and interfaces with the Emergency Radiation Protection Manager, and the OSC Manager.

g. Owner Controlled Area Security Supervisor

The Owner Controlled Area Security Supervisor is responsible for controlling access to the emergency facilities, and ensuring that all ERO personnel in the DBAB have received emergency dosimetry. The Owner Controlled Area Security Supervisor also directs the action of the security force when controlling access to the Owner Controlled Area (OCA).

The Owner Controlled Area Security Supervisor reports to the Emergency Security Manager.

5.4.5 Operations Support Center (OSC) Organization

a. OSC Manager

The OSC Manager is responsible for the supervision of OSC personnel and their associated activities. The OSC Manager will assess the manpower requirements and technical skill level required by the given emergency situation, and provide for augmentation as appropriate. At a minimum, the OSC Manager will provide personnel to staff the following OSC teams:

1. Emergency Repair
2. Search and Rescue
3. First Aid
4. Fire Brigade

The OSC Manager reports to and interfaces directly with the Emergency Plant Manager and interfaces with the Emergency Assistant Plant Manager and the Emergency Radiation Protection Manager. Reporting to the OSC Manager are the Assistant OSC Manager, the OSC Materials Manager, and the OSC Radiation Protection Coordinator.

b. Assistant OSC Manager

The Assistant OSC Manager reports to and assists the OSC Manager as directed. He is responsible for the OSC personnel pool, and assumes the duties and responsibilities of the OSC Manager in his absence.

c. The OSC Radiation Protection Coordinator

The OSC Radiation Protection Coordinator dispatches RP and Chemistry technicians, within the protected area to survey, sample, and analyze various systems and/or areas to determine the emergency radiological conditions. The OSC Radiation Protection Coordinator also provides radiological support for emergency repair teams, the fire brigade, and first aid teams.

The OSC Radiation Protection Coordinator reports to the OSC Manager, and informs and is advised by the Emergency RP Manager.

Reporting to the OSC Radiation Protection Coordinator are all RP and Chemistry testers not specifically assigned other responsibilities within the emergency organization.

d. Rad Data Technician

The Rad Data Technician is an RP tester who obtains area radiation data from the Control Room back panels and transmits it by fax, or verbally by telephone, to the OSC RP Coordinator and Emergency RP Manager.

e. OSC Materials Manager

The OSC Materials Manager is responsible for supervision and coordination of onsite procurement of spare parts and equipment. The OSC Materials Manager is responsible for ensuring the warehouse is staffed to support the given situation.

The OSC Materials Manager reports to the OSC Manager, and interfaces with those components of the emergency organization seeking onsite spare parts or equipment.

Reporting to the OSC Materials Manager are personnel retained from the warehouse staff(s) to support the emergency situation.

f. OSC Personnel Pool

The OSC Personnel Pool will be comprised of Maintenance, RP, Chemistry, and Operations personnel who are not assigned other roles and responsibilities within the emergency response organization. OSC personnel will be trained to staff one or more of the following OSC emergency teams:

1. Emergency Repair
2. Search and Rescue
3. First Aid
4. Fire Brigade

Members of the OSC Personnel Pool report to the Assistant OSC Manager.

g. OSC Systems Engineers

A minimum of three OSC Systems Engineers will be called out to support OSC activities. The disciplines represented will include primary systems, secondary systems, and electrical and controls.

The OSC Systems Engineers will report to the OSC Manager, and interface with the various emergency repair teams, and the TSC engineers.

5.4.6 Emergency Operations Facility (EOF) Organization

Under the direction of the Emergency Offsite Manager, the following positions staff the EOF.

a. NRC Liaison

The NRC Liaison is responsible for establishing and maintaining communications with the Nuclear Regulatory Commission (NRC): The NRC Liaison will be present at meetings between the Onsite Emergency Organization and the NRC.

The NRC Liaison Communicator reports directly to the NRC Liaison.

b. EOF Operations Advisor

The EOF Operations Advisor is responsible for gathering, interpreting, and advising the Emergency Offsite Manager with respect to current or potential plant situations; and for providing key plant parameters to the dose assessment group to support their evaluation efforts.

c. Dose Assessment Coordinator

The Dose Assessment Coordinator has the overall responsibility for evaluation and computation of projected dose rates and doses, for areas outside of the Protected Area.

The Dose Assessment Coordinator interfaces with the EOF Operations Advisor and the Emergency RP Manager.

The following individuals report directly to the Dose Assessment Coordinator:

1. Dose Assessment Staff

The Dose Assessment Staff is responsible for evaluating plant and meteorological parameters associated with a potential or ongoing radiological release. A quantitative evaluation of the collected data is performed by the Dose Assessment Staff and the results are provided to the Dose Assessment Coordinator for review. The Dose Assessment Staff interfaces with the RMT Coordinator and Rad Data Technician.

2. Radiation Monitoring Team (RMT) Coordinator

The RMT Coordinator is responsible for coordinating the activities of the RMTs, while they are in the field. Under the direction of the Dose Assessment Coordinator, the RMT Coordinator assesses current and projected meteorological conditions and positions the RMTs to track the radiological release. Data gathered in the field by the RMTs is provided to the Dose Assessment Staff for evaluation. The RMT Coordinator coordinates radiological surveys of the owner-controlled area, contiguous to the DBAB, but outside of the Protected Area.

The RMT Coordinator interfaces with the RTL Coordinator and the Dose Assessment Staff.

Reporting to the RMT Coordinator are the Radiation Monitoring Teams.

3. Radiation Testing Lab (RTL) Coordinator

The RTL Coordinator is located in the RTL and is responsible for:

- a) Set up of contamination survey equipment at points of entry and exit to the DBAB emergency complex.
- b) Routine habitability surveys of the DBAB.
- c) Decontamination of individuals and equipment within the DBAB.
- d) Preliminary analyses of environmental samples gathered by the RMTs.

4. Radiation Monitoring Team (RMT)

Each Radiation Monitoring Team is comprised of two individuals who have been trained in radiological and environmental sampling techniques.

The RMT members are responsible for taking air, water and soil samples, performing radiation surveys, and using associated survey equipment.

d. Emergency Planning Advisor

The Emergency Planning Advisor is responsible for the coordination of the Emergency Operations Facility (EOF) physical operating requirements. The Emergency Planning Advisor assesses facility readiness, supervises offsite communication, and provides for around-the-clock staffing during extended emergency situations.

The Emergency Planning Advisor interfaces with the Emergency Facility Services Manager for the procurement of personnel and equipment.

Reporting to the Emergency Planning Advisor are the EOF Communications Staff, EOF Administrative Assistant, and the DBAB Log and Status Board Keepers (EOF).

The EOF communications staff is comprised, at a minimum, of two communicators who are responsible for communications with the Ottawa County Emergency Operations Center, the Lucas County Emergency Operations Center, the State of Ohio, and the Corporate Emergency Response Organization. The EOF Communications staff may be augmented by additional personnel to assist in communications, Nuclear Network transmissions, and operations of support equipment.

- e. **Emergency Facilities Services Manager**
1. The Emergency Facilities Services Manager is responsible for coordinating with emergency response facility management to ensure the sufficient availability of personnel to support the operations of the DBAB. This personnel pool includes:
 - a) Communicators
 - b) Logkeepers
 - c) Status Board Keepers
 - d) Clerical
 - e) Maintenance
 - f) Laborers
 2. The Emergency Facilities Services Manager is also responsible for the procurement of the following equipment in support of DBAB operations during an emergency:
 - a) Food and sleeping supplies.
 - b) Road maintenance, (e.g., snow removal).
 - c) Phone service.
 - d) Onsite transportation.
 - e) Support as requested by the Emergency Offsite Manager.
 3. The Emergency Facilities Services Manager is responsible for the communications with the Assembly Areas.

The Emergency Facilities Services Manager interfaces with the Emergency Planning Advisor and Emergency Offsite Manager.

f. **County and State Technical Liaisons**

One technical liaison is dispatched to Ottawa and Lucas County and the State Emergency Operations Center, respectively at the declaration of a Site Area Emergency. The technical liaisons provide interpretation of events that occur at the station. They report to the Emergency Offsite Manager and will communicate with station personnel to obtain information, as necessary, and report offsite activities.

5.5 **Joint Public Information Center (JPIC)**

The Emergency Public Information staff is activated by call tree notification, and operates the Joint Public Information Center (JPIC). Coordination of the JPIC is the responsibility of the JPIC Manager, who reports to the Company Spokesperson.

5.6 Corporate Emergency Response Organization (CERO)

The CERO has been established to ensure that the full capabilities and resources of the Company can be effectively utilized to respond to any postulated emergency condition at Davis-Besse. The CERO is staffed by designated personnel who coordinate and provide various technical, logistical, and liaison support services to the Emergency Director. This support could include public relations, engineering, technical assistance, security services, and procurement.

Notification and activation of the CERO will depend upon the classification of the emergency event. At the ALERT level, key CERO members are notified and provide support as necessary. At SITE AREA EMERGENCY and GENERAL EMERGENCY levels, the CERO is activated.

Coordination of the CERO is the responsibility of a senior company officer located at an unaffected FirstEnergy nuclear station. The Senior Company Officer oversees the operation of the CERO and ensures that CERO activities are carried out in a manner that supports the requests made from the Emergency Director.

5.7 Supporting Emergency Organizations

5.7.1 Letters of Agreement

Since an emergency may require augmenting the onsite ERO, it may become necessary to request and utilize assistance furnished by local personnel, organizations, and activities.

Since it is essential that support from local law enforcement agencies, fire departments, hospitals, and ambulance services be available on relatively short notice, letters of agreement have been signed with many of these personnel, organizations, agencies and support groups.

Sample letters of agreement are contained in Appendix C.

a. Medical Support Organizations and Personnel

The following medical support organizations and personnel have signed letters of agreement to furnish necessary services upon request:

1. H. B. Magruder Memorial Hospital
2. St. Charles Hospital
3. Carroll Township Emergency Medical Services
4. Fremont Memorial Hospital

b. Fire-Fighting Organizations

The Carroll Township Fire Department will provide fire fighting assistance, as requested by Davis-Besse Nuclear Power Station.

When local fire support is required within the Protected Area, local fire department personnel will function in conjunction with, and under the direction of, the DBNPS Fire Brigade.

5.7.2 Medical Emergency Response Organization

a. Medical support for the DBNPS is a three-tiered system consisting of:

1. First Aid and evaluation at the station.
2. Emergency treatment at H. B. Magruder Memorial Hospital, Port Clinton, Ohio; St. Charles Hospital, Oregon, Ohio; or Fremont Memorial Hospital, Fremont, Ohio (noncontaminated injuries may receive routine medical treatment at other area hospitals).
3. Consultative or direct medical and radiological assistance is provided by the radiological emergency assistance provider.

b. Emergency Medical Responsibilities

1. Plant Manager:

The Plant Manager is notified in all cases of serious personnel injury or illness.

2. First Aid Teams:

First Aid Teams consisting of station personnel have been established along with a continuous training program. These teams provide first aid for both radiation and nonradiation injuries in a manner outlined below:

a) Injuries Involving Radiological Complications:

- 1) Injured personnel, whose injuries are known or suspected to have been complicated by excessive internal or external exposure to radioactive materials or ionizing radiation, shall be given first aid and shall be medically evacuated to the hospital for further treatment if their injuries warrant. Decontamination and treatment of excessive dose will be rendered on a second priority basis.
- 2) First Aid Team members will work with Radiation Protection personnel to ensure radioactive contamination is removed or contained as much as possible prior to the patient's medical treatment if the injuries allow.

b) Non-Radiological Injuries:

- 1) Any injury requiring medical assistance at DBNPS shall be given first aid by the First Aid Team.
- 2) A minor injury is an injury that can be treated by the First Aid Team.
- 3) Major injuries are injuries that require offsite assistance, in addition to treatment by the first Aid Team.

3. Radiation Protection Personnel:

- a) Shall respond to injuries involving radioactive contamination and shall control radiological aspects of the scene as much as possible.
- b) Shall remove or contain the injured person's contamination as much as possible prior to medical treatment or transportation if injuries allow.
- c) Shall accompany the potentially contaminated injured person(s) to the hospital and render assistance to the attending physicians as required.
- d) Shall provide the attending physicians with prompt evaluations of the internal and/or external doses incurred by injured personnel. The services of the radiological emergency assistance provider are available for assistance in this matter.

4. Davis-Besse Security:

Shall notify the appropriate hospital as soon as it is suspected that a potentially contaminated injured person may be sent to Magruder Memorial, St. Charles, or Fremont Memorial Hospital, so that they may prepare their Radiation Emergency Area.

5. Ambulance Service:

Carroll Township Emergency Medical Services (EMS), located four (4) miles from DBNPS, has agreed to provide ambulance service to DBNPS. Backup ambulance service is provided in accordance with the Ottawa County Mutual Aid Agreement, which all EMS services in the county have signed.

All personnel involved with this service have received extensive first aid training and have been certified by the Ohio Department of Education as Emergency Medical Technicians (EMT). Periodic

training is given to the members of the Carroll Township Emergency Medical Services (EMS) and Mid-County EMS at which time discussions are held on the handling of contaminated injured personnel and standard health physics practices.

6. Radiological Emergency Assistance Provider:

In the event of radiation/medical emergencies, the Radiological Emergency Assistance Provider will provide medical assistance.

The Radiological Emergency Assistance Provider has expertise and is equipped to conduct:

- a) Medical and radiological triage
- b) Decontamination procedures and therapies for external contamination and internally deposited radionuclides
- c) Diagnostic and prognostic assessments of radiation induced injuries
- d) Radiation dose estimates by methods that include cytogenetic analysis, bioassay and invivo counting

c. Over-Exposure/Internal Contamination:

If it is known, or suspected, that an individual has been exposed in excess of the limits specified by 10 CFR 20.1201, an immediate investigation shall be conducted by Radiation Protection personnel, and such reports or notifications required by 10 CFR20 shall be submitted.

If a dose falls outside the acceptable limits of 10 CFR 20.2202(a)(1), the Plant Manager shall immediately obtain medical consultation from the radiological emergency assistance provider. The radiological emergency assistance provider, in turn, will assure that the exposed individual(s) are promptly evaluated and appropriately treated.

5.7.3 Government Agency Support

a. Agreements with Government Agencies

- 1. Discussions have been held with appropriate government agencies, which have emergency preparedness responsibilities. The responsibility for overall management of response to accidental off-site releases of radioactivity resulting from either a nuclear power plant, or a transportation accident, rests with the State of Ohio and local governments. Through the provisions of the Atomic Energy Development and Radiation Control Act, P.L. 1625 (1965), as amended, the following State agencies have prime responsibilities in matters of radiation hazards:

- a) Ohio Department of Agriculture
 - b) Ohio Department of Health
 - c) Ohio Department of Highway Safety
 - d) Ohio Department of Natural Resources
 - e) Ohio Department of Public Safety
 - f) Ohio Department of Transportation
 - g) Ohio Emergency Management Agency (OEMA)
 - h) Ohio Environmental Protection Agency
2. The Emergency Plans for DBNPS, State of Ohio, Ottawa County and Lucas County, have been formulated to provide timely notification and close coordination with these agencies.
3. In addition, arrangements have been made for timely notification of the NRC in an emergency. Emergency support will be provided by the NRC, Region III, Office of Inspection and Enforcement; and the Department of Energy, Chicago Operations Office, Radiological Assistance Program. Other arrangements include police protection, fire-fighting support, and ambulance support.
- b. Criteria for Notification of Government Agencies
1. Federal regulations require timely notification of local and state emergency response agencies. Additionally, notifications are made to the NRC and the Onsite Emergency Response Organization and other key company personnel.
- Upon declaration of an emergency, and periodically throughout the emergency, notifications are made to the following:
- a) Station Personnel
 - b) Onsite Emergency Response Personnel and other Key Company Personnel
 - c) Ottawa County Sheriff's Office or the OCEMA
 - d) Lucas County Sheriff's Office or the LCEMA
 - e) Ohio Emergency Management Agency or Ohio Highway Patrol
 - f) NRC, Emergency Incident Response Center
2. In the event of personnel injury/illness, which require transportation to an offsite medical facility, the Ottawa County Sheriff's Office will be notified so that local authorities may prepare to answer public/media inquiries.
3. Section 6.0 discusses the radiological incident notification order.
4. Notification will take place as soon as the emergency is declared. Notification will normally be in the order noted above. The Shift Manager/ Emergency Director will ensure that the Ottawa and Lucas

County Sheriff's Offices, and the State of Ohio, are notified within 15 minutes of the declaration. The NRC will be notified as soon thereafter as possible, but in no case more than one hour after declaration.

5. The Emergency Notification System (ENS) (red phone) will be used for notifying the NRC. In the event that the ENS is unavailable, the NRC commercial number will be used. If radiological concerns arise, the NRC Health Physics Network should be utilized.

c. Local Agencies

1. Ottawa County Sheriff's Office

The Ottawa County Sheriff's Office is experienced in providing area control, communications assistance, and direct handling of the local population; including evacuation, should it become necessary. The Sheriff's Office provides 24-hour radio communication coverage with the Central Alarm Station at DBNPS. Until the Ottawa County Emergency Management Agency (OCEMA) is activated, the Ottawa County Sheriff's Office is the lead Ottawa County agency contacted in the event of an emergency at DBNPS.

2. Lucas County Sheriff's Office

The Lucas County Sheriff's Office is experienced in providing area control, communications assistance, and direct handling of the local population; including evacuation, should it become necessary. Until Lucas County Emergency Management Agency (LCEMA) is activated, the Lucas County Sheriff's Office is the lead Lucas County agency contacted in the event of an emergency at the site.

d. State of Ohio Agencies

As outlined in the State of Ohio Emergency Plan, the following State Departments/Agencies are prepared for and will respond to radiological incidents involving licensed nuclear facilities:

1. Department of Public Safety will:
 - a) Act as the lead-planning agency for developing the State of Ohio Nuclear Incident Plans for Licensed Nuclear Facilities.
 - b) Determine which State agencies should perform specific tasks within their capabilities and ensure assignment of responsibility.
 - c) Coordinate preparation of annexes by other State agencies having response capability/ responsibility.

- d) Assist, if needed, in the preparation of plans by other state agencies and counties. Coordinate agreements in local plans between nuclear power utility operators and the county Radiological Emergency Response Plans for disasters as identified by the Ohio Emergency Management Agency.
 - e) Establish additional or alternate radiological field monitoring stations, as necessary for data acquisition.
 - f) Develop notification methods and procedures, which will include communication with the nuclear facility licensee.
 - g) Coordinate with adjacent states in matters pertaining to radiological emergency planning.
 - h) Instruct National Guard units located in the vicinity of the nuclear power station to prepare plans to provide access control and other general assistance with local government officials and the licensee.
 - i) Be prepared to support the evacuation process, with the assistance of the National Guard, for residents near the nuclear site unable to transport themselves.
 - j) Make provisions for the alerting of boaters on Lake Erie inside the 10-mile EPZ. In coordination with the United States Coast Guard, Ohio Department of Natural Resources and Ohio Department of Transportation make provisions to close the portion of Lake Erie inside the 10 mile EPZ when directed by Ohio EMA.
2. State Department of Agriculture shall:
- a) Plan and direct a statewide program for protection against radiological damage to animals, foodstuffs, and crops.
 - b) Coordinate with the U.S. Department of Agriculture in making estimates of crop and animal damage from radiation incidents.
 - c) Coordinate with the Department of Jobs and Family Services in matters pertaining to feeding and housing evacuees.
 - d) Control, through quarantine, isolation, or confiscation, crops and foodstuffs, on the stalk or harvested, that might be contaminated.
3. Ohio Environmental Protection Agency shall:
- a) Assist the Ohio Department of Health in establishing protective actions based on projected radiation dose levels, which might result from a nuclear incident. Due consideration will be given to protective action guidelines established by the U.S. Environmental Protection Agency.
 - b) Provide assistance to the Ohio Department of Health and Ohio Emergency Management Agency in the development of radiological emergency response plans.

- c) Cooperate with the Ohio Department of Health in recommending protective measures to mitigate the effects of a nuclear incident.
 - d) Review emergency contingency plans for all proposed and existing Licensed Nuclear Facilities with either the facility operators, or sponsors, and the U.S. Nuclear Regulatory Commission.
 - e) Ensure that an adequate supply of safe, potable water is maintained.
4. Ohio Department of Health shall:
- a) Coordinate Department of Health planning for radiation emergencies at licensed nuclear facilities.
 - b) Provide guidance and support to other State agencies and local health services with regard to the assessment of radiological hazards and protective actions.
 - c) Formulate protective action guides to be used in the assessment of radiological hazards, which would be used as the basis for protective action decisions.
 - d) Act as the chief State agency in evaluating the extent of the hazard and recommending protective actions.
 - e) Make arrangements for emergency medical supplies and health service to the affected areas.
 - f) Develop plans for:
 - 1) Relocation of hospitalized persons.
 - 2) Utilization of hospitals and other medical facilities during radiation incidents.
 - 3) Assuring environmental sanitation.
 - 4) Stockpiling and distribution of Potassium Iodide (KI)
5. Ohio Department of Highway Safety shall:
- a) Develop a system for implementing emergency traffic control measures within areas affected by radiological incidents.
 - b) The Ohio Highway Patrol shall:
 - 1) Operate the National Warning System (NAWAS) for warning and emergency communication services insofar as it relates to the State Plan.
 - 2) Obtain information about the radiological incident and resultant damage, and report it to the State Emergency Operations Center (EOC).
 - 3) Provide a mobile radiological monitoring capability, consistent with the capabilities and limitations of the equipment, which is provided.

- 4) Operate, through the statewide Law Enforcement Emergency Radio Network, a notification system for State Highway Patrol Posts to disseminate nuclear incident information to local authorities as required.

6. Ohio Department of Natural Resources shall:

- a) Maintain inventories of primary and secondary sources for water, and prescribe methods of use for such sources, in areas affected by radiological incidents.
- b) Cooperate with the Ohio Department of Human Services in providing for the use of departmental land and facilities as evacuation centers or mass care areas.
- c) Make provisions for the alerting of persons on state property (e.g., campers and vacationers) to possible radiological dangers, and provide for marine emergency access to the Lake Erie Islands, for possible evacuation in cooperation with the Ohio National Guard.
- d) Make available the departments radio communications system for use in the state Emergency Operations Center, if needed.

7. Ohio Department of Transportation (ODOT):

ODOT supports the Ottawa County Engineer's Office with traffic and perimeter control assistance, impediment removal, and evacuation route maintenance.

The Division of Aviation will provide air transportation and aerial radiological monitoring in case of an incident at a licensed facility.

e. Federal Agencies

1. Department of Energy (DOE), Chicago Operations Office, Radiological Assistance Program (RAP)

Upon notification of a hazard to public health and safety, the DOE, Chicago Operations Office, will dispatch a Radiological Assistance Program (RAP) Team to the scene to advise and assist, as necessary, and to minimize the public radiation exposure. This advice and assistance will take the form of technical advice and environmental monitoring assistance, and will support the efforts of the Ohio Emergency Management Agency.

2. U.S. Environmental Protection Agency (USEPA)

Region V, USEPA, Chicago, will provide support to the DOE, Chicago Operations Office, upon request. This support consist of qualified radiation monitoring teams.

3. Nuclear Regulatory Commission, Region III, Office of Inspection and Enforcement.

The Office of Inspection and Enforcement Region III, NRC, will dispatch personnel to the scene in the event of an emergency, and will lend support in the areas of observation and accident evaluation.

4. U.S. Coast Guard (USCG)

Upon request, the USCG will broadcast an emergency notice to mariners. In addition, the Ninth District USCG stations will provide available resources (i.e., vessels, aircraft, and personnel) to begin notifying boaters on Lake Erie.

5.7.4 Other Support Organizations

Assistance in response to an emergency is provided to DBNPS by several organizations which specialize in various areas of emergency response, or are structured to provide timely and effective mobilization of resources when the need exists. These organizations are:

a. Institute of Nuclear Power Operations (INPO)

1. One of the roles of INPO is to assist the affected utility in quickly applying resources throughout the nuclear industry to meet the needs of the emergency.
2. INPO, when notified of an emergency situation at a nuclear plant, will provide emergency response as requested. Such situations are equivalent to the ALERT, SITE AREA EMERGENCY and GENERAL EMERGENCY conditions as defined by NRC.
3. INPO is able to provide the following emergency support functions:
 - a) Assistance in locating sources of emergency manpower and equipment.
 - b) Analysis of the operational aspects of the incident.
 - c) Dissemination to member utilities, of information concerning the incident, that is applicable to their operations.

- d) Organization of industry experts who could advise the utility on technical matters.
4. To support these functions, INPO maintains the following emergency support capabilities:
- a) Twenty-four hour-a-day operation of an Emergency Response Center.
 - b) Designated INPO representative(s) who can be quickly dispatched to the utility emergency response organization to coordinate INPO support activities and information flow.
5. If requested by DBNPS, one or more suitably qualified members of the INPO technical staff will report to the Recovery Manager, and will assist his staff in coordinating INPO's response to the emergency as follows:
- a) Staff a liaison to the appropriate utility manager.
 - b) Work with the INPO Duty Person, in Atlanta, to coordinate all requests for assistance, INPO response, and related communications.
 - c) Assist the utility, as requested, in initiating and updating entries into industry information systems (such as NUCLEAR NETWORK).
 - d) Ensure that all information concerning the emergency, which is released by the INPO liaison, is properly and formally cleared through appropriate utility channels.
6. The president of INPO will direct an analysis of operational factors relating to the incident.

Onsite activities, when undertaken, will be coordinated with the onsite INPO Representative.

b. Davis-Besse's Insurance Carriers

- 1. There are three occasions that require interfacing with the insurance carriers:
 - a) Nuclear Emergencies (Alert, Site Area Emergency, General Emergency).
 - b) Fire Protection impairment.
 - c) Accidents involving damage to insured property (e.g., fire, smoke, explosion, sprinkler leakage, damage to property by vehicles, lightning, windstorm, materials handling, losses.)

2. American Nuclear Insurers (ANI) will be notified in accordance with the Emergency Plan Implementing Procedures.
 3. In the event of an extraordinary nuclear occurrence (as defined in the Price-Anderson Law), ANI has plans prepared to provide prompt emergency funding to affected members of the public.
 4. The provisions of the Price-Anderson Law facilitate providing prompt assistance to members of the public who may be adversely affected in the event of a nuclear incident at an ANI indemnified facility. This arrangement is intended to alleviate the immediate financial burden which may be incurred by members of the public due, for example, to evacuation and relocation activities initiated as a consequence of the nuclear occurrence.
 5. In providing emergency assistance to members of the public, representatives will be promptly dispatched to commence the distribution of emergency assistance funds. Such emergency assistance enables members of the public to cope with and to otherwise defray the reasonable immediate expenses incurred by a nuclear occurrence.
 6. Nuclear Electric Insurance Limited is the Station's property damage carrier and is notified of situations requiring their attention by appropriate Station procedures.
- c. Nuclear Steam Supply System (NSSS) Vendor and Architect/Engineer Support

The NSSS vendor for the Davis-Besse plant was the Babcock and Wilcox (B&W) Company. Babcock & Wilcox later became B&W Nuclear Technology (BWNT) and is currently known as Framatome Technologies Inc. (FTI). The Architect/ Engineer (A/E) for construction of the Davis-Besse plant was the Bechtel Power Corporation.

These two firms can be called on during emergency situations to provide the technical analysis and engineering support necessary to mitigate abnormal plant conditions.

d. **Bordering Counties and Contiguous States**

Davis-Besse notifies Ottawa and Lucas Counties, and the Ohio Emergency Management Agency.

Ottawa County, in turn, notifies Sandusky County, Ohio; and Erie County, Ohio; of the emergency.

The Ohio Emergency Management Agency notifies the State of Michigan of emergencies at Davis-Besse.

TABLE 5-1

MANPOWER, LOCATION, AND RESPONSE CONSIDERATIONS FOR EMERGENCIES

UNUSUAL EVENT		ALERT	
PERSONNEL	TIME	PERSONNEL	TIME
CONTROL ROOM		CONTROL ROOM	
Shift Manager (ED) (1)	Immediately	Shift Manager (ED) (1)	Immediately
Unit/Field Supervisor (1)		Unit/Field Supervisor (1)	
Control Room Operator (2)		Control Room Operator (2)	
Shift Engineer (Shift Technical Advisor) (1)*		Shift Engineer (Shift Technical Advisor) (1)*	
Non-Licensed Operators (2)		Non-Licensed Operators (2)	
Emergency Assistant Plant Manager (1)	Alerted	Emergency Assistant Plant Manager (1)	Normal Hours: 30 minutes Off Hours: 60 minutes
OPERATIONS SUPPORT CENTER		OPERATIONS SUPPORT CENTER	
First Aid (1)	As Required: Immediately	First Aid (1)	As Required: Immediately
Fire Brigade (5)		Fire Brigade (5)	
RP Technician (1)		RP Technician (1)	
Chemistry Technician (1)		Chemistry Technician (1)	
OSC Manager (1)	Alerted	OSC Manager (1)	Normal Hours: 30 minutes Off Hours: 60 minutes
OSC RP Coordinator (1)		OSC RP Coordinator (1)	
		Mechanical Maintenance (2)	
		Instrument & controls (2)	
		Electrical Maintenance (2)	
		RP Technician (1) (2)	
		Chemistry Technician (0) (1)	
	RP Technician (3) (5)	1-2 hours	
	Chemistry Technician (1) (2)		
TECHNICAL SUPPORT CENTER		TECHNICAL SUPPORT CENTER	
TSC Engineering Manager (1)	Alerted	TSC Engineering Manager (1)	As Required: Normal Hours: 30 minutes Off Hours: 60 minutes
		Core/Thermal Hydraulic Engineer (1)	
		TSC I&C Engineer (1)	
		TSC Electrical Engineer (1)	
	TSC Mechanical Engineer (1)	1-2 hours	
	Other NRC Personnel	Variable	
EMERGENCY OPERATIONS FACILITY		EMERGENCY OPERATIONS FACILITY	
Emergency Director (1)	Alerted	Emergency Offsite Manager (1)	As Required: Normal Hours: 30 minutes Off Hours: 60 minutes
Emergency Offsite Manager (1)		Dose Assessment Coordinator (1)	
		RMTs (3)	
		Emergency Planning Advisor (1)	
		Emergency Director (1)	
	NRC Liaison (1)	1-2 hours	
	State/County Communicator (1)		

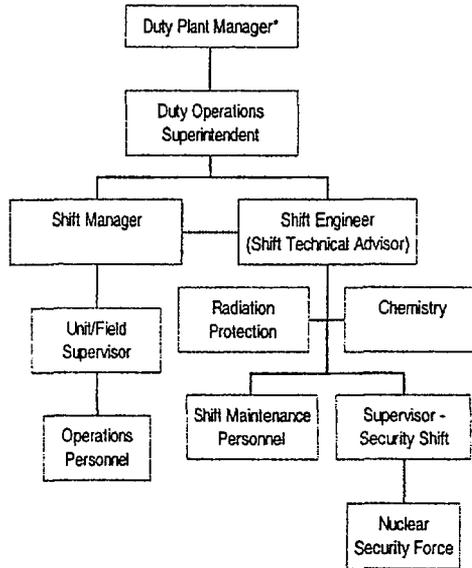
NOTE: All time requirements are based on optimum response conditions.

* This position may be filled by a shift SRO assigned another function.

FIGURE 5-1

ONSHIFT EMERGENCY ORGANIZATION

Page 1 of 1



*This position may be filled by an onshift SRO assigned another function.

FIGURE 5-2

ONSITE EMERGENCY ORGANIZATION Page 1 of 10

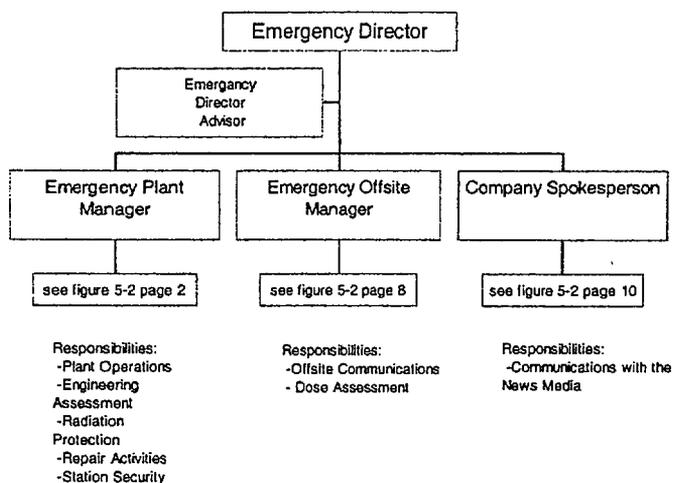


FIGURE 5-2

ONSITE EMERGENCY ORGANIZATION

Page 2 of 10

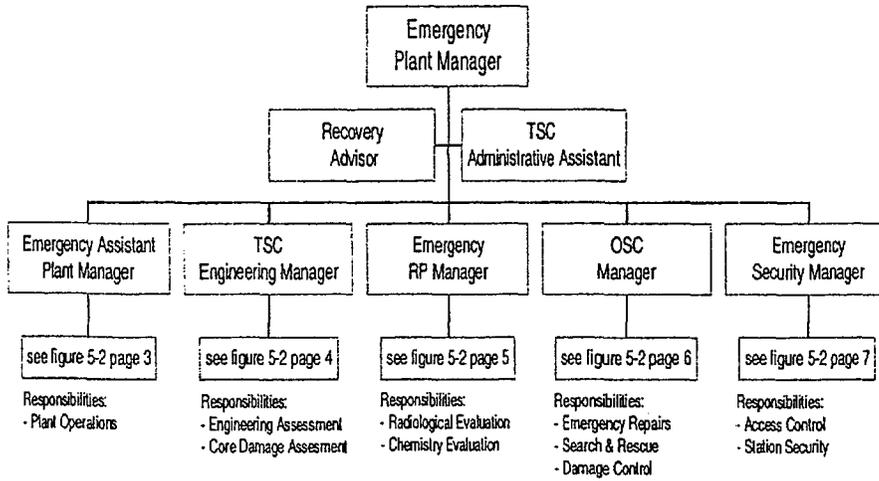


FIGURE 5-2

ONSITE EMERGENCY ORGANIZATION

Page 3 of 10

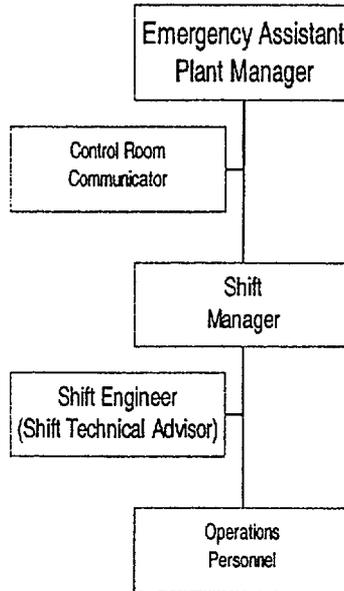


FIGURE 5-2

ONSITE EMERGENCY ORGANIZATION

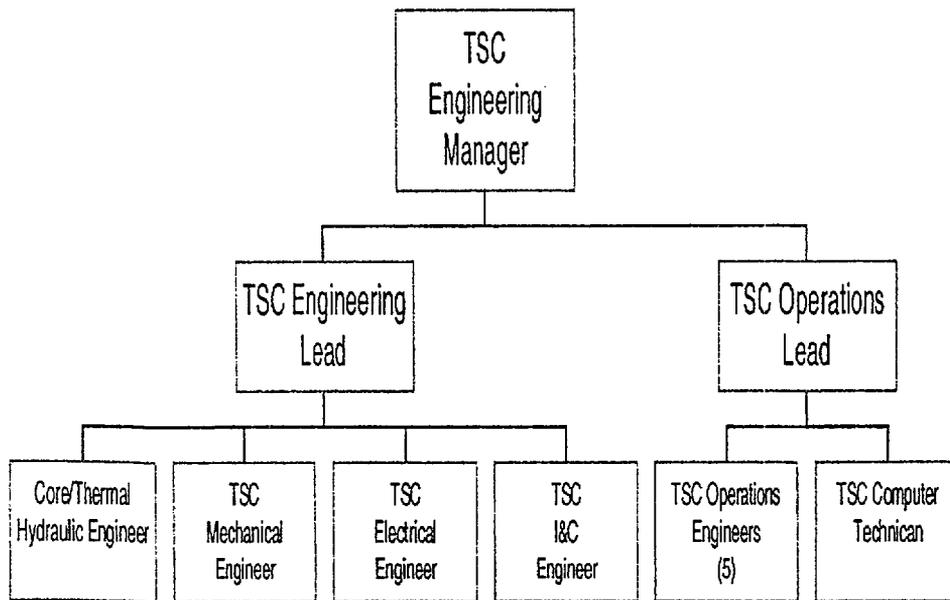


FIGURE 5-2

ONSITE EMERGENCY ORGANIZATION Page 5 of 10

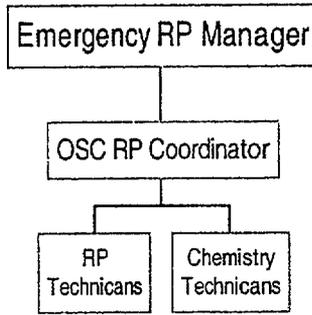


FIGURE 5-2

ONSITE EMERGENCY ORGANIZATION

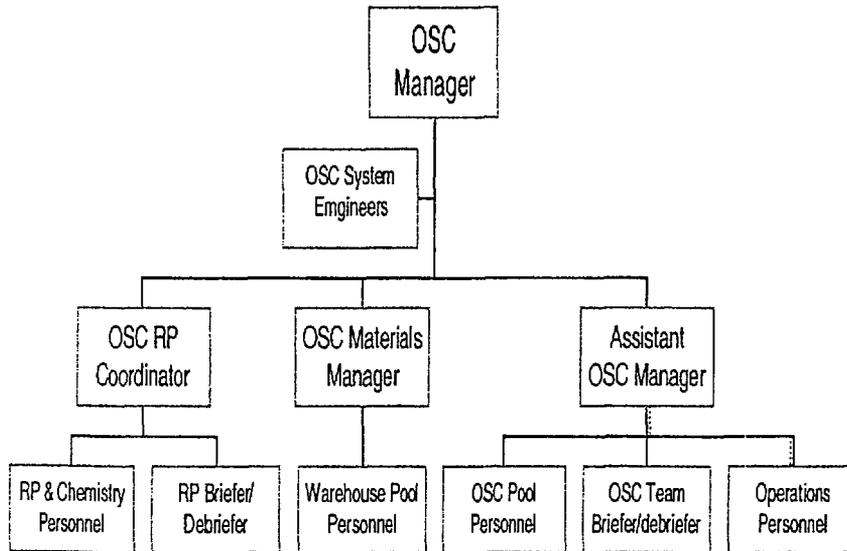


FIGURE 5-2

ONSITE EMERGENCY ORGANIZATION

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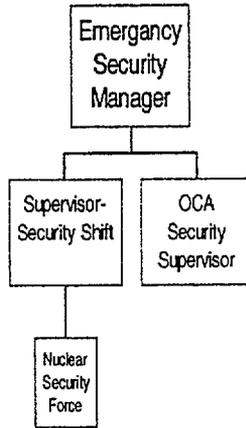


FIGURE 5-2

ONSITE EMERGENCY ORGANIZATION

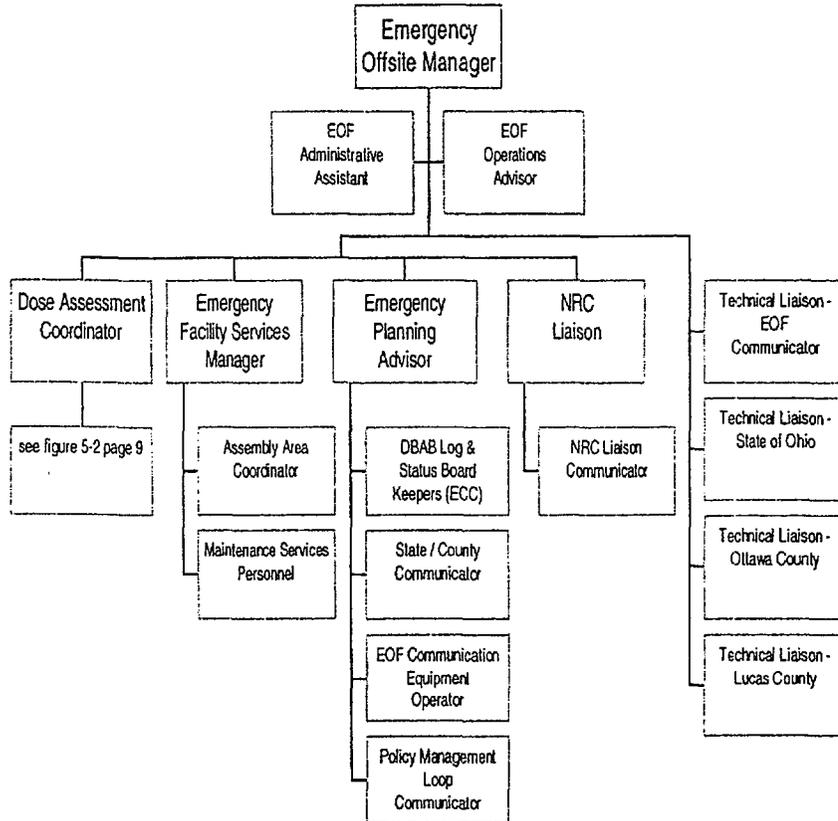


FIGURE 5-2

ONSITE EMERGENCY ORGANIZATION

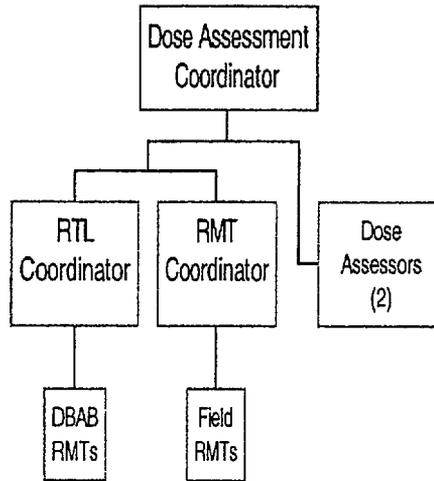
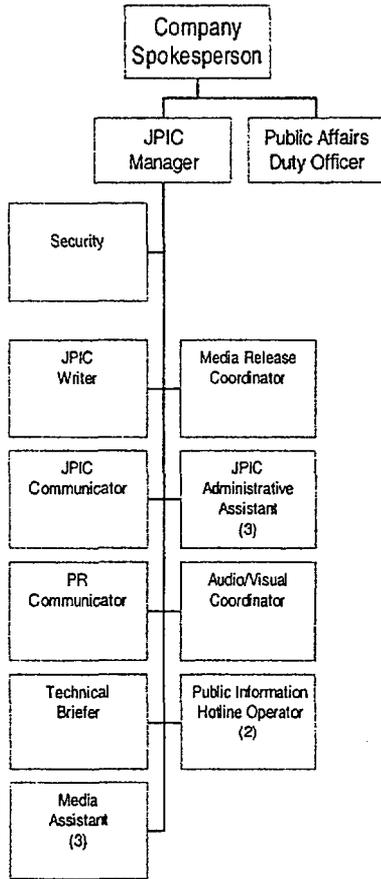


FIGURE 5-2

ONSITE EMERGENCY ORGANIZATION



6.0 EMERGENCY MEASURES

This section identifies the specific measures that are taken for each class of emergency defined in Section 4.0, "Emergency Conditions", of this Plan. The logic presented in this section is the basis for detailed Emergency Plan Procedures which define the emergency actions to be taken for each emergency category. Emergency measures begin with the following:

- a. The recognition and declaration of an emergency.
- b. Notification of the applicable agencies for each emergency classification.
- c. Mobilization of the appropriate portions of the emergency response organization.

Emergency measures can be classified as falling into one of the following categories:

- a. Assessment Actions
- b. Corrective Actions
- c. Protective Actions

Figure 6-1 is a summary of typical emergency measures, which may be appropriate for each classification of emergency. Figure 6-2 indicates the groups and organizations that will be notified at each emergency classification.

6.1 ACTIVATION OF THE EMERGENCY RESPONSE ORGANIZATIONS

If conditions at Davis-Besse meet or exceed a predetermined value or condition specified as an EAL in the emergency classification procedure, the provisions of this plan, and those of the specific procedures shall be implemented.

Specific emergency action levels for each emergency category are defined in Section 4.0. The Shift Manager, acting as Emergency Director, will implement this plan by initially classifying the emergency and ensuring that required notifications are made. Notification will be made to the counties, state, and NRC; the Plant Manager, the Manager of Operations, and the Emergency Director, or their designated alternates. The Emergency Assistant Plant Manager, working closely with the Shift Manager, will continually assess the emergency to verify that the most appropriate classification is made.

Depending on the level of the emergency and its severity, portions or all of the onsite and offsite EROs and the CERO will be mobilized as detailed below:

6.1.1 Shift Manager/Control Room Operations

- a. Should emergency conditions arise, it is expected that the Control Room Operator(s) and/or the Shift Manager will be made aware of the situation by alarms, instrument readings, reports, etc. The Control Room Operator(s) will ensure that the Shift Manager is immediately informed of the situation. The Shift Manager will direct the Control Room staff to inform the Emergency Director and Station Management immediately.

- b. The Shift Manager, when informed of an emergency situation, is responsible for assessing the emergency (e.g., plant systems and reactor core status, radiological conditions, etc.) in the following manner:
1. Determine the immediate actions to be taken (e.g., use of Abnormal Procedures and the Emergency Operating Procedure) to ensure the safe and proper operation of the plant. The Shift Engineer acting as Shift Technical Advisor (STA) will advise and assist the Shift Manager on matters pertaining to the safety and proper operation of the plant, with regards to nuclear safety.
 2. If the situation requires implementation of the DBNPS Emergency Plan, the Emergency Director will:
 - a) Classify the emergency. Classification of emergencies is a non-delegable responsibility of the Emergency Director.
 - b) Ensure that the appropriate alarm (Fire, Access Evacuation, or Initiate Emergency Procedures) is sounded.
 - c) Announce the location, type and classification of the emergency on the station public address system (twice).
 - d) Implement the applicable Emergency Plan Procedure.
 - e) Notify the following personnel and organizations of the emergency conditions:
 - 1) Nuclear Security Supervision.
 - 2) Station Management.
 - 3) Ottawa County Sheriff/EMA (within 15 minutes).
 - 4) Lucas County Sheriff/EMA (within 15 minutes).
 - 5) Ohio State Highway Patrol/EMA (within 15 minutes).
 - 6) Key Emergency Response Personnel.
 - 7) NRC, Emergency Operations Center, Bethesda, Maryland (within one hour).
 - f) Provide periodic follow-up notifications.
 - g) Recommend protective actions for public protection, as needed. Recommending public protective actions is a non-delegable responsibility of the Emergency Director.
 3. Due to the numerous responsibilities assigned to the Shift Manager at the onset of an emergency, he will perform the following actions in their listed priority.
 - a) Ensure the safe operation of the plant.
 - b) Ensure that immediate notification requirements are met.
 - c) Dispatch, in the event of radiological emergencies, Radiation Protection (RP) personnel to appropriate locations within the protected area.
 - d) Perform additional emergency actions as time and conditions permit.

6.1.2 Emergency Director

The designated Emergency Director, upon being informed that an emergency exists and has been declared by the Emergency Director on-shift will:

- a. Review information, data, and methods used by the on-shift Emergency Director (Shift Manager) in making the emergency classification. The Emergency Director may NOT delegate the responsibility of classifying emergencies.
- b. Determine, to what extent the Emergency Response Organization (ERO) will be activated, using the following guidelines:
 1. For an UNUSUAL EVENT, key individuals in the ERO will be alerted or mobilized at the discretion of the Emergency Director.
 2. For an ALERT, all of the ERO will be activated. Key individuals in the CERO will be alerted.
 3. For a SITE AREA EMERGENCY or GENERAL EMERGENCY, the entire ERO, and the CERO will be activated.
- c. Ensure that the Emergency Response Organizations have been activated as indicated above. (If not already performed by Control Room staff.)
- d. Report to the TSC/EOF and relieve the Emergency Director.
- e. Ensure that the Periodic Update Form, as provided in the Emergency Plan Procedures, is completed and supplied to the state and county Emergency Management Agencies. Protective action recommendations, for the Plume Exposure EPZ, is a non-delegable responsibility of the Emergency Director.
- f. Ensure that dose rate calculations, in accordance with the Emergency Plan Procedures, are performed periodically. A total population dose estimation may also be performed.

6.1.3 Ottawa and Lucas County Sheriffs' Offices

Dispatchers at the Sheriffs' Office for both counties, will notify key county officials and organizations, according to established procedures.

6.1.4 Ottawa County and Lucas County Emergency Management Agency Directors

The County EMA Directors will ensure that their county EROs are activated when necessary, and will notify municipalities near DBNPS.

6.1.5 Ohio Emergency Management Agency (OEMA)

The OEMA will ensure that applicable state agencies and organizations are notified and will ensure the State Emergency Operations Center is activated when necessary. Additional state agencies are contacted depending on the severity of the emergency classifications. These notifications are made in accordance with the State of Ohio emergency plan.

The OEMA will have Radiological Monitoring Teams and an accident assessment team respond to an emergency at DBNPS. The accident assessment team will set up an operations center at the local governmental Emergency Operations Center. Using estimates from utility and offsite monitoring teams; and local governmental official's input, the accident assessment team will perform independent accident assessment activities to determine:

- a. Protective measures including evacuation.
- b. Actions to control exposure to radioactivity.
- c. What further sampling of milk, food chain, water and air will be required.

If deemed appropriate, the accident assessment team will request assistance from responding federal agencies in accordance with the State of Ohio emergency plan.

6.1.6 Federal Agencies (Other than NRC)

The NRC, as the cognizant federal agency, will request assistance from other federal agencies when and if deemed appropriate.

Station management may also request assistance and/or information from federal agencies (other than the Department of Energy Radiological Assistance Program) as appropriate to the circumstances.

State organizations and agencies may consult with their federal counterparts if appropriate.

If required, the Department of Energy Radiological Assistance Program teams can be expected to begin arriving at the site in 4 to 6 hours following notification. The first teams to arrive will have some survey instruments and air samplers. A mobile environmental monitoring lab can be expected to arrive at the site in 6 to 8 hours. Appendix B contains a more detailed description of the DOE monitoring teams, support provided and the equipment available.

6.1.7 Ohio Department of Health

The Ohio Department of Health, Radiological Health Unit, maintains a communications link with the U.S. NRC, Region III Office, from which assistance and support may be requested.

6.2 ASSESSMENT ACTIONS

Effective coordination and direction of all elements of the emergency organization requires continuing accident assessment throughout an emergency situation. Each emergency class invokes similar assessment methods; however each classification imposes a different magnitude of assessment effort. In the following sections, assessment actions taken for each emergency classification are outlined.

6.2.1 Assessment Actions for an UNUSUAL EVENT

The declaration of an UNUSUAL EVENT arises when a specific Emergency Action Level for this classification has been met.

Recognition of the need to declare the event will result from alarms, instrument readings, severe weather warnings, operating experience, or any combination thereof.

Continuing assessment actions to be performed for this category of emergency will be in accordance with the Emergency Plan Procedures and consist of the normal monitoring of Control Room and plant instrumentation and status, until the situation is resolved. Tornado and severe weather assessment actions consist of keeping in contact with the system dispatcher and the appropriate public authorities. If a fire prompted the declaration of an UNUSUAL EVENT, the Fire Brigade Captain will go to the fire location, make continuing assessments, and report to the Shift Manager on whether offsite fire fighting support is required.

6.2.2 Assessment Actions for an ALERT

Once an incident has been classified as an ALERT, assessment actions will be performed in accordance with the Emergency Plan Procedure for an ALERT. These actions include:

- a. Increased surveillance of in-plant instrumentation.
- b. If possible, the dispatching of shift personnel to the identified problem area to confirm and visually assess the problem.
- c. The dispatching of personnel to monitor for possible releases, and to confirm the correct classification.
- d. If a radiological incident is occurring, surveillance of the in-plant instrumentation necessary to obtain meteorological and radiological data required for calculating or estimating projected doses. Dose assessment activity will continue until termination of the emergency, so that assessment updates may be provided to all concerned offsite agencies and to the Emergency Director. Emergency Plan Procedures are provided to allow a rapid, consistent projection of dose.

6.2.3 Assessment Actions for a SITE AREA EMERGENCY

Assessment actions for the SITE AREA EMERGENCY category are similar to the actions for an ALERT. However, due to the increased potential for a possible release, assessment activity of greater scope will occur. The personnel necessary for this assessment effort will be provided by mobilization of the onsite and offsite EROs.

These actions include:

- a. An increased amount of plant instrumentation will be monitored. (In particular, indications of core status, e.g., incore thermocouple readings, etc.)
- b. Radiation monitoring efforts will be greatly increased. Radiation Monitoring Teams will be available for immediate dispatch. Beta-gamma field measurements may be performed; air sampling, environmental thermoluminescent dosimeter (TLD) change out, and collection of environmental media for assessment of material transport and deposition will be performed as necessary.
- c. Dose assessment activities will be performed more frequently, with an increased emphasis on dose projection for use as a factor in determining necessary protective actions. Radiological and meteorological instrumentation readings will be used to project the dose rate at predetermined distances from the station, and to the potential integrated dose.

In reporting the dose projections to the Emergency Director or to offsite agencies, the dose rate, dose, and basis for the time used for the dose estimate will always be provided. Confirmation of dose rates by RMTs will be reflected in reports and/or revised dose estimate information provided to offsite agencies.

All dose projections will be performed in accordance with the Emergency Plan Procedures which incorporate recommendations found in EPA-400-R-92-001 Manual of Protective Action Guides and Protective Actions for Nuclear Incidents. Reports to offsite authorities will include the relationship of dose to these guidelines. Emergency Plan Procedures are provided for recording pertinent information.

6.2.4 Assessment Actions for a GENERAL EMERGENCY

Assessment actions for the GENERAL EMERGENCY category are the same as for the SITE AREA EMERGENCY, with some possible increase in the scope of dose assessment/projection activities. Additionally, since projected doses are likely to be much closer to EPA Protective Action Guidelines (PAGs), greater emphasis will be placed on the assessment of release duration. Judgments and assumptions used for dose assessment will be documented.

6.3 CORRECTIVE ACTIONS

Detailed operating procedures are available for use during emergencies, as well as during normal operations. Specific Emergency Operating Procedures and Abnormal Procedures are provided to assist the operators in placing the plant in a safe condition, and taking necessary supplemental corrective actions. In addition, operations personnel are trained in the operation of the plant systems and their associated procedures, and are therefore capable of taking appropriate corrective actions based on their training, knowledge, and experience.

Selected DBNPS Staff personnel, including Operations, Radiation Protection, Chemistry, and Maintenance personnel are trained and assigned to emergency teams. These teams are capable of responding to situations as set forth in the Emergency Plan Procedures, to assess conditions and take appropriate corrective actions. Maintenance personnel will provide the necessary expertise to effect damage control and repair activities.

Corrective actions will normally be planned events that are taken to gain control of, or terminate the emergency situation. Planned radioactive releases, or corrective actions that may result in a radioactive release will be evaluated by the Emergency Director and staff as far in advance of the event as is possible. Such events and data pertaining to the release, will be reported to the appropriate offsite organizations and/or agencies. DBNPS recommendations to authorities regarding the Plume Exposure EPZ are the non-delegable responsibility of the Emergency Director.

6.4 PROTECTIVE ACTIONS

Protective actions are emergency measures taken during or after an emergency situation to minimize or eliminate the hazard to the health and safety of the general public and/or station personnel. Such actions taken onsite are the responsibility of Company management, while those taken offsite fall under the jurisdiction of the State of Ohio and other offsite response agencies. All visitors to the Protected Area will be either escorted by an employee or receive training on actions required by them during an emergency.

6.4.1 Protective Cover, Evacuation, Personnel Accountability

During an emergency, sheltering or evacuation of personnel may be required to prevent or minimize exposure to radiation and radioactive materials. The following sub-sections present information on policies concerning such situations. Figure 6-3 illustrates the routes to be taken from the site if evacuation becomes necessary.

a. Plant Site (within the protected area):

All personnel within the site protected area at the time of the declaration of an emergency, will be notified of the emergency by audible or visual alarms and verbal announcement over the public address system (Gai-Tronics). Personnel may be instructed to report to assembly areas. Personnel will be trained as to the location of assembly areas and the suggested routes to each. Visitors will assemble with their escorts, or be escorted offsite. At the assembly areas, members of the emergency organization will conduct personnel assembly and evacuation (if required).

Accountability within the protected area is coordinated by the OSC Manager and Security. The goal for completion of personnel accountability is 30 minutes. Results are forwarded to the Emergency Director. Once established, accountability within the protected area will be maintained throughout the course of the event. Specific guidance for performing accountability can be found in the Emergency Plan Procedures. Search for and rescue of missing persons will be performed in accordance with Emergency Plan Procedures.

Sheltering at onsite locations will be ordered when the projected dose would be less than or equal to that received during evacuation. For essential personnel who must remain within the protected area following an evacuation (e.g., Operations and Security personnel), particular attention will be paid to their radiation dose for ALARA purposes.

If a localized emergency exists, evacuation of the affected facility or area can be performed. Access to this area should then be restricted. The Protected Area will be evacuated if a SITE AREA EMERGENCY has been declared or if, at the discretion of the Emergency Director/Shift Manager, a personnel hazard exists. Nonessential personnel shall be evacuated from the site if a GENERAL EMERGENCY has been declared, or if, at the discretion of the Emergency Director/Shift Manager, site evacuation is warranted for personnel safety reasons. Access control will be established by Security to prohibit the entry of unauthorized personnel to the protected area.

Personal vehicles will be used for site evacuation. Nonessential personnel may be evacuated to the designated offsite assembly area; the Lindsey Service Center, or other company facilities as appropriate. Personnel and vehicles will be monitored for contamination at the offsite assembly area, if necessary, prior to release.

b. Plant Site (Outside the Protected Area):

All personnel onsite, but outside the protected area will be notified, at the declaration of an emergency, of conditions that may affect them. Personnel outside of the range of the Gai-Tronics system will be notified via bullhorn. Additionally, site personnel who are assigned pagers will automatically receive notification of the emergency condition. Personnel may be instructed to report to the nearest assembly area as described below. At other site locations (i.e., DBTC, DBAB, DBABA, Warehouse, PPF), key personnel have been delegated responsibility for receiving emergency information and disseminating such information to personnel in these areas. If assembly becomes necessary, Assembly Area Coordinators will perform these functions and report the results to the Emergency Director.

c. Offsite Areas:

Responsibility for implementing actions to protect personnel in offsite areas rests with State and local officials, and is described in detail in the The Ohio Plan for Response to Radiation Emergencies at Licensed Power Facilities (under a separate cover), and is implemented in conjunction with The Ottawa County Plan for Response to Radiation Emergencies at Licensed Nuclear Facilities, and The Lucas County Radiological Emergency Response Plan (under separate covers).

Davis-Besse, through the Emergency Director, shall make protective action recommendations to state and local authorities, based on the emergency conditions. Table 6-1 summarizes typical protective action recommendations for the general public and emergency workers. Tables 6-2, 6-3, 6-4, and 6-5 provide guidelines for the expected local protection against direct and inhalation exposure afforded by structures.

The means to warn or advise persons involved in taking protective actions is the responsibility of the Ottawa County EMA Director, Lucas County EMA Director, and the Ottawa and Lucas County emergency organizations. These counties are responsible for the preparation and dissemination of public information material related to implementation of protective actions for the general public. The Ottawa County Sheriff's Office and Lucas County Sheriff's Office will authorize the broadcast of appropriate Emergency Alert System messages to the public, when necessary. The general content of these messages is contained in the Ottawa County Plan, the Lucas County Plan, and the State of Ohio Plan.

6.4.2 Use of Onsite Protective Equipment and Supplies

The following onsite locations have been designated for assembly and dispatch of emergency teams:

- a. Operations Support Center
- b. Radiological Testing Laboratory.

The exact location, type, and quantity of emergency equipment and supplies is specified in the Emergency Plan Procedures.

6.4.3 Contamination Control Measures

a. Station Area:

Access to the owner-controlled area will be limited. Contamination control within the station shall be exercised in accordance with approved Radiation Protection procedures.

b. Offsite Areas:

It is the responsibility of the State Department of Agriculture, in conjunction with the Department of Health and the Ohio Environmental Protection Agency, to issue guidance and coordinate actions to control the use and transport of contaminated agricultural products.

6.4.4 Ingestion Pathway Control Measures

The Ingestion Pathway EPZ (50-mile radius) has been established to address the additional concern for ingestion of contamination. There are two levels at which protective actions may be recommended by the State (i.e., preventive and emergency levels) for food and water contamination. Suggested action levels for ground, food, and water contamination are given in Table 6-6.

6.5 AID TO AFFECTED PERSONNEL

6.5.1 Emergency Personnel Exposure

Under emergency conditions, it may not be possible to perform corrective/protective actions, while maintaining exposure (i.e., radiation doses) below limits specified in 10CFR20. Saving a life, measures to circumvent substantial doses to population groups, or preservation of safety related equipment, may be sufficient cause for above normal doses.

The following are the exposure limits based on EPA-400-R-92-001 guidance for these emergency activities:

a. Corrective/protective actions:

Limit doses to the following when protecting valuable property and lower doses are not practicable:

1. 10,000 mrem Total Effective Dose Equivalent (TEDE)
2. 30,000 mrem Lens Dose Equivalent (LDE)
3. 100,000 mrem:
 - Total Organ Dose Equivalent (TODE)
 - Shallow Dose Equivalent (SDE) to the skin of the whole body or to any extremity

b. Lifesaving actions:

Limit doses to the following when protecting large populations or performing life saving activities and lower doses are not practicable:

1. 25,000 mrem TEDE
 2. 75,000 mrem LDE
 3. 250,000 mrem
- Total Organ Dose Equivalent (TODE)
 - Shallow Dose Equivalent (SDE) to the skin of the whole body or to any extremity

The Emergency Director has the authority to permit the above exposures in excess of the 10 CFR 20 occupational dose limits. This responsibility may be delegated to the Emergency Plant Manager.

Personnel involved in any of the above actions must be volunteers, and cognizant of the effects of such doses.

Emergency worker dose records shall be maintained in accordance with Davis-Besse RP Procedures.

Although doses in excess of the normal legal limits may be authorized, the Emergency Director will ensure that all doses are kept ALARA.

6.5.2 Thyroid Blocking

A ready supply of suitable thyroid blocking agent is maintained and available for use by emergency workers. Guidance for administration of the blocking agent will be provided by medical advisors, and is specified in emergency plan procedures.

The Emergency Director or, when designated, the Emergency Plant Manager shall authorize the use of the thyroid blocking agent, e.g., potassium iodide (KI).

The State of Ohio has elected to distribute and stockpile potassium iodide (KI) for the general public. At a General Emergency the Ohio Department of Health in coordination with the local Health Departments may elect to recommend that the general public take potassium iodide.

6.5.3 Decontamination and First Aid

Decontamination materials, including specialized equipment and supplies are available in station decontamination areas. Portable instruments for personnel monitoring and portal monitors are available at the RRA entrance. Decontamination showers and sinks, both of which drain to the radwaste system, are also located in the Decontamination Area.

Action levels for determining the need for decontamination of personnel and equipment are specified in the Davis-Besse RP Procedures.

Personnel found to be contaminated will be decontaminated by Radiation Protection personnel (or other qualified personnel, as specified in RP Procedures). It is preferred that personnel decontamination be performed by trained RP personnel.

Measures shall be taken to prevent the spread of contamination. Such measures may include isolating the affected areas, placing contaminated personnel in "clean" clothing before moving them, and decontaminating affected personnel, their clothing, and equipment prior to release.

Emergency first aid and medical treatment will be given to injured personnel who are contaminated. Station personnel trained in first aid are available onsite, on a 24-hour basis, and will assist injured personnel. Provisions have been made to ensure contaminated and injured personnel receive specialized medical treatment, if necessary. H. B. Magruder Memorial Hospital, Fremont Memorial Hospital, and St. Charles Mercy Hospital have agreed to accept contaminated patients for emergency medical and surgical treatment. If affected personnel must be transported, measures will be taken to limit the spread of contamination.

Any contaminated patient moved to an offsite facility will be accompanied by a member of the RP staff. If during the same incident, more than one victim is involved, the first victim will be accompanied by a member of the RP staff who will remain at the receiving facility during transport of the remaining patients. If more than one offsite facility is involved, then a member of the RP staff shall be present at each offsite facility. If necessary, a physician may be requested to provide onsite medical assistance.

6.5.4 Medical Transportation

Ambulance service for Davis-Besse is provided for by a letter of agreement with Carroll Township Emergency Medical Service.

6.5.5 Medical Treatment

Arrangements for hospital and medical services for injured and/or contaminated/over-exposed personnel are provided for by letters of agreement with the H. B. Magruder Memorial Hospital; Fremont Memorial Hospital; St. Charles Mercy Hospital.

The services of the radiological emergency assistance provider assures personnel providing services are prepared and qualified to handle radiological emergencies.

TABLE 6-1
PAGs for the Early Phase of a Nuclear Incident

Protective Action	PAG (Projected Dose)	Comments
Evacuation (or sheltering ¹)	1-5 rem ²	Evacuation (or for some situations, sheltering ¹) should normally be initiated at 1 rem.
Administration of stable iodine	25 rem ³	Requires approval of State medical officials

¹Sheltering may be the preferred protective action when it will provide protection equal to or greater than evacuation, based on consideration of factors such as source term characteristics, and temporal or other site-specific conditions.

²The sum of the effective dose equivalent resulting from exposure to external sources and the committed effective dose equivalent incurred from all significant inhalation pathways during the early phase. Committed dose equivalent to the thyroid and to the skin may be 5 and 50 times larger, respectively.

³Committed dose equivalent to the thyroid from radioiodine.

Guidance on Dose Limits for Workers Performing Emergency Services

Dose Limit ¹ (rem)	Activity	Condition
5	all	
10	protecting valuable property	lower dose not practicable
25	life saving or protection of large populations	lower dose not practicable
>25	life saving or protection of large populations	only on a voluntary basis to persons fully aware of the risks involved

¹Sum or external effective dose equivalent and committed effective dose equivalent to nonpregnant adults from exposure and intake during an emergency situation. Workers performing services during emergencies should limit dose to the lens of the eye to three times the listed value and doses to any other organ (including skin and body extremities) to ten times the listed value. These limits apply to all doses from an incident, except those received in unrestricted areas as members of the public during the intermediate phase of the incident.

Reference: Manual of Protective Action Guides and Protective Actions for Nuclear Incidents. (EPA-400-R-92-001) U.S. Environmental Protection Agency, Washington, D.C., May 1992.

TABLE 6-2**RECOMMENDED PROTECTIVE ACTIONS**

Accident Phase	Exposure Pathway	Examples Of Actions To Be Recommended
Emergency Phase ¹ (0 to 4 hours)	Inhalation of gases, radio-iodine, or particulate	Evacuation, shelter, access control, respiratory protection, prophylaxis (thyroid protection)
	Direct whole body dose	Evacuation, shelter, access control
INTERMEDIATE PHASE ² (4 to 48 hours)	Ingestion of milk	Take cows off pasture, prevent cows from drinking surface water, discard contaminated milk, or divert to stored products such as cheese
	Ingestion of fruits and vegetables	Wash all produce, or impound produce, delay harvest until approved, substitute uncontaminated produce
	Ingestion of water	Cut off contaminated supplies, substitute from other sources, filter, demineralize
LONG TERM PHASE ³ (2 to 14 days)	Whole body exposure and inhalation	Relocation, decontamination, access control
	Ingestion of food and water contaminated from the soil either by resuspension or uptake through roots	Decontamination, condemnation, or destruction of food; deep plowing, condemnation, or alternate use of land
	Whole body exposure from deposition material or inhalation of resuspended material.	Relocation, access control, decontamination, fixing of contamination, deep plowing

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

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

³Long Term Phase - Recovery period.

TABLE 6-3**REPRESENTATIVE SHIELDING FACTORS FROM GAMMA CLOUD SOURCE**

Structure or Location	Shielding ¹ Factor	Representative Range
Outside	1.0	--
Vehicles	1.0	--
Wood-frame house ² (no basement)	0.9	--
Basement of wood house	0.6	0.1 to 0.7 ³
Masonry House (no basement)	0.6	0.4 to 0.7 ³
Basement of masonry house	0.4	0.1 to 0.5 ³
Large office or industrial building	0.2	0.1 to 0.3 ^{3,4}

¹The ratio of the dose received inside the structure to the dose that would be received outside the structure.

²A wood frame house with brick or stone veneer is approximately equivalent to a masonry house for shielding purposes.

³This range is mainly due to different wall materials and different geometries.

⁴The shielding factor depends on where the personnel are located within the building (e.g., the basement or an inside room).

Reference: Aldrich, D.C., D.M. Ericson, Jr., and T. D. Johnson. Public Protection Strategies for Potential Nuclear Reactor Accidents: Sheltering Concepts with Existing Public and Private Structures. Sandia Laboratories Report SAND 77-1725 (February 1978).

TABLE 6-4**SELECTED SHIELDING FACTORS FOR AIRBORNE RADIONUCLIDES**

Wood house, no basement	0.9
Wood house, basement	0.6
Brick house, no basement	0.6
Brick house, basement	0.4
Large office or industrial building	0.2
Outside	1.0

Reference: Aldrich, D.C., D.M. Ericson, Jr., and T. D. Johnson. Public Protection Strategies for Potential Nuclear Reactor Accidents: Sheltering Concepts with Existing Public and Private Structures. Sandia Laboratories Report SAND 77-1725 (February 1978).

TABLE 6-5
**REPRESENTATIVE SHIELDING FACTORS FOR SURFACE DEPOSITED
RADIONUCLIDES**

Structure or Location	Representative ¹ Shielding Factor	Representative Range
1 m above an infinite smooth surface	1.00	—
1 m above ordinary ground	0.70	0.47-0.85
1 m above center of 50-ft roadways, 50% decontaminated	0.55	0.4-0.6
Cars on 50-ft road:		
Road fully contaminated	0.50	0.4-0.7
Road 50% decontaminated	0.50	0.4-0.6
Road fully decontaminated	0.25	0.2-0.5
Trains	0.40	0.3-0.5
One and two-story wood-frame house (no basement)	0.4 ²	0.2-0.5
One and two-story block and brick house (no basement)	0.2 ²	0.04-0.40
House basement, one or two walls fully exposed	0.1 ²	0.03-0.15
One story, less than 2 ft of basement, walls exposed	0.05 ²	0.03-0.07
Two stories, less than 2 ft of basement, walls exposed	0.03 ²	0.02-0.05
Three- or four-story structures, 5000 to 10,000 ft ² per floor		
First and second floors	0.05 ²	0.01-0.08
Basement	0.01 ²	0.001-0.07
Multistory structures, >10,000 sq. ft. per floor:		
Upper floors	0.01 ²	0.001-0.02
Basement	0.005 ²	0.001-0.015

¹The ratio of dose received inside the structure to the dose that would be received outside the structure.

²Away from doors and windows.

Reference: Aldrich, D.C., D.M. Ericson, Jr., and T. D. Johnson. Public Protection Strategies for Potential Nuclear Reactor Accidents: Sheltering Concepts with Existing Public and Private Structures. Sandia Laboratories Report SAND 77-1725 (February 1978).

TABLE 6-6

Page 1 of 2

GUIDELINES FOR PROTECTION AGAINST INGESTION OF CONTAMINATION**A. Response Levels for Preventive PAG**

A "Preventive PAG" is the projected dose commitment value at which responsible officials should take protective actions with minimal impact, to prevent or reduce the radioactive contamination of human food or animal feeds.

Sample Media	I-131 ¹	Cs-134 ²	Cs-137 ²	Sr-90	Sr-89
Initial Activity Area Deposition ($\mu\text{Ci}/\text{m}^2$)	0.13	2.0	3.0	0.5	8.0
Forage Concentration ³ ($\mu\text{Ci}/\text{kg}$)	0.05	0.8	1.3	0.18	3.0
Peak Milk Activity ($\mu\text{Ci}/\text{l}$)	0.015	0.15	0.24	0.009	0.14
Total Intake (μCi)	0.09	4.0	7.0	0.2	2.6

¹The cumulative intake of Iodine-133 via milk is about 2 percent of Iodine-131 assuming equivalent deposition.

²Intake of Cesium via the meat/person pathway for adults may exceed that of the milk pathway; therefore, such levels in milk should cause surveillance and protective actions for meat as appropriate. If both Cesium-134 and Cesium-137 are equally present, the response levels should be reduced by a factor of two.

³Fresh weight.

Reference: Federal Radiation Council. Radiation Protection Guidance for Federal Agencies. Federal Register (May 22, 1965).

TABLE 6-6

Page 2 of 2

GUIDELINES FOR PROTECTION AGAINST INGESTION OF CONTAMINATION

B. Response Levels for Emergency PAG

An "Emergency PAG" is the projected dose commitment value at which responsible officials should isolate food containing radioactivity, to prevent its introduction into commerce, and at which responsible officials should determine whether condemnation or another method of disposal is appropriate. At the Emergency PAG, higher impact actions are justified because of the projected health hazards.

Sample Media	I-131 Infant ³ /Adult	Cs-134 ² Infant ⁴ /Adult	Cs-137 Infant ⁴ /Adult	Sr-90 Infant ⁴ /Adult	Sr-89 Infant ⁴ /Adult
Initial Activity Area Deposition ($\mu\text{Ci}/\text{m}^2$)	1.3/18	20/40	30/50	5.0/20	80/1600
Forage Concentration ⁵ ($\mu\text{Ci}/\text{kg}$)	0.5/7.0	8.0/17	13/19	1.8/8.0	30/700
Peak Milk Activity ($\mu\text{Ci}/\text{l}$)	0.015/2.0	1.5/3.0	2.4/4.0	0.09/0.4	1.4/30
Total Intake (μCi)	0.9/10	40/70	70/80	2.0/7.0	26/400

¹The cumulative intake of Iodine-133 via milk is about 2 percent of Iodine-131 assuming equivalent deposition.

²Intake of cesium via the meat/person pathway for adults may exceed that of the milk pathway; therefore, such levels in milk should cause surveillance and protective actions for meat as appropriate. If both Cesium-134 and Cesium-137 are equally present, the response levels should be reduced by a factor of 2.

³Newborn infant, includes fetus (pregnant woman) as critical segment of population for Iodine-131.

⁴"Infant" refers to child less than 1 year of age.

⁵Fresh weight.

Reference: Federal Radiation Council. Radiation Protection Guidance for Federal Agencies. Federal Register (May 22, 1965).

Figure 6-1

SUMMARY OF TYPICAL EMERGENCY MEASURES

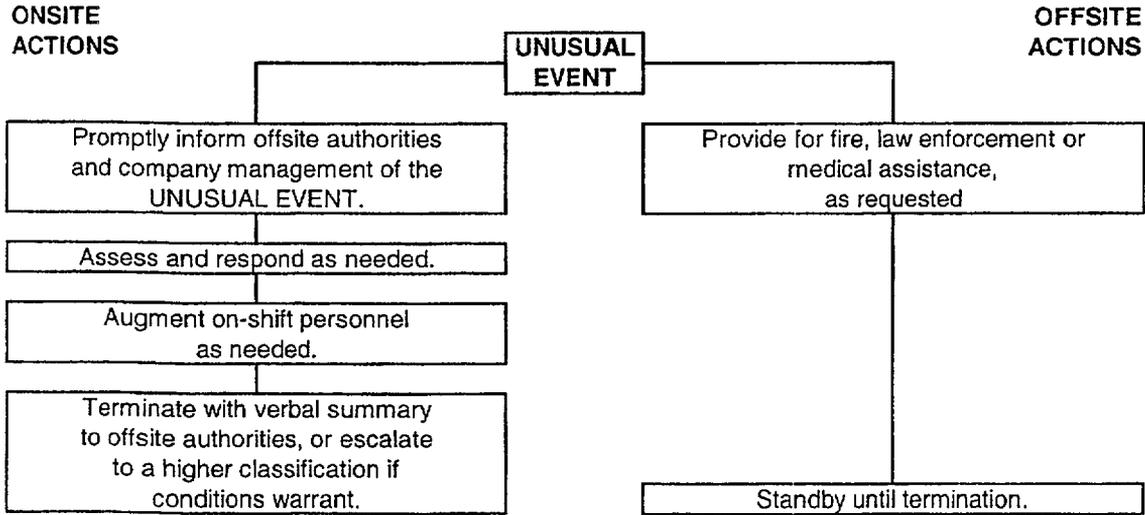


Figure 6-1

SUMMARY OF TYPICAL EMERGENCY MEASURES

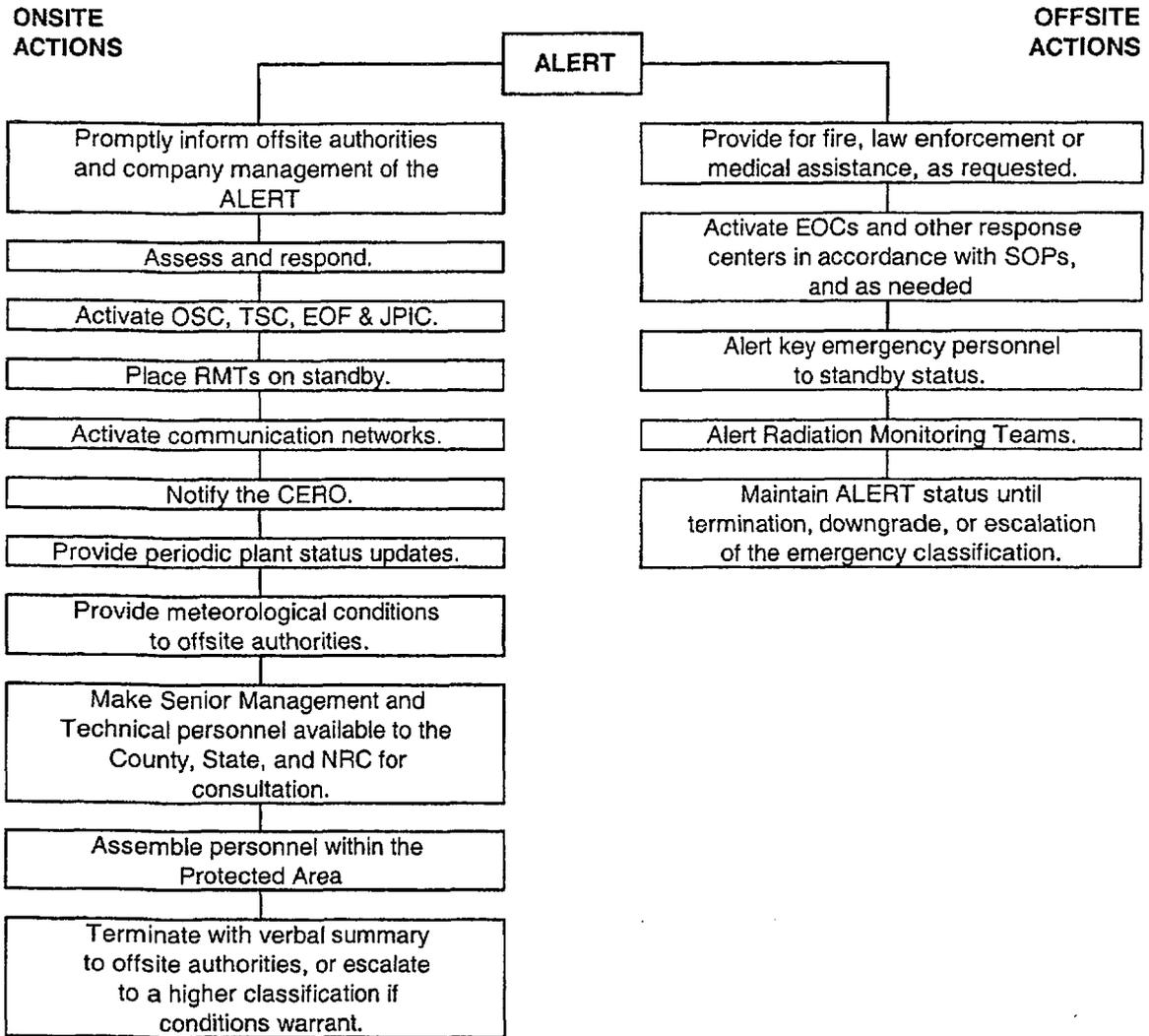


Figure 6-1

SUMMARY OF TYPICAL EMERGENCY MEASURES

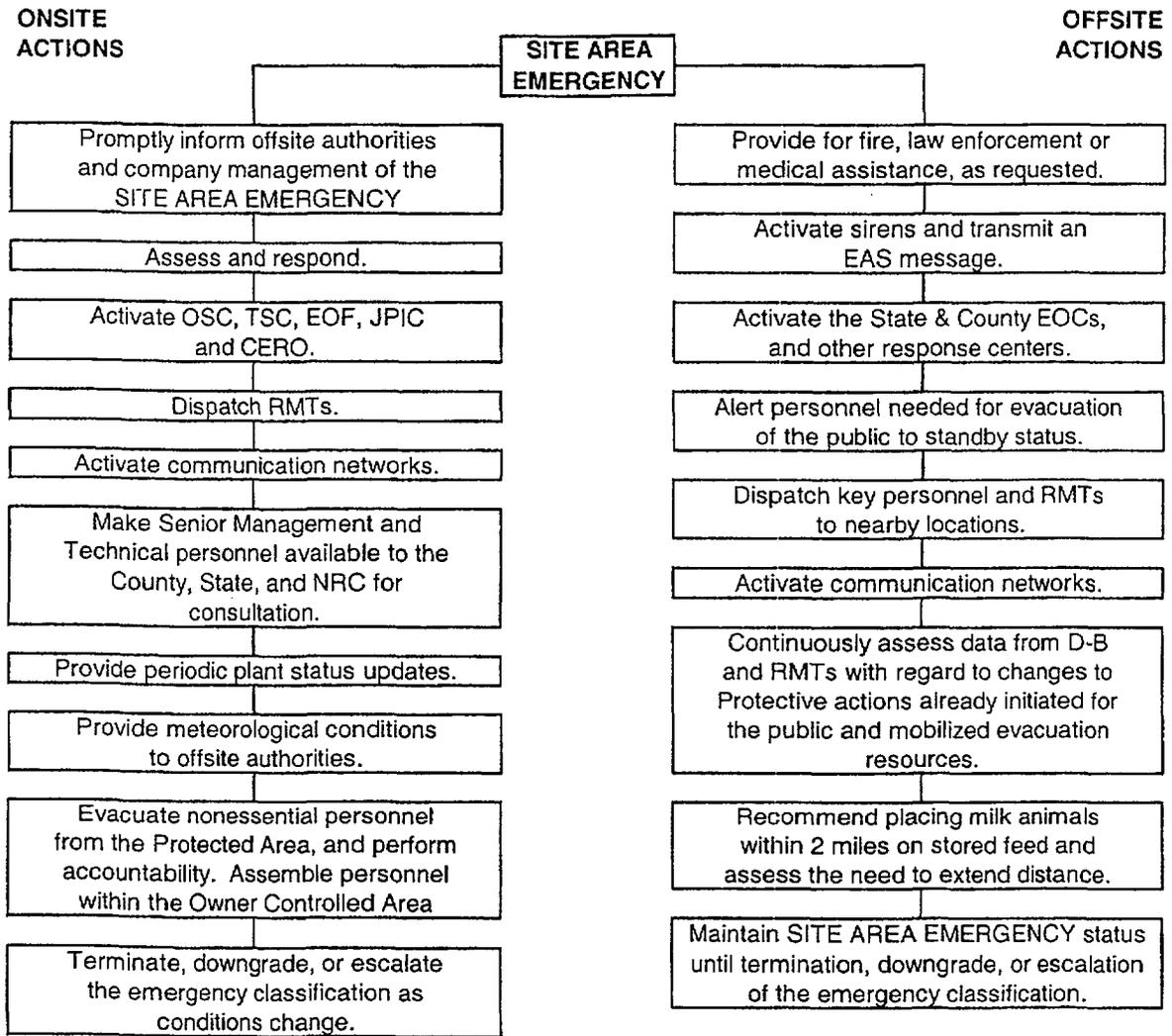


Figure 6-1

SUMMARY OF TYPICAL EMERGENCY MEASURES

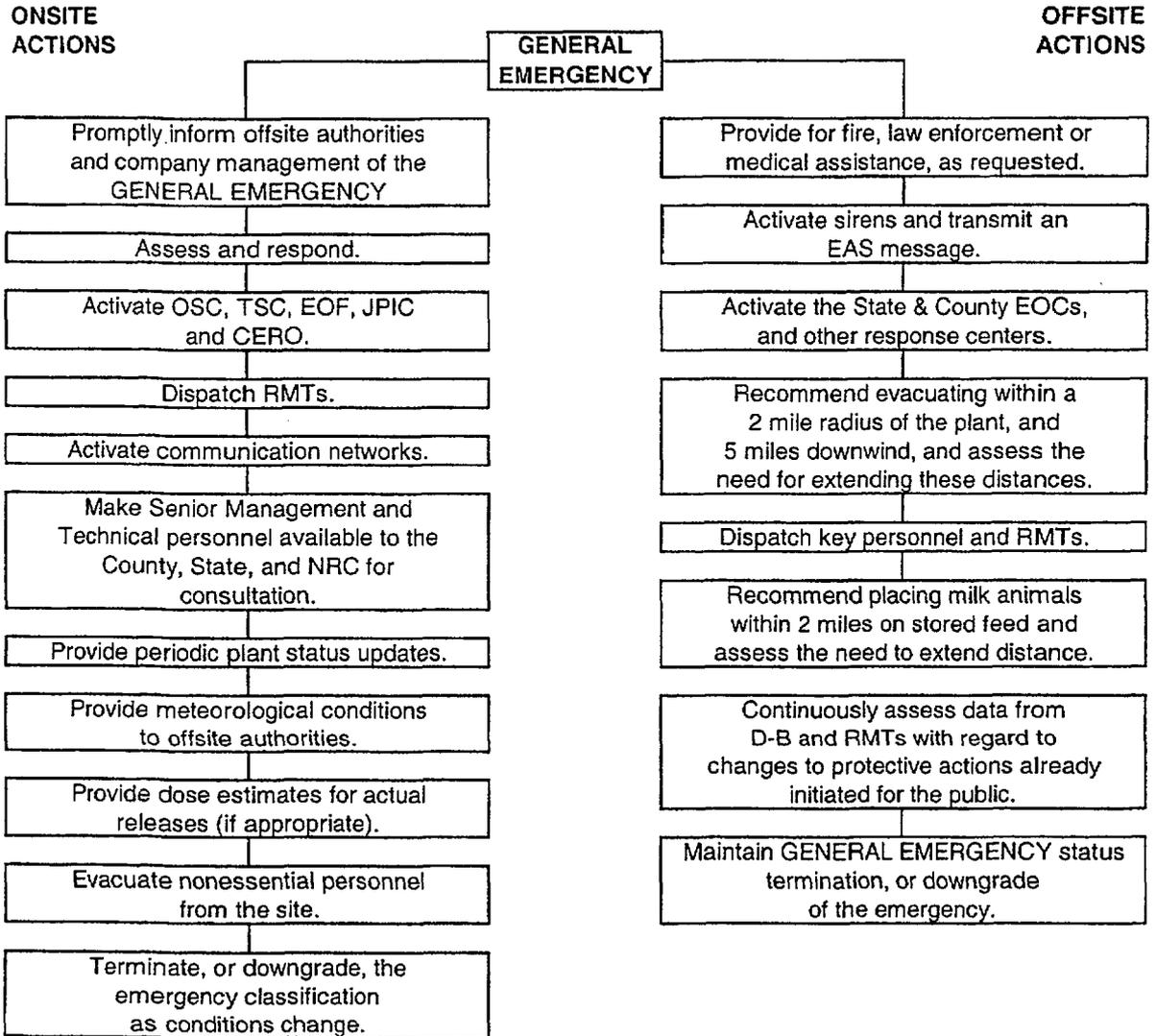


Figure 6-2

EMERGENCY NOTIFICATION:
UNUSUAL EVENT

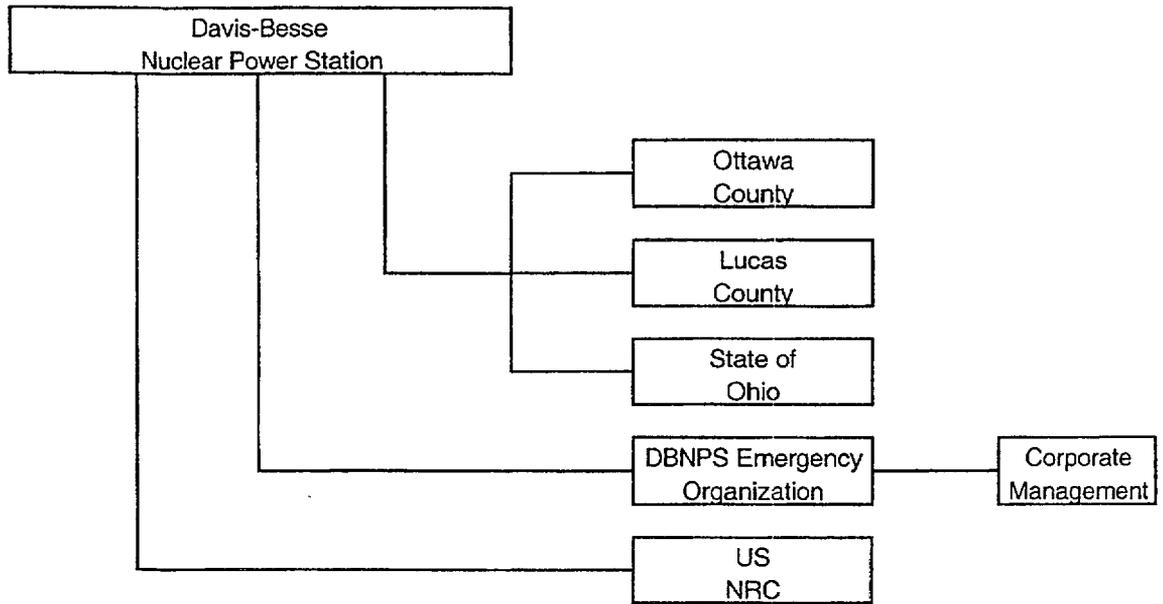
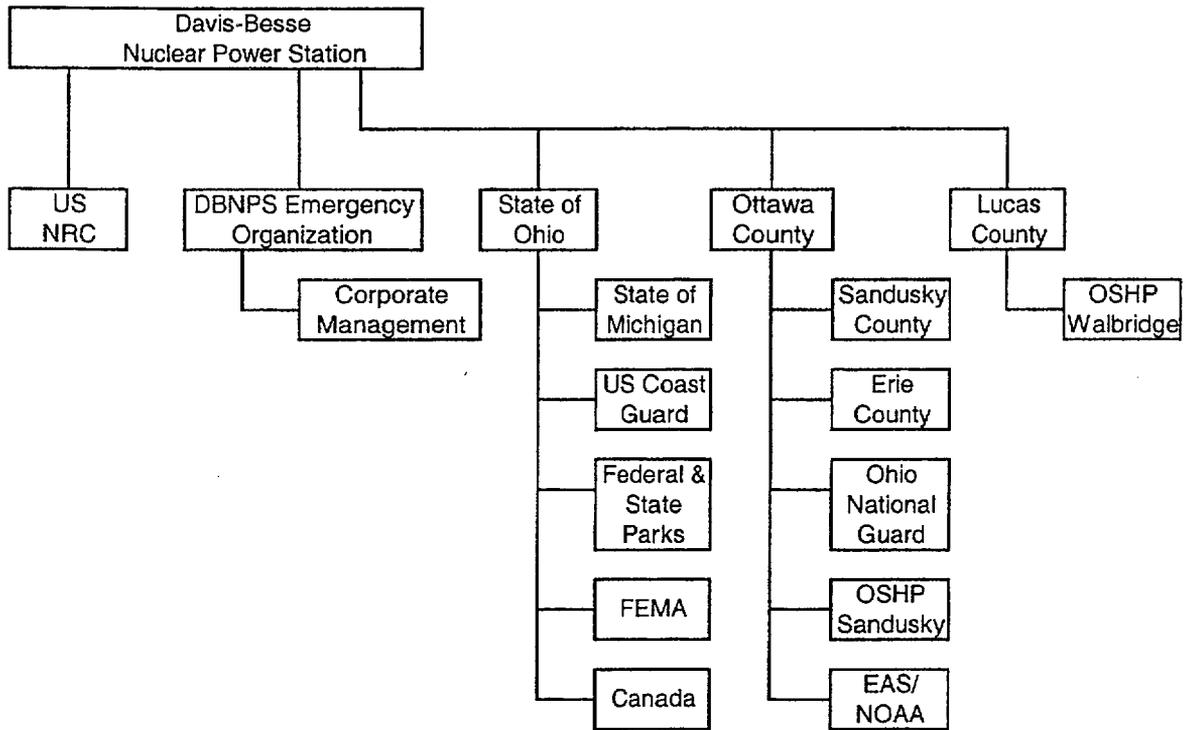


Figure 6-2

**EMERGENCY NOTIFICATION:
ALERT, SITE AREA EMERGENCY, GENERAL EMERGENCY**



7.0 EMERGENCY FACILITIES AND EQUIPMENT

This section describes the equipment and facilities used at DBNPS to:

- Assess the extent of accident hazards.
- Mitigate the consequences of an accident.
- Provide protection to station personnel.
- Support accident mitigation operations.
- Provide immediate care for injured personnel.

A diagram identifying the emergency facilities and their general location relative to each other, is included as Figure 7-1, "Emergency Facilities by General Location". Many of the DBNPS facilities and much of the equipment is normally used for routine plant operations. Other items are reserved for use only on an "as needed" basis.

7.1 DBNPS IN-PLANT EMERGENCY FACILITIES

7.1.1 Control Room

- a. The Control Room is the location from which the plant is operated. It contains the instrumentation, controls, and displays for:
 1. Nuclear systems
 2. Reactor coolant systems
 3. Steam systems
 4. Electrical systems
 5. Safety systems (including engineered safety features)
 6. Accident monitoring systems.

The operating shift is staffed in accordance with Technical Specifications. Control manipulations and the safe operation of the plant are directed by the Senior Reactor Operator licensed Shift Manager and Unit/Field Supervisor, and are performed by licensed Reactor Operators.

- b. During abnormal operating conditions, the complexity of Station responsibilities increase significantly and the Control Room transforms into an emergency response center. These responsibilities include the following:
 1. Diagnosing the abnormal conditions.
 2. Performing corrective actions.
 3. Mitigation of abnormal conditions.
 4. Management of plant operations.
 5. Management of emergency response.
 6. Informing Federal, State, and local officials.
 7. Recommendations for public protective measures to State and local officials.
 8. Restoring the plant to a safe condition.
 9. Recovering from the abnormal conditions.

Initially, Control Room personnel will assume all of these responsibilities. However, by activating other emergency response facilities, much of this responsibility is turned over to other personnel.

During emergencies, the Emergency Assistant Plant Manager uses the Shift Manager's Office, which is within the Control Room envelope, to observe and provide guidance to the Shift Manager for direction and control of in-plant activities.

7.1.2 Operations Support Center (OSC)

The OSC is on the fourth floor of the Personnel Shop Facility (PSF). The area designated for the OSC consists of a conference room and an adjacent storage room. The OSC is the assembly and dispatch point for damage control and repair teams.

7.2 DAVIS-BESSE ADMINISTRATION BUILDING (DBAB) FACILITIES

The DBAB contains the Emergency Response Facilities (ERFs) necessary to assist Control Room personnel in accident assessment and abnormal operating conditions. The ERF area of the DBAB has been designed to provide radiological habitability for approximately 30 days during a design basis accident, as described in Chapter 15 of the Davis-Besse Updated Safety Analysis Report. Within this protected environment, the ERFs function to:

1. Help the Control Room staff determine the plant safety status.
2. Relieve the Control Room staff of peripheral duties and communications not directly related to reactor system manipulations.
3. Prevent congestion in the Control Room.
4. Provide assistance to the operators from technical personnel who have comprehensive plant data at their disposal.
5. Provide a coordinated emergency response by both technical and management personnel.
6. Provide reliable communications between onsite and offsite emergency response personnel.
7. Provide a focal point for development of recommendations for offsite actions.
8. Provide relevant plant data to the NRC for its analysis of abnormal plant operating conditions.

The DBAB Annex and the second floor of the DBAB provide general administrative office space for the Station. The ERFs are on the first floor and are either in the restricted (north end) or unrestricted areas (south end).

The restricted area consists of two mechanical equipment rooms, a computer equipment room, telephone equipment room, Emergency Operations Facility (EOF), Technical Support Center (TSC), TSC Library, Radiological Testing Laboratory (RTL), badging area, kitchen, and two areas designated as private office space.

The unrestricted area consists of the Energy Education Center (EEC), a Site Emergency Operations Center (SEOC) and several work/conference rooms. The DBAB is approximately 2100 feet from the Control Room. They are linked by a paved road which is completely contained within the site security boundary.

The water supply to the DBAB can store up to 4,000 gallons within the buildings, if necessary. Electrical power for the DBAB is supplied by the grid through a power structure approximately 200 feet east of the building. Backup power is provided by a diesel generator and vital loads are protected by an uninterruptible power supply.

The electrical and mechanical systems within the DBAB are computer controlled and activated using the Central Control and Monitoring System (CCMS). This system maintains building temperature and ventilation, and provides security alarms, trouble alarms, and fire protection, as conditions may warrant. For fires, an alarm on the CCMS can automatically activate the dry main sprinkler system in the records management vault; or a wet main sprinkler system in any other area. To minimize radiation exposure, two emergency ventilation air handling units are provided; one for the restricted area (north end) and one for the remaining areas (south end). By design, either unit can supply the restricted area, should the primary unit fail. Upon local activation, the units will switch to the recirculation mode employing high efficiency filters to minimize the introduction of airborne radiation sources into the emergency facilities.

7.2.1 Emergency Operations Facility (EOF)

The EOF provides a central location for the development of protective action recommendations by DBNPS and for representatives from offsite organizations. The EOF staff evaluates the magnitude and effects of actual or potential radioactive releases, and provides management assistance in the decision-making process to protect the public health and safety. Recommendations are based on station conditions with radiological and meteorological data obtained, through the Data Acquisition and Display System (DADS). The EOF utilizes various communication systems to establish and maintain communications with State, Federal, and local officials, and mobile Radiation Monitoring Teams (RMTs).

The EOF is in the restricted side of the DBAB.

The EOF provides space for at least 22 people.

Activation and operation of the EOF is described in the Emergency Plan Procedures.

7.2.2 Technical Support Center (TSC)

The TSC serves as the workplace for key ERO personnel who, during emergencies, assist the Control Room staff, perform accident assessment, and determine appropriate protective actions. The TSC provides for direct voice and data communication with the Control Room. The TSC also contains the Data Acquisition and Display computer system (DADS).

The DADS computer was designed to provide sufficient Station information and data communication for operations personnel to evaluate and diagnose station conditions and activities so as to conduct emergency operations in an orderly manner. The DADS provides data communication to the EOF, TSC, and Control Room. Because DADS aids in the detection and monitoring of plant transients and accidents, the DADS is capable of functioning during and following most events expected to occur during the life of the station.

The TSC is in the restricted side of the DBAB.

The TSC contains workspace for up to 25 people, within a main work area and three conference areas.

A detailed description of the activation and operation of the TSC is contained in the Emergency Plan Procedures.

7.2.3 Radiological Testing Laboratory (RTL)

The RTL is a facility near the EOF and TSC for equipping and dispatching Radiological Monitoring Teams; and for the receipt, counting, and disposition of potentially contaminated environmental samples.

The RTL is on the ground floor of the DBAB.

7.2.4 Site Emergency Operations Center (SEOC)

Located in the unrestricted side of the DBAB, the SEOC provides protected accommodations for those state and local officials who will coordinate with their respective emergency response agencies offsite.

7.2.5 Private Office Areas

Two areas are available as private office space for the NRC Site Director and other key emergency response officials. These office areas are in the restricted area of the DBAB.

7.2.6 Equipment Rooms

The telephone equipment room contains communications equipment necessary to connect the site telephone system into the Centrex System.

Two mechanical equipment rooms contain redundant systems for electrical distribution, heating and ventilation, and compressed air. Both mechanical equipment rooms are in the restricted side of the DBAB.

7.3 OTHER COMPANY EMERGENCY FACILITIES

7.3.1. Joint Public Information Center (JPIC)

The Joint Public Information Center (JPIC) is the emergency facility for coordinating news releases and providing joint media briefings during an event at Davis-Besse. The Company, state, local and federal agencies represented at the JPIC jointly prepare news information for release to the public via the news media. Equipment and work spaces for Public Information Officers and their staffs are provided to support timely communications on plant status and emergency response actions. JPIC facilities include news briefing areas for electronic and print media representatives. JPIC support is available for any plant emergency. However, facility activation is mandatory at (and above) the Alert emergency classification level. The JPIC is located at a FirstEnergy Corporation facility outside the 10-mile EPZ.

7.3.2. Alternate Emergency Operating Facility (AEOF)

The AEOF is a predesignated conference area outside the 10 mile Emergency Planning Zone (EPZ) which is available to hold meetings between Davis-Besse emergency management personnel and offsite agency management personnel. The AEOF is located in a FirstEnergy facility and has access to current plant status through a communicator.

The AEOF may be activated only under extreme conditions when travel to the Davis-Besse Nuclear Power Station has become hazardous.

7.3.3. Corporate Emergency Facilities

Company facilities located throughout the service districts are available to provide support for the Corporate Emergency Response Organization (CERO). Certain Company facilities have been designated to support coordination of CERO activities and centralized management of Company resources. The primary company facility identified for CERO Management support is the Corporate Planning Center (CPC), at a FirstEnergy office facility.

7.4 COUNTY AND STATE EMERGENCY OPERATIONS CENTERS

7.4.1 Ottawa County Emergency Operations Center

Potential or actual emergencies at Davis-Besse could impact those persons who reside in Ottawa County within the 10-mile Emergency Planning Zone. To aid in protecting these residents, Ottawa County has constructed an Emergency Operating Center (EOC) which meets the minimum federal criteria for space, communications, warning systems, and supplies.

The EOC is in the basement of the Ottawa County Courthouse Annex, in Port Clinton, Ohio. Communications during an emergency at Davis-Besse are coordinated through this facility, and the Ottawa County Sheriff's Office.

Davis-Besse dispatches a technical liaison to the EOC to help to aid offsite officials in understanding the event.

7.4.2 Lucas County Emergency Operations Center

Potential or actual emergencies at Davis-Besse could impact those persons who reside in the eastern portion of Lucas County within the 10-mile Emergency Planning Zone. To aid in protecting these residents, Lucas County has constructed an Emergency Operating Center (EOC) which meets the minimum federal criteria for space, communications, warning systems, and supplies.

The EOC is in the subbasement of the Lucas County Corrections Center, in Toledo, Ohio. Communications during an emergency at Davis-Besse are coordinated through this facility, and the Lucas County Sheriff's Office.

Davis-Besse dispatches a technical liaison to the EOC to help to aid offsite officials in understanding the event.

7.4.3 State of Ohio Emergency Operations Center

The State Emergency Operations Center is operated by the Ohio Emergency Management Agency, in Worthington, Ohio. During an emergency, representatives from all State agencies assemble at the State EOC to manage the response efforts. A technical liaison will also be sent to the State EOC, to help coordinate communications and provide technical advice.

A reliable communications system, utilizing the Fixed Monitor Station Network of the State Highway Patrol, ties all areas, and both the Ottawa and Lucas County Emergency Operations Centers into the State EOC.

7.5 COMMUNICATIONS SYSTEMS

7.5.1 Normal Communications Systems

A comprehensive communications network with backup capabilities has been provided to assure reliable communications among the various emergency facilities and agencies. The network is composed of the following systems:

- a. Commercial telephone systems:
 1. DBNPS Centrex lines (on uninterruptible power source).
 2. Microwave connections for selected telephone lines.
 3. Port Clinton and Oak Harbor connections (includes backup power for some lines).
- b. A public address system (Gai-tronics), which is totally separate from the telephone system, includes handset stations, loud speakers, and portable station jacks. It provides five normal plant channels, five maintenance channels, two switchyard maintenance channels, and four fuel handling channels.

- c. A radio system capable of transmitting and receiving the following types of voice communications:
 - 1. A two-way mobile channel is normally used by service dispatchers in various locations to mobile units.
 - 2. A channel for direct radio communications with the Ottawa County Sheriff's dispatcher.
 - 3. A channel used exclusively by Security.
 - 4. A channel used by the Maintenance Department for normal day-to-day transmissions.
- d. Radiation Monitoring Teams communicate on a five-channel trunked 800 megahertz radio system. Cellular telephones are also available if needed.
- e. Alphanumeric pagers, are carried by key emergency responders to provide 24-hour a day coverage. These pagers display an emergency classification code, and can be used to communicate with other key personnel.
- f. A Computerized Automated Notification System (CANS) is available to facilitate the notification process. The system is composed of at least 16 phone lines. One telephone line is dedicated to the Control Room, and the others are connected to the telephone network. The CANS will initiate a group page, an individual page, and individually call all emergency response personnel carrying pagers, as well as calling out non-pager carrying responders. The system transmits a code specific to the classification and logs personnel response times.

7.5.2 Emergency Communications Systems

- a. The following phone systems are dedicated for emergency communications:
 - 1. The Davis-Besse 4-way ring down circuit including the State and County EOCs, the Ohio Highway Patrol Office, the Lucas County and Ottawa County Sheriff's dispatcher offices, the Emergency Control Center/Emergency Operations Facility, and the Control Room.
 - 2. A diverse network of commercial telephones, on uninterruptable power has been installed to provide:
 - a. NRC Emergency Notification System (ENS) telephone ("red phone").
 - b. NRC Health Physics Network (HPN) telephones.
 - c. Emergency Response Data System (ERDS) data lines.
 - 3. Media charge-call lines.

- b. DBNPS has also established two separate communication loops between various ERFs to ensure reliable and timely exchange of information between the emergency organizations. These loops consist of the following:

1. Technical Data Loop

Provides a technical data link for the following:

- a) Control Room
- b) Technical Support Center
- c) Emergency Operations Facility
- d) Operations Support Center

2. Radiation Management Loop

Provides dedicated communications for radiological conditions and radiation protection management information among the following:

- a) Control Room
- b) Technical Support Center
- c) Operations Support Center
- d) Dose Assessment Center

7.5.3 Maintenance of Emergency Telephone Numbers

The communication system which has been provided assures reliable onsite and offsite communications in any emergency. DBNPS maintains an Emergency Plan Telephone Directory, which is kept current by the Supervisor - Emergency Preparedness. This directory is reviewed quarterly and includes ERO personnel, the radiological emergency assistance provider, hospitals, local, state, and federal agencies, and others with special qualifications for emergency support.

7.6 ALARMS

There are three station alarms as follows:

- 7.6.1 FIRE - Rise and Fall Siren
- 7.6.2 ACCESS EVACUATION - Pulsed Tone Burst
- 7.6.3 INITIATE EMERGENCY PROCEDURES - Warbled Tone

The alarms are activated from the Control Room. The FIRE, INITIATE EMERGENCY PROCEDURES, and ACCESS EVACUATION alarms sound in all plant areas (i.e., station office building, personnel shop facility, radiologically restricted area, fuel handling area, outdoor areas, personnel processing facility, etc.)

7.7 PROMPT NOTIFICATION SYSTEM

Early warning of, and instructions to the population-at-risk are done under the direction of the Ohio Emergency Management Agency (OEMA) in conjunction with local officials, the Ottawa County Emergency Management Agency, and the Lucas County Emergency Management Agency. Prompt notification by the DBNPS is the vital first link in this process.

Once local and state authorities have been notified, several methods to warn the population-at-risk can be utilized. The method used and the time required will depend upon the severity of the situation. The methods available are:

- 7.7.1. Prompt Notification System (PNS) - Fifty-four high powered rotating sirens have been installed to provide an acoustic alerting signal for the residents and transients within the 10-mile radius of the Davis-Besse Station. The sirens have been located to meet the design objectives of Appendix 3 in NUREG-0654/ FEMA-REP-1, REV. 1. Local authorities activate the warning sirens from the Ottawa County Sheriff's Office. The sounding of the Prompt Notification System alerts the public to tune to local radio stations for EAS messages.
- 7.7.2. Emergency Alert System (EAS) - State and local authorities can broadcast information, instructions, and necessary bulletins to the general public over the EAS (e.g., from the local Sheriff's offices or their Emergency Operations Centers).
- 7.7.3. NOAA National Weather Service alert monitors can be pulsed, and automatically turned on to disseminate emergency information.
- 7.7.4. Central Dispatching - The Ottawa and Lucas County Sheriff's Offices have central dispatches, manned 24 hours a day, to communicate with the police, fire, medical responders, and the OEMA.
- 7.7.5. Commercial Paging System - A paging system, backed up by the local telephone service, is used to permit immediate contact of local officials.
- 7.7.6. Emergency Vehicles - Vehicles with loudspeakers can be dispatched to various remote locations to broadcast warning messages.
- 7.7.7. House-To-House Notification - Local fire and police departments can perform house-to-house notification of residents in the affected areas around the plant.

Notification times have been included in the Evacuation Time Estimate. Information and appropriate advisories developed for the public, including transient areas, concerning the actions to be taken during an emergency, are available. Pertinent information can also be found in the local telephone directories.

Additional information regarding warning capability and information to transient areas around the plant can be found in The Ottawa County Plan for Response to Radiation Emergencies at Licensed Nuclear Facilities, Section II Part D; The Lucas County Radiological Emergency Response Plan, Section II Part E; and The Ohio Plan for Response to Radiation Emergencies at Licensed Nuclear Facilities, Parts E and F.

7.8 ASSESSMENT FACILITIES

The systems and equipment described in the following sections ensure that the capability and resources are available to provide valid and continuing assessment throughout the course of an incident.

7.8.1 Radiation Monitoring System

The onsite Radiation Monitoring System contributes to personnel radiological protection within the plant, in accordance with regulatory guidelines. The Radiation Monitoring System detects, alarms, and initiates emergency actions when radiation levels or radionuclide concentrations exceed predetermined levels. To perform these functions, area, liquid, and atmospheric monitoring subsystems are employed.

The data from these subsystems are displayed by readouts in the Control Room. Additionally, certain monitors sound an alarm and are displayed on the Fire Detection System/Radiation Monitoring System (FDS/RMS) Console in the Control Room. A summary description of individual radiation monitor channels, described below, is provided in the Updated Safety Analysis Report (USAR) Table 11.4-1, Liquid Gas, and Airborne Radiation Monitors, and Table 12.1-3, Area Radiation Monitors.

In general the radiation monitoring equipment is designed in accordance with the following specifications:

- a. Each monitoring station has adjustable, high level, low level, and power supply failure alarms.
- b. Solid-state circuitry is used except for primary detectors.
- c. The safety-related radiation monitors are powered from the essential instrument distribution panels. The non-essential radiation monitors are powered from the uninterruptible instrument distribution panels.
- d. With the exception of the Kaman monitors, each radiation monitor is capable of being checked periodically with solenoid actuated check sources.
- e. A pulse generator or current source is used for electrically checking each monitor or subsystem. Electrical input tests measure the functional operation of the monitoring system from the detector output through the readout devices.
- f. The modules are designed so that an alarm and/or indication is initiated when failure occurs anywhere in the channel.

7.8.2 Area Radiation Monitoring

The Area Radiation Monitoring subsystem is comprised of area monitors located throughout the plant. Under normal operating conditions, the area monitors warn personnel of increasing radiation level, which may result in a radiation health hazard.

There are a total of 40 area monitors consisting of two types, Geiger-Mueller detectors and Ionization Chamber detectors. The detectors are housed in weather-proof containers and equipped with a remote controlled check source. The local alarm and readout for each of these channels is separate from the detector and is also housed in a weatherproof container.

These detectors can also monitor the high level of radiation that would be characteristic of the post-accident atmosphere in the containment. The detectors are desensitized by a lead shield.

The Control Room readout modules are located in the radiation monitoring panel in the Control Room.

7.8.3. Atmospheric Radiation Monitoring

Atmospheric Radiation Monitoring measures radioactive material contained in the air.

The atmospheric radiation monitoring subsystem is comprised of monitors of the fixed and movable type. Each fixed atmospheric monitor is comprised of a particulate measuring channel, iodine measuring channel, and a gaseous measuring channel. The air sample that passes through each of these channels is obtained by means of a sampler and a pump assembly. Samples are obtained by means of a sampling head placed in a ventilation duct.

Movable atmospheric monitors on carts are available for use during maintenance operations. These monitors are supplemented by various portable radiation monitoring equipment. Each monitor contains three channels for particulate, iodine, and gaseous monitoring, respectively.

Visual high-radiation alert/low-level alarms are provided for each channel at the local monitor sampling station for all atmospheric monitors. Each channel shares an audible alarm at the local monitor sampling station.

7.8.4. Process Radiation Monitoring

Process radiation monitoring measures radiation given off radioactive material contained in process fluids within systems.

The process radiation monitoring subsystem consists of monitors each of which consists of a sampler, scintillation detector, and Control Room ratemeter module. The monitors readout in the Control Room on the individual ratemeter and two common recorders.

7.8.5. Portable Radiation Monitoring Equipment

Portable radiation monitoring equipment includes those pieces of equipment which may be taken into the field (both on and offsite) to determine the presence of gaseous, particulate or airborne radioactive material. This includes general survey instruments. Portable radiation survey instruments and personnel monitoring devices are shown in Table 7-1.

7.8.6 Fire Protection and Detection Devices

Fire protection at Davis-Besse is provided by (1) the Fire Protection Water System, and (2) the Fire Detection System.

a. Fire Protection Water System

The Fire Protection Water System is a full-loop, piped system that supplies water for (1) sprinklers, (2) deluge water spray, (3) fire hydrants, and (4) hose connections that are located such that they provide fire protection for all major areas of the plant and site.

A Fire Water Storage Tank provides a source of water via the Electric Driven Fire Pump. A jockey pump maintains system piping full and pressurized.

The Diesel Driven Fire Pump takes suction from the intake forebay. In the event that a fire occurs, and either an automatic or manual system is initiated, the Fire Protection Water System piping pressure will decrease and cause the electric (120 psig) and the diesel (100 psig) fire pumps to start at their respective pressure setpoint, to meet system flow requirements.

Sprinkler systems provide a coverage of 0.3 gpm per square foot of floor area, for any (including the most remote) 3,000 square foot area; and 0.2 gpm per square foot, for any 10,000 square foot of floor area under the turbine operating and intermediate floors, and in all areas to which oil may spread in the event of an oil line break. This protection is also provided below major steel grating floor whether or not sprinklers are installed above.

Fire hydrants are connected to the main fire yard loop around the periphery of the station. A distribution header loop is provided within the turbine building, with four branch feeders from the underground fire yard loop. Each section of the header loop and each branch line are provided with isolation valves. The headers supply readily accessible, mounted, fire hose stations located throughout the turbine and auxiliary buildings.

Hose cabinets are provided throughout the auxiliary building. Each hose cabinet contains 50-75 feet of 1½ inch hose, with an adjustable fog nozzle, and a separate 2½-inch hose connection for local fire department use. Fire extinguishers are provided throughout the building.

Hose reel units are provided in the turbine building. Each reel is provided with 50-75 feet of 1½ inch fire hose, and an adjustable fog and stream hose nozzle. Adjacent to each hose reel is a separate 2½-inch hose connection for local fire department use. Portable fire extinguishers are located throughout the building.

Fire suppression to the Administration Building, Warehouse, Training Center, Personnel Processing Facility, and Service Building #3 consists of sprinkler systems and hose stations.

b. Fire Detection System

The fire detection system is comprised of detectors located throughout Davis-Besse, especially in those areas not protected by sprinkler systems.

1. Temperature Rise Detectors

Temperature rise detectors monitor the protected area and will send a signal to a local control cabinet and Control Room alarm if the rise in temperature reaches a setpoint.

2. Smoke and Vapor Detectors

Ionization type smoke detectors monitor the area, and when activated, send a signal to a local control cabinet and Control Room alarm.

The Fire Detection Panels receive their inputs from the various detectors, and in turn send an alarm to the Control Room.

An alarm initiates when any of the following conditions occur within the Fire Detection System:

- a) Fire
- b) Trouble
- c) Ground Fault

If any of the above occur, a line printer, fed by the Fire Detection System/Radiation Monitoring System (FDS/RMS), will print out the alarm in the Control Room.

Upon receipt of an alarm, the Control Room operator acknowledges the alarm on the FDS/RMS console printer, and identifies the specific cause of the alarm.

7.8.7 Seismic Monitoring System

The Seismic Monitoring System records (on magnetic tape) vibrations in the earth due to a local earthquake. In addition, the system will record the vibrations on man-made structures caused by the earthquake. The data acquired will contribute to the assessment of damage and the determination of cause of damage. The data is useful in confirming the design and analysis of the structure. To aid decision making, six alarm lights are provided at the system rack, in the cabinet area of the Control Room. These lights show the exceedance of Operating Basis Earthquake (OBE) or Safe Shutdown Earthquake (SSE) at the containment foundation.

The sensors and seismic triggers are installed remotely from the system rack, and are connected by cables to the rack. (See the Technical Requirements Manual (TRM) for location of the sensors and trigger.)

One low-level triaxial seismic trigger is used to turn on the system automatically during the buildup of the event vibrations. The seismic trigger is adjustable from approximately 0.005g to 0.02g (g=acceleration due to gravity). The recording system is in full operation within 0.1 second after a low-level trigger signal. Recording continues with out interruption for approximately 10 seconds after the last low-level trigger signal. Upon completion of the seismic event recording, the Control Room operator removes the magnetic tape cassette from the recording machine. The recording cassette tape is placed in a playback unit which converts to strip-chart form, the longitudinal, transverse, and vertical axes of vibration. The time domain tape recording can be transferred to other available data analysis or acquisition equipment for more detailed analysis.

In keeping with the purposes of the system, the power is supplied by rechargeable batteries so that loss of site power will not prevent system operation. Continuous float charging of the batteries is provided by a battery charger module.

In addition to the components associated with the system rack, there are three peak recording accelerometers as listed in the TRM, Table 3.3-7, which require no electrical power to operate. After a seismic event operators can remove the three tape strips from each recorder, develop the strips, and determine the peak values recorded at the associated location.

7.8.8 Onsite Meteorological Measurement Programs

Data collection from the current onsite meteorological monitoring system began at DBNPS on August 4, 1974. The location of both meteorological towers is such that the meteorological data from the towers are representative of the DBNPS site. The system includes two levels of instrumentation on a 340-foot freestanding tower and one level of instrumentation on a 35-foot satellite tower. Both towers are located in the southwest corner of the site approximately 2800 feet from DBNPS.

Wind direction and speed are measured at the 250 and 340-foot levels on the freestanding tower and at 35 feet on the satellite tower. Differential temperature measurements (ΔT) are made between 35 and 250 feet and between 35 and 340 feet on the free standing tower.

The Control Room, Emergency Operations Facility (EOF), and Technical Support Center (TSC) can obtain meteorological data through the Data Acquisition and Display System (DADS). All meteorological data are recorded on strip chart recorders. Dual-channel strip chart recorders are used for recording wind speed and direction; one recorder for each tower level. Ambient temperature, dewpoint, delta T, and precipitation are recorded on one multipoint strip chart recorder; each parameter is recorded on an individual channel. The data recording and signal conditioning equipment is housed in an environmentally controlled out structure located near the base of the tower.

The meteorological instruments at DBNPS are calibrated at least semiannually. The instrumentation and records are checked on a nominal daily basis for proper functioning of equipment. All maintenance and calibrations are performed in accordance with written procedures.

Backup meteorological data (i.e., wind speed and direction) are available from the National Weather Service. Arrangements have also been made to obtain complete backup meteorological information from the Enrico Fermi Nuclear Power Station at Newport, Michigan. Backup hydrological data can be obtained from the Marblehead Coast Guard Station, and the Port Clinton Sewage treatment plant (lake level and precipitation respectively).

7.8.9 Control Room Instrumentation

Control Room Instrumentation measures appropriate parameters that are indicative of the status of various plant systems and the reactor itself.

The Post Accident Monitoring System (PAMS) is also available to follow the course of an accident with wide range instrumentation. This system will provide to the plant operators, the essential safety status information necessary to allow them to return the plant to a maintained, safe, shutdown condition.

USAR Table 7.5-1 provides a listing and a description of Control Room instrumentation, including PAMS that would be used in performing continued assessment of plant conditions.

7.8.10 Laboratory Facilities

The Davis-Besse laboratory facilities are equipped to provide the water chemistry and radiochemical analysis support required during normal plant operations. This equipment can also be utilized in the analysis of abnormal events to assist in the diagnosis of plant operation when conditions permit.

If an accident occurs which would make normal sampling and counting methods impractical, the following measures can be taken:

- a. A Radiological Testing Laboratory (RTL) is located in the DBAB in the restricted area near the TSC and EOF. Its primary functions are to act as a staging area for Radiation Monitoring Teams and provide a handling area for environmental samples.
- b. For reactor coolant system sampling, a shielded, high-pressure sampler is available for pressurized samples. These samples are obtained using the Post Accident Sampling System (PASS) which was designed specifically for this purpose.
- c. For containment atmosphere sampling, the normal sampling procedure is used. If any channel of the RE 4597 series monitor is off scale or an independent sample and analysis is required, a grab sample can be obtained from the Emergency Grab Sample System.

- d. For station vent sampling, normal sampling procedures can be followed except that silver zeolite filters can be used for iodine. Also if RE 4598 series Channel 1, 2 or 3 is off scale, a portable survey instrument on the sample line can be used and dose rate is then converted to $\mu\text{Ci/cc}$.

7.8.11 Facilities and Equipment for Offsite Monitoring

A complete Radiological Environmental Monitoring Program (REMP) for effluent control has been established at the DBNPS. The program has been in effect since August 1972.

The REMP employs fixed radiation/radionuclide detection and measurement instruments at various locations within a 25 mile radius from DBNPS. Samples of vegetation, water, soil, milk, and produce are routinely collected and analyzed. Figures 7-2 and 7-3 show the sampling/monitoring locations in the DBNPS area.

During emergencies at DBNPS, baseline data from the REMP will be used in assessing the radiological effects of any possible releases on the environment.

DBNPS has three, four-wheel drive vehicles, equipped to perform field monitoring during emergencies. These vehicles are available within about 30 minutes after declaration of an emergency. Radiation Monitoring Teams (RMTs), dispatched at an ALERT or higher, will conduct emergency field monitoring of radiation and airborne activity levels throughout the EPZ, under direction from the Dose Assessment Center, in the EOF. Monitoring results will be used to verify plume boundaries and to adjust dose projections for more correct protective action recommendations.

7.8.12 Offsite Analysis

Offsite analysis of post accident samples are performed by Framatome in accordance with the contract established for DBNPS participation in the post accident sampling program.

7.9 PROTECTIVE FACILITIES AND EQUIPMENT

Personnel protective action at DBNPS is a function of the nature of the hazards, for instance, preparing for a hurricane is somewhat different from preparing for radiological hazards. Preplanned responses to the basic hazards, such as high winds, flooding, earthquakes, and radiation exposures are an integral part of the DBNPS Emergency Plan and are therefore discussed separately. A fundamental concept in personnel protection is the immediate release and removal of all individuals not essential to the operation, safety, security, and damage control of the plant. Obviously some hazards can occur before any protective action can be taken. When the situation permits, the appropriate alarms are sounded and all personnel on site either assume their assigned emergency responsibilities, or are assembled at the designated points for accountability prior to release from the site or reassignment to an emergency team.

Protected facilities include the DBNPS Control Room and the emergency facilities on the first floor of the Administration Building. These areas are located in seismically rated structures and have adequate shielding to permit safe occupation for extended periods of time without exceeding a dose limit. The ventilation systems in these facilities have redundant fans and chillers and are provided with appropriate alarms and interlocks. Provisions have also been made for the air to be recirculated through high efficiency particulate (HEPA), and activated charcoal filters when necessary.

Self contained breathing apparatus (SCBA) and respirators are located in the Control Room to permit continued occupancy if ventilation systems fail. Additional SCBAs, protective clothing, and respirators are available at, or near, each onsite ERF, and are listed in applicable Emergency Plan Procedures.

Parts for the respirators and SCBAs, as well as additional bundles of protective clothing are available at the warehouse.

7.10 FIRST AID AND MEDICAL FACILITIES

First aid facilities at DBNPS are designed to support immediate care ranging from simple first aid to procedures requiring a physician. The most readily available first aid is provided by the small kits placed throughout the plant. These kits contain items typically needed to care for minor injuries.

More complete medical cabinets are located throughout the site and contain medical supplies needed to care for more serious injuries.

7.11 DAMAGE CONTROL EQUIPMENT

The DBNPS is extensively equipped to conduct preventive and corrective maintenance and repairs on mechanical, structural, electrical and instrumentation and control equipment found in the station.

Each maintenance crew is qualified and, when required, certified to perform the tasks associated with their craft in the working environment of a nuclear plant.

In addition to the equipment and materials required for normal maintenance, other items are available to handle extraordinary maintenance jobs that might arise in damage control. Refer to the appropriate system procedure or Emergency Plan Procedure for equipment lists.

TABLE 7-1

Page 1 of 2

PORTABLE RADIATION SURVEY INSTRUMENTS

Portable Survey Instruments	Range	Type Detector	Quantity	Location
High Range Survey Instruments	0-1000	GM	3	RP Area
	mrad/hr-10 ³ rem/hr			
	0-5 rem/hr	Ion Chamber	6	RTL
Low Range Survey Instrument	0-5 rem/hr	Ion Chamber	2	RP Area
	0-5 x 10 ⁵ cpm	GM	4	RTL
Alpha Survey Meter	0-5 x 10 ⁵ cpm	Scintillator	1	RP Area
Neutron	0-5000 mrem/hr	BF ₃	2	RP Area

PORTABLE AIR SAMPLING EQUIPMENT

	Type	Quantity	Location
Offsite	Air Sample	10	Environmental Survey Stations
Low Volume	12 volt D.C.	4	RTL
	Battery Power	4	RTL
Onsite	High Volume	1	RP Area
	Low Volume	2	

TABLE 7-1

Page 2 of 2

PERSONNEL MONITORING DEVICES

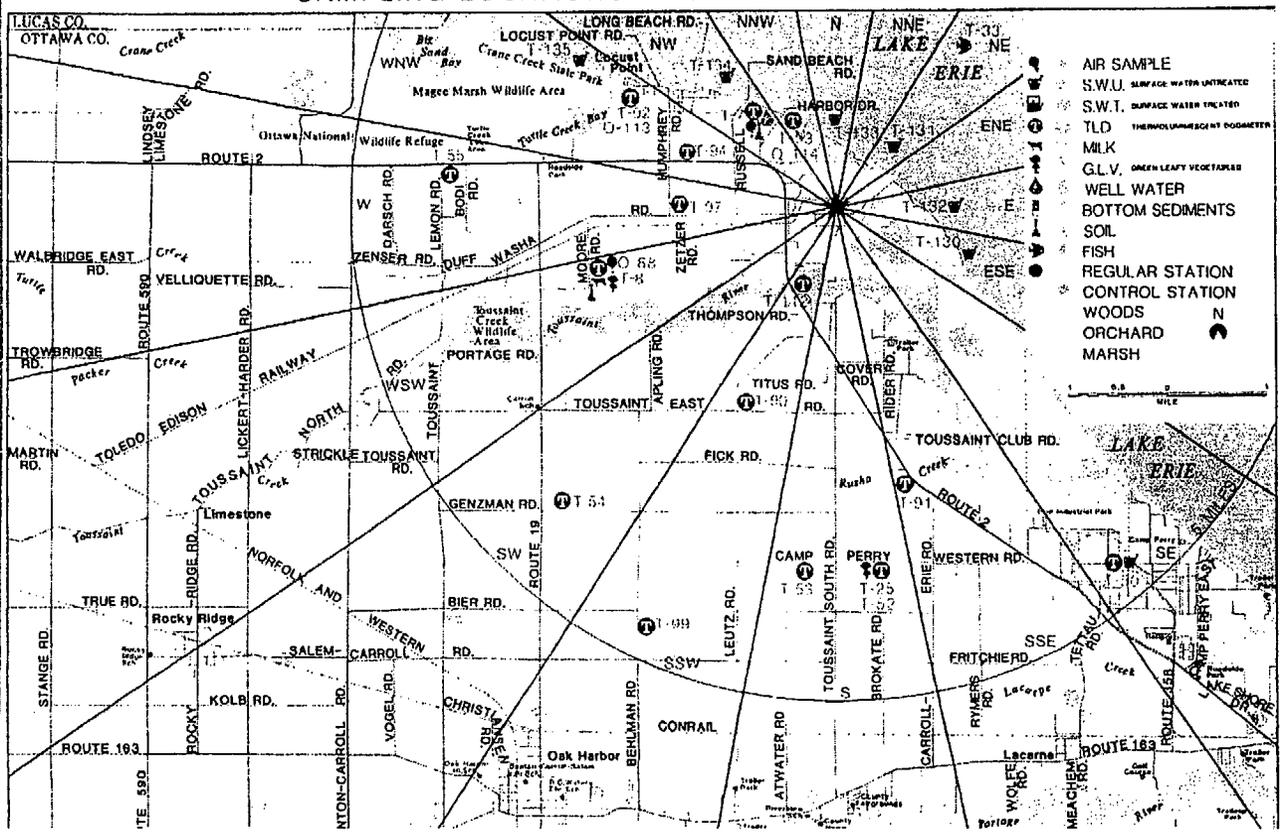
	Range
Self-Reading Dosimeters	0-10 rem or 0-100 rem 0-1.5 rem or 0-5 rem 0 - 200 mrem or 0-500 mrem
<u>OR</u>	
Electronic Alarming Dosimeters	
Dosimeter Charger	All ranges
Broad Spectrum TLD	All ranges
Radiation Monitor (Frisker)	0-50 kcpm
Eberline PCM-1	N/A

Figure 7-1

EMERGENCY FACILITIES BY GENERAL LOCATION

<u>SUPPORT AGENCIES</u>		<u>COMPANY</u>											
<u>(OFFSITE / GENERAL AREA)</u>		<u>(OFFSITE)</u>	<u>(ONSITE)</u>										
<table border="1"> <tr> <td colspan="2">State of Ohio Emergency Operations Center (EOC)</td> </tr> <tr> <td colspan="2">Ohio Emergency Management Agency Worthington, Ohio</td> </tr> </table>		State of Ohio Emergency Operations Center (EOC)		Ohio Emergency Management Agency Worthington, Ohio		<table border="1"> <tr> <td>Joint Public Information Center (JPIC)</td> </tr> <tr> <td>Toledo Edison Plaza Toledo, Ohio</td> </tr> </table>	Joint Public Information Center (JPIC)	Toledo Edison Plaza Toledo, Ohio	<table border="1"> <tr> <td>Control Room (CTRM)</td> </tr> <tr> <td>Davis-Besse 623' Elevation</td> </tr> </table>	Control Room (CTRM)	Davis-Besse 623' Elevation		
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Davis-Besse 623' Elevation													
<table border="1"> <tr> <td colspan="2">County Emergency Operations Center (EOC)</td> </tr> <tr> <td>Ottawa County Courthouse Annex Port Clinton, Ohio</td> <td>Lucas County Correction Center Toledo, Ohio</td> </tr> </table>		County Emergency Operations Center (EOC)		Ottawa County Courthouse Annex Port Clinton, Ohio	Lucas County Correction Center Toledo, Ohio	<table border="1"> <tr> <td>Corporate Planning Center (CPC)</td> </tr> <tr> <td>FirstEnergy Corp. Facility</td> </tr> </table>	Corporate Planning Center (CPC)	FirstEnergy Corp. Facility	<table border="1"> <tr> <td>Operations Support Center (OSC)</td> </tr> <tr> <td>Personnel Shop Facility (PSF) Fourth Floor</td> </tr> </table>	Operations Support Center (OSC)	Personnel Shop Facility (PSF) Fourth Floor		
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Ottawa County Courthouse Annex Port Clinton, Ohio	Lucas County Correction Center Toledo, Ohio												
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Personnel Shop Facility (PSF) Fourth Floor													
<table border="1"> <tr> <td>Nuclear Regulatory Commission (NRC) Operations Center</td> </tr> <tr> <td>Rockville, Maryland</td> </tr> </table>	Nuclear Regulatory Commission (NRC) Operations Center	Rockville, Maryland	<table border="1"> <tr> <td>Institute of Nuclear Power Operations Emergency Response Center (ERC)</td> </tr> <tr> <td>Atlanta, Georgia</td> </tr> </table>	Institute of Nuclear Power Operations Emergency Response Center (ERC)	Atlanta, Georgia	<table border="1"> <tr> <td>Alternate Emergency Operating Facility (AEOF)</td> </tr> <tr> <td>Lindsey Service Center Lindsey, Ohio</td> </tr> </table>	Alternate Emergency Operating Facility (AEOF)	Lindsey Service Center Lindsey, Ohio	<table border="1"> <tr> <td>Technical Support Center (TSC)</td> </tr> <tr> <td>Emergency Operations Facility (EOF)</td> </tr> <tr> <td>Radiological Testing Laboratory (RTL)</td> </tr> <tr> <td>Davis-Besse Administration Building First Floor (North)</td> </tr> </table>	Technical Support Center (TSC)	Emergency Operations Facility (EOF)	Radiological Testing Laboratory (RTL)	Davis-Besse Administration Building First Floor (North)
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Rockville, Maryland													
Institute of Nuclear Power Operations Emergency Response Center (ERC)													
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<table border="1"> <tr> <td>Incident Response Center (IRC)</td> </tr> <tr> <td>NRC Region III Lisle, Illinois</td> </tr> </table>	Incident Response Center (IRC)	NRC Region III Lisle, Illinois	<table border="1"> <tr> <td>Federal Emergency Operations Center</td> </tr> <tr> <td>DOE, COO Argon, Illinois</td> </tr> </table>	Federal Emergency Operations Center	DOE, COO Argon, Illinois								
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NRC Region III Lisle, Illinois													
Federal Emergency Operations Center													
DOE, COO Argon, Illinois													
<table border="1"> <tr> <td>Framatome Technologies</td> </tr> <tr> <td>Lynchburg, Virginia</td> </tr> </table>	Framatome Technologies	Lynchburg, Virginia	<table border="1"> <tr> <td>Bechtel Power Corporation</td> </tr> <tr> <td>Gaithersburg, Maryland</td> </tr> </table>	Bechtel Power Corporation	Gaithersburg, Maryland		<table border="1"> <tr> <td>Site Emergency Operations Center (SEOC)</td> </tr> <tr> <td>Davis-Besse Administration Building First Floor (Center)</td> </tr> </table>	Site Emergency Operations Center (SEOC)	Davis-Besse Administration Building First Floor (Center)				
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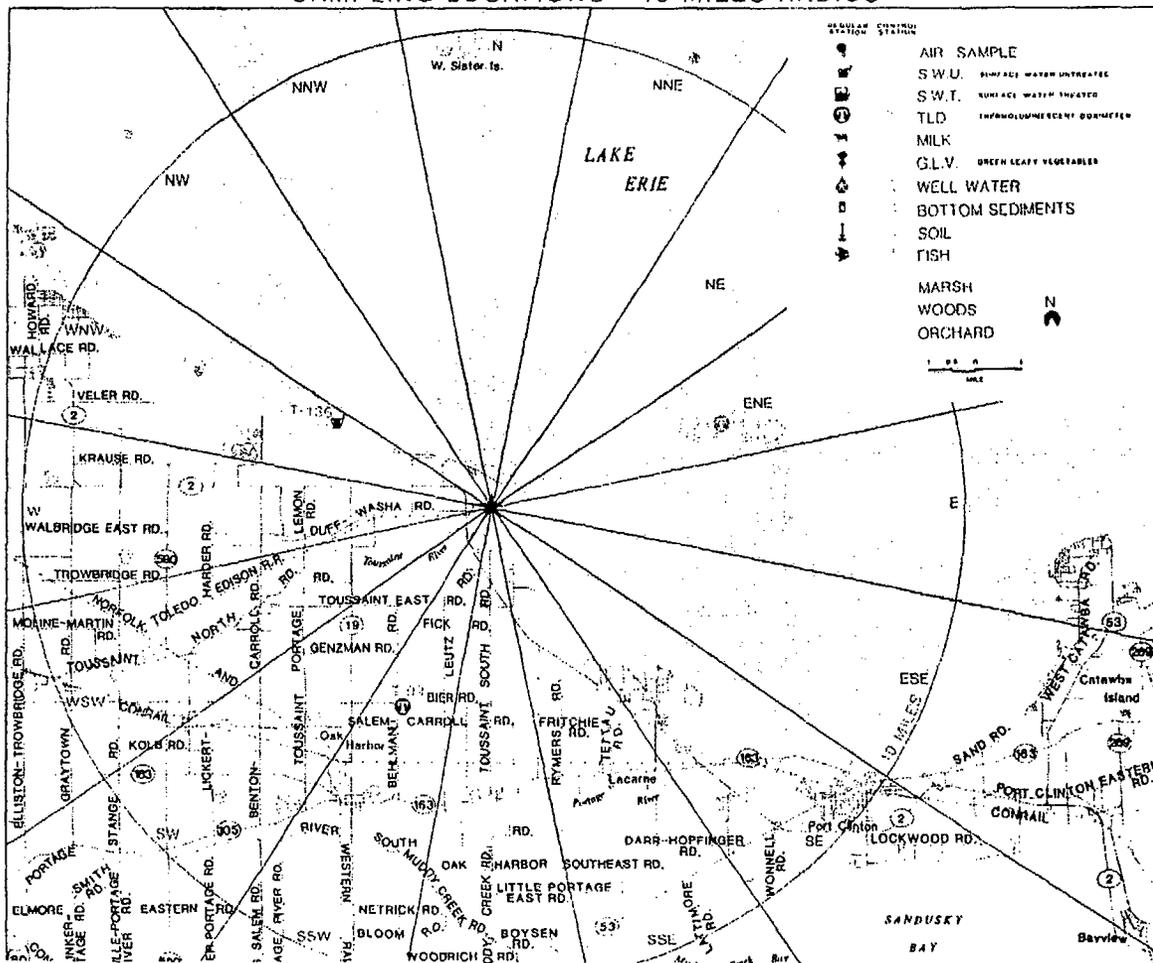
DAVIS-BESSE NUCLEAR POWER STATION RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SAMPLING LOCATIONS - 5 MILES RADIUS



DBNPS Sampling Locations - 5-mile Radius

Figure 7-2

**DAVIS BESSE NUCLEAR POWER STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
SAMPLING LOCATIONS - 10 MILES RADIUS**



DBNPS Sampling Locations - 10-mile Radius

Figure 7-3

8.0 MAINTENANCE OF EMERGENCY PREPAREDNESS

Efforts will be made to assure continuous emergency preparedness and operational readiness among Company personnel and the offsite response agencies and organizations. The Vice President - Nuclear has been assigned the overall responsibility for emergency preparedness as related to the DBNPS. This responsibility includes not only maintenance of the DBNPS Emergency Plan and Emergency Plan Procedures, but also its interrelationships with state, federal and county plans; agreement letters; corporate policy and plans; and other related plans, programs, and procedures. The Vice President - Nuclear is also responsible for training of personnel who implement the Plan and Procedures. To assist the Vice President - Nuclear in meeting these assigned responsibilities, a Manager – Regulatory Affairs has been designated. The specific responsibilities of the Manager – Regulatory Affairs are described in the following subsections; and in particular, subsection 8.1.3.

8.1 ORGANIZATIONAL PREPAREDNESS

8.1.1 Training

All personnel permitted access to the DBNPS protected area will take part in a formal training program under the direction of the Vice President - Nuclear. This training program provides for the indoctrination of Company employees and contractors. In addition it provides specialized training for licensed operators, chemistry personnel, radiation protection personnel, and personnel assigned specific responsibilities in the ERO.

The Vice President - Nuclear is responsible for ensuring that personnel in each department receive the appropriate training. The Nuclear Group Department Directors are responsible for identifying training required for each individual's job specialty. Training in support of the Emergency Plan, includes the following:

- a. All DBNPS staff personnel requiring unescorted access into the protected and certain vital areas will initially qualify in Plant Access and, requalify annually.

With regard to Emergency Preparedness, the following objectives have been established for the Plant Access Training Program:

1. State the purpose of the Emergency Plan, and associated procedures.
2. State the classifications of station emergencies.
3. Recognize the emergency alarms and state the proper response for each.
4. State the actions required during Emergency Plan implementation.
5. State the purpose and importance of accountability.
6. Identify the location of emergency facilities and assembly areas inside the Protected Area and Owner Controlled Area.
7. Discuss evacuation plans, including identification of evacuation routes.
8. State the company's policy concerning the release of information to the public and news media regarding an emergency.

9. State the function of the Prompt Notification System.
 10. Identify the appropriate communication system to be used for reporting emergencies, locating an individual in the Plant, and conducting lengthy discussions.
 11. Identify and discuss operation of the radiation exposure control criteria for personnel during an emergency for the persons who have access to Radiation Restricted Areas.
- b. Personnel assigned to the DBNPS ERO with specific Emergency Plan duties and responsibilities will receive specialized training for their respective assignments. Table 8-1 delineates which personnel shall receive specialized training, the type of training, and the minimum required frequency for each type of training.
- c. Training for offsite organizations and personnel involved in emergency preparedness for DBNPS is the responsibility of the State of Ohio and Ottawa and Lucas County Emergency Management Agencies. Training programs for these agencies are controlled and conducted in accordance with existing radiological emergency plans and procedures. Davis-Besse coordinates with the State of Ohio, county emergency management agency directors, and local authorities to ensure consistency and continuity of the above-mentioned plans and procedures with the DBNPS Emergency Plan and Emergency Plan Procedures. Davis-Besse financially supports the State of Ohio and the county agencies to ensure continued program maintenance and training support of the Radiological Emergency Preparedness (REP) program.
- d. The local fire departments will be invited to participate in a training program, which, as a minimum, will include the following topics:
1. Interface with the nuclear security force during emergencies.
 2. Basic health physics indoctrination and training.
 3. The DBNPS facility layout.
 4. Onsite fire protection system equipment (permanent and portable).
 5. Differences between onsite fire fighting equipment and fire company supplied equipment.
 6. Communications systems.
 7. Review of applicable parts of the DBNPS Emergency Plan and Emergency Plan Procedures.
 8. The onsite emergency organization, with specific emphasis on the interface between the DBNPS Fire Brigade and local fire department personnel. (Included in this training will be the understanding that when local fire support is required within the protected area, local fire department personnel will function in conjunction with, and under the direction of, the DBNPS Fire Brigade.)
- e. A joint review of the DBNPS EALs will be performed annually, by the Emergency Preparedness Unit, with state and local governmental agencies. This EAL review is directed toward offsite senior management personnel.

- f. A coordinated program shall be conducted annually to acquaint the news media with the Emergency Plan, information concerning radiation, and points of contact for release of public information in an emergency. Normally, this information will be presented through a mailing, which may include an invitation for a site/plant tour.

8.1.2 Drills and Exercises

- a. Periodic drills and exercises will be conducted in order to test the overall state of emergency preparedness. The prime objective of this form of training is to determine the level of emergency preparedness of all participating personnel, organizations, and agencies. More specifically, each drill or exercise will be conducted to meet the following objectives:
 - 1. Ensure that the participants are familiar with their duties and responsibilities.
 - 2. Verify the adequacy of the DBNPS Emergency Plan and Emergency Plan Procedures.
 - 3. Test communications networks and systems.
 - 4. Check the availability of emergency supplies and equipment.
 - 5. Verify the operability of emergency equipment.

The Manager – Regulatory Affairs is responsible for the planning, scheduling, and coordination of all emergency preparedness related drills and exercises.

All drills and exercises are subject to the approval of the Plant Manager. In addition, the Vice President, Nuclear will approve the Biennial Exercise.

Each drill requirement will be performed within the specified time interval, with a maximum allowable extension not to exceed 25% of the drill interval. An exercise will be conducted once every other calendar year to demonstrate the overall effectiveness of the Davis-Besse Emergency Preparedness Program. The scope and content of the biennial exercise will be consistent with established departmental procedures and regulatory requirements.

Instructions and coaching may be given to participants during a drill. Such actions are prohibited during a biennial exercise. Therefore, in order to take credit for specific drill objectives during an exercise, no instructions or coaching may occur.

- b. When a major drill or exercise is to be conducted, the Manager – Regulatory Affairs will:
 - 1. Assign personnel to prepare a scenario.
 - 2. Coordinate efforts with other participating emergency personnel, organizations, and agencies.
 - 3. Obtain the approval of the Plant Manager, and the Vice President-Nuclear (for the Biennial Exercise).

4. Schedule a date for drill execution and assign controllers.
5. Critique the results of the drill.
6. Assign personnel to correct any deficiencies.
7. Ensure that deficiencies are corrected.
8. Prepare and submit documentation to the Nuclear Records Management for record keeping of training conducted.

Scheduled drills and exercises will involve onsite as well as offsite emergency personnel, organizations, and agencies. These drills and exercises will be conducted simulating, as closely as possible, actual emergency conditions; and may be scheduled such that one or more drills or exercises are held simultaneously. Drill scenarios will be prepared that involve the participation of several emergency teams and all or specific parts of the onsite and offsite emergency organizations. This may include varying degrees of participation of state, county, and federal organizations and agencies, and local service support personnel and organizations. The Manager – Regulatory Affairs will notify the offsite emergency response organizations and agencies at least thirty days in advance of the scheduled date of the drill or exercise. Collection and analysis of all sample media (e.g., water, grass, soil and air) should be included in the drills. Drills will involve on-the-spot correction of erroneous performance, and a demonstration of the proper performance by the controller, if necessary.

During the conduct of exercises, the controllers are restricted in their ability to correct erroneous performance, and may only intercede to assure safety of personnel, or prevent damage to equipment.

Recommendations for revisions to the DBNPS Emergency Plan, Emergency Plan Procedures, and/or the upgrading of emergency equipment and supplies, as a result of a drill or exercise, are forwarded to the Manager – Regulatory Affairs by observers or participants. The Manager - Regulatory Affairs will submit such procedure revisions for review in accordance with Emergency Plan Administrative Procedure. Approved changes will be incorporated into the Emergency Preparedness Program under the direction of the Manager – Regulatory Affairs.

- c. Records will be maintained on each drill/exercise listed below.

1. Medical Emergency Drill:

At least one drill per calendar year will be conducted.

The drill will involve the participation of some, if not all, of the local medical support personnel and organizations (e.g., local physicians, ambulance services, hospitals, etc.), and will involve cases of radiation overexposure and/or contaminated personnel and/or contaminated/injured personnel.

2. Fire Emergency Drill:

Fire drills will be conducted in accordance with DB-FP-00005, Fire Brigade.

3. Communications Links Test:

The communication links used for notification (e.g., DBNPS Control Room to Ottawa and Lucas County Sheriffs' Offices, OEMA, Ottawa County EMA and Lucas County EMA) will be tested at least monthly.

Communications between the Nuclear Regulatory Commission (i.e., NRC Headquarters) and the TSC, EOF and Control Room will be tested at least monthly.

The communications links used for contacting federal agencies (i.e., NRC and the DOE Radiological Assistance Program personnel) and the State of Michigan will be tested at least quarterly.

The communications links between emergency centers and Field Assessment Teams (i.e., DBNPS EOF to RMTs) will be tested at least annually. Table 1-2, Communication Test Frequencies, defines the above time periods.

4. Exercise and Drills:

Emergency Preparedness exercises shall test the adequacy of timing, the content of implementing procedures and methods, test emergency equipment and communication networks, test the public notification system, and ensure that emergency organization personnel are familiar with their duties.

- a) DBNPS shall conduct an exercise of its onsite emergency plan every two years. This biennial exercise will include full participation by Ottawa and Lucas counties, and either full or partial participation by the State of Ohio. Federal agencies may also elect to participate.
- b) In those years between biennial exercises, at least one drill involving a combination of some of the principal functional areas of the onsite emergency capabilities shall be conducted. The principal areas of emergency response include activities such as management and coordination of emergency response, accident assessment, protective action decision-making, and plant system repair and corrective actions. During these drills, activation of all of the emergency response facilities is not necessary. State and local agencies within the plume exposure pathway EPZ may participate in these drills at their request.

5. Health Physics Drills:
 - a) Semiannual Health Physics drills will be conducted which involve response to, and analysis of, simulated elevated airborne samples and direct radiation measurements in the environment.
 - b) Radiation Monitoring Team (RMT) drills will be conducted semiannually which involve simulated elevated airborne samples and direct radiation measurements in the offsite environment.
 - c) An annual Post Accident Sampling System (PASS) drill will be conducted which includes an analysis of actual in-plant liquid samples (Reactor Coolant System) with simulated elevated radiation levels.
6. One exercise/drill in a six-year cycle will start between 6:00 p.m. and 4:00 a.m. Drills should be conducted under various weather conditions. Some drills may be unannounced.
7. Staff Augmentation Drills

Off-hours augmentation drills will be conducted semiannually to test and document the response times of the station emergency response staff personnel.

8.1.3 Manager – Regulatory Affairs

The Manager – Regulatory Affairs shall ensure that:

- a. Information, data, and procedures detailed in the Emergency Plan Procedures are consistent with the DBNPS Emergency Plan.
- b. Emergency Plan Procedures and other procedures are coordinated and interface properly (e.g., Administrative Procedures, Security Procedures, Radiation Protection Procedures, Training Procedures, etc.).
- c. Coordination of the DBNPS Emergency Plan and Emergency Plan Procedures with the:
 1. State Plans
 2. County Plans
 3. Davis-Besse Nuclear Security Plan
- d. Adequate staffing of the ERO is maintained.
- e. Emergency preparedness related training documentation is sent to Nuclear Records Management.

- f. Emergency preparedness related drills and exercises are coordinated as described in this Plan.
- g. Periodic reviews and updates of the DBNPS Emergency Plan and Emergency Plan Procedures occur as described in this Plan.
- h. Maintenance and inventory of emergency equipment and supplies is as described in this Plan.
- i. Changes in the federal regulations and guidance that impact emergency preparedness activities are incorporated into the program as applicable.

8.1.4 Ottawa County EMA and Lucas County EMA Directors

Emergency planning coordination among all Ottawa County and Lucas County agencies is the responsibility of the EMA Directors for each county. The Directors for these counties have the following responsibilities:

- a. Ensure that a sufficient number of preparatory courses are scheduled in the areas of radiological monitoring and decontamination procedures. These courses will assist radiological monitors and local officials in fulfilling their assigned functions in an emergency.
- b. In coordination with the American Red Cross, determine that a sufficient number of care centers will be available to house evacuees.
- c. Ensure a complete evacuation education program is available for residents and transients within the risk area.
- d. Work with state and local authorities to complete, test, and improve upon the Countywide Emergency Warning Plans, Emergency Communications Development Plans and Countywide Resource Manuals.

8.2 EDUCATIONAL INFORMATION FOR THE PUBLIC

For those members of the public residing within the 10-mile Emergency Planning Zone, DBNPS will provide written information on the following topics:

- a) Educational information on radiation;
- b) Contact for additional information;
- c) Protective measures, e.g., evacuation routes and relocation centers, sheltering, respiratory protection, radioprotective drugs; and
- d) Special needs of the handicapped.

Methods of providing this information may include direct mail, billing statement inserts, and/or telephone book inserts.

At least annually, in cooperation with the EMAs of Ottawa and Lucas Counties and the State of Ohio, DBNPS will update the information provided to members of the public within the 10-mile Emergency Planning Zone.

8.3 REVIEW AND UPDATE OF THE EMERGENCY PLAN AND EMERGENCY PLAN PROCEDURES

DBNPS maintains, as separate documents; this Emergency Plan, the Emergency Plan Implementing Procedures, Off-Normal Occurrence Procedures, the Emergency Plan Administrative Procedures, a Corporate Emergency Response Plan, a Public Information Emergency Response Procedure, the Emergency Plan Telephone Directory, and the Evacuation Time Estimate (ETE). It is intended that this plan, although considered as part of the Davis-Besse Nuclear Power Station (DBNPS), Unit 1, Final Safety Analysis Report (FSAR), will be maintained as a separate document. This is more clearly defined in the Updated Safety Analysis Report (USAR), Section 13.3.

- 8.3.1 The DBNPS Emergency Plan, including appended letters of agreement and plans of offsite organizations and agencies will be reviewed and updated biennially by the Emergency Preparedness Unit, under the direction of the Manager – Regulatory Affairs.
- 8.3.2 The DBNPS Emergency Plan will be reviewed annually by an independent group with no immediate responsibility for the emergency preparedness program. This group is the Nuclear Quality Assessment organization . Results and recommendations from the review will be documented and sent to appropriate corporate and plant management. A report on the adequacy of the interfaces between the DBNPS Emergency Plan and the state and local governments will be sent to the respective government agencies by the Emergency Preparedness Unit, and retained on file for at least five years.

Nuclear Quality Assessment is responsible for auditing the DBNPS Emergency Plan at least annually to verify compliance with the company's fire protection program, internal rules and procedures, federal regulations, and operating license provisions. Personnel performing audits of the DBNPS Emergency Plan and/or Emergency Plan Procedures will take into account corporate policy, state policy and plans, county plans, and the various agreements and understandings with federal, state, county and local support groups, agencies and organizations.

Results of each annual and biennial review and update (if needed) of the Davis-Besse Nuclear Power Station Emergency Plan and Emergency Plan procedures will be reported to the Vice President-Nuclear.

- 8.3.3 The Manager – Regulatory Affairs will provide an ongoing review of the Emergency Plan and Procedures.
- a. The DBNPS Emergency Plan Procedures will be incorporated into the DBNPS procedures program. As such, procedures will be prepared, reviewed, approved, controlled, distributed, and revised in accordance with DBNPS administrative procedures. Document holders (e.g., DBNPS, state, county, and federal agencies, etc.) will receive revisions to the Emergency Plan Procedures in a controlled manner, as they are issued. In addition, these Emergency Plan Procedures will provide guidance to document holders on how to make comments and recommendations concerning the Emergency Preparedness Program to DBNPS. Revisions to the DBNPS Emergency Plan will be similarly controlled.
 - b. The Manager – Regulatory Affairs is responsible for coordinating the periodic review and audit of the DBNPS Emergency Plan and Emergency Plan Procedures. In addition, the Manager – Regulatory Affairs will, through letters, meetings, seminars, or other means available; ensure that appropriate elements of the emergency organization are informed of the DBNPS Emergency Plan and amendments thereto, and the Emergency Plan Procedures and revisions thereto.

8.4 MAINTENANCE AND INVENTORY OF EMERGENCY EQUIPMENT AND SUPPLIES

The Manager – Regulatory Affairs is responsible for planning and scheduling the quarterly inventory and inspection of designated emergency supplies and equipment.

Designated emergency equipment and supplies, and their storage locations, will be listed in the Emergency Plan Administrative Procedures.

Such equipment and supplies will be maintained in accordance with approved DBNPS procedures. Equipment, supplies, and parts having shelf lives shall be checked and replaced as necessary.

TABLE 8-1

Sheet 1 of 3

PERIODIC TRAINING OF EMERGENCY RESPONSE PERSONNEL

Personnel Category	Involved Personnel	Training and Frequency
Emergency Assistant Plant Manager	Station personnel designated as Emergency Assistant Plant Manager	Emergency Assistant Plant Manager shall periodically receive training on DBNPS Emergency and Abnormal Operating Procedures and reactor thermal shock considerations equivalent to that received by SRO licensed individuals.
Licensed Operators	Shift Managers Unit/Field Supervisors Other licensed staff members	Reactor Operators and Senior Reactor Operators receive extensive on-the-job and formal training as scheduled and conducted by the operator requalification training program. This program shall include a comprehensive review of the DBNPS Emergency Plan and the Emergency Plan Procedures.
Personnel responsible for assessment of emergencies	Emergency Director, Emergency Plant Manager, Emergency Offsite Manager, Shift Managers, Shift Technical Advisors (STAs), Key Emergency Response Personnel Staff personnel designated by the Plant Manager who may act as OSC and TSC Managers Other members of the Nuclear Group staff as designated by the Vice President - Nuclear.	Training will include the Emergency Plan, Emergency Plan Procedures, Technical Specifications (that are referenced in the Emergency Action Levels), and other station programs, plans, and procedures. The listed individuals attend at least one meeting per year to receive training on the Emergency Plan and Procedures. Detailed instructions with special attention given to the use of either dose assessment or engineering assessment techniques is provided based on the role they are expected to play during an emergency. Personnel shall participate in scheduled exercise and drills depending on availability.
Radiological Monitoring Personnel	Station personnel designated as Radiation Monitoring Team Members	On an annual basis, detailed instructions are provided on such topics as classification of emergencies, interfaces and responsibilities of the radiological monitoring and assessment personnel, personnel protection during emergencies, location and use of emergency equipment, monitoring techniques, and communications.

TABLE 8-1

Sheet 2 of 3

PERIODIC TRAINING OF EMERGENCY RESPONSE PERSONNEL

Personnel Category	Involved Personnel	Training and Frequency
Post Accident Sampling Personnel	Chemistry personnel designated by the Chemistry Supervisor to perform PASS samples	On an annual basis, detailed training shall be provided on the purpose and applications of the Post Accident Sampling System with both a detailed review of applicable system procedures and a walkdown of the system equipment.
First Aid Team(s)	Station personnel as designated by station management	Each member of the First Aid Team(s) shall receive a standard accredited first aid course, including cardiopulmonary resuscitation (CPR). Satisfactory completion of this course certifies them as members of the First Aid Team(s). Recertification training shall be provided at the frequency required by the certifying organization. Annually, a refresher course shall be made available for the team members which shall include a review of CPR, portions of the standard first aid course and handling of contaminated injured victims. In addition, after completing the standard first aid course, and during each of the annual refresher courses, each member shall be instructed on the availability of onsite medical treatment facilities, equipment, and supplies; communication systems; radiological hazards existing during personnel-related emergencies; and interfaces and responsibilities with local medical support personnel (e.g., local physicians, ambulance personnel, etc.).
Security Force	Nuclear Security Management	The listed individuals will receive training on at least an annual basis. The training program shall include the following subjects: a review of the applicable parts of the Emergency Plan, and Emergency Plan Procedures with emphasis on the classification of emergencies, communications, and specific areas of responsibility; personnel accountability; personnel and vehicle access control during emergencies; evacuation control; and interfaces with offsite support organizations and agencies.

TABLE 8-1

Sheet 3 of 3

PERIODIC TRAINING OF EMERGENCY RESPONSE PERSONNEL

Personnel Category	Involved Personnel	Training and Frequency
Fire Brigade	Fire Captains Designated shift personnel Other station personnel as designated by station management as Fire Brigade Members	This training which is provided to each person involved, is given by instructors trained in fire fighting. The program shall include, but not be limited to, the types of fires and their particular hazards, equipment to be used on each type of fire, the installed fire detection and protection systems, portable firefighting equipment and locations, respiratory protection devices, and radiological hazards existing during fire emergencies. In addition, a review of fire fighting procedures and techniques shall be included in the training program. Practical demonstrations of firefighting shall also be given. Fire Brigade training frequency is defined by the Fire Protection Program.
Corporate Emergency Response Organization Personnel	All Company personnel assigned duties and responsibilities in the Corporate Emergency Response Organization to support the DBNPS Emergency Plan	These personnel shall receive training at least on an annual basis. The program shall include a comprehensive review of the Corporate Emergency Response Organization and applicable procedures with specific attention and instruction given to their support role, responsibilities and duties.
Emergency Preparedness Personnel	Manager – Regulatory Affairs and designated staff	Periodic classroom training and seminars on Emergency Preparedness shall be provided on an as-needed basis and at the discretion of the Manager – Regulatory Affairs to these individuals from qualified outside organizations and documentation of this training maintained by the Emergency Preparedness Unit.

9.0 REENTRY AND RECOVERY

9.1 REENTRY

During an emergency, immediate actions are directed toward limiting the consequences of the accident, so as to afford maximum protection to Station personnel and the general public. Once corrective measures have been taken and effective control reestablished, the response efforts shift towards reentry and recovery. Reentry is made to perform certain essential actions which could not be performed coincident with the immediate response to the emergency.

Offsite Reentry is the responsibility of state and local authorities. It typically consists of environmental monitoring and assessment of the actions required to support return of the public to evacuated areas and residences. Additional details regarding plans and procedures for offsite reentry are found in The Ohio Plan for Response to Radiation Emergencies at Licensed Nuclear Facilities. DBNPS will provide support and assistance to offsite agencies as requested to facilitate these efforts.

Onsite reentry is made when the emergency situation is under control and more deliberate planning can be made for the activities to be performed. These activities may occur prior to termination of the emergency, or they may be conducted as part of the Recovery phase of the response. All reentry actions conducted prior to the termination of the emergency will be authorized by the Emergency Plant Manager, and coordinated by the Operations Support Center (OSC) Manager and the Emergency Radiation Protection (RP) Manager. Reentry conducted during Recovery will be authorized by the Plant Recovery Manager. When preplanning these initial onsite reentries, the following items will typically be considered:

- 9.1.1 Review available radiation surveillance data to determine plant areas potentially affected by radiation and/or contamination.
- 9.1.2 Review radiation dose histories of personnel required to participate in the recovery operations.
- 9.1.3 Determine the need for additional personnel and the source of these additional personnel.
- 9.1.4 Review adequacy of radiation survey instrumentation and equipment (i.e., types, ranges, number, calibration).
- 9.1.5 Pre-plan survey team activities to include:
 - a. Areas to be surveyed
 - b. Anticipated radiation and contamination levels
 - c. Radiation survey equipment required
 - d. Shielding requirements and availability
 - e. Protective clothing and equipment required
 - f. Access control procedures (issuance of new RWPs) including exposure control limits and personnel dosimetry required
 - g. Decontamination requirement
 - h. Communications requirements

- 9.1.6 Review and revise security access lists to prevent unauthorized or unintentional entry into hazardous areas.
- 9.1.7 Reentry teams should be tasked with as many of the following as possible:
- a. Determination of the initial required recovery operations.
 - b. Observation of hazards or potential hazards associated with the recovery operations.
 - c. Conducting comprehensive surveillance of plant facilities.
 - d. Isolating and posting of areas in the plant with appropriate warning signs and rope barriers, such as Radiation Areas, High Radiation Areas, High Airborne Activity Areas, and Contaminated Areas, etc.
 - e. Assessing the conditions of station equipment and areas.

In the period immediately following an accident, initial radiation monitoring functions involve only gross hazard evaluations, isolation of the hazard, and the definition of radiological problem areas. This immediate radiation surveillance activity is used to provide the basic information for recovery operations.

9.2 RECOVERY

The Emergency Director and Emergency Plant Manager have the joint responsibility for determining when an emergency situation is stable and the Station is ready to enter the recovery phase. The Recovery Organization will develop and coordinate plans and schedules for recovery operations. Following a SITE AREA or GENERAL EMERGENCY, the Company Nuclear Review Board (CNRB) will participate in the recovery planning effort to assure that all nuclear safety aspects of the recovery are satisfied. The CNRB will report their findings to the Recovery Director, who shall take the actions that he deems appropriate for safe recovery operations.

The Emergency Plant Manager, under the direction of the Emergency Director, will be responsible at the site for coordinating onsite recovery activities and the return to normal operations.

At the time that an emergency has been terminated, and Recovery has been initiated, the Emergency Offsite Manager will be responsible for providing notification to all applicable agencies (federal, state, county, etc.).

- 9.2.1 Prior to terminating an emergency and entering the Recovery phase, the Emergency Director will coordinate with the Emergency Plant Manager and the Emergency Offsite Manager to ensure that the following criteria have been considered:
- a. The conditions which caused the emergency have stabilized, are under control, and are unlikely to deteriorate further.
 - b. The plume is beyond the ten-mile Emergency Planning Zone, and/or plume tracking is no longer required. The only environmental assessment activities in progress may be those necessary to assess the extent of deposition resulting from passage of the plume.

- c. In-plant radiation levels are acceptable, and are stable or decreasing.
- d. Radioactive releases are under control and are no longer in excess of technical specification limits.
- e. The potential for uncontrolled radioactive releases is acceptably low.
- f. Containment pressure is within technical specifications.
- g. The reactor is in a stable safe shutdown condition and long-term core cooling is available as required.
- h. Any fire, flood, earthquake or similar emergency condition no longer exist.
- i. All contaminated injured, personnel have been transported to a medical care facility.
- j. All required notifications have been made.
- k. Offsite conditions will not limit access of personnel and support resources to DBNPS.
- l. Discussions have been held with all offsite and select regulatory agencies, and agreement has been reached to terminate the emergency.

9.2.2 The extent of recovery activities will dictate the precise framework of the Recovery Organization:

- a. For events of a minor nature, the normal onshift organization should be adequate to perform necessary recovery actions (e.g., for UNUSUAL EVENT classifications).
- b. For events involving significant damage to plant systems required to maintain operation of the plant, the onsite emergency organization, or portions thereof, should be adequate to coordinate the necessary recovery actions (e.g., for ALERT classifications).
- c. For events involving damage to plant systems required to maintain safe shutdown of the reactor, a formal Recovery Organization will be established to manage the recovery actions (e.g., for SITE AREA or GENERAL EMERGENCY classifications).

Particular attention should be directed toward isolating components and systems as required to control or minimize the hazards. A systematic investigation will be conducted to determine the extent of any equipment damage. Recovery operations are considered to be terminated when the plant has returned to pre-accident levels of radiation and contamination or to conditions, which are acceptable and controllable for an extended period of time.

Recovery operations that may result in the release of radioactive materials shall be evaluated by the Recovery Director. Such events and data pertaining to the release will be reported to the appropriate offsite emergency organizations and agencies.

In the final phase of the recovery operations, a restoration program will begin. The overall purpose of the restoration program is to prepare for resumption of full-power operations. This program will include a detailed incident analysis. Determinations will be made as to the repair work required to perform needed modifications to plant equipment and/or operating procedures. Repair work and approved modifications will be carried out as authorized. Test programs to confirm fitness and acceptability to return to service will be developed and executed.

Since no emergency is considered to exist during this time period, normal limits of radiation dose will be applied during the restoration. Compliance with the limits are the responsibility of the Recovery Director.

A recovery plan, must be flexible enough to adapt to existing, rather than theoretical, conditions. It is not possible to anticipate in advance all of the conditions that may be encountered in an emergency situation. Therefore, the DBNPS plan addresses some general principles that will serve as a guide for developing a flexible plan of action.

Specific members of the Recovery Organization will be selected based upon the sequence of events that preceded the recovery activities.

9.2.3 The following is a basic framework for the formation of a formal Recovery Organization. The reporting chain for the organization is outlined in Figure 9-1. This organization may be modified as necessary for any particular incident.

a. Recovery Director

The Recovery Director is responsible for directing the activities of the Recovery Organization, including the following:

1. Ensure that sufficient personnel from DBNPS and other organizations are available to support recovery.
2. Direct the development of a recovery plan and implementing procedures, as required.
3. Coordinate with the CNRB to ensure adequate review of engineering activities and proper review and approval of the recovery plan and implementing procedures.
4. Coordinate the deactivations of emergency response facilities and personnel as appropriate.
5. Coordinate the integration of available state and federal assistance into recovery activities.
6. Coordinate with offsite authorities, and provide support as required for offsite recovery activities.
7. Review all information released by the Public Information Organization.

- b. Plant Recovery Manager:
 - 1. Reports to the Recovery Director.
 - 2. Coordinates the development and implementation of the recovery plans and procedures, under the direction of the Recovery Director.
 - 3. Directs all onsite activities supporting of the recovery of DBNPS.

- c. Radiation Protection Coordinator:
 - 1. Reports to the Plant Recovery Manager.
 - 2. Develop plans and instructions to process and control liquid, gaseous and solid wastes in a manner consistent with the recovery organizational goals.
 - 3. Coordinate cleanup and repair activities, in such a manner as to ensure that dose to the workers is maintained as low as is reasonably achievable.
 - 4. Estimate the total population dose, as necessary.
 - 5. Develop plans for plant radiation surveys, sampling, and shielding in support of waste system processing, plant repairs, and design modification activities.
 - 6. Designate members of Reentry/Recovery Team(s) dealing with onsite radiological aspects of the response.
 - 7. Organize and coordinate actions of the Reentry Team.
 - 8. Ensure teams are adequately briefed and equipped with the required protective gear, and are familiar with the radiological conditions and precautions for the area to be reentered.
 - 9. Provide an interface between the teams and the Recovery Management to ensure reentry actions are approved and executed in accordance with instructions, and provide the teams with the required support.

- d. Technical and Engineering Coordinator:
 - 1. Reports to the Plant Recovery Manager.
 - 2. Coordinate the development of plans and procedures in support of plant systems and operation activities.
 - 3. Provide a central point for the collection, retention, retrieval and transmission of plant data.
 - 4. Analyze problems, determine alternatives and develop plans in the recovery of system operations.
 - 5. Designate members of Recovery Team(s) dealing with technical and engineering aspects of the plant.

- e. Operations Coordinator:
 - 1. Reports to the Plant Recovery Manager.
 - 2. Direct recovery activities conducted by Operations personnel.
 - 3. Provide recommendations to the Plant Recovery Manager regarding plant operations-related aspects of the recovery.

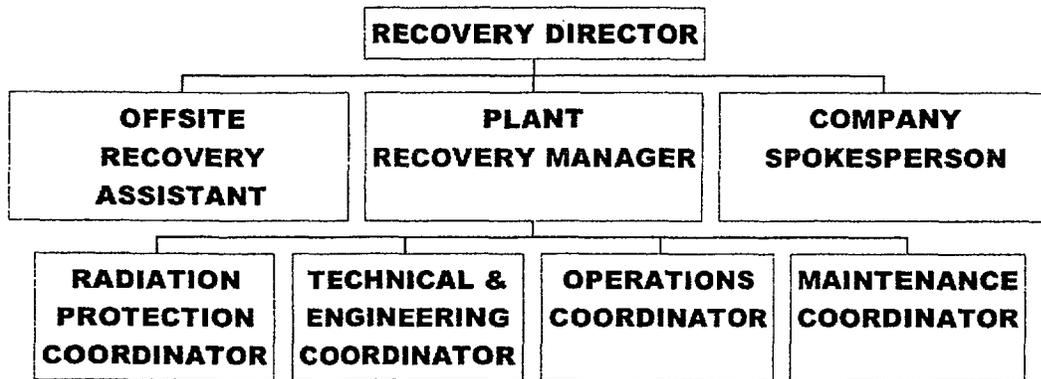
- f. Maintenance Coordinator:
 - 1. Reports to the Plant Recovery Manager.
 - 2. Coordinate maintenance activities conducted in support of recovery.
 - 3. Designate members of the Reentry team, as appropriate to support maintenance.

 - g. Offsite Recovery Assistant:
 - 1. Reports to the Recovery Director.
 - 2. Provides liaison with offsite agencies and coordinating DBNPS assistance with offsite recovery and assessment efforts, as requested.
 - 3. Coordinates any ingestion pathway sampling DBNPS elects to do to supplement that performed by the state.
 - 4. Coordinates the collection of other offsite radiological data, as required, in support of DBNPS recovery activities.

 - h. Company Spokesperson:
 - 1. Reports to the Recovery Director.
 - 2. Functions as the official spokesperson for the Company on all matters relating to the accident or the recovery.
 - 3. Coordinates with non-Company public information groups (e.g., Ottawa County, Lucas County, OEMA, NRC, FEMA, etc.).
 - 4. Interfaces with the news media.
 - 5. Coordinates media monitoring and rumor control activities.
- 9.2.4 The Recovery Organization described herein represents the disciplines and areas of expertise that would typically be required to support recovery from a severe nuclear accident. The organization will be modified based upon the specific accident from which DBNPS is recovering.
-

FIGURE 9-1

Recovery Organization Framework



Appendix A

EMERGENCY PLAN IMPLEMENTING

PROCEDURE INDEX AND CROSS-REFERENCE

**Emergency Plan Implementing
Procedure Index and Cross-Reference**

Page 1 of 2

<u>Implementing Procedures</u>	<u>Procedure Number</u>	<u>DBNPS Emergency Plan Section</u>
1. Emergency Classification	RA-EP-01500	4.1
2. Unusual Event	RA-EP-01600	4.1.1
3. Alert	RA-EP-01700	4.1.2
4. Site Area Emergency	RA-EP-01800	4.1.3
5. General Emergency	RA-EP-01900	4.1.4
6. Emergency Management	RA-EP-02010	5.1, 5.2, 5.3
7. Emergency Notifications	RA-EP-02110	6.1.1, 7.5
8. ECC Activation and Response	RA-EP-02220	5.4.6, 6.1.2, 7.0, 7.2
9. Dose Assessment Center Activation and Response	RA-EP-02230	5.4.6, 7.2
10. Offsite Dose Assessment	RA-EP-02240	6.2
11. Protective Action Guidelines	RA-EP-02245	6.4
12. RMT Surveys	RA-EP-02250	6.2, 5.4.6
13. Radiological Controls in the DBAB	RA-EP-02260	6.4.1, 6.4.2, 7.2
14. Facilities Support	RA-EP-02270	7.0
15. TSC Activation and Response	RA-EP-02310	5.4.4, 7.2
16. Emergency Technical Assessment	RA-EP-02320	6.2
17. OSC Activation and Response	RA-EP-02410	5.4.5, 6.4.2, 7.1.2
18. Search and Rescue	RA-EP-02420	6.4.1
19. Emergency Security Activation and Response	RA-EP-02510	5.3.4, 5.4.4, 6.4.3
20. Assembly and Accountability	RA-EP-02520	6.4.1
21. Evacuation	RA-EP-02530	6.4.1
22. Offsite Personnel & Vehicle Monitoring & Decontamination	RA-EP-02550	6.4.1
23. Emergency RP Organization Activation and Response	RA-EP-02610	5.4.4, 5.4.5
24. Emergency Exposure Control and Potassium Iodide Distribution	RA-EP-02620	6.5.1, 6.5.2
25. Station Radiological Surveys and Controls During Emergencies	RA-EP-02640	5.4.5, 6.5
26. Reentry	RA-EP-02710	9.1
27. Recovery Organization	RA-EP-02720	9.2

Emergency Plan Implementing
Procedure Index and Cross-Reference

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<u>Off Normal Procedures</u>	<u>Procedure Number</u>	<u>DBNPS Emergency Plan Section</u>
1. Medical Emergencies	RA-EP-02000	2.7, 5.7.2, 6.5.3
2. Preparation and Transport of Contaminated Injured Personnel	RA-EP-02800	2.7
3. Davis-Besse Emergency Telephone System	RA-EP-02805	2.7, 5.3.4
4. Emergency Helicopter Landing Zone	RA-EP-02807	2.7
5. Tornado	RA-EP-02810	2.6.5, 2.7.4, 7.9
6. Earthquake	RA-EP-02820	2.6.5, 2.7.4, 7.9
7. Flooding	RA-EP-02830	2.6.5, 2.7.4, 7.9
8. Explosion	RA-EP-02840	2.6.5, 2.7.4, 7.9
9. Hazardous Chemical and Oil Spills	RA-EP-02850	2.6.5, 2.7.4, 7.9
10. Radiological Incidents	RA-EP-02861	2.6.5, 2.7.4, 7.9
11. Containment Evacuation	RA-EP-02864	2.7, 6.4.1
12. Station Isolation	RA-EP-02870	2.6.5, 2.7, 7.9
13. Internal Flooding	RA-EP-02880	2.6.5, 2.7, 7.9
 <u>Administrative Procedures</u>		
1. Emergency Plan Training Program	RA-EP-00100	2.7, 8.1.1
2. Emergency Plan Drill and Exercise Program	RA-EP-00200	2.7, 8.1.1
3. Emergency Planning Activity Scheduling System	RA-EP-00300	2.7,
4. Prompt Notification System Maintenance	RA-EP-00400	2.7, 7.7
5. Response to Prompt Notification System Malfunction	RA-EP-00420	2.7, 7.7
6. Maintenance of Emergency Plan Telephone Directory	RA-EP-00510	2.7, 7.5.3
7. Emergency Response Organization	RA-EP-00520	2.7, 6.1
8. Computerized Automated Notification System	RA-EP-00550	2.7, 7.5.1
9. Emergency Facilities and Equipment Maintenance Program	RA-EP-00600	2.7, 8.4
10. DBAB Emergency Response Facility Preventative Maintenance Program	RA-EP-00650	2.7, 8.4
11. Emergency Facilities Communications Monthly Test	RA-EP-04000	2.7, 8.1.2
12. Station Alarm Test	RA-EP-04001	2.7, 8.1.2
13. Communication System Quarterly Test	RA-EP-04002	2.7, 8.1.2
14. Computerized Automated Notification System Weekly Test	RA-EP-04003	2.7, 8.1.2
15. Emergency Facilities Communication Quarterly Test	RA-EP-04010	2.7, 8.1.2
16. Prompt Notification System Test	RA-EP-04400	2.7
 <u>Public Information Procedure</u>		
1. JPIC Activation and Response	RA-EP-02950	2.7, 4.3.3, 5.5, 7.2

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A 1a		2.8, 5.7, Table 2.1	F 1d		7.5
A 1b		5.1 - 5.7	F 1e		6.1.2, 7.5.1
A 1c		Table 2-1	F 1f		7.5
A 1d		5.2	F2		7.5.3, 7.7
A 1e		5.1.2, 5.1.3, Table 5.1	F 3		8.1.2
A 2a		N/A	G 1		8.2
A 2b		N/A	G 2		8.2
A 3		App. C	G 3a		7.2.4
A 4		5.0	G 3b		7.2.4
B 1		5.3	G 4a		5.2.4
B 2		5.2.1	G 4b		5.5, 7.2.4
B 3		5.2.1, 5.3.1-5.3.3	G 4c		7.2.4
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B 6		Figure 6-2	H 2		7.2
B 7		Table 5-1, 5.6	H 3		N/A
B 7a		7.0	H 4		Table 5-1, 7.5.1
B 7b		7.2	H 5a		7.8
B 7c		7.2	H 5b		7.8.6, 7.8.8
B 7d		7.2	H 5c		7.8.9
B 8		5.7.4	H 5d		7.8.6
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D 2		Table 4-2	I 1		Table 4-1, Table 4-3
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F 1a		7.5	I 9		7.8, Table 7-4
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J 1a		6.4.1	K 6c		6.4.3
J 1b		6.4.1	K 7		6.5.3
J 1 c		6.4.1	L 1		5.7.2, 6.5.4, 6.5.5
J 1d		6.4.1	L 2		6.5.3
J 2		6.4.1	L 3		N/A
J 3		6.4.1, 6.4.3, 6.5.3	L 4		5.7.2, 6.5.4
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J 7		6.4.1	M 4		9.2.3.c.3
J 8		App. D	N 1a		8.1.2
J 9		N/A	N 1b		8.1.2
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J 10b		App. D	N 2b		8.1.2
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J 10d		N/A	N 2d		8.1.2
J 10e		N/A	N 2 e(1)		8.1.2
J 10f		N/A	N 2e (2)		8.1.2
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J 10j		N/A	N 3d		8.1.2
J 10k		N/A	N 3e		8.1.2
J 10l		N/A	N 3f		8.1.2
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K 1b		6.5.1	0 1b		N/A
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K 1f		6.5.4	0 4b		8.1.1
K 1g		6.5.5	0 4c		8.1.1
K 2		5.2.1, 6.5.1	0 4d		8.1.1
K 3a		5.2.1	0 4e		8.1.1
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K 4		N/A	0 4g		8.1.1
K 5a		6.5.3	0 4h		8.1.1
K 5b		6.5.3	0 4i		8.1.1
K 6a		6.4.3	0 4j		8.1.1
K 6b		6.4.3	0 5		8.1.1

CROSS-REFERENCE

NUREG		DB Emerg.		NUREG		DB Emerg.
<u>0654</u>	to	<u>Plan Section</u>		<u>0654</u>	to	<u>Plan Section</u>
P 1		Table 8-1		P 6		App. A, 8.3, Table of Contents
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P 3		8.1.3, 8.3		P 8		App. A
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P 5		8.3		P 10		7.5.3

Appendix B

Department of Energy Emergency Radiological Assistance Plan

for

Toledo Edison Company

Davis-Besse Nuclear Power Station

(Under Separate Cover)

Appendix C

SAMPLE LETTERS OF AGREEMENT

Contents

Carroll Township EMS & Fire Service, Inc.

H. B. Magruder Hospital

St. Charles Mercy Hospital

Memorial Hospital

Institute of Nuclear Power Operations

EMERGENCY RESPONSE AGREEMENT

This Agreement made and entered into by and between FirstEnergy (hereinafter "Utility") and the Carroll Township Emergency Medical and Fire Service, Inc., in consideration of the following:

1. The Carroll Township Emergency Medical and Fire Service, Inc., (hereinafter "Service, Inc.") agrees to use equipment available to it to provide twenty-four hour emergency ambulance and fire protection for actual emergencies, drills and training activities at FirstEnergy, located within the jurisdictional boundary of Carroll Township, Ottawa County, Ohio, all subject to the actual emergency needs of the whole Township. When necessary to provide such actual emergency service, Service, Inc., will request any mutual aid or assistance, as may be necessary and that may be available from surrounding communities.
2. The Utility shall provide Service, Inc., with any supplies and additional equipment or modifications to current equipment that may be necessary, as determined in the sole judgment of the Utility, for Service, Inc., to fulfill its obligations hereunder or to meet the requirements of the Nuclear Regulatory Commission that may apply to this Agreement; if the necessary equipment is not provided to Service, Inc., by Utility, then the obligations hereunder required of Service, Inc., are waived and Service, Inc., shall not be required in any fashion to fulfill the obligations hereof, nor shall Service, Inc., be liable for failing to fulfill said obligations. Any equipment provided by the Utility to Service, Inc., shall be stored and maintained in the discretion of Service, Inc.
3. Further, the Utility agrees to assume all expense and costs of providing specialized training for participating personnel and support personnel as designated by Service, Inc. This training shall include an annual review of necessary emergency transportation procedures, equipment, supplies, annual training sessions and participation in periodic emergency drills. Service,

Inc., will submit invoices for reimbursement on a time and material basis which shall be promptly paid to Service, Inc., by the Utility.

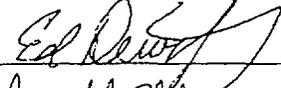
4. Carroll Township Emergency Medical and Fire Service, Inc., agrees to make practice runs and/or drills in conjunction with exercises of the emergency plan as may be mutually agreed upon, but such agreement shall not be unreasonably withheld.
5. It shall be the responsibility of The Utility to protect and safeguard the personnel and equipment of Service, Inc., and any mutual aid responders, from radiation, and The Utility shall further be totally liable for and shall assume all costs of complete decontamination, repair and/or replacement of any and all property, damaged or destroyed, and the expenses and damages for persons injured or killed, in fulfillment of the obligations of this Agreement, regardless of what entity or person is injured or killed, or what entity or person is the owner of the damaged property; this shall be done promptly in order to avoid any interruption in fire and ambulance service to the community. However, in no event shall The Utility be required to replace or repair any property in excess of its prior fair market value. Further, The Utility shall not be liable for any cost of complete decontamination, repair and/or replacement of any and all property which is the result of sole active negligence of the Service, Inc.
6. Further, The Utility shall indemnify and hold Service, Inc., Carroll Township, the Board of Carroll Township Trustees, any other entity providing mutual aid response, and any and all persons associated with any such organizations, harmless from any and all liability for damages, expense, injuries or losses that may occur in the fulfillment of the obligations of this Agreement, except for nonradiological emergency ambulance and fire protection services. The Utility aforesaid indemnity and hold harmless agreement shall not be applicable to any liability caused by the sole activity negligence of Service, Inc., or any other mutual aid responder.

- 7. There shall be no charge for the aforesaid fire protection; however, the Utility shall pay the Carroll Township Emergency Medical and Fire Service, Inc., the rate of \$60.00 per hour, for time from call until the ambulance is back in service, for emergency ambulance calls in excess of twelve per year.
- 8. This Agreement shall remain in effect until terminated in writing by either party (30) days prior to the effective date.

FirstEnergy

By: 
By: _____

Carroll Township Emergency
Medical and Fire Service, Inc.

By: 
By: 

STATE OF OHIO)
) SS:
COUNTY OF OTTAWA)

Be it remembered that on this 8th day of August, 2000,
before me a Notary Public in and for said County, personally came
Guy G. Campbell and _____,
officers of FirstEnergy, who acknowledged the signing of the above Agreement as
officers of FirstEnergy, on behalf of FirstEnergy, and by the authority of its Board of
Directors, and that the Agreement is the voluntary act and deed of
Guy G. Campbell and _____, as such officers, and the
voluntary act and deed of FirstEnergy for the purposes stated therein.

IN TESTIMONY WHEREOF, I have hereunto subscribed by name and affixed my
seal this 8th day of August, 2000.

Nora L. Flood

Notary Public – State of Ohio
My Commission expires Sept. 4, 2002.
Nora L. Flood



STATE OF OHIO)
) SS:
COUNTY OF OTTAWA)

Be it remembered that on this 23rd day of August, 2000,
before me a Notary Public in and for said County, personally came
~~Lowell Johannsen~~ and Ed Dewitz,
officers of Carroll Township Emergency Medical and Fire Service, Inc., who
acknowledged the signing of the above Agreement as officers of Service, Inc., on behalf
of Service, Inc., and by the authority of its Board of Directors, and that the Agreement is
the voluntary act and deed of Lowell Johannsen and
Ed Dewitz, as such officers, and the voluntary act and deed
of the Service, Inc., for the purposes stated therein.

IN TESTIMONY WHEREOF, I have hereunto subscribed by name and affixed my
seal this 23rd day of August, 2000.

Sharron K. Farrow exp 08-24-00
Notary Public - State of Ohio
My Commission expires August 24, 2000
Sharron Farrow

*Magruder
Hospital*

*EKT 00-00625
E 1.19.1*

615 Fulton Street
Port Clinton, Ohio 43452
(419) 734-3131, FAX (419) 732-8217

November 29, 2000

Mr. Patrick J. McCloskey
Supervisor – Emergency Preparedness
Davis-Besse Nuclear Power Station
5501 State Route 2, Mail Stop 3060
Oak Harbor, Ohio 43449-9760

Dear Mr. McCloskey:

This is to reaffirm our commitment of November 14, 1972 in that H.B. Magruder Memorial Hospital will accept casualties arising from radiation accidents at the Davis-Besse Nuclear Power Station.

It is understood that the FirstEnergy Company is financially responsible for any modifications of the existing hospital facility which may be required by regulations of the Nuclear Regulatory Commission or others, for the treatment of patients exposed to radioactive materials. This also includes training of hospital personnel as may be required, and for special equipment as may be necessary.

It is further understood that written procedures detailing the actions to be followed for the care of these patients will be implemented and that our personnel will continue to receive instructions regarding this plan of action and will make periodic “dry runs” as needed.

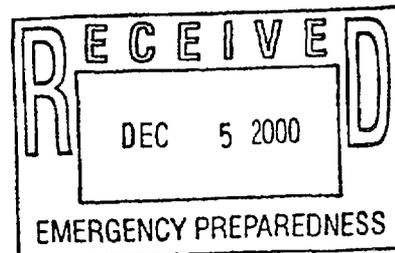
This agreement shall remain in effect until terminated in writing by either party thirty (30) days prior to the effective date.

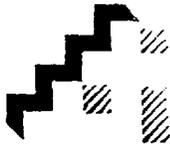
Sincerely,

David R. Norwine
David R. Norwine
President & CEO

DRN/pap

*12/7/00
cc R. Strauss*





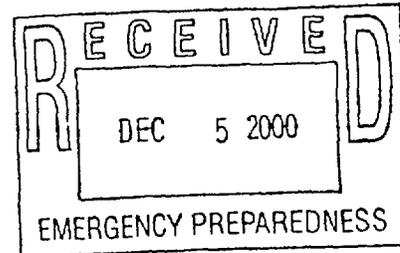
ST. CHARLES
Mercy Hospital

OK7 00 006d6
8.1.19.1

2600 Navarre Avenue
Oregon, Ohio 43616
(419) 698-7200

30 November 2000

Mr. Patrick McCloskey
Supervisor - Emergency Preparedness
Davis-Besse Nuclear Power Station
5501 N. State Route 2, Mail Stop 3060
Oak Harbor, OH 43449-9760



Dear Mr. McCloskey,

This is to reaffirm our commitment, specified in our mutual agreement with First Energy, that St. Charles Hospital will accept casualties arising from radiation accidents at the Davis-Besse Nuclear Power Station.

It is understood that First Energy is financially responsible for any modifications of the existing hospital facility which may be required by regulations or other guidance of the Nuclear Regulatory Commission (NRC) or the Federal Emergency Management Agency (FEMA) for the treatment of patients exposed to radioactive materials. This also includes training of hospital personnel as may be required, and for special equipment as may be necessary.

It is further understood that written procedures detailing the actions to be followed for the care of these patients will be implemented and that our personnel will continue to receive instructions regarding this plan of action and will make periodic "dry runs" as needed.

This agreement shall remain in effect until terminated in writing by either party thirty (30) days prior to the effective date.

Sincerely,

Sharon Belkofer

Sharon Belkofer, RN, CEN
Director Emergency Services

cc: Carol Whittaker, Metro Vice President Patient Services

12/7/00 cc J.M. Teal

EKT 01-00053
8.19.1

January 26, 2001



MEMORIAL
HOSPITAL

715 SOUTH TAFT AVENUE
FREMONT, OHIO 43420
419 332-7321

Mr. Patrick J. McCloskey
Supervisor - Emergency Preparedness
Davis-Besse Nuclear Power Station
5501 State Route 2, Mail Stop 3060
Oak Harbor, Ohio 43449-9760

Dear Mr. McCloskey:

This letter reaffirms our commitment of June 30, 1998, that Memorial Hospital will accept casualties arising from radiation accidents at the Davis-Besse Nuclear Power Station.

It is understood that FirstEnergy is financially responsible for any modifications to the existing hospital facility which may be required for regulations of the Nuclear Regulatory Commission or others, for the treatment of patients exposed to radioactive materials. This also includes training of hospital personnel as may be required and for special equipment as may be necessary.

It is further understood that written procedures detailing the actions to be followed for the care of these patients will be implemented and that our personnel will continue to receive instructions regarding this plan of action and will make periodic "dry runs" as needed.

This agreement shall remain in effect until terminated in writing by either party thirty (30) days prior to the effective date.

Sincerely,

John A. Gorman/A

John A. Gorman, CEO

JAG:pc
cc: Safety Committee

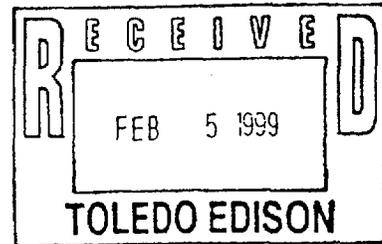
Jerome McTague, Medical Director, Emergency Department

1/31/01
cc RWS/D5G

INPO*Institute of
Nuclear Power
Operations*700 Galleria Parkway, NW
Atlanta, GA 30339-5957
770-644-8000
FAX 770-644-8549

February 2, 1999

EXT-99-00086

Mr. Michael Brees
Senior Staff Advisor
Perry Nuclear Power Plant
FirstEnergy Corp.
P. O. Box 97
Perry, OH 44081

Dear Mr. Brees:

This letter certifies that the plant emergency assistance agreement between INPO and its member utilities remains in effect. In the event of an emergency at your utility, INPO will assist you in acquiring the help of other organizations in the industry, as described in Section 1 of the *Emergency Resources Manual*, INPO 86-032. If requested, INPO will provide the following assistance:

- facilitate technical information flow from the affected utility to the nuclear industry
- locate replacement equipment and personnel with technical expertise
- obtain technical information and industry experience regarding plant component and systems
- provide an INPO liaison to facilitate interface

This agreement will remain in effect until terminated in writing. Should you have questions, please call me at (770) 644-8210.

Sincerely,

James R. Morris
Vice President and Director
Plant Operations Division

JRM:ss

cc: Mr. John P. Stetz
Mr. James L. Freels
Mr. Vernon K. Higaki
Mr. James H. Syrowski
Mr. Sigval M. Berg

Appendix D

Supporting Documents

(Under Separate Cover)

FIRSTENERGY CORPORATE EMERGENCY RESPONSE PLAN

EVACUATION TIME ESTIMATES

THE OHIO PLAN FOR RESPONSE TO RADIATION
EMERGENCIES AT LICENSED NUCLEAR FACILITIES

OTTAWA COUNTY PLAN FOR RESPONSE TO
RADIATION EMERGENCIES AT LICENSED NUCLEAR FACILITIES

LUCAS COUNTY RADIOLOGICAL EMERGENCY RESPONSE PLAN

Davis-Besse Nuclear Power Station

EMERGENCY PLAN IMPLEMENTING PROCEDURE

RA-EP-02245

Protective Action Guidelines

REVISION 03

Prepared by: B. W. Cope

Procedure Owner: Manager, Regulatory Compliance

Effective Date: JUN 08 2005

Procedure Classification:

Safety Related

Quality Related

Non-Quality Related

LEVEL OF USE:
IN-FIELD REFERENCE

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1.0 PURPOSE

- 1.1 This procedure defines specific guidelines for determining protective action recommendations for emergencies involving abnormal releases of radioactivity at the Davis-Besse Nuclear Power Station (DBNPS).

2.0 REFERENCES

2.1 Developmental

- 2.1.1 U.S. Food and Drug Administration, Federal Register, Vol. 47, No. 205, Oct. 22, 1982
- 2.1.2 NRC IE Information Notice No. 83-28: Criteria for Protective Action Recommendations for General Emergencies, dated May 4, 1983.
- 2.1.3 EPA-400-R-92-001, May 1992, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents
- 2.1.4 Anno, George, Dore, and Michael: The Effectiveness of Sheltering as a Protective Action Against Nuclear Accidents Involving Gaseous Releases, EPA 520/I-78- 001A, April 1978.
- 2.1.5 SAND 77-1725, Public Protection Strategies for Potential Nuclear Reactor Accidents – Sheltering Concepts with Existing Public and Private Structures.
- 2.1.6 Davis-Besse Nuclear Power Station Emergency Plan.
- 2.1.7 Regulatory Information Summary (RIS) 2003-12, NRC Regulatory Issue Summary 2003-12: Clarification of NRC Guidance for Modifying Protective Actions
- 2.1.8 KLD Associates, Inc., “Development of Evacuation Time Estimates for Davis-Besse Nuclear Power Station”, Revision 5, February 2003.
- 2.1.9 NEI Position Paper, Range of Protective Actions for Nuclear Power Plant Incidents, July, 2004.
- 2.1.10 Regulatory Information Summary (RIS) 2002-16, Current Incident Response Issues
- 2.1.11 Regulatory Information Summary (RIS) 2004-13, Consideration of Sheltering in Licensee's Range of Protective Action Recommendations

2.2 Implementation

- 2.2.1 RA-EP-02110, Emergency Notification
- 2.2.2 RA-EP-02240, Offsite Dose Assessment
- 2.2.3 RA-EP-02520, Assembly and Accountability
- 2.2.4 RA-EP-02530, Evacuation

2.2.5 RA-EP-02620, Emergency Dose Control and Potassium Iodide Distribution

3.0 DEFINITIONS

- 3.1 ALARA – As Low As Reasonably Achievable, means making every reasonable effort to maintain exposures to radiation as far below the dose limits in 10CFR20 as is practical and consistent with the purpose for which the licensed activity is undertaken.
- 3.2 COMMITTED DOSE EQUIVALENT (CDE) – The dose equivalent to organs or tissues that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.
- 3.3 CORE MELT SEQUENCE – A situation in which the core could be uncovered and there is no means for restoring cooling to the core. Without cooling, overheating and melting of the fuel will occur.
- 3.4 DADS – The Data Acquisition and Display System is a computerized system, which provides plant parameters, meteorology data, dose calculations, and other related programs.
- 3.5 EMERGENCY PLANNING ZONE (EPZ) – The two zones that are established around a nuclear power station in which predetermined protective actions plans are needed.
- 3.5.1 The first zone has an approximate radius of 10 miles for the plume exposure pathway.
- 3.5.2 The second zone has an approximate radius of 50 miles for the ingestion exposure pathway.
- 3.6 EVACUATION DOSE – The dose that a potential evacuee would receive if he or she were openly exposed during the evacuation.
- 3.7 EVACUATION EXPOSURE PERIOD – The period during which those people being evacuated are exposed to the radioactive plume.
- 3.8 EXPOSURE TIME – That period of time during which the offsite population will be exposed to radiation as a result of an airborne radioactive release.
- 3.9 KI FOR THE GENERAL PUBLIC - Recommending potassium iodide (KI) for the general public is the responsibility of the State of Ohio Department of Health. The station will recommend to the State administering KI in accordance with State procedures upon declaration of a General Emergency.
- 3.10 LAKE BREEZE – A meteorological condition that may occur on clear, sunny days. During a lake breeze, a radioactive release can travel inland, rise, reverse course in an overhead return flow, and then return to land in a convoluted path.
- 3.11 MINIMUM RADIOACTIVE RELEASE PROTECTIVE ACTION RECOMMENDATIONS (PAR) – At a minimum a PAR will be issued for Subarea 1, Subarea 12, and affected downwind subareas within five miles AND advise the general public to take KI in accordance with the Ohio Plan for Response to Radiation Emergencies at Licensed Nuclear Facilities.

- 3.12 OFFSITE – Any area outside the Owner Controlled Area surrounding Davis-Besse Nuclear Power Station.
- 3.13 PUFF (SHORT DURATION) RELEASE – A radioactive release of less than one hour duration.
- 3.14 RELEASE - A release is defined as a radiological release attributable to the emergency event. Two levels of radiological release exist:
- a. A minor unplanned release below levels that require offsite Protective Action Recommendations.
 - b. A release that requires offsite Protective Action Recommendations.
- 3.15 SAFETY PARAMETER DISPLAY SYSTEM (SPDS) – The SPDS is a group of graphic displays developed to assist with monitoring plant operations.
- 3.16 SECTOR – One of the 16 areas bounded by radii 22½ degrees apart into which the 10-mile EPZ is divided. Sectors are designated by the Letters A through P, excluding I and O. Sector A is north, E is East, J is south, and N is west.
- 3.17 SHELTERING – The use of a structure for radiation protection from an airborne plume and from deposited radioactive material. A wood frame home without a basement is the assumed structure for sheltering in the Davis-Besse EPZ.
- 3.18 TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE) – The sum of the deep-dose equivalent (for external exposure) and the Committed Effective Dose Equivalent (for internal exposure).

4.0 RESPONSIBILITIES

- 4.1 The Emergency Director is responsible for directing protective actions for Station personnel and recommending protective actions to offsite officials for the Plume Exposure Pathway (10-mile EPZ).
- 4.2 The Dose Assessment Coordinator is responsible for collecting and analyzing offsite dose assessment data used to provide the basis for protective action recommendations.

5.0 INITIATING CONDITIONS

Initiate this procedure when a declared emergency has the potential for an abnormal release of radioactivity.

6.0 PROCEDURE

6.1 Onsite Protective Actions

- 6.1.1 The Emergency Director shall initiate the necessary actions to protect DBNPS personnel.
- a. Evacuate personnel in accordance with RA-EP-02530, Evacuation.
 - b. Account for personnel in accordance with RA-EP-02520, Assembly and Accountability.
 - c. Distribute potassium iodide in accordance with RA-EP-02620, Emergency Dose Control and Potassium Iodide Distribution.
- 6.1.2 All supervisors shall ensure that appropriate safety and ALARA precautions are implemented.

NOTE 6.2

- ANY CONDITION THAT JUSTIFIES ISSUING AN OFFSITE PROTECTIVE ACTION REQUIRES A GENERAL EMERGENCY DECLARATION.
- Offsite Protection Action Recommendations shall be made with initial notification of a General Emergency.
- Davis-Besse will always recommend EVACUATION of Subarea 12 (Lake Erie) and when appropriate Subarea 10 (Wildlife area) due to lack of shelters in these areas.
- A SHELTERING PAR will NOT be issued for any subarea in which an EVACUATION PAR has already been recommended.

6.2 Offsite Protective Actions

6.2.1 Complete Attachment 1 to determine recommended PAR.

CAUTION 6.2.2

Protective Action Recommendations once issued start in motion a sequence of events in the 10-mile emergency planning zone that, if modified, have the potential to cause confusion that may hamper the orderly implementation of protective actions for the general public.

6.2.2 Notify offsite agencies and the NRC of the PARs and the affected subareas using RA-EP-02110, Emergency Notification, and Initial Notification Form, DBEP-010.

- a. **IF** these are revised PARs
THEN DO NOT downgrade a previously issued PAR for a specific subarea until the conditions that caused the PAR to be issued are fully under control. The new PAR should include those subareas that were previously evacuated or sheltered and any new subareas.
- b. **IF** a lake breeze is occurring, the wind direction is unknown, or the wind direction is from between 162° and 277°,
THEN inform the NRC that the release may enter Canadian territory.
- c. **IF** TEDE doses are ≥ 1 Rem or thyroid dose ≥ 5 Rem are projected beyond 10 miles,
THEN coordinate with state and county officials to determine appropriate PAR.

6.2.3 As Radiation Monitoring Team (RMT) data becomes available, compare it to dose projections and verify that Protective Action Recommendations are adequate.

6.3 Continue to monitor radiological and meteorological conditions, and repeat Steps 6.1 and 6.2 as required.

7.0 FINAL CONDITIONS

Terminate this procedure when the Emergency Director, and offsite agencies determine that dose assessment and protective actions are no longer necessary.

8.0 RECORDS

8.1 The following quality assurance records are completed by this procedure and shall be listed on the Nuclear Records List, captured, and submitted to Nuclear Records Management in accordance with NG-NA-00106:

8.1.1 None

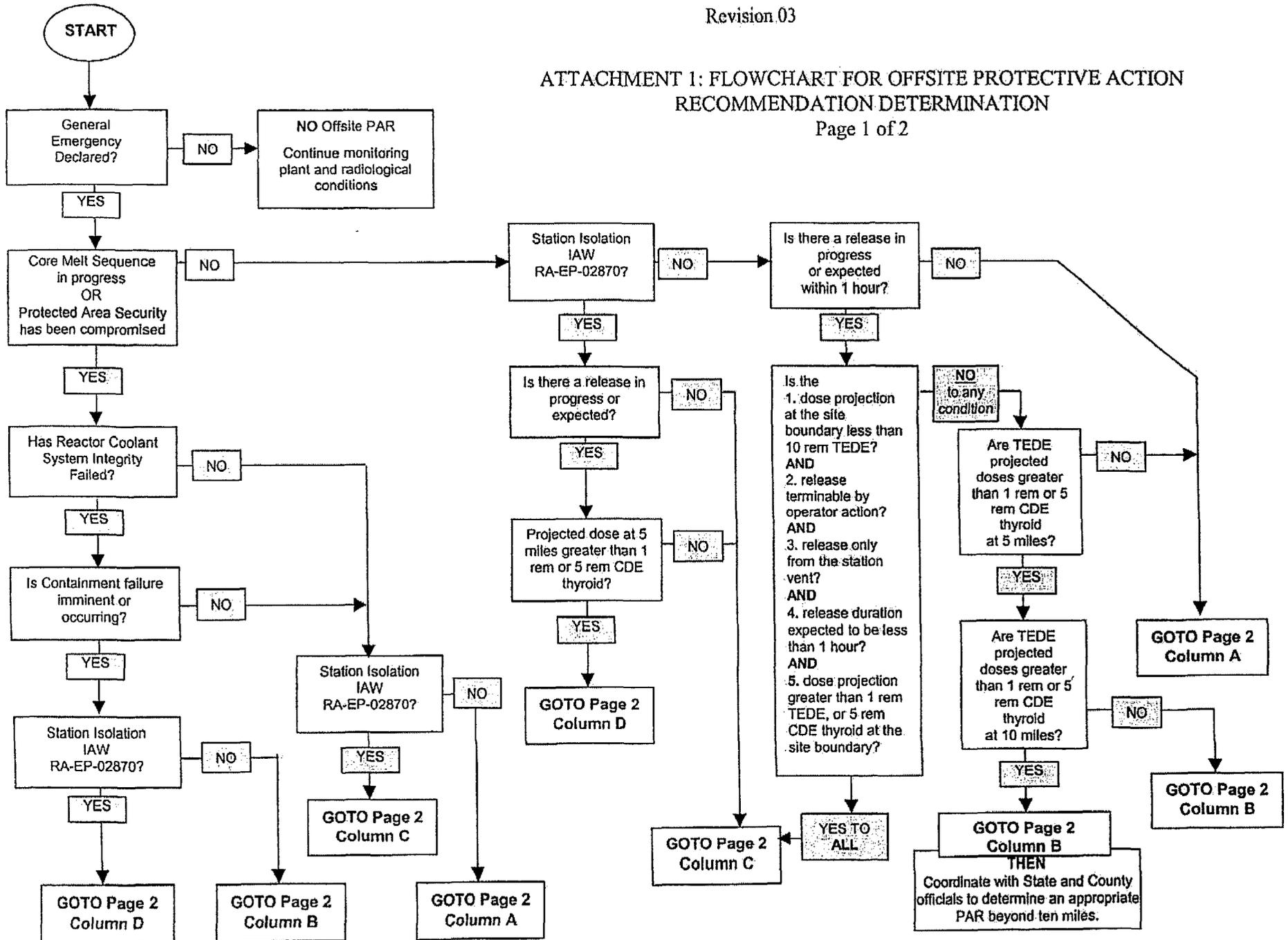
8.2 The following non-quality assurance records are completed by this procedure and may be captured and submitted to Nuclear Records Management, in accordance with NG-NA-00106:

8.2.1 None

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ATTACHMENT 1: FLOWCHART FOR OFFSITE PROTECTIVE ACTION
RECOMMENDATION DETERMINATION

Page 1 of 2



ATTACHMENT 1: FLOWCHART FOR OFFSITE PROTECTIVE ACTION
RECOMMENDATION DETERMINATION

Evacuate

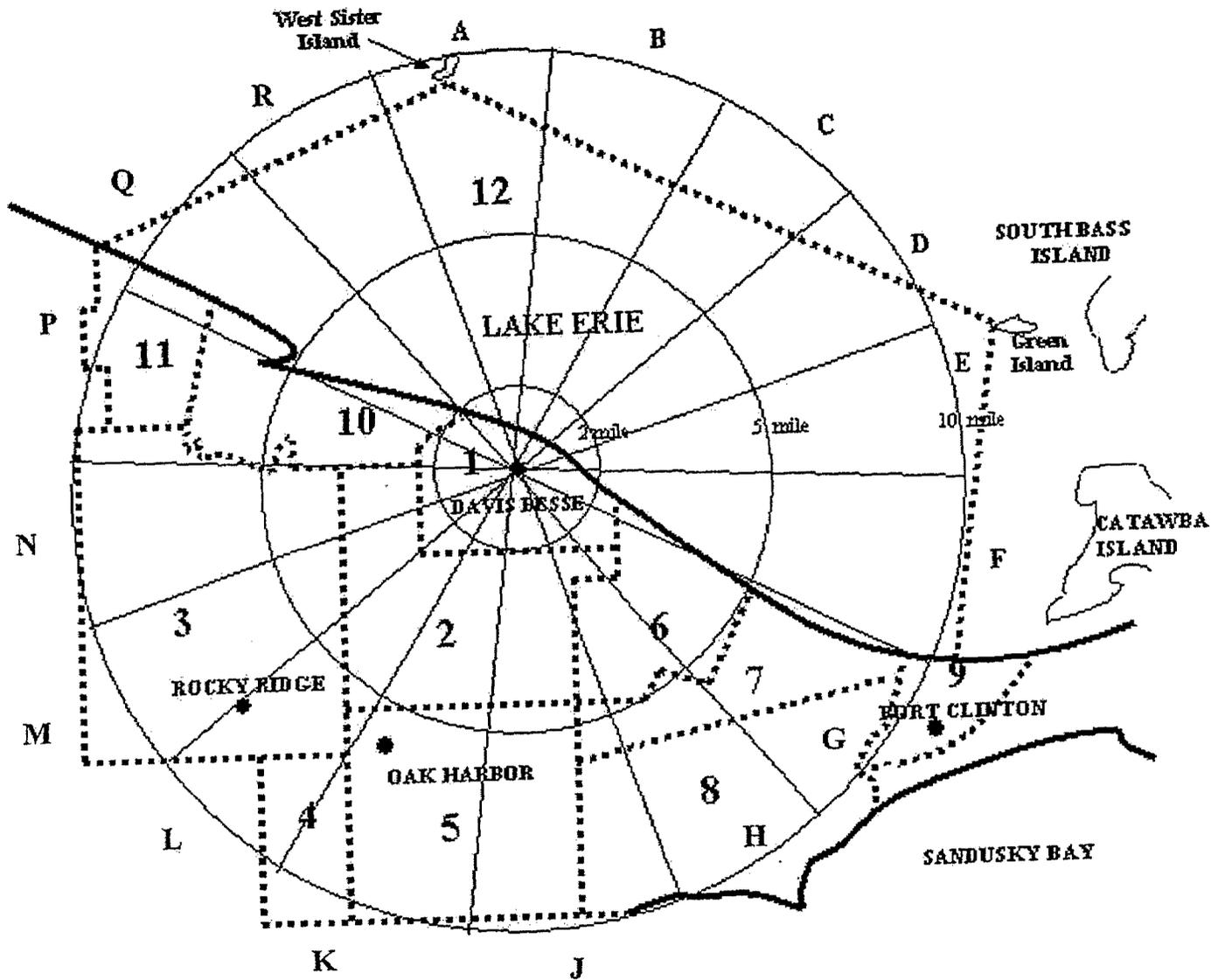
Wind Direction From	A	B
	2-Mile Radius & 5-Miles Downwind	5-Mile Radius & 10-Miles Downwind
	Subareas	Subareas
Unknown or Lake Breeze	1, 2, 6, 10, 12	ALL Subareas
141° to 278°	1, 12	1, 12
279° to 286°	1, 6, 12	1, 6, 7, 9, 12
287° to 293°	1, 6, 12	1, 6, 7, 8, 9, 12
294° to 330°	1, 2, 6, 12	1, 2, 6, 7, 8, 9, 12
331° to 005°	1, 2, 6, 12	1, 2, 5, 6, 7, 8, 12
006° to 013°	1, 2, 6, 12	1, 2, 4, 5, 6, 7, 8, 12
014° to 020°	1, 2, 12	1, 2, 4, 5, 12
021° to 065°	1, 2, 12	1, 2, 3, 4, 5, 12
066° to 072°	1, 2, 12	1, 2, 3, 4, 12
073° to 078°	1, 2, 10, 12	1, 2, 3, 10, 12
079° to 117°	1, 2, 10, 12	1, 2, 3, 10, 11, 12
118° to 122°	1, 10, 12	1, 3, 10, 11, 12
123° to 140°	1, 10, 12	1, 10, 11, 12

Shelter/Evacuate

Wind Direction From		C	D
		2-Mile Radius & 5-Miles Downwind	5-Mile Radius & 10-Miles Downwind
		Subareas	Subareas
Unknown or Lake Breeze	Shelter	1, 2, 6	1, 2, 3, 4, 5, 6, 7, 8, 9, 11
	Evacuate	10, 12	10, 12
141° to 278°	Shelter	1	1
	Evacuate	12	12
279° to 286°	Shelter	1, 6	1, 6, 7, 9
	Evacuate	12	12
287° to 293°	Shelter	1, 6	1, 6, 7, 8, 9
	Evacuate	12	12
294° to 330°	Shelter	1, 2, 6	1, 2, 6, 7, 8, 9
	Evacuate	12	12
331° to 005°	Shelter	1, 2, 6	1, 2, 5, 6, 7, 8
	Evacuate	12	12
006° to 013°	Shelter	1, 2, 6	1, 2, 4, 5, 6, 7, 8
	Evacuate	12	12
014° to 020°	Shelter	1, 2	1, 2, 4, 5
	Evacuate	12	12
021° to 065°	Shelter	1, 2	1, 2, 3, 4, 5
	Evacuate	12	12
066° to 072°	Shelter	1, 2	1, 2, 3, 4
	Evacuate	12	12
073° to 078°	Shelter	1, 2	1, 2, 3
	Evacuate	10, 12	10, 12
079° to 117°	Shelter	1, 2	1, 2, 3, 11
	Evacuate	10, 12	10, 12
118° to 122°	Shelter	1	1, 3, 11
	Evacuate	10, 12	10, 12
123° to 140°	Shelter	1	1, 11
	Evacuate	10, 12	10, 12

Once the PAR and subareas are selected **GOTO** Step 6.2.2

ATTACHMENT 2: COMPARISON OF OFFSITE SECTORS AND SUBAREAS
Page 1 of 1



COMMITMENTS

<u>Step Number</u>	<u>Reference</u>	<u>Comments</u>
Attachment 2	O 13602	Depiction of both 22.5° sectors and evacuation subareas
Attachments 1	O 13523	Combination of subareas 1 and 12 for protective action recommendations
Attachment 1	O 13592	Release duration considered in projected dose calculations
Attachment 1	O 13645	Automatic recommendation to evacuate "keyhole"
Attachments 2	O 13920	Combine Subareas 1, 8, and 11 of Evacuation Sector Map (Note: Original Lake subareas were 8 - 13. Subarea 12 now includes all of Lake Erie within 10-miles of the station. The area within 2 miles of the station is described by Subarea 1 (Land) and Subarea 12 (Lake Erie)
Attachment 2	O 13684	Large scale EPZ map same as this attachment
6.2.2.b	O 14992	Protective Action decisions during Lake Breeze
Attachment 1	O 13584	Provide sufficient guidance to make appropriate Protective Action Recommendations
Entire Procedure	Q 00780	Procedure for determining protective measures during an emergency
6.2.2.a	O 20716	RIS 2003-12, Clarification of NRC Guidance for Modifying Protective Action guidance for changing offsite protective action was incorporated. (CR 03-06439)
Attachment 1		RIS 2004-13, Consideration of Sheltering in Licensee's Range of Protective Action Recommendations

Davis-Besse Nuclear Power Station

EMERGENCY PLAN OFFNORMAL OCCURRENCE PROCEDURE

RA-EP-02870

STATION ISOLATION

Revision 02

Prepared by: Craig Stachler

Procedure Owner: Manager - Security

Effective Date: NOV 13 2002

Procedure Classification:

- Safety Related
- Quality Related
- Non-Quality Related

**LEVEL OF USE:
IN-FIELD REFERENCE**

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1.0 PURPOSE

This procedure describes measures to be taken if the Davis-Besse Nuclear Power Station (DBNPS) is or is likely to become isolated.

2.0 REFERENCES

2.1 Developmental

2.1.1 Davis-Besse Nuclear Power Station (DBNPS) Emergency Plan

2.1.2 Emergency Plan Telephone Directory

2.1.3 Human Resources Letter 513: Pay in Adverse Weather/Emergency Situations

2.2 Implementation

2.2.1 NOP-LP-1002, Fitness for Duty Program

2.2.2 RA-EP-00600, Emergency Facilities and Equipment Maintenance Program

3.0 DEFINITIONS

- 3.1 **ADVERSE WEATHER CONDITIONS** - Weather conditions which can disrupt normal vehicular transportation to and from DBNPS. These conditions are primarily winter storms and flooding.
- 3.2 **CONTINUOUS STATION ISOLATION PREPARATIONS** - Actions taken in advance to minimize discomfort for persons who are stranded at DBNPS. These preparations include storage and maintenance of isolation supplies and the staging of Isolation Supply Trailers.
- 3.3 **ISOLATION WATCH** - Adverse weather has formed and is approaching the area.
- 3.4 **ISOLATION WARNING** - A formal notice that DBNPS may be isolated from normal vehicular transportation by adverse weather conditions.
- 3.5 **STATION ISOLATION** - DBNPS will be considered isolated when normal vehicular transportation to and from the station is no longer possible.
- 3.6 **ISOLATION SUPPLY TRAILER(S)** - Three trailers contain basic supplies for 50 people for two days; and one trailer contains supplies for 100 people for two days.
- 3.7 **STAGING** - The act of relocating one or more of the Station Isolation Supply Trailers in preparation for use.
- 3.8 **EMERGENCY VEHICLES** - Any vehicle which may be utilized during an emergency (salt truck, ski-dozer, etc.).
- 3.9 **DISMISS** - As used in this procedure, dismissed personnel are not required for continued station operation. Dismissed personnel may stay at DBNPS or they may leave if they wish.

4.0 RESPONSIBILITIES

- 4.1 The Supervisor - Emergency Preparedness shall maintain food supplies and sleeping facilities as defined in RA-EP-00600, Emergency Facilities and Equipment Maintenance Program.
- 4.2 The Shift Manager is responsible for declaring Isolation Watches, Warnings and Station Isolations when weather conditions necessitate these declarations.
- 4.3 Other positions with responsibilities in this procedure are: The Emergency Plant Manager, the Shift Engineer, the Supervisor - Security Shift, and the Isolation Coordinator.
- 4.4 Davis-Besse Nuclear Power Station Personnel:
 - a. should monitor local television and radio stations for weather and road conditions.
 - b. shall not contact the Control Room for weather and road reports.
 - c. shall carry their Company identification card whenever performing Company business.
 - d. are responsible for leaving their work area in a safe condition.

5.0 INITIATING CONDITIONS

This procedure shall be utilized by the Shift Manager during station isolation. Station isolations are typically caused by adverse weather conditions such as snow storms, ice storms, and flooding.

6.0 PROCEDURE

NOTE 6.1

1. An Isolation Watch is used to increase station and On Call Management's awareness of the potential for adverse offsite road conditions, and to prestage equipment and personnel.
2. Refer to Attachment 4, Terms Commonly Used During Adverse Weather Conditions.

6.1 Isolation Watch

- 6.1.1 The Shift Manager and Emergency Plant Manager, utilizing available information, evaluate projected severe weather conditions which may impact access to station.

Note: Available Information Sources are:

- Distribution Dispatcher (Delaware Service Center)
- System Dispatcher (System Operation Center)
- Periodic weather reports received on Control Room fax machine
- Local weather reports
- Reports from staff
- Other

- 6.1.2 If the assessment determines that projected weather may impact access, the following should occur:
- a. Evaluate consumable resources: fuel oil, compressed gases, gasoline, etc., necessary for continued plant operation and, as appropriate, arrange delivery prior to the storm.
 - b. Ensure proper staging of an Isolation Supply Trailer as needed for the Protected Area. Primary staging for the Protected Area is the north side of Service Building 6. Consideration should be given to staging the trailer out of the weather if possible (inside Service Building 6 or the Turbine Building Train Bay).
 - c. Fuel and shelter designated emergency vehicles, e.g., snow plows.
 - d. Notify the following continuous service personnel: Maintenance, Security, Radiation Protection and Chemistry.

NOTE 6.1.2.e

1. Call-outs of personnel are subject to the requirements of NOP-LP-1002, Fitness for Duty Program.
2. As appropriate, establish conference calls between selected personnel.

- e. Evaluate plant needs and place on standby those personnel which may be called in. At a minimum, call in the following on-call personnel when an isolation warning is issued:
 - Emergency Plant Manager
 - Emergency Assistant Plant Manager
 - Emergency Offsite Manager

6.2 Isolation Warning

6.2.1 When the Distribution Dispatcher (Delaware Service Center), the System Dispatcher (System Operation Center) or any other credible source indicates that weather conditions will impact or are impacting station access to the point that conditions will result in a Station Isolation the Shift Manager shall:

- a. Issue an Isolation Warning with the concurrence of the Emergency Plant Manager.

NOTE 6.2.1.b

1. Call-outs of personnel are subject to the requirements of NOP-LP-1002, Fitness for Duty Program.
2. As appropriate, establish conference calls between selected personnel.

- b. Call in the Emergency Plant Manager (EPM), Emergency Offsite Manager (EOM), and the Emergency Assistant Plant Manager . The EOM and EPM may elect to call in additional staff.
- c. Call in or retain Operations, Security, Radiation Protection, Chemistry and Maintenance personnel.

- d. Notify all personnel on the Integrated On Call Report of the Isolation Warning.
- e. Notify the Supervisor - Security Shift of the Isolation Warning.
- f. Appoint an Isolation Coordinator to assist the Shift Manager by maintaining a current status of activities associated with the isolation. Ordinarily the EOM is appointed Isolation Coordinator upon arrival at the site.

6.2.2 The Supervisor - Security Shift shall:

- a. As appropriate, seek information from personnel reporting to the Station as to the road conditions.
- b. Establish contacts with local law enforcement agencies to gather information on road conditions.
- c. Periodically advise the Shift Manager as to current road conditions.

6.2.3 The Shift Manager or designee shall:

- a. Ensure proper staging of an Isolation Supply Trailer as needed for the Protected Area. Primary staging for the Protected Area is the north side of Service Building 6. Consideration should be given to staging the trailer out of the weather if possible (inside Service Building 6 or the Turbine Building Train Bay).
- b. Ensure proper staging of two Isolation Supply Trailers as needed for the Owner Controlled Area. Primary staging for the Owner Controlled Area is the east parking lot between the Davis-Besse Administration Building and the Davis-Besse Administration Building Annex.
- c. Ensure emergency vehicles and snow removal equipment are ready for use, as appropriate.
- d. If station warning is due to snow, ensure that Maintenance Services personnel keep station roadways accessible.

6.2.4 The Emergency Plant Manager should:

- a. Confer with the On Call Emergency Director to determine the disposition of non-essential personnel. The following issues should be considered:
 - 1. Staffing requirements for continuous station operation.
 - 2. Staffing requirement for the Emergency Response Organization.
- b. IF non-essential personnel are to be dismissed, THEN, Human Resources Letter 513, Pay in Adverse Weather/Emergency Situations, should be reviewed. An appropriate message should then be prepared and communicated to non-essential employees.

NOTE 6.2.5

1. The need and ability to arrange for transportation is dependent upon the duration and severity of the storm, and the need for personnel. In some cases, it may be more appropriate from a personnel safety perspective to wait out the storm.
2. Call-outs of personnel are subject to the requirements of NOP-LP-1002, Fitness for Duty Program.
3. As appropriate, establish conference calls between selected personnel.
4. Utility employees with a valid Company Identification Card are permitted to travel "closed roads" when performing Company business or when returning directly home from work. As always, personnel should exercise good judgment when traveling on weather impacted roads.

6.2.5 The Isolation Coordinator shall:

- a. Use Attachment 1, Minimum Supplemental Station Isolation Staffing, and the Emergency Plan Telephone Directory, to assure the minimum staffing is called in.
- b. Arrange transportation for required staff members that can not reach the Station. Transportation resources should be considered in the following order:
 1. Station resources
 - 4 Wheel Drive Vehicles
 - Various Trucks
 - Ski-dozer
 2. First Energy resources
 - Materials/Fleet Management Director
- c. Contact personnel to advise them of the location of the pickup point. Contacted personnel shall be informed of the impending isolation, and should be told to prepare to remain onsite for several days.
- d. Arrange for staging of Protected Area and Owner Controlled Area Isolation Supply Trailers.
- e. Coordinate eating and sleeping arrangements for all isolated personnel with the On Call Emergency Facilities Services Manager (Owner Controlled Area) and the Shift Engineer (Protected Area), as appropriate.

6.3 Station Isolation

NOTE 6.3.1

Flooding is a local problem which generally affects all access routes, winter weather may only impact employees in a given community.

6.3.1 When vehicle access to the plant is no longer possible, the Shift Manager shall:

- a. Declare station isolation based on the current weather conditions and with the concurrence of the Emergency Plant Manager.
- b. Make an announcement over the Gaitronics advising all station personnel of the station isolation.
- c. Develop a shift schedule utilizing all available personnel based on the estimated duration of the station isolation.
- d. Notify the NRC if the isolation is considered to be a reportable condition under 10 CFR 50.72(b)(1)(v). At a minimum this notification should occur if minimum staffing of the Emergency Response Organization has been called for, and the isolation has lasted longer than four hours. The On Call NRC Liaison should be consulted, as appropriate.
- e. Evaluate ongoing and planned work activities and, as appropriate, suspend work which has the potential to impact plant operations.

6.3.2 The Isolation Coordinator shall:

- a. Establish a center to collect information and station a communicator.
- b. Advise the Shift Manager, Emergency Plant Manager and Emergency Assistant Plant Manager of your location and keep them informed as to the isolation status.
- c. Contact each office area in the Owner Controlled Area and advise personnel to keep you apprised as to the number of personnel present in the structure.
- d. Supervise issue of supplies from Isolation Supply Trailers for the Protected Area and the Owner Controlled Area using Attachment 3, Inventory Sign Out/Sign In Checklist located in each trailer, as appropriate.
- e. Coordinate use of the berthing areas in the DBAB.

6.3.3 The Isolation Coordinator should coordinate the recovery effort to establish priorities following the isolation.

- a. Shift relief and staff augmentation
- b. Re-establishment of site access and parking
- c. Additional and replacement material, as needed.

6.4 Deactivation

6.4.1 The Shift Manager shall contact the Emergency Plant Manager and obtain concurrence to deactivate Station Isolation.

6.4.2 The Shift Manager, when the isolation is terminated, shall:

- a. Notify the Supervisor - Security Shift that the isolation is terminated.
- b. Return shiftworkers to their normal hours and rotation.
- c. Release extra personnel from duty.
- d. Advise NRC that Station Isolation has been deactivated.

6.4.3 The Isolation Coordinator shall:

- a. Ensure that all equipment is returned to the appropriate Isolation Supply Trailer(s) for the Protected Area.
- b. Forward all Inventory Sign Out/Sign In sheets to the Supervisor - Emergency Preparedness.

6.4.4 The Supervisor - Security Shift shall:

- a. Reevaluate Security staffing and return to normal as appropriate.

6.4.5 The Isolation Coordinator shall:

- a. Ensure that all equipment is returned to the appropriate Isolation Supply Trailer(s) for the Owner Controlled Area.
- b. Forward all Inventory Sign Out/Sign In Checklist sheets to the Supervisor - Emergency Preparedness.

6.4.6 The Supervisor - Emergency Preparedness shall:

- a. Inventory all Isolation Supply Trailers in accordance with RA-EP-00600, Emergency Facilities and Equipment Maintenance Program.
- b. Order/replenish immediately all supplies needed to restock all Isolation Supply Trailers to ensure a continuous state of readiness.
- c. Ensure restaging of Isolation Supply Trailers to specified locations.
- d. Ensure any soiled linen is laundered and replaced in the appropriate Isolation Supply Trailer(s).

7.0 FINAL CONDITIONS

Normal access to the Station has been restored, extra personnel have been released, normal shift manning restored housekeeping supplies inventoried and stored, and replacement supplies ordered.

8.0 RECORDS

8.1 The following quality assurance records are completed by this procedure and shall be listed on the Nuclear Records List, captured, and submitted to Nuclear Records Management in accordance with NG-NA-00106:

8.1.1 None

8.2 The following non-quality assurance records are completed by this procedure and may be captured and submitted to Nuclear Records Management, in accordance with NG-NA-00106.

8.2.1 None

ATTACHMENT 1: MINIMUM SUPPLEMENTAL STATION ISOLATION STAFFING

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<u>Required*</u>	<u>Recommended</u>	
		<u>Control Room</u>
1		Shift Manager
1		Unit Supervisor
2		Reactor Operators
2	5	Equipment Operators
1		Emergency Assistant Plant Manager (as required by Technical Specifications)
5		Fire Brigade Team
1	2	First Aid Team
		<u>Operations Support Center (OSC)</u>
1		OSC Manager
1	2	Chemistry Tester
	1	OSC Briefer
2		Mechanical Maintenance Personnel
2		I&C Technicians
2		Electrical Maintenance Personnel
	1	OSC Materials Manager
1		OSC RP Coordinator
5		RP Testers
	2	Maintenance Services Personnel
		<u>Technical Support Center (TSC)</u>
	1	Emergency Plant Manager
1		TSC Engineer Manager
1		Core/Thermal Hydraulic Engineer
1		I&C System Engineer
1		Electrical Engineer
1		Mechanical Engineer
	4	Operations Engineer
	1	Computer Technician
	1	Emergency RP Manager
	1	Emergency Security Manager
	1	DBAB Access Security Supervisor
		<u>Emergency Control Center/Emergency Operations Facility (ECC/EOF)</u>
1		Emergency Director
1		Emergency Offsite Manager
1		Emergency Planning Advisor
1		Dose Assessment Coordinator
	1	Dose Assessor
	1	RMT Coordinator
	1	RTL Coordinator
3	6	Radiological Monitoring Team Personnel
1		NRC Liaison
1		State/County Communicator
1		Emergency Facilities Manager

* Required in accordance with the DBNPS Emergency Plan Table 5-1

ATTACHMENT 2: EMERGENCY VEHICLE LIST

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<u>Vehicle</u>	<u>Storage Location</u>	<u>Location of Keys</u>
Isolation Supply Trailers	Outside Service Building 4	ECC/EOF Dose Assessment Area, Security, and Shift Manager
*RMT Vehicles	Parking Lot between DBAB and DBABA	ECC/EOF Dose Assessment Area
Ski-dozer	Outside Service Building 4	Shift Manager
Maintenance Services Dump Truck	Service Building 6	Maintenance Services Key Box
*4-Wheel Drive Pick-up	Outside the Personnel Processing Facility (PPF)	Maintenance Services Key Box
Station Services Tractors	Service Building 6	Maintenance Services Key Box
Forklift	Service Building 6	Maintenance Services Key Box

*Denotes vehicles which are equipped to tow the Isolation Supply Trailers

NOTES:

1. Fuel is available at Service Building 4. If the pumps are locked, contact Security for the key.
2. Back-up locations for all keys are the Security locksmith or Mobile Central.
3. This list is correct as of November 2002 and changes may occur.

ATTACHMENT 3: INVENTORY SIGN OUT/SIGN IN CHECKLIST

Page 1 of 1

ATTACHMENT 4
TERMS COMMONLY USED DURING ADVERSE WEATHER CONDITIONS

Page 1 of 1

NOTE

Experience has found that these terms are not consistently used by all media and governmental agencies.

1. *Blizzard Warning* - The worst of all winter warnings, with winds speeds of at least 35 MPH. Heavy snow, dangerous wind chills and blowing snow.
2. *Blowing Snow Advisory* - Snow already on the ground being wind blown and intermittently reducing visibility to ¼ mile or less.
3. *Freezing Rain or Drizzle Advisory* - Light amounts of freezing rain or drizzle enough to cause some travel problems. A winter storm warning is issued for severe freezing rain events.
4. *Snow Advisory* - Snow fall in amounts sufficient to cause significant travel problems (usually several inches).
5. *Snow Emergency* - Bans parking on streets identified as snow-routes. A Snow Emergency may be classified as one of the following levels:
 - Level 1 Roadways are hazardous with blowing and drifting snow. Roads are also icy. Drive very cautiously.
 - Level 2 Roadways are hazardous with blowing and drifting snow. Only those who feel it is necessary to drive should be out on the roadways. Contact your employer to see if you should report to work.
 - Level 3 All roadways are closed to non-emergency personnel. No one should be out during these conditions unless it is absolutely necessary to travel. All employees should contact their employer to see if they should report to work. Those traveling on the roadways may subject themselves to arrest.
6. *Storm Warning* - Bad weather is imminent and actions shall be taken immediately to protect life and property.
7. *Storm Watch* - Bad weather has formed and is approaching the area.
8. *Wind Chill Advisory* - Wind chill levels in the dangerous category (-30° or below).
9. *Winter Weather Advisory* - Used for a combination of snow, freezing rain or sleet and cold temperatures which reduce visibility and cause problems for travelers.

COMMITMENTS

<u>Section</u>	<u>Reference</u>	<u>Comments</u>
None	None	None

8. EVACUATION TIME ESTIMATES (ETE)

This section presents the current results of the computer analyses using the IDYNEV System. These results cover:

- Eleven evacuation scenarios as summarized in Table 8-1, and discussed in Section 5.
- Ten regions within the Davis Besse Station EPZ, as defined in Table 8-2 and discussed in Section 5. Each region consists of one or more Subareas.

The ETE for each Region-Scenario combination are presented in Tables 8-3a through 8-3c for Scenarios 1-10. These tables present the time to clear the indicated population percentages from those subareas where an evacuation is the recommended protective action. Tables 8-4a through 8-4c present the times to clear the 2, 5 and 10-mile radial areas. Note that, in most cases, subarea boundaries do not fall on these radial arcs.

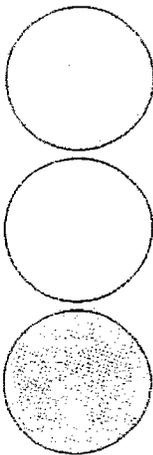
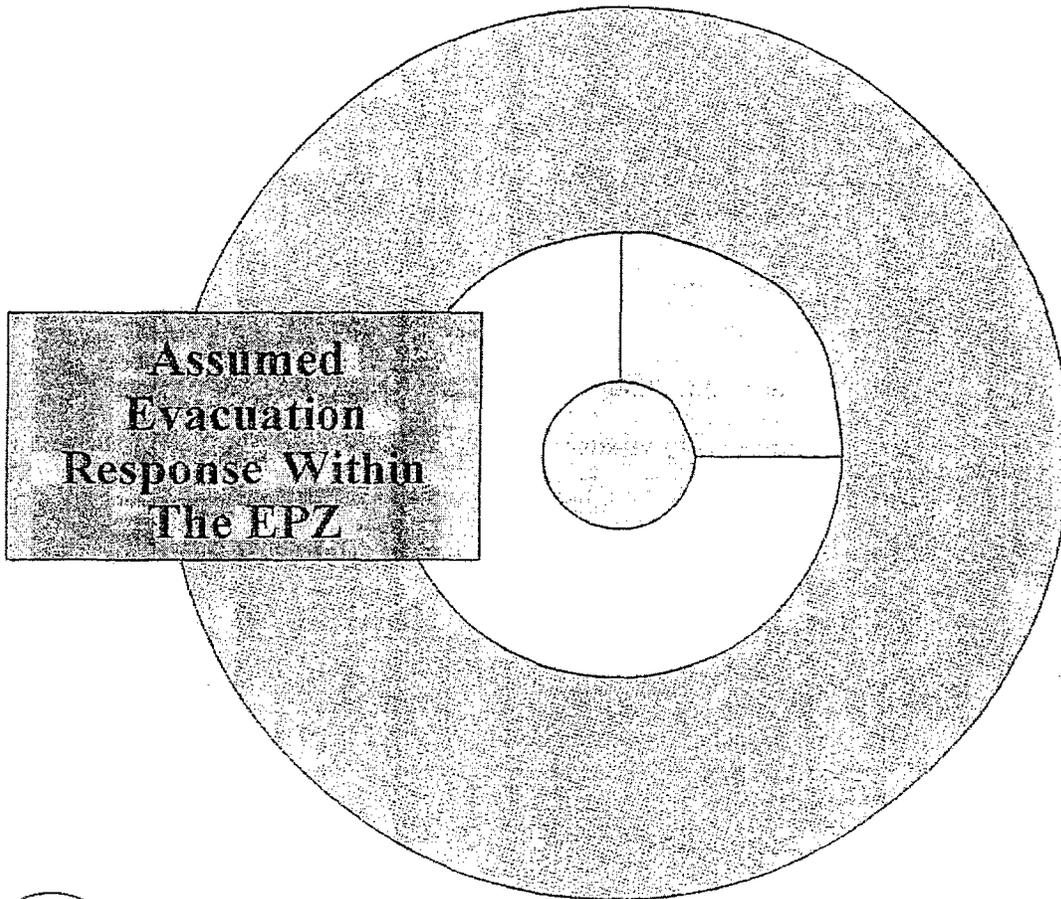
The issue of voluntary evacuation must be addressed when an evacuation recommendation is issued to regions, which comprise an area less than the entire EPZ. Voluntary evacuees are defined as those people who live within the EPZ in subareas for which an evacuation recommendation has not been issued who, nevertheless, choose to evacuate spontaneously. People who have been asked to evacuate may be delayed in leaving the area at risk due to the presence of voluntary evacuees on evacuation routes.

The ETE for Davis Besse Station addressed the issue of voluntary evacuees in the manner shown in Figure 8-1. Within the annular ring defined by the furthest extent of the evacuation recommendation, 50 percent of those people in subareas not advised to evacuate will do so. In the annular ring beginning at the furthest extent of the evacuation recommendation, 25 percent of the people will evacuate spontaneously.

Table 8-3a presents the time to evacuate 50 percent of the affected population. Evacuation times are expressed as hours and minutes after the evacuation recommendation is given. It should be noted that the park and lake areas will be alerted earlier than the general population and it is likely that those areas begin evacuating before the general population is notified of an evacuation recommendation.

Table 8-3b presents the ETE for 90 percent of the affected population. Table 8-3c similarly presents the ETE for 100 percent of the affected population.

The values of ETE are obtained by interpolating from IDYNEV output, which are generated at 30-minute intervals, then rounding to the nearest 5 minutes. Thus, the numerical precision of these values is within ± 10 minutes.



Area to be Evacuated:
100 Percent

50 Percent Voluntary Evacuation

25 Percent Voluntary Evacuation

Figure 8-1. Voluntary Evacuation Rates

Table 8-1. Summary of Evacuation Scenarios

Scenario	Description
1	Summer, Midday, Midweek, Good Weather
2	Summer, Midday, Midweek, Rain
3	Summer, Midday, Midweek, Flood
4	Summer, Midday, Weekend, Good Weather
5	Summer, Midday, Weekend, Rain
6	Summer, Evening, Good Weather
7	Winter, Midday, Midweek, Good Weather
8	Winter, Midday, Midweek, Rain
9	Winter, Midday, Midweek, Snow
10	Winter, Evening, Good Weather
11	Spring, Midday, Midweek, Flood

Table 8-2. Summary of Evacuation Regions

Region	Subareas Evacuated
0 - 2 miles	1, 10, 12
0 - 5 miles	1, 2, 10, 12
	1, 6, 10, 12
	1, 2, 6, 10, 12
0 - 10 miles	1, 6, 7, 8, 9, 10, 12
	1, 2, 5, 6, 7, 8, 9, 10, 12
	1, 2, 3, 4, 5, 10, 11, 12
	1, 2, 3, 10, 11, 12
	1, 10, 11, 12
	1 through 12

Table 8-3A: Time to Clear the Indicated Area of 50 Percent of the Affected Population (Hrs:Min)

Region	Subareas	Summer					Winter					Spring
		Midday			Evening		Midday			Evening		Midday
		Midweek		Weekend		Midweek			Evening		Flood	
		Good Weather	Rain	Flood	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow		Good Weather
0-2 Miles	1,10,12	1:15	1:15	1:05	1:20	1:30	0:45	0:55	1:00	1:25	0:45	0:40
0-5 Miles	1,2,10,12	1:25	1:30	1:10	1:30	1:45	0:55	1:05	1:10	2:00	0:50	0:50
	1,6,10,12	1:10	1:15	0:55	1:20	1:30	0:45	0:55	0:55	1:15	0:45	0:35
	1,2,6,10,12	1:20	1:25	1:05	1:30	1:45	0:55	1:00	1:05	1:45	0:50	0:50
0-10 Miles	1,6,7,8,9,10,12	1:35	1:45	1:25	1:50	2:05	0:55	1:10	1:15	2:15	0:55	1:15
	1,2,5,6,7,8,9,10,12	1:45	1:55	1:30	2:00	2:15	1:00	1:15	1:20	2:25	0:55	1:20
	1,2,3,4,5,10,11,12	1:45	2:00	1:40	1:50	2:05	1:10	1:20	1:25	2:30	1:00	1:25
	1,2,3,10,11,12	1:30	1:35	1:20	1:35	1:50	0:55	1:10	1:15	2:20	0:50	1:10
	1,10,11,12	1:30	1:35	1:10	1:35	1:35	0:45	1:10	1:15	1:55	0:45	0:50
	1 - 12	2:00	2:15	1:55	2:10	2:30	1:10	1:20	1:25	2:35	1:00	1:35

Table 8-3B: Time to Clear the Indicated Area of 90 Percent of the Affected Population (Hrs:Min)

Region	Subareas	Summer					Winter					Spring	
		Midday			Evening		Midday			Evening		Midday	
		Midweek		Weekend				Midweek					Flood
		Good Weather	Rain	Flood	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather		
0-2 Miles	1,10,12	2:30	2:50	2:05	2:40	3:15	1:30	1:50	1:50	3:10	1:30	1:45	
0-5 Miles	1,2,10,12	2:55	3:30	2:15	3:05	3:50	2:00	1:55	2:10	3:40	1:45	2:00	
	1,6,10,12	2:30	2:50	2:00	2:40	3:15	1:35	1:50	1:50	3:00	1:30	1:35	
	1,2,6,10,12	2:55	3:30	2:10	3:05	3:50	2:00	1:55	2:05	3:30	1:40	1:55	
0-10 Miles	1,6,7,8,9,10,12	3:00	3:30	2:55	3:45	4:40	1:50	1:55	2:05	3:45	1:40	2:40	
	1,2,5,6,7,8,9,10,12	3:25	4:05	3:25	3:55	4:55	2:25	2:10	2:25	4:00	1:55	2:50	
	1,2,3,4,5,10,11,12	3:50	4:45	3:55	3:55	4:55	2:55	2:25	3:00	4:05	2:20	3:00	
	1,2,3,10,11,12	3:05	3:35	2:40	3:10	3:55	2:00	2:00	2:10	3:50	1:45	2:25	
	1,10,11,12	2:30	2:50	2:10	2:40	3:10	1:30	1:55	1:55	3:35	1:30	2:00	
	1 - 12	3:45	4:45	4:05	4:20	5:25	2:50	2:20	2:45	4:05	2:15	3:00	

Table 8-3C: Time to Clear the Indicated Area of 100 Percent of the Affected Population (Hrs:Min)

Region	Subareas	Summer					Winter					Spring
		Midday			Evening		Midday			Evening		Midday
		Midweek		Weekend		Good Weather	Midweek			Good Weather	Flood	
		Good Weather	Rain	Flood	Good Weather		Rain	Good Weather	Rain			Snow
0-2 Miles	1,10,12	3:30	3:50	3:00	4:00	4:55	1:50	2:30	2:30	4:30	1:50	3:00
0-5 Miles	1,2,10,12	4:00	4:55	3:15	4:20	5:20	3:00	2:30	2:35	4:40	2:30	3:30
	1,6,10,12	3:50	4:50	3:00	4:00	4:55	2:40	2:30	2:30	4:30	1:50	3:00
	1,2,6,10,12	4:00	4:55	3:15	4:20	5:20	3:00	2:30	2:35	4:40	2:30	3:30
0-10 Miles	1,6,7,8,9,10,12	4:25	5:55	4:30	5:10	6:15	3:30	2:35	2:45	4:35	2:15	3:20
	1,2,5,6,7,8,9,10,12	5:50	7:30	5:55	6:15	7:45	4:45	3:10	3:50	4:55	3:20	4:05
	1,2,3,4,5,10,11,12	5:50	7:30	5:55	6:15	7:45	4:45	3:25	4:20	4:55	3:20	4:05
	1,2,3,10,11,12	4:55	5:45	4:05	5:15	6:35	3:30	2:40	3:15	4:40	2:40	3:30
	1,10,11,12	3:55	4:00	3:00	4:00	4:55	1:50	2:30	2:30	4:30	1:50	3:00
	1 - 12	5:50	7:30	5:55	6:15	7:45	4:45	3:25	4:20	4:55	3:20	4:05

Table 8-4A: Time to Clear the Indicated Area of 50 Percent of the Affected Population (Hrs:Min)

Region	Summer						Winter				Spring
	Midday					Evening	Midday			Evening	Midday
	Midweek			Weekend			Midweek				
	Good Weather	Rain	Flood	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather	Flood
0 - 2 Miles	1:30	1:35	1:05	1:35	1:40	0:45	0:55	1:00	1:30	0:45	0:40
0 - 5 Miles	1:45	1:55	1:05	2:05	2:25	0:55	1:00	1:00	1:50	0:50	0:45
0 - 10 Miles	2:00	2:15	1:55	2:10	2:30	1:10	1:20	1:25	2:35	1:00	1:35

Table 8-4B: Time to Clear the Indicated Area of 90 Percent of the Affected Population (Hrs:Min)

Region	Summer						Winter				Spring
	Midday					Evening	Midday			Evening	Midday
	Midweek			Weekend		Good Weather	Midweek			Good Weather	Flood
	Good Weather	Rain	Flood	Good Weather	Rain		Good Weather	Rain	Snow		
0 - 2 Miles	2:55	3:15	2:05	2:55	3:45	1:30	1:50	1:50	3:20	1:30	1:45
0 - 5 Miles	3:15	4:05	2:15	3:40	4:35	2:00	1:55	1:55	3:30	1:35	1:55
0 - 10 Miles	3:45	4:45	4:05	4:20	5:25	2:50	2:20	2:45	4:05	2:15	3:00

Table 8-4C: Time to Clear the Indicated Area of 100 Percent of the Affected Population (Hrs:Min)

Region	Summer						Winter				Spring
	Midday					Evening	Midday			Evening	Midday
	Midweek			Weekend			Midweek				
	Good Weather	Rain	Flood	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather	Flood
0 - 2 Miles	3:25	3:50	3:00	3:25	4:30	1:50	2:30	2:30	4:30	1:50	3:00
0 - 5 Miles	3:55	5:00	3:15	4:25	5:20	3:00	2:35	2:35	4:40	2:30	3:30
0 - 10 Miles	5:50	7:30	5:55	6:15	7:45	4:45	3:25	4:20	4:55	3:20	4:05

Patterns of Traffic Congestion during Evacuation

Figures 8-2 through 8-3 illustrate the patterns of traffic congestion that arise for the case when the entire EPZ is ordered to evacuate during the summer, midday, weekend period under good weather conditions (Scenario 4).

Traffic congestion, as the term is used here, is defined as Levels of Service E and F. Level of Service E and F may be characterized as follows:

- Level-of-service E represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.
- Level-of-service F is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount that can traverse the point. Queues form behind such locations. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. Vehicles may progress at reasonable speeds for several hundred feet or more, then be required to stop in a cyclic fashion. Level-of-service F is used to describe the operating conditions within the queue, as well as the point of the breakdown. It should be noted, however, that in many cases operating conditions of vehicles or pedestrians discharged from the queue may be quite good. Nevertheless, it is the point at which arrival flow exceeds discharge flow, which causes the queue to form, and level-of-service F is an appropriate designation for such points.

6.0 EMERGENCY MEASURES

This section identifies the specific measures to be taken for each class of emergency defined in Section 4.0 of this plan. The logic presented in this section is used as the basis for detailed EPI's which define the emergency actions to be taken for each emergency classification. Emergency measures begin with the following:

1. The recognition and declaration of an emergency classification.
2. Notification of the applicable agencies.
3. Mobilization of the appropriate portions of the emergency organization.

The additional measures are organized into the following categories:

1. Assessment Actions.
2. Corrective Actions.
3. Protective Actions.
4. Aid to Affected Personnel.

These measures are described in the sections below for each emergency classification. Figure 6-1 indicates the individuals and organizations which may be notified as required within each emergency classification.

6.1 Activation of Emergency Organizations

When it becomes apparent that a predetermined value or condition specified as an EAL in EPI-A1 may be met or exceeded, implementation of the provisions of this plan is required.

The Perry Plant EALs for each emergency classification are defined in Section 4.0. The Shift Manager, in implementing this plan, initially classifies the emergency and notifies the local counties, the State of Ohio, the NRC, and the Perry Plant ERO.

The Perry Plant, in conjunction with the State of Ohio, Ashtabula, Geauga, and Lake County EMAs, has established initial notification and follow-up emergency messages to be sent from the plant in the event that an emergency condition is declared.

The initial notification will be sent to the OEMA and local counties within fifteen (15) minutes of the declaration of an emergency condition at the Perry Plant or upon the decision to issue or revise an offsite protective action recommendation (PAR) for the general public, using the Initial Notification form contained in the <EPI-B1>. The Initial Notification Form includes information about the class of emergency, a brief description of the cause of the emergency, whether a release is taking or has taken place, potentially affected population and areas, and protective measures that may be necessary.

The Perry Plant will send a follow-up message to the OEMA and the local counties no later than one hour after the declaration or reclassification of an emergency event to keep the responsible agencies/organizations informed of the emergency condition. Subsequent follow-up messages will be sent on approximately an hourly basis, unless an alternative is agreed upon at the time by all parties concerned.

Follow-up messages will utilize the Follow-up Notification form, also provided in EPI-B1, and will contain the following information if it is known and appropriate:

1. Location of incident, and name and telephone number of caller.
2. Date/Time of incident.
3. Class of emergency.
4. Type of actual or projected abnormal release (airborne or liquid) and estimated duration/impact times.
5. Estimate of quantity of radioactive material released or being released and the points of releases.
6. Meteorological conditions wind speed, direction (from), stability class, precipitation, if any.
7. Actual or projected dose rates and integrated dose at the projected peak and at the Site Boundary 2, 5 and 10 miles, including sector(s) affected.
8. Estimate of any abnormal surface radioactive contamination in plant, onsite or offsite.
9. Perry Plant emergency response actions underway.
10. Recommended public protective actions.
11. Request for onsite support by offsite organizations.
12. Prognosis for event based on plant information.

If notifications are made using other than dedicated telephone lines, a separate verification response will be made by the notified persons/agency to the notifier to verify authenticity.

6.1.1 Shift Manager/Unit Supervisor/Reactor Operator(s)

If emergency conditions (real or potential) arise, the Reactor Operator(s) and/or the Unit Supervisor will be initially made aware of the situation by alarms, instrument readings, reports, etc. The Reactor Operator(s) shall ensure that the Unit Supervisor and the Shift Manager are immediately informed of the situation.

The Shift Manager, when informed of an emergency situation, is responsible for the assessment of the emergency in the following manner:

1. Determine the immediate actions that must be taken to ensure the safe and proper operation of the plant. The Shift Engineer is available to assist the Shift Manager on matters pertaining to nuclear safety.
2. If the situation requires implementation of the Perry Plant Emergency Plan, the Shift Manager shall classify the emergency and implement the appropriate event EPI which will direct the following:
 - a. Ensure that the appropriate alarm, and the Exclusion Area Paging system if required, are sounded.
 - b. Announce the location, type and classification of the emergency on the plant public address system.
 - c. Ensure the following agencies and organizations are notified of the emergency conditions as shown on Figure 6-1.
 - 1) Perry Plant ERO via the SAS Operator, or the on-call Emergency Response Unit (ERU) representative.
 - 2) Lake County, Ashtabula County, Geauga County, and State of Ohio. These notifications are to be made within fifteen (15) minutes of the declaration or reclassification of the emergency condition or upon the decision to issue or revise an offsite protective action recommendation (PAR) for the general public, using the Initial Notification form contained in the <EPI-B1>.
 - 3) NRC Headquarters Operations Center, White Flint, Maryland. This notification is to be made as soon as possible upon completion of the notifications to the State of Ohio, and the local counties, but must be made within one (1) hour of the declaration or reclassification of an emergency.
3. Due to the numerous responsibilities assigned to the Shift Manager at the onset of an emergency, he shall perform the following actions in the priority listed below:
 - a. Ensure the safe operation of the plant.
 - b. Ensure that immediate notification requirements are met.
 - c. Make appropriate protective action recommendations to offsite authorities.
 - d. Dispatch, in the event of radiological emergencies, Health Physics personnel to locations onsite.

- e. Perform additional emergency actions as time and conditions permit.

6.1.2 Local Counties

Upon receipt of notification from the Perry Plant, each of the three county Sheriff's Dispatchers will initiate their notification procedures. The Counties will notify their response personnel based on the classification of the emergency. The County Commissioners and the EMA/DES Directors for each county will be notified by the Sheriff's Dispatchers, who begin the notifications. The EOCs will complete these notifications.

The notifications by the counties of their response agencies will be by radio and/or telephone depending on each agency's communications capabilities. Further detail regarding these notifications is contained in each local County Radiological Emergency Response Plan.

The local counties will also notify the general public as required by their respective response plans. The primary means of public notification is through the use of the Prompt Alert Siren System, discussed in Section 7.4. These sirens alert the public to turn to the Emergency Alert System (EAS) for further information. It is expected that this method will notify essentially 100 percent of the population within 10 miles of the Perry Plant within 15 minutes after the decision is made to implement a protective action by the appropriate government officials.

Boaters on Lake Erie will be notified by either the United States Coast Guard (USCG), Ohio Department of Natural Resources (ODNR), Ohio Department of Transportation (ODOT), or National Oceanic and Atmospheric Administration (NOAA) in accordance with the appropriate State and local county response plans.

Information available to the general public, which describes actions to be taken in the event of an emergency at the Perry Plant, are discussed in Section 8.6.

6.1.3 State of Ohio

Upon receipt of notification of an emergency at the Perry Plant, the OEMA will notify the appropriate officials and agencies in the State of Ohio, the Commonwealth of Pennsylvania, and the Province of Ontario, as well as other organizations as described in the State Emergency Plan. The State of Ohio will also notify the USCG of an emergency at the Perry Plant involving USCG territorial jurisdiction.

6.1.4 Federal Agencies

Upon receipt of notification of an emergency at the Perry Plant, the NRC will notify other federal agencies when and if deemed appropriate. Federal agencies may also be contacted by their state counterparts should it become necessary.

If it becomes necessary for the Perry Plant to request federal assistance, the Emergency Coordinator will make this request.

6.2 Assessment Actions

Effective coordination and direction of all elements of the emergency organization requires continuing accident assessment throughout an emergency situation. Each emergency class shall invoke similar assessment methods; however, each classification imposes a different magnitude of assessment effort. In the following sections, assessment actions to be taken for each emergency classification are outlined. During an emergency, conditions will be periodically evaluated to determine if the emergency should be reclassified.

6.2.1 Assessment Actions for Unusual Events

The detection of an Unusual Event arises from either exceeding a specific emergency action level for this case, or as a result of alarms, instrument readings, recognition through experience, or any combination thereof. The continuing assessment action to be performed for this classification of emergency shall be in accordance with the EPIs. This consists of monitoring Control Room and other plant instrumentation and status indication until the situation is resolved. The Shift Engineer assists the Shift Manager by providing independent assessments and technical advice. If a fire is the reason for the declaration of an Unusual Event, the Shift Manager will direct the SAS to request offsite fire fighting support.

6.2.2 Assessment Actions for Alerts

Once an accident has been classified as an Alert, assessment actions shall be performed in accordance with the EPIs for an Alert. These actions include:

1. Increased surveillance of in-plant instrumentation.
2. If possible, the dispatching of shift personnel to the identified problem area for confirmation and visual assessment of the problem.
3. The mobilization of two RMTs to monitor for possible releases.
4. If a radiological accident is occurring, surveillance of the in-plant instrumentation necessary to obtain meteorological and radiological data required for calculation or estimating projected doses. This dose assessment activity continues until termination of the emergency in order that the updating of initial assessments may be provided to all concerned offsite agencies by the acting Emergency Coordinator. EPIs are provided to allow a rapid, consistent projection of doses.

6.2.3 Assessment Actions for Site Area Emergencies

The assessment actions for the Site Area Emergency classification are similar to the actions for an Alert; however, due to the increased magnitude of the possible release of radioactive material, a significantly larger assessment activity shall occur.

Specifically:

1. An increased amount of plant instrumentation shall be monitored. In particular, indications of core status shall be monitored.
2. Radiological monitoring efforts shall be greatly increased. An additional RMT shall be mobilized to obtain air samples and perform beta-gamma field measurements. The collection of environmental media for assessment of material, transport and deposition shall be performed, as necessary, by qualified FirstEnergy personnel.
3. Dose assessment activities shall be conducted more frequently, with an increased emphasis on dose projection for use as a factor in determining the necessity for protective actions. Radiological and meteorological instrumentation readings shall be used to project the dose rate at predetermined distances from the plant, and to determine the integrated dose received. In reporting the dose projections to offsite agencies, the dose rate, dose, and basis for the time used for the dose estimate should be provided. Any confirmation of dose rates by RMTs shall be reflected in reporting and/or revising dose estimate information provided to offsite agencies.

Dose projections shall be considered by plant personnel in relation to the EPA PAGs. Reporting of assessments to offsite authorities shall include the relationship of dose to these guidelines. EPIs are provided for recording all pertinent information.

6.2.4 Assessment Actions for General Emergencies

Assessment actions for the General Emergency classification are to be the same as for the Site Area Emergency with some possible shift of emphasis to greater offsite monitoring efforts and dose projection efforts extending to distances much further from the plant. Additionally, since the projected doses are likely to be much closer to the EPA PAGs, greater emphasis is placed on the assessment of release duration.

6.2.5 State and County Accident Assessment

The OEMA may send field monitoring teams, equipped with all necessary field monitoring equipment, to the local area upon declaration of an Alert. Upon arrival, teams will report to a staging area designated by OEMA. Monitoring teams will then be deployed to designated field monitor locations. Additionally, Lake County Health District deploys two field monitoring teams; these teams are utilized until the OEMA teams arrive and also supplement the State teams. The Lake County teams are equipped to perform plume monitoring, including air sampling.

They will report these readings, by radio, to the State EOC in Columbus, the EOF, and the local County EOC. The readings from the Lake County teams are reported to the Lake County EOC, which relays this data to the State EOC and EOF.

Based on OEMA and Lake County monitoring as well as data from the Perry Plant, the State EOC will assess the hazard consequences of the radiological releases from the Perry Plant. This assessment will guide the decision making group at the Ohio EOC on the protective actions to be recommended to the local Counties.

6.3 Onsite Personnel Accountability <S00554>

In the event of a Site Area or General Emergency, or in the judgment of the acting Emergency Coordinator based on emergency conditions, site personnel will be instructed to begin personnel accountability. This notification will be performed essentially immediately using the Plant Public Address (PA) System and Exclusion Area Paging System as described in Section 7.2.1.2. To accomplish personnel accountability within 30 minutes, all personnel without an emergency response function will be directed to exit the site areas via normal exit routes and exit procedures. <S00560>

For the Protected Area, a list will be provided by the Fire/Security Computer of the personnel remaining within the area. This list will be compared to lists of personnel within emergency facilities to ascertain the names of missing individuals. If personnel are missing, security will begin searching at the individuals last known location.

Outside the Protected Area, personnel will be directed to exit the site by means of the Plant PA System and Exclusion Area Paging System. Security will then perform a sweep of controlled areas to locate any individuals who have not yet evacuated.

At the Training and Education Center (TEC), the EOF Manager using the EOF staff will establish access control and then search the building, removing personnel who are not assembling in support of the TSC, OSC or EOF staffing.

Personnel accountability will be performed concurrently with the evacuation of personnel from the Perry Plant site. Monitoring of plant personnel exiting the Protected Area will be accomplished at the Primary Access Control Point, and appropriate decontamination measures implemented as needed per Section 6.5.

If a significant release of radioactive materials occurs onsite, personnel evacuating the Perry Plant site may be directed to monitoring and decontamination centers located outside the 10-mile EPZ. These centers are activated and staffed in accordance with their respective county response plans. Figure 6-2 illustrates the location of these centers in relation to the Perry Plant. Specific directions to the centers are contained in EPI-B5, posted in specific site locations, and provided as part of Plant Access Training (PAT).

6.4 Offsite Protective Actions

A wide range of protective actions for the public have been developed including evacuation, sheltering, administering of potassium iodide (KI) and placing the EPZ on heightened awareness. Possible protective action recommendations made by the Perry Plant may range from no action necessary, to the evacuation of the entire 10-mile EPZ. The appropriate protective action recommendation (PAR) is determined using a decision flowchart per <EPI-B8>. The flowchart provides protective actions based on plant status, EPA protective action guidelines (PAGs), and short duration, controlled releases as described below.

6.4.1 Protective Action Based on Plant Status <S00541>

In addition to the PAGs established by the EPA, the following plant status PAGs have been established. These PAGs are based on the potential for major radioactive material releases from the Perry Plant rather than the projected dose approach used by the EPA's PAGs per the guidance set forth in Supplement 3 to NUREG-0654/FEMA-REP. Implicit in these recommendations is that assessment activities will continue to determine what additional protective actions should be recommended for the entire EPZ.

The minimum plant status PAGs, as applicable, for Subareas 1 through 3 and Lake Erie (as identified on Figure 2-1), are as follows:

WIND DIRECTION - "FROM" (in degrees)	AFFECTED SUBAREAS
102 to 213	EVACUATE 1 & Lake
214 to 281	EVACUATE 1, 2 & Lake
282 to 11	EVACUATE 1, 2 & 3
12 to 33	EVACUATE 1 & 3
34 to 101	EVACUATE 1, 3 & Lake

Administering KI to the general public and placing the remainder of the EPZ on heightened awareness will also be recommended. These protective action recommendations assume that conditions listed in Table 4-1 for a General Emergency have been met or exceeded.

The following table summarizes these additional protective actions above the minimum plant status PAGs, which may be recommended based on a projected or actual dose of ≥ 1 rem TEDE or ≥ 5 rem CDEct from 5 to 10 miles:

WIND DIRECTION - "FROM" (in degrees)	AFFECTED SUBAREAS
102 to 213	EVACUATE 1 & Lake
214 to 258	EVACUATE 1, 2, 4 & Lake
259 to 281	EVACUATE 1, 2, 4, 5 & Lake
282 to 304	EVACUATE 1, 2, 3, 4 & 5
304 to 326	EVACUATE 1, 2, 3, 4, 5 & 6
327 to 348	EVACUATE 1, 2, 3, 5 & 6
349 to 11	EVACUATE 1, 2, 3, 5, 6 & 7
12 to 33	EVACUATE 1, 3, 6 & 7
34 to 56	EVACUATE 1, 3, 6, 7 & Lake
57 to 101	EVACUATE 1, 3, 7 & Lake

Administering KI to the general public and placing the remainder of the EPZ on heightened awareness will also be recommended.

Recommended protective actions may be extended or modified depending on population distribution, meteorological conditions, and condition of roads and major traffic ways, following discussions with County and State officials.

6.4.2 Protective Actions based on a Short Duration, Controlled Release

A protective action of sheltering will be recommended during a General Emergency for a short duration, controlled release of radioactive material from containment.

The following conditions will result in the recommendation to shelter a 2 mile radius and 5 miles downwind, administer KI to the general public, place the general public on heightened awareness of the remainder of the EPZ and evacuate Lake Erie:

1. A controlled release from containment will last less than one or equal to one hour, AND
2. Evacuation has not been initiated; AND
3. The time until the release begins is less than $\frac{1}{2}$ the fastest evacuation time according to the latest Evacuation Time Estimated study; AND
4. Dose projections at the site boundary are greater than or equal to 1 Rem TEDE or greater than or equal to 5 Rem child thyroid.

The following table summarizes these protective actions in terms of subareas:

WIND DIRECTION - "FROM" (in degrees)	AFFECTED SUBAREAS
102 to 213	SHELTER 1 & EVACUATE Lake
214 to 281	SHELTER 1, 2 & EVACUATE Lake
282 to 11	SHELTER 1, 2 & 3
12 to 33	SHELTER 1 & 3
34 to 101	SHELTER 1, 3 & EVACUATE Lake

6.4.3 Accident Assessment and Decision-Making

The responsibility for actions to protect persons in offsite areas rests with the State of Ohio and the local government officials. The chain of events which precede protective actions for the general public are described here and illustrated in Figure 6-3. Information is gathered by the EOF Plant Operations Advisor and the EOF Offsite Radiation Advisor to begin formulating PARs. The Plant uses the Integrated Computer System (ICS), described in Section 7.5.1 to obtain information concerning the status of plant systems and to estimate the duration of any release of radioactive material. The Plant Operations Advisor can also contact the TSC to obtain further assistance and assessment information. This estimate of release duration is then provided to the Offsite Radiation Advisor for use in dose projection calculations.

The Offsite Radiation Advisor will be simultaneously using the Computer-Aided Dose Assessment Program (CADAP) software program, described in Section 7.5.10, to obtain information concerning the present meteorological conditions, release rates from the effluent monitors, and other applicable data source to perform offsite dose projections. In addition, the Offsite Radiation Advisor will utilize the field information obtained by the RMTs to verify an estimated offsite dose or dose rate projections which may have been made.

In the event that CADAP is unavailable, the Offsite Radiation Advisor can obtain meteorological and release information directly from the ICS or locally at the on-site meteorological tower. The Offsite Radiation Advisor will also have a manual method for performing dose projections. This manual method, described in Section 7.5.10.2, provides several levels of assumptions for available data and allows projections to be performed with minimal information if necessary.

Evacuation time estimates (ETE) for areas near the Perry Plant have been generated and are contained in PSI-0013, "Control and Revision of the Evacuation Time Estimates for Areas Near the Perry Plant." The ETE was developed in accordance with Appendix 4 of NUREG-0654 and provides evacuation estimates for various areas, times, and weather conditions. These estimates represent the times required for completing the following actions:

1. public notification,
2. preparation and mobilization, and
3. actual movement out of the 10-mile EPZ (i.e., on-road travel time including delays associated with vehicle queuing).

Using the offsite dose projection, the evacuation time estimates, representative shielding factors, known or estimated isotopic compositions and projected exposure periods, the Offsite Radiation Advisor will determine an estimated dose for both Total Effective Dose Equivalent (TEDE) and Committed Dose Equivalent (CDE) - child thyroid exposures. These doses will then be compared to the EPA-400 protective action guidelines (PAGs) to arrive at a PAR. All recommendations will then be reviewed and approved by the Emergency

Coordinator. The recommendation will be transmitted to the EMAs in each of the local Counties and State via the dedicated telephone system.

In the event that immediate offsite dose projections are required, they can be performed by the on-shift chemistry technician(s). During this initial phase, the Shift Manager, in his capacity of Emergency Coordinator, will evaluate the available information and recommend appropriate protective actions to the offsite agencies in accordance with Section 6.4.1.

In parallel with the activities at the Perry Plant, the State of Ohio will also develop PARs. The OEMA and Department of Health will establish a Radiological Assessment Team at the State EOC to develop a recommendation. The State will deploy field monitoring teams to the vicinity of the Perry Plant to collect field monitoring data and will use a computerized link to the Perry Plant to obtain site meteorological and release data. Should this data link be unavailable, the State can also obtain meteorological and release information directly from the Perry Plant via the dedicated communications line.

The State Radiological Assessment Team will develop a protective action recommendation using meteorological and release information similar to that used by the Offsite Radiation Advisor. The State PAR will be reviewed and approved by the Office of the Governor per the State's response plan prior to being transmitted to the three counties for consideration.

In accordance with the emergency plans for each of the three counties, their respective county EROs will receive the recommendations from the Perry Plant and the State of Ohio. The County EOC Executive Groups will coordinate with one another via a telephone conference network and make a final decision on protective actions to be implemented for the general public. Lake County will develop the appropriate Emergency Alert System (EAS) message and will coordinate the transmission and broadcasting of the appropriate message over EAS.

While the EAS message is being sent, Lake County will activate the Prompt Alerting System for the entire EPZ. This activation of the Prompt Alerting System is a signal to the public that an important message is being broadcast by EAS. By procedure, the County EOCs will implement the Radiological Emergency Response Plans and applicable SOPs to carry out the agreed upon protective actions.

In the event of a rapidly escalating emergency, the county plans and procedures direct the dispatcher to attempt to contact a higher authority to make the protective action decision. If a higher authority cannot be contacted, the dispatcher has the authority and responsibility to activate the Prompt Alerting System and to place a message on EAS implementing a protective action recommendation.

<S00539>

Detailed discussions of the specific actions to be taken by the State and local county agencies are contained in the respective county Radiological Emergency Response Plans and the corresponding SOPs.

6.4.4 Ingestion Pathway Control Measures

Provisions are made for implementing protective measures against excessive radiation exposure within the 10-mile EPZ due to direct radiation exposure and inhalation of radioactive material from the plume, in addition to exposure via the food ingestion pathway. The ingestion pathway control measures extend to a 50-mile radius. Table 6-2 provides guidance for the control of water and agricultural products within the Ingestion EPZ.

State and local agencies will implement ingestion exposure control measures in accordance with these tables, based on field monitoring data and/or projected surface contamination concentrations. Interface with the Pennsylvania Emergency Management Agency (PEMA) for ingestion pathway exposure control measures is provided by the State of Ohio.

6.5 Contamination Control Measures <S00560>

This section describes provisions for preventing or minimizing direct exposure to radiation or subsequent ingestion exposure to radioactive materials deposited on the ground or other surfaces.

6.5.1 Site Areas

Access to the site area is controlled. In-plant contamination control is exercised in accordance with PAPs and Health Physics Instructions (HPIs). The methods include isolation of contaminated areas to the extent feasible. Necessary occupancy of contaminated areas requires the use of appropriate protective equipment. If contamination is suspected outside the Protected Area, a personnel monitoring control point will be established at the EOF entrance.

Contamination control measures for equipment, tools, and other materials will be implemented in accordance with the Radiation Protection Program procedures and instructions. These measures may include decontamination, marking for controlled use, or disposal as radioactive waste.

6.5.2 Offsite Areas

Measures available to minimize radiation exposure due to offsite surface contamination include evacuation, sheltering, or relocation of the affected population, and control of drinking water and agricultural products. Federal government guidance for implementation of these measures is contained in Tables 6-1 and 6-2. The Emergency Coordinator will provide projected and/or measured offsite surface contamination concentrations to Federal, State and local agencies based on the Perry Plant emergency environmental monitoring activities. These sampling activities, as well as the transfer of analyses results, will be coordinated with Federal and State monitoring efforts.

6.5.3 Decontamination <S00564>

Individuals are considered contaminated when any area of the body surface is contaminated to levels of 1000 dpm/100 cm² beta-gamma and/or 100 dpm/100 cm² alpha or greater. Personnel found to be contaminated will undergo decontamination by Health Physics personnel or other qualified personnel, in accordance with approved plant instructions. It is preferred that personnel decontamination be performed by trained HP personnel, however, other Perry Plant personnel are instructed in both decontamination and first aid procedures.

Measures will be taken to prevent the spread of contamination. Such measures may include isolating the affected areas, placing contaminated personnel in "clean" clothing before moving them, and decontamination of affected personnel, their clothing and equipment prior to release. Contaminated equipment and items generated as a result of the accident or decontamination process will be disposed of as radioactive waste.

Provisions have been made to ensure contaminated and injured personnel receive specialized medical treatment if necessary. Refer to Section 5.3.3 for contamination control and decontamination efforts associated with a radiologically contaminated injury. If contaminated injured personnel must be transported, measures shall be taken to prevent the spread of contamination. Such measures may include placing the affected person in "clean" protective clothing, wrapping in blankets or plastic sheeting, and alerting the organizations which provide transportation and treatment.

6.6 Emergency Personnel Dose Control

Emergency measures may warrant the acceptance of above-normal radiation exposures. Saving a life, measures to circumvent substantial exposures to population groups, or even preservation of a valuable installation, may all be sufficient cause for above normal exposures.

The Perry Plant's Radiation Protection Program provides procedural guidance for increased administrative dose control level authorization during emergency circumstances, and provides specific emergency exposure guides for the following situations:

1. Emergency conditions where immediate action is required to prevent destruction of equipment.
2. Emergency conditions where immediate action is required for life-saving actions.

While specific exposure limits can be difficult to specify under emergency circumstances, exposures should be commensurate with the significance of the objective and held to the lowest practicable level that the emergency permits.

The TSC Operations Manager, or the Operations Shift Manager, acting as Emergency Coordinator, if the TSC is not activated, is responsible for authorizing plant personnel to receive doses in excess of 10CFR20 limits

under emergency situations. The procedural guidance provides for permitting onsite volunteers to receive radiation exposures in the course of carrying out lifesaving and other emergency activities.

Dose rates during emergency situations will be evaluated utilizing normally available survey equipment. Special portable survey instruments with an extended range to 1000 rem/hr are also available for conditions involving abnormally high radiation fields.

Respiratory equipment is available for issuance by Radiation Protection (RP) Section during emergency conditions. This equipment includes full-faced particulate and iodine respirators, and self-contained breathing apparatus.

Emergency dosimetry, stored in emergency response facilities, will be issued, accounted for, and maintained in accordance with EPIs. Each emergency worker will be issued a permanent recording dosimeter and a direct reading dosimeter prior to either: (1) entering a RRA, (2) leaving or if located outside of the Control Room, TSC or EOF upon the declaration of a Site Area Emergency, or (3) as conditions warrant. The emergency personnel dosimetry program includes the capability to determine individual exposure on a 24-hour per day basis. <S00566>

Conduct of normal operations and maintenance inside the RRA requires utilization of a radiological work permit (RWP). During emergency conditions, provisions have been made to direct radiological surveillance and perform emergency work without a RWP. Radiological conditions and other applicable information will be documented as soon as possible after the emergency.

6.7 Thyroid Blocking

6.7.1 Members of the General Public

Upon declaration of a General Emergency, the Emergency Coordinator will recommend to the State and Counties that KI be issued to the General Public in accordance with the State Plan.

6.7.2 Perry Emergency Workers

A KI dose of 130 mg per day (one tablet) will be recommended for Perry Plant ERO personnel, who have no known thyroid problems or iodine allergies, if the potential exists for a radioiodine exposure to the thyroid at the following levels:

1. Radiation Monitoring Teams (RMTs) - 10 Rem Committed Dose Equivalent to Adult Thyroid
2. ERO personnel onsite - Derived Airborne Concentration (DAC) of 4000 (Corresponds to 10 Rem CDE Adult Thyroid)

Approval for the issuance of KI and its distribution shall be in accordance with EPI-B8.

A sufficient quantity of KI to allow administration to onsite emergency workers for a period of ten days will be available.

TABLE 6-1

GUIDELINE FOR PROTECTIVE ACTIONS AGAINST INGESTION OF CONTAMINATION

1. Response Levels for Emergency PAG:

<u>Isotope</u>	<u>DIL (1) (Bq/kg) (2)</u>
Sr-90	160
I-131	170
Cs-134 + 137	1,200
Pu-238 + Pu-239 + Am-241	2
Ru-103 + 106	$(\text{Ru-103})/6800 + (\text{Ru-106})/450 < 1$ (3)
Sr-89	1400
Y-91	1200
Zr-95	4000
Nb-95	12000
Te-132	4400
I-129	56
I-133	7000
Ba-140	6900
Ce-141	7200
Ce-144	500
Np-237	4
Np-239	28000
Pu-241	120
Cm-242	19
Cm-244	2

- (1) DIL (Derived Intervention Level) is the concentration in food, in the absence of intervention, which could lead to an individual receiving a radiation dose equal to the PAG (0.5 Rem CEDE or 5 Rem CDE).
- (2) 1 bequerel = 27 pCi
- (3) Divide the concentration of Ru-103 by 6800, then divide the concentration of Ru-106 by 450. If the sum is less than 1, the food is edible; if the sum is equal to or greater than 1, then the food is inedible.

TABLE 6-2

RECOMMENDED PROTECTIVE ACTIONS

Approximate Initiation Time	Exposure of Pathway	Action to be Initiated
0-4 hours	inhalation of gases or particulates	evacuation, shelter, access control, respiratory protection, prophylaxis (thyroid protection)
	direct radiation	evacuation, shelter, access control
4-48 hours	milk	take cows off pasture, prevent cows from drinking surface water, quarantine contaminated milk
	harvested fruits and vegetables	wash all produce, or impound produce
	drinking water	cut off contaminated supplies, substitute from other sources
	unharvested produce	delay harvest until approved
2-14 days	harvested produce	substitute uncontaminated produce
	milk	discard or divert to stored products, as cheese
	drinking water	filter, demineralize

FIGURE 6-1 - EMERGENCY NOTIFICATION

NF906

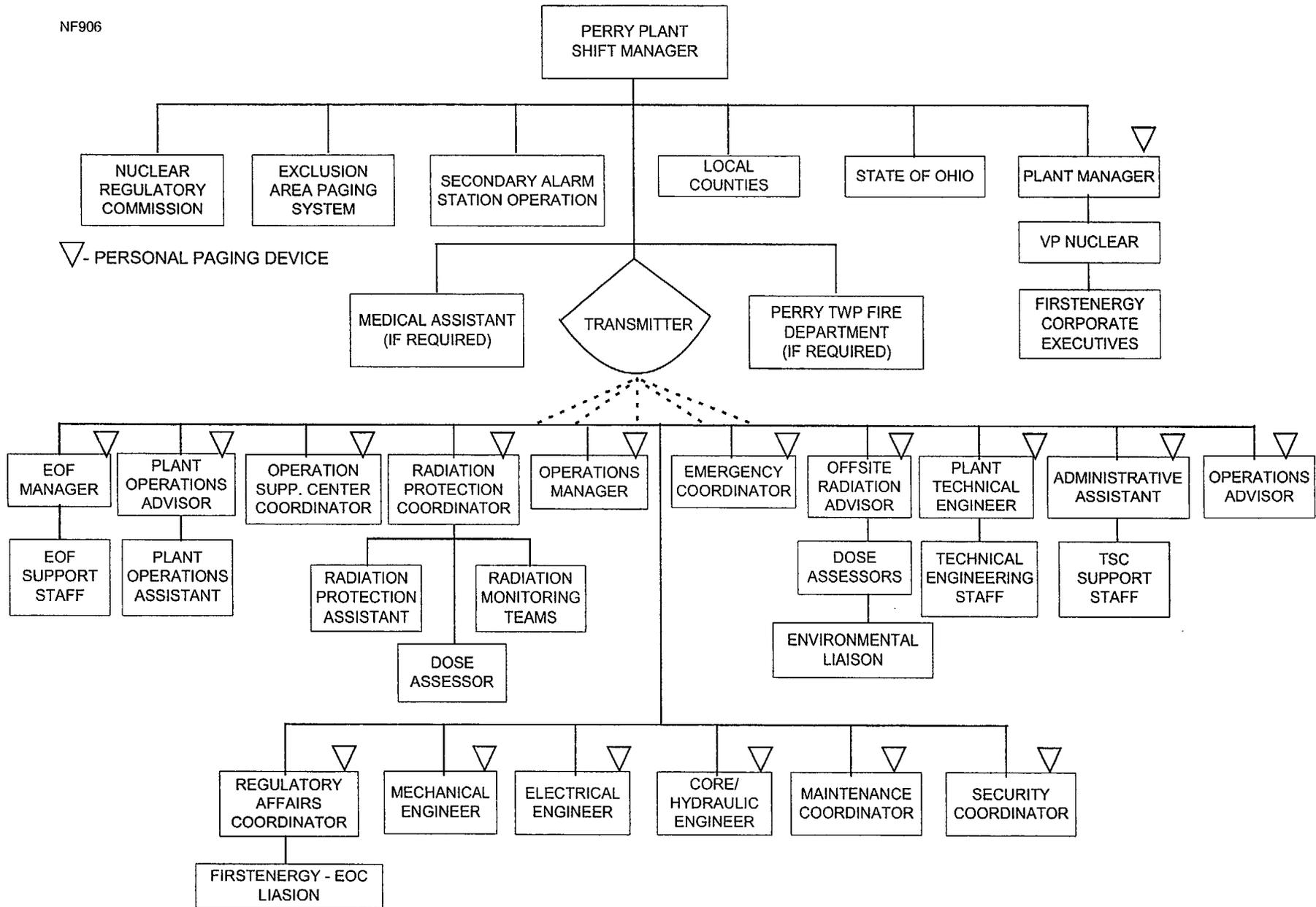


FIGURE 6-2 - OFFSITE MONITORING/DECONTAMINATION CENTER LOCATIONS

Directions to Monitoring and Decontamination Centers

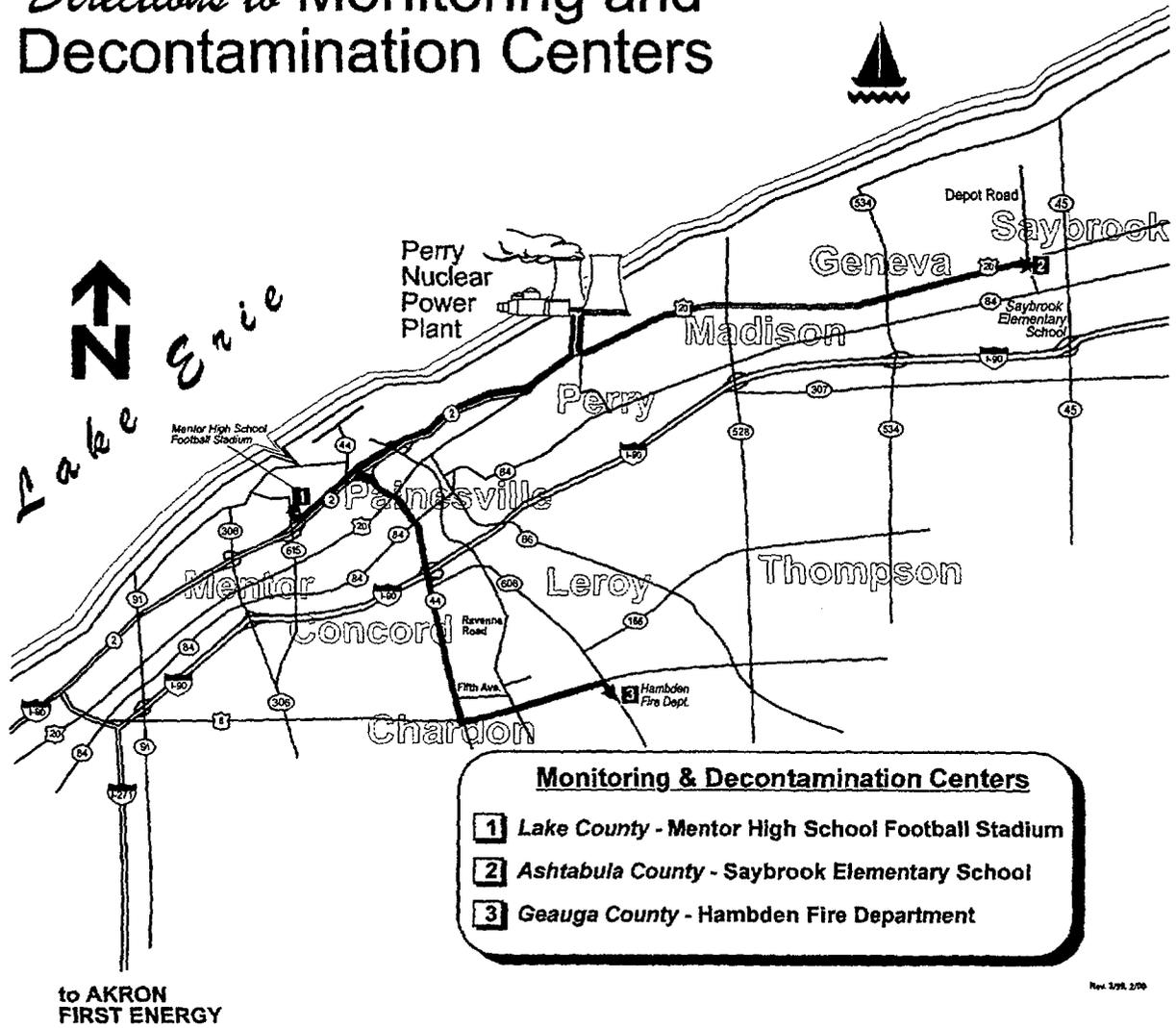
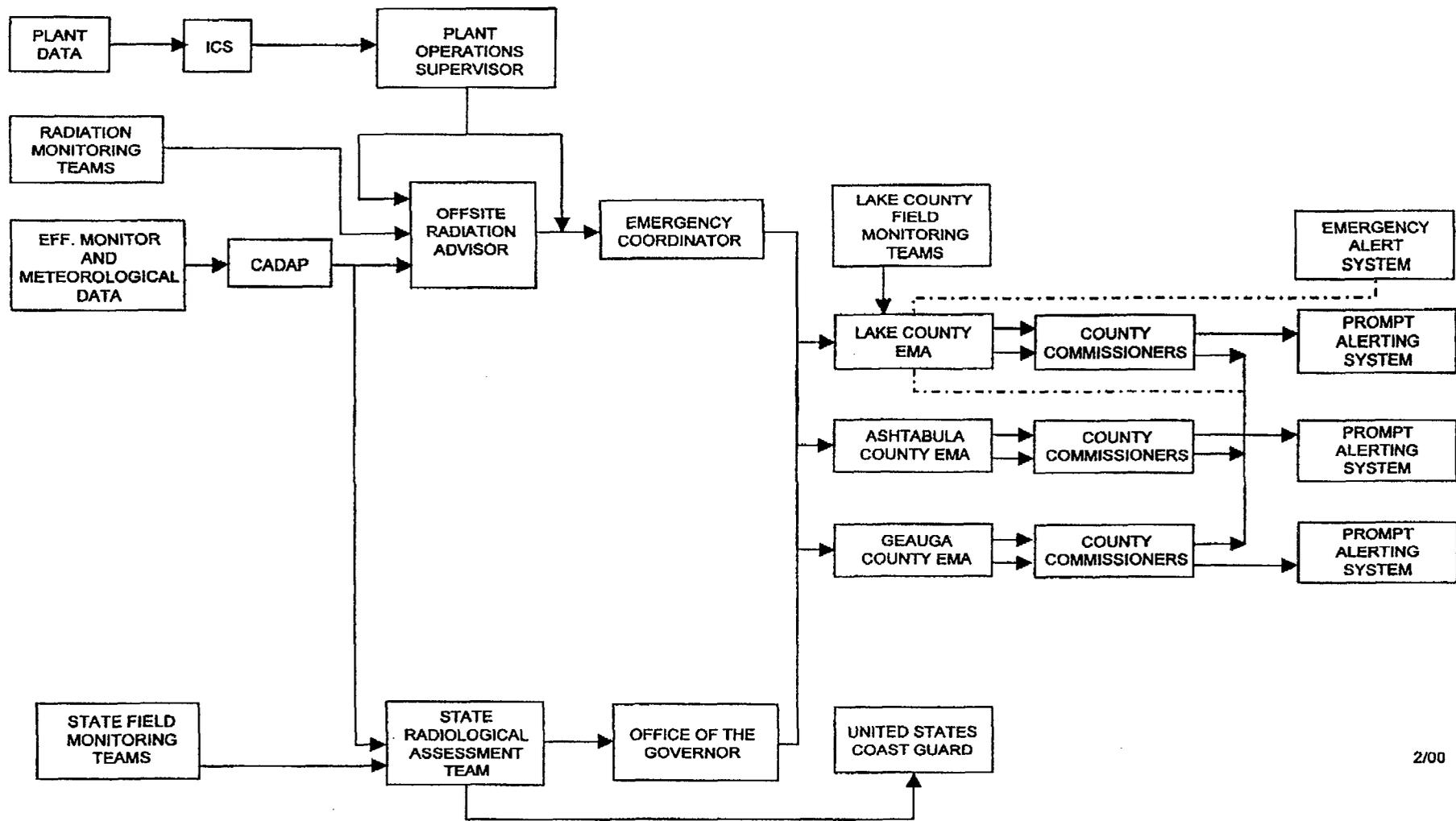


FIGURE 6-3 - PROTECTIVE ACTION FLOW CHART

PROTECTIVE ACTION FLOW CHART



2/00

FIGURE 6-4 - CONTAINMENT RADIATION PLOT

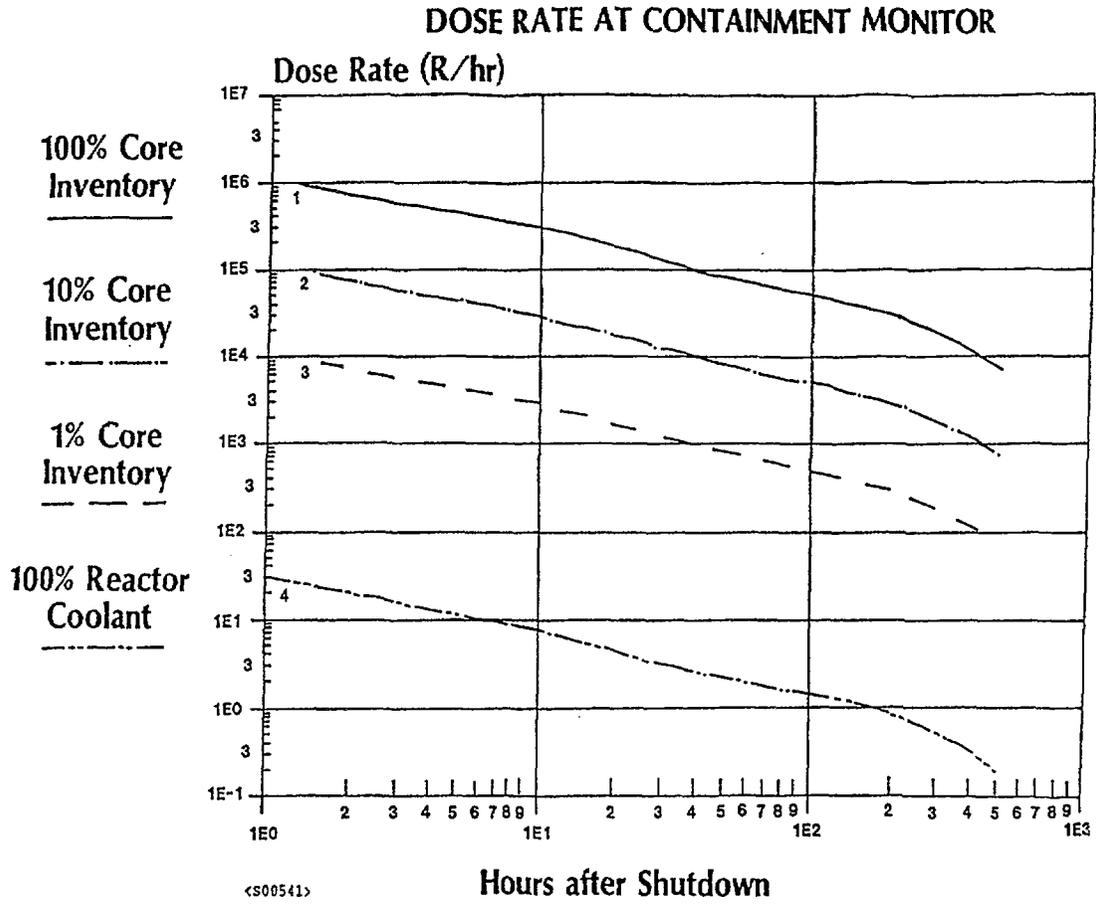


FIGURE 6-4 - CONTAINMENT RADIATION PLOT (Cont.)

<S00541>

Figure 6-4 provides theoretical curves of gross gamma dose rate versus time for a range of potential source terms. To determine the meaning of the measured dose rates:

1. Determine the Time after reactor shutdown.
2. Locate the radiation monitor Dose Rate Reading on the graph for the time after shutdown.
3. Determine the percent fuel inventory released to the containment air corresponding to the measured dose rate by taking the ratio of the measured dose rate to the dose rate given on one of the curves for a known percent inventory, i.e., interpolate between curves.
4. Relate the percent fuel inventory released, as calculated in the previous step, to the approximate source and damage estimate.

Curve No. Estimate	% Fuel (4) Inventory (1,2,3) Released	Approximate Source and Damage
1	100	100% Fuel Damage, potential core melt
2	10	Total clad failures, core partially uncovered
3	1	Approximately 10% clad failure
4	-	100% coolant release

NOTE:

- (1) The curves represent direct readings from the Containment Post Accident Radiation Monitors (D19-K100 & K200), at elevation 689 feet, inside containment.
- (2) The curves account for the finite containment volume seen by the detector but do not account for any physical or shielding characteristics or calibration uncertainties of the radiation monitor.
- (3) The curves assume that only airborne noble gases and iodines are significant. Sprays (if used) would make the iodine and any particulate contribution insignificant. However, particulate plateout on surfaces and direct shine doses from components may make the readings unreliable.
- (4) 100% Fuel Inventory = 100% Noble Gas, 25% Iodine

The calculation of monitor response did not include any particulates since the noble gases and iodine are the most significant contributors to dose rate in the containment.

6.3 Evacuation Times for Response Areas

Predicted 100 percent evacuation times to evacuate different response areas for each scenario are summarized in Table 6-2. The results show that the evacuation of Sub-Areas 6 and 7 generally controls the evacuation times for the entire EPZ, as expected, since Sub-Area 7 contains the largest population.

For the Response Areas within 5 miles of PNPP, the primary factor that controls predicted evacuation times is competing local traffic demands on the capacity of US 20. Evacuation times for the 2-mile response area (Sub-Area 1) are very short. Evacuation of Sub-Area 2 controls evacuation times for the 5-mile response area (Sub-Areas 1, 2, and 3). The Winter Day scenarios generally have the longest evacuation times for Response Areas within 5 miles. For these Sub-Areas, population and vehicle demand are highest for the Winter Day scenarios, as shown in Table 3-5.

For the Winter Night scenarios, the evacuation times for the EPZ east Response Area (Sub-Areas 1, 2, 4, 5) are approximately the same as evacuation times for the EPZ west Response Area (Sub-Areas 1, 3, 6, 7). This reflects the time required to evacuate Geneva City (with competing demand from the population evacuating to the east along US 20 and OH 84 from Madison and Perry Townships).

Table 6-2: Perry EPZ Evacuation Times by Scenario for Each Response Area

Response Area	Winter Day		Winter Night		Summer Weekend	
	Fair weather	Adverse weather	Fair weather	Adverse weather	Fair weather	Adverse weather
Sub-Area 1 (0-2 miles)	2 hr 20 min	2 hr 20 min	2 hr 20 min	2 hr 20 min	2 hr 20 min	2 hr 20 min
Sub-Areas 1,2 (0-5 miles E)	3 hr 22 min	4 hr 2 min	3 hr 17 min	3 hr 43 min	3 hr 17 min	3 hr 33 min
Sub-Areas 1,3 (0-5 miles W)	3 hrs	3 hr 30 min	3 hrs	3 hr 20 min	3 hr 10 min	3 hr 20 min
Sub-Areas 1,2,3 (0-5 miles)	3 hr 22 min	4 hr 2 min	3 hr 17 min	3 hr 43 min	3 hr 17 min	3 hr 33 min
Sub-Areas 1,2,4,5 (EPZ east)	3 hr 50 min	5 hr 30 min	3 hr 31 min	4 hr 54 min	3 hr 40 min	4 hr 40 min
Sub-Areas 1,3,6,7 (EPZ west)	4 hr 13 min	6 hr 3 min	3 hr 30 min	4 hr 50 min	4 hr 56 min	6 hr 4 min
Full EPZ	4 hr 13 min	6 hr 3 min	3 hr 31 min	4 hr 54 min	4 hr 56 min	6 hr 4 min

EPI-B8
Page: i
Rev.: 11

PERRY OPERATIONS MANUAL

Emergency Plan Implementing Instruction

TITLE: PROTECTIVE ACTIONS AND GUIDES

REVISION: 11 EFFECTIVE DATE: 1-20-05

PREPARED: L. VanDerHorst 12-8-04
/ Date

PROTECTIVE ACTIONS AND GUIDES

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SCOPE OF REVISION:

Periodic Review - Required

- Rev. 11 - 1. Added a paragraph to the Purpose to discuss the different types of protective actions recommended for the general public.
2. The reference to PAP-0114 was deleted under the definition of Derived Air Concentration (DAC) to avoid potential confusion. DAC is defined by the regulatory requirement, not PAP-0114. (CA 04-05922-01)
3. Added a definition of the Sheltering PAR to explain the basis behind it.
4. Added the definition of the recommendation of administering KI to the general public. This information previously was located incorrectly in Section 5.2. The note located in Section 5.2 was deleted because the information is now in the definitions section.
5. Added a definition of Heightened Awareness which is a new recommended action with the implementation of the sheltering guidelines.
6. Added the definition of a release.

SCOPE OF REVISION (Cont.):

- Rev. 11 - 7. Divided the first bullet in Section 5.1.1.1 into two bullets for clarity. The first bullet was revised to clarify how to proceed using the PAR flowchart if dose projections are not available. The second bullet was clarified to ensure an initial notification form is used if the PAR is revised. These changes were also carried through to Section 5.1.3.1.
8. The note in Section 5.3.2 was deleted because it contained incorrect information. The correct information, regarding the control and movement of the radiation monitoring teams, is located in EPI-B3. (CA 04-05922-01)
9. Section 5.2.1.1 was revised to clarify the dose for issuing potassium iodide.
10. The conditions under which sheltering should be recommended for the general public were added to the PAR flowchart in Attachment 1 and associated steps in the procedure. This change is being made in response to industry experience and the issuance of Regulatory Issue Summary (RIS) 2004-13 issued August 2, 2004. (CA 04-02593-01, 04-02593-03)
11. Added commitment B00800 to the procedure and underlined it to denote that the entire procedure meets the commitment. (CA 04-05417-02)
12. Changed Emergency Planning Unit (EPU) to Emergency Response Unit (ERU) due to organizational change.

PROTECTIVE ACTIONS AND GUIDES

1.0 PURPOSE

This instruction provides guidelines for the formulation of protective actions for the plume exposure pathway to be recommended to State of Ohio and local county Emergency Management Agencies in the event of an emergency involving the possibility of an abnormal release of radioactive material(s) at the Perry Plant.

This procedure outlines several different protective actions that can be recommended for the general public including sheltering, evacuation, administering potassium iodide (KI), and heightened awareness.

Development of ingestion pathway protective action recommendations will be the responsibility of the State of Ohio and Federal response agencies. The Perry Plant will assist in the collection and analysis of environmental samples using <EPI-B10>.

2.0 REFERENCES

2.1 Source References:

1. 10CFR20, Standards for Protection Against Radiation
2. EPA-400-R-92, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (May 1992)
3. U.S. Nuclear Regulatory Commission Response Technical Manual (RTM) - 92 (October 1992)
4. Emergency Plan for PNPP Docket Nos. 50-440, 50-441
5. EPI-B7a: Automated Offsite Dose Calculations
6. EPI-B7b: Manual Offsite Dose Calculations
7. Patient Package Insert for THYRO-BLOCKTM, Wallace Laboratories (10/79)
8. Regulatory Information Summary (RIS) 2004-13, Consideration of Sheltering in Licensee's Range of Protective Action Recommendations

2.2 Use References:

1. EPI-B10: Emergency Radiological Environmental Monitoring Program
2. EPI-B3: Radiological Surveys for Emergencies

3. EPI-B1: Emergency Notification System
4. EPI-A1: Emergency Action Levels
5. EPI-A2: Emergency Actions Based On Event Classification
6. EPI-A11: Activation of the Backup Emergency Operations Facility
7. Supplement 3 to NUREG-0654/FEMA-REP-1 (Revision 1): Criteria for Protective Action Recommendations for Severe Accidents
8. PAP-0114: Radiation Protection Program
9. Commitments addressed in this document:

H00022	<u>P00005</u>	P00029	P00046
H00024	P00011	P00037	<u>B00800</u>

3.0 DEFINITIONS

3.1 Protective Actions

Those emergency measures taken before or after an uncontrolled release of radioactive material has occurred to prevent or minimize radiological exposure to persons that would likely be exposed, if the actions were not taken.

3.2 Protective Action Guides (PAGs)

Projected radiological doses to individuals in the general population that warrant Protective Actions following a release of radioactive material. Protective Actions would be warranted provided the reduction in individual dose is not offset by excessive risks to individual safety in taking the Protective Action. The Protective Action Guide (PAG) does not include the dose that has unavoidably occurred prior to the assessment.

3.3 Deep Dose Equivalent (DDE)

The dose equivalent measured at a tissue depth of 1 cm (1000 mg/cm²). DDE is the external component of TEDE.

3.4 Committed Dose Equivalent (CDE)

The dose equivalent to organs or tissues of reference that will be received from an intake of radioactive material by an individual during the 50 year period following the uptake.

3.5 Committed Effective Dose Equivalent (CEDE)

The sum of the products of the weighting factors applicable to each of the body organs or tissues and the CDE to these organs or tissues. CEDE is the internal dose component of TEDE.

3.6 Total Effective Dose Equivalent (TEDE)

Sum dose of DDE (external dose) and CEDE (internal dose).

3.7 Derived Air Concentration (DAC)

The concentration of a given radionuclide in air which, if breathed by the reference man for a working year of 2,000 hours under conditions of light work (inhalation rate of 1.2 cubic meters of air per hour), results in an intake of one Annual Limit on Intake (ALI).

3.8 Radiation Emergency Assistance Center/Training Site (REAC/TS)

REAC/TS is operated by the Medical Sciences Division of the Oak Ridge Institute for Science and Education for the U.S. Department of Energy (DOE). REAC/TS provides 24-hour direct or consultative assistance with medical and health physics problems associated with radiation accidents in local, national, and international incidents.

3.9 Subarea 1

Subarea 1 is defined as the area within two miles from the Perry Nuclear Power Plant which includes two miles of Lake Erie.

3.10 "Lake" Evacuation Subarea

If an affected area evacuation includes "Lake", it means that Lake Erie should be evacuated out to 10 miles.

3.11 General Emergency Default PARS

General Emergency Default Protective Action Recommendations (PARs) are based on the potential for a major release of radioactive material from the Perry plant per the guidance set forth in Supplement 3 to <NUREG-0654/FEMA-REP-1>. The intent of these PARS is to provide a means of promptly implementing a minimum evacuation for the general public within 5 miles downwind of the Perry Plant until a detailed assessment can be performed. Implicit in these PARS is that assessment actions will continue to determine what additional protective actions are required to ensure the health and safety of the general public.

3.12 Sheltering PAR

A sheltering PAR is recommended when a controlled release via containment vent is occurring or expected to start within 2 hours and will last less than or equal to 1 hour AND the projected dose to the public is greater than or equal to 1 rem TEDE or 5 rem CDE Child Thyroid at the site boundary. The intent of the sheltering PAR is to minimize the dose to the public (i.e., the dose received during sheltering will be less than or equal to the dose received when evacuating through the plume) and position the public to receive additional instructions.

3.13 KI for the General Public

Recommending the use of KI for the general public is the responsibility of the State of Ohio Department of Health. The Perry Plant will recommend administering KI in accordance with the State procedures upon a declaration of a General Emergency.

3.14 Heightened Awareness

A protective action recommendation that the general public monitor the radio or television broadcasts for additional information about protective actions.

3.15 Release

A release is defined as a radiological release attributable to the emergency event.

4.0 RESPONSIBILITIES

4.1 Emergency Coordinator

1. Approve plume exposure pathway protective action recommendations (PARs) for the general public.
2. Notify the State of Ohio, local counties, and Nuclear Regulatory Commission (NRC) of changes in PARs for the general public developed by the Perry Plant.
3. Approve the use of Potassium Iodide (KI) by Radiation Monitoring Team (RMT) personnel.

4.2 TSC Operations Manager

1. Assume the responsibilities of the Emergency Coordinator prior to the Emergency Operations Facility (EOF) being operational.
2. Approve the usage of Potassium Iodide (KI) for all onsite Emergency Response Organization (ERO) personnel. <P00011>

4.3 **Shift Manager**

1. Assume the responsibilities of the TSC Operations Manager prior to the Technical Support Center (TSC) being operational.

4.4 **EOF Offsite Radiation Advisor**

1. Supervise the development of plume exposure pathway PAR for the general public.
2. Review PAR developed for the general public and recommend approval.
3. Recommend approval for the use of KI for RMT personnel.

4.5 **TSC Radiation Protection Coordinator** <P00046>

1. Assume the responsibilities of the EOF Offsite Radiation Advisor prior to the EOF being operational.
2. Recommend approval for the use of KI for all onsite ERO personnel.

4.6 **Shift Engineer**

1. Review PARs developed for the general public prior to the TSC being operational.
2. Assist in estimating the duration of a release and the prognosis for the restoration or failure of plant equipment/structures which may result in a release being terminated or (re)initiated.

4.7 **TSC/EOF Dose Assessor(s)**

1. Develop plume exposure pathway PARs for the general public per this instruction.

4.8 **Shift Lead Chemistry Technician**

1. Assume responsibility for developing PARs for the general public prior to the TSC being operational.

4.9 **TSC Operations Advisor/EOF Plant Operations Advisor**

1. Assist in estimating the duration of a release and the prognosis for the restoration or failure of plant equipment/structures which may result in the release being terminated or (re)initiating.

5.0 ACTIONS

5.1 Protective Action Logic

5.1.1 **Shift Lead Chemistry Technician/Dose Assessor:**

1. Use the PAR Decision Flow Chart (Attachment 1), to determine the appropriate PAR.
 - If a dose projection cannot be completed within 10 minutes of the declaration of the General Emergency, use the PAR decision flowchart using the "UNKNOWN" decision path per Attachment 1.
 - A change in PAR based on projected or actual dose shall be issued as part of a subsequent initial offsite notification per <EPI-B1>.
 - If the release has not been terminated and an estimate on release duration is not immediately available from the Shift Engineer (SE)/TSC Operations Advisor/EOF Plant Operations Advisor, a 6 hour default release duration shall be used.
2. Submit the PAR, along with supporting data, for review and subsequent approval to the SE/TSC Radiation Protection Coordinator (RPC)/EOF Offsite Radiation Advisor (ORA).
 - If the SE is not stationed (prior to transferring PAR responsibilities to the TSC), forward the PAR directly to the Shift Manager for approval.
3. Assist, when directed, in completing appropriate portions of the Initial Notification (PNPP No. 7794) and Follow-Up Notification (PNPP No. 7795).
4. Monitor potential upgrades or changes in the PAR based on degrading plant conditions or changes in wind direction or other meteorological conditions, and if warranted, recommend required PAR changes to the SE/TSC RPC/EOF ORA in accordance with logic contained in Attachment 1.

NOTE: Once a subarea is included in a PAR, it shall not be removed for subsequent PARs based on changes in conditions.

NOTE: A sheltering PAR should not be recommended if evacuation has already been recommended for the same subareas.

5. Turnover PAR development duties from the Control Room to the TSC, and subsequently to the EOF, when directed.

5.1.2 **Shift Engineer (SE)/TSC Radiation Protection Coordinator (RPC)/EOF
Offsite Radiation Advisor (ORA):**

1. Review PARs developed for the general public and recommend their approval based on the PAR Decision Flowchart (Attachment 1).
2. Ensure that changes in PARs, including their effect on existing subarea protective actions, are adequately reflected in a timely manner on offsite notifications conducted per <EPI-B1>. -- If the release has not been terminated and an estimate on release duration is not immediately available from the Shift Engineer (SE)/TSC Operations Advisor/EOF Plant Operations Advisor, a 6 hour default release duration shall be used.
3. Provide clarification when required to facility staff on the factors considered in developing the PAR.
4. Periodically review the PAR based on degrading plant conditions or changes in wind direction or other meteorological conditions to ensure that required protective actions are being considered in accordance with the PAR logic outlined in Attachment 1. <P00029>

NOTE: Once a subarea is included in a PAR, it shall not be removed for subsequent PARs based on changes in conditions.

NOTE: A sheltering PAR shall not be recommended if evacuation has already been recommended for the same subareas.
5. Assist in completing appropriate portions of the Initial Notification (PNPP No. 7794) and Follow-Up Notification (PNPP No. 7795).
6. Ensure the coordinated turnover of PAR development and review duties from the Control Room to the TSC, and subsequently to the EOF.

5.1.3 **Emergency Coordinator:**

1. Determine if the appropriate method was used to determine the PAR using the PAR Decision Flow Chart (Attachment 1).

2. Approve PARs for the general public developed utilizing Attachment 1 and ensure that the State of Ohio, local counties, and the NRC are notified per <EPI-B1>.
 - If a dose projection cannot be completed within 10 minutes of the declaration of the General Emergency, use the PAR decision flowchart using the "UNKNOWN" decision path per Attachment 1.
 - A change in PAR based on projected or actual dose shall be issued as part of a subsequent initial offsite notification per <EPI-B1>.
3. Ensure that PAR is periodically evaluated based on degrading plant conditions or changes in wind direction or other meteorological conditions using Attachment 1. <P00029>
 - NOTE: Once a subarea is included in a PAR, it shall not be removed for subsequent PAR's based on changes in conditions.
 - NOTE: A sheltering PAR shall not be recommended if evacuation has already been recommended for the same subareas.
4. Ensure the timely and coordinated turnover of PAR approval duties from the Control Room to the TSC, and subsequently to the EOF, when the non-delegatable Emergency Coordinator responsibilities are transferred per <EPI-A2>.

5.2 Potassium Iodide (KI) Distribution to Onsite Emergency Response Organization (ERO) Personnel <H00022, H00024>

5.2.1 **TSC Radiation Protection Coordinator:**

1. Direct that the following information be recorded on a Potassium Iodide (KI) Tracking Form (PNPP No. 9177, Attachment 3) for each Control Room, TSC, Operations Support Center (OSC) and EOF staff member who has exceeded or may exceed a dose of 4000 DAC-hrs AND can not be relocated, dismissed, or have work activities altered to avoid receiving a dose of 10 Rem CDE to the adult thyroid (CDE - child thyroid x 2):
 - a. Full name,
 - b. Social Security No.,
 - c. Employee's Section/Unit, and

d. Estimated date/time of exposure.

NOTE: KI is 90% effective if administered within 1 hour after inhalation or ingestion, and 50% effective if administered within 4 hours after inhalation or ingestion.

2. Review completed form(s) and forward to TSC Operations Manager for approval.

5.2.2 **TSC Operations Manager:**

1. Discuss with TSC Radiation Protection Coordinator whether sufficient As Low As Reasonably Achievable (ALARA) precautions have been taken in lieu of KI.

NOTE: Activation of the Backup EOF per <EPI-All> should be initiated in lieu of issuing KI to EOF staff. KI should only be issued to EOF staff when necessary to allow for movement of personnel from the EOF, if needed, once deactivated.

2. Once a need for KI is determined, approve the distribution of KI by signing the KI Tracking Form(s).
3. Contact the Ohio Emergency Management Agency (OEMA), using the telephone number listed in the Emergency Response Telephone Directory, to obtain guidance from the Radiation Emergency Assistance Center/Training Site (REAC/TS) on further issuance of KI to those individuals who were already issued the drug.

NOTE: A dosage of one tablet per day for ten days should be followed unless instructed otherwise after consulting with REAC/TS.

4. Order additional quantities of KI through the ODH, as required, using the telephone number listed in the Emergency Response Telephone Directory.

NOTE: Sufficient KI is available onsite for three shifts per day for ten days (except for the EOF which only has limited quantities of KI for evacuation purposes). <P00011>

5.2.3 **Shift Manager/OSC Health Physics Supervisor/TSC Radiation Protection Coordinator/EOF Offsite Radiation Advisor:**

1. Brief facility staff to be issued KI on the possible side effects using the manufacturer's patient package insert located on the back of the KI Tracking Forms, and ensure that each individual has no known allergies to iodide.

NOTE: Ingestion of KI, even as a precautionary measure, is a voluntary act and, therefore, at the discretion of each individual.

2. Instruct each employee receiving KI to initial the KI Tracking Form.
3. Distribute one KI tablet (130 mg.) to each authorized individual, and record the date/time issued on the KI Tracking Form.

NOTE: KI is stored in the E-Plan equipment/supply cabinets in the Control Room, TSC Display Room, OSC Conference Room, and in the EOF Decontamination Room.

4. Do not dismiss staff members issued KI until guidance on further KI usage can be obtained from REAC/TS.

5.3 Potassium Iodide (KI) to RMT Members <H00022, H00024>

5.3.1 **TSC/EOF Dose Assessors:**

1. Identify to the EOF Offsite Radiation Advisor the need to consider issuing KI to RMT members who have exceeded or may exceed a dose of 10 Rem CDE to the adult thyroid (CDE - child thyroid x 2).

-- If the EOF is not operational, this concern shall be brought to the attention of the TSC Radiation Protection Coordinator.

2. Once issuance of KI has been approved, ensure that RMT members are briefed on the possible side effects using the manufacturer's patient package insert located on the back of the KI Tracking Form, and ensure that each individual has no known allergies to iodide.

NOTE: Ingestion of KI, even as a precautionary measure, is a voluntary act and, therefore, at the discretion of each individual.

3. Document RMT members' concurrence to taking KI by having each individual initial on the KI Tracking Form.
 - a. If team is currently in the field, obtain a verbal concurrence from each RMT member and document response in RMT Log. Direct RMT members to initial KI Tracking Form upon their return to the Perry Plant site.
4. Direct authorized RMT member(s) to take one KI tablet each (130 mg.).

NOTE: One bottle of KI (14 tablets) each is stored in RMT Sampling Kit.
5. Record the date/time issued block on the KI Tracking Form, when notified by RMT member that he/she has ingested KI tablet.
6. Do not dismiss RMT members issued KI until guidance on further KI usage can be obtained from REAC/TS by contacting the OEMA, using the telephone number listed in the Emergency Response Telephone Directory.

5.3.2 **EOF Offsite Radiation Advisor:**

1. Evaluate the need for KI and, if deemed necessary, direct that the following information be completed on a Potassium Iodide Tracking Form (PNPP No. 9177, Attachment 3) for each RMT member:
 - a. Full Name,
 - b. Social Security No.,
 - c. Employee's Section/Unit, and
 - d. Estimated date/time of exposure.
2. Review the KI Tracking Form to ensure that above information on each individual is recorded; then forward tracking form to Emergency Coordinator for approval.

-- If the EOF is not yet operational, the TSC Operations Manager will be responsible for approving issuance of KI.
3. Notify the TSC/EOF Dose Assessor(s) when approval is obtained for issuing KI.
4. Contact the OEMA, using the telephone number listed in the Emergency Response Telephone Directory, to obtain guidance from REAC/TS on further issuance of KI to those individuals who were already issued the drug.

5.3.3 **EOF Emergency Coordinator:**

1. Discuss with EOF Offsite Radiation Advisor whether sufficient ALARA precautions have been taken in lieu of KI and that adequate justification exists for issuance of KI.
2. Once the need for KI is determined, approve the issuance of KI to RMT members by signing the completed KI Tracking Form(s).

5.4 Records

5.4.1 Records Handling

1. The records generated by emergency response personnel will be collected and maintained by Emergency Response Unit (ERU) pursuant to <EPI-B9>. The Emergency Records Package will be transferred to Records Management pursuant to <PAP-1701>.

5.4.2 Records Capture

The following records are generated by this document:

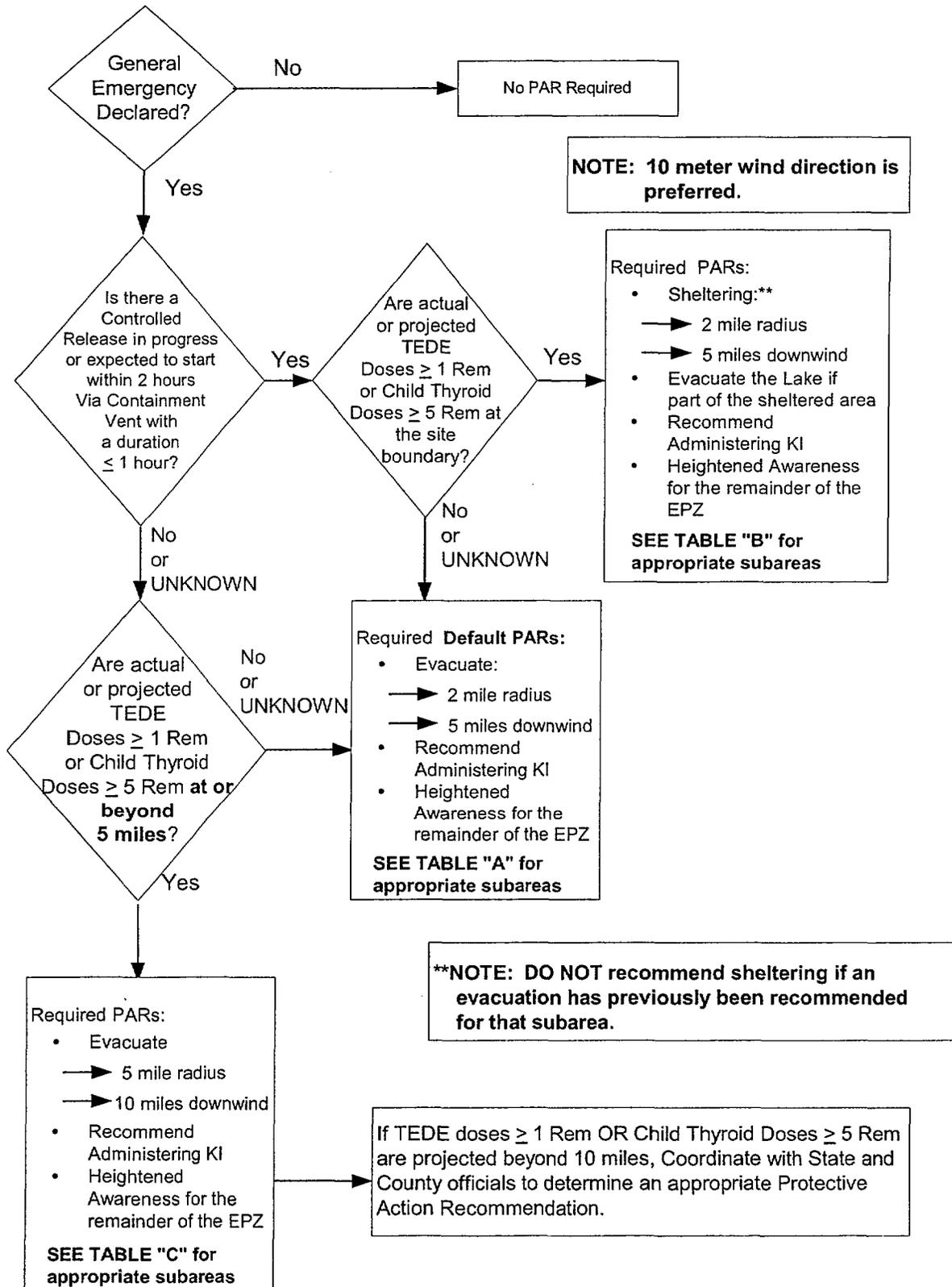
Quality Assurance Records

Potassium Iodide (KI) Tracking Form (PNPP No. 9177)

Non-Quality Records

None

PAR DECISION FLOWCHART



PAR DECISION FLOWCHART continued

TABLES CORRESPONDING SECTORS TO SUBAREAS FOR PROTECTIVE ACTION RECOMMENDATIONS

TABLE A:

Wind Direction	Affected Subareas
102° to 213°	EVACUATE 1 & Lake*
214° to 281°	EVACUATE 1, 2 & Lake*
282° to 11°	EVACUATE 1, 2 & 3
12° to 33°	EVACUATE 1 & 3
34° to 101°	EVACUATE 1, 3 & Lake*

TABLE B:

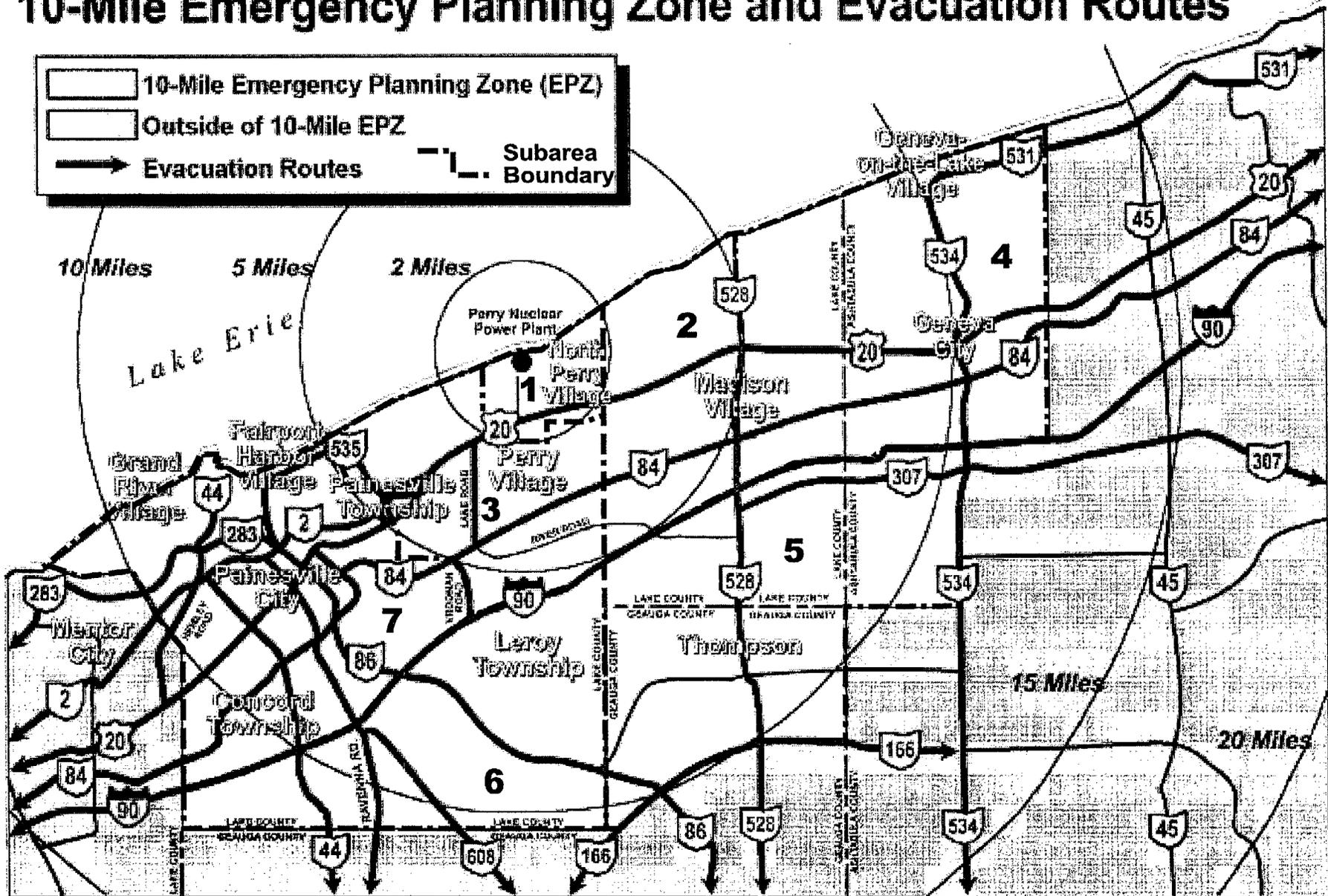
Wind Direction	Affected Subareas
102° to 213°	SHELTER 1 and EVACUATE Lake*
214° to 281°	SHELTER 1, 2 and EVACUATE Lake*
282° to 11°	SHELTER 1, 2 & 3
12° to 33°	SHELTER 1 & 3
34° to 101°	SHELTER 1, 3 and EVACUATE Lake*

TABLE C:

Wind Direction	Affected Subareas
102° to 213°	EVACUATE 1 & Lake*
214° to 258°	EVACUATE 1, 2, 4 & Lake*
259° to 281°	EVACUATE 1, 2, 4, 5 & Lake*
282° to 303°	EVACUATE 1, 2, 3, 4 & 5
304° to 326°	EVACUATE 1, 2, 3, 4, 5 & 6
327° to 348°	EVACUATE 1, 2, 3, 5, & 6
349° to 11°	EVACUATE 1, 2, 3, 5, 6 & 7
12° to 33°	EVACUATE 1, 3, 6 & 7
34° to 56°	EVACUATE 1, 3, 6, 7 & Lake*
57° to 101°	EVACUATE 1, 3, 7 & Lake*

* Lake Evacuation is out to 10 miles

10-Mile Emergency Planning Zone and Evacuation Routes



POTASSIUM IODINE (KI) TRACKING FORM (PNPP No. 9177)

Patient Package Insert For

THYRO-BLOCK®

TABLETS

(POTASSIUM IODIDE TABLETS, USP)
(pronounced *poe-TASS-e-um EYE-oh-dyed*)
(abbreviated: KI)

TAKE POTASSIUM IODIDE ONLY WHEN PUBLIC HEALTH OFFICIALS TELL YOU. IN A RADIATION EMERGENCY, RADIOACTIVE IODINE COULD BE RELEASED INTO THE AIR. POTASSIUM IODIDE (A FORM OF IODINE) CAN HELP PROTECT YOU.

IF YOU ARE TOLD TO TAKE THIS MEDICINE, TAKE IT ONE TIME EVERY 24 HOURS. DO NOT TAKE IT MORE OFTEN. MORE WILL NOT HELP YOU AND MAY INCREASE THE RISK OF SIDE EFFECTS. **DO NOT TAKE THIS DRUG IF YOU KNOW YOU ARE ALLERGIC TO IODIDE.** (SEE SIDE EFFECTS BELOW.)

INDICATIONS

THYROID BLOCKING IN A RADIATION EMERGENCY ONLY.

DIRECTIONS FOR USE

Use only as directed by State or local public health authorities in the event of a radiation emergency.

DOSE

Tablets: **ADULTS AND CHILDREN 1 YEAR OF AGE OR OLDER:** One (1) tablet once a day. Crush for small children.
BABIES UNDER 1 YEAR OF AGE: One-half (½) tablet once a day. Crush first.

Take for 10 days unless directed otherwise by State or local public health authorities.

Store at controlled room temperature between 15° and 30°C (59° to 86°F). Keep container tightly closed and protect from light.

WARNING

Potassium iodide should not be used by people allergic to iodide. Keep out of reach of children. In case of overdose or allergic reaction, contact a physician or the public health authority.

DESCRIPTION

Each THYRO-BLOCK® TABLET contains 130 mg of potassium iodide. Other ingredients: magnesium stearate, microcrystalline cellulose, silica gel, sodium thiosulfate.

HOW POTASSIUM IODIDE WORKS

Certain forms of iodine help your thyroid gland work right. Most people get the iodine they need from foods, like iodized salt or fish. The thyroid can "store" or hold only a certain amount of iodine.

In a radiation emergency, radioactive iodine may be released in the air. This material may be breathed or swallowed. It may enter the thyroid gland and damage it. The damage would probably not show itself for years. Children are most likely to have thyroid damage.

If you take potassium iodide, it will fill up your thyroid gland. This reduces the chance that harmful radioactive iodine will enter the thyroid gland.

WHO SHOULD NOT TAKE POTASSIUM IODIDE

The only people who should not take potassium iodide are people who know they are allergic to iodide. You may take potassium iodide even if you are taking medicines for a thyroid problem (for example, a thyroid hormone or antithyroid drug). Pregnant and nursing women and babies and children may also take this drug.

HOW AND WHEN TO TAKE POTASSIUM IODIDE

Potassium Iodide should be taken as soon as possible after public health officials tell you. You should take one dose every 24 hours. More will not help you because the thyroid can "hold" only limited amounts of iodine. Larger doses will increase the risk of side effects. You will probably be told not to take the drug for more than 10 days.

SIDE EFFECTS

Usually, side effects of potassium iodide happen when people take higher doses for a long time. You should be careful not to take more than the recommended dose or take it for longer than you are told. Side effects are unlikely because of the low dose and the short time you will be taking the drug.

Possible side effects include skin rashes, swelling of the salivary glands, and "iodism" (metallic taste, burning mouth and throat, sore teeth and gums, symptoms of a head cold, and sometimes stomach upset and diarrhea).

A few people have an allergic reaction with more serious symptoms. These could be fever and joint pains, or swelling of parts of the face and body and at times severe shortness of breath requiring immediate medical attention.

Taking iodide may rarely cause overactivity of the thyroid gland, underactivity of the thyroid gland, or enlargement of the thyroid gland (goiter).

WHAT TO DO IF SIDE EFFECT OCCUR

If the side effects are severe or if you have an allergic reaction, stop taking potassium iodide. Then, if possible, call a doctor or public health authority for instructions.

HOW SUPPLIED

THYRO-BLOCK® TABLETS (Potassium Iodide Tablets, USP) bottles of 14 tablets (NDC 0037-0472-20). Each white, round, scored tablet contains 130 mg potassium iodide.

WALLACE LABORATORIES

Division of
CARTER-WALLACE, INC.
Cranbury, New Jersey 08512

PERRY OPERATIONS MANUAL

Emergency Plan Implementing Instruction

TITLE: PERSONNEL ACCOUNTABILITY/SITE EVACUATION

REVISION: 10 EFFECTIVE DATE: 12-22-04

PREPARED: Lawrence Burgwald 12-3-04
/ Date

PERSONNEL ACCOUNTABILITY/SITE EVACUATION

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SCOPE OF REVISION:

Periodic Review - Required

- Rev. 10 -
1. Changed Emergency Planning Unit (EPU) to Emergency Response Unit due to organizational change.
 2. Changed Primary Access Control Point (PACP) to Primary Access Facility (PAF) to be consistent with current terminology.
 3. Changed Supervisor, Nuclear Security Operations (SNSO) to Security Shift Supervisor to be consistent with the current titles.
 4. Correct the title of SPI-0023.

SCOPE OF REVISION (Cont.):

- Rev. 10 - 5. Removed the reference to commitment L00406 as it is not applicable to EPI-B5. (CA 04-05417)
6. Added and/or clarified definitions.
7. Added Public Information Response Team (PIRT) to Step 5.6.4.
8. The allowance for plant management not staffing an emergency response facility to remain onsite was deleted as it is contrary to the Emergency Plan. (CA 04-05815-01)
9. Replaced Operations Manager with TSC Operations Manager for clarity.

PERSONNEL ACCOUNTABILITY/SITE EVACUATION

1.0 PURPOSE

This instruction outlines actions to be taken during an emergency at the Perry Plant for the accountability of all FirstEnergy Nuclear Operating Company (FENOC) employees, contractors, consultants, and visitors within the site boundary, including those involved in Control Room activities or members of the Emergency Response Organization (ERO).

Personnel accountability will be implemented upon declaration of a Site Area Emergency, or based on the discretion of the Emergency Coordinator, with all personnel within the Protected Area being accounted for within 30 minutes. If the emergency escalates to a General Emergency without having been previously classified as a Site Area Emergency, accountability shall be initiated upon declaring the General Emergency. Once implemented, accountability is to be maintained continuously thereafter until the emergency is terminated or until otherwise directed by the Technical Support Center (TSC) Operations Manager.

2.0 REFERENCES

2.1 Source References:

1. Emergency Plan for PNPP Docket No. 50-440
2. Nuclear Regulation (NUREG) 0654: "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

2.2 Use References:

1. EPI-A7: Operations Support Center Activation
2. EPI-B1: Emergency Notification System
3. EPI-B9: Emergency Records
4. SPI-0023: Site Evacuation/Personnel Accountability and Access Control Measures
5. PAP-1701: Records Management Program
6. Commitments addressed in this document:

P00006 P00073

3.0 DEFINITIONS

3.1 Accountability

Actions taken to ascertain the whereabouts of persons within the Site Boundary either by means of evacuation or assembly.

NOTE: Protected Area (PA) accountability is achieved when the Shift Manager is notified of the number of personnel unaccounted for within thirty (30) minutes of the declaration of accountability. Owner Controlled Area (OCA) accountability is achieved when actions are initiated to sweep the OCA to locate individuals that have not yet evacuated.

3.2 Evacuation

The action(s) necessary to remove non-essential personnel from an area of immediate danger to an area of safety.

3.3 Owner Controlled Area

Areas owned by the FirstEnergy Corporation which are located within, or adjacent to, the Site Boundary security fence.

3.4 Protected Area

The area encompassing the vital areas, all areas inside the double perimeter barrier fence and the Primary Access Facility (PAF).

3.5 Site Boundary

The area within the owner-controlled Area, encompassed by a security fence surrounding the Perry Nuclear Power Plant (PNPP).

3.6 Assembly Area

Those areas designated as collection points for performing personnel accountability and evaluating available personnel resources.

3.7 Primary Access Facility (PAF)

On-site facility, which is used to control access to and maintain personnel accountability within the protected area. The facility is also employed in monitoring personnel exiting the protected area for radiological contamination.

4.0 RESPONSIBILITIES

4.1 TSC Operations Manager

1. As acting Emergency Coordinator, ensure the initiation of accountability as required by this instruction.

2. Assume overall authority for the accountability of personnel within the Site Boundary area.

4.2 **Shift Manager**

1. Assume the Technical Support Center (TSC) Operations Manager's duties prior to the TSC being declared operational.
2. Ensure the prompt accountability of Control Room staff and on-shift personnel.

- 4.3 **TSC Radiation Protection Coordinator:** Assess radiological conditions and recommend the use of the designated offsite monitoring/decontamination centers or other areas on-site.

4.4 **TSC Security Coordinator**

1. Coordinate the implementation of accountability measures by the Security Shift Supervisor (SSS) in support of the TSC Operations Manager.
2. Oversee accountability of TSC staff members.

- 4.5 **OSC Coordinator:** Direct the accountability of personnel responding to or already staffing the Operations Support Center (OSC).

- 4.6 **Security Shift Supervisor (SSS):** Direct the actions of the security force personnel in obtaining the accountability of onsite personnel in accordance with <SPI-0023>.

- 4.7 **Perry Plant Section Managers:** Ensure that Company, Contractor, and consultant personnel are trained in their appropriate response to accountability through Plant Access Training (PAT), this instruction, or other periodic training as deemed necessary.

- 4.8 **Perry Plant Personnel:** Follow the requirements of this instruction when personnel accountability is initiated.

- 4.9 **Regulatory Affairs Coordinator:** Notify local county Emergency Operations Centers (EOCs) when the activation of offsite monitoring/decontamination centers is required in support of site evacuation.

5.0 **ACTIONS**

5.1 **TSC Operations Manager** shall:

- 5.1.1 Determine, based on the TSC Radiation Protection Coordinator's recommendation, whether the offsite monitoring/decontamination centers should be activated to monitor personnel evacuating the site due to a significant radiological release or to assemble contractor/vendor support evacuated from the site during outages.

NOTE: It may be prudent to delay implementation of accountability in situations where personnel safety may be jeopardized, such as a security event or severe weather.

5.1.2 Direct the Shift Manager, or designee, to initiate the applicable pre-recorded "Emergency" (Accountability) Message (Attachment 1) or if the pre-recorded "Emergency" message is not available, read the "Emergency" message (Attachment 1) on the Exclusion Area Paging (R53) System.

1. Provide additional guidance, if required, to personnel evacuating the site, using the R53 PA feature, for the following:

- designated evacuation routes due to a security contingency
- use of offsite monitoring and decontamination centers

5.1.3 If the offsite monitoring/decontamination centers are being activated, direct the Administrative Assistant to notify the NRC, State of Ohio, and local counties on the next Follow-up Notification form (PNPP No. 7795) per <EPI-B1>.

5.2 Shift Manager shall:

5.2.1 Perform the actions outlined in Section 5.1 if the TSC is not yet operational, and utilize TSC staff as they become available to accomplish the actions listed in Sections 5.2 thru 5.4.

5.2.2 Activate the applicable pre-recorded "Emergency" message (Attachment 1) on the Exclusion Area Paging (R53) System or if the pre-recorded "Emergency" message is not available, read the "Emergency" message (Attachment 1) approximately every five (5) minutes until accountability is completed.

NOTE: The Shift Manager is responsible to ensure that the accountability message gets repeated approximately every 5 minutes until accountability is completed. The accountability message, once automatically initiated, will be repeated every 5 minutes for 45 minutes. The accountability message is announced via the microphone if the automated message is not available and must be manually repeated approximately every five minutes until accountability is completed. The Shift Manager may delegate this responsibility to another person.

1. Provide additional guidance, if required, to personnel evacuating the site, using the R53 PA feature, for the following:

- designated evacuation routes due to a security contingency
- use of offsite monitoring and decontamination centers

- 5.2.3 Direct all Control Room staff and Plant Operators (POs) located in the Unit 2 Control Room, to promptly use the designated accountability card readers.
- 5.2.4 If not yet relocated to the OSC, verify the location and status of POs presently dispatched in-plant.

After the OSC is operational, shift personnel such as the Shift I&C/HP/Chemistry Technicians and Plant Operators (POs) will be accounted for through the OSC.

1. Complete Personnel Accountability Checklist (PNPP No. 7957, Attachment 2) to account for on-shift POs outside the Control Room, and forward to the CAS via the Secondary Alarm Station (SAS). <P00073>
- 5.2.5 Obtain the number of unaccounted for people within the Protected Area from the CAS no later than 30 minutes after accountability was initiated.
- 5.3 **Radiation Protection Coordinator** shall:
- 5.3.1 When radiological conditions onsite pose a hazard to plant personnel evacuating the site, recommend the use of the offsite monitoring/decontamination centers to the TSC Operations Manager.
 - 5.3.2 Dispatch available Radiation Protection support to the Primary Access Facility (PAF) to aid in the monitoring and potential decontamination of personnel exiting the Protected Area.
 - 5.3.3 Designate and set-up an alternate monitoring area onsite for personnel exiting the Protected Area if radiological conditions in the immediate vicinity of the PAF render the portal monitors useless, and activation of the offsite decontamination centers is not warranted.
 - 5.3.4 Periodically apprise the TSC Operations Manager and Security Coordinator of radiological conditions onsite which may affect accountability actions.
- 5.4 **TSC Security Coordinator** shall:
- 5.4.1 Ensure the SSS has initiated applicable accountability actions per <SPI-0023>.
 - 5.4.2 Request that the TSC Operations Manager make an announcement over the facility PA directing TSC and OSC personnel, whom have not yet done so, to log into the TSC Hallway "accountability" card reader.

-- If the TSC "accountability" card reader is not operational, use available TSC staff to complete a Personnel Accountability Checklist using TSC Staffing Board and forward completed form to CAS.

5.4.3 Direct the SSS to allow immediate access to the Protected Area for on-call ERO responders caught outside the Protected Area upon initiation of accountability.

1. Relay requests to the PAF from TSC staff and the OSC Coordinator for Protected Area access for craft, technicians, or support staff members caught outside the Protected Area upon initiation of accountability.

Protected Area access to all but on-call ERO responders may be restricted until personnel accountability is obtained or adequate security officers are available to man PAF access.

5.4.4 During normal working hours or outage situations, traffic control points should be established at the main traffic arteries leading from the Perry Plant by contacting the Law Enforcement Coordinator at (440) 953-5477/5478, at the Lake County Emergency Operations Center (EOC).

1. If the EOC is not yet in operation, contact the Lake County Sheriff's Department directly.

5.4.5 Notify the TSC Operations Manager of the accountability results once completed, and keep him informed of on-going search and rescue activities.

5.4.6 Coordinate the sheltering and relocation of non-essential personnel without transportation by performing the following:

1. Direct the SSS to:
 - a. Notify the Security Officers at the PAF that they should direct any individuals without transportation to Warehouse 1 - Receiving Area.
 - b. Dispatch a Security Officer, when available, to the Warehouse 1 - Receiving Area and report back to the TSC the number of people that require offsite transportation.
2. When only a small number of individuals require assistance, arrange for interim sheltering and monitoring through the Radiation Protection Coordinator until site/company transportation can be arranged.
3. Perform the following if the number of individuals assembled precludes the use of site/company transportation.
 - a. Contact the Transportation Officer in the Lake County EOC at (440) 953-5480 or Emergency Management Agency (EMA) Director at (440) 953-5455, and request bus support in transporting individuals to the monitoring and decontamination center at Mentor High School Football Stadium.

b. Contact the Fire Coordinator in the Lake County EOC at (440) 953-5489, and request the activation and staffing of the emergency worker monitoring and decontamination facility at the Mentor High School Football Stadium.

4. Notify the Security Officer(s) at the Center Road Traffic Post, if dispatched, to divert buses to Warehouse 1 - Receiving Area.

5.5 **OSC Coordinator** shall:

5.5.1 Direct OSC staff to utilize the "accountability" card reader located in the TSC hallway, as part of OSC activation process per <EPI-A7> upon arrival at the OSC.

5.5.2 Maintain accountability of personnel staffing the OSC utilizing the OSC personnel/repair team status boards and the OSC Team Briefing/Debriefing Sheet (PNPP No. 7793) per <EPI-A7>.

1. If informed that the "accountability" card readers are NOT operational, a "working copy" of the Personnel Accountability Checklist can be maintained at the OSC Coordinator's discretion in conjunction with the OSC status boards in expediting accountability of OSC personnel.

5.5.3 When the Plant PA announcement initiating accountability is heard, perform the following: <P00073>

1. Verify that OSC staff members have logged into the TSC "accountability" card reader.

-- If an OSC team member has not used the "accountability" card reader and is located in-plant, complete a Personnel Accountability Checklist and forward to the CAS.

2. When notified by Security that the "accountability" card readers are NOT operational, forward a completed Personnel Accountability Checklist to the CAS.

5.6 **Emergency Response Organization (ERO) Personnel Response**

5.6.1 **Control Room/Shift Staffing** shall:

1. Respond as outlined in Control Room Shift Staff and General Site Accountability actions (Attachment 3).

5.6.2 **Technical Support Center (TSC) Staff** shall:

1. Use the TSC Hallway "accountability" card reader upon entering the TSC for accountability purposes.

2. Log into and out of the TSC using the hallway Staffing Board, indicating location/destination upon leaving facility.

3. Respond as outlined in TSC Staff Accountability Actions (Attachment 4), when personnel accountability is initiated.

5.6.3 **Operations Support Center (OSC) Staff shall:**

1. Use the TSC Hallway "accountability" card reader upon responding to the OSC.
2. Respond as outlined in OSC Staff Accountability Actions (Attachment 5), when personnel accountability is initiated.

5.6.4 **Public Information Response Team (PIRT)/Emergency Operations Facility (EOF) Staff shall:**

1. Respond as outlined in PIRT/EOF Staff Accountability Actions (Attachment 6).

5.6.5 **Joint Public Information Center (JPIC) Staff shall:**

1. Respond as outlined in Attachment 3.

5.7 Non-ERO Personnel Response

5.7.1 **Plant Personnel not assigned to ERO shall:**

1. Exit the Protected Area and Perry Plant Site using normal exiting procedures once accountability announcement is heard over the Plant PA, Exclusion Area Paging System or via another employee.
 - a. If directed, report to one of the designated offsite monitoring and decontamination centers listed below, using directions provided in Attachment 7.
 - (1) LAKE COUNTY - MENTOR HIGH SCHOOL FOOTBALL STADIUM, located off Civic Center Blvd. on Munson Road behind school (State Route 615).
 - (2) ASHTABULA COUNTY - SAYBROOK ELEMENTARY SCHOOL, located on Depot Road, south of State Route 20 intersection.
 - (3) GEAUGA COUNTY - HAMB DEN FIRE DEPARTMENT, located on State Route 608 (old State Road), south of State Route 6.

Copies of the directions to Offsite Monitoring/Decontamination Centers are available at the TEC lobby and PAF exit lane. Postings providing directions to centers are also available throughout the site on Company bulletin boards.

2. If you do not have offsite transportation, report to the Warehouse 1 - Receiving Area and await a Security Officers arrival.

Transportation support will be requested from Lake County to relocate these individuals to the Mentor High School Football Stadium, where radiological monitoring/ decontamination can be performed if required and further arrangements made.

5.8 **Regulatory Affairs Coordinator** shall:

5.8.1 Notify the local county EOCs if radiological conditions warrant the activation of offsite monitoring and decontamination centers listed below to support plant personnel evacuating the Perry Plant site.

- (1) **LAKE COUNTY** - MENTOR HIGH SCHOOL FOOTBALL STADIUM, located off Civic Center Blvd. on Munson Road behind school (State Route 615).
- (2) **ASHTABULA COUNTY** - SAYBROOK ELEMENTARY SCHOOL, located on Depot Road, south of State Route 20 intersection.
- (3) **GEAUGA COUNTY** - HAMBDEN FIRE DEPARTMENT, located on State Route 608 (old State Road), south of State Route 6.

5.9 **Records**

5.9.1 Records Handling

1. The records generated by emergency response personnel will be collected and maintained by Emergency Response Unit (ERU) pursuant to <EPI-B9>. The Emergency Records Package will be transferred to Records Management pursuant to <PAP-1701> under Record Type 9J100.

5.9.2 Records Capture

The following records are generated by this document:

Quality Assurance Records

Personnel Accountability Checklist (PNPP No. 7957)

Non-Quality Records

None

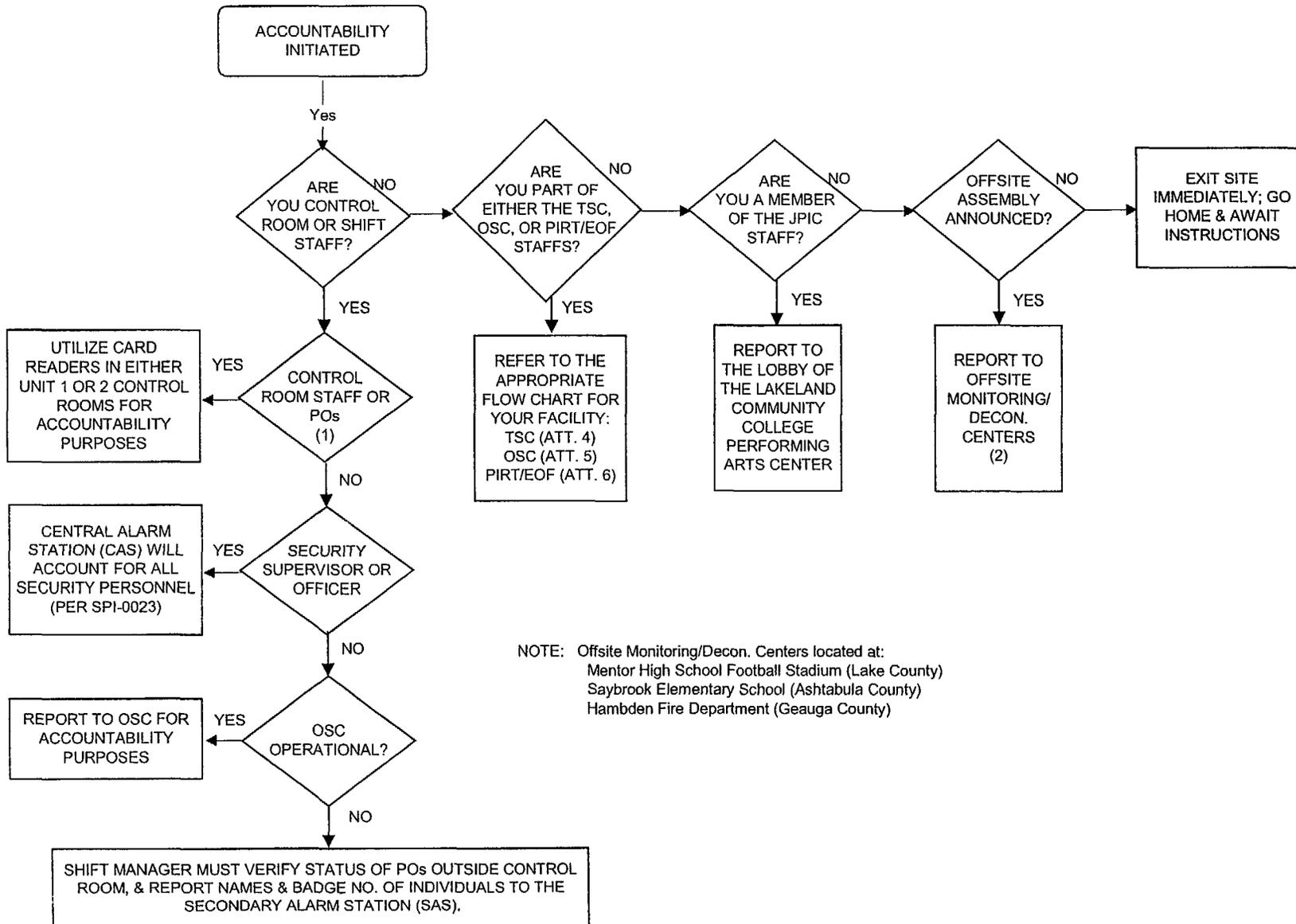
PRE-RECORDED "EMERGENCY" (ACCOUNTABILITY) MESSAGE

"ATTENTION ALL SITE PERSONNEL. ACCOUNTABILITY IS NOW IN EFFECT.
PERSONNEL PERFORMING A PLANT OPERATING OR EMERGENCY FUNCTION, REPORT
YOUR LOCATION TO THE CONTROL ROOM OR APPROPRIATE EMERGENCY FACILITY.
ALL OTHER PERSONNEL EXIT THE SITE USING NORMAL EXITING PROCEDURES."

CONTROL ROOM/SHIFT STAFF & GENERAL SITE ACCOUNTABILITY GUIDELINES

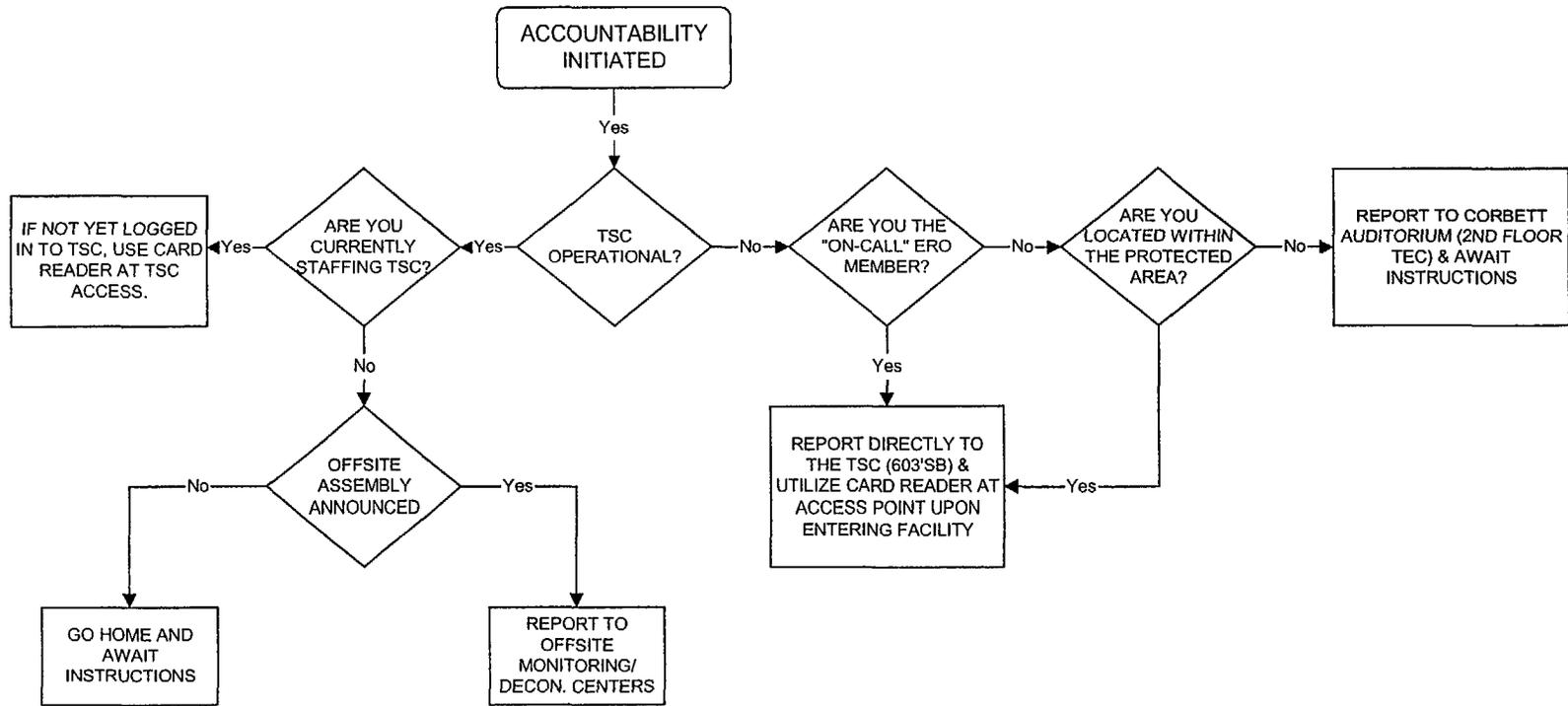
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EPI-B5



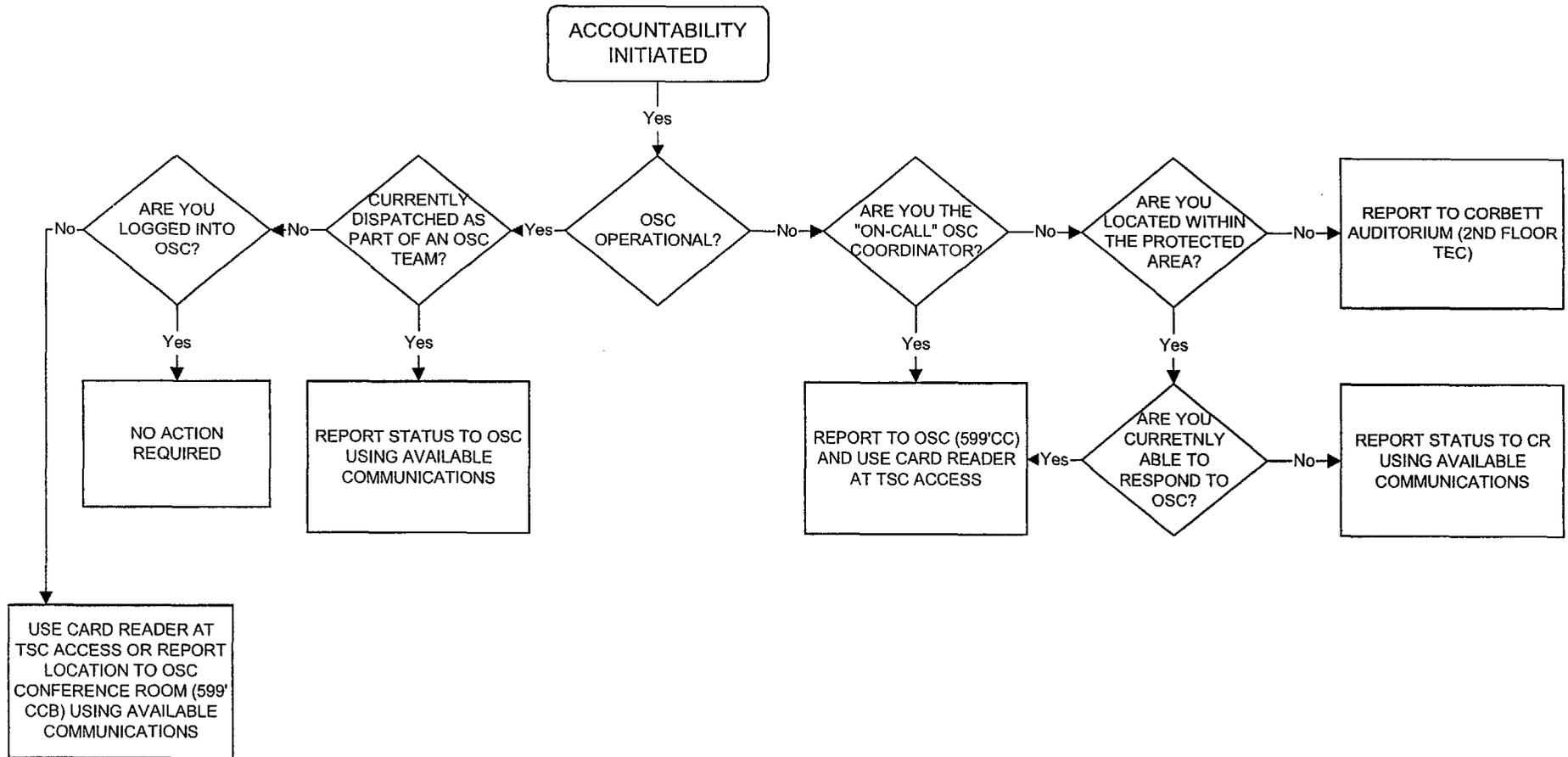
NF975

TSC STAFF ACCOUNTABILITY ACTIONS



NF974

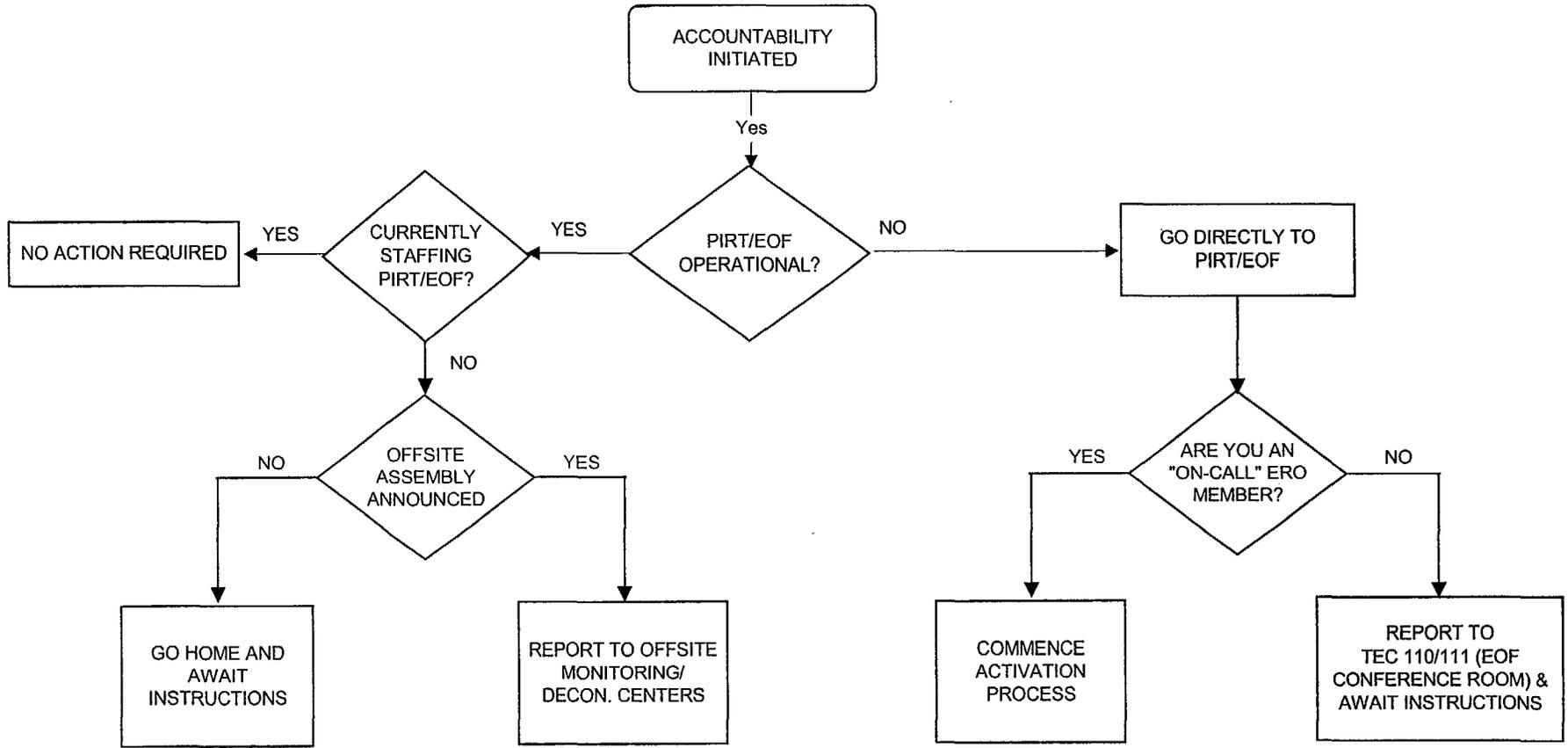
OSC STAFF ACCOUNTABILITY ACTIONS



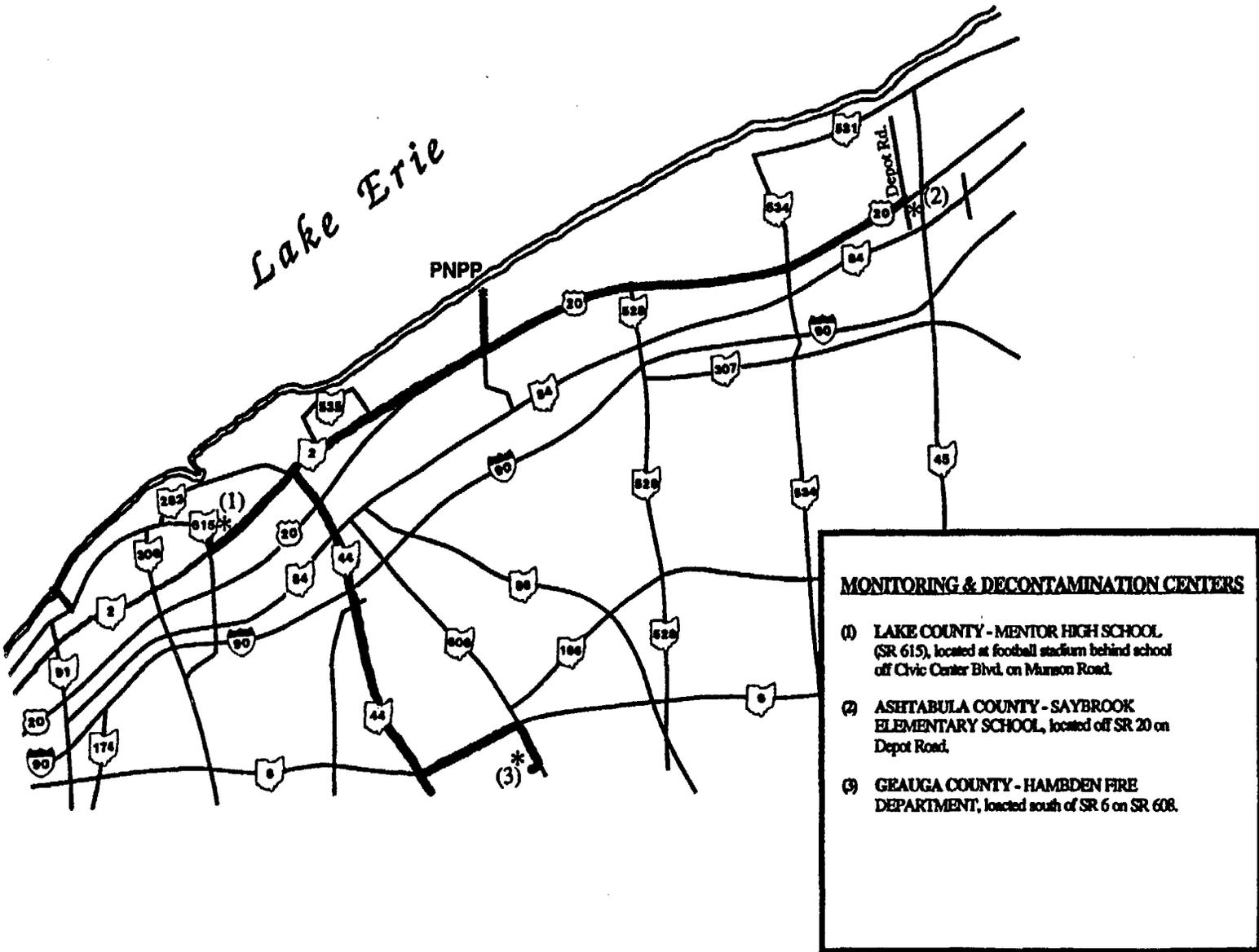
PIRT/EOF STAFF ACCOUNTABILITY ACTIONS

NF973

EPI-B5



OFFSITE MONITORING & DECONTAMINATION CENTER LOCATIONS



J. PROTECTIVE RESPONSE

This Plan Section describes the range of protective actions developed for plant workers and the general public within the plume exposure pathway, the 10-mile Emergency Planning Zone.

J.1 Onsite Notification

The Protected Area is the zone within the Owner-Controlled Area bounded by the Protected Area security fence. The plant itself is located within this zone. In the event of an emergency situation at Fermi 2, methods are established for notifying personnel within the Protected Area. These people include the following:

- Employees not having emergency assignments
- Visitors
- Contractor personnel

Methods are also established for notifying personnel outside the Protected Area yet still in facilities within the Owner-Controlled Area (site boundary). These facilities include the following:

- Fermi Information Center
- General Training and Orientation Center (GTOC)
- Technical Assistance Center (TAC)
- Nuclear Operations Center (NOC)
- Fermi 1

The primary means of notification within the Protected Area is the emergency alarm system. This system provides an audible signal that alerts personnel to the existence of an emergency event. The following emergency events have specific audible alarm signals:

- Fire - yelp
- Tornado - siren
- Plant area - steady

Following the alarm, personnel are advised of the nature of the emergency via the plant intercom (HiCom) system.

Activation of the emergency alarm system and the subsequent announcement is the responsibility of the Emergency Director. The activation and the appropriate announcement are performed immediately upon classification of an Alert, Site Area Emergency, or General Emergency. If an Unusual Event occurs, notification announcements are performed on a timely basis consistent with the nature of the event. Following activation of the emergency alarm system, all personnel within the Protected and Owner-Controlled Areas are notified and advised within 15 minutes of an emergency situation.

All personnel working within the Protected Area (including contractors, vendors, and visitors) are either trained in emergency procedures or escorted at all times by an authorized individual. Within the Protected Area, a visitor is anyone who has not been issued an unescorted access keycard for the Protected Area. Within the Owner-Controlled Area, a visitor is defined as anyone whose work location is not Fermi 2. The cognizant supervisor is responsible for visitors inside the Owner-Controlled Area but outside the Protected Area.

Authorized escorts are trained in emergency procedures and in the appropriate steps to be taken by visitors in an emergency. Visitors entering the Protected Area meet their assigned escorts at the Security Access Building and are promptly escorted back if an emergency event requiring accountability occurs.

The Fermi Information Center, GTOC, TAC, NOC, and Fermi 1 will be notified of an emergency by Hi-Com announcement.

J.2 Evacuation

A Plant Area Evacuation is defined as the supervised evacuation of all nonessential personnel from a specific area of the plant to another designated safe area. A Protected Area Evacuation is defined as the supervised evacuation of all nonessential personnel from the Protected Area. A Site Area Evacuation is defined as the supervised evacuation of all nonessential personnel from all Owner-Controlled Areas of the site, including but not limited to the Protected Area, the Fermi Information Center, GTOC, TAC, Fermi 1, and the NOC. Evacuated personnel will be directed to assemble at the Newport Service Center, Monroe Power Plant, Trenton Channel Power Plant or will be sent home.

Figure J-1 identifies the Owner-Controlled Area. The evacuation routes and the relocation and monitoring centers for persons leaving Fermi 2 are shown in Figure J-2. The directions of travel and the off-site assembly area(s) (Edison's Newport Service Center, Monroe Power Plant, and Trenton Channel Power Plant) are determined by the Emergency Director based on the current meteorological and emergency conditions. An announcement will be made over the HiCom system in the Protected Area, Fermi Information Center, GTOC, TAC, NOC, and Fermi 1. Nuclear Security is responsible for traffic direction and control of persons leaving Fermi 2, including special provisions for a coordinated evacuation under severe conditions such as inclement weather, large groups of personnel to be evacuated, or a high level radioactive release. Assembly, accountability, and evacuation are conducted in accordance with established procedures.

- J.2.1 **Monitoring and Decontamination** - In the event of a Site Area Evacuation, all nonessential personnel exiting the Protected Area are monitored for contamination by passing through passive portal radiation monitors. Personnel in the Fermi Information Center, GTOC, TAC, NOC, and Fermi 1 are directed to offsite assembly areas and monitored, if emergency conditions warrant, by individuals trained in the operation of personnel monitoring equipment. Vehicles are monitored, as necessary, depending on the amount and direction of the radioactivity released.

Facilities will be available at the offsite assembly areas should it be necessary to decontaminate individuals and/or vehicles. Decontamination equipment is listed in Radiation Protection Procedure 67.000.405. Personnel monitoring and decontamination is performed using techniques described in Radiation Protection Procedure 67.000.400. Vehicle monitoring and decontamination is performed in accordance with EP-220.

- J.2.2 **Accountability** - As individuals exit the Protected Area, they leave their identification badges with the Nuclear Security personnel. Nuclear Security will account for each person inside the Protected Area, using either the security computer system or by visual inspection using the badge exchange system.

Either method provides for accountability of all individuals within 30 minutes of the start of an assembly and accountability and continuously thereafter for all individuals remaining within the protected area.

The accountability of tour groups is the responsibility of the guides who are escorting each group. Persons leaving the NOC, TAC, and Fermi 1 are accounted for by their work supervisors. Assembled groups report to the senior person at each assembly area.

J.3 **Radiation Protection Equipment**

Adequate supplies of radiation protection equipment including protective clothing are maintained for persons remaining in or entering the Protected Area or the Emergency Response Facilities. This emergency equipment is listed, maintained, and inspected in accordance with Radiation Protection Procedure 67.000.405.

Onsite Medical maintains adequate amounts of potassium iodide (KI) to support the Onsite Emergency Response Organization for emergency situations at Fermi 2. The Emergency Director is responsible for authorizing the distribution and use of KI. Protective clothing and respiratory protection equipment are used as directed by the Emergency Director (or delegate).

J.4 Protective Actions

In a radiological emergency, an estimate must be made of the radiation dose that affected population groups may potentially receive. A protective action is taken to avoid or reduce the effects of this projected radiation dose. The Protective Action Guideline (PAG) is a predetermined level of projected dose to individuals in the population at which protective actions are warranted.

Procedures are in place to recommend plume exposure protective actions to State and local offsite emergency response agencies. Prompt notification of protective action recommendations is made to State and local agencies. The Nuclear Regulatory Commission is informed of these recommendations.

The implementation of protective actions taken offsite to protect the health and safety of the general public is the responsibility of the State of Michigan in conjunction with local emergency response agencies.

The Michigan Emergency Management Plan, Monroe County Emergency Management Plan, and Wayne County Emergency Operations Plan describe the provisions to implement measures for the plume exposure pathway EPZ for State and local emergency response personnel and the public. Provisions include the following:

- Maps showing evacuation routes, evacuation areas, congregate care centers, and shelter areas
- Maps showing the population distribution around the nuclear facility
- Methods for notifying all segments of the transient and resident population
- Means for protecting handicapped, institutionalized, or confined individuals whose mobility may be impaired
- Methods for registering and monitoring evacuees at reception centers
- Means of relocation, including reception centers, access control, and evacuation routes and methods
- Methods for protecting the public from consumption of contaminated foodstuffs

- J.4.1 **Basis for Recommending Protective Actions** - The Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (EPA 400-R-92-001) and NUREG-0654 are used as the basis for recommendations for protective actions for the offsite public. Table J-1 summarizes possible protective actions to be implemented by State and local agencies during an emergency. As a further aid in determining appropriate protective actions, Table J-2 contains representative shielding factors provided by typical structures against direct exposure from the plume.
- J.4.2 **Evacuation Time Estimates** - When evacuation is being considered, the time required to implement the evacuation may be an important factor in reaching a protective action recommendation. Evacuation time estimates in the plume exposure EPZ are contained in a separate study "Evacuation Time Estimate Analyses for the Fermi 2 Nuclear Power Plant Emergency Planning Zone," revised March, 2003. Advent Engineering Services, Inc., Ann Arbor, Michigan, performed this study for Detroit Edison. The evacuation time estimate study includes considerations for periods of peak traffic congestion, adverse weather conditions, and the evacuation of institutionalized population.
- J.4.3 **Population Distribution** - The 10-mile and 50-mile EPZs are shown in Figures A-1 and A-2. The population distribution in the 10-mile EPZ is given in Table J-3. There are approximately 5.5 million people in the 50-mile EPZ.
- J.4.4 **Offsite Monitoring** - The locations of the offsite environmental monitoring stations are listed in the Offsite Dose Calculation Manual.

**TABLE J-1: EXPOSURE PATHWAYS, INCIDENT PHASES,
AND PROTECTIVE ACTIONS (a)**

POTENTIAL EXPOSURE PATHWAYS AND INCIDENT PHASES	PROTECTIVE ACTIONS
1. External radiation from facility	Sheltering Evacuation Control of access
2. External radiation from plume	Sheltering Evacuation Control of access
3. Inhalation of activity in plume	Sheltering Administration of stable iodine Evacuation Control of access
4. Contamination of skin and clothes	Sheltering Evacuation Decontamination of persons
5. External radiation from ground deposition of activity	Evacuation Relocation Decontamination of land and property
6. Ingestion of contaminated food and water	Food and water controls (e)
7. Inhalation of resuspended activity	Relocation Decontamination of land and property

- (a) Reference: U.S. Environmental Protection Agency, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," EPA 400-R-92-001.
- (b) Period at the beginning of a nuclear incident when immediate decisions for effective protective actions are required and must therefore usually be based primarily on the status of the facility and the prognosis for worsening conditions.
- (c) Period beginning after the source and releases have been brought under control and reliable environmental measurements are available for use as a basis for decisions on additional protective actions.
- (d) Period beginning when recovery actions designed to reduce radiation levels in the environment to acceptable levels for unrestricted use are commenced.
- (e) The use of stored animal feed and uncontaminated water to limit the uptake of radionuclides by domestic animals in the food chain can be applicable in any of the phases.

TABLE J-2: REPRESENTATIVE SHIELDING FACTORS FROM GAMMA CLOUD SOURCE (a)

<i>Structure or Location</i>	<i>Representative Shielding Factor (b)</i>	<i>Representative Range</i>
Outside	1.0	---
Vehicles	1.0	---
Woodframe house (c) (no basement)	0.9	---
Basement of wood house	0.6	0.1 to 0.7 (d)
Masonry house (no basement)	0.6	0.4 to 0.7 (d)
Basement of masonry house	0.4	0.1 to 0.5 (d)
Large office or industrial building	0.2	0.1 to 0.3 (d, e)

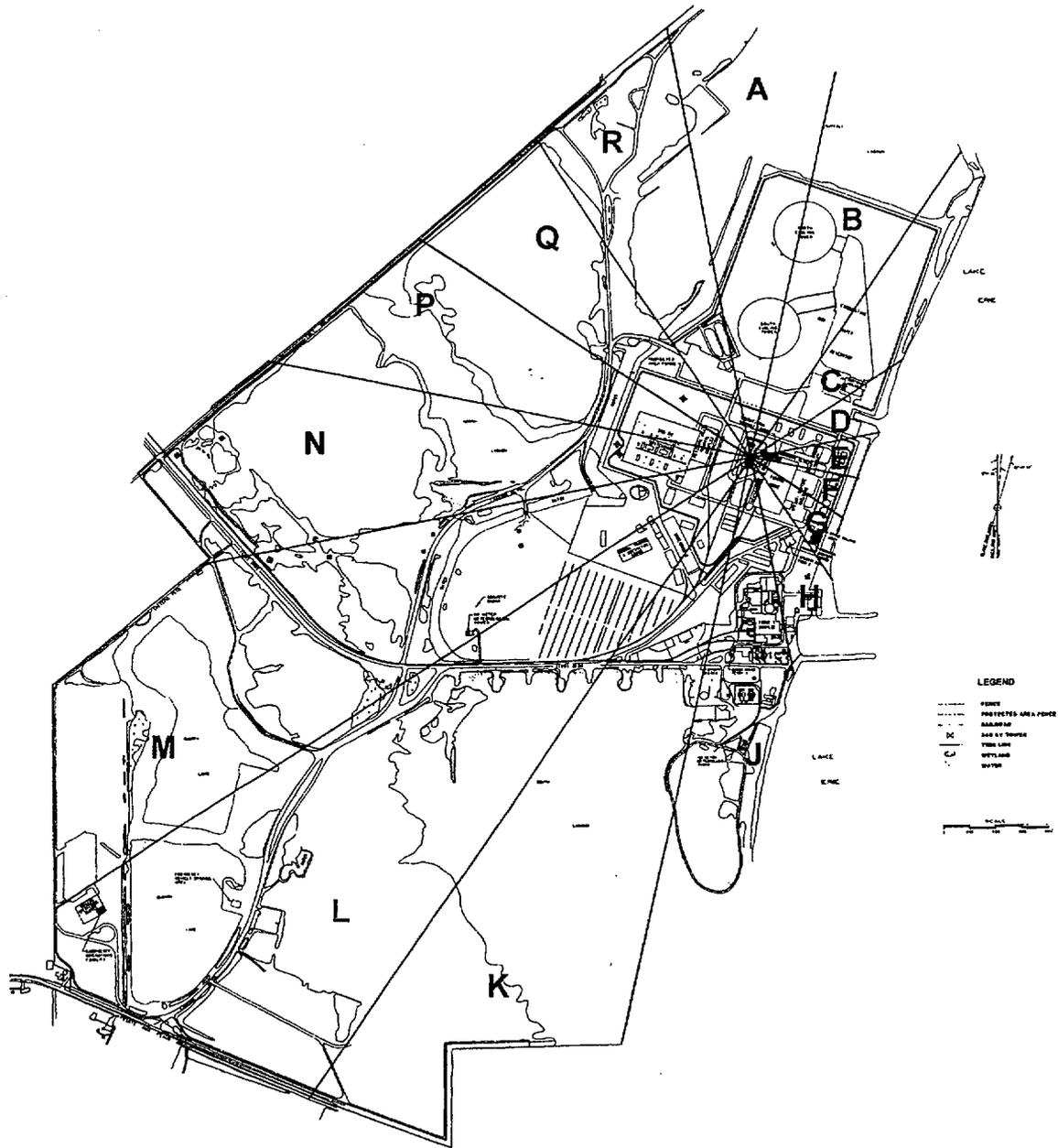
- (a) Taken from SAND 77-1725 (Unlimited Release)
- (b) The ratio of the dose received inside the structure to the dose that would be received outside the structure.
- (c) A wood-frame house with brick or stone veneer is approximately equivalent to a masonry house for shielding purposes.
- (d) This range is mainly due to different wall materials and different geometries.
- (e) The shielding factor depends on where the personnel are located within the building (for example, the basement or an inside room).

TABLE J-3: DISTRIBUTION OF 2000 POPULATION IN EMERGENCY PLANNING ZONE RINGS AND SECTORS, MONROE AND WAYNE COUNTIES, MICHIGAN

Sector	Ring (One-Mile)										Total
	1	2	3	4	5	6	7	8	9	10	
A	0	118	242	179	195	201	873	3656	4367	4658	14489
B	0	214	62	21	54	249	779	1002	835	3761	6977
C	0	191	98	0	0	1	5	0	0	0	295
D	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0	0	0	0
H	0	0	8	0	0	0	0	0	0	0	8
J	3	782	103	0	0	0	0	0	0	0	888
K	4	621	0	0	0	0	0	0	0	0	625
L	3	245	44	144	876	144	17	560	406	2703	5142
M	3	76	807	2035	1355	1036	3353	10182	11075	7370	37292
N	5	73	105	219	358	776	1080	1131	781	685	5213
P	2	45	103	107	240	3334	601	499	490	590	6011
Q	1	165	467	340	707	265	1093	337	809	2862	7046
R	1	110	393	137	137	150	187	495	745	2556	4911
Total	22	2640	2432	3182	3922	6156	7988	17862	19508	25185	88897

* Includes 583 persons who live outside the ten mile EPZ boundary but are included for protective action decision implementation.

Figure J-1
OWNER-CONTROLLED AREA



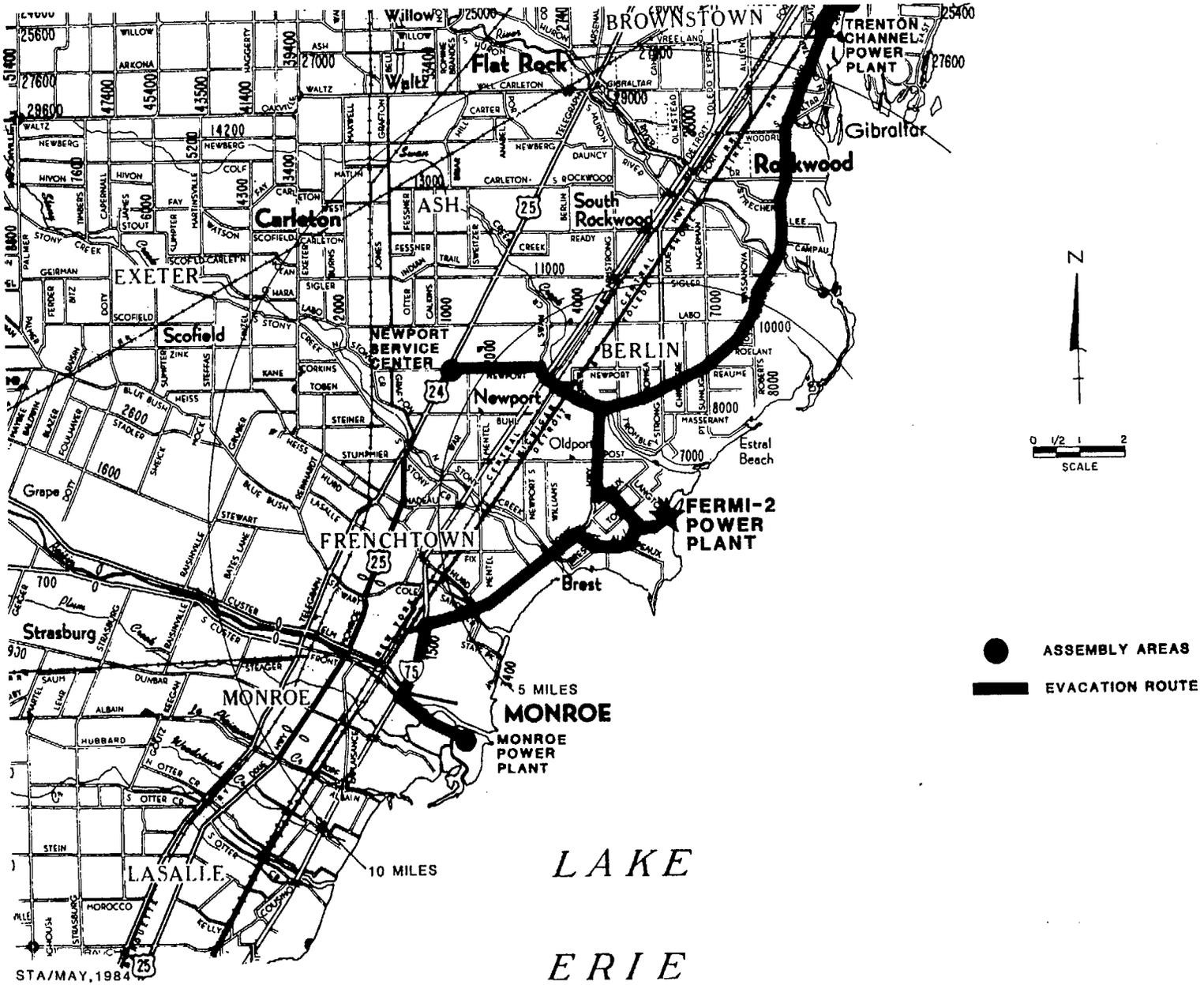


Figure J-2
EVACUATION ROUTES AND ASSEMBLY AREAS

PROTECTIVE ACTION RECOMMENDATIONS

Revision Summary

- 1) Changed 5 Rem to ≥ 5 Rem in Enclosure A.
- 2) Corrected Note numbers in Enclosure A.
- 3) Made editorial changes in Enclosure A. No revision bars used to mark these changes.

Implementation Plan

- 1) This procedure goes into effect upon issuance.

Attachments - None

CM

Enclosures

- | | | |
|---|--------|--|
| A | 121304 | PAR Flowchart |
| B | 101204 | Downwind Affected Sector to Area Conversion Table |
| C | 012798 | Protective Action Areas |
| D | 032803 | EF 2 10-Mile EPZ Evacuation Time Estimates Summary |
| E | 032803 | EF 2 10-Mile EPZ Population Analysis |
| F | 050602 | Representative Shielding Factors From a Gamma Cloud Source |
| G | 050602 | Inhalation Shielding Factors for a Wood House, Snug Doors,
Closed Windows (Thyroid) |

<i>Information and Procedures</i>				
DSN EP-545	Revision 20	DCR # 04-1964	DTC TPEPT	File # 1703.10
IP Code I	Date Approved 12-14-04	Released By M. Struck /s/	Date Issued 12-14-04	Recipient

1.0 PURPOSE

To provide guidelines for formulating and recommending appropriate protective actions for the general public in the event of a General Emergency.

2.0 USE REFERENCES

2.1 EP-290, Emergency Notifications

3.0 ENTRY CONDITIONS

3.1 A Site Area Emergency or General Emergency is declared.

4.0 GENERAL INFORMATION

4.1 Protective actions (evacuation and/or sheltering) are required for the affected areas of the general public at the General Emergency declaration and are recommended to local and/or state authorities as appropriate.

4.2 Protective Action Recommendation (PAR) formulation involves an assessment of risk to the general public. Appropriate recommendations are determined using Enclosure A, PAR Flowchart, which considers risk assessment based on two primary indicators.

4.2.1 Dose Projections

1. Dose projections are classified as "Actual" or "Potential."

- a. **Actual** doses are based on radioactivity actually being released from the plant. They are calculated using either effluent radiation monitor readings (normal), grab sample results, or actual field measurements.
- b. **Potential** doses are based on radioactivity in primary containment available for release. They are calculated using Containment High Range Radiation Monitors (CHRRMs) or containment atmosphere grab sample results.

2. PAR decision making may be based on an estimate of radiation exposure an individual might receive over a projected period in comparison to a Protective Action Guideline (PAG).
 - a. A PAG is a level of exposure that an individual might receive that warrants a specific protective action to be implemented.
 - b. PAG values are expressed in units of dose and represent the risk of health effects to the exposed population.
 - c. PAG values are as follows:

TEDE	1 rem
Adult Thyroid	5 rem
 - d. A projected dose greater than a PAG value is used to initiate PAR decision-making and **normally** requires an evacuation.
3. The risk associated with a projected dose that exceeds a PAG value is generally higher than the risk associated from an evacuation.
 - a. The risks associated with an evacuation during inclement weather or other competing disasters may be greater than that associated with a PAG value. In these cases, sheltering of the public may be appropriate.
 - b. For short, controlled releases, the risk of evacuation in comparison to dose that might be received may be too great. In these cases, sheltering of the public may be appropriate.
4. When projected doses exceed a PAG value at a distance greater than 10 miles, manual dose calculations may be used to determine the affected areas and distances. Protective actions would be determined by a joint assessment between state and facility decision-makers.

4.2.2 Plant Status

1. PAR decision-making also includes an assessment of plant conditions, specifically core damage estimates.

2. Normally a General Emergency declaration represents a significant risk to the general public and indicates a severe core damage accident is in progress **or** projected (> 20% gap release) with a potential for containment failure.
3. Severe core damage accidents reflect an amount of radioactivity that may be available and presents an unacceptable risk to the general health of the public. These accidents would require evacuation of those close to the plant and certain potentially affected downwind areas.
4. The risks due to the potential radiation exposure from a severe core damage accident are reduced by the implementation of protective actions.
5. PAR decision-making based on plant status represents the **desired proactive approach** to the protection of the public. It focuses the decision-maker on the likelihood of radiation exposure thereby offering the greatest reduction of risk.
6. Careful evaluation of plant conditions is needed to properly determine if a *fuel melt* accident is in progress or projected. This evaluation may include, but is not limited to:
 - a. Status of reactor water level and injection capabilities
 - b. Amount of time the fuel has been uncovered
 - c. CHRRMs
 - d. Core damage estimates such as EP-547, "Rapid Estimate of Core/Fuel Damage Based on Containment High Range Radiation Monitor," or dose assessment program
7. Fuel melt sequences represent the greatest risk to the health of the general public. Activity produced from these sequences, if released, can produce severe early health effects and necessitates immediate protection of the public.
8. Analysis of potential primary containment failure during a severe accident may prove to be extremely difficult or impossible to predict since plant conditions are outside of plant design. Therefore, status of primary containment is not considered for the initial PAR development.

4.2.3 PARs must be **continually** evaluated to assure the public's health and safety as conditions change or more information becomes available.

1. If dose calculations become available after an initial PAR has been made the impact on PAR effectiveness must be determined.
2. Meteorological data and the Offsite Radiological Emergency Team (RET) survey(s) provide useful information for PAR development. Each provides information on plume position.
3. Weather forecast data may provide insight on future plume positions. This information should be considered for incorporation into PAR development when available.
4. Current offsite hazards may also exist that might impact protective actions. The presence of physical or environmental hazards (e.g., tornadoes, ice storms, road hazards) should be identified as soon as possible. Presence of these conditions may lead to a shelter recommendation.
5. The current status of emergency response efforts can provide insight to future PARs. Successful (or failed) efforts can provide decision makers with data to help determine likelihood of further core damage.

4.3 Other considerations may be involved when evaluating the effectiveness of a PAR and are normally evaluated by **state** decision-makers.

4.3.1 Certain members of the general public may be at a greater risk from an evacuation or evacuation efforts may take much longer. These members may include, but are not limited to, schools, hospitals, nursing homes, parks, etc.

4.3.2 Evacuations are most effective if completed before plume arrival.

1. Enclosures D and E identify evacuation time estimates and total population which may be useful to evaluate evacuation effectiveness.
2. Enclosure F, Representative Shielding Factors From a Gamma Cloud Source, and Enclosure G, Inhalation Shielding Factors for a Wood House, Snug Doors, Closed Windows (Thyroid), may be used to evaluate sheltering effectiveness by multiplying projected Total Effective Dose Equivalent (TEDE) and adult thyroid dose respectively by the Enclosure's shielding factors.

- 4.3.3 Dose received before PAR implementation is not used for PAR effectiveness evaluations.
- 4.3.4 In cases where evacuations are **not** prudent, sheltering may be appropriate.
- 4.4 Protective actions for the early phase of a General Emergency are prescribed for the 10-Mile Emergency Planning Zone (EPZ) surrounding the site.
 - 4.4.1 For planning purposes, the EPZ is divided into concentric rings of 2, 5, and 10 miles.
 - 4.4.2 The EPZ is also divided into sixteen 22.5° sectors.
 - 4.4.3 The EPZ is further divided into five Protective Action Areas (PAAs) as shown in Enclosure C, Protective Action Areas.
 - 4.4.4 When making PARs, the minimum area considered is the PAAs located in the 2-mile radius, and the projected plume's centerline sector, and two adjacent sectors out to five miles.
 1. When developing PARs for "Security Event Resulting in Loss of Physical Control of the Plant" (HG1), the minimum area considered is located in the 2-mile radius (Area 1).
 2. If the projected dose exceeds a PAG value >10 miles away, adhoc protective actions would be developed in conjunction with offsite authorities.
 - 4.4.5 Once a PAR has been determined **and** communicated, less stringent recommendations are normally **not** considered or used.
 - 4.4.6 Other information such as better understood accident sequence, presence of significant particulate fission products or radioiodine, or the presence of an unmonitored or unfiltered release path may lead to more stringent Adhoc protective actions.
- 4.5 Responsibility for PARs
 - 4.5.1 Emergency Response Organization decision-makers only **recommend** protective actions. State decision-makers make the final decision on what protective action(s) to implement.

- 4.5.2 If the Technical Support Center (TSC) and Emergency Operations Facility (EOF) are **not** functional:
1. The Shift Technical Advisor evaluates available information and advises the Emergency Director in matters related to protective action recommendations.
 2. The Emergency Director is responsible for making the final recommendation(s) to local and/or state authorities as appropriate.
- 4.5.3 If the TSC is functional and the EOF is **not** functional:
1. The Radiation Protection Advisor and/or Technical Engineer, as appropriate, evaluate available information and advise the Emergency Director in matters related to protective action recommendations.
 2. The Emergency Director is responsible for making a final recommendation to local and/or state authorities as appropriate.
- 4.5.4 If the EOF is functional:
1. The Radiation Protection Coordinator evaluates available information and advises the Emergency Officer in matters related to protective action recommendations. The Nuclear Operations Advisor should assist as appropriate.
 2. The Emergency Officer is responsible for making a final recommendation to local and/or state authorities as appropriate.
- 4.5.5 PARs are made to the State Emergency Operations Center (SEOC) if the SEOC is functional.
1. Recommendations will be discussed with the State Emergency Director before issuance, when time permits.
 2. The State Emergency Director will consider recommendations and issue a Protective Action Order, when appropriate, acting with the delegated authority of the Governor.

4.5.6 PARs are made directly to Wayne and Monroe Counties when the SEOC is **not** functional.

1. Recommendations will be discussed with county officials before issuance, when time permits.
2. When deemed appropriate, recommendations will be passed on to the public by county officials.

5.0 IMMEDIATE ACTIONS

5.1 When a Site Area Emergency is declared:

NOTE: Do **not** make any PAR until a General Emergency has been declared.

5.1.1 Initiate formulation of PARs using Enclosures A and B when possible before declaration of a General Emergency.

5.2 When a General Emergency is declared:

NOTE: A PAR shall be made to appropriate offsite authorities concurrent with the initial notification of General Emergency declaration and documented using a Nuclear Plant Event Notification Form.

5.2.1 Formulate PARs using Section 6.0.

6.0 PROCEDURE

6.1 Initial PAR

6.1.1 Determine centerline sector using available resources.

6.1.2 Determine if dangerous travel conditions exist.

6.1.3 Determine if there is a radioactive release.

1. Determine the direction of the radioactive release.

6.1.4 Determine appropriate PAR using Enclosures A and B.

NOTE: Notifications of initial PARs **must** be completed within 15 minutes of the General Emergency declaration.

6.1.5 Immediately communicate the PAR to offsite authorities in accordance with EP-290, "Emergency Notifications."

6.1.6 GO TO step 6.2.

6.2 PAR Effectiveness

6.2.1 Evaluate the effectiveness of the existing PAR using the questions listed in Enclosure A, "Evaluation Considerations for PAR Effectiveness" block as a guide.

6.2.2 Modify the existing PAR using Enclosures A and B as necessary.

NOTE: Notifications of any change to PARs **must** be completed within 15 minutes upon indication(s) of conditions requiring a PAR change.

6.2.3 **Immediately** communicate the new PAR to offsite authorities in accordance with EP-290, "Emergency Notifications."

7.0 FOLLOW-UP ACTIONS

7.1 Continue to evaluate PAR effectiveness (step 6.2.1) as conditions require.

7.2 Keep offsite authorities informed of current dose projection results, plant status, response efforts, and other information which may potentially affect PARs in accordance with EP-290, "Emergency Notifications."

8.0 RECORDS

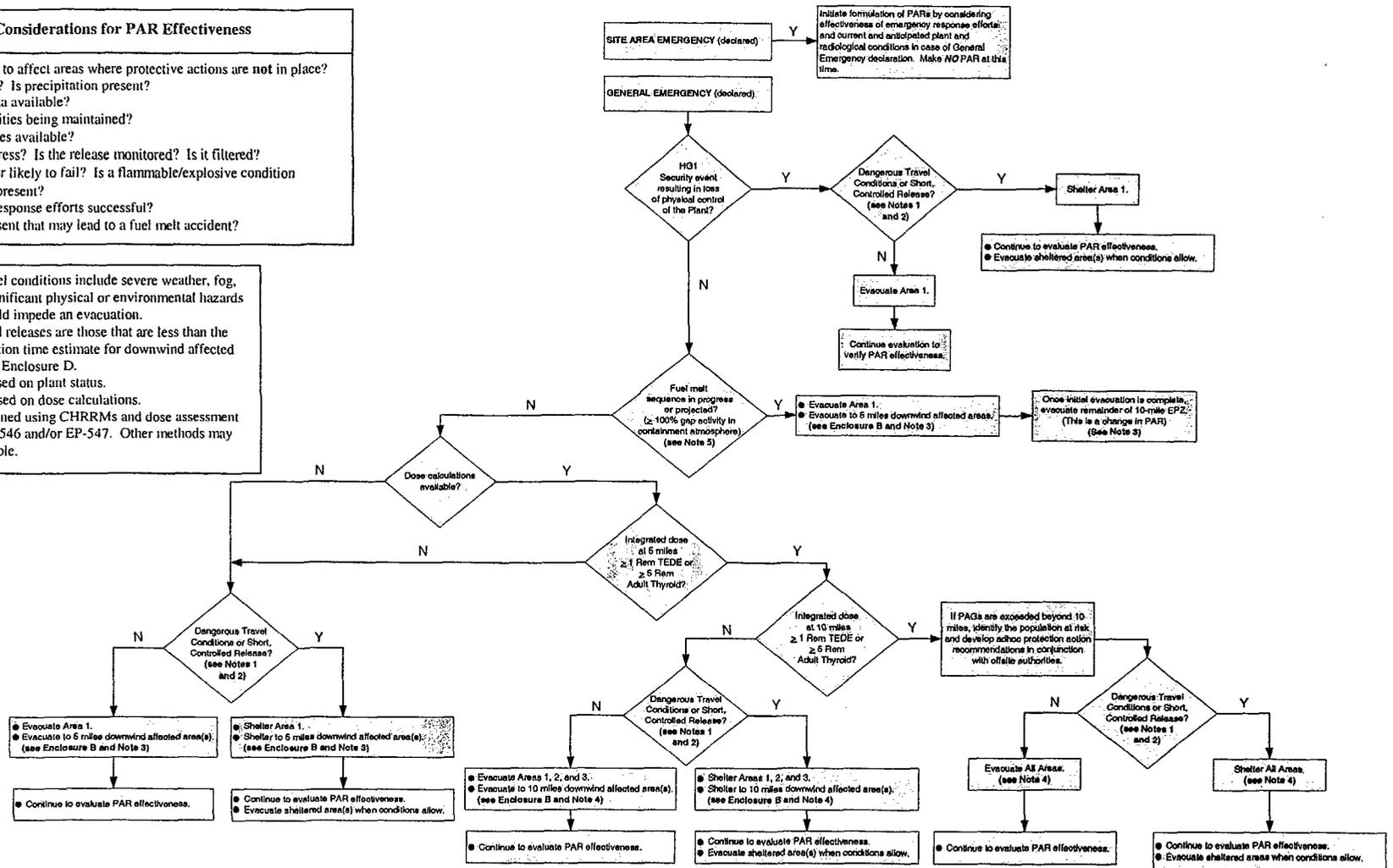
8.1 There are no required records generated through this procedure.

END OF TEXT

PAR FLOWCHART

Evaluation Considerations for PAR Effectiveness	
1.	Are wind shifts expected to affect areas where protective actions are not in place?
2.	Is a lake breeze in effect? Is precipitation present?
3.	Is offsite RET survey data available?
4.	Are core cooling capabilities being maintained?
5.	Are core damage estimates available?
6.	Is there a release in progress? Is the release monitored? Is it filtered?
7.	Has containment failed or likely to fail? Is a flammable/explosive condition ($H_2 \geq 6\%$ and $O_2 \geq 5\%$) present?
8.	Are current emergency response efforts successful?
9.	Are plant conditions present that may lead to a fuel melt accident?

- NOTE (1):** Dangerous travel conditions include severe weather, fog, ice, or other significant physical or environmental hazards offsite that would impede an evacuation.
- NOTE (2):** Short controlled releases are those that are less than the shortest evacuation time estimate for downwind affected area(s) listed in Enclosure D.
- NOTE (3):** This PAR is based on plant status.
- NOTE (4):** This PAR is based on dose calculations.
- NOTE (5):** May be determined using CHRRMs and dose assessment program or EP-546 and/or EP-547. Other methods may also be acceptable.



DOWNWIND AFFECTED SECTOR TO AREA CONVERSION TABLE

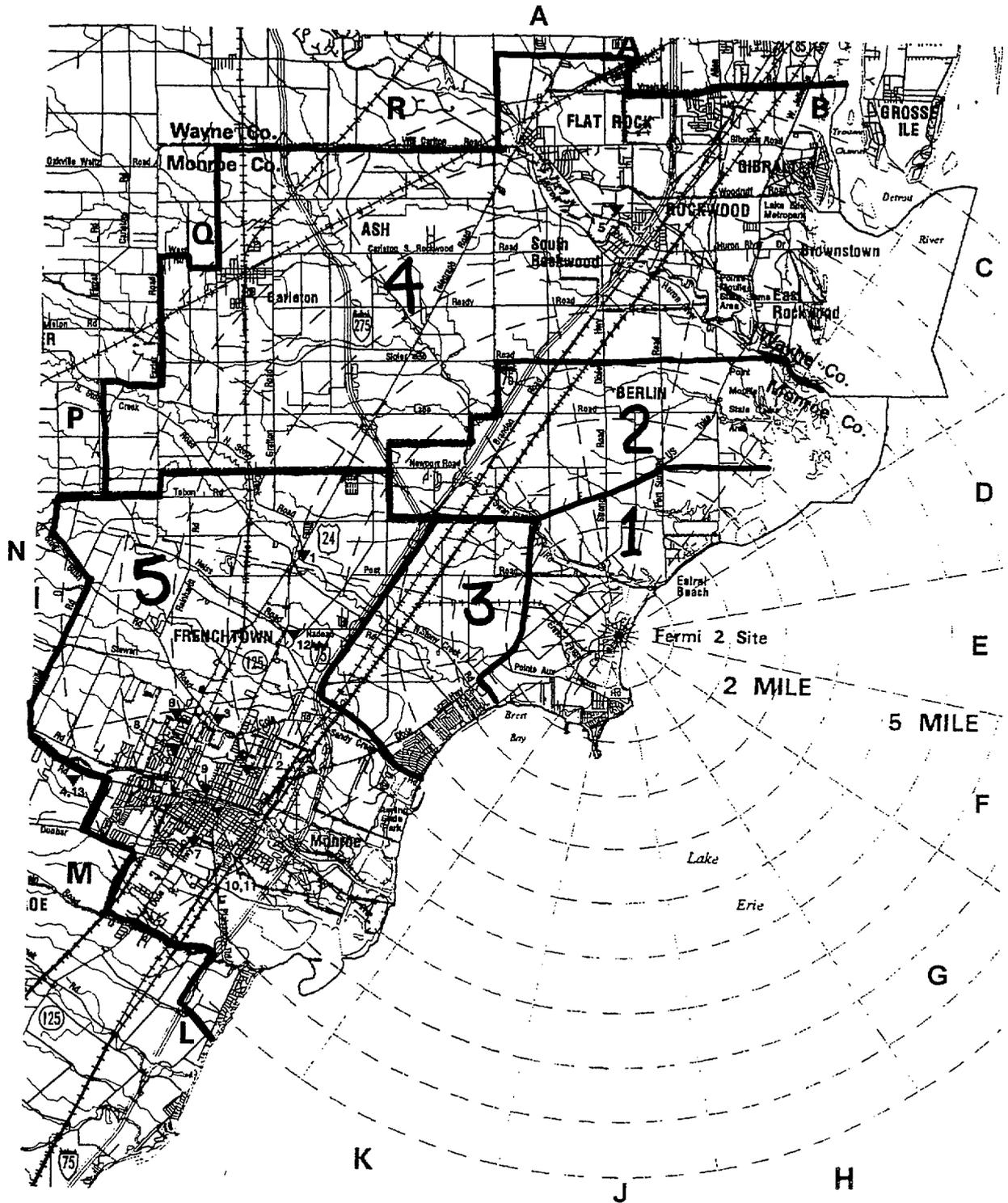
NOTE: The Centerline Sector can be identified on:

- the Integrated Plant Computer System (IPCS) “Straight Line” plume plot display
- dose reports indicating “Affected Sector”
- field team data

When evacuating to 5 miles “Downwind Affected Area(s)”	The “Downwind Affected Area(s)” are:
If Downwind Centerline Sector is E, F, G, H, or J or if wind direction “from” is ≥ 258.8 and ≤ 11.2 deg	Area 1
If Downwind Centerline Sector is A, B, C, or D or if wind direction “from” is ≥ 168.8 and ≤ 258.7 deg	Areas 1 and 2
If Downwind Centerline Sector is K, L, or M or wind direction “from” is ≥ 11.3 and ≤ 78.7 deg	Areas 1 and 3
If Downwind Centerline Sector is N, P, Q, or R or if wind direction “from” is ≥ 78.8 and ≤ 168.7 deg	Areas 1, 2, and 3

When evacuating to 10 miles “Downwind Affected Area(s)”	The “Downwind Affected Area(s)” are:
If Downwind Centerline Sector is R, A, B, C, or D or if wind direction “from” is ≥ 146.3 and ≤ 258.7 deg	Areas 1, 2, 3, and 4
If Downwind Centerline Sector is E, F, G, H, or J or if wind direction “from” is ≥ 258.8 and ≤ 11.2 deg	Areas 1, 2, and 3
If Downwind Centerline Sector is K, L, or M or if wind direction “from” is ≥ 11.3 and ≤ 78.7 deg	Areas 1, 2, 3, and 5
If Downwind Centerline Sector is N, P, or Q or if wind direction “from” is ≥ 78.8 and ≤ 146.2 deg	Areas 1, 2, 3, 4, and 5

PROTECTIVE ACTION AREAS



EF2 10-MILE EPZ EVACUATION TIME ESTIMATES SUMMARY*

Area	Description	Summer Day Normal	Summer Day Adverse ^b	Summer Night Normal	Summer Night Adverse ^b	Winter Day Normal	Winter Day Adverse ^b	Winter Night Normal	Winter Night Adverse ^b
1	All Sectors to 2 miles	2:40	3:10	1:15	1:15	2:40	3:10	1:15	1:15
1 & 2	All Sectors to 2 miles Northwest sectors to 5 miles	2:40	3:15	1:15	1:20	2:45	3:05	1:15	1:20
1 & 3	All Sectors to 2 miles Southwest sectors to 5 miles	4:45	5:05	1:55	2:05	4:00	4:50	1:35	1:25
1, 2, & 3	All sectors to 5 miles	4:45	5:05	1:55	2:05	4:00	4:50	1:35	1:25
1, 2, 3, & 4	All Sectors to 5 miles Northwest sectors to 10 miles	4:45	5:05	2:25	2:30	4:15	5:05	2:20	2:20
1, 2, 3, & 5 ^a	All Sectors to 5 miles Southwest sectors to 10 miles	4:55	5:40	4:55	5:10	5:40	5:50	4:30	4:55
1, 2, 3, 4, & 5 ^a	All sectors to 10 miles	5:12	5:53	5:03	5:21	5:51	6:06	4:40	5:09

* These are comparative times based on data drawn from the Evacuation Time Estimates Analyses for the Fermi 2 Nuclear Power Plant Emergency Planning Zone, March, 2003, prepared by Advent Engineering Services. **Times are given in hours : minutes.**

- a. When evaluating an evacuation PAR for distances greater than 5 miles, and including Area 5, consideration should be given to the special needs of Mercy Memorial Hospital and Mercy Memorial Nursing Center. These facilities are located approximately 7 miles from the site and require approximately 6 hours - 6 minutes to complete an evaluation.
- b. "Adverse" weather conditions are those which may impair visibility and/or traction, such as light snow, ice, rain, or fog.

EF2 10-MILE EPZ POPULATION ANALYSIS*

Area	Description	Summer Day	Summer Night	Winter Day	Winter Night
1	All Sectors to 2 miles	4271	3656	5156	3646
1 & 2	All Sectors to 2 miles Northwest sectors to 5 miles	6726	5876	7953	5866
1 & 3	All Sectors to 2 miles Southwest sectors to 5 miles	8810	7933	11431	7881
1, 2, & 3	All sectors to 5 miles	11265	10153	14227	10101
1, 2, 3, & 4	All sectors to 5 miles Northwest sectors to 10 miles	52603	48664	64554	45381
1, 2, 3, & 5	All sectors to 5 miles Southwest sectors to 10 miles	74526	65673	83703	63013
1, 2, 3, 4, & 5	All sectors to 10 miles	115864	104184	134030	98293

* EPZ population data extracted from the Evacuation Time Estimates Analyses for the Fermi 2 Nuclear Power Plant Emergency Planning Zone, March, 2003, prepared by Advent Engineering Services. Additional population data provided by local planning agencies using U.S. Census data.

REPRESENTATIVE SHIELDING FACTORS FROM GAMMA CLOUD SOURCE^(a)

Structure or Location	Representative Shielding Factor (b)	Representative Range
Outside	1.0	--
Vehicles	1.0	--
Wood frame house ^(c) (no basement)	0.9	0.9
Basement of wood house	0.6	0.1 to 0.7 ^(d)
Masonry house (no basement)	0.6	0.4 to 0.7 ^(d)
Basement of masonry house	0.4	0.1 to 0.5 ^(d)
Large office or industrial building	0.2	0.1 to 0.3 ^(d,e)

(a) Taken from SAND 77-1725 (Unlimited Release).

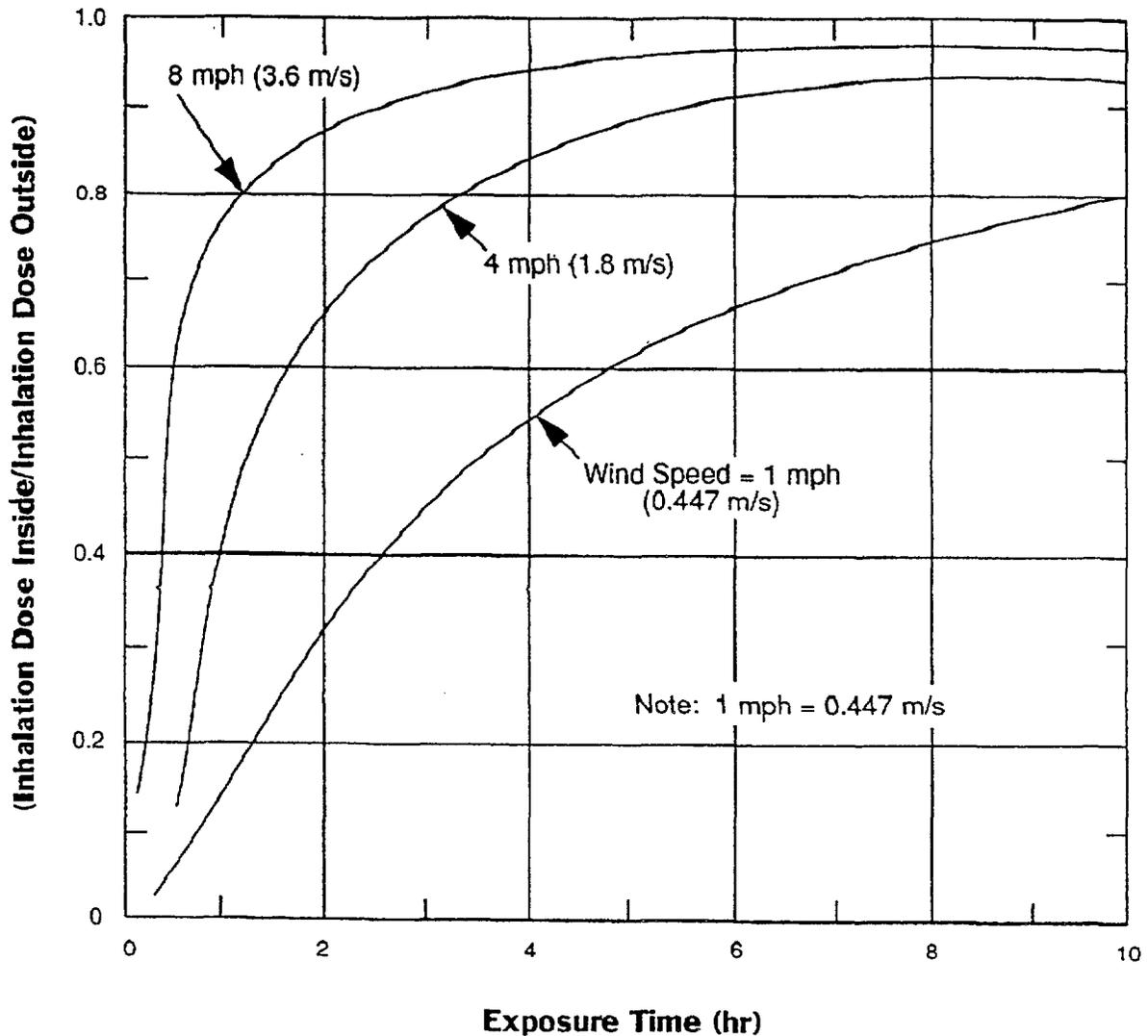
(b) The ratio of the dose received inside the structure to the dose that would be received outside the structure.

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

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

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

**INHALATION SHIELDING FACTORS FOR A WOOD HOUSE,
SNUG DOORS, CLOSED WINDOWS (THYROID)**



The above curve assumes the house remains closed up for the duration. Actually, the dose inside the house can be further reduced by opening the doors and windows after the cloud has passed and purging the house with fresh air.

"Reactor Safety Study," Appendix VI, Wash-1400, October 1975

END

ASSEMBLY AND ACCOUNTABILITY AND ONSITE PROTECTIVE ACTIONS
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Revision Summary

- 1) Added step 5.1.2 to reference new Enclosure B.
- 2) Revised Enclosure A to relocate security event protective actions to Enclosure B.
- 3) Added new Enclosure B.
- 4) Changed Enclosure B to C.
- 5) Changed Enclosure C to D.
- 6) Deleted former Enclosure D.
- 7) Revised wording announcement in Enclosure E.
- 8) Added NTC shelter areas to Enclosure F.
- 9) Made editorial changes throughout procedure. No revision bars used to mark these changes.

Implementation Plan

- 1) This revision goes into effect upon issuance.

Attachments

- 1 020305 OCA Assembly and Accountability Log

Enclosures

- A 080905 Onsite Protective Actions Flowchart
 B 080905 Security Event Onsite Protective Actions Flowchart
 C 080905 Announcement for Assembly and Accountability
 D 080905 Announcement for Unaccounted Personnel Within the Protected Area
 E 080905 Announcement for Onsite Evacuation Order
 F 080905 Safe Shelter Area

<i>Information and Procedures</i>				
DSN EP-530	Revision 18	DCR # 05-1313	DTC TPEPT	File # 1703.10
IP Code I	Date Approved 8-10-05	Released By P. Scott /s/	Date Issued 8-31-05	Recipient

1.0 PURPOSE

To describe the actions necessary to order assembly and accountability including guidance for ordering onsite protective actions.

2.0 USE REFERENCES - None

3.0 ENTRY CONDITIONS

3.1 Either or both of the following conditions exist:

- 3.1.1 An Alert, a Site Area Emergency, or a General Emergency has been declared.
- 3.1.2 An unexpected or uncontrolled hazard exists, or is anticipated in the plant or Owner Controlled Area.

4.0 GENERAL INFORMATION

4.1 When an Alert or higher emergency classification is declared, all personnel onsite shall be accounted for to ensure their location.

- 4.1.1 Assembly and Accountability starts when the order is given to assemble via Hi-Com announcement or by Nuclear Security.
- 4.1.2 Accountability of all personnel within the **Protected Area** shall be completed within 30 minutes. Protected Area Assembly and Accountability ends when the status of all personnel has been reported to the Emergency Director.
- 4.1.3 Assembly of the Owner Controlled Area (OCA) requires all other personnel and visitors to report to the NTC Auditorium.
 - 1. Personnel who report to the NTC Auditorium should log in using Attachment 1, OCA Assembly and Accountability Log.
 - 2. The most senior DTE Energy person present should assume control of personnel present.
 - 3. A brief will be provided to assembled personnel prior to release from the NTC Auditorium. The brief will be provided by senior EOF personnel.

- 4.2 Assembly and Accountability will precede, whenever possible, the order to evacuate. It is desirable in an emergency to establish accountability of personnel as soon as possible to facilitate location of any missing individuals.
- 4.3 For the purpose of Assembly and Accountability, all personnel report to the following facilities:
- 4.3.1 Control Room
- Emergency Response Organization (ERO) assigned to Control Room
- 4.3.2 Technical Support Center (TSC)
- Medical personnel trained in Radiological Medical Emergency Response
 - ERO assigned to TSC
 - NRC Inspectors (having unescorted access to Protected Area)
- 4.3.3 Operations Support Center (OSC)
- Operations Support personnel
 - Radiation Protection personnel assigned to OSC
 - Chemistry personnel assigned to OSC
 - Fire Brigade
 - ERO assigned to OSC
- 4.3.4 Alternate Operations Support Center (AOSC)
- I&C personnel
 - Electrical/Mechanical Maintenance personnel
 - Fire Protection personnel
 - Warehouse A personnel
 - ERO assigned to the AOSC

4.3.5 Emergency Operations Facility (EOF)

- ERO assigned to EOF
- Nuclear Information Personnel

4.3.6 Nuclear Training Center (NTC) Auditorium

- All other DECo personnel
- All non-ERO contractors and visitors

4.4 Normal means of OCA exit is through the main Security Gate on Fermi Drive.

4.4.1 An alternate means of OCA exit is located southeast of the Nuclear Operation Center (NOC) through a locked security gate at Quarry Lake and Pt. Aux Peaux Road.

4.5 Any media requests shall be directed to Corporate Communications.

5.0 PROCEDURE

5.1 Immediate Actions

<i>Who</i>	<i>Step</i>	<i>Action</i>
Emergency Director/ Shift Manager	5.1.1	If emergency conditions/events are occurring that require onsite protective actions, GO TO the Onsite Protective Actions Flowchart in Enclosure A.
	5.1.2	If there is a security event, GO TO the Security Event Onsite Protective Actions Flowchart in Enclosure B.

5.2 Assembly and Accountability Order

<i>Who</i>	<i>Step</i>	<i>Action</i>
Emergency Director/ Shift Manager	5.2.1	Order Assembly and Accountability in accordance with Enclosure C.
	5.2.2	Inform the Security Shift Supervisor that Assembly and Accountability has been ordered.

5.2.3 Protected Area

1. Verify personnel accountability by checking reports received from the Security Shift Supervisor.
2. If personnel are unaccounted for, make the announcement in Enclosure D over the plant Hi-Com, using the Hi-Com Override to locate missing persons.
3. If personnel are still unaccounted for after using Enclosure D, direct the OSC Coordinator to dispatch a Damage Control and Rescue Team to locate any unaccounted for personnel.
4. Provide frequent updates to Emergency Director until all personnel have been accounted for in the Protected Area.
5. When all personnel have been accounted for, notify the Emergency Director.

**Security
Personnel/
Damage Control
Rescue Team**

5.2.4 Owner Controlled Area

1. Perform facility (building or office) sweeps, during normal work hours, to ensure personnel assemble in the NTC Auditorium.
2. Announce the Assembly and Accountability order in accordance with EP-205-01, "Security Force," during off hours **or** when the Hi-Com Override is **not** functioning.
3. Ensure personnel assembling in the NTC Auditorium sign in on Attachment 1.
4. Brief assembled personnel on plant conditions and status of emergency response.

**OCA Building
Coordinators**

Security

**Building
Coordinator(s)/
Security**

**Emergency
Officer/delegate**

5.3 Onsite Sheltering

NOTE: Onsite sheltering is a protective action taken for tornado observations. Onsite sheltering for tornado warnings (normally received by way of Security or System Supervisor) is ordered in accordance with Abnormal Operating Procedures.

<i>Who</i>	<i>Step</i>	<i>Action</i>
Emergency Director/ Shift Manager	5.3.1	<p>If tornado observations are reported:</p> <ol style="list-style-type: none">1. Sound tornado alarm. <p>NOTE: Safe shelter areas are identified in Enclosure F.</p> <ol style="list-style-type: none">2. Make Hi-Com System/Override announcement ordering all onsite personnel to take shelter at the nearest Safe Shelter Area.3. If the Hi-Com System/Override is not functioning, instruct Nuclear Security to announce the sheltering order in accordance with EP-205-01, "Security Force."

NOTE: The Emergency Director should consult with the STA (Control Room) or Radiation Protection Advisor (RPA) before ordering onsite sheltering for abnormal effluent releases.

Emergency Director/ Shift Manager	5.3.2	<p>If a short duration radiological effluent release occurs (< 2 hours), consider performing the following actions:</p> <ol style="list-style-type: none">1. Make Hi-Com System/Override announcement ordering all onsite personnel to remain indoors with doors and windows closed until further notice.2. Inform Nuclear Security of sheltering order.3. If the Hi-Com System/Override is not functioning, instruct Nuclear Security to announce the sheltering order in accordance with EP-205-01.
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5.4 Onsite Evacuation

Who Step Action

NOTE: Assembly and Accountability should be complete prior to an evacuation order.

**Emergency
Director/
Shift Manager**

5.4.1 Before ordering an onsite evacuation:

1. Determine hazard location/plume direction (consult with Shift Technical Advisor/Radiation Protection Advisor/Dose Assessors).
2. Ensure the onsite protective action order does not conflict with any state protective action order in effect.
3. Determine, from Nuclear Security, if the normal (Fermi Drive Gate) or alternate (Pt. Aux Peaux gate) site exit from the OCA will be used.
4. Brief personnel assembled in NTC Auditorium on plant status.

**Emergency
Officer/Delegate**

5.4.2 **If no** radiological hazards are present at the time of the evacuation order:

1. Inform Nuclear Security of the evacuation order.
2. GO TO step 5.4.5.

5.4.3 **If** radiological hazards are present and/or personnel monitoring is required:

1. Select one of the following offsite Assembly Areas:
 - a. Newport Service Center (evacuating West)
 - b. Monroe Power Plant (evacuating South)
 - c. Trenton Channel Power Plant (evacuating North)
2. Inform Nuclear Security of the evacuation order and selected Offsite Assembly Area.

5.4.4 If personnel evacuate to an offsite assembly area, inform the Radiological Emergency Team (RET) Leader or Radiation Protection Coordinator (RPC) to dispatch the Personnel Monitoring Teams (PMTs).

- 5.4.5 Order onsite evacuation in accordance with Enclosure E.
- 5.4.6 If Hi-Com System/Override is not functioning, instruct Nuclear Security to announce the evacuation order in accordance with EP-205-01, "Security Force."

5.5 Follow-up Actions

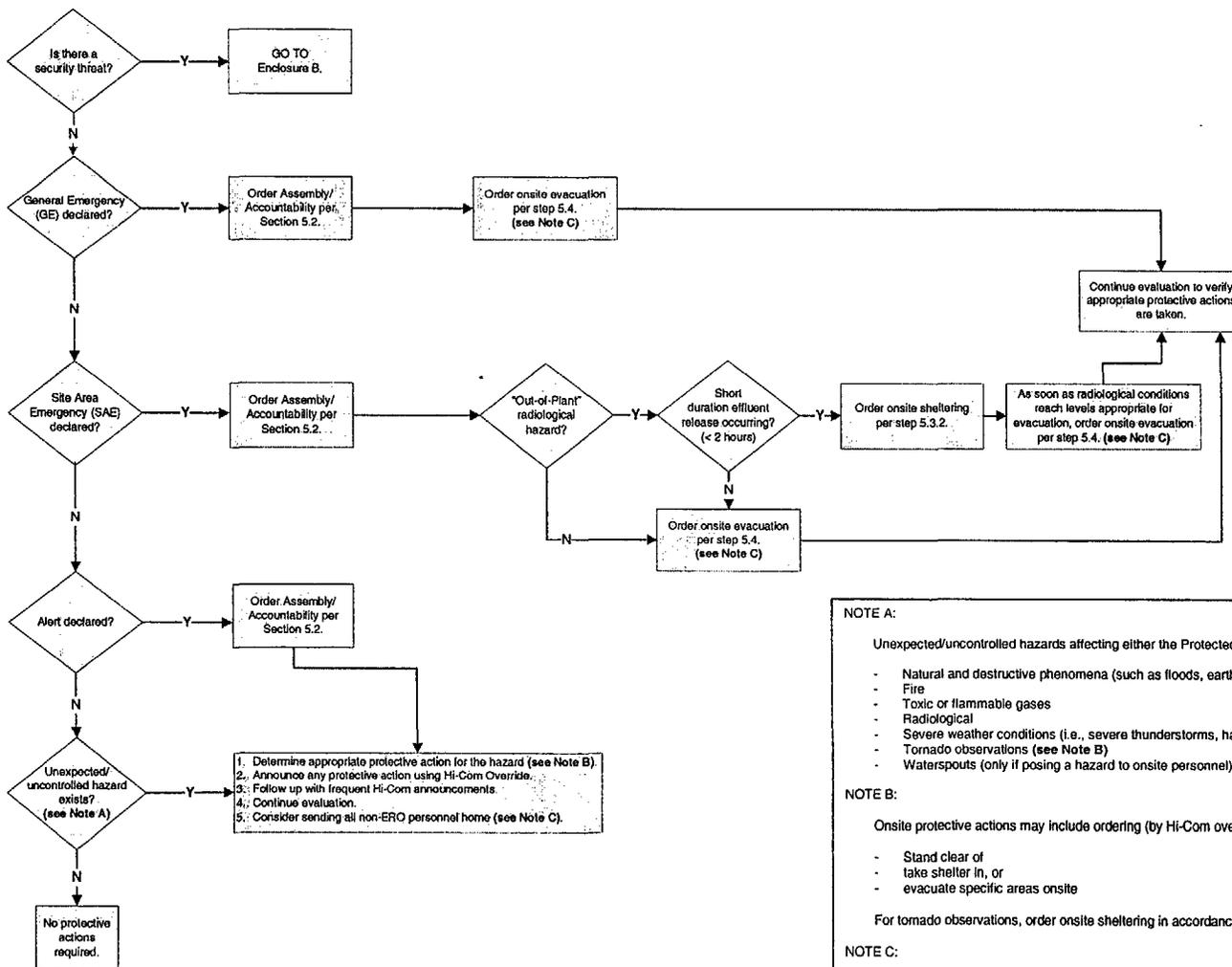
<i>Who</i>	<i>Step</i>	<i>Action</i>
Emergency Director/ Shift Manager	5.5.1	Follow-up onsite protection action orders as follows: <ol style="list-style-type: none">1. Continue to assess physical and radiological hazards onsite.2. Verify appropriate onsite protective actions have been taken to protect the health and safety of onsite personnel.

6.0 RECORDS

- 6.1 OCA Assembly and Accountability Log (Attachment 1) is a required record and shall be retained or dispositioned in accordance with established requirements.

END OF TEXT

ONSITE PROTECTIVE ACTIONS FLOWCHART



NOTE A:

Unexpected/uncontrolled hazards affecting either the Protected Area or Owner Controlled Area include:

- Natural and destructive phenomena (such as floods, earthquakes, vehicle crashes, etc.)
- Fire
- Toxic or flammable gases
- Radiological
- Severe weather conditions (i.e., severe thunderstorms, hail, blizzards, etc.)
- Tornado observations (see Note B)
- Waterspouts (only if posing a hazard to onsite personnel)

NOTE B:

Onsite protective actions may include ordering (by Hi-Com override) personnel to:

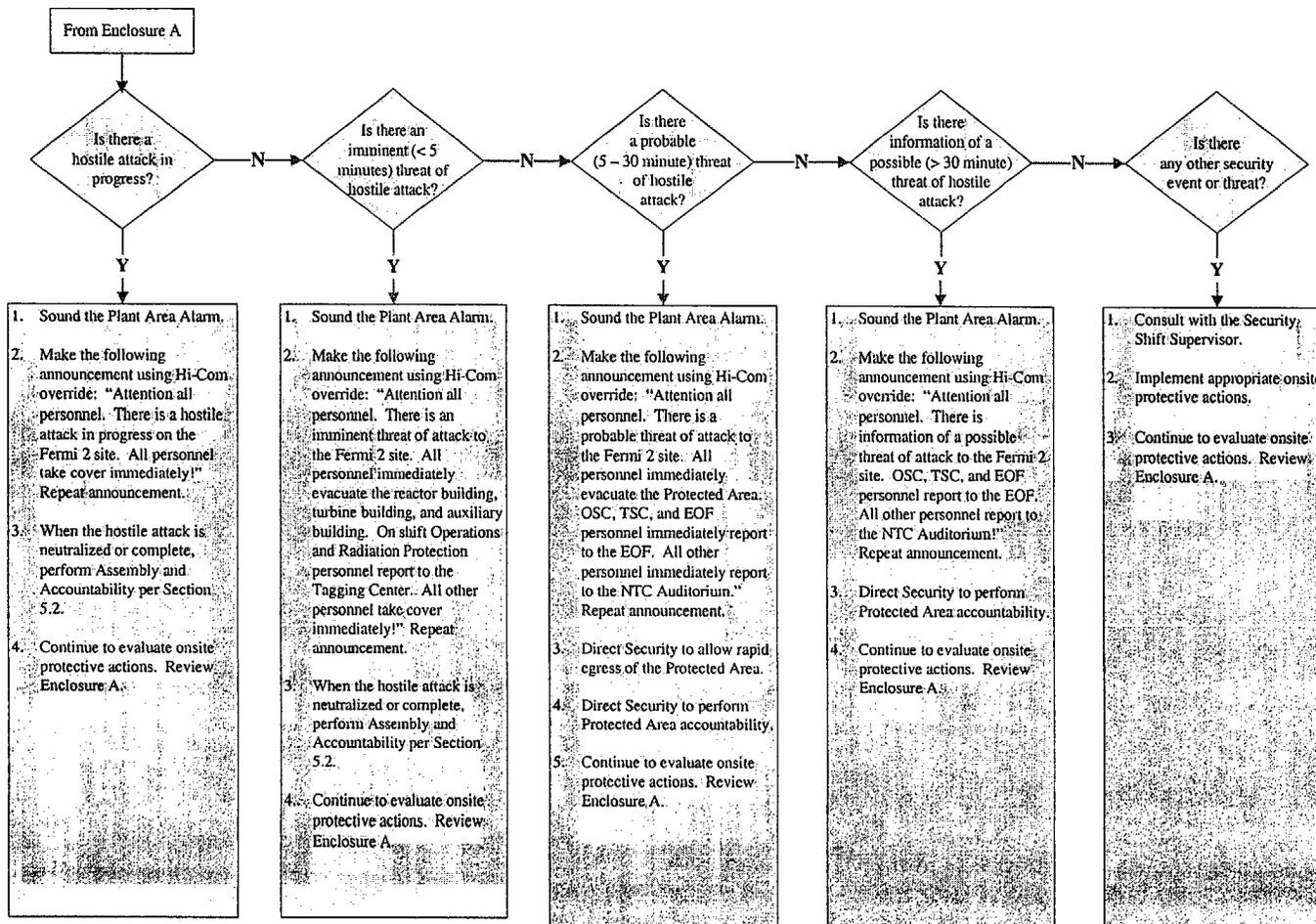
- Stand clear of
- take shelter in, or
- evacuate specific areas onsite

For tornado observations, order onsite sheltering in accordance with step 5.3.1.

NOTE C:

Personnel should be briefed on plant conditions prior to release from site.

SECURITY EVENT ONSITE PROTECTIVE ACTIONS FLOWCHART



ANNOUNCEMENT FOR ASSEMBLY AND ACCOUNTABILITY

NOTE (1): Considerations **before** Ordering Assembly and Accountability:

- If severe weather/tornado warning is in progress, the Emergency Director must verify outside conditions are safe before ordering Assembly and Accountability.
- If physical hazards are present (such as fire, flood, earthquake, toxic or flammable gases, etc.), the Assembly and Accountability message must be modified to include protective actions for the hazard.
- If emergency repair activities are in progress and need to be continued per the Emergency Director's discretion, the Emergency Director will notify Nuclear Security to have individuals accounted for.

NOTE (2): Enclosure B shall be used for security events that involve a threat to the facility.

When an ALERT (or higher class if applicable) is declared:

1. Sound the Plant Area alarm.
2. Make the following announcement on the plant Hi-Com system, using Hi-Com override:

"Attention all personnel. An Alert (or higher class if applicable) has been declared by the Emergency Director. **All** personnel are to report to their assigned assembly area **immediately!** **OSC, TSC, and EOF** personnel immediately report to your Emergency Response Facility. **All other** personnel immediately report to the Nuclear Training Center Auditorium!

REPEAT ANNOUNCEMENT

3. If Hi-Com override is not functioning, instruct Nuclear Security to announce Assembly and Accountability (in accordance with EP-205-01) using battery powered bull horns and vehicle public address speakers.
4. GO TO step 5.2.2.

**ANNOUNCEMENT FOR UNACCOUNTED PERSONNEL WITHIN THE
PROTECTED AREA**

1. Make the following announcement over the plant Hi-Com system, using Hi-Com override:

"Attention all personnel
Will the following personnel immediately report your location to the Control Room."
(Announce the name of each unaccounted for person.)
REPEAT ANNOUNCEMENT

2. GO TO step 5.2.3.3.

ANNOUNCEMENT FOR ONSITE EVACUATION ORDER

When an onsite evacuation is ordered:

1. Sound the Plant Area Alarm.
2. Make the appropriate announcement below on the plant Hi-Com System using the Hi-Com Override.

For non-radiological hazards:

"Attention all personnel. A site evacuation has been ordered by the Emergency Director. All non-Emergency Response Organization personnel evacuate the site and go home."

REPEAT ANNOUNCEMENT

For radiological hazards/personnel monitoring:

"Attention all personnel. A site evacuation has been ordered by the Emergency Director. All non-Emergency Response Organization personnel evacuate to (name one below):"

NEWPORT SERVICE CENTER (evacuating West)

or

MONROE POWER PLANT (evacuating South)

or

TRENTON CHANNEL POWER PLANT (evacuating North)

REPEAT ANNOUNCEMENT

3. GO TO step 5.4.6.

SAFE SHELTER AREAS

NOTE (1): The following locations are designated Safe Shelter Areas for all onsite personnel located both in the Protected Area and Owner Controlled Area. These locations are for safe sheltering for severe weather warnings (tornadoes). Onsite personnel must immediately report to the nearest Safe Shelter Area upon acknowledging a sheltering order due to a tornado warning announcement made by the Control Room (via Hi-Com Override) or Nuclear Security personnel.

NOTE (2): Signs are posted throughout the Fermi site to identify the nearest Safe Shelter Area.

Seven locations are identified as Safe Shelter Areas:

1. Turbine Building 1st Floor for personnel with RRA access
2. OSB hallway (next to RRA entrance) leading to the Turbine Building 1st Floor entrance for personnel without RRA access
3. Outage Building (DWEEB) 1st Floor
4. Technical Support Center (TSC) 1st Floor OBA
5. Inside identified Shelter Areas in Fermi 1
6. Nuclear Operations Center (NOC) in Room 146, 160, 162, and 164 (EOF)
7. Nuclear Training Center (NTC) first floor center area

NOTE: Nuclear Security personnel can remain in the Primary Access Portal (PAP) during severe weather events since the PAP is considered a Safe Shelter Area.

Personnel located throughout the OSB and Outer Buildings 41, 42, and 49 take shelter in the Turbine Building 1st Floor (RRA access) or hallway leading to TB-1 entrance (without RRA access).

Personnel located in the Availability Improvement Building (AIB), Buildings 24 (Warehouse D) 44A, 45, 45A, Warehouse C, and Alternate Access Portal (AAP) take shelter in the Drywell Entry/Exit Building (DWEEB).

Personnel located in Warehouse B, Communications Building, General Training & Orientation Center (GTOC), Technical Assistance Building (TAC), Fermi Information Center, and Buildings 20, 21, 22, 23, 26, 27, 37, 40, and 96 take shelter inside the posted Shelter Areas in Fermi 1.

Personnel located in the NOC take shelter in Rooms 146, 160, 162, and 164 (EOF).

Personnel located in the NTC take shelter in computer rooms, bathrooms, telephone/email rooms, and center classrooms.

END

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

1.0 INTRODUCTION

This report summarizes updates to Evacuation Time Estimates (ETEs) for the Palisades Nuclear Power Plant (PNPP). The purpose of the ETEs is to analyze how the population within the Emergency Planning Zone (EPZ) around the nuclear power plant would evacuate during a radiological emergency.

Estimates of the time required to evacuate from areas around nuclear power plant sites are required for all operating plants in the United States. The Federal government has prepared guidance for the preparation and format of these evacuation time estimates. Most notable are the guidance documents prepared by the U.S. Nuclear Regulatory Commission (NUREG-0654, Rev.1¹ and NUREG/CR 4831²).

1.2 Emergency Planning Zone Description

The Palisades Nuclear Power Plant is located in Van Buren County, Michigan approximately five miles south of the city of South Haven, Michigan. The Emergency Planning Zone (EPZ) encompasses an approximate ten-mile radius around the PNPP including the town of South Haven and portions of Van Buren, Allegan and Berrien Counties.

1.3 Sources of Data

The following data sources were reviewed in order to develop the appropriate input required for the computer simulation model used for the evacuation analysis:

1. Nuclear Management Corporation (NMC) provided a copy of the previous evacuation time estimate study and maps of the EPZ. Additional information including listings of major employers, schools, daycares, nursing and group homes, and recreation areas was providing by emergency planning official from Van Buren, Allegan, and Berrien Counties and from representatives of the Emergency Management Division of the Michigan State Police.
2. U.S. Census (2000) data was used to estimate the permanent population residing in the EPZ and to estimate the average household size (persons/household). This data was obtained from the U.S. Census Bureau website and from the Environmental Systems Research Institute (ESRI), 380 New York Street, Redlands, California.
3. Estimates of workforce populations were based on information from the previous evacuation time estimate study and telephone conversations with specific employers.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

4. Listings of transient facilities (parks, hotels, motels, recreational) were provided by emergency planning officials from Van Buren, Allegan, and Berrien Counties. Additional information was obtained from telephone phone books and Internet searches.
5. Descriptions of the roadway network were obtained from the previous evacuation time estimate study and the Van Buren, Allegan, and Berrien County Highway Departments. The roadway network was surveyed and the characteristics such as number of lanes, pavement width, shoulder type and width, posted speed limits, interchange and intersection geometries were noted and used for preparing the input streams for the transportation model.

1.4 General Assumptions

1. An actual evacuation would be conducted in accordance with current State and County radiological emergency response plans.
2. The evacuation time estimates represent an estimate of the time required to evacuate the population from the affected subareas included in the evacuation cases and include estimates of preparation and mobilization time.
3. The evacuation time estimates were developed assuming that all special facilities (eg, schools, group homes) will be informed to evacuate at the same time as the general population.
4. The simultaneous evacuation of the Palisades AND DC Cook EPZs was not considered in this study.
5. It is assumed that all persons within the EPZ would evacuate the affected subareas.
6. It was assumed that the public would travel on evacuation routes designated by State and County law enforcement and emergency preparedness officials.
7. It was assumed that the permanent population would evacuate from their residences.
8. It was assumed that persons would evacuate as a family unit.
9. It was assumed that 100% of the school population would be evacuated directly to the appropriate reception centers and that no parental pickup would occur.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

10. It was assumed that school staff would evacuate with the students and not via their own vehicles.
11. Transport-dependent, including special needs individuals, would be evacuated by bus or ambulance as coordinated by State and County, and municipal emergency preparedness officials.
12. It was assumed that existing lane utilization and traffic control devices would be used during the evacuation.
13. It was assumed that State and County, and municipal preparedness officials would restrict access into the EPZ or affected areas during the evacuation.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

2.0 POPULATION ESTIMATION

The development of evacuation times necessarily involves estimation of vehicle demand. For this study, vehicle demand estimation was done in two stages. First, the number and distribution of the human population was made. Second, the number and types of vehicles that would be used during an evacuation were estimated. Regulatory guidance suggests that three population segments should be considered: permanent residents, transients, and special facility residents¹.

Permanent residents were defined as those individuals residing at a primary residence that is within the EPZ. Persons considered transients included tourists and employees not residing in the EPZ. The special facility population included those residents confined to hospitals and nursing and group homes. School populations (students and staff) were considered part of the special facility population.

2.1 Permanent Population

The permanent population was estimated by superimposing the PNPP EPZ map on U.S. Census Bureau census block maps. Using EPZ maps those census blocks that best matched the actual EPZ were selected. The five subareas within the EPZ were also defined based on the best match to the census block map. In most instances the actual EPZ edges and the subarea boundaries were consistent with census block boundaries; census boundaries usually follow man-made and natural geographic divisions such as major roadways, rivers, and political boundaries such as County lines. The location of the PNPP was taken as $x=12596562$, $y=305912$.

Once the EPZ and subarea boundaries were developed, the census tract and block attributes were linked to Table P39 in Census Summary File 1 (SF1), which was obtained from the US Census Bureau website. The linked tables were then compiled for each subarea and the permanent populations were tabulated. This data is summarized in Table 2.1. The detailed permanent population for each subarea and county data is given in Appendix A.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 2.1 Permanent populations for subareas in the Palisades EPZ.

Subarea	Permanent Population		
	This study	Previous Study	% Change
1	2,001	-	-
2	1,939	-	-
3	2,360	-	-
4 (Van Buren)	10,283	-	-
4 (Allegan)	1,433	-	-
5 (Van Buren)	4,308	-	-
5 (Berrien)	10,703	-	-
Van Buren County	20,891	19,212	8.7%
Allegan County	1,433	1,142	25.5%
Berrien County	10,703	11,180	- 4.3%
TOTAL EPZ Perm. Pop.	33,027	31,534	4.7%

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

2.2 **Transient Population**

The transient population includes those persons that work at locations within the EPZ. Several components of the transient population are discussed below.

Employees

A listing of major employers and employee estimates is given in Table 2.2. Employee population information provided by the Chamber of Commerce survey was updated through telephone conversations. Employers were also asked to estimate the number of workers for each shift and for weekends.

Transient Population in Hotels and Motels

Hotels, motels, and bed and breakfasts that could be identified within the EPZ are given in Table 2.3. Local telephone books were used to develop a listing of these facilities and facility information (eg, number of rooms) was gathered during telephone conversations.

Transients at Parks

A listing of the parks and recreation areas was taken from the previous ETE and was updated using information provided by emergency planning officials from Berrien and Van Buren Counties and is presented in Table 2.4. It was also assumed that all persons at these facilities would be from outside the EPZ.

Transients at Marinas

Marinas in the EPZ are listed in Table 2.5. This listing was taken from the previous ETE and updated with information provided by officials from Van Buren County.

Transients at Shopping Centers

No major shopping centers were found in the PNPP EPZ.

2.3 **SPECIAL FACILITY POPULATIONS**

This section describes how different components of the special facility population were estimated. In this study, special facility populations included those individuals that have special needs and might require assistance during an evacuation, school and preschool children, and residents of facilities such as hospitals, and nursing homes.

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POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 2.2 Major employers within the EPZ and estimations of employees.

Subarea	City	Facility	Workforce Population		
			Day	Night	Weekend
1	Covert	Palisades Nuclear Power Plant	395	315	315
Subarea 1 Subtotals			395	315	315
2	South Haven	Adkin's Blue Ribbon Packaging	60	0	0
	South Haven	Alpha Engineering	3	0	0
	South Haven	Baars Printing Company	6	0	0
	South Haven	Bohn Engine and Foundry	200	150	5
	South Haven	Taylor Controls, Inc	12	0	0
Subarea 2 Subtotals			281	150	5
4	South Haven	American Twisting Co	25	20	0
	South Haven	Anderson Box	4	0	0
	South Haven	B & K Machine	15	5	0
	South Haven	BEI Incorporated	24	0	0
	South Haven	Consumers Concrete Co	8	0	0
	South Haven	Controlled Rubber Products	60	60	0
	South Haven	Daggett's Concrete Products	10	0	3
	South Haven	Precision Machine	14	0	0
	South Haven	Scott Aviation Plant 4	45	45	0
	South Haven	SE Overton Co	50	0	0
	South Haven	Sherman Dairy Products, Inc	50	0	0
	South Haven	South Haven Coil	50	0	0
	South Haven	South Haven Community Hospital	152	100	100
	South Haven	South Haven Rubber Co	40	30	0
	South Haven	System Components, Inc	35	0	0
	South Haven	Triangle Trades, Inc	20	0	0
	South Haven	Wyckoff Chemical Company, Inc	60	0	0
Subarea 4 Subtotals			662	260	103
5	Watervliet	Custom Built Brush Co	12	0	0
	Coloma	Hipskind Building Supply	10	0	0
	Coloma	InnoCorp	25	0	0
	Watervliet	Jarvis Concrete Products	3	0	0
	Coloma	Menasa Corporation	70	40	0
	Coloma	Modern Light Metals	14	0	0
	Coloma	Russell Vending Company	7	0	0
	Watervliet	Shoreline Industries	15	8	0
	Coloma	Spartan Industries	8	0	0
	Watervliet	Watervliet Fruit Exchange	7	0	0
	Watervliet	Watervliet Paper Company	285	0	0
	Watervliet	Watervliet Hospital	110	90	90
	Coloma	West Gate Oil	8	3	0
Subarea 5 Subtotals			574	141	90
EPZ Totals			1,912	866	513

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 2.3 Hotels, motels, bed and breakfasts within the EPZ.

Subarea	City	Facility	Populations		
			Day	Night	Weekend
4	South Haven	A & R's North Beach Inn and Cottages	40	40	40
4	South Haven	A Country Place Bed and Breakfast	29	29	29
4	South Haven	Arundel House	25	25	25
4	South Haven	Compton's Cove	32	32	32
4	South Haven	Elmhurst Farm Inn	10	10	10
4	South Haven	North Beach Inn and Restaurant	16	16	16
4	South Haven	Old Harbor Inn	65	65	65
4	South Haven	The Colonial	70	70	70
4	South Haven	The Last Resort Bed and Breakfast Inn	34	34	34
4	South Haven	The New Victoria Inn	54	54	54
Subarea 4 Subtotals			375	375	375
5	Coloma	Cez Du Lac Motel	9	9	9
5	Coloma	Motto's Resort	42	42	42
Subarea 5 Subtotals			51	51	51
EPZ Totals			426	426	426

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 2.4 Population and vehicle demand estimates for parks, trails, and recreation areas within the EPZ.

Subarea	Site	Population	Vehicles
1	Covert Township Park	400	80
	Van Buren State Park	6,500	1,760
Subarea 1 Subtotals		6,900	1,840
3	Dune Lake Campground	100	55
	Subarea 3 Subtotals		100
4	Black River	600	125
	Cousin's Campground	120	30
	Jensen's Trailer Park	1,000	80
	North Beach	1,500	500
	Singing Sands RV Park	90	90
	South Beach	1,500	500
Subarea 4 Subtotals		4,810	1,325
5	Benton Harbor/St Joseph KOA	390	130
	Forest Beach	50	15
	Paw Paw Lake	280	15
	Paw Paw River Trading Post	115	30
	Rush Lake Campgrounds	24	24
	Sunset Park	50	15
Subarea 5 Subtotals		909	229
EPZ Totals		12,719	3,449

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 2.5 Transient population estimates for marinas within the Palisades EPZ.

<u>Subarea</u>	<u>Site</u>	<u>No of Slips</u>	<u>Est Population</u>
4	All Seasons Marine, Inc	46	92
	Bard's Marina		
	Black River Marina	45	90
	Boat Yard Basin	70	140
	Burr Docks		
	J&B Landing Launch		
	Jensen's Marina		
	Municipal Marina	74	148
	Nichols Landing Condo Assoc		
	Oak Harbor Marina	85	170
	River Noire Marina		
	River Ridge Marina		
	Slips Away		
	South Haven City		
	South Haven Yacht Club		
	Summer Place Mooring		
	Three Mile Lake		
	Woodland Harbor Marina		
	Subarea 4 Subtotals		
5	Paw Paw Lake Sports and Marina	45	90
	Subarea 5 Subtotals	45	90
	EPZ Totals		

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Hospitals

The hospitals and medical facilities in the EPZ are given in Table 2.6.

Nursing Homes

A list of nursing homes, group homes, and community-based care centers is given Table 2.7. This listing was taken from the previous ETE and reviewed by officials from Allegan, Van Buren, and Berrien Counties.

Schools

A listing of schools and preschools provided by emergency planning officials from Allegan, Van Buren, and Berrien Counties. Each facility was contacted via telephone and the estimates of enrollment and staff were tabulated. This data is given in Table 2.8.

2.4 **Special Events Populations**

Several festival events are held in the South Haven vicinity on an annual basis. The Harbor Fest and All Crafts Fair attract about 20,000 people and are held on the first weekend in September. The South Haven Blueberry Festival is held on the last full weekend of July and attracts about 14,000 people to the area. Finally, the Fourth of July parade and fireworks draw approximately 25,000 to the South Haven beach area.

These events are not concurrent so it is not necessary to plan for an event with more than the event with the greatest attendance. For these EPZ, the greatest special event attendance is the Fourth of July activity.

2.5 **Adjustments To Populations**

Some adjustments to the population estimates were made when it was plausible that a given population could fluctuate and affect evacuation time estimates.

For example, a population change might occur as a result of workforce populations moving in and out of the EPZ. Whatever the reason, it is impossible for a person to be in more than one place at a given time and approximated adjustments to populations may be deemed appropriate. Following are discussions on how the various populations presented in Sections 2.1 through 2.4, were adjusted.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 2.6 Population estimates for hospitals.

Subarea	Facility	Patients			Staff*
		Ambulatory	Req. W.C.	Req. Amb.	
4	South Haven Community Hospital	44	26	12	252
Subarea 4 Subtotals		44	26	12	252
5	Watervliet Hospital	48	12	10	200
Subarea 5 Subtotals		48	12	10	200
EPZ Totals		92	38	60	452

*List as employees in Table 2.2.

Table 2.7 Population estimates for nursing homes and community-based residential facilities.

Subarea	Facility	Residents			Staff
		Ambulatory	Req. W.C.	Req. Amb.	
3	Hebrews Adult Foster Care Home	3	-	-	1
Subarea 3 Subtotals		3	-	-	1
4	Country Side Nursing Home	7	102	-	98
4	South Haven Care Centre	125	-	-	125
Subarea 4 Subtotals		132	102	0	223
5	Abattoir Adult Foster Care	6	-	-	1
5	Deverney Adult Foster Care	12	-	-	1
5	Forest Beach AFC Home	15	-	-	8
5	Juniper Home	6	-	-	10
5	Pine Manor Adult Foster Care	18	-	-	1
Subarea 5 Subtotals		57	0	0	21
EPZ Totals		192	102	0	245

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POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 2.8 Population estimates for schools and preschools, and daycare centers.

Subarea	Facility	Summer			Winter		
		Day	Night	Weekend	Day	Night	Weekend
3	Covert Elementary	0	0	0	454	0	0
	Covert High School	0	0	0	192	0	0
Subarea 3 Subtotals		0	0	0	646	0	0
4	Central Elementary	0	0	0	534	0	0
	Hartman Elementary	0	0	0	124	0	0
	Indiana Elementary	0	0	0	116	0	0
	Lincoln Elementary	0	0	0	489	0	0
	Maple Grove Elementary	0	0	0	220	0	0
	South Haven High School	0	0	0	764	0	0
	South Haven Middle School	0	0	0	408	0	0
	St. Basil's Catholic Church	0	0	0	201	0	0
	St. Paul's Lutheran School	0	0	0	70	0	0
	Sunshine Day Care and Preschool	38	0	0	33	0	0
	Tiny Tots Preschool	208	0	0	208	0	0
Subarea 4 Subtotals		246	0	0	3,167	0	0
5	Bangor High School	0	0	0	485	0	0
	Bangor Middle School	0	0	0	482	0	0
	Bangor Primary School	0	0	0	551	0	0
	Coloma Elementary	0	0	0	510	0	0
	Coloma High School	0	0	0	386	0	0
	Coloma Junior High	0	0	0	564	0	0
	Coloma Middle School	0	0	0	386	0	0
	Coloma Migrant Program	186	0	0	0	0	0
	Faith Evangelic Lutheran	0	0	0	26	0	0
	Harford Center	68	0	0	68	0	0
	Preschool Learning Center	103	0	0	103	0	0
	Salem Lutheran School	0	0	0	25	0	0
	Washington Elementary	0	0	0	481	0	0
	St. Joseph Prekindergarten	0	0	0	26	0	0
	Wood School	0	0	0	73	0	0
Subarea 5 Subtotals		357	0	0	4,166	0	0
EPZ Totals		603	0	0	7,979	0	0

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Permanent Population Adjustments

The permanent population was adjusted to account for those individuals that commute to workplaces outside the EPZ. In the event of an actual evacuation, these individuals would be outside the EPZ and would already be evacuated.

Table P31 of the U.S. Census Summary File 3 (SF3) was used to estimate the portion of employees (citizens > 16 years age) commuting to workplaces outside the EPZ. A commute time of greater than 30 minutes was assumed to be indicative of travel outside the EPZ. Based on this assumption and using Table P31 of SF3, approximately 33% of Van Buren County residents leave the EPZ for work and approximately 20% of Berrien County residents leave the EPZ for work. There are no major employers in the Allegan County portion of the EPZ.

Employee Population Adjustments

The employee populations were adjusted to reflect the knowledge that some of the employees at workplaces in the EPZ probably commute from outside the EPZ and thus were not also counted in the permanent population. During the telephone conversations conducted to update the employee populations, the employers were asked to estimate the percentage of employees traveling more than 10 miles to work. Unfortunately, none of the employers listed in Table 2.2 were able to provide such estimates.

The only worker demographic information was provided by emergency planning officials from Van Buren County and is summarized in Table 2.9. Of the approximate 19,737 workers in Van Buren County, 15,286 (or 77.5%) were from Van Buren County. It was assumed that the remaining 4,451 workers from outside the county were also from outside the EPZ. The employee transient population was not counted as permanent population and the adjustment was 22.5% (4,451/19,737).

Hotel, Motel, Park and Marina Populations

It was assumed that the transient populations estimated at hotels and motels, and for parks and recreation areas and marinas would be from outside the EPZ and were not part of the permanent population. While it is possible that permanent residents could be using these facilities, which would constitute double counting, no data was available to make such an estimate. Also, it is possible that some of the hotel and motel population might also use parks and recreation areas while in the EPZ, which would also result in double counting. Similarly, no data was available to make an estimate so it was assumed that hotel and motel populations and park and recreation area populations were distinct and separate.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Hospital Populations

It was assumed that all patients at hospitals were from outside the EPZ. The staff were treated as employees (listed in Table 2.2) and adjusted as discussed in Sections 2.5.2.

Table 2.9 Estimation of employees commuting into the EPZ for work.

<u>Van Buren County worker place of residence</u>	<u>No. of workers</u>
Van Buren County	15,286
Berrien County	892
Allegan County	1,154
Cass County	451
Kalamazoo County	1,638
Other	316
<u>Total workers from outside Van Buren County</u>	<u>4,451 (22.5%)</u>

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Nursing and Group Home Populations

It was assumed that all residents of nursing and group homes reside at such facilities on a permanent basis and were counted as permanent residents in the Census data. Therefore, no adjustments to these populations were necessary.

School Populations

The data for schools given in Table 2.8 indicate population estimates for both staff and students. All student populations, and a portion of the staff population, were also considered part of the permanent population. During non-school times (evenings and summers) students were assumed to reside at their residences.

Special Events Populations

No data was available to estimate the percentage of the special event attendees that reside outside the EPZ. Therefore, it was assumed that all special event attendees reside outside the EPZ and were not counted as part of the permanent population.

3.0 VEHICLE DEMAND ESTIMATION

Once the specific population components were established the average number of people occupying vehicles was determined. Following are vehicle demand estimates for each of the population components.

3.1 Vehicle Demands of the Permanent Population

The average household size and vehicle occupancy data were estimated using Summary File 3 of the U.S. 2000 census. The population of each county was taken from Table P39 of Summary File 1, the number of households was taken from Table DP-4 of SF3, and the number of vehicles was taken from Table H46 of SF3.

For Allegan County the average household size was 105,665 persons per 43,292 households, or 2.44. The vehicle occupancy for the permanent population was 105,665 persons per 75,510 vehicles or 1.40.

For Berrien County the household size was 162,452/73,445, or 2.21. Vehicle occupancy was 162,452/110,443, or 1.47.

In Van Buren County, the household size was 76,263/33,975, or 2.24. Vehicle occupancy was 76,263/54,292, or 1.41.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

A summary of the permanent population, households, and vehicle count by subarea is given in Table 3.1. The data presented in Table 3.1 are estimates of the maximum permanent population and vehicle counts but do not reflect the minor corrections discussed in Section 2.5.1.

3.2 Vehicle Demands of Transient Populations

Vehicle Demands of Employees

Estimates of vehicle counts for employees are given in Table 3.2. The employee populations given in Table 2.2 were adjusted to account for only those individuals living outside the EPZ (50% of total) and were applied to each shift. Vehicle estimates were based on the assumption that an average of one person would occupy evacuating vehicles. Most, if not all, staff at schools would accompany students to relocation centers and are not counted in this table.

Vehicle Demands for Other Transient Populations

A summary of vehicle demand estimates for populations at hotels and motels is given in Table 3.3. Populations in motels and hotels were based on the assumptions that room occupancy is an average of two persons per room. Vehicle demands for hotels and motels were based on the assumption that one vehicle per room would be used during an evacuation.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 3.1 Summary of the permanent population, households, and vehicle count by subarea.

Subarea	This study	Households	Vehicles
1	2,001	893	1,419
2	1,939	866	1,375
3	2,360	1,054	1,674
4 (Van Buren)	10,283	4,591	7,293
4 (Allegan)	1,433	587	1,024
5 (Van Buren)	4,308	1,923	3,055
5 (Berrien)	10,703	4,843	7,281
Van Buren County	20,891	9,326	14,816
Allegan County	1,433	587	1,024
Berrien County	10,703	4,843	7,281
TOTAL EPZ Perm Pop	33,027	14,757	23,121

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POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 3.2 Summary of the adjusted population and vehicle demand estimates for employees.

Subarea	Facility	Workforce Population			Vehicles		
		Day	Night	Weekend	Day	Night	Weekend
1	Palisades Nuclear Power Plant	395	315	315	395	315	315
	Subarea 1 Subtotals	395	315	315	395	315	315
2	Adkin's Blue Ribbon Packaging	60	0	0	60	0	0
	Alpha Engineering	3	0	0	3	0	0
	Baars Printing Company	6	0	0	6	0	0
	Bohn Engine and Foundry	200	150	5	200	150	5
	Taylor Controls, Inc	12	0	0	12	0	0
	Subarea 2 Subtotals	281	150	5	281	150	5
4	American Twisting Co	25	20	0	25	20	0
	Anderson Box	4	0	0	4	0	0
	B & K Machine	15	5	0	15	5	0
	BEI Incorporated	24	0	0	24	0	0
	Consumers Concrete Co	8	0	0	8	0	0
	Controlled Rubber Products	60	60	0	60	60	0
	Daggett's Concrete Products	10	0	3	10	0	3
	Precision Machine	14	0	0	14	0	0
	Scott Aviation Plant 4	45	45	0	45	45	0
	SE Overton Co	50	0	0	50	0	0
	Sherman Dairy Products, Inc	50	0	0	50	0	0
	South Haven Coil	50	0	0	50	0	0
	South Haven Community Hospital	152	100	100	152	100	100
	South Haven Rubber Co	40	30	0	40	30	0
	System Components, Inc	35	0	0	35	0	0
	Triangle Trades, Inc	20	0	0	20	0	0
	Wyckoff Chemical Company, Inc	60	0	0	60	0	0
	Subarea 4 Subtotals	662	260	103	662	260	103
5	Custom Built Brush Co	12	0	0	12	0	0
	Hipskind Building Supply	10	0	0	10	0	0
	InnoCorp	25	0	0	25	0	0
	Jarvis Concrete Products	3	0	0	3	0	0
	Menasa Corporation	70	40	0	70	40	0
	Modern Light Metals	14	0	0	14	0	0
	Russell Vending Company	7	0	0	7	0	0
	Shoreline Industries	15	8	0	15	8	0
	Spartan Industries	8	0	0	8	0	0
	Watervliet Fruit Exchange	7	0	0	7	0	0
	Watervliet Paper Company	285	0	0	285	0	0
	Watervliet Hospital	110	90	90	110	90	90
	West Gate Oil	8	3	0	8	3	0
	Subarea 5 Subtotals	574	141	90	574	141	90
	EPZ Totals	1,912	866	513	1,912	866	513

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POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 3.3 Vehicle demand for hotels, motels, bed and breakfasts within the EPZ.

Subarea	Facility	Population			Vehicles		
		Day	Night	Weekend	Day	Night	Weekend
4	A & R's North Beach Inn and Cottages	40	40	40	20	20	20
	A Country Place Bed and Breakfast	29	29	29	15	15	15
	Arundel House	25	25	25	13	13	13
	Compton's Cove	32	32	32	16	16	16
	Elmhurst Farm Inn	10	10	10	5	5	5
	North Beach Inn and Restaurant	16	16	16	8	8	8
	Old Harbor Inn	65	65	65	33	33	33
	The Colonial	70	70	70	35	35	35
	The Last Resort Bed and Breakfast Inn	34	34	34	17	17	17
	The New Victoria Inn	54	54	54	27	27	27
	Subarea 4 Subtotals	375	375	375	188	188	188
5	Cez Du Lac Motel	9	9	9	5	5	5
	Motto's Resort	42	42	42	21	21	21
	Subarea 5 Subtotals	51	51	51	26	26	26
	EPZ Totals	426	426	426	213	213	213

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

A summary for parks and recreation areas was given in Table 2.4. Populations and vehicle estimates for parks and recreational facilities were based on telephone conversations, Internet searches and assumptions that maximum use is based on available parking spaces. A population of four persons per parking space was assumed. A summary of all transient populations by subarea is given in Table 3.4.

3.3 Vehicle Demands of Special Facility Populations

Estimates of the special facilities populations were presented in Table 2.6 (hospitals), Table 2.7 (nursing and group homes) and Table 2.8 (schools, preschools, daycares). Estimates of the special needs individuals and transportation-dependent individuals were presented in Section 2.3.1.

Most individuals in the special facilities population are ambulatory and would not require special transportation capability such as wheel chair lifts or ramps or an ambulance. Nevertheless, the staff at the Country Side Nursing Home and the South Haven Community Hospital (both in Subarea 4) and The Watervliet Hospital in Subarea 5 did indicate that as many as 140 persons might require wheel chair-capable transportation. Also, the two hospitals indicated that as many as 22 people may require ambulance transportation.

It was assumed that all special facility populations, including the necessary staff persons, would evacuate with the population via bus, van, ambulance, or other suitable means as described in existing response plans. Emergency planning officials provided listings of transportation resources that would be available in an evacuation event.

Van Buren County has available up to 156 school buses each with a capacity of 72 persons. Also, Van Buren County has 34 special education vehicles each with a capacity of 15 persons. Van Buren Transit could also provide 12 additional buses with capacities of 12 plus one wheel chair each, 7 buses with capacities of 22 plus two wheel chairs each, and two minivans providing capacity of nineteen. Allegan County has available 61 buses each with a capacity of 66.

Ambulances would be available from South Haven Emergency (2), Covert Fire and Ambulance (2), Van Buren EMS (4 + 3 wheel chair units), and Coloma Ambulance (3). Each ambulance unit has a capacity of two persons (plus crew). Based on these resource estimates, bus capacity is approximately 16,000 persons, wheel chair capacity is 32 persons, and ambulance capacity is 11 persons.

A summary of the special facility populations and vehicle demand is given in Table 3.5.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 3.4 Summary of transient populations and vehicle demand by subarea.

Subarea	Number of Persons			Number of Vehicles		
	Weekday	Night	Weekend	Weekday	Night	Weekend
1	7,295	7,215	7,215	2,235	2,155	2,155
2	281	150	5	281	150	5
3	100	100	100	55	55	55
4	5,847	5,445	5,288	2,175	1,773	1,616
5	1,579	1,146	1,095	874	395	390
EPZ Total	15,102	14,056	13,703	5,620	4,528	4,221

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 3.5 Summary of special populations and vehicle demand by subarea.

Subarea	Number of Persons			Number of Vehicles (no of buses unless noted)		
	Ambulatory	WC	Req Amb	Ambulatory	WC	Req Amb
3	649 ^a	0	0	10	0	0
4	3,502	128	12	49 ^b	64	6
5	4,480	12	10	63	6	5
EPZ Total	8,631	140	22	122	72	11

^afrom Table 2.8, 646 + 1 staff/20 students (=33) + 3 from Table 2.7.

^bbased on expected bus capacity of 72 for Van Buren County transportation resources. Actual vehicle demand would likely be more if Allegan County transportation resources were also used because bus capacities are less (66).

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

4.0 **METHODOLOGY**

4.1 **Estimation of Trip Generation Times**

Trip generation times can be thought as descriptions of how vehicles begin to move on the roadway network. In this study, it was assumed that no vehicles would begin evacuating for at least 30 minutes (maximum 15 minute notification time and 15 minute trip preparation time) after the declaration of an emergency. It must be emphasized that the evacuating public will not begin to leave at the same time. Rather, the departure times for vehicles vary. A common way of expressing trip generation times is with cumulative time distributions. The set of these distribution used for this study is presented in Figure 4.1.

Departure times are a function of trip preparation times, perceived urgency, and logistics involved in arriving home from work and coordinating efforts with other family members. It was assumed that all the permanent population would begin an evacuation within two hours of an emergency announcement.

It was assumed that the transient population would be informed of the evacuation within 30 minutes. While employees may be expected to remain at the workplace to facilitate workplace shutdowns, it was assumed that such activities would not last longer than 30 minutes. Other components of the transient population (ie; hotel and motel patrons) would likely act similarly.

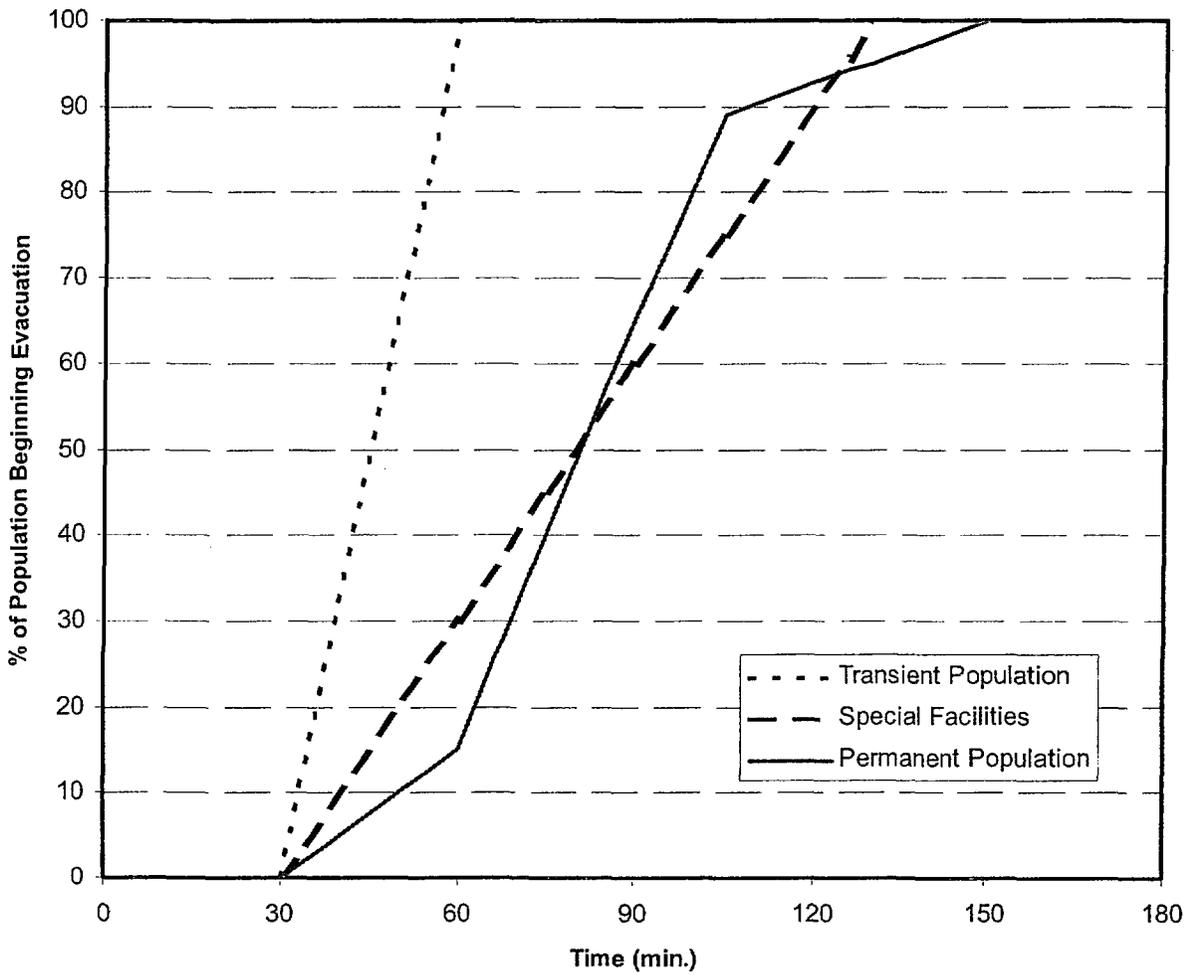
Schools will be evacuated, also at the Site Area Emergency level, directly to reception centers as soon as transportation resources arrive at the schools. It was assumed that bus mobilization times would be about an hour. Accordingly, the schools population could be expected to evacuate within ninety minutes of an evacuation decision.

4.2 **Evacuation Routes**

The evacuation routes evaluated in this study have been established in previous traffic network analyses and reflect the need to move vehicles from specific subareas to designated relocation destinations. The purpose of this study is to generate evacuation time estimates assuming these routes are appropriate. Evacuation routes are listed by subarea in Table 4.1.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 4.1 The cumulative time distribution describing the rate of evacuation commencement for the various population components.



POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 4.2 Evacuation routes for the Palisades EPZ.

Evacuation Routes

Subarea 1

Blue Star Highway North
Blue Star Highway South
I-196 South
I-196 North
30th Ave East
32nd Ave East

Subarea 2

Blue Star Highway North
Blue Star Highway South
Adam Road North
Highway 1 South
I-196 South
I-196 North
12th Ave East
16nd Ave East

Subarea 3

Blue Star Highway North
Blue Star Highway South
I-196 South
I-196 North
Coloma North Road South
70th Street South
30th Ave East
34nd Ave East

Subarea 4

Blue Star Highway North
Blue Star Highway South
I-196 South
I-196 North
68th Street North
66th Street North
62nd Street North
Kibbie Lacota Road East
Phoenix Road East
8th Ave East
12th Ave East
16th Ave East

Subarea 5

Blue Star Highway North
Blue Star Highway South
I-196 South
I-196 North
Coloma North Road South
Friday Road South
70th Street South

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

4.3 Estimation of Highway Capacity

Once the vehicle demand and loading characteristics (eg, trip generation time) have been determined the next step is to estimate the capacity of the street and highway network. The ability of the road network to handle vehicle demand is a major factor in determining evacuation times.

By definition, capacity is the maximum numbers of vehicles that can pass a given point during a specified period considering roadway, traffic, and control conditions (ie, signaling or signage). By convention, capacity is expressed in units of vehicles per hour (vph).

In discussing capacity, different traffic flow conditions have been assigned alphabetical designations, A through F, to generally reflect varying traffic operational characteristics. These designations have been termed "Levels of Service" (LOS). For example, LOS A connotes free-flow and high-speed operating conditions; LOS F represents a forced flow condition. LOS E describes traffic operating at or near capacity.

Because of the effect of weather on the capacity of a roadway, it is necessary to adjust capacity figures to represent estimated road conditions during inclement weather. Based on limited empirical data, weather conditions such as heavy rain reduce the values of capacity for highways by approximately 20%. For snowy weather conditions during the winter months, reductions of 25% relative to normal weather conditions were assumed. Free-flow speeds for inclement weather conditions were also reduced 20% for rain and 25% for snow. These factors are applied to all roadway segments.

In the congested traffic environment, which is often characteristic of an evacuation scenario, the capacity of a roadway section has the greatest effect on travel time. The major factors that control capacity of intersections and the approaches to intersections are turning movements, competing traffic streams, control regimes, traffic composition, and approach geometries. The major factors that control capacity along roadway segments are traffic composition, weather conditions, pavement conditions, and lighting.

Capacity estimations were made for two-lane roads, multi-lane roads, multi-lane freeways, and freeway ramps. Estimates for roads and freeways were done on a "per lane" basis. Capacities at intersections were approximated by the simulation software and are described later.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

To represent the varying road types and geometries, roads were categorized in the following manner:

- 10 ft lanes with 1 ft shoulders
- 11 ft lanes with 2 ft shoulders
- 12 ft lanes with 6 ft shoulders

Using data from Chapter 20 of HCM 2000 and from the previous ETES for the PNPP estimates were made for both two-way and one-way traffic. Highway capacity was estimated to be 1,000 vph per lane. Freeway capacity was estimated to be 1,692 vph per lane and freeway ramp capacity was estimated to be 1,333 vph.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

4.4 Application of EPZ Data to Model

The model simulation tools used for this ETE are grouped together in a computer software package called the Traffic Software Integrated System (TSIS). TSIS is developed and distributed by the Federal Highway Administration (FHWA). TSIS consists of several modules, or components, that can be used to represent entire traffic environments.

The first tool used in TSIS is TRAFED, a graphical tool that allows one to create representations of traffic networks and is specifically designed to work with FHWA's Corridor Simulation (CORSIM) microscopic traffic simulator. CORSIM consists of an integrated set of two microscopic models; NETSIM represents traffic on urban streets and FRESIM represents traffic on freeways.

In this study, the network of major roadways in the PNPP was entered into TSIS using the TRAFED module. TRAFED network layouts consist of a series of nodes and links. In general, nodes can be thought of as intersections and links can be thought of as roadways. Some nodes are not intersections but represent sources or sinks of traffic, or describe a connection between a FRESIM and NETSIM modules. Source nodes were used to describe traffic loading onto the roadway network from population "centroids". These centroids were developed by combining vehicle counts from adjoining census blocks. Sink, or exit, nodes represented points on evacuation routes outside the EPZ.

Once a roadway network has been developed and the entry nodes have been edited to reflect the loading histograms, the TRAFED file is loaded into the CORSIM module. CORSIM is a stochastic, or probabilistic model. This means that random numbers are generated and assigned to vehicles. When a simulation is run the characteristics of that vehicles travel are the result of a specific set of random numbers. Therefore, to gain a better understanding of transportation the network must be simulated several times using different sets of random numbers. In this study, each scenario examined was run at least three times.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

5.0 EVACUATION TIME ESTIMATES

5.1 Evacuation Regions and Scenarios

Evacuation Regions

The Palisades NPP EPZ is divided into five subareas that reflect a best match between geographic boundaries and two-, five-, and ten-mile radii around the plant.

Federal guidance documents also specify that the EPZ be divided into sixteen sectors each representing 22.5° segments around the compass¹. In the event of an emergency, officials will consider the severity and nature of the emergency and weather conditions (eg, wind strength and direction), and will recommend protective action for some or all of the subareas. Officials will specify which segment(s) at what distance from the Palisades NPP (2-, 5-, or 10-miles) are affected. This "keyhole" is superimposed on the EPZ map and subarea area selected. Sixteen compass segments at three different radii yields forty-eight, subarea groupings. Because there are only 5 subareas, however, most of the subarea groups are the same. To avoid redundant analyses of scenarios a list of unique subarea groups was assembled and is given in Table 5.1. Each of these six subarea groups is referred to as an Evacuation Region.

Evacuation Scenarios

To evaluate the evacuation of the Palisades NPP EPZ under circumstances that offer different population composition and attributes, evacuation time estimates were conducted considering different combinations of these scenarios. An evacuation scenario can be thought of as a specific set of conditions that might exist at the commencement of a General Emergency. The conditions considered in this study are season (summer versus winter), day of the week (weekday versus weekend day), Time of day (daytime versus evening or night), and weather (fair or poor). If the season is summer poor weather is rain and if the season is winter poor weather is a 6-8" snow. These scenarios are given in Table 5.2.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

5.2 EPZ Evacuation Time Estimates

Using data described in Section 3.0 and the simulation described in Section 4.0, evacuation time estimates were made. The results of these estimates are summarized in Table 5.3 and Table 5.4. The times provided in this table represent estimates of travel time of the last evacuating vehicle to reach the EPZ edge and do not consider travel time from the EPZ edge to a relocation center. It should also be noted that these estimates only reflect the movement of people from the affected areas and do not reflect movement of those individuals that might evacuate from subareas adjoining the affected subarea(s).

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 5.1 Evacuation regions for the Palisades NPP EPZ.

Evac Region	Subareas				
	1	2	3	4	5
1	1				
2	1	2			
3	1		3		
4	1	2	3	4	
5	1	2	3		5
6	1	2	3	4	5

Table 5.2 Evacuation scenarios.

Scenario	Season	Day	Time of Day	Weather
1	Summer	Weekend	Midday	Fair
2	Summer	Weekend	Midday	Poor/Adverse
3*	Summer	Weekend	Evening/Night	Fair
4*	Summer	Weekend	Evening/Night	Poor/Adverse
5	Summer	Weekday	Midday	Fair
6	Summer	Weekday	Midday	Poor/Adverse
7	Summer	Weekday	Evening/Night	Fair
8	Summer	Weekday	Evening/Night	Poor/Adverse
9	Winter	Weekend	Midday	Fair
10	Winter	Weekend	Midday	Poor/Adverse
11	Winter	Weekend	Evening/Night	Fair
12	Winter	Weekend	Evening/Night	Poor/Adverse
13	Winter	Weekday	Midday	Fair
14	Winter	Weekday	Midday	Poor/Adverse
15	Winter	Weekday	Evening/Night	Fair
16	Winter	Weekday	Evening/Night	Poor/Adverse

*Includes summer festival populations.

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Table 5.3 Evacuation Times Estimates (in minutes) for Scenarios 1-8
Scenarios

Region	1	2	3	4	5	6	7	8
	Summer Weekend Midday Fair	Summer Weekend Midday Poor	Summer Weekend Evening Fair	Summer Weekend Evening Poor	Summer Weekday Midday Fair	Summer Weekday Midday Poor	Summer Weekday Evening Fair	Summer Weekday Evening Poor
1	150	170	150	170	150	170	140	150
2	170	180	170	180	180	190	170	170
3	160	170	160	170	170	170	150	150
4	290	320	540	600	230	240	230	230
5	300	300	560	600	230	240	220	230
6	320	340	600	620	260	280	240	230

Table 5.4 Evacuation Times Estimates (in minutes) for Scenarios 9-16.

Scenarios

Region	9	10	11	12	13	14	15	16
	Winter Weekend Midday Fair	Winter Weekend Midday Poor	Winter Weekend Evening Fair	Winter Weekend Evening Poor	Winter Weekday Midday Fair	Winter Weekday Midday Poor	Winter Weekday Evening Fair	Winter Weekday Evening Poor
1	160	180	170	180	180	190	160	160
2	170	190	170	190	180	250	190	210
3	160	190	170	190	190	210	180	190
4	310	350	300	330	360	390	230	240
5	320	350	320	340	340	400	330	340
6	380	380	360	390	400	440	380	420

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PERMANENT POPULATION DATA

STFID is a concatenated string of state (26), county (eg, 159), block tract (eg, 960500), and census block (4 digits).

POP100 is the permanent population

POPDENS is permanent population density (permanent population/sq. mile)

HU100 is the number of households

ZTCA5 is the five-digit zip code

AREALAND is the Block land area in units of sq. meters

AREAWATR is the Block water area in units of sq. meters

Subarea 1 (Van Buren County)

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590105001019	0	0	15358	0	49090	0
261590105001020	79	35	517934	0	49090	395
261590105001021	0	0	6165	0	49090	0
261590105001022	131	67	7664	0	49090	44270
261590105001023	98	44	353183	0	49090	719
261590105001025	0	0	60274	0	49090	0
261590105001026	0	0	52435	0	49090	0
261590105001027	0	0	9570	0	49090	0
261590105001028	0	1	24352	0	49090	0
261590105001029	52	41	569410	0	49090	237
261590105001030	12	4	12921	0	49090	2405
261590105001031	17	5	28435	0	49090	1548
261590105001032	10	4	164313	0	49090	158
261590105001033	18	6	31028	0	49090	1503
261590105001034	28	19	14831	0	49090	4890
261590105001035	6	5	14607	0	49090	1064
261590105001036	0	0	151	0	49090	0
261590105001037	16	6	193327	0	49090	214
261590105001038	49	28	1874507	0	49090	68
261590105002014	87	31	808646	0	49090	279
261590105002015	12	13	81968	0	49090	379
261590105002016	30	14	1131101	0	49090	69
261590105002017	33	13	268142	0	49090	319
261590105002018	0	0	250454	0	49090	0
261590105002019	37	3	76977	0	49090	1245
261590105002020	42	15	245864	0	49090	442
261590105002021	55	19	1262786	0	49090	113
261590106001000	7	6	16945	0	49043	1070
261590106001001	26	13	204490	0	49043	329
261590106001002	122	47	996832	0	49043	317

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STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590106001003	73	24	955068	0	49043	198
261590106001004	13	6	607442	0	49043	55
261590106001006	0	0	42728	0	49043	0
261590106001009	7	6	550096	0	49043	33
261590106001010	0	0	265794	0	49090	0
261590106001011	0	0	22628	0	49090	0
261590106001012	0	0	89696	0	49043	0
261590106001013	3	35	2297131	0	49090	3
261590106001014	5	8	16633	0	49043	779
261590106001015	0	0	1955	0	49090	0
261590106001016	2	6	6509	0	49043	796
261590106001017	13	9	11769	0	49043	2861
261590106001018	0	0	1339	0	49043	0
261590106001019	6	3	236133	0	49043	66
261590106001020	0	2	1466	0	49043	0
261590106001021	59	153	1262797	0	49043	121
261590106001022	0	10	27915	0	49043	0
261590106001023	0	0	2452	0	49043	0
261590106001024	0	17	40939	0	49043	0
261590106001025	0	2	3703	0	49043	0
261590106001026	0	5	8068	0	49043	0
261590106001027	0	5	7983	0	49043	0
261590106001028	0	0	36617	0	49090	0
261590106001029	17	11	662545	0	49043	66
261590106001054	24	11	52577	0	49043	1182
261590106001055	9	5	14369	0	49043	1622
261590106002002	37	19	1198504	0	49090	80
261590106002003	18	4	189425	0	49090	246
261590106002004	30	25	1348013	0	49090	58
261590106002005	22	9	1279775	0	49090	45
261590106002006	28	13	1012716	0	49090	72
261590106002007	65	32	951371	0	49043	177
261590106002008	69	32	1079566	0	49043	166
261590106002009	41	14	202441	0	49043	525
261590106002014	26	8	145021	0	49043	464
261590106002015	48	25	1146024	0	49043	108
261590106002016	21	11	973208	0	49043	56
261590106002017	18	7	185977	0	49043	251
261590106002018	10	6	250555	0	49043	103
261590106002019	12	3	578906	0	49043	54
261590106002020	0	0	6493	0	49043	0
261590105002005	144	53	1450749	0	49090	257
261590105001024	102	89	395195	0	49090	668
261590106001008	14	8	939358	0	49043	39
261590106001005	98	36	6575096	0	49043	39
261590106001007	0	0	597615	0	49043	0

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Subarea 2 (Van Buren County)

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590102002013	78	26	830615	0	49090	243
261590102002018	14	5	513789	0	49090	71
261590102002019	2	1	187347	0	49090	28
261590102002020	16	6	321989	0	49090	129
261590104002009	32	17	46845	0	49090	1769
261590104002010	26	14	163281	0	49090	412
261590104002011	0	0	104154	0	49090	0
261590104002021	32	24	28341	0	49090	2924
261590104002022	23	13	26774	0	49090	2225
261590104002023	31	19	24748	0	49090	3244
261590104002024	16	7	26911	0	49090	1540
261590104002025	0	3	36869	0	49090	0
261590104002026	0	1	17285	0	49090	0
261590104002027	0	0	9842	0	49090	0
261590104002028	0	0	916	0	49090	0
261590104002029	16	11	8467	0	49090	4894
261590104002030	0	0	5736	0	49090	0
261590104002031	14	16	23720	0	49090	1529
261590104002032	0	0	15890	0	49090	0
261590104002033	136	63	678220	0	49090	519
261590104002034	0	0	3185	0	49090	0
261590104002035	0	0	8450	0	49090	0
261590104003021	11	7	91533	0	49090	311
261590104003022	11	3	258678	0	49090	110
261590104003023	8	4	276873	0	49090	75
261590104003024	0	0	114242	0	49090	0
261590104003025	0	0	84625	0	49090	0
261590104003026	0	0	9735	0	49090	0
261590104003027	0	0	4358	0	49090	0
261590104003028	33	18	223665	0	49090	382
261590104003029	0	0	57752	0	49090	0
261590104003030	0	0	2113	0	49090	0
261590104003031	11	6	63522	0	49090	449
261590104003032	21	7	75117	0	49090	724
261590104003033	2	3	19829	0	49090	261
261590104003034	1	1	106772	0	49090	24
261590104003035	0	1	94107	0	49090	0
261590104003036	0	0	9073	0	49090	0
261590105001000	81	41	852222	0	49090	246
261590105001001	32	17	496148	0	49090	167
261590105001002	8	3	10982	0	49090	1887
261590105001003	4	2	100442	0	49090	103
261590105001004	24	9	363770	0	49090	171
261590105001005	9	3	280276	0	49090	83
261590105001006	0	0	37103	0	49090	0
261590105001007	11	6	274658	0	49090	104
261590105001008	10	6	133776	0	49090	194
261590105001009	2	3	1633	0	49090	3172
261590105001010	5	1	82995	0	49090	156
261590105001011	6	3	64006	0	49090	243
261590105001012	8	5	58858	0	49090	352

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

APPENDIX C
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POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590105001013	49	24	354238	0	49090	358
261590105001014	0	3	31197	0	49090	0
261590105001015	48	17	520842	0	49090	239
261590105001016	20	11	121861	0	49090	425
261590105001017	27	11	321411	0	49090	218
261590105001018	0	1	460989	0	49090	0
261590105002000	134	55	1259366	0	49090	276
261590105002001	101	38	1268686	0	49090	206
261590105002002	59	24	790512	0	49090	193
261590105002003	69	29	1243802	0	49090	144
261590105002004	32	14	378933	0	49090	219
261590105002006	26	8	160102	0	49090	421
261590105002007	74	33	2869433	0	49090	67
261590105002008	103	44	2539856	0	49090	105
261590105002009	50	23	2518218	0	49090	51
261590105002010	70	30	1366663	0	49090	133
261590105002011	2	2	76967	0	49090	67
261590105002012	52	31	1711661	0	49090	79
261590105002013	43	21	204423	0	49090	545
261590105001024	102	89	395195	0	49090	668
261590105002005	144	53	1450749	0	49090	257

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

APPENDIX C
Attachment A
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POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Subarea 3 (Van Buren County)

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POP DENS
261590106001030	0	3	429917	0	49043	0
261590106001031	8	20	1204574	0	49043	17
261590106001032	2	1	63905	0	49043	81
261590106001033	1	7	108659	0	49043	24
261590106001034	26	44	947708	0	49043	71
261590106001035	0	1	626998	0	49043	0
261590106001036	11	3	677622	0	49038	42
261590106001037	0	3	652335	0	49038	0
261590106001038	21	20	455273	0	49038	119
261590106001039	39	16	45392	0	49038	2225
261590106001040	41	16	243013	0	49038	437
261590106001041	0	0	63130	0	49038	0
261590106001042	44	21	1063642	0	49038	107
261590106001043	0	0	6084	0	49038	0
261590106001044	0	0	3571	0	49038	0
261590106001045	40	17	929578	0	49038	111
261590106001046	67	34	2547361	0	49038	68
261590106001047	132	58	2566061	0	49038	133
261590106001048	97	41	3857513	0	49043	65
261590106001049	58	30	3650035	0	49043	41
261590106001050	28	11	657323	0	49043	110
261590106001051	28	11	1299136	0	49043	56
261590106001052	88	35	2554810	0	49043	89
261590106001053	162	71	2570680	0	49043	163
261590106001056	0	0	6108	0	49038	0
261590106001057	32	13	419866	0	49038	197
261590106001058	36	13	372716	0	49038	250
261590106001059	2	1	20731	0	49038	250
261590106001060	0	1	163740	0	49038	0
261590106001061	0	1	18912	0	49038	0
261590106001062	4	24	252440	0	49038	41
261590106001063	0	0	293252	0	49038	0
261590106001064	0	0	542463	0	49038	0
261590106001065	2	7	42085	0	49038	123
261590106001066	2	16	268826	0	49038	19
261590106002000	68	22	1536130	0	49090	115
261590106002001	114	46	1516556	0	49090	195
261590106002010	91	29	1305166	0	49043	181
261590106002011	42	21	2183292	0	49043	50
261590106002012	40	13	1291580	0	49090	80
261590106002013	54	29	1301817	0	49043	107
261590106002021	4	2	8424	0	49043	1230
261590106002022	62	30	1160022	0	49043	138
261590106002023	0	0	323974	0	49043	0
261590106002024	24	8	433615	0	49043	143
261590106002025	8	4	371175	0	49043	56
261590106002026	12	3	61166	0	49043	508
261590106002027	19	8	296825	0	49043	166
261590106002028	26	11	465991	0	49043	145
261590106002029	10	7	960159	0	49043	27
261590106002030	27	5	812449	0	49043	86

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590106002031	43	8	333550	0	49043	334
261590106002032	4	5	712338	0	49043	15
261590106002033	48	14	540810	0	49043	230
261590106002034	33	10	43209	0	49043	1978
261590106002035	13	6	13797	0	49043	2440
261590106002036	55	37	76548	0	49043	1861
261590106002037	46	16	46028	0	49043	2588
261590106002038	19	7	402633	0	49043	122
261590106002039	11	4	222689	0	49043	128
261590106002040	21	5	1589464	0	49043	34
261590106002041	6	3	771219	0	49043	20
261590106002042	10	4	440849	0	49043	59
261590106002043	26	8	1576056	0	49043	43
261590106002044	53	31	4474686	0	49043	31
261590106002045	0	0	277430	0	49043	0
261590106002046	0	0	32800	0	49043	0
261590106002047	22	8	674357	0	49043	84
261590106002048	7	7	624357	0	49043	29
261590106002049	9	3	57644	0	49043	404
261590106002050	1	1	401214	0	49043	6
261590106002051	0	0	31503	0	49043	0
261590106002052	0	0	37568	0	49043	0
261590106002053	0	0	100742	0	49043	0
261590106002054	0	0	25525	0	49043	0
261590106002055	68	37	2209170	0	49043	80
261590106002056	95	40	2562813	0	49043	96
261590106002057	15	6	424262	0	49043	92
261590106002058	16	8	501661	0	49043	83
261590106002059	5	2	656251	0	49043	20
261590108001018	4	2	615833	0	49090	17
261590108001019	4	1	45500	0	49043	228
261590108001070	18	11	1031177	0	49043	45
261590108001071	19	6	782099	0	49043	63
261590108001072	5	3	246373	0	49043	53
261590106001005	98	36	6575096	0	49043	39
261590106001007	0	0	597615	0	49043	0
261590106001008	14	8	939358	0	49043	39

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Subarea 4 (Van Buren County)

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590102001000	106	34	2691213	0	49090	102
261590102001001	160	66	1362085	0	49090	304
261590102001002	395	172	1268071	0	49090	807
261590102001003	60	29	1217356	0	49090	128
261590102001004	33	13	443751	0	49090	193
261590102001005	17	10	878847	0	49090	50
261590102001006	2	1	21738	0	49090	238
261590102001007	19	7	15216	0	49090	3234
261590102001008	0	0	15629	0	49090	0
261590102001009	0	0	14250	0	49090	0
261590102001010	10	4	48459	0	49090	534
261590102001011	268	114	2586277	0	49090	268
261590102001012	0	0	6433	0	49090	0
261590102001013	0	1	7478	0	49090	0
261590102001014	248	110	1216103	0	49090	528
261590102001015	0	0	52470	0	49090	0
261590102001016	26	8	17296	0	49090	3893
261590102001017	5	3	57297	0	49090	226
261590102001018	15	8	1003692	0	49090	39
261590102001019	7	3	1696869	0	49090	11
261590102001020	70	27	599061	0	49090	303
261590102001021	21	7	25074	0	49090	2169
261590102001022	28	9	31856	0	49090	2276
261590102001023	19	8	24974	0	49090	1970
261590102001024	67	24	2565854	0	49090	68
261590102001025	25	13	2546106	0	49090	25
261590102001026	95	45	2578898	0	49090	95
261590102001027	8	4	157887	0	49090	131
261590102001028	13	4	288461	0	49090	117
261590102001029	46	18	1732979	0	49090	69
261590102001030	35	17	2313931	0	49090	39
261590102001031	0	0	52238	0	49090	0
261590102001032	5	4	487965	0	49090	27
261590102001033	18	7	299347	0	49090	156
261590102001034	23	7	1001204	0	49090	59
261590102001035	19	6	1132000	0	49090	43
261590102002000	40	21	2538136	0	49013	41
261590102002001	120	35	2578662	0	49013	121
261590102002002	49	17	1292370	0	49013	98
261590102002003	23	8	1114050	0	49013	53
261590102002004	7	2	155901	0	49013	116
261590102002005	14	7	287641	0	49090	126
261590102002006	20	10	996450	0	49013	52
261590102002007	0	1	256307	0	49013	0
261590102002008	9	5	186862	0	49090	125
261590102002009	56	14	1026751	0	49090	141
261590102002010	35	8	831324	0	49090	109
261590102002011	21	7	460793	0	49090	118
261590102002012	45	20	1135948	0	49090	103
261590102002014	197	73	342374	0	49090	1490
261590102002015	0	0	9407	0	49090	0

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590102002016	0	0	9095	0	49090	0
261590102002017	36	12	647229	0	49090	144
261590102002021	33	12	643218	0	49090	133
261590102002022	3	2	153974	0	49090	50
261590102002023	9	2	210771	0	49090	111
261590102002024	36	11	76956	0	49090	1212
261590102002025	2	1	125507	0	49090	41
261590102002026	23	10	245050	0	49090	243
261590102002027	4	2	50957	0	49090	203
261590102002028	4	2	31275	0	49090	331
261590102002029	19	10	1002322	0	49090	49
261590102002030	55	22	2338136	0	49013	61
261590102002031	25	9	640875	0	49013	101
261590102002032	98	36	3209650	0	49013	79
261590102002033	63	20	1924662	0	49013	85
261590102002034	0	0	84608	0	49013	0
261590102002035	29	12	1857794	0	49013	40
261590102002036	0	0	10288	0	49013	0
261590102002037	22	8	210985	0	49013	270
261590102002038	4	3	306701	0	49013	34
261590102002039	39	12	631543	0	49090	160
261590102002040	0	0	122080	0	49090	0
261590102002041	3	2	14267	0	49090	545
261590102002042	6	4	63464	0	49090	245
261590102002043	10	3	173630	0	49090	149
261590102002044	19	4	348010	0	49090	141
261590102002045	0	0	7725	0	49090	0
261590102002046	1	1	99048	0	49013	26
261590102003001	0	0	179065	0	49056	0
261590102003002	6	3	567649	0	49056	27
261590102003003	43	17	961167	0	49056	116
261590102003004	48	15	413387	0	49056	301
261590102003005	2	1	362285	0	49056	14
261590102003006	40	15	2655831	0	49090	39
261590102003007	105	39	1841303	0	49090	148
261590102003008	0	0	11491	0	49090	0
261590102003009	23	8	327449	0	49056	182
261590102003010	6	3	422782	0	49056	37
261590102003011	3	1	129413	0	49056	60
261590102003014	23	7	1258937	0	49056	47
261590102003015	25	9	1258152	0	49056	51
261590102003016	83	31	2568412	0	49090	84
261590102003017	44	18	2560863	0	49090	45
261590102003018	10	5	1655909	0	49090	16
261590102003019	25	8	489006	0	49090	132
261590102003020	35	19	2546731	0	49090	36
261590102003021	60	24	1191345	49816	49056	130
261590102003022	11	1	23689	0	49090	1203
261590102003023	72	24	1276896	0	49056	146
261590102003024	53	22	2525918	0	49056	54
261590102003025	29	15	2560442	0	49013	29
261590102003026	23	7	704129	0	49090	85
261590102003027	15	7	221981	0	49090	175

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STPID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590102003028	4	3	154925	0	49090	67
261590102003029	35	16	1849540	0	49090	49
261590103001000	150	95	95513	0	49090	4067
261590103001001	3	6	170441	0	49090	46
261590103001002	288	91	613281	0	49090	1216
261590103001003	4	2	787	0	49090	13164
261590103001004	11	6	18844	0	49090	1512
261590103001005	0	0	2091	0	49090	0
261590103001006	1	1	11128	0	49090	233
261590103001007	44	34	36368	0	49090	3134
261590103001008	8	17	15483	0	49090	1338
261590103001009	84	152	175774	0	49090	1238
261590103001010	8	21	12394	0	49090	1672
261590103001011	0	3	10940	0	49090	0
261590103001012	0	0	1064	0	49090	0
261590103001013	45	67	216180	0	49090	539
261590103001014	7	3	131296	0	49090	138
261590103001015	1	2	10417	0	49090	249
261590103001016	4	2	9676	0	49090	1071
261590103001017	0	0	24800	0	49090	0
261590103001018	2	1	77213	0	49090	67
261590103001019	2	1	28048	0	49090	185
261590103001020	53	37	234536	0	49090	585
261590103001021	0	0	56492	0	49090	0
261590103001022	0	0	13411	0	49090	0
261590103001023	34	46	26096	0	49090	3374
261590103001024	23	46	33700	0	49090	1768
261590103001025	22	25	23358	0	49090	2439
261590103001026	0	1	5074	0	49090	0
261590103001027	33	42	25013	0	49090	3417
261590103001028	7	7	30521	0	49090	594
261590103001029	26	31	21496	0	49090	3133
261590103001030	10	35	40999	0	49090	632
261590103001031	8	16	8937	0	49090	2318
261590103001032	0	3	10402	0	49090	0
261590103001033	12	14	20310	0	49090	1530
261590103001034	10	11	52241	0	49090	496
261590103001035	12	15	9034	0	49090	3440
261590103001036	6	9	1022	0	49090	15205
261590103001037	23	66	48731	0	49090	1222
261590103001038	7	14	5742	0	49090	3157
261590103001039	7	14	965	0	49090	18787
261590103001040	4	19	14791	0	49090	700
261590103001041	0	0	1362	0	49090	0
261590103001042	4	2	6698	0	49090	1547
261590103001043	0	0	4331	0	49090	0
261590103001044	0	0	36296	0	49090	0
261590103001045	5	4	83586	0	49090	155
261590103001999	0	0	0	58388	490HH	
261590103002000	119	60	108769	0	49090	2834
261590103002001	40	17	17393	0	49090	5956
261590103002002	47	24	21394	0	49090	5690
261590103002003	18	10	36861	0	49090	1265

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590103002004	100	84	37618	0	49090	6885
261590103002005	0	2	5452	0	49090	0
261590103002006	4	8	12703	0	49090	816
261590103002007	9	20	22568	0	49090	1033
261590103002008	6	2	16421	0	49090	946
261590103002009	53	24	55056	0	49090	2493
261590103002010	52	21	43804	0	49090	3075
261590103002011	45	14	47630	0	49090	2447
261590103002012	31	11	14019	0	49090	5727
261590103002013	96	44	67581	0	49090	3679
261590103002014	8	3	15239	0	49090	1360
261590103002015	37	21	17620	0	49090	5439
261590103002016	1	1	24899	0	49090	104
261590103002017	5	5	9278	0	49090	1396
261590103002018	0	1	7888	0	49090	0
261590103002019	2	1	11296	0	49090	459
261590103002020	15	8	6732	0	49090	5771
261590103002021	16	5	7468	0	49090	5549
261590103002022	24	13	33325	0	49090	1865
261590103002023	48	24	62610	0	49090	1986
261590103002024	45	19	21532	0	49090	5413
261590103002025	12	5	15140	0	49090	2053
261590103002026	18	6	10171	0	49090	4584
261590103002027	23	11	12594	0	49090	4730
261590103002028	38	16	26279	0	49090	3745
261590103002029	15	5	16677	0	49090	2330
261590103003000	8	34	96691	0	49090	214
261590103003001	44	33	27203	0	49090	4189
261590103003002	50	40	12493	0	49090	10366
261590103003003	20	27	12802	0	49090	4046
261590103003004	12	19	11382	0	49090	2731
261590103003005	49	24	12105	0	49090	10484
261590103003006	28	13	13847	0	49090	5237
261590103003007	23	12	13409	0	49090	4443
261590103003008	23	16	11613	0	49090	5130
261590103003009	8	4	14557	0	49090	1423
261590103003010	10	6	24251	0	49090	1068
261590103003011	0	0	11058	0	49090	0
261590103003012	0	4	5845	0	49090	0
261590103003013	24	12	11534	0	49090	5389
261590103003014	23	18	12901	0	49090	4617
261590103003015	33	16	13328	0	49090	6413
261590103003016	8	4	11775	0	49090	1760
261590103003017	29	12	11101	0	49090	6766
261590103003018	33	15	11981	0	49090	7134
261590103003019	31	17	11906	0	49090	6744
261590103003020	24	15	10579	0	49090	5876
261590103003021	1	1	8474	0	49090	306
261590103003022	18	13	12253	0	49090	3805
261590103003023	25	17	13044	0	49090	4964
261590103003024	23	14	15321	0	49090	3888
261590103003025	38	21	15680	0	49090	6277
261590103003999	0	0	0	33674	490HH	

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590104001000	60	24	41258	0	49090	3767
261590104001001	17	10	14731	0	49090	2989
261590104001002	27	13	15044	0	49090	4648
261590104001003	32	20	13086	0	49090	6333
261590104001004	23	14	14861	0	49090	4008
261590104001005	0	1	15879	0	49090	0
261590104001006	13	13	12106	0	49090	2781
261590104001007	18	16	14323	0	49090	3255
261590104001008	21	15	14846	0	49090	3664
261590104001009	33	15	15339	0	49090	5572
261590104001010	30	12	14038	0	49090	5535
261590104001011	46	17	13783	0	49090	8644
261590104001012	41	16	14574	0	49090	7286
261590104001013	108	48	78518	0	49090	3562
261590104001014	11	7	5892	0	49090	4835
261590104001015	47	30	59064	0	49090	2061
261590104001016	0	2	4039	0	49090	0
261590104001017	32	13	22840	0	49090	3629
261590104001018	7	1	12038	0	49090	1506
261590104001019	7	4	38157	0	49090	475
261590104001020	34	13	15358	0	49090	5734
261590104001021	32	12	14852	0	49090	5580
261590104001022	31	13	10953	0	49090	7330
261590104001023	24	7	11723	0	49090	5302
261590104001024	4	4	13609	0	49090	761
261590104001025	26	11	13540	0	49090	4973
261590104002000	8	3	10953	0	49090	1892
261590104002001	13	6	12613	0	49090	2669
261590104002002	0	0	38753	0	49090	0
261590104002003	0	0	66280	0	49090	0
261590104002004	95	34	42762	0	49090	5754
261590104002005	58	30	35510	0	49090	4230
261590104002006	18	12	60566	0	49090	770
261590104002007	17	10	32759	0	49090	1344
261590104002008	20	9	8281	0	49090	6255
261590104002012	22	8	12704	0	49090	4485
261590104002013	28	11	13209	0	49090	5490
261590104002014	0	0	15636	0	49090	0
261590104002015	18	9	12107	0	49090	3851
261590104002016	16	5	13528	0	49090	3063
261590104002017	37	13	12398	0	49090	7729
261590104002018	37	12	10944	0	49090	8756
261590104002019	20	7	11962	0	49090	4330
261590104002020	20	10	11777	0	49090	4398
261590104003000	0	0	7240	0	49090	0
261590104003001	1	2	11511	0	49090	225
261590104003002	4	3	37634	0	49090	275
261590104003003	12	4	8340	0	49090	3727
261590104003004	11	3	9946	0	49090	2864
261590104003005	38	14	14159	0	49090	6951
261590104003006	43	22	14106	0	49090	7895
261590104003007	14	8	10814	0	49090	3353
261590104003008	119	46	128571	0	49090	2397

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590104003009	19	12	18178	0	49090	2707
261590104003010	9	4	15271	0	49090	1526
261590104003011	0	0	17937	0	49090	0
261590104003012	22	10	17819	0	49090	3198
261590104003013	199	47	232718	0	49090	2215
261590104003014	0	0	43280	0	49090	0
261590104003015	26	14	15733	0	49090	4280
261590104003016	21	10	10218	0	49090	5323
261590104003017	19	9	13796	0	49090	3567
261590104003018	23	10	9308	0	49090	6400
261590104003019	22	13	10603	0	49090	5374
261590104003020	0	0	118392	0	49090	0
261590104004000	5	3	12888	0	49090	1005
261590104004001	83	33	15420	0	49090	13941
261590104004002	31	13	17134	0	49090	4686
261590104004003	120	54	80841	0	49090	3845
261590104004004	36	11	16830	0	49090	5540
261590104004005	33	10	15918	0	49090	5369
261590104004006	8	2	17169	0	49090	1207
261590104004007	45	18	18631	0	49090	6256
261590104004008	9	5	10496	0	49090	2221
261590104004009	7	4	8270	0	49090	2192
261590104004010	16	6	30035	0	49090	1380
261590104004011	74	33	74738	0	49090	2564
261590104004012	18	10	15432	0	49090	3021
261590104004013	8	3	8173	0	49090	2535
261590104004014	58	24	30915	0	49090	4859
261590104004015	55	32	46064	0	49090	3092
261590104004016	26	8	19404	0	49090	3470
261590104004017	9	3	60812	0	49090	383
261590104004018	0	0	62491	0	49090	0
261590104004019	44	22	108541	0	49090	1050
261590104004020	0	0	12059	0	49090	0
261590104004021	52	35	46302	0	49090	2909
261590104004022	0	0	30740	0	49090	0
261590105003000	23	8	442502	0	49090	135
261590105003001	0	0	197207	0	49090	0
261590105003002	0	0	29978	0	49090	0
261590105003003	0	0	15758	0	49090	0
261590105003004	11	10	98822	0	49090	288
261590105003005	50	23	568843	0	49090	228
261590105003006	0	0	51073	0	49090	0
261590105003007	10	5	86709	0	49090	299
261590105003008	0	0	53553	0	49090	0
261590105003009	145	64	77619	0	49090	4838
261590105003010	10	4	260645	0	49090	99
261590105003011	10	4	392242	0	49090	66
261590105003012	11	6	86359	0	49090	330
261590105003013	35	14	683596	0	49090	133
261590105003014	85	30	950440	0	49090	232
261590105003015	0	1	317606	0	49090	0
261590105003016	0	1	365730	0	49090	0
261590105003017	0	0	31930	0	49090	0

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POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590105003018	0	0	5270	0	49090	0
261590105003019	37	18	728979	0	49090	131
261590105003020	4	2	6500	0	49090	1594
261590105003021	0	0	690	0	49090	0
261590105003022	2	1	58398	0	49090	89
261590105003023	0	0	51420	0	49090	0
261590105003024	0	0	88092	0	49090	0
261590105003025	40	16	212672	0	49090	487
261590105003026	7	2	86167	0	49090	210
261590105003027	17	8	252061	0	49090	175
261590105003028	311	145	219813	0	49090	3664
261590105003029	10	4	130509	0	49090	198
261590105003030	16	6	28206	0	49090	1469
261590105003031	2	2	42111	0	49090	123
261590105003032	24	12	150347	0	49090	413
261590105003033	107	51	975666	0	49090	284
261590105003034	67	32	877370	0	49090	198
261590105003035	76	27	972224	0	49090	202
261590105003036	93	40	971288	0	49090	248
261590105003037	18	7	16335	0	49090	2854
261590105003038	164	65	2645518	0	49090	161
261590105003039	63	26	1258720	0	49090	130

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Subarea 4 (Allegan County)

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
260050309004000	38	16	945416	0	49090	104
260050309004001	133	51	3371771	0	49090	102
260050309004002	14	5	21627	0	49090	1677
260050309004003	0	1	195412	0	49090	0
260050309004004	46	13	1156669	0	49090	103
260050309004005	37	19	1393289	0	49090	69
260050309004006	18	6	323859	0	49090	144
260050309004007	48	20	1432355	0	49090	87
260050309004008	0	0	17106	0	49090	0
260050309004009	3	2	73832	0	49090	105
260050309004010	22	11	374792	0	49090	152
260050309004011	32	12	217304	0	49090	381
260050309004012	41	39	601470	0	49090	177
260050309004013	0	0	95567	0	49090	0
260050309004014	23	13	29280	0	49090	2034
260050309004015	28	38	302207	0	49090	240
260050309004018	3	2	41215	0	49090	189
260050309004019	6	3	17714	0	49090	877
260050309004020	25	6	14487	0	49090	4470
260050309004021	15	7	12446	0	49090	3121
260050309004022	2	3	17136	0	49090	302
260050309004023	5	7	42747	0	49090	303
260050309004024	0	3	12446	0	49090	0
260050309004025	0	1	29220	0	49090	0
260050309004026	5	5	44404	0	49090	292
260050309004027	0	2	5308	0	49090	0
260050309004028	10	9	75125	0	49090	345
260050309004029	0	5	13865	0	49090	0
260050309004030	0	7	18933	0	49090	0
260050309004031	0	14	16009	0	49090	0
260050309004032	0	11	14163	0	49090	0
260050309004033	0	12	18111	0	49090	0
260050309004034	5	9	18565	0	49090	698
260050309004035	0	0	100494	0	49090	0
260050309004036	0	0	6750	0	49090	0
260050309004037	9	5	63428	0	49090	368
260050309004038	11	6	310337	0	49090	92
260050309004039	8	2	16568	0	49090	1251
260050309004040	2	88	22015	0	49090	235
260050309004041	16	18	125880	0	49090	329
260050309004042	10	8	1986	0	49090	13041
260050309004043	15	15	54708	0	49090	710
260050309004044	8	13	65844	0	49090	315
260050309004045	8	21	14052	0	49090	1475
260050309005005	159	67	5134405	0	49090	80
260050309005006	0	0	11425	0	49090	0
260050309005007	61	21	635440	0	49090	249
260050309005008	34	13	3057966	0	49090	29
260050309005009	24	9	1388388	0	49090	45
260050309005010	0	0	8051	0	49090	0
260050309005011	82	29	1907483	0	49090	111

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POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
260050309005012	13	7	1672395	0	49090	20
260050309005013	52	22	1042439	0	49090	129
260050309005016	97	45	2708705	0	49090	93
260050309005017	0	0	98198	0	49090	0
260050309005018	42	17	2192466	0	49090	50
260050309005019	0	0	2930	0	49090	0
260050309005020	88	28	3826673	0	49090	60
260050309004016	135	263	3195547	0	49090	109

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Subarea 5 (Van Buren County)

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590107001002	46	20	218504	0	49013	545
261590107001003	80	38	324738	0	49013	638
261590107001004	4	1	38183	0	49013	271
261590107001005	4	2	33309	0	49013	311
261590107001006	25	7	30387	0	49013	2131
261590107001007	32	13	83924	0	49013	988
261590107001008	89	45	125221	0	49013	1841
261590107001009	26	10	18441	0	49013	3652
261590107001010	32	13	33519	0	49013	2473
261590107001011	24	6	9170	0	49013	6779
261590107001012	14	6	32256	0	49013	1124
261590107001013	18	12	24198	0	49013	1927
261590107001014	8	5	22519	0	49013	920
261590107001015	18	9	15476	0	49013	3012
261590107001019	34	8	14549	0	49013	6053
261590107001020	44	16	23026	0	49013	4949
261590107001021	27	9	19583	0	49013	3571
261590107001022	10	4	12278	0	49013	2109
261590107001023	0	0	8907	0	49013	0
261590107001024	6	2	40777	0	49013	381
261590107001025	0	0	21581	0	49013	0
261590107001026	0	0	43056	0	49013	0
261590107001044	0	0	18181	0	49013	0
261590107001045	0	0	13403	0	49013	0
261590107001046	5	4	7947	0	49013	1630
261590107001047	14	5	4554	0	49013	7962
261590107001048	14	7	12196	0	49013	2973
261590107001049	12	4	9347	0	49013	3325
261590107001050	29	11	18284	0	49013	4108
261590107002000	7	3	16386	0	49013	1106
261590107002001	2	1	14512	0	49013	357
261590107002002	0	0	10773	0	49013	0
261590107002003	11	6	11688	0	49013	2438
261590107002004	17	8	13302	0	49013	3310
261590107002005	7	3	13381	0	49013	1355
261590107002006	17	5	10349	0	49013	4254
261590107002007	47	18	61076	0	49013	1993
261590107002008	0	0	3972	0	49013	0
261590107002009	10	5	13675	0	49013	1894
261590107002010	14	6	9862	0	49013	3677
261590107002011	28	10	12684	0	49013	5717
261590107002012	21	7	12810	0	49013	4246
261590107002013	31	10	12664	0	49013	6340
261590107002014	13	7	5955	0	49013	5654
261590107002015	0	1	9342	0	49013	0
261590107002016	14	7	9695	0	49013	3740
261590107002017	27	11	18332	0	49013	3815
261590107002018	0	0	712	0	49013	0
261590107002019	30	8	9679	0	49013	8028
261590107002020	15	9	9795	0	49013	3966
261590107002021	15	4	9435	0	49013	4118

**PALISADES NUCLEAR PLANT
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POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590107002022	33	8	7319	0	49013	11678
261590107002023	50	18	110538	0	49013	1172
261590107002024	50	24	287798	0	49013	450
261590107002025	0	0	4677	0	49013	0
261590107002026	0	0	7903	0	49013	0
261590107002027	3	2	161042	0	49013	48
261590107002028	2	1	8497	0	49013	610
261590107002029	26	9	22677	0	49013	2970
261590107002030	12	6	11208	0	49013	2773
261590107002031	10	4	8106	0	49013	3195
261590107002032	0	1	4246	0	49013	0
261590107002033	20	4	10795	0	49013	4798
261590107002034	25	11	12622	0	49013	5130
261590107002035	18	8	11586	0	49013	4024
261590107002036	39	11	10954	0	49013	9221
261590107002037	3	1	4710	0	49013	1650
261590107002038	18	8	11390	0	49013	4093
261590107002039	23	7	12774	0	49013	4663
261590107002040	15	5	25170	0	49013	1543
261590107002041	20	6	14415	0	49013	3593
261590107002042	3	1	5709	0	49013	1361
261590107002043	0	0	4891	0	49013	0
261590107002044	32	13	172334	0	49013	481
261590107002045	19	9	83513	0	49013	589
261590107002046	0	0	1014	0	49013	0
261590107002047	0	0	884693	0	49013	0
261590107002048	0	0	8421	0	49013	0
261590108001000	27	11	1175611	0	49013	59
261590108001001	18	7	699111	0	49013	67
261590108001002	8	6	594597	0	49013	35
261590108001003	0	0	21263	0	49013	0
261590108001004	24	8	158655	0	49013	392
261590108001005	0	0	7021	0	49013	0
261590108001006	0	0	4509	0	49013	0
261590108001007	8	4	135617	0	49013	153
261590108001008	16	12	2138789	0	49013	19
261590108001009	13	5	916675	0	49013	37
261590108001010	3	1	613740	0	49013	13
261590108001011	2	1	128166	0	49013	40
261590108001012	1	2	672599	0	49013	4
261590108001013	0	0	39255	0	49090	0
261590108001014	2	1	431714	0	49090	12
261590108001015	3	1	321050	0	49090	24
261590108001016	0	0	7526	0	49090	0
261590108001017	2	1	377807	0	49090	14
261590108001020	4	3	433420	0	49090	24
261590108001021	32	12	1279234	0	49043	65
261590108001022	14	5	350078	0	49013	104
261590108001023	8	4	934781	0	49013	22
261590108001024	5	1	169234	0	49013	77
261590108001025	0	0	136452	0	49013	0
261590108001026	2	1	132652	0	49013	39
261590108001027	0	0	24215	0	49013	0

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590108001028	0	1	62192	0	49013	0
261590108001029	2	1	408302	0	49013	13
261590108001030	6	2	35710	0	49013	435
261590108001031	13	4	220450	0	49013	153
261590108001032	0	0	12223	0	49013	0
261590108001033	0	0	4942	0	49013	0
261590108001034	23	8	1557975	0	49013	38
261590108001035	0	0	537692	0	49013	0
261590108001036	4	1	385263	0	49013	27
261590108001037	8	3	1083764	0	49013	19
261590108001038	51	18	1718612	0	49013	77
261590108001039	53	26	1829216	0	49013	75
261590108001040	20	9	432203	0	49013	120
261590108001041	36	10	313592	0	49013	297
261590108001042	71	20	1030918	0	49013	178
261590108001043	2	1	12525	0	49013	414
261590108001044	20	6	423914	0	49013	122
261590108001045	53	22	2574903	0	49013	53
261590108001046	5	1	21944	0	49013	590
261590108001047	61	20	1308412	0	49013	121
261590108001048	0	0	736	0	49013	0
261590108001049	4	3	28284	0	49013	366
261590108001050	25	9	977336	0	49013	66
261590108001051	2	1	114061	0	49013	45
261590108001052	9	3	477421	0	49013	49
261590108001053	4	2	267616	0	49013	39
261590108001054	43	15	1464126	0	49013	76
261590108001055	5	2	549799	0	49013	24
261590108001056	0	0	36963	0	49013	0
261590108001057	7	4	14789	0	49013	1226
261590108001058	0	2	9503	0	49013	0
261590108001059	8	3	69767	0	49013	297
261590108001060	2	1	329180	0	49013	16
261590108001061	41	13	1799026	0	49013	59
261590108001062	15	5	342216	0	49013	114
261590108001063	5	4	281499	0	49013	46
261590108001064	12	2	1216267	0	49013	26
261590108001065	15	7	2196229	0	49013	18
261590108001066	5	2	110197	0	49013	118
261590108001067	60	23	2638620	0	49013	59
261590108001068	45	18	1228957	0	49043	95
261590108001069	13	8	782333	0	49043	43
261590108001073	9	3	261667	0	49043	89
261590108001074	0	0	38203	0	49043	0
261590108001075	68	22	1159268	0	49043	152
261590108001076	30	12	1175380	0	49043	66
261590108001077	49	19	1917728	0	49013	66
261590108001078	25	12	2561226	0	49013	25
261590108001998	0	0	0	143909	49013	
261590108001999	0	0	0	108773	49013	
261590108002000	24	12	37204	0	49013	1671
261590108002001	19	8	762424	0	49013	65

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPENS
261590108002002	39	12	1567009	0	49013	64
261590108002003	0	0	40920	0	49013	0
261590108002004	13	6	894908	0	49013	38
261590108002005	38	13	1304044	0	49013	75
261590108002006	76	29	3004863	0	49013	66
261590108002007	64	16	1172789	0	49013	141
261590108002008	19	13	2226352	52968	49013	22
261590108002009	0	0	65282	0	49013	0
261590108002010	23	14	3217512	0	49013	19
261590108002011	29	14	2512160	66343	49013	30
261590108002012	10	4	436249	0	49013	59
261590108002013	0	0	174679	0	49013	0
261590108002014	0	0	34642	0	49013	0
261590108002015	14	10	2294399	117926	49057	16
261590108002016	0	0	167320	0	49057	0
261590108002017	14	6	487180	0	49013	74
261590108002018	23	9	338818	0	49057	176
261590108002019	3	1	3832	0	49013	2028
261590108002020	9	3	7026	0	49013	3318
261590108002021	23	11	1128488	0	49057	53
261590108002022	76	44	2810509	0	49013	70
261590108002023	14	9	321766	0	49013	113
261590108002024	91	98	557048	0	49013	423
261590108002025	18	8	3698	0	49013	12607
261590108002026	24	18	406402	0	49013	153
261590108002027	34	27	1271742	0	49057	69
261590108002028	83	14	1178240	0	49057	182
261590108002029	54	35	1635484	0	49057	86
261590108002030	25	12	572487	0	49057	113
261590108002031	1	1	398162	0	49057	7
261590108002032	0	0	171227	0	49013	0
261590108002033	0	0	6199	0	49013	0
261590108002034	0	0	47616	0	49013	0
261590108002035	0	0	58518	0	49057	0
261590108002036	3	1	1354403	0	49057	6
261590108002037	26	9	686604	0	49057	98
261590108002038	27	12	1058567	0	49057	66
261590108002039	20	9	1307797	148140	49064	40
261590108002040	14	7	925541	76918	49064	39
261590108002041	0	0	7783	0	49064	0
261590108002042	0	0	9592	0	49013	0
261590108002043	0	0	4622	0	49064	0
261590108002044	0	0	9414	0	49064	0
261590108002997	0	0	0	216288	49057	
261590108002998	0	0	0	487397	490HH	
261590108002999	0	0	0	507729	490HH	
261590114001005	19	9	1873618	0	49057	26
261590114001006	40	16	1383060	0	49057	75
261590114001007	57	50	301897	0	49057	489
261590114001008	0	2	14896	0	49057	0
261590114001009	0	0	104092	0	49057	0
261590114001010	30	12	283340	0	49057	274

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
261590114001011	28	10	1633096	0	49057	44
261590114001012	78	32	3912271	0	49057	52
261590114001013	14	5	310163	0	49057	117
261590114001014	18	6	1016183	0	49057	46
261590114001015	0	0	7586	0	49057	0
261590114001016	42	16	960474	0	49057	113
261590114001017	20	10	851754	0	49057	61
261590114001021	2	1	2028978	0	49057	3
261590114001024	2	1	185683	0	49057	28
261590114001025	23	9	17756	0	49057	3355
261590114001026	34	9	9942	0	49057	8857
261590114001027	0	0	18728	0	49057	0
261590114001028	0	0	6218	0	49057	0
261590114001029	38	12	293966	0	49057	335
261590114001030	4	1	13832	0	49057	749
261590114001031	37	18	632416	0	49057	152
261590114001032	13	5	440130	0	49057	76
261590114001033	9	4	268658	0	49057	87
261590114001034	215	76	3778258	0	49057	147
261590114001035	42	13	37202	0	49057	2924
261590114001036	25	10	21877	0	49057	2960
261590114001037	59	20	103694	0	49057	1474
261590114001038	26	12	90951	0	49057	740
261590114001039	0	0	15791	0	49057	0
261590114001998	0	0	0	251128	49057	
261590114001999	0	0	0	54935	49057	

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

Subarea 5 (Berrien County)

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTAS	POPDENS
260210101002000	189	91	2617260	53588	49038	187
260210101002001	0	0	1050	0	49038	0
260210101002002	0	0	1196	0	49038	0
260210101002003	17	10	24088	0	49038	1828
260210101002004	11	7	23170	0	49038	1230
260210101002005	32	23	127852	0	49038	648
260210101002006	16	10	67482	0	49038	614
260210101002007	18	15	141444	0	49038	330
260210101002008	1	4	19668	0	49038	132
260210101002009	138	165	1056189	0	49038	338
260210101002010	8	17	10786	0	49038	1921
260210101002011	0	0	1972	0	49038	0
260210101002012	57	30	167599	0	49038	881
260210101002013	15	8	13740	0	49038	2827
260210101002014	53	28	1331731	0	49038	103
260210101002015	4	3	7743	0	49038	1338
260210101002016	16	7	35823	0	49038	1157
260210101002017	21	9	17895	0	49038	3039
260210101002018	3	8	9514	0	49038	817
260210101002019	22	7	19330	0	49038	2948
260210101002020	22	8	40563	0	49038	1405
260210101002021	16	5	35901	0	49038	1154
260210101002022	6	5	13600	0	49038	1143
260210101002023	5	5	16694	0	49038	776
260210101002024	16	5	17715	0	49038	2339
260210101002025	3	2	37165	0	49038	209
260210101002026	52	19	182608	0	49022	738
260210101002027	32	11	314375	0	49038	264
260210101002028	72	30	949061	0	49022	196
260210101002029	38	20	564139	0	49022	174
260210101003000	58	22	1300728	0	49038	115
260210101003001	111	62	1686518	151674	49038	170
260210101003002	51	34	261416	0	49038	505
260210101003003	15	8	25946	0	49038	1497
260210101003004	8	2	15715	0	49038	1318
260210101003005	6	3	15553	0	49038	999
260210101003006	0	0	92598	0	49038	0
260210101003007	67	29	2045875	0	49038	85
260210101003008	29	11	564191	0	49038	133
260210101003009	31	18	1301781	16468	49038	62
260210101003010	0	0	471	0	49038	0
260210101003011	27	13	688069	0	49038	102
260210101003012	0	0	22532	0	49038	0
260210101003013	0	0	65104	0	49038	0
260210101003014	78	27	1707449	0	49038	118
260210101003015	54	24	1752814	0	49038	80
260210101003016	18	8	58218	0	49038	801
260210101003021	5	5	126247	0	49038	103
260210101004000	39	18	1776837	68940	49038	57
260210101004001	23	7	629886	0	49038	95
260210101004002	27	12	13937	0	49038	5018

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
260210101004003	12	10	178824	0	49038	174
260210101004004	223	85	579676	0	49038	996
260210101004005	0	0	815	0	49038	0
260210101004006	21	21	340443	0	49038	160
260210101004007	36	37	330447	0	49038	282
260210101004008	23	20	39970	0	49038	1490
260210101004009	8	5	25124	0	49038	825
260210101004010	12	11	142057	0	49038	219
260210101004011	9	9	29294	0	49038	796
260210101004012	14	11	29295	0	49038	1238
260210101004013	8	6	12600	0	49038	1644
260210101004014	0	0	302	0	49038	0
260210101004015	17	14	29103	0	49038	1513
260210101004016	2	1	11729	0	49038	442
260210101004017	25	11	9525	0	49038	6798
260210101004018	6	8	15210	0	49038	1022
260210101004019	0	6	14476	0	49038	0
260210101004020	8	5	13795	0	49038	1502
260210101004021	39	23	108861	0	49038	928
260210101004022	15	9	21600	0	49038	1799
260210101004023	17	5	25288	0	49038	1741
260210101004024	14	10	25936	0	49038	1398
260210101004025	5	3	11669	0	49038	1110
260210101004026	59	28	178338	0	49038	857
260210101004027	0	1	6972	0	49038	0
260210101004028	0	0	627	0	49038	0
260210101004029	5	3	14034	0	49038	923
260210101004030	9	9	18256	0	49038	1277
260210101004031	3	1	8061	0	49038	964
260210101004032	7	3	16507	0	49038	1098
260210101004033	20	8	17775	0	49038	2914
260210101004034	18	9	13082	0	49038	3564
260210101004035	0	0	9520	0	49038	0
260210101004036	2	1	4912	0	49038	1055
260210101004037	15	9	4588	0	49038	8468
260210101004038	0	4	6771	0	49038	0
260210101004039	7	5	6924	0	49038	2618
260210101004040	9	4	3054	0	49038	7633
260210101004041	0	0	6556	0	49038	0
260210101004042	6	16	12640	0	49038	1229
260210101004043	13	6	17320	0	49038	1944
260210101004044	6	6	16376	0	49038	949
260210101004045	7	4	16410	0	49038	1105
260210101004046	14	10	30633	0	49038	1184
260210101004047	45	26	157095	0	49038	742
260210101004048	8	4	8347	0	49038	2482
260210101004049	3	3	13294	0	49038	584
260210101004050	12	6	13383	0	49038	2322
260210101004051	16	11	15768	0	49038	2628
260210101004052	9	9	13853	0	49038	1683
260210101004053	15	9	15105	0	49038	2572
260210101004054	0	0	1183	0	49038	0
260210101004055	6	4	18259	0	49038	851

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
260210101004056	27	9	31456	0	49038	2223
260210102001000	18	7	597447	0	49038	78
260210102001001	51	20	1639569	0	49038	81
260210102001002	87	39	2562457	0	49038	88
260210102001003	125	47	1590600	0	49038	204
260210102001004	94	49	233310	0	49038	1043
260210102001005	123	56	1682825	0	49038	189
260210102001006	23	12	704182	0	49038	85
260210102001007	48	15	260935	0	49038	476
260210102001008	26	9	34574	0	49038	1948
260210102001009	13	8	13829	0	49038	2435
260210102001010	15	16	19836	0	49038	1959
260210102001011	17	8	16261	0	49038	2708
260210102001012	11	18	28702	0	49038	993
260210102001013	24	9	10443	0	49038	5952
260210102001014	22	12	14397	0	49038	3958
260210102001015	15	11	15174	0	49038	2560
260210102001016	21	12	13540	0	49038	4017
260210102001017	9	5	8190	0	49038	2846
260210102001018	12	10	11983	0	49038	2594
260210102001019	37	15	22067	0	49038	4343
260210102001020	68	47	228943	0	49038	769
260210102001999	0	0	0	386176	49038	
260210102002000	208	209	384471	0	49038	1401
260210102002001	13	8	15811	0	49038	2130
260210102002002	21	13	26641	0	49038	2042
260210102002003	15	10	12934	0	49038	3004
260210102002004	9	7	12403	0	49038	1879
260210102002005	24	10	18102	0	49038	3434
260210102002006	12	11	27005	0	49038	1151
260210102002007	15	12	11120	0	49038	3494
260210102002008	186	92	253581	0	49038	1900
260210102002009	67	29	156763	0	49038	1107
260210102002010	138	65	362986	0	49038	985
260210102002011	18	13	13899	0	49038	3354
260210102002012	15	7	9148	0	49038	4247
260210102002013	297	122	953475	0	49038	807
260210102002014	15	8	15974	0	49038	2432
260210102002015	14	6	9562	0	49038	3792
260210102002016	12	5	17479	0	49038	1778
260210102002017	20	9	19887	0	49038	2605
260210102002018	19	9	15512	0	49038	3172
260210102002019	38	11	11223	0	49038	8769
260210102002020	97	28	153547	0	49038	1636
260210102002021	3	4	12008	0	49038	647
260210102002022	75	113	134727	0	49038	1442
260210102002023	0	12	3775	0	49038	0
260210102002999	0	0	0	1497312	490HH	
260210102003000	125	104	238018	0	49038	1360
260210102003001	6	5	11034	0	49038	1408
260210102003002	3	3	8282	0	49038	938
260210102003003	58	25	44434	0	49038	3381
260210102003004	8	4	9871	0	49038	2099

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
260210102003005	32	11	18802	0	49038	4408
260210102003006	22	10	15199	0	49038	3749
260210102003007	36	14	32449	0	49038	2873
260210102003008	0	0	9343	0	49038	0
260210102003009	0	0	601	0	49038	0
260210102003010	26	11	46987	0	49038	1433
260210102003011	114	49	158061	0	49038	1868
260210102003012	55	27	55639	0	49038	2560
260210102003013	64	31	156650	0	49038	1058
260210102003014	33	17	58958	0	49038	1450
260210102003015	57	33	87658	0	49038	1684
260210102003016	16	7	21986	0	49098	1885
260210102003017	43	19	484578	0	49098	230
260210102003018	40	13	35489	0	49038	2919
260210102003999	0	0	0	164331	490HH	
260210102005000	43	21	2495190	0	49038	45
260210102005001	7	2	330115	0	49038	55
260210102005002	33	12	827836	0	49038	103
260210102005003	47	16	1281271	0	49038	95
260210102005004	71	34	2575296	0	49038	71
260210102005005	141	51	1294431	0	49038	282
260210102005006	60	28	1282783	0	49038	121
260210102005007	91	38	1255305	0	49038	188
260210102005008	53	22	805125	56755	49038	170
260210102005009	393	143	3012121	0	49038	338
260210102005010	153	74	37924	0	49038	10449
260210102005011	90	40	454791	0	49038	513
260210102005012	0	0	6552	0	49038	0
260210102006000	37	18	534537	0	49098	179
260210102006001	78	74	14050	0	49038	14379
260210102006002	22	15	6611	0	49038	8619
260210102006003	14	13	7341	0	49038	4939
260210102006004	23	10	12623	0	49038	4719
260210102006005	27	11	13166	0	49038	5311
260210102006006	28	9	16874	0	49038	4298
260210102006007	0	0	37435	0	49098	0
260210102006008	0	0	5316	0	49098	0
260210102006009	4	1	11395	0	49038	909
260210102006010	0	0	14462	0	49038	0
260210102006011	27	15	75307	0	49038	929
260210102006012	37	17	250041	0	49038	383
260210102006013	13	5	99603	0	49038	338
260210102006014	48	21	1760139	0	49038	71
260210102006015	41	13	1386756	0	49038	77
260210102006016	123	50	205951	0	49038	1547
260210102006017	5	4	37869	0	49038	342
260210102006018	50	25	44878	0	49038	2886
260210102006019	0	0	1314	0	49038	0
260210102006020	29	12	10599	0	49038	7086
260210102006021	15	7	10735	0	49038	3619
260210102006022	13	7	11424	0	49038	2947
260210102006023	8	5	5216	0	49038	3972
260210102006024	17	8	5141	0	49038	8564

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
260210102006025	39	15	10493	0	49038	9626
260210102006026	0	1	9105	0	49038	0
260210102006027	0	0	4767	0	49038	0
260210102006028	0	0	4978	0	49038	0
260210102006029	0	0	8574	0	49038	0
260210102006030	0	0	4489	0	49038	0
260210102006031	21	8	168664	0	49038	322
260210102006032	12	6	242863	0	49038	128
260210102006033	19	6	15444	0	49038	3186
260210102006034	8	4	14531	0	49038	1426
260210102006035	23	10	17487	0	49038	3407
260210102006036	1	3	16093	0	49038	161
260210102006037	12	6	31195	0	49038	996
260210102006038	0	0	1906	0	49038	0
260210102006039	17	7	12664	0	49038	3477
260210102006040	34	15	14069	0	49038	6259
260210103001000	0	0	7643	0	49098	0
260210103001001	23	13	50212	0	49098	1186
260210103001002	111	44	348158	0	49098	826
260210103001003	31	12	57240	0	49098	1403
260210103001004	10	3	31467	0	49098	823
260210103001005	20	7	31190	0	49098	1661
260210103001006	0	0	5213	0	49098	0
260210103001007	13	5	5417	0	49098	6216
260210103001008	51	20	32716	0	49098	4037
260210103001009	58	25	51972	0	49098	2890
260210103001010	84	27	42862	0	49098	5076
260210103001011	17	10	7085	0	49098	6215
260210103001012	21	8	9894	0	49098	5497
260210103001013	6	3	5273	0	49098	2947
260210103001014	36	15	14812	0	49098	6295
260210103001015	24	9	14720	0	49098	4223
260210103001016	64	27	40709	0	49098	4072
260210103001017	24	10	19475	0	49098	3192
260210103001018	0	0	812	0	49098	0
260210103001019	50	22	51278	0	49098	2525
260210103001020	16	7	43059	0	49098	962
260210103001021	44	16	68038	0	49098	1675
260210103001022	26	7	21858	0	49098	3081
260210103001023	23	9	15630	0	49098	3811
260210103001024	2	1	2934	0	49098	1765
260210103002000	47	18	95777	0	49098	1271
260210103002001	51	29	471579	0	49098	280
260210103002002	59	51	637451	0	49098	240
260210103002003	27	22	36205	0	49098	1931
260210103002004	78	30	155743	0	49098	1297
260210103002005	22	10	34897	0	49098	1633
260210103002006	21	9	39859	0	49098	1365
260210103002007	0	0	479482	0	49098	0
260210103002008	148	85	283323	0	49098	1353
260210103002009	36	17	21772	0	49098	4283
260210103002010	0	0	16804	0	49098	0
260210103002011	23	10	11014	0	49098	5409

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTAS	POPDENS
260210103002012	20	6	6938	0	49098	7466
260210103002013	14	6	7434	0	49098	4878
260210103002014	0	0	3899	0	49038	0
260210103002015	21	8	10392	0	49098	5234
260210103002016	13	4	12042	0	49098	2796
260210103002017	61	23	20370	0	49098	7756
260210103002018	47	16	13178	0	49098	9237
260210103002019	15	6	4709	0	49098	8250
260210103002020	6	2	6301	0	49098	2466
260210103002021	91	37	260866	0	49038	903
260210103002022	35	12	34408	0	49098	2635
260210103002999	0	0	0	462945	490HH	
260210103004000	49	22	1099002	0	49098	115
260210103004001	97	37	2200231	0	49098	114
260210103004002	38	14	1269199	0	49098	78
260210103004003	0	0	72530	119372	49098	0
260210103004004	11	4	28583	0	49098	997
260210103004005	5	1	54928	0	49098	236
260210103004006	30	11	222813	0	49098	349
260210103004007	6	5	114504	0	49098	136
260210103004008	12	5	87797	0	49098	354
260210103004009	49	24	47050	0	49098	2697
260210103004010	10	4	6980	0	49098	3711
260210103004011	23	9	36243	0	49098	1644
260210103004012	66	23	89855	0	49098	1902
260210103004013	29	10	35146	0	49098	2137
260210103004014	27	13	14854	0	49098	4708
260210103004015	37	16	49056	0	49098	1953
260210103004016	0	0	26668	0	49098	0
260210103004017	38	16	19279	0	49098	5105
260210103004018	6	2	11684	0	49098	1330
260210103004019	0	0	23400	0	49098	0
260210103004020	16	8	62669	0	49098	661
260210103004021	21	6	5936	0	49098	9163
260210103004022	9	2	27027	0	49098	862
260210103004023	6	3	16478	0	49098	943
260210103005000	126	34	2497360	23978	49098	131
260210103005001	84	30	1443065	0	49098	151
260210103005002	10	4	384668	0	49098	67
260210103005003	0	0	107601	0	49098	0
260210103005004	31	13	551310	0	49098	146
260210103005005	6	3	838412	0	49098	19
260210103005006	28	12	439872	0	49098	165
260210103005007	123	48	3237708	47427	49098	98
260210103005008	3	1	83646	0	49098	93
260210103005009	10	4	93382	0	49098	277
260210103005010	17	15	420387	0	49098	105
260210103005011	0	0	155270	0	49098	0
260210103005012	30	36	68375	0	49038	1136
260210103005013	0	0	178	0	49098	0
260210103005014	40	79	197807	0	49098	524
260210103005015	13	29	34066	0	49098	988
260210103005016	0	0	15970	0	49098	0

**PALISADES NUCLEAR PLANT
SITE EMERGENCY PLAN**

POPULATION DISTRIBUTION AND EVACUATION TIME ESTIMATES

STFID	POP100	HU100	AREALAND	AREAWATR	ZCTA5	POPDENS
260210103005017	8	3	7633	0	49098	2715
260210103005018	6	7	21393	0	49098	726
260210103005019	10	5	144828	0	49098	179
260210103005020	5	3	154134	0	49098	84
260210103005021	0	0	5512	0	49098	0
260210103005022	27	15	23322	0	49098	2998
260210103005023	0	2	2394	0	49098	0
260210103005024	8	3	3035	0	49098	6827
260210103005025	65	75	68885	0	49098	2444
260210103005026	0	2	3220	0	49098	0
260210103005027	0	0	26057	0	49098	0
260210103005028	6	2	3441	0	49098	4516
260210103005029	2	15	12383	0	49098	418
260210103005030	39	44	97586	0	49098	1035
260210103005031	3	4	2763	0	49098	2812
260210103005032	28	17	2939	0	49098	24675
260210103005033	120	47	231845	0	49098	1341
260210103005034	42	36	48467	0	49098	2244
260210103005035	2	17	23419	0	49098	221
260210103005036	8	14	36754	0	49098	564
260210103005037	20	10	7514	0	49098	6894
260210103005038	19	17	22028	0	49098	2234
260210103005039	11	9	9920	0	49098	2872
260210103005040	25	10	13750	0	49098	4709
260210103005041	59	19	49623	0	49098	3079
260210103005042	28	11	14881	0	49098	4873
260210103005043	13	7	10992	0	49098	3063
260210103005044	8	5	11879	0	49098	1744
260210103005045	44	13	17491	0	49098	6515
260210103005046	18	6	8797	0	49098	5300
260210103005047	26	12	25426	0	49098	2648
260210103005048	18	5	8862	0	49098	5261
260210103005999	0	0	0	1436216	490HH	

TITLE: PROTECTIVE ACTION RECOMMENDATIONS FOR OFFSITE POPULATIONS

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- Attachment 5, "Projected Dose Evaluation From Field Data"

TITLE: PROTECTIVE ACTION RECOMMENDATIONS FOR OFFSITE POPULATIONS

USER ALERT
REFERENCE USE PROCEDURE

Refer to the procedure periodically to confirm that all procedure segments of an activity will be or are being performed. Where required, sign appropriate sign-off blanks to certify that all segments are complete.

1.0 RESPONSIBILITIES AND AUTHORITIES

This procedure provides protective action recommendations. The authority and responsibility for the selection and implementation of offsite response options rests fully with the appropriate state and local authorities. Nuclear Management Company (NMC) has no authority with respect to imposing protective response options beyond the boundaries of its site.

- 1.1 If the Technical Support Center (TSC) is not operational, the Shift Manager/Site Emergency Director is responsible for recommending protective actions to local or state authorities.
- 1.2 If the TSC is operational, but the Emergency Operations Facility (EOF) is not operational, Radiation Protection staff will be responsible for providing dose calculations and advising the Site Emergency Director on protective action recommendations. The Operations Support Group is responsible for providing core damage determinations. The Site Emergency Director is responsible for recommending protective actions to the local or state authorities.
- 1.3 If the EOF is operational, the Radiation Protection staff in that facility is responsible for providing dose calculations and advising the EOF Director on a protective action recommendation. A Reactor Engineer is available to provide core damage determinations. The EOF Director is responsible for making protective action recommendations and should discuss the protective action with the SED before recommending protective actions to the local or state authority.

2.0 PURPOSE

This procedure provides guidelines for determining protective actions for the general public to be recommended to the appropriate local or state authorities in the event of a radiological emergency.

TITLE: PROTECTIVE ACTION RECOMMENDATIONS FOR OFFSITE POPULATIONS

3.0 REFERENCES

3.1 SOURCE DOCUMENTS

- 3.1.1 Emergency Implementing Procedure EI-1, "Emergency Classification and Actions"
- 3.1.2 Emergency Implementing Procedure EI-2.1, "Site Emergency Director"
- 3.1.3 Emergency Implementing Procedure EI-11, "Determination of Extent of Core Damage"
- 3.1.4 Site Emergency Plan, Section 6, "Emergency Measures"
- 3.1.5 NUREG 0654, Rev 1
- 3.1.6 EA-JLF-93-01

3.2 REFERENCE DOCUMENTS

- 3.2.1 Emergency Implementing Procedure EI-6.7, "Plant Site Meteorological System"
- 3.2.2 Emergency Implementing Procedure EI-6.8, "Backup and Supplemental Meteorology"
- 3.2.3 Emergency Implementing Procedure EI-6.9, "Automated Dose Assessment Program"
- 3.2.4 Emergency Implementing Procedure EI-6.10, "Offsite Dose Calculation - Straight Line Gaussian (Manual Method)"
- 3.2.5 Emergency Implementing Procedure EI-13, "Evacuation/Reassembly"
- 3.2.6 TOM COD Data Systems "Evacuation Time Estimates for the Palisades Power Plant Plume Exposure Pathway Emergency Planning Zone," December 19, 2003
- 3.2.7 Emergency Implementing Procedure EI-3, "Communications and Notifications"
- 3.2.8 Palisades Administrative Procedure 10.46, "Plant Records"
- 3.2.9 NMC Fleet Procedure FP-G-DOC-04, "Procedure Processing"

TITLE: PROTECTIVE ACTION RECOMMENDATIONS FOR OFFSITE POPULATIONS

4.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

4.1 Attachment 1 provides a flowchart of PARs and the recommended protective actions for the plume exposure pathway. The flowchart is divided into three sections:

- **MINIMUM RECOMMENDATIONS** - Minimum protective action recommendations when a General Emergency is being declared.
- **CORE/CONTAINMENT STATUS RECOMMENDATIONS** - Protective actions that are required whenever major core/containment failure has occurred, or is projected.
- **OFFSITE DOSE STATUS RECOMMENDATIONS** - Protective actions that are required when offsite doses exceed the EPA protective actions dose limits.

4.2 Attachment 1 also includes tables for identifying affected areas.

4.3 Attachment 2 is a map showing sectors and areas.

4.4 Attachment 3 converts the direction the wind is coming from to the 3 affected downwind sectors.

4.5 Attachment 4 provides evacuation time estimates for the 10 mile Emergency Planning Zone (EPZ).

TITLE: PROTECTIVE ACTION RECOMMENDATIONS FOR OFFSITE POPULATIONS

5.0 PRECAUTIONS AND LIMITATIONS

This procedure is a guide for determining recommended protective actions. Since it is impossible to cover all potential situations, the judgment of the person responsible for recommending protective actions shall take precedence over the requirements of this procedure. However, since the protection of the general public is the ultimate concern, protective actions less stringent than those in this procedure should be recommended only if constraints make the actions a greater hazard to public health.

NOTE: Severe core damage is indicated by:

1. Loss of critical functions required for core protection (eg, loss of injection combined with a LOCA);
2. High core temperatures;
3. Very high radiation levels in area or process monitors.

Following the declaration of a General Emergency, the initial minimum protective action recommendation must focus on the status of the core. **IF** severe core damage cannot be ruled out, **THEN** the initial recommendation shall be to evacuate. It may be concluded that "severe core damage **cannot** be ruled out" if any of the following conditions exist:

- a. If there are symptoms of severe core damage, whether explainable or not.
- b. If there is not enough information to positively state that there is **no** severe core damage.
- c. If current plant conditions persist, severe core damage is projected, unless some improvement is seen in plant conditions.

Field surveys should be conducted to confirm dose projections. If these recommendations are available at the time a recommendation is made, they should be considered together with the dose projection. However, a protective action recommendation should not be delayed until field survey results are reported.

If Protective Action Guidelines are exceeded beyond 10 miles, consult with the state on ad hoc protective actions. The dose assessment computer may be used to estimate dose beyond 10 miles by changing the "Downwind Distance, Miles" parameter to a desired distance.

TITLE: PROTECTIVE ACTION RECOMMENDATIONS FOR OFFSITE POPULATIONS

6.0 PROCEDURE

USER ALERT
REFERENCE USE PROCEDURE

Refer to the procedure periodically to confirm that all procedure segments of an activity will be or are being performed. Where required, sign appropriate sign-off blanks to certify that all segments are complete.

6.1 DECLARATION OF UNUSUAL EVENT OR ALERT

- 6.1.1 Unusual Event - No protective actions required. Emergency Implementing Procedure EI-3, "Communications and Notifications," Attachment 1, "Palisades Event Notification Form," should be used.
- 6.1.2 Alert - No protective actions required beyond accountability.

6.2 DECLARATION OF A SITE AREA EMERGENCY

- 6.2.1 Evacuate nonessential personnel from the site per Emergency Implementing Procedure EI-13, "Evacuation/Reassembly."

6.3 DECLARATION OF GENERAL EMERGENCY

6.3.1 Initial Recommendation

NOTE: The Initial recommendation that is formulated should evaluate whether the Minimum, Core/Containment, or Dose Status recommendation is applicable.

The declaration of a General Emergency requires that an **INITIAL PROTECTIVE ACTION RECOMMENDATION** be formulated (see Attachment 1, Pages 1 and 2) and communicated to offsite authorities.

- a. **IF** the State Emergency Operations Center is **not** activated, **THEN** the SED shall personally communicate the General Emergency and the initial protective action recommendation to Van Buren County.
- b. **WHEN** the State Emergency Operations Center (EOC) is activated, **THEN** the General Emergency and the initial protective action recommendation shall be communicated directly (via telephone) from the SED/EOF Director to the State EOC Director.

TITLE: PROTECTIVE ACTION RECOMMENDATIONS FOR OFFSITE POPULATIONS

6.3.2 Follow-Up Recommendation

- a. Using available Plant status information, dose projections, and/or field surveys, and Attachment 1, "Protective Action Recommendations for Offsite Population," evaluate and recommend a follow-up protective action. Notification to the appropriate state and local authorities shall be made as soon as the recommendation has been prepared (not later than 30 minutes after initial recommendations).
- b. Assess the conditions affecting the follow-up protective action and make revisions to the protective action recommendation that include appropriate consideration of the protective action orders given to the public by offsite authorities. For example: If a protective action order has been given to the public to evacuate an area, a change in protective action recommendation to shelter would not be appropriate until the source of the threat to the public is clearly under control.
- c. Attachment 5 provides a work sheet that may be used to assist in determining Projected TEDE, adult thyroid CDE, and/or skin DE from field survey data.

6.3.3 The Radiation Protection Group Leader should provide the protective action recommendation for SED/EOF Director approval.

6.3.4 Record the recommended protective action and affected area(s) on the Palisades Event Notification Form.

7.0 ATTACHMENTS AND RECORDS

7.1 Attachment 1, "Protective Action Recommendations for Offsite Population"

7.2 Attachment 2, "Area/Sector Map"

7.3 Attachment 3, "Determination of Affected Downwind Sectors"

7.4 Attachment 4, "Palisades 10-Mile EPZ Evacuation Time Estimates Summary"

7.5 Attachment 5, "Projected Dose Evaluation From Field Data"

7.6 RECORDS

Records generated by this procedure shall be filed in accordance with Palisades Administrative Procedure 10.46, "Plant Records." Refer to the records matrix attached to Palisades Administrative Procedure 10.46 for information needed to complete Record Indexing Form (Form 104).

TITLE: PROTECTIVE ACTION RECOMMENDATIONS FOR OFFSITE POPULATIONS

8.0 SPECIAL REVIEWS

The scope of this procedure does not include activities that require a 50.59 review per NMC Fleet Procedure FP-G-DOC-04, "Procedure Processing." Therefore, changes to this procedure do not require a 50.59 review.

**PROTECTIVE ACTION RECOMMENDATIONS
 FOR OFFSITE POPULATION**

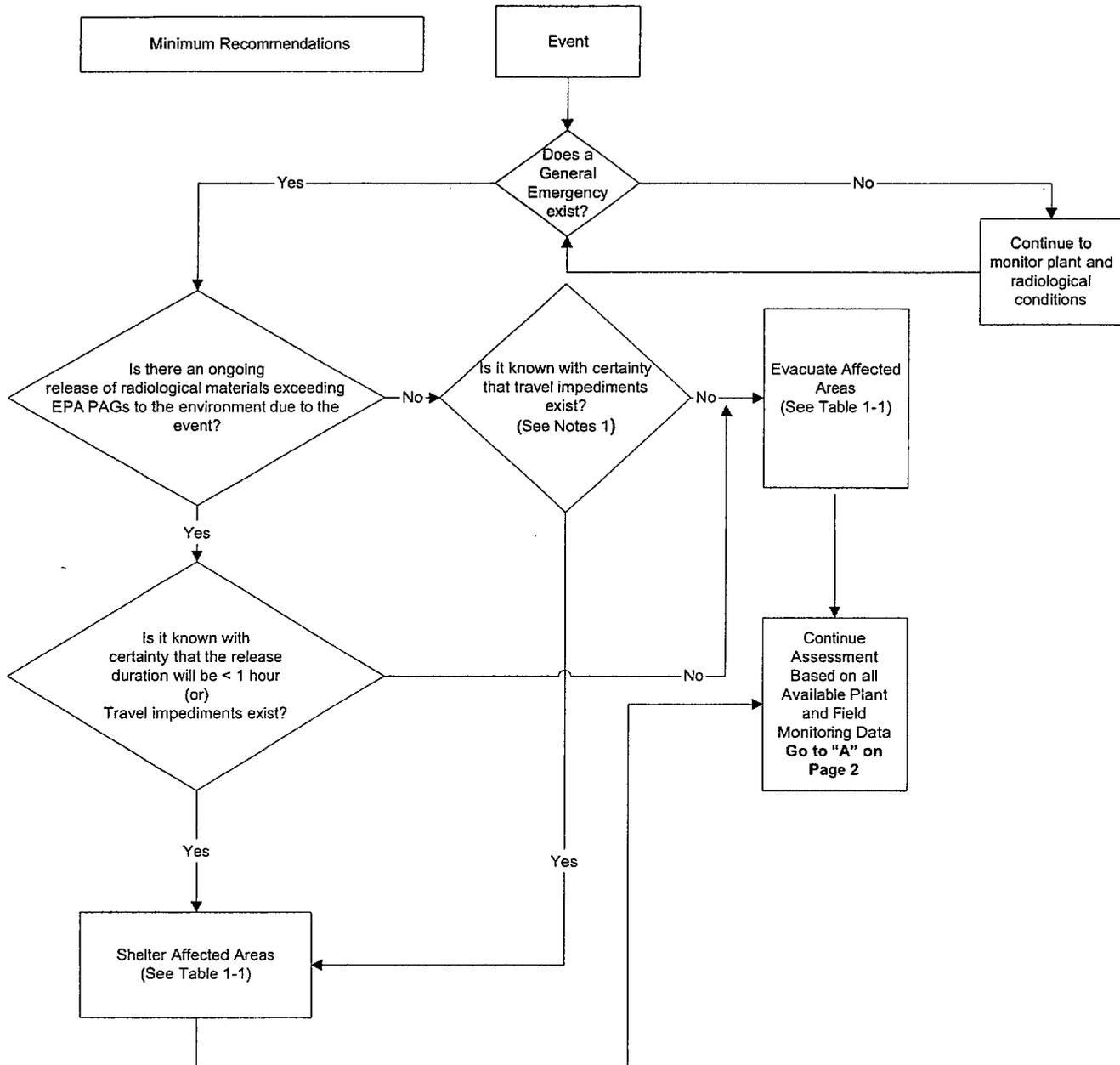


TABLE 1 - 1
0 - 5 Miles Wind Direction Conversion

Wind Direction Degrees (From):	Areas Affected
≥169 and <236	1 and 2
≥236 and <303	1, 2 and 3
≥303 and <56	1 and 3
≥56 and <169	1

PROTECTIVE ACTION RECOMMENDATIONS FOR OFFSITE POPULATION

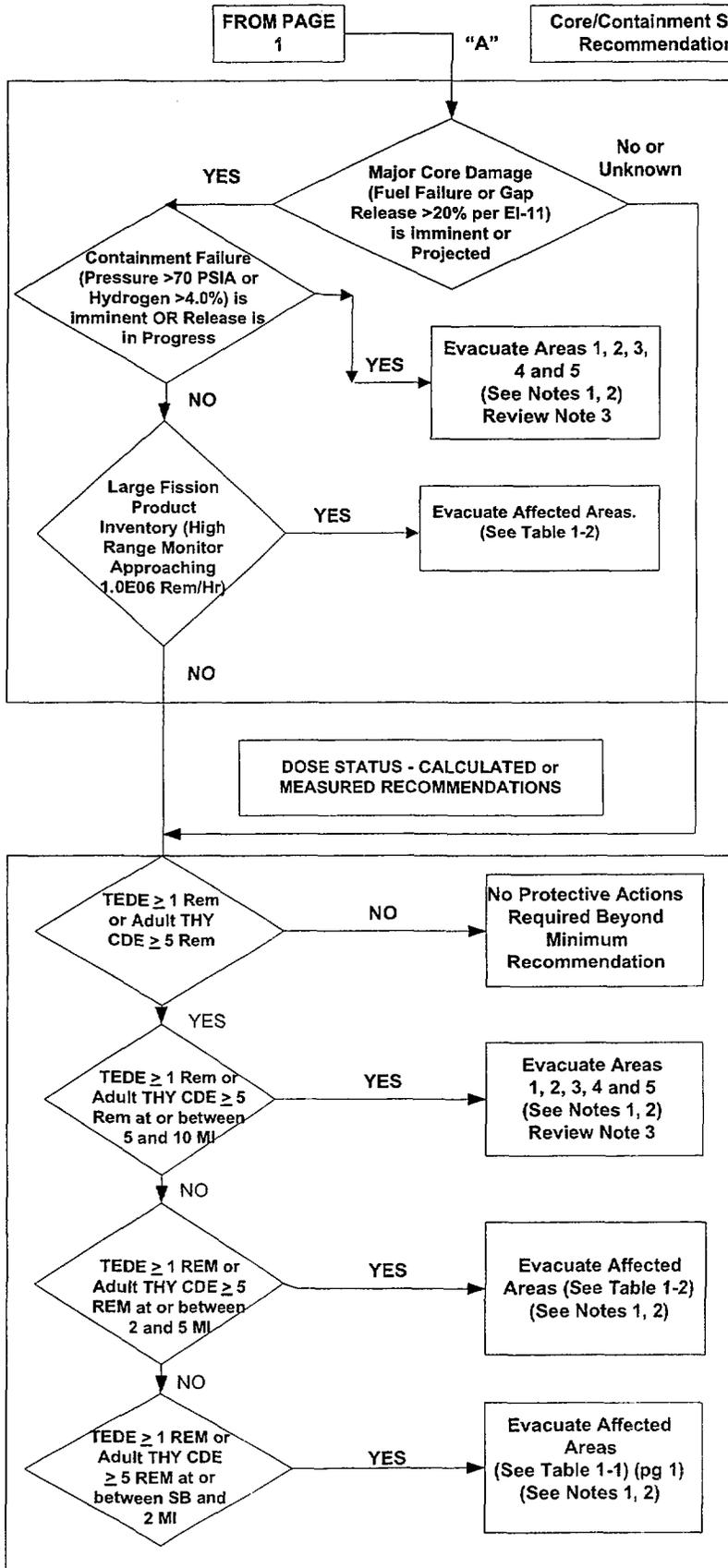


Table 1-2
 0-10 Miles Wind Direction Conversion

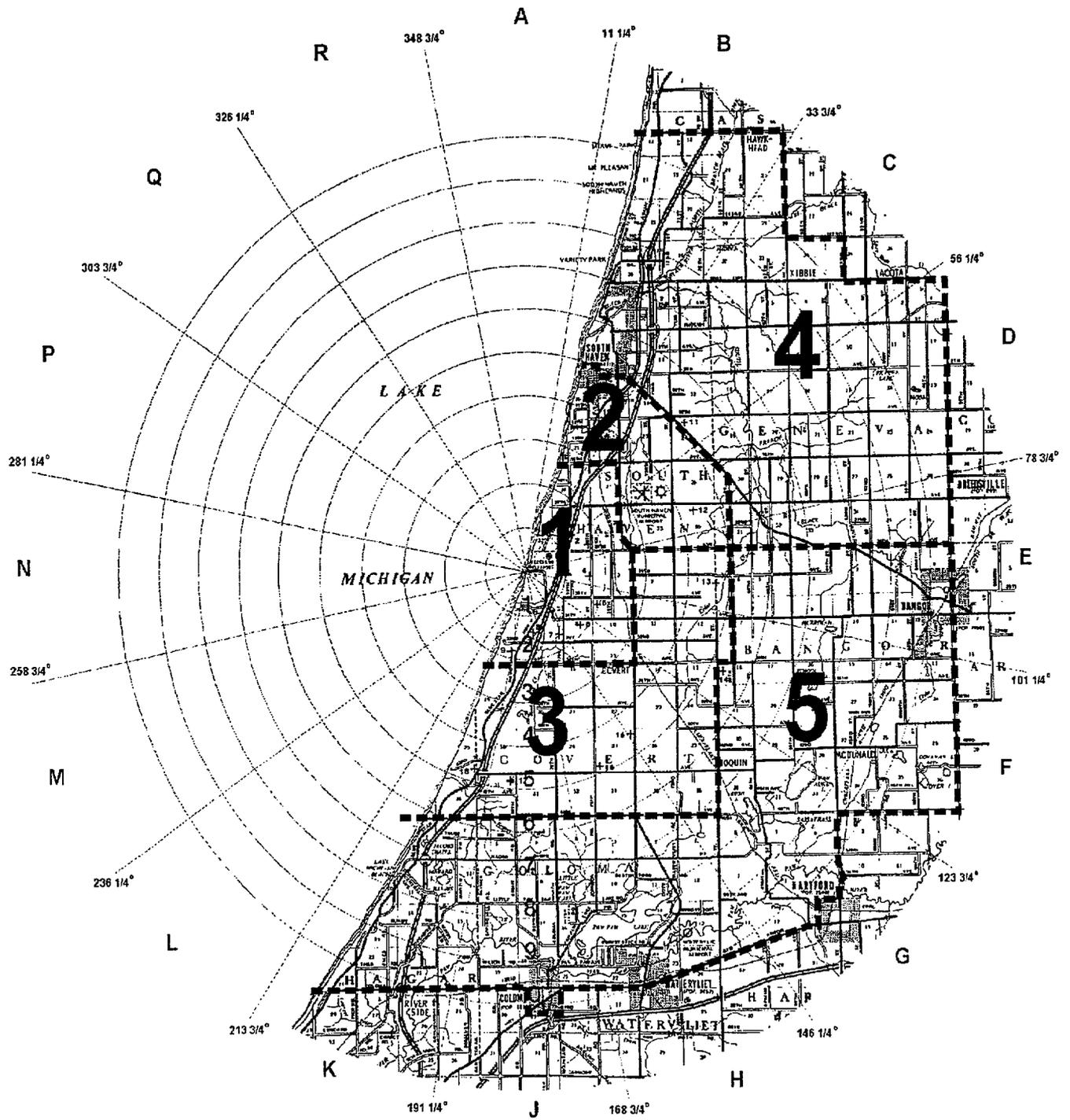
Wind Direction Degrees (From):	Areas Affected
>169 and <236	1, 2, 3 and 4
≥236 and <303	1, 2, 3, 4 and 5
≥303 and <56	1, 2, 3 and 5
≤56 and <169	1, 2, and 3

NOTE 1: If there are known travel impediments (Adverse weather that impacts most or all the Affected Areas e.g. a blizzard which has caused known widespread road closures or an ongoing security event in which Areas 1 and 2 and/or 3 have or potentially will be occupied by an adversarial force), initially shelter rather than evacuate until conditions improve.

NOTE 2: Sheltering may be the appropriate action for controlled releases from containment if there is assurance that the release is short term (puff release) and the area near the plant cannot be evacuated before the plume arrives.

NOTE 3: If TEDE ≥ 1 REM or Thyroid CDE ≥ 5 REM are expected to be exceeded beyond 10 Miles consult with the State of Michigan on ad hoc protective actions

AREA/SECTOR MAP



DETERMINATION OF AFFECTED DOWNWIND SECTORS

WIND DIRECTION (DEGREES FROM)	SECTOR	AFFECTED DOWNWIND SECTORS		
		CENTERLINE	ADJACENT	
169-191	J	A	R	B
192-213	K	B	A	C
214-236	L	C	B	D
237-258	M	D	C	E
259-281	N	E	D	F
282-303	P	F	E	G
304-326	Q	G	F	H
327-348	R	H	G	J
349-11	A	J	H	K
12-33	B	K	J	L
34-56	C	L	K	M
57-78	D	M	L	N
79-101	E	N	M	P
102-123	F	P	N	Q
124-146	G	Q	P	R
147-168	H	R	Q	A

PALISADES 10-MILE EPZ EVACUATION TIME ESTIMATES SUMMARY*

AREA	AREA DESCRIPTION	WEEKDAY FAIR WEATHER	WEEKNIGHT FAIR WEATHER	WEEKNIGHT ADVERSE WEATHER
Area 1	All sectors to 2 miles	180	160	190
Areas 1 & 2	All sectors to 2 miles - northeast sectors to 5 miles	180	180	250
Areas 1 & 3	All sectors to 2 miles - southeast sectors to 5 miles	190	180	210
Areas 1, 2, 3, & 4	All sectors to 5 miles - northeast sectors to 10 miles	360	230	600
Areas 1, 2, 3 & 5	All sectors to 5 miles - southeast sectors to 10 miles	340	330	600
Areas 1, 2, 3, 4, & 5	All sectors to 10 miles	400	380	620

* These are comparative times based on data drawn from the Evacuation Time Estimates for the Palisades Nuclear Power Plant Plume Exposure Pathway Emergency Planning Zone, December 19, 2003, prepared by TOM COD Data Systems. **Times are given in minutes.**

PROJECTED DOSE EVALUATION FROM FIELD DATA

1. Determination of Projected TEDE:

NOTE: Perform A OR B and then perform C AND D.

A. DDE (Plume Shine or Immersion):

3-Foot Closed Window Reading	_____	mrem/h
Expected Duration (Default 2h)	X _____	h
Projected DDE	= _____	mrem (A)

B. DDE (Ground Disposition):

3-Inch Closed Window Reading	_____	mrem/h
Expected Duration (Default 96h)	X _____	h
Projected DDE	= _____	mrem (B)

C. CEDE:

Particulate:

_____ $\mu\text{Ci/cc}$ x $3.90 \text{ E}+7 \text{ mrem cc}/\mu\text{Ci-h}^*$ x _____ h = _____ mrem (C)

Iodine:

_____ $\mu\text{Ci/cc}$ x $3.90 \text{ E}+7 \text{ mrem cc}/\mu\text{Ci-h}^*$ x _____ h = _____ mrem (D)

D. Projected TEDE:

_____ mrem (A or B) + _____ mrem (C) + _____ mrem (D) = _____ mrem (TEDE)

2. Determination of Projected Adult Thyroid CDE:

Iodine CDE: _____ $\mu\text{Ci/cc}$ x $1.30 \text{ E}+9 \text{ mrem cc}/\mu\text{Ci-h}^*$ x _____ h = _____ mrem

3. Determination of Projected Skin DE:

3ft or 3in: (OW - CW) X BCF	= _____	mrem**
Expected Duration (default 2h)	X _____	h
Projected Beta Skin DE	= _____	mrem
Projected DDE (A or B)	+ _____	mrem
Total Projected Skin Dose	= _____	mrem

* Dose conversion factor from EPA-400 Table 5-2.

** Assumes 1 rad = 1 rem

PLANNING STANDARD J

PROTECTIVE RESPONSE

J. PROTECTIVE RESPONSE

J.1. Owner Controlled Area Warning and Advisement

Since the PA system within the plant is extensive, an announcement of the nature of the emergency can be made to most personnel immediately.

Upon sounding of the Nuclear Emergency Alarm personnel in the outlying areas of the plant site are notified using the methods described in section E.2.a of this plan.

J.1.a. Non ERO Employees

Plant employees without ERO duties and personnel temporarily assigned to the plant for training or other purposes, are required to know the location and routes to the assembly areas and be familiar with the emergency alarm procedure. Personnel already onsite immediately proceed to their appropriate assembly area upon sounding of the Nuclear Emergency Alarm.

J.1.b. Visitors

Groups on tour are escorted to an assembly area by their tour guide, should the Nuclear Emergency Alarm be sounded. Personnel already onsite immediately proceed to their appropriate assembly area upon sounding of the Nuclear Emergency Alarm.

J.1.c. Contractors and Construction

Contractors, supervisors, and/or foremen (i.e., outside labor) are provided with instructions, prior to beginning work as to the emergency alarm procedure and as to their responsibility for assembling the people under their supervision in the area designated by the SEC or designated alternate. Personnel already onsite immediately proceed to their appropriate assembly area upon sounding of the Nuclear Emergency Alarm.

J.1.d. Others

The decision to commence evacuation of the Cook Energy Information Center is made by the SEC on the basis of the evaluation of the condition of the plant and the extent of the emergency.

The Manager of the Cook Energy Information Center or designee is responsible for the accountability of all Energy Information Center employees and all visitors of the Center should the Nuclear Emergency Alarm be sounded.

When State Police and National Guard are assigned to the plant their disposition will be determined by the nature of the emergency. If the plant is under attack the MSP and National Guard are considered essential personnel and become Emergency Workers for the event. If the emergency does not involve attack of the plant the MSP and National Guard are considered non-essential personnel and evacuated from site upon evacuation of non-essential personnel.

J.2. Evacuation Routes

If the SEC deems evacuation of personnel from the plant site necessary, the evacuation route to be taken is determined by the nature of the incident. Personnel evacuate the plant and site as directed by the SEC. Evacuation of individuals shall not commence until it is determined that personnel exposure for such evacuation is within the limits of 10 CFR Part 20, or if this is not practical due to the nature of the emergency, the most expeditious and non-hazardous evacuation route shall be used.

The SEC designates the evacuation route. One of the below designated routes is utilized (see Figure 13)

1. East along the plant main access road.
2. North along the Lake Michigan Beach to the plant property line or Rosemary Road.
3. South along the Lake Michigan Beach to Livingston Road.

The Security Director (or alternate) is responsible for the accountability of evacuated personnel from the plant site and reports any missing persons to the SEC.

J.3. Evacuee Monitoring

If evacuation is initiated a personnel monitoring station is established for those evacuated by a person trained in radiation protection. The Radiation Protection Plan specifies the acceptable limits for contamination to the body and clothing for exiting the plant. Suitable equipment intended for such personnel monitoring stations will be stored in both the OSC and the Training Center.

Other equipment is available from the Radiation Protection Access Control (RPAC), if access to that area is feasible.

J.4. Evacuee Decontamination

If any of the evacuated personnel are contaminated, the OSC Manager will institute the necessary steps for movement of these personnel to decontamination facilities and initiate surveys of the surrounding areas.

J.5. Personnel Accountability

Control of all personnel entering, leaving and at various locations throughout the plant is a function of the plant security force. The accountability of all personnel in the protected area of the plant is maintained via the security computer system. The security computer records provide the primary means of assuring the accountability of all persons of the site. Use of this computer will enable the accountability to be performed rapidly with a stated goal of achieving completion of personnel accountability within 30 minutes.

Once the Nuclear Emergency Alarm has been sounded all personnel onsite shall report to their pre-assigned assembly areas. The SEC will notify personnel via the PA system of any changes in the areas to be used due to the release or expected release of radiological effluents from the plant.

Personnel reporting to their assembly area onsite will be accounted for using the plant security access list and security computer. This list provides an up-to-date listing of all personnel onsite by area location. The results of the accountability process will be transmitted to the individual in charge of personnel accountability.

If personnel are unaccounted for, the security computer will be queried to determine the individuals last known location. The individual(s) will be paged on the PA system, the individual's supervisor will be notified and if required, the SEC will initiate search and rescue operations.

J.6 Protective Measures for Those Remaining, or Reporting to the Site

Personnel remaining onsite after the sounding of the Nuclear Emergency Alarm will be required to assemble in an area that is free from ionizing radiation and contamination, or presents the minimum exposure to personnel engaged in emergency operations. Surveys of the assembly area(s) will be conducted to ensure continued habitability.

Personnel remaining onsite who are engaged in emergency operations where there is an actual or potential radiological hazard, shall upon the direction of the RP Director, wear the required protective clothing and respiratory protection. The RP Department shall perform the required surveys and establish the type and quantity of clothing, and other protective measures required.

The Plant Security Force will control access to the Owner Controlled Area at the I-94 Gatehouse as directed by the SEC.

Personnel arriving at the plant to assist in the emergency will be allowed access to the plant via minimal exposure routes as identified by the Plant RP Department and approved by the SEC. The RP Department will establish a Controlled Area Access Point for personnel arriving at (and departing from) the plant from offsite if the access route exceeds the criteria for "Clean Areas" as identified in the Radiation Protection Plan. The amount of exposure personnel receive in reporting to the plant will be included in the individual's dose records.

Additionally, other precautions, such as decontamination, will be taken as necessary prior to entering the plant and reporting to the assigned assembly area. Equipment decontamination and controls are described in detail in the Radiation Protection Plan.

J.6.a. Respiratory Protection

The Radiation Protection Plan and Radiation Protection Procedures identify the instructions and requirements pertaining to respiratory protection requirements and respiratory protection equipment usage.

J.6.b. Protective Clothing

The Radiation Protection Plan and Radiation Protection Procedures identify the instructions and requirements pertaining to protective clothing requirements and protective clothing usage.

J.6.c. Radioprotective Drugs

The procedures and precautions for the issuance and use of thyroid prophylaxis, e.g., individual thyroid protection, by emergency workers will be based on existing conditions. The provisions for stockpiling, inventory, storage and use are included in Emergency Plan Procedures. However, since the medical aftereffects of the agent cannot be determined, wholesale (wide) distribution cannot be incorporated as a responsible protective measure for personnel onsite.

J.7 Off-site Protective Actions

For incidents that fall under the ECLs as defined herein, the SEC or ED will notify the Michigan State Police, the Berrien County Sheriff's Department, the NRC, and the AEP Emergency Response Organization described in this plan that such an incident has occurred.

It is the responsibility of the Governor of Michigan, or authorized representative, to issue Protective Action Orders (PAOs) such as sheltering, evacuation, administration of thyroid blocking agents, etc. These decisions are based upon the protective action guides in Annex S of the Michigan Emergency Management Plan (MEMP). Since copies of the MEMP are maintained

and readily available at the various Emergency Response Facilities, the protective action guides and their bases will not be reproduced here.

For incidents involving actual or imminent releases of radioactive material to the atmosphere the control room or EOF protective action recommendation procedures, as appropriate, will be used as the basis for recommendations for protective actions to the public. These procedures are based on the current issue of the "Manual for Protective Action Guides and Protection Action for Nuclear Incidents" (EPA 400-R-92-001). The EPA Guide provides Protective Action Guides (PAGs) for whole body external gamma radiation and for inhalation of radioactive material in an airborne plume.

The most effective actions to be recommended to the public are evacuation, sheltering, and access control. Evacuation potentially provides the greatest margin of protection. On the other hand, because sheltering may be implemented in less time than evacuation, it may be the protective action of choice if rapid evacuation is impeded for any reason. Also, since sheltering is less disruptive than evacuation, it may be the protective action of choice when the dose reduction factor associated with shelter is adequate to reduce the projected dose to less than PAG levels. Access control is an effective action to avoid exposure of personnel who might otherwise enter areas of high exposure unnecessarily.

Emergency Plan Procedures have been established to provide the mechanism and criteria for recommending protective actions to state and local government.

Additionally the protective action guides for emergency workers and those engaged in lifesaving activities exposed to airborne radioactive materials are listed in Section K.1., Emergency Exposure, and in the Plant Radiation Protection Plan.

J.8. Evacuation Times

Evacuation time estimates and informational county maps are contained in the Berrien County Emergency Operations Plan submitted to the Nuclear Regulatory Commission (NRC).

J.9. Not Applicable

J.10 Plume Exposure Pathway Protective Measures Implementation

J.10.a. Route and Facility Location Maps

Maps for the 10 and 50 mile EPZ, developed by the Michigan State Police are provided for use at the following locations:

Control Rooms	TSC
EOF	OSC
ENC/JPIC	Berrien County EOC
Cook Energy Information Center	

These maps show information such as sector designations, emergency center locations topographical information, and when used in conjunction with Berrien County plan indicates preferred evacuation routes.

J.10.b. Population Distribution Maps

Evacuation time estimates and informational county maps are contained in the Berrien County Emergency Operations Plan submitted to the Nuclear Regulatory Commission (NRC).

J.10.c. Population notification

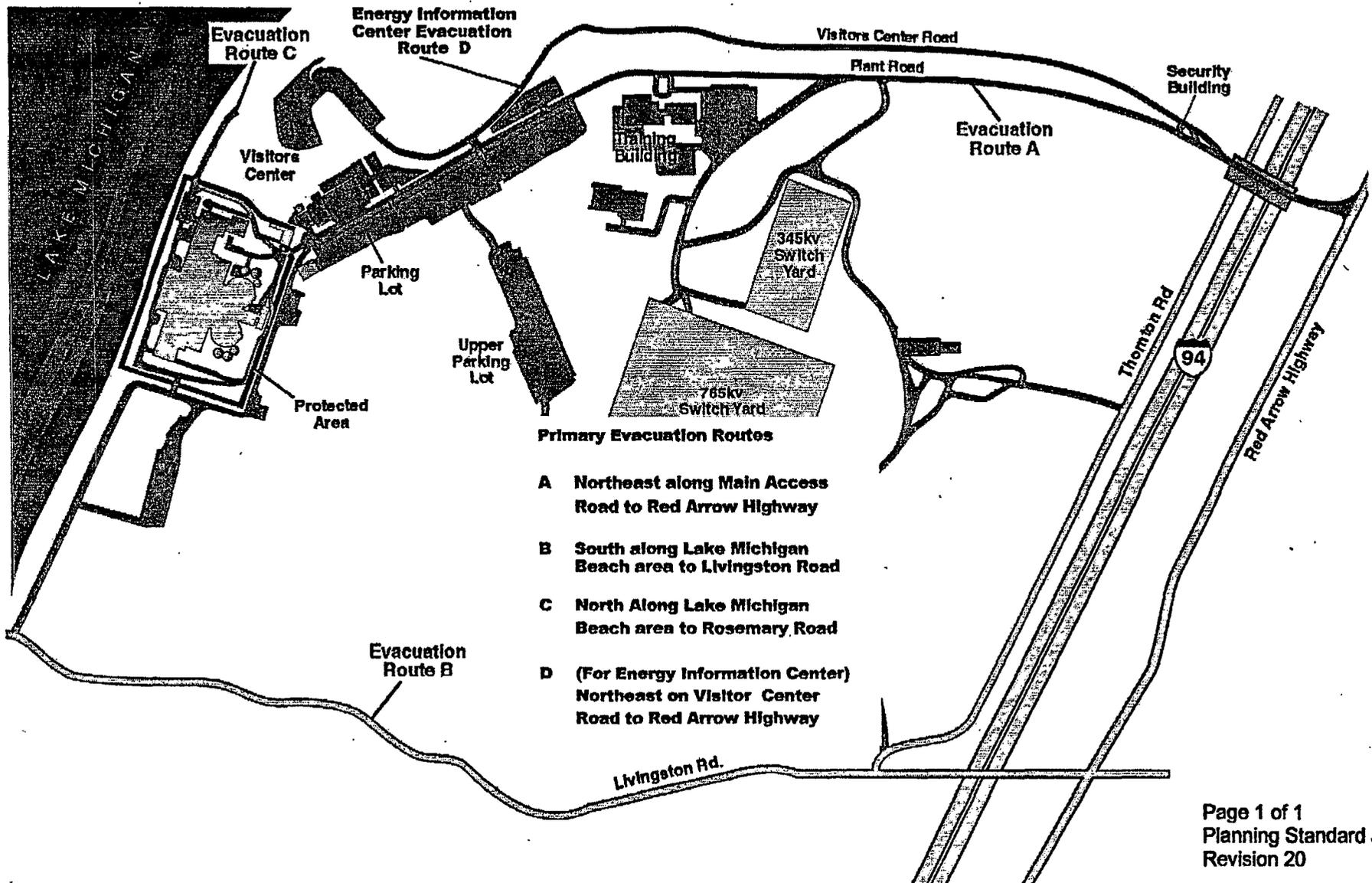
The Berrien County Plan includes provisions for alerting local radio and television stations and, local news media to be prepared to transmit Emergency Public Information. Section E.6 addresses Public Notification

J.10.d. Protective Action Basis

The Dose Assessment Program and off-site survey team results, as well as plant system and equipment status, are the basis for Protective Action Recommendations. DAP and off-site surveys are addressed in sections I.4 and I.5.

Figure 13

Cook Nuclear Plant Primary Evacuation Routes



REVISION SUMMARY

Number: PMP-2080-EPP-100 Revision: 5
Title: Emergency Response

Alteration	Justification
Page 9, PAR Flowchart under Default PAR; revised the phrase "Determine affected areas as follows using the chart on page 9" to "Determine affected areas as follows using the chart on the following page".	Typographical correction that also allows for easier future procedure revisions within this Visio drawing. CR-05115035

Office Information For Form Tracking Only – Not Part of Form

This is a free-form as called out in PMP-2010-PRC-002, Procedure Alteration, Review, and Approval.

Page 2 of 2

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Emergency Response			
Reference			Effective Date: 6/30/05
<u>C.J. Graffenius</u> Writer	<u>P. F. Carteaux</u> Owner	<u>Emergency Preparedness</u> Cognizant Organization	

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1 PURPOSE AND SCOPE

- 1.1 This procedure provides Instructions to the Shift Manager (SM) acting as the Site Emergency Coordinator (SEC), and to the Control Room (CR) (under the direction of the SEC) for implementing a response to an Unusual Event (UE), Alert, Site Area Emergency (SAE) and General Emergency (GE) after an emergency has been declared per PMP-2080-EPP-101, Emergency Classification.
- 1.2 Once turnover of SEC duties has been completed, the SM retains the overall responsibility of directing and implementing emergency and abnormal procedures to bring the unit(s) to a safe condition.
- 1.3 The CR will retain responsibility for Public Address (PA) announcements and Nuclear Emergency Alarm (NEA) activation throughout the emergency.
- 1.4 The steps in this procedure are listed in the preferred order of performance for maximum efficiency. However, the steps may be performed in a different sequence.

2 DEFINITIONS AND ABBREVIATIONS

Term	Meaning
AOP	Abnormal Operating Procedure
BCSD	Berrien County Sheriff Department
CR	Control Room
DAP	Dose Assessment Program
EAL	Emergency Action Level
EMD-32	Nuclear Plant Accident Notification form
ENC	Emergency News Center
EOC	Emergency Operation Center
EOF	Emergency Operations Facility
EOP	Emergency Operating Procedure

Emergency Response

ERDS	Emergency Response Data System
ERF	Emergency Response Facility
ERO	Emergency Response Organization
GE	General Emergency
IC	Initiating Conditions
JPIC	Joint Public Information Center
MSP	Michigan State Police
NEA	Nuclear Emergency Alarm
OSC	Operations Support Center
PA	Public Address
PAR	Protective Action Recommendation
PPC	Plant Process Computer
SAE	Site Area Emergency
SAS	Secondary Alarm Station
SEC	Site Emergency Coordinator
SM	Shift Manager
TSC	Technical Support Center
UE	Unusual Event

Emergency Response**3 DETAILS****3.1 General Information**

- 3.1.1 IF a classification upgrade is required at any time while the procedure is being performed or after it is completed, THEN return to step 3.2, Instructions, and proceed through the procedure again.
- 3.1.2 The Operations SM acting as the SEC shall implement this procedure until relieved of SEC duties. Notification duties, under the direction of the SEC remain with the CR until the EOF has been activated.
- 3.1.3 The following actions shall not be delegated by the SEC (Command & Control Function):
- Classification of the emergency.
 - Directing the notification of offsite officials.
 - Approval of PAR to offsite emergency management agencies.
- 3.1.4 Declaration of an emergency requires the notification of the BCSD and MSP within 15 minutes. Notification of the NRC shall follow county and state notification and in all cases be completed within one hour.
- 3.1.5 Accountability and subsequent evacuation are required at a SAE or higher for non-essential (non-ERO) personnel. SEC discretion should be used for these activities when taking these actions would jeopardize the safety of personnel (e.g., hostile force, radiation release, toxic spill, etc.).
- 3.1.6 Declaration of a GE requires that a PAR be made to the state. The PAR should be made immediately after the notification of a GE (i.e., during the same phone call).
- 3.1.7 The ERDS for the affected Unit must be operational and transmitting data to the NRC within one hour of an ALERT or higher declaration.

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3.1.8 The OSC, TSC, and the EOF are required to be activated at an ALERT classification or higher.

3.2 Instructions (initial steps as they are completed, or mark as N/A)

3.2.1 Inform Unit 1 and Unit 2 CR personnel of the event classification and that the SM has assumed the position of SEC. _____

- IF any H-2 ICs (Security EALs) were used to classify the current event, phone calls to offsite agencies (State of Michigan, Berrien County and NRC) must be made as expeditiously as possible. Advise Control Rooms whether or not PA announcements or sounding of the NEA, if applicable, should be performed. _____

3.2.2 Direct the Unaffected Unit (or Unit 1 if a dual unit event) to perform Step 3.2.3.b of this procedure. _____

3.2.3 Direct the implementation of activities per the checklists below:

- a. SEC Checklist - perform each step that applies per the current classification:
 1. IF at Alert or higher, (OR UE at SEC discretion), THEN Activate Dialogic pagers using Attachment 2 (performed only once per event). _____
 2. IF at UE or Alert and degrading/hazardous conditions warrant, THEN use SEC discretion to Dismiss Non-Essential Personnel from the site per Attachment 3 (performed only once per event). _____
 3. IF in a SAE, (or GE, if SAE was not entered), OR at a lower threshold per SEC discretion, THEN Order Accountability using Attachment 4, (performed only once per event). _____
 4. IF in a SAE (or GE, if SAE was not entered), AND non-essential personnel were not dismissed/evacuated under Step 3.2.3.a.2 or 3.2.3.a.3, THEN order Site Evacuation using Attachment 5, (performed only once per event). _____

Emergency Response

5. **IF** in a GE, **THEN** direct the development of a Protective Action Recommendation (mandatory) using Attachment 1. _____
 6. **IF** in a UE and conditions warrant **AND** SEC has Command & Control function, **THEN** terminate the UE using Attachment 6. _____
 7. **IF** in an Alert, or higher **AND** conditions warrant **AND** SEC has Command & Control function, **THEN** terminate the event using RMT-2080-EOF-002, Event Termination and Recovery. _____
 8. When the TSC-SEC or EOF-ED reports for duty, conduct turnover and transfer of command and control function using Data Sheet 2. _____
 - Upon completion of turnover, inform both control rooms that the Command and Control function has been transferred to the SEC (or ED, as applicable). _____
 9. **WHEN** the event has been terminated, **THEN** inform both control rooms of the event termination. _____
- b. Unaffected CR Checklist (or per SEC discretion) – perform each step that applies per the current classification, delegating assignments as resources permit:
1. Notify Site Personnel of the emergency classification using Attachment 7. _____
 2. Notify Offsite Authorities of the emergency using Attachment 8. _____
 3. **IF** a radiological release is in progress due to the emergency, **THEN** perform PMP-208-EPP-108, Initial Dose Assessment. _____
 4. **IF** the PPC or RDR are inoperable **THEN** complete portions of Data Sheet 1, Technical Information Sheet, every 15 minutes, or as otherwise specified by requesting facility until the PPC and RDR are operable. _____

Emergency Response

- Not all portions of Data Sheet 1 need be completed; coordinate with requesting facility (usually TSC) for desired information.
- Transmit Data Sheet 1 to requesting facility (usually TSC).

4 FINAL CONDITIONS

- 4.1 The emergency has been terminated and the plant has entered the recovery phase.

5 REFERENCES**5.1 Use References:**

- 5.1.1 PMP-2080-EPP-101, Emergency Classification
- 5.1.2 PMP-2080-EPP-108, Initial Dose Assessment
- 5.1.3 RMT-2080-EOF-001, Activation and Operation of the EOF.
- 5.1.4 RMT-2080-EOF-002, Emergency Termination and Recovery

5.2 Writing References:**5.2.1 Source References:**

- a. Cook Nuclear Plant Emergency Plan

5.2.2 General References

- a. Michigan Emergency Management Plan
- b. NRC Regulatory Issue Summary, RIS-2002-21
- c. NRC Regulatory Issue Summary, RIS-2004-13

Reference	PMP-2080-EPP-100	Rev. 5	Page 8 of 40
Emergency Response			
Attachment 1	Protective Action Recommendations		Pages: 8 - 11

NOTE: DO NOT revise protective actions such that protection is reduced for areas already addressed in previously issued PARs. For example, if evacuation was recommended for Area 1 in a previous PAR, do not revise this recommendation to sheltering for Area 1 in any subsequent PAR.

1 PAR Development

1.1 Proceed through the flowchart on page 10 to develop a PAR.

1.1.1 In selecting a PAR, consider what method (evacuation or sheltering) would have the greatest dose-saving benefit to the public. Conditions to consider include:

- Dangerous travel conditions (i.e., snow squalls, thunderstorms, major traffic accident on a main evacuation route, etc.).
- A forecast of changing weather conditions (i.e., changing wind direction and/or speed, precipitation, etc.).
- Radiological release characteristic (continuous release due to the event, that can not be controlled, vice a short-term "puff" release that can be controlled/stopped – e.g., containment pressure relief).
- Evacuation times (Refer to table on page 11).

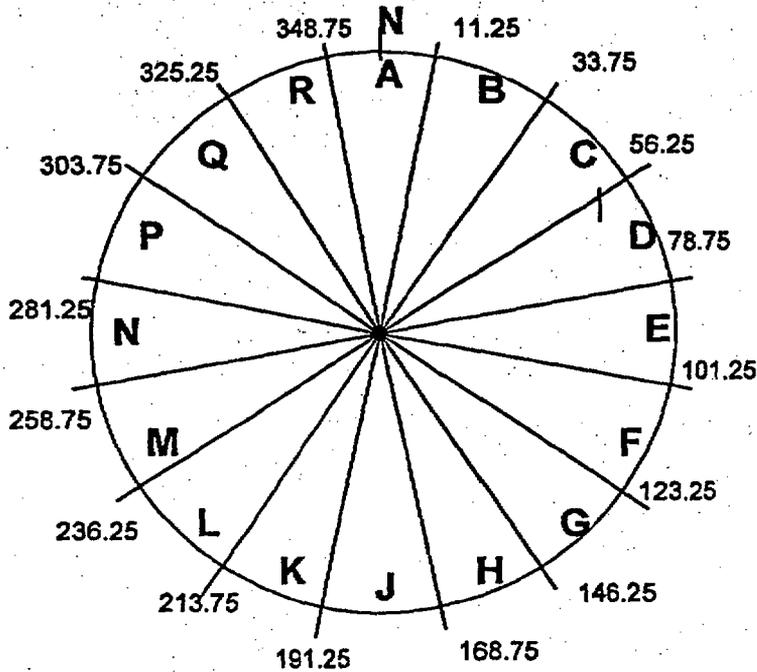
2 Issuing a PAR

2.1 After a PAR is developed, SEC judgment should be applied as necessary in altering the PAR from that determined by use of the flowchart.

2.2 Ensure that the appropriate PAR boxes are checked on the EMD-32a form, before approving the form.

2.3 Ensure that the GE and PAR are verbally transmitted to the State, and that the EMD-32a (and EMD-32b, if GE is due to dose considerations) is/are transmitted to offsite agencies per Attachment 8, within 15 minutes of the GE/PAR declaration, or PAR change.

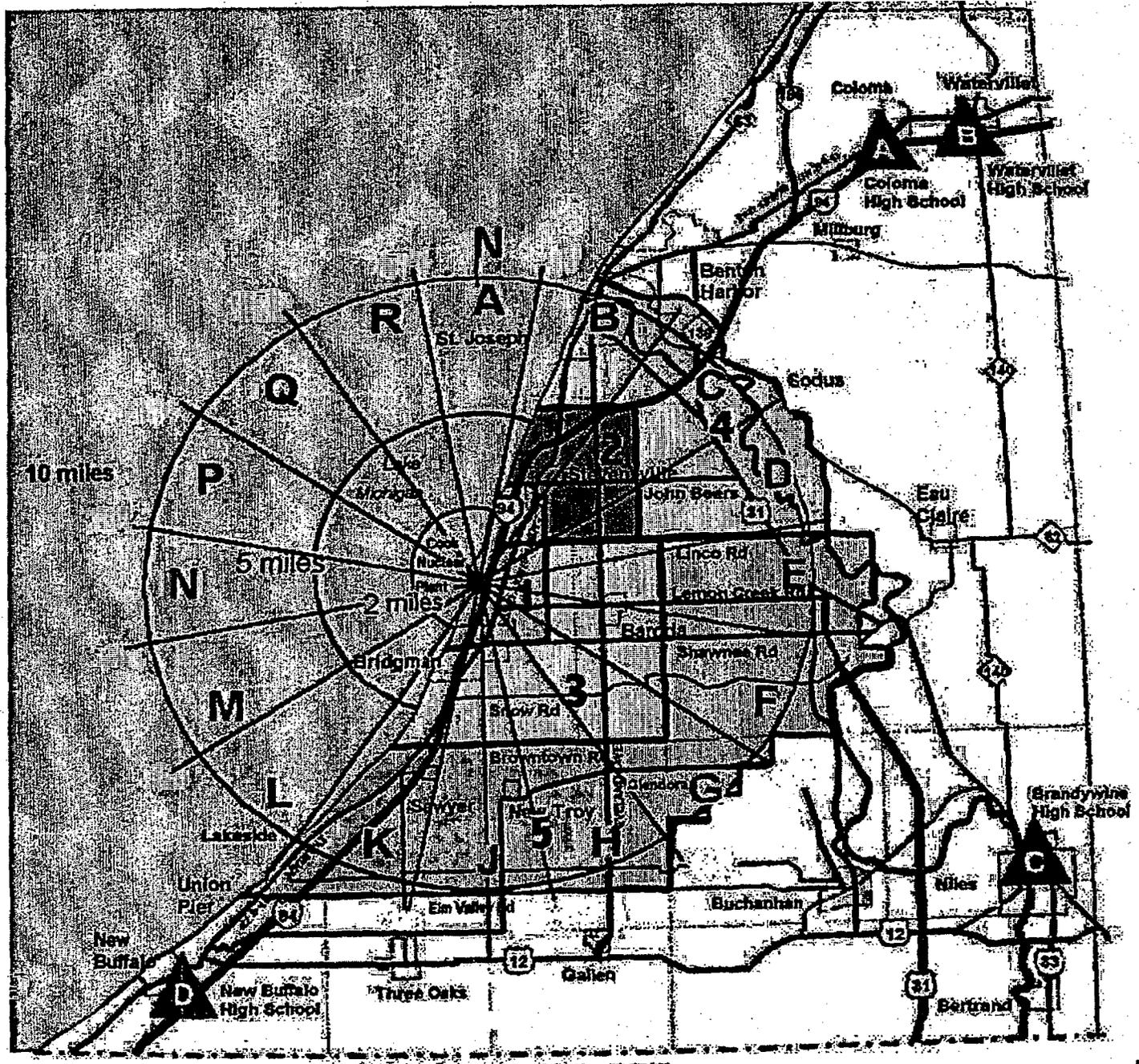
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Attachment 1	Protective Action Recommendations		Pages: 8 - 11



Sectors	Areas
A, B & C to 5 miles	1 and 2
B, C & D to 5 miles	1, 2 and 3
C, D & E to 5 miles	1, 2 and 3
D, E, & F to 5 miles	1, 2 and 3
E, F & G to 5 miles	1, 2 and 3
F, G & H to 5 miles	1 and 3
G, H & J to 5 miles	1 and 3
H, J & K to 5 miles	1 and 3
J, K & L to 5 miles	1 and 3
K, L & M to 5 miles	1 and 3
L, M & N to 5 miles	1
M, N & P to 5 miles	1
N, P & Q to 5 miles	1
P, Q & R to 5 miles	1
Q, R & A to 5 miles	1
R, A & B to 5 miles	1 and 2

Affected Areas	Longest Estimated Evacuation Time in Minutes	
	Fair Weather	Poor Weather
1	180	200
1 and 2	200	230
1 and 3	180	200
1, 2 and 3	220	240
1, 2, 3 and 4	450	480
1, 2, 3 and 5	230	250
1, 2, 3, 4 and 5	460	480

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Emergency Response			
Attachment 1	Protective Action Recommendations	Pages: 8 - 11	



Reference	PMP-2080-EPP-100	Rev. 5	Page 12 of 40
Emergency Response			
Attachment 2	Activation of Dialogic Pagers		Page: 12

NOTE: SEC judgment will be used to determine which of the following codes will be used. The "007" code will be used if it is determined to be unsafe to report to the plant site (i.e., security event).

1 IF an Alert or higher classification has been declared, OR if the ERO is needed at a UE per SEC discretion, THEN activate the Dialogic pagers.

1.1 Choose a pager code for use:

- Code "911" will direct ERO responders to their respective facilities in the TSC, OSC, EOF, and ENC/JPIC.
- Code "007" will direct all ERO responders reporting from offsite to the Buchanan Office Building. The EOF will activate and the backup TSC will be manned. Personnel will remain in Buchanan pending further instructions by the SEC.

1.2 Open the "Dialogic Instructions" envelope in the Emergency Plan briefcase located in the control room.

1.3 On any touchtone phone, follow the directions provided in the "Dialogic Instructions".

2 IF the Dialogic pager system is inoperable, THEN direct the Security Shift Supervisor (2005 or 2731) or SAS (1118 or 1119) to make manual notifications to ERO members per the ERO Phone Directory.

Reference	PMP-2080-EPP-100	Rev. 5	Page 13 of 40
Emergency Response			
Attachment 3	Dismissal of Non-Essential Personnel	Pages: 13 - 14	

NOTE: SEC judgment should be used in making the decision to dismiss non-essential personnel (i.e., non-ERO members) from the site. Events where dismissal should strongly be considered are rapidly degrading conditions (core damage is occurring or imminent), large fire, or other conditions which, in the judgment of the SEC warrants such dismissal.

- 1 IF hazardous conditions are occurring or imminent AND no further hazard would be introduced by the dismissal of non-essential personnel, THEN dismiss all non-essential personnel from the site.
- 1.1 IF radiological conditions may impact dismissal of non-essential personnel (e.g., radiological release in progress), THEN, contact RP for assistance/guidance in dismissal route, and other considerations as applicable.
- 1.2 Contact the Security Shift Supervisor (2005 or 2731) to coordinate the dismissal of non-essential personnel from site. Discuss:
 - Whether or not rapid egress is required (e.g., imminent airborne attack)
 - Route to be used for dismissal (e.g. main plant access road or Livingston Road).
- 1.2.1 Instruct the Security Shift Supervisor to carry out agreed upon method of egress using specific route, and to inform personnel in the Owner-Controlled Area to leave the site.
- 1.2.2 Instruct the Security Shift Supervisor to inform the SM/SEC when dismissal of Non-Essential Personnel has been completed.
- 1.3 Inform both Control Rooms of the decision to dismiss non-essential personnel and how dismissal will be accomplished (normal or rapid egress, with specific route to be used).
- 1.4 Determine if the Unit 1 and/or Unit 2 Containment evacuation Alarm should be sounded.

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Emergency Response			
Attachment 3	Dismissal of Non-Essential Personnel		Pages: 13 - 14

- 1.4.1 Sound the Containment Evacuation Alarm(s), if required.
- 1.5 Direct an operator to make PA announcement for dismissal of all non-essential personnel. Repeat the announcement once.
- 1.5.1 IF normal egress is to be used, THEN make the following announcement two times. Modify the announcement if an alternate route (Livingston Road) is used:

“Attention all personnel. Attention all personnel. Due to the current plant conditions, all non-essential personnel are requested to leave the plant site at this time using the main plant access road.”

- a. Make the same announcement two times in the Training Building by dialing 1646.

- 1.5.2 IF rapid egress is to be used, THEN make the following announcement two times:

“Attention all personnel. Attention all personnel. Due to the current plant conditions, all non-essential personnel are requested to leave the plant site, using (specify Security portal, including location, e.g., “vehicle portal near the North Access Building”) and exiting the site using (State the route).”

- a. Make the same announcement two times in the Training Building by dialing 1646, omitting the “using Security portal” statement.

Reference	PMP-2080-EPP-100	Rev. 5	Page 15 of 40
Emergency Response			
Attachment 4	Accountability		Pages: 15- 18

NOTE: During some postulated events, assembly & accountability, may pose a greater danger than directing a rapid egress of personnel from the Protected Area, or directing personnel to remain in their work areas. SEC discretion, with input from Security personnel when necessary, should be used in the decision to perform accountability and/or evacuation under these conditions.

1 Review the three methods of Accountability below:

- **Primary Method** - using this method, all non-ERO individuals within the Protected Area will proceed to an Assembly Area located in the Office Building and Service Building and swipe their security badges at one of the associated Accountability Card Readers. Personnel will remain in the Assembly Areas until evacuated per SEC direction. A list of missing individuals will be generated by Security 30 minutes from the time accountability is ordered (i.e., NEA is sounded).
- **Alternate Method** - using this method, and under direction from the Security Shift Supervisor all non-ERO individuals within the Protected Area will exit through a Security Portal (e.g., vehicle portal near North Access Building) selected by Security per conditions at the time. This method allows for rapid egress of personnel from the Protected Area because exit card readers/turnstiles may be bypassed. In this method, individuals may be required to relinquish their security badges so that Security personnel can account for them and verify their leaving the Protected Area. This method should only be used under extreme circumstances where assembly and accountability may pose a greater hazard to personnel than rapid evacuation.
- **No Accountability** - under some Security events Accountability may be delayed or omitted entirely per SEC discretion (e.g., security event in a vital area - intrusion by a hostile force).

2 Contact the Security Shift Supervisor (2005 or 2731) to consult about which method of accountability should be used.

Reference	PMP-2080-EPP-100	Rev. 5	Page 16 of 40
Emergency Response			
Attachment 4	Accountability		Pages: 15- 18

2.1 Choose which of the accountability methods will be used, Primary, Alternate, or No Accountability and inform the Shift Security Supervisor.

2.1.1 IF using the Primary Method of accountability, THEN request that Security:

- Prepare for accountability.
 - Commence evacuation of the Owner Controlled Area outside of the Protected Area.
- a. GO TO Step 3.

NOTE: RP should be consulted for input on best means of egress from the Protected Area/Site if a radiological release is in progress or imminent.

2.1.2 IF using the Alternate Method of accountability, THEN request that Security initiate the alternate method of accountability.

- a. Coordinate with the Security Shift Supervisor (and RP, if a radiological release is imminent or in progress) as to which Security Portal(s) will be used for Protected Area evacuation.
- b. Request that the Owner-Controlled area also be evacuated.

3 Contact Personnel Inside the Protected Area.

3.1 IF using the Primary Method of Accountability, THEN direct an Operator to perform the following:

- Sound the Unit 1 and Unit 2 Containment Evacuation Alarm.
- Sound the Nuclear Emergency Alarm.
- Make a Public Address announcement for personnel to report for accountability. Repeat the announcement once. An example of this announcement is:

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Emergency Response			
Attachment 4	Accountability		Pages: 15- 18

“Attention all personnel. Attention all personnel. A (State the current classification - usually a SAE) has been declared due to (brief description of EAL). Report to an Assembly Area located in the North Office Buildings or Service Building for accountability at this time. Use an accountability card reader and then remain in the area for further announcements.”

- **IF the ERFs have not already been activated, THEN make the following announcement twice:**

“Attention all personnel. Attention all personnel. Activate the Technical Support Center, Operations Support Center, Emergency Operations Facility, and Joint Public Information Center.”

- 3.2 IF using the Alternate Method of Accountability, THEN direct an Operator to perform the following:**

- **Sound the Unit 1 and Unit 2 Containment Evacuation Alarm.**
- **Sound the Nuclear Emergency Alarm.**
- **Make a Public Address announcement for personnel to use the alternate method of accountability. Repeat the announcement once. An example of this announcement is:**

“Attention all personnel. Attention all personnel. A (State the current classification - usually a SAE) has been declared due to (brief description of EAL). Due to the current plant conditions, all non-essential personnel are requested to leave the plant site, using (specify Security portal, including location, e.g., “vehicle portal near the North Access Building”) and exiting the site using (State the route).”

- 3.3 IF the No Accountability Method is used, THEN DO NOT sound the NEA, Containment Evacuation Alarms, or make a public address announcements. Direct any necessary announcements per Security Shift Supervisor guidance.**

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Emergency Response			
Attachment 4	Accountability		Pages: 15- 18

4 Perform follow-up actions.

4.1 IF the Primary Method of Accountability was used, THEN

- Obtain a list of missing personnel from Security (this list should be provided 30 minutes following the sounding of the NEA).
- Coordinate with Security to locate any missing individuals.

4.2 IF the Alternate Method of Accountability was used, THEN

- Obtain a list of missing personnel from Security upon completion of the manual accountability (this will take longer than 30 minutes).
- Coordinate with Security to locate any missing individuals.

4.3 IF the No Accountability Method was used, THEN take any necessary follow-up actions when conditions warrant. Examples of the follow-up actions include:

- After hostile force has been neutralized, SEC may choose to perform accountability (per Primary or Alternate Method).
- Coordinate with Security to locate any missing personnel.
- Public Address announcements as necessary.
- Dismissal or evacuation of personnel as necessary.

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Emergency Response			
Attachment 5	Evacuation		Page: 19 - 21

NOTE: During some postulated events, evacuation may pose a greater danger than sheltering personnel within buildings. Under other events, rapid egress from the Protected Area and evacuation of the site is prudent. SEC discretion, with input from Security and/or RP personnel as applicable, should be used in the decision whether to evacuate under these conditions.

1 Determine If Evacuation Should Be Performed

1.1 IF a security event is in progress in which evacuation could cause personnel harm (e.g., hostile force in a vital area), **THEN** SEC should shelter personnel within work areas, or as recommended by Security, rather than evacuation.

1.1.1 Coordinate with Security (1118, 1119, 2005 or 2731) in taking protective measures as necessary for plant personnel.

1.1.2 **WHEN** the security event has been terminated (i.e., hostile force has been neutralized, **THEN GO** to Step 2.

1.2 IF a radiological release is in progress, **THEN** consult with RP in determining whether evacuation should be delayed.

1.3 IF no new hazards would be introduced by evacuation, **THEN** evacuate personnel per Step 2.

1.4 IF offsite agency personnel (e.g., National Guard, MSP, etc. are stationed in the Owner Controlled Area, **THEN** determine if these personnel should be evacuated or if they will remain on site.

- Take appropriate actions (e.g., evacuate, shelter, relocate on site, issue dosimetry, etc.) as necessary to protect the offsite agency personnel.

2 Site Evacuation

2.1 Rapid Egress

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Attachment 5	Evacuation		Page: 19 - 21

2.1.1 IF an event is in progress in which rapid evacuation of the Protected Area is necessary (e.g., airborne attack threat), THEN implement such evacuation by using the Rapid Egress Method.

- a. **Contact the Security Shift Supervisor (2005 or 2731) to initiate Rapid Egress of the Protected Area.**
 - **Coordinate with the Security Shift Supervisor (and RP, if available, if a radiological release is imminent or in progress) as to which Security Portal(s) and evacuation route (main access road or Livingston Road) will be used for Protected Area evacuation.**
 - **Request that the Owner Controlled Area also be evacuated.**
 - **Instruct the Security Shift Supervisor to notify the SEC when evacuation of the Protected Area is complete.**
 - **Instruct the Security Shift Supervisor to notify the SEC when evacuation of the Owner Controlled Area is complete.**
- b. **Direct an Operator to make the following announcements for personnel to exit the Protected Area per designated Security Portal(s). Modify the announcement if an alternate route (Livingston Road) is used and as conditions warrant. Repeat the announcement once.**

“Attention all personnel. Attention all personnel. A (State the current classification – usually a SAE) has been declared due to (brief description of EAL). Due to the current plant conditions, all non-essential personnel are requested to exit the Protective Area using (specify Security portal, including location, e.g., ‘vehicle portal near the North Access Building’) and leave the site using (State the route) .”

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Attachment 5	Evacuation		Page: 19 - 21

- c. Direct an Operator to make the following announcements in the Training Building and TSOC by dialing 1646. Modify the announcement if an alternate route is used (Livingston Road), and as conditions warrant.

“Attention all personnel. Attention all personnel. A (State the current classification – usually a SAE) has been declared due to (brief description of EAL). Due to the current plant conditions, all non-essential personnel are requested to leave the site using (State the route).”

- d. Direct an Operator to make an announcement to evacuate the beach area using the Beach PA system microphone.

2.2 Normal Egress

2.2.1 IF normal egress from the Protected Area will be used for evacuation (North Access turnstiles), THEN contact the Security Shift Supervisor (2005 or 2731) to initiate evacuation.

- Coordinate with the Security Shift Supervisor (an RP, if a radiological release is imminent or in progress) as to which evacuation route (e.g., main access road or Livingston Road) will be used for evacuation.
- Request that the Owner Controlled Area also be evacuated.
- Instruct the Security Shift Supervisor to notify the SEC when evacuation of the Protected Area is complete.
- Instruct the Security Shift Supervisor to notify the SEC when evacuation of the Owner Controlled Area is complete.

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Emergency Response			
Attachment 6	Terminating a UE		Page: 22

1 UE Termination

1.1 IF the conditions for the UE no longer exist, and no escalation of classification is expected, THEN perform the following:

1.1.1 Instruct operators to inform the BCSD and MSP that the event is terminated.

1.1.2 Instruct operators to:

- Fax a final EMD-32a form (with the current classification check box marked *Termination*) to BCSD and MSP.
- Verify that the form was received by the State and County.
- Notify the NRC (Red Phone - NRC Operations Center) that the emergency is terminated.

1.2 Inform both Control Rooms that the event is terminated.

1.3 Inform Security that the event is terminated (1118, 1119, 2005 or 2731).

1.4 Direct an operator to make a public address announcement that the UE has been terminated per the SEC.

2 Collection of Data

2.1 Provide for collection of data, paperwork, etc. related to the event and forward to Emergency Preparedness for disposition.

Reference	PMP-2080-EPP-100	Rev. 5	Page 23 of 40
Emergency Response			
Attachment 7	Notification of On-Site Personnel		Pages: 23 - 24

1 Notify Security

1.1 Inform the Security Shift Supervisor (ext. 2005 or 2731) or SAS Operator (ext. 1118 or 1119) of the initial emergency classification or classification upgrade.

1.1.1 IF an UE, THEN instruct Security to notify personnel as prescribed in Section 5 of the ERO Phone Directory.

1.1.2 IF an Alert, THEN instruct Security to notify personnel as prescribed in Sections 2 and 5 of the ERO Phone Directory.

1.1.3 IF a SAE, THEN instruct Security to:

- Ready the Security Computer for accountability and prepare for subsequent evacuation.
- Notify personnel as prescribed in Sections 2 and 5 of the ERO Phone Directory (if not already performed for this emergency).

1.1.4 IF a GE, THEN instruct Security to:

- Ready the Security Computer for accountability and prepare for subsequent evacuation (if not already performed for this emergency).
- Notify personnel per instructions in the ERO Phone Directory (if not already performed for this emergency).

1.1.5 IF conditions at the plant are such that personnel reporting to the plant would be at risk (e.g., security event, radiation release, toxic spill, etc.), THEN direct Security to close access to the plant until the SEC determines that the condition no longer exists.

2 Notify Chemistry and RP Technicians of the initial emergency classification.

3 Make Public Addresses Announcements

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Emergency Response			
Attachment 7	Notification of On-Site Personnel	Pages: 23 - 24	

CAUTION: PA announcements should not be made for some ICs (EALs) due to their sensitive nature. IF any of the H-2, Security ICs (EALs) have been used to classify the current event, THEN obtain SEC permission before making any PA announcements or sounding the NEA.

NOTE: PA announcements for SAE and GE are conducted via Attachments 4 and 5.

3.1 Direct an operator to make a PA announcement for the current classification. Make the announcement twice. Modify announcements below as conditions warrant.

3.1.1 IF in a UE, THEN make the following announcement:

“Attention all personnel. Attention all personnel. An Unusual Event has been declared due to (brief description) . Continue with your work and be prepared for future announcements.”

3.1.2 IF in an Alert, THEN make the following announcement:

“Attention all personnel. Attention all personnel. An Alert has been declared due to (brief description) .”

- IF emergency facilities are not already activated continue the announcement with:

“Activate the Operations Support Center, Technical Support Center, Emergency Operations Facility, and the Emergency News Center. All other personnel stand by for further announcements.”

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Emergency Response			
Attachment 8	Notification of Off-Site Agencies	Pages: 25 - 28	

NOTE: Notification to offsite authorities (State and County) must be initiated within 15 minutes of classification.

1 Completing MSP EMD-32 Form

1.1 Direct a licensed operator to:

NOTE: PARs are developed using Attachment 1, Protective Action Recommendations

- 1.1.1 Complete a EMD-32a form for the classification and/or PAR.
 - a. IF in a GE due to dose calculation, THEN an EMD-32b form must also be completed.
 - b. IF a release is in progress due to the event, THEN coordinate with personnel performing dose assessment per PMP-2080-EPP-108 for completion of EMD-32 form(s).
- 1.1.2 Obtain the SM/SECs "Plant Approval" signature on the form(s).
- 1.1.3 Make copies of the form(s) as necessary for offsite notification phone communicators.

NOTE: Alternate phones/extension may be used, at the discretion of the Unit Supervisor, or designee as conditions warrant.

2 Phone Contacts and Faxes (usually performed by AEOs)

- 2.1 Setup the Emergency Plan telephones (located in the "E-Plan" drawer) in the back of the Control Room (if not already performed).

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Emergency Response			
Attachment 8	Notification of Off-Site Agencies		Pages: 25 - 28

2.2 Contact:

- MSP at 8-1-517-336-6250 using the MSP bridge phone (ext. [REDACTED] in the back of the Control Room.
- BCSD at 8-1-269-983-3911. (IF the automated system answers, THEN dial [REDACTED])

2.3 Provide the following to the MSP and BCSD:

- Provide the information from the EMD-32 form.
- Inform the agency that the EMD-32 will be faxed.
- Request a callback (for authentication) from the applicable agency (using ext. [REDACTED] for MSP) and then hang up.

NOTE: Offsite agencies may wish to maintain constant communications with the Control Room until the EOF is activated.
--

- For callbacks: BCSD callback, dial ext. [REDACTED] and wait for the deputy to call into the phone bridge; for MSP callback ext. [REDACTED] phone line will ring in the Control Room.

2.4 Fax the signed EMD-32 form(s):

- Place the form(s) face down in the fax machine in either Control Room,
- Push the P1 Function button (Red) to broadcast the form(s) (to the State, County, and ERFs),
- Push the Start button

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Emergency Response			
Attachment 8	Notification of Off-Site Agencies		Pages: 25 - 28

- 2.4.1 IF the Broadcast feature does not work, THEN fax the form(s) individually at the following numbers:
- MSP EOC: 8-1-517-336-6257
 - BC EOC: 8-1-269-983-5726
 - State EOC: 8-1-517-333-4987
- 2.5 Call the NRC Operations Center on the NRC "Red Phone" (FTS-2000 phone) by dialing 1-301-816-5100.
- Provide the information on Data Sheet 4, Plant Status, to the NRC as soon as possible after the State and County have been notified, and within one hour of classification.
 - Make the one hour notification in accordance with the instructions provided in PMP-7030-001-001, Prompt NRC Notification.
- 2.6 Document phone calls on Data Sheet 3, Shift Manager Initial Notification List.
- 3 Follow Up Notifications
- 3.1 UNLESS the State of Michigan has been notified in advance of a delay or change in frequency, THEN direct a licensed operator to complete an EMD-32b form at least every 30 minutes, (commencing 30 minutes from initial notification).
- 3.2 Obtain the SM/SECs "Plant Approval" signature on the form.
- 3.3 Fax the signed EMD-32 form(s):
- Place the form(s) face down in the fax machine in either Control Room,
 - Push the P1 Function button (Red) to broadcast the form(s) (to the State, County, and ERFs),
 - Push the Start button.

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Emergency Response			
Attachment 8	Notification of Off-Site Agencies	Pages: 25 - 28	

3.3.1 IF the broadcast feature does not work, THEN fax the form(s) individually at the following fax numbers:

- **MSP EOC: 8-1-517-336-6257**
- **BC EOC: 8-1-269-983-5726**
- **State EOC: 8-1-517-333-4987**

- a. **IF ERFs will be activated (at Alert or higher, or UE per SEC discretion), THEN also send EMD-32 form(s) to the following fax numbers (if broadcast feature is non-functional):**
 - **EOF: 8-284-2942**
 - **TSC: 2431**
 - **ENC/JPIC: 8-284-5892**

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Emergency Response			
Attachment 9	Drills and Exercises		Page: 29

1 Drills and Exercises

- 1.1 **IF an Alert, Site Area Emergency, or a General Emergency has been declared, THEN the Simulator Shift Manager implements the Dialogic Emergency Response Organization pager system for an announced or unannounced drill as directed by the controller. The drill or exercise controller may provide alternate instructions for contacting Security as dictated by the drill scenario.**
- 1.2 **The Simulator Shift Manager requests that the Shift Manager have a control room staff member page the plant using the Plant PA system, and make an announcement in accordance with the drill controller's instructions.**
- 1.3 **The Simulator Shift Manager directs the Simulator control room staff to sound the Nuclear Emergency Alarm and the Containment Evacuation Alarm in the SIMULATOR for a Site Area Emergency or General Emergency.**
- 1.4 **The Simulator Shift Manager directs the Simulator unaffected control room staff to page the Training Building and Buchanan Office Building by dialing 41-1646 on the plant phone system, and make an announcement in accordance with the drill controller's instructions.**

Reference	PMP-2080-EPP-100	Rev. 5	Page 30 of 40
Emergency Response			
Attachment 10	Communication System Tests	Pages: 30 - 31	

1 Communication System Tests

1.1 Nuclear Emergency Alarm Test and ERO Turnover/Notification Process Test

1.1.1 Operating shift shall perform the following tests every Tuesday at approximately 1000 hours during non-outages, approximately 0700 hours during outages, or at a time approved by the Shift Manager:

1.1.2 Test Nuclear Emergency Alarm

- **Announce: "This is a test. The following is a test of the Nuclear Emergency Alarm and ERO turnover notification."**
- **Sound the Nuclear Emergency Alarm (NEA) for 8 to 10 seconds and then reset by pushing "OVERRIDE" button.**
- **Announce: "The test of the Nuclear Emergency Alarm is complete. Oncoming duty ERO personnel should call Dialogic when the ERO pager activates."**

1.1.3 ERO Pager Activation

- **Obtain the "ERO Weekly Turnover Pager Test" instruction (available in E-Plan briefcase in Control Room).**
- **Follow the instructions for turnover for the applicable oncoming team.**
- **Acceptance Criteria:**

NEA alarm is heard in the Control Room.

Print Name/Signature

Date

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Emergency Response			
Attachment 10	Communication System Tests		Pages: 30 - 31

1.1.4 Perform test of the Training Building and Buchanan Office Building Public Address System.

- **Dial 1646 and announce the following:**

“This is a test of the Training Building and Buchanan Office Building Public Address System and ERO turnover notification. Oncoming duty ERO personnel should call Dialogic when the ERO pager activates. Test is complete.”
- **Acceptance Criteria: (only required to be verified during normal work days):**

Emergency Preparedness personnel report that PA system test is heard in the Training Building and Buchanan Office Building.

Print Name/Signature

Date

1.1.5 Perform the test of the Beach PA system monthly, between May 1st and October 31st.

- **Station an AEO within range of the Beach PA system speakers.**
- **Make the following announcement using the Beach PA system microphone.**
- **“This is a test of the Beach Public Address System. Test complete.”**
- **Acceptance Criteria:**

Announcement is heard by the AEO stationed for the test.

Print Name/Signature

Date

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Emergency Response			
Data Sheet 1	Technical Information Sheet		Pages: 32 - 33

Unit No: _____ Date: _____ Time: _____

Data Taken By: _____ Data Reviewed By: _____

NOTE: When redundant indication exists, record most severe condition.

- | | |
|--|--|
| <p>1. Containment Temp. _____ °F</p> <p>2. Cont. H₂ Concentration _____ %</p> <p>3. RWST Level _____ %</p> <p>4. Source Range _____ CPM</p> | <p>5. Intermediate Range _____ AMPS</p> <p>6. Containment Pressure _____ PSIG</p> <p>7. Containment Sump Level _____ %</p> <p>8. Containment Level _____ %</p> <p>9. Containment High Range Radiation Level
Upper/Lower _____ / _____ R/HR</p> |
| <p>9. CTS Pumps East ON / OFF</p> <p>10. RHR Spray Flow East _____ GPM</p> <p>11. SI Flow North _____ GPM</p> <p>12. BIT Flow LP1 _____ GPM LP2 _____ GPM</p> <p>13. Accum Pressure LP1 _____ PSIG LP2 _____ PSIG</p> <p>14. RHR Injection Flow East _____ GPM</p> <p>15. RCP Status LP1 ON / OFF LP2 ON / OFF LP3 ON / OFF LP4 ON / OFF</p> | <p>West ON / OFF</p> <p>West _____ GPM</p> <p>South _____ GPM</p> <p>LP3 _____ GPM LP4 _____ GPM</p> <p>LP3 _____ PSIG LP4 _____ PSIG</p> <p>West _____ GPM</p> |
| <p>16. RCS Pressure _____ PSIG</p> <p>17. Charging Flow _____ GPM</p> <p>18. PZR Liquid Temp. _____ °F</p> <p>19. PZR Steam Temp. _____ °F</p> <p>20. PZR Level _____ %</p> <p>21. PRT Temp. _____ °F</p> | <p>22. PRT Level _____ %</p> <p>23. PRT Pressure _____ PSIG</p> <p>24. PZR Cycling Htrs ON / OFF</p> <p>25. PZR Backup Htrs ON / OFF</p> <p>26. Letdown Flow _____ GPM</p> <p>27. Saturation Margin _____ °F</p> |

Reference	PMP-2080-EPP-100	Rev. 5	Page 33 of 40
Emergency Response			
Data Sheet 1	Technical Information Sheet		Pages: 32 - 33

NSSS LOOP PARAMETERS

	Loop 1	Loop 2	Loop 3	Loop 4
28. Wide Range T Hot	_____ °F	_____ °F	_____ °F	_____ °F
29. Wide Range T Cold	_____ °F	_____ °F	_____ °F	_____ °F
30. S / G Pressure	_____ PSIG	_____ PSIG	_____ PSIG	_____ PSIG
31. S / G N. R. Level	_____ %	_____ %	_____ %	_____ %
32. S / G W .R. Level	_____ %	_____ %	_____ %	_____ %
33. Steam Flow (pph x 10 ⁶)	_____	_____	_____	_____
34. Feed Flow (pph x 10 ⁶)	_____	_____	_____	_____
35. Aux. Feed Flow (pph x 10 ³)	_____	_____	_____	_____
36. MSIV Status	OPEN / CLOSE	OPEN / CLOSE	OPEN / CLOSE	OPEN / CLOSE
37. CST Level	_____ %	_____ Ft		
38. Steam Dump	ATMOS / COND			

EQUIPMENT STATUS

	AVAILABLE / UNAVAILABLE			AVAILABLE / UNAVAILABLE	
39. East ESW	_____	/	_____	49. East CCP	_____ / _____
40. West ESW	_____	/	_____	50. West CCP	_____ / _____
41. East CCW	_____	/	_____	51. TDAFP	_____ / _____
42. West CCW	_____	/	_____	52. EMDAFP	_____ / _____
43. East CTS	_____	/	_____	53. WMDAFP	_____ / _____
44. West CTS	_____	/	_____	54. AB Diesel	_____ / _____
45. North SI	_____	/	_____	55. CD Diesel	_____ / _____
46. South SI	_____	/	_____	56. Normal Res.	_____ / _____
47. East RHR	_____	/	_____	57. 12 EP	_____ / _____
48. West RHR	_____	/	_____		

Reference	PMP-2080-EPP-100	Rev. 5	Page 34 of 40
Emergency Response			
Data Sheet 2	Emergency Turnover Checklist		Pages: 34 - 37

1. **Emergency Classification**

	<u>Time Declared</u>
_____ Unusual Event	_____
_____ Alert	_____
_____ Site Area Emergency	_____
_____ General Emergency	_____

2. **Have notifications been completed?**

a. Berrien County:	yes / no / in progress	Time: _____
b. Michigan:	yes / no / in progress	Time: _____
c. NRC:	yes / no / in progress	Time: _____
d. NGG Personnel:	yes / no / in progress	Time: _____

3. **Protective Actions:**

a. Local area evacuation	yes / no	Time: _____
b. Site evacuation	yes / no	Time: _____
c. Accountability	yes / no	Time: _____
d. Site closed to visitors	yes / no	Time: _____
e. Offsite protective action recommended:		
• Evacuation:	yes / no areas: _____	Time: _____
• Shelter:	yes / no areas: _____	Time: _____

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Emergency Response			
Data Sheet 2	Emergency Turnover Checklist		Pages: 34 - 37

4. Plant Operational Status

a. Reactor trip: yes / no time: _____ Trip signal: _____

b. ESF Status: _____

c. EOP Status: _____

5. Plant Status

a. Chronology of Events

<u>Time</u>	<u>Event</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

b. Current Plant Conditions

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Emergency Response			
Data Sheet 2	Emergency Turnover Checklist		Pages: 34 - 37

c. Potential for Plant Degradation

d. Mitigating Actions Taken or Underway

6. Plant Radiological Conditions

a. Inplant/Onsite Radiological Conditions

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Emergency Response			
Data Sheet 3	Shift Manager Initial Notification List		Page: 38

ON-SITE NOTIFICATION	PHONE NUMBER	CONTACT ESTABLISHED INITIALS / TIME
Security Notification	1118 or 1119 or 2005	_____/_____ _____
Training and Buchanan Office PA Announcement	1646	_____/_____ _____

OFF-SITE NOTIFICATION	PHONE NUMBER	CONTACT ESTABLISHED INITIALS / TIME	EVENT CLOSEOUT INITIALS / DATE
Berrien County Sheriff's Department	8-1-269-983-3911	_____/_____ _____	_____/_____ _____
REQUEST CALL BACK VERIFICATION	BCSD Person Contacted: _____ Time Call Back Received: _____		
Michigan State Police	8-1-517-336-6250	_____/_____ _____	_____/_____ _____
REQUEST CALL BACK VERIFICATION	MSP Person Contacted: _____ Time Call Back Received: _____		
NRC Operations Center -	8-1-301-816-5100	Red Phone or Commercial	
	8-1-301-951-0550	_____/_____ _____	_____/_____ _____
	8-1-301-415-0553	_____/_____ _____	_____/_____ _____
NRC Person Contacted: _____			
Continuous contact will be required for an Alert, Site Area Emergency, or General Emergency			

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Emergency Response			
Data Sheet 4	Plant Status		Pages: 39 - 40

NOTE: This Data Sheet is not required to be sent to the NRC unless asked for by the NRC. It is to be used as a guide for the communicator talking to the NRC.

Time of NRC Notification: _____

Reactivity Control

- | | | | |
|---------------------------------|-----|----|---------------------|
| • All Control rods inserted? | Yes | No | _____ # of rods out |
| • Reactor Subcritical? | Yes | No | |
| • Emergency Boration initiated? | Yes | No | |
| • Adequate Shutdown Margin? | Yes | No | |

RCS Inventory Control - check all that apply for the current plant conditions

- Inventory makeup controlled by: (Identify all pumps injecting into RCS)

CVCS - Normal Charging _____

Charging Pumps via BIT (High Head SI) _____

Safety injection pumps (Intermediate Head SI) _____

RHR Pumps (Low Head SI) _____

Other: _____

RCS Pressure Control

- | | | |
|--------------------------------|-----|----|
| • Pressurizer PORVs Closed? | Yes | No |
| • Pressurizer Safeties Closed? | Yes | No |

EMERGENCY MEASURES

1.0 DISCUSSION

Emergency measures begin with the identification and classification of an emergency and the activation of the appropriate emergency organization. Activation of the emergency response organization is outlined in EP 5.0. Emergencies are arranged into four distinct classifications. Descriptions for each classification and initial protective actions are outlined in EP 4.0. Criteria for classifying emergency situations and examples of emergencies in each classification are described in the EPIPs. The details of the initial corrective and protective emergency measures are contained in the EPIPs.

2.0 ASSESSMENT ACTIONS

2.1 Responsibility for Assessment

Effective coordination and direction of all elements of the emergency organization require continuing assessment throughout the emergency.

2.2 Types of Assessment Actions

The different types of assessment actions are described in Table 6-1. The details of the assessment function are incorporated in the EPIPs for each emergency classification. Continued assessment will be performed as required, with updating of offsite response agencies. In addition, the results may require additional notifications, emergency actions, or reclassification of the accident.

2.3 Methods of Assessment

Accidents involving releases of radioactive materials to the environment require special methods of assessment to ensure that responses are appropriate for the protection of the population-at-risk as well as plant personnel.

The plant has an extensive system for monitoring radioactive materials released to the environment (e.g., liquid process, containment purge exhaust and auxiliary building ventilation exhaust, air ejector vent monitors). As a general requirement, the various process monitors are capable of initiating appropriate alarms or actuating control equipment to provide containment of radioactive materials if pre-established limits are reached. These systems will allow for monitoring releases of radioactivity during accident conditions. In any accident condition where releases are not monitored or able to be monitored, EPIPs provide the basis for calculating theoretical worst-case release rates corresponding to a design basis accident described in the PBNP FSAR.

EMERGENCY MEASURES

In addition, the site has a permanent meteorological installation so that wind speed and direction, standard deviation of wind direction as well as change of temperature with height, are recorded continuously in the Control Room. Wind speed, direction, and standard deviation of wind direction are also available from a backup tower on site and from an inland tower located several miles west of PBNP. The inland tower is used to identify lake effect winds. In the event the above instrumentation is inaccessible or inoperative, such information can be obtained from Kewaunee Nuclear Power Plant, the local Coast Guard Station, or the National Weather Service in Green Bay.

Upon determination of any emergency or potential emergency condition anticipated to have significant offsite dose consequences, appropriate EIPs are initiated to project doses. The Emergency Director is responsible for ensuring that the appropriate EIPs are performed. Airborne radioactivity concentration levels will be verified by offsite field monitoring teams deployed with portable radiological measurement and communications equipment. This information will aid state and county authorities in evaluating emergency action responses.

3.0 CORRECTIVE ACTIONS

Plant procedures contain steps to take corrective actions in order to avoid or mitigate serious consequences. Operator training is a vital factor in ensuring that corrective actions are taken in an expeditious manner. Instrumentation, plant parameter system monitors, and the radiation monitoring system provide indications used by the operators to regulate systems necessary for the safe and proper operation of the plant.

Plant system indicators provide the operator with the information and controls needed to start up, operate at power, and shut down the plant. The system indicators and controls also provide the information and means needed to cope with abnormal operating conditions should they occur. Control of systems and display of information from these various systems are centralized in the Control Room. This instrumentation provides a basis for initiation of corrective actions.

When necessary, the following additional corrective actions can be implemented during emergency situations:

3.1 Fire Fighting

Detailed procedures for responding to fire situations are defined in the PBNP Fire Protection Manual. The Fire Protection Manual contains instructions on fire protection and fire fighting along with specifying the fire protection organization and individual responsibilities. If outside assistance is needed, the Two Creeks Fire Department is called in to assist in extinguishing the fire.

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3.2 Damage Control and Repair

For minor emergencies, the plant personnel will normally be able to handle the cleanup, repair, and damage control. For major emergencies, the support of other company personnel or specialized outside contractors may be required to assist in the damage control, cleanup, and repair operation. Emergency response operations will be handled with the assistance of agencies available for that purpose.

Personnel exposure to radiation and radioactive materials during corrective actions should be controlled as stipulated in EP 6.0, Section 5.1.

4.0 PROTECTIVE ACTIONS

The EPIP used in classifying emergencies has predetermined EALs that, when met or exceeded, will require protective actions to be taken. In addition, the Shift Manager may initiate EPIPs when they are determined to be necessary. EPIPs include assessment actions, corrective actions, and protective actions as appropriate.

Protective actions will ensure that personnel, both on and offsite, will be notified and actions initiated for their protection in the event radiation or airborne activity levels from a radiological emergency onsite exceed or are predicted to exceed predetermined values, or when other situations threaten personnel safety.

Protective actions taken within the exclusion and protected area (onsite) are the responsibility of the SM and TSC Manager with input from the Operations Coordinator, while those taken offsite fall under the jurisdiction of Wisconsin Emergency Management with the resources of the State Division of Health and Family Services, Radiation Protection Unit, and the Manitowoc and Kewaunee County Emergency Managements. Recommendations of protective actions to be taken offsite will be made only by the Emergency Director. It is recognized that at the beginning of an emergency evolution, the Shift Manager will have the responsibility and authority of the Emergency Director until relieved.

4.1 Protective Actions, Evacuation, and Personnel Accountability

This subsection provides for the timely relocation of individuals to prevent or minimize exposure to direct or airborne radiation or toxic/flammable gas intrusion.

4.1.1 Exclusion Area

a. Action Criteria

Protective actions for personnel onsite shall be taken when a radiological emergency has occurred, or may occur, which will result in concentrations of airborne activity or radiation levels that exceed normal limits for a specific area or areas and cannot be readily controlled. In addition, protective actions shall be taken for onsite personnel in such situations as toxic/flammable gas intrusion, fire, meteorological danger, etc., where personnel safety is threatened.

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b. Notification Time for Onsite Personnel

The actuation of fire alarms, radiation alarms, plant evacuation alarm, telephone calls, paging system, and public address announcements, as applicable, will alert onsite personnel to hazardous conditions and to actions they must take. These actions may be to assemble, to report to Emergency Response Facilities, to evacuate specific areas within the plant, or to evacuate the plant. Table 6-2 describes the assembly areas for onsite personnel (which could include plant personnel, contractor personnel, and visitors) to protect them from direct radiation or airborne radioactivity or toxic/flammable gas hazards according to evacuation classification. The best estimate for initial notification of onsite personnel would be a minimum of 10 minutes, depending on instrumentation response and assessment capability at the time of the incident. It is important to note that most credible accidents in a nuclear power plant develop slowly and "defense-in-depth" concepts delay the release of significant amounts of radioactivity.

c. Security Access Control

The security program at PBNP is designed to deter, detect, and delay an intruder. The plant protected area is enclosed by a security fence. Plant personnel reporting to the plant during an emergency will enter via the SBCC. Security personnel will control access, log incoming personnel, and provide assistance, as required or requested. In the event these areas are uninhabitable, security control will be performed at an alternate location.

Provisions to restrict access to areas of the site outside the fenced protected area shall be accomplished under the direction of the Security Shift Commander. The Security Shift Commander will assign a security force to control access to the plant property by barricading and staffing the site roads with appropriate placement of lights, chains, traffic cones, padlocks, and gates. Access control shall be performed with the aid and cooperation of the Manitowoc County Sheriff's Department, as well as assistance from the Wisconsin State Patrol.

Plant security procedures are found in the PBNP Security Plan.

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d. Assembly and Evacuation

Personnel assembly, and evacuation at PBNP will depend on the nature of the emergency and the extent of the area affected. The Shift Manager, or the TSC Manager if the TSC is activated, shall initiate any limited evacuation or full-site assembly, and/or evacuations. These protective actions shall be made after careful consideration of the benefits and risks involved. The details of these protective actions are included in the EIPs. In general, these protective actions shall be in accordance with the following:

1. A limited evacuation (withdrawal of personnel from affected portion(s) of the plant) shall be considered when any of the following conditions exist:
 - (a) Unscheduled area radiation monitor high-level alarm.
 - (b) Conditions which indicate a valid containment high-flux-at-shutdown alarm is necessary.
 - (c) Unevaluated airborne radioactive concentrations in excess of the derived air concentrations (DACs) specified in Appendix B to 10 CFR 20.
 - (d) Excessive radioactive surface contamination levels.
 - (e) Other emergency conditions, such as fire, or toxic/flammable gas intrusion that may endanger human life or health.

The criteria for these radiation levels, alarms and conditions do not apply to anticipated increases or alarms resulting from planned operations.

When a limited evacuation is ordered, personnel in the room, area, or building will proceed as directed. If evacuation is from areas within the RCA, personnel will proceed to the RP station for accountability and contamination monitoring.

If a hazard continues to increase in severity or spreads to other areas, and the Shift Manager or TSC Manager deems it necessary, an evacuation or an assembly and subsequent evacuation may also be ordered.

2. An evacuation, or an assembly and subsequent evacuation shall be ordered upon the classification of an Alert, or higher.

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3. An Exclusion Area assembly or an assembly and subsequent evacuation shall be considered when:
 - (a) The conditions of a limited evacuation continue to increase in severity or spread to other areas.
 - (b) The general area radiation levels outside of the Radiation Control Area exceed prescribed limits.
4. When an Exclusion Area assembly or an assembly and subsequent evacuation is ordered, personnel shall proceed as listed below (Reference Table 6-2):
 - (a) Public visitors on the beach, fishing pier, and Energy Center will proceed to the SBCC Security Checkpoint, to receive further direction.
 - (b) Duty Shift Operations personnel will report immediately to the Control Room and remain there unless instructed otherwise.
 - (c) Personnel with assigned emergency duties shall proceed to their pre-assigned emergency response facility or designated assembly area.
 - (d) All personnel who do not have an emergency assignment shall proceed to the nearest designated assembly areas listed in Table 6-2 unless directed otherwise.
5. When an Exclusion Area evacuation is ordered, personnel shall proceed as listed below (Reference Table 6-2):
 - (a) Public visitors on the beach, fishing pier, and Energy Center will proceed to the SBCC Security Checkpoint, to receive further direction.
 - (b) Duty Shift Operations personnel will report immediately to the Control Room and remain there unless instructed otherwise.
 - (c) Personnel with assigned emergency duties shall proceed to their pre-assigned emergency response facility or designated assembly area.
 - (d) All other personnel shall proceed to the Security Checkpoint at SBCC to be released.

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6. At the discretion of the TSC Manager, the assembled non-ERO personnel may be evacuated from the site when chemical, radiological, or meteorological conditions allow, or if conditions warrant, take additional actions, such as radiological monitoring and relocation.
7. Evacuation of a specific emergency response facility (ERF) will be considered when habitability or function of that facility is questionable

e. Personnel Accountability

Assembly and Evacuation actions are contained in Step 4.1.1d and Table 6-2. Personnel accountability shall be conducted at an Alert classification or higher. Accountability is the responsibility of the Shift Manager or TSC Manager, in conjunction with the Security Coordinator. During an emergency situation that requires personnel in the plant to assemble in the various assembly areas, management personnel should help ensure that all their personnel are accounted for.

Accountability, within the Protected Area of the plant, should take no longer than 30 minutes from the time of the announcement. The Security Supervisor will verify complete accountability using the security computer or the manual accountability procedure, and will forward this information to the TSC Manager. If the TSC is not activated, this information will be forwarded to the Shift Manager. If personnel are unaccounted for, teams will be dispatched to locate and, if necessary, rescue the personnel. Personnel accountability procedures are included in the EPIPs.

Accountability outside the Protected Area is accomplished by Security physically entering the plant buildings to check for personnel. Aid to affected personnel will be provided as specified in Section 6.0.

f. Radiological Monitoring of Personnel Evacuated from Site

Requirements for external radiation exposure monitoring are contained in Section 5.0. A combination of checking SRDs/EPDs, if worn, and questioning of evacuees will be used to determine if there were any significant external exposures received prior to evacuation. Section 6.0 addresses appropriate actions for any known or suspected overexposures

If normal contamination monitoring is not possible, monitoring for contamination and internal exposure at the OSRPF and OSC shall be accomplished by using portable instrumentation, as necessary. Any persons suspected or known to have ingested or inhaled radioactive material will be whole body counted to assess internal exposure as soon as conditions permit.

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4.1.2 Offsite Area (Area Beyond the Exclusion Area)

a. Action Criteria

Required protective actions for offsite areas are discussed in the state and county plans. The ERO shall classify the accident (reference EP 4.0) and notify the federal, state, and county authorities. The State plan has adopted the U.S. Environmental Protection Agency's Protective Action Guides for initiating actions to protect public health and safety. The county and state agencies have detailed plans for activating their agencies, taking various protective actions, and performing social services. Protective Action Recommendations for people offsite shall come from the Emergency Director.

The criteria for recommending protective action strategies to be taken in areas beyond the Exclusion Area encompass a number of factors and considerations. The determination of what emergency protective actions should be implemented in any given accident situation must be based on the actual plant conditions that exist or that are projected at the time of the accident, with the consideration of weather conditions, local protection factors for typical residential units, evacuation times, release potential, and projected or potential doses. Therefore, the effective means in utilizing and applying protective actions in the event of an accident is an important consideration to reduce radiation exposure to the general public.

Protective Actions for the public beyond the site boundary would apply to a radius of two miles in all directions from the plant and a larger radius of 5 miles from the plant in a sector greater than 60° (up to 360°) centered on the average downwind direction.

There are various types of protective actions that can be implemented by the state and counties which include the following:

1. Population sheltering
2. Evacuation
3. Controlling food, milk, and water distribution

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4. Prophylaxis (e.g., thyroid protection)
5. Individual protective actions (e.g., respiratory protection equipment and protective clothing)

Table 6-3 lists protective actions that may be recommended for various accident phases and approximate time periods as a function of exposure pathways following an initiation of an accident. This information should be useful for appropriate state and county agencies in making value judgments that are necessary to plan actions in limiting the radiation exposure to the general public during an emergency at PBNP.

(a) Sheltering and Evacuation

Protective actions such as sheltering and evacuation can provide protection for the public against exposure to gaseous radioactive fission products released during an accident at PBNP. Evacuation of the population in the plume exposure pathway to minimize public exposure to a passing radioactive cloud could be potentially 100% effective. However, the protective action of population sheltering may be more appropriate at the time of the accident with the consideration of such factors as weather conditions, wind direction, roadway conditions, duration and type of exposure, and projected or potential doses to the population.

(b) Shielding

Shielding estimates for several distinct building types have been made by using currently available shielding technology. Table 6-4 through Table 6-6 present these estimates and indicate the wide range of potential shielding factors afforded by normally inhabited structures, and that basements of both homes and large buildings offer very effective shielding against radiation. The shielding effectiveness of a structure is expressed in terms of a shielding factor which is the ratio of the dose received inside the structure to the dose that would be received outside the structure. The benefits of population sheltering can be maximized by recommending that windows and doors of homes be closed and sealed, and ventilation systems turned off to minimize the turnover rate of air within the building.

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(c) Exposure Pathways

If there were an atmospheric release of radioactive materials, doses to the public could occur by external radiation as the cloud passes, by exposure to external radiation from radionuclides deposited on the ground and other surfaces, or by internal exposure due to inhalation or ingestion of radionuclides. Levels in excess of accepted protective action guides would generally occur closer to the source so that the protective actions could be recommended on a two-phased approach. The first phase would be to protect individuals in these closer areas (i.e., within a 2-mile radius), while the second phase could be a recommendation to take shelter and institute food, water, and milk control since the need for evacuation versus sheltering in the 2- to 10-mile area may not be evident. However, beyond 10 miles, there is little apparent distinction between the effectiveness of evacuation and sheltering in terms of minimizing projected health effects.*

The protective actions discussed above are only a few of the alternate courses of action which could be taken in a radiological emergency.

b. Licensee Responsibilities During an Emergency

The responsibilities of the licensee during an emergency include the following:

1. To provide the best possible effort to resolve the emergency onsite and thus alleviate the offsite conditions.
2. To notify participating agencies in accordance with EP 5.0, Figure 5-7. In addition, the licensee will provide the best possible information, protective action recommendations (PARs), and support services to these agencies.
3. To coordinate actions with those of federal, state, and county agencies involved.
4. In some unlikely cases, it is possible for a radiological release to exceed the 10-mile EPZ. In such cases, additional PARs could be issued and tracking support provided if the counties so desire.

c. Participating Agency Responsibilities

* Examination of Offsite Emergency Protective Measures for Core Melt Accidents. Aldrich, D. C., McGrath, P. E., Ericson, D. M., Jr., and Jones, R. B., of Sandia Laboratories, Albuquerque, New Mexico, and Rasmussen, N. C., Department of Nuclear Engineering, M. I. T., Cambridge, Massachusetts, as presented at the American Nuclear Society Topical Meeting on Probabilistic Analysis of Nuclear Reactor Safety, May 8-10, 1978.

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Participating agency responsibilities are denoted in EP 5.0, Section 5.0 and are further explained in the letters of agreement referenced in Appendix D.

d. Notification and Response Time

Notification of businesses, property owners and tenants, school administrators, recreation facility operators, and the general public within the EPZs will be accomplished by county and state authorities as described in their response plans. An integrated siren system and the Emergency Alerting System (EAS) will be used to notify the general public of an emergency requiring protective action. The State of Wisconsin has the responsibility of determining public protective actions and coordinating the activation of the integrated siren system with the county agencies.

The counties have the responsibility to activate the sirens at the predetermined time and to disseminate EAS messages to the public which are consistent with the protective action recommendations made by the State of Wisconsin. These messages will include protective action instructions as well as general information concerning emergencies. The siren system controls are operated by the Sheriffs Dispatch of Manitowoc and Kewaunee counties. The siren system operability is tested routinely.

The details of the means and the times to evacuate the above persons are discussed in Appendix J.

4.2 Onsite Protective Equipment and Supplies

Protective equipment and supplies, as presented in Table 6-7, will be used to minimize external and internal radiological exposure and contamination to ERO members on and offsite. Typical emergency equipment lists are located in the EPMPs. Detailed procedures on the use of protective equipment and supplies are in the Radiation Protection procedures and the EPIPs (see Appendix I).

4.3 Contamination Control Measures

4.3.1 Exclusion Area

- a. Measures are taken on a continual basis to prevent or minimize direct exposure to or ingestion of radioactive materials within the Exclusion Area. Controls have been established at the plant to minimize and control the spread of contamination.
- b. The details of routine contamination control measures for onsite areas may be referenced in the Radiation Protection procedures. The following is a brief outline of these procedures:

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1. All tools and equipment used in radiologically controlled areas are checked for contamination before being taken from the radiologically controlled area. If the item is found to be contaminated and decontamination is not practical, the item remains controlled. Equipment and tools are unconditionally released for use outside the radiologically controlled areas if the items are free from detectable radioactive contamination. (Reference NP 4.2.25)
 2. Removal of material and equipment from an RCA with radiation and contamination levels in excess of the allowable limits must be approved for "conditional" release by Radiation Protection (RP) personnel. Any item approved for "conditional" release will be packaged, sealed, labeled, and handled in accordance with applicable regulations to prevent the release of any contamination. (Reference NP 4.2.25)
 3. Personnel working within a radiologically controlled area are periodically monitored by RP personnel. Radiation work permits (RWP) are required for all personnel working in radiologically controlled areas. Specific instructions, precautions, and limitations are listed on the RWP. (Reference NP 4.2.20)
 4. Individuals leaving the RCA are to monitor themselves for contamination before entering the clean area of the plant. (Reference NP 4.2.19)
 5. The accumulation of radionuclides in the body shall not exceed that which would result from exposure to the derived air concentrations (DACs) of radionuclides in air or drinking water for occupational exposure as indicated in 10 CFR 20.1201. In general, exposure to airborne concentrations higher than the DACs are prevented or avoided to the extent practicable. If exposures are necessary, the wearing of appropriate, properly fitted, respiratory protective equipment may be required as determined by an RP supervisor. Periodic air samples are taken in selected operational and work areas to ensure that DAC levels are not exceeded.
- c. In addition, contamination control measures following a radiological emergency shall include:
1. Decontamination of personnel and equipment will be conducted in accordance with approved routine RP practices. (Reference HP 2.1.2)
 2. Area access control will be controlled by Radiation Protection personnel.

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3. Access to drinking water and food supplies will be controlled by Radiation Protection personnel.
4. RP shall determine criteria for return of areas and items to normal use.

4.3.2 Offsite (Areas Beyond the Exclusion Area)

Wisconsin Emergency Management and the Division of Health and Family Services, Radiation Protection Section, are responsible for assessment and evaluation and determination of protective actions to be taken within the EPZs. The State of Wisconsin Radiological Response Team(s) will identify hazards and control access within the affected area. Other State agencies shall take actions, as necessary, under the direction of the Administrator of the Wisconsin Emergency Management, to assess and control the dairy and agricultural products within the affected area(s). In addition, the Administrator of the Wisconsin Emergency Management, along with principal supportive State agencies, will provide advisory information regarding the use of potentially affected home food and water supplies throughout the EPZ. These State agencies will also be responsible for ensuring that contamination levels are below the established criteria before normal use is restored.

Table 6-8 provides guidelines and recommendations for use by appropriate State and county agencies involved with response planning. This includes radiation protection activities involving protection against ingestion of contamination from the release of radioactivity to the environment. This table describes action levels and recommended protective actions for ground, food, milk, and water contamination control.

5.0 PERSONNEL EMERGENCY RADIATION EXPOSURE

5.1 Emergency Personnel Exposure Monitoring (External Dose)

ERO personnel within the Exclusion Area of the plant, who have radiologically controlled area access, are issued personnel monitoring devices capable of measuring the dose received from external sources of ionizing radiation. This device is a thermoluminescent dosimeter (TLD), which is normally used for permanent record. TLDs are required to be worn in radiologically controlled areas. In addition to a TLD, a self-reading dosimeter (SRD) or electronic personnel dosimeter (EPD) is worn in radiologically controlled areas for day-to-day indication of external radiation exposures. For personnel not routinely monitored, the use of paired TLDs located throughout the plant, may be used to reconstruct exposure. Non-monitored plant personnel will be issued radiation monitoring devices when their services are required during an emergency. It is the responsibility of RP personnel to ensure issuance of personnel monitoring devices to these personnel. Personnel monitoring devices are available at the RP station, gatehouses, TSC/OSC, and the EOF/OSRPF.

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5.1.1 ERO Members

In all situations, every reasonable effort will be made to minimize exposure to emergency personnel. Plant management may authorize emergency workers to receive up to the maximum PBNP administrative radiation dose levels. These levels are summarized in Table 6-9. The ED may authorize emergency workers to receive doses in excess of the administrative dose levels. The Rad/Chem Coordinator, Dose/PAR Coordinator and respective OSC Leaders are responsible to carefully control exposure to emergency workers.

In some situations, it is possible that certain activities or duties for the protection of persons or the substantial protection of property may result in doses in excess of 10 CFR 20.1201 limits. In these situations, dose levels may be authorized to those listed in Table 6-10. The Emergency Director shall authorize the dose extension based on recommendations from the Rad/Chem Coordinator or Dose/PAR Coordinator. However, the Emergency Director (SM) has the authority to take immediate actions and authorize dose extensions as required.

Decisions to accept doses in excess of occupational limits will be on a volunteer basis and approved by the Emergency Director, based on the recommendation of the Rad/Chem Coordinator or Dose/PAR Coordinator. The prospective volunteer shall be made aware of the risks. Whole body doses in the order of 100-200 rem may result in radiation sickness, and whole body doses in excess of 300 rem involve a risk of fatality to 50% of those exposed, if medical treatment is not provided. Individuals exposed to more than 25 rem TEDE shall be removed from further emergency duty and referred to a physician for evaluation. (Reference EPA-R-92-001)

5.1.2 Other Emergency Responders

The emergency exposure criteria for non-plant personnel and volunteers involved in providing first aid, decontamination, ambulance service, and medical treatment to injured persons and deployed National Guard and State Police (Reference RIS 2002-21) shall be limited to the following criteria:

- a. Non-plant personnel (except medical, fire and National Guard and State Police personnel) are evacuated from the area and denied reentry.
- b. The EPA dose limits in Table 6-10 may be applied to medical, fire, and National Guard and State Police personnel
- c. In the event of some emergencies, the provisions of emergency exposure criteria that were set for plant personnel shall be applied to assisting non-plant personnel in the emergency response effort. When an assisting agency, e.g., DOE Region V Radiological Assistance Team or State of Wisconsin Radiation Protection Section, has its own emergency plan, the provisions of that agency's plan shall apply to that agency's personnel.

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5.2 Emergency Exposure Criteria for Airborne Concentrations (Internal Dose)

In the event of an emergency, exposure to airborne radioactivity shall be limited by the following:

- 5.2.1 Whenever practicable, the total exposure of any individual during an emergency should be limited to the limits allowed in 10 CFR 20.1201. If external radiation fields are minimal, the total exposure of any individual should be limited to 2,000 DAC-hours, where 2,000 DAC-hrs may be considered to be equivalent to 5 rem committed effective dose equivalent for radionuclides that have their DACs based on the committed effective dose equivalent or 50 rem CDE for radionuclides that have DAC based on CDE. DAC-hours are calculated by multiplying the concentration of airborne radioactivity in terms of the number of DACs by the total time of exposure.
- 5.2.2 In the event emergency operations demand life-saving or rescue actions and external radiation fields are minimal individuals may be allowed exposures of 10,000 DAC-hours. If external radiation fields are not minimal, the sum of the external and internal doses should be limited to 25 rem TEDE. Exposures above 2,000 DAC-hours should be received only with the approval of the Emergency Director.
- 5.2.3 Respiratory protection and stable iodine shall be used whenever appropriate to control inhalation doses. (Also, see Step 6.6 for details on administering thyroid-blocking agents.)
- 5.2.4 It is the responsibility of all plant personnel, the respective OSC Leaders, the Rad/Chem Coordinator and Dose/PAR Coordinator and to carefully control the exposure permitted by 5.2.1 and 5.2.2, above.
- 5.2.5 Personnel who have been exposed to more than 10,000 DAC-hours shall be removed from further emergency duty and referred to a physician for evaluation.
- 5.2.6 Limits for exposure to Xe-133 and other noble gases are based on beta plus gamma dose limits to the skin.

5.3 Exposure Records and Control

Exposure records and forms for emergency workers are maintained for plant personnel at the South Service Building, OSC and OSRPF. This information will be utilized to determine emergency team assignments. It is the responsibility of the Rad/Chem Coordinator, Dose/PAR Coordinator, and their designated personnel to establish and maintain the personnel monitoring program during emergency situations.

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Provisions for establishing an emergency dosimeter service within 24 hours are provided, as is distribution of self-reading dosimeters or EPDs to determine doses received by emergency personnel. Detailed procedures for personnel monitoring are included in the EIPs (see Appendix I).

6.0 AID TO AFFECTED PERSONNEL

Provisions have been made to assist personnel who are injured or have received high radiation exposures. Many plant employees and some contractor personnel are trained in first aid and radiation protection procedures. First aid and decontamination facilities are available onsite and offsite, and necessary transportation services are also available. The following subsections describe measures to be used to provide necessary assistance.

6.1 Radiation Overexposure

For any known or suspected overexposures, the TLDs will be read as soon as possible, and further investigation will be conducted to determine the amount of exposure and the necessary action to be taken. Checking SRDs/EPDs and questioning evacuees may be used to determine if there were any significant external exposures involved in the emergency.

6.2 Decontamination

Facilities and supplies for decontaminating personnel are available at the RP station, OSC, and OSRPF. All personnel leaving the RCA or leaving a contaminated area will be monitored for contamination. During emergencies, other onsite personnel will be checked for contamination as necessary. Measures will be taken to minimize the spread of contamination.

Such measures may include isolating affected areas, placing contaminated personnel in clean protective clothing before moving, and decontaminating personnel, their clothing, and equipment prior to release. Personnel found to be contaminated will be decontaminated under the direction of RP personnel.

6.3 First Aid

Emergency first aid and medical treatment will be given to injured or ill personnel. Onshift personnel trained in first-aid are available onsite, 24 hour-per-day, and will assist injured or ill personnel either at the scene of the accident or in the first-aid room. If personnel must be transported to medical facilities, measures will be taken to prevent the spread of contamination if present. Such measures may include the placing of affected personnel in clean protective clothing or wrapping in blankets. If the injured individual is contaminated, the organizations who will provide the transportation and treatment shall be informed. The plant maintains an onsite first-aid room located in the Extension Building. The first-aid room is equipped with facilities suitable for the temporary care of a victim of an accident or illness until the services of a physician or transport can be obtained. Additional first-aid supplies are available at the following locations: gatehouses, turbine building, switchyard, Unit 1 and Unit 2 facades, EOF, TSC, RCA checkpoint, Control Room, Sewage Treatment Plant and RCA Maintenance Shop.

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6.4 Medical Transportation

In the event that offsite emergency medical transportation is required, the Manitowoc County Sheriff's dispatcher will be called. The dispatcher will determine who should respond to the emergency. Normally, the Mishicot emergency vehicle will respond first. If the Mishicot emergency vehicle is unavailable, the City of Two Rivers Fire Department emergency vehicle will respond.

6.5 Medical Treatment

Arrangements have been made with Aurora Medical Center - Manitowoc County for treatment of personnel working at PBNP. Hospital personnel have been instructed and trained in treating potentially contaminated patients. In addition, arrangements have been made with two area physicians who maintain a medical affiliation with the Aurora Medical Center - Manitowoc County for the medical treatment of potentially contaminated personnel from PBNP. The University of Wisconsin Hospital and Clinics in Madison, Wisconsin, will provide backup services in the event that the services of Aurora Medical Center - Manitowoc County become unavailable or that additional services are required. The University Hospital provides instruction and training on handling radiological accident patients. Letters of Agreements with respect to arrangements for both hospitals and medical services are referenced in Appendix D.

6.6 Iodine Prophylaxis (Thyroid Protection)

6.6.1 Background

A number of chemical compounds can be ingested before or shortly after inhalation of radioactive material to inhibit the biological assimilation of inhaled radionuclides. Of these, stable iodine has received more attention as a chemical prophylactic agent than other elements because inhaled radioiodine presents a radiological hazard under certain types of nuclear reactor accidents.

Radioiodine is quickly absorbed into the blood stream and concentrates primarily in the thyroid gland. This can result in significant doses to the thyroid. Therefore, a protective action to be considered after an accident involving the release containing radioactive iodine is the use of stable iodine as a thyroid-blocking agent. This can reduce the accumulation of radioactive iodine in the thyroid gland.

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6.6.2 Criteria for Use

The criteria for administering a thyroid-blocking agent (Potassium Iodide) to emergency personnel depends on the projected absorbed dose to the thyroid based on the severity and magnitude of the accident. If the initial estimate indicates a thyroid committed dose equivalent of 25 rem CDE or more, a thyroid-blocking agent will be distributed to plant emergency and support personnel. Prior to distribution, the Rad/Chem Coordinator or Dose/PAR Coordinator will make this recommendation with final approval by the Emergency Director.

For the greatest effectiveness, the thyroid-blocking agent should be administered as soon as possible, preferably before the exposure or within two hours of exposure. For most individuals the majority of radioiodine uptake by the thyroid occurs within 12 hours after a short-term exposure. The initial administration of a blocking agent will be of some value even as long as 4-8 hours after the exposure period. The determination of whether the thyroid-blocking agent should be continued on a daily basis will be made by the Medical Services Division after evaluation of the situation.

7.0 REFERENCES

Regulatory Issue Summary, RIS 2002-21, National Guard and Other Emergency Responders Located in the Licensee's Controlled Area. November 8, 2002.

NP 4.2.14, Administrative Dose Levels/Dose Level Extension Procedure

NP 4.2.19, General Rules for Work in a Radiologically Controlled Area

NP 4.2.20, Radiation Work Permit

NP 4.2.25, Release of Material, Equipment and Personal Items from Radiologically Controlled Areas

HP 2.1.2, Personnel Contamination Monitoring, Decontamination and Documentation

SAND 77-1725, Public Protection Strategies for Potential Nuclear Reactor Accidents Sheltering Concepts with Existing Public and Private Structures. February 1978.

EPA 400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents. May 1992.

NUREG-0654 FEMA-REP-1 Rev.1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Plants," November 1980.

8.0 BASES

None

EMERGENCY MEASURES

TABLE 6-1

ASSESSMENT ACTIONS*

<u>Action</u>	<u>Description</u>
1. Surveillance of Control Room Instrumentation	Radiation levels, pressures, temperatures, levels, flows, and meteorological data are monitored. The Control Room operators can assess plant status by observing instrumentation readout. Most indicators have visual and audio alarms. Primary and secondary system data will be provided to the Shift Technical Advisor as necessary for their assessment. Control Room operators will take corrective actions as necessary
2. In-plant Radiological Surveys	The re-entry teams with RP personnel assigned, as necessary, will perform these surveys. The radiation levels on the plant's fixed area and process monitoring systems will be obtained from the TSC or Control Room to assist in these evaluations. Surveys of equipment and personnel for contamination are done with portable equipment from the emergency lockers or other devices used routinely.
3. Site Boundary Control Center Surveys	Handled in same fashion as in-plant surveys by the RP personnel teams.
4. Offsite Consequence Assessment	The radiological assessment personnel will use effluent monitors and meteorological data to make projections of offsite consequences. Radiation Field Monitoring Teams will take direct readings (air, water, soil, vegetation).
5. Environmental Monitoring	Samples of various environmental media are collected and analyzed by either PBNP personnel or an outside contractor laboratory. Results will be evaluated by plant emergency response personnel.

***NOTE: Detailed assessment actions are described in the EPIPs.**

EMERGENCY MEASURES

TABLE 6-2

ASSEMBLY AND EVACUATION ACTIONS

<u>Evacuation Classification</u>	<u>Public Visitors (Energy Center, Beach)</u>	<u>Emergency Response Organization</u>	<u>Plant Personnel, Corporate Personnel, Contractors, Temporary Employees and Visitors Not Assigned Emergency Duties[†]</u>
Limited Evacuation	Take Action as Directed	Take Action as Directed	Take Action as Directed
Protected Area Assembly	Immediately leave Exclusion Area via SBCC Security Checkpoint; follow instructions	Report to Assigned Emergency Response Facility.	Report to NSB Cafeteria, Admin. Bldg. El. 26', NES Cafeteria, Training Building North Foyer or Warehouse #4
Exclusion Area Assembly	Immediately leave Exclusion Area via SBCC Security Checkpoint; follow instructions	Report to Assigned Emergency Response Facility, or designated assembly area	Training Building North Foyer or Warehouse #4
Exclusion Area Evacuation	Report to SBCC Security Checkpoint. Go to Two Creeks Town Hall or Two Rivers National Guard Armory as directed.	Report to Assigned Emergency Response Facility.	Report to SBCC Security Checkpoint. Go to Two Creeks Town Hall or Two Rivers National Guard Armory as directed.

NOTE: At an Alert or higher classification, on-site protective actions comprising a plant and exclusion area evacuation may be initiated. Plant and exclusion area evacuation may be waived for certain scenarios in which the classification would be terminated prior to evacuation or for security reasons. Assembly (on-site or off-site) may be required depending on environmental conditions. Emergency Response Organization (ERO) members will report to their Emergency Response Facilities given acceptable environmental and security related conditions.

EMERGENCY MEASURES

TABLE 6-3 (page 1 of 2)

STATE AND COUNTY AGENCIES POSSIBLE PROTECTIVE ACTIONS

<u>ACCIDENT PHASE</u>	<u>EXPOSURE PATHWAY</u>	<u>EXAMPLES OF ACTIONS TO BE IMPLEMENTED</u>
Emergency Phase 1 (0.5 to 24 hours)*	Inhalation of gases, radio iodine, or particulate	Evacuation, access control, shelter, respiratory protection, thyroid protection
	Direct whole body exposure	Evacuation, access control, shelter
Intermediate Phase 2 (24 hours to 30 days)*	Ingestion of milk	Take cows off pasture, prevent cows from drinking surface water, discard contaminated milk or divert to stored products such as cheese.
	Ingestion of fruits and produce	Wash all produce or impound produce, delay harvest until approved, substitute uncontaminated produce.
	Ingestion of water	Isolate contaminated supplies, substitute from other sources, filter, demineralize.
	Whole body exposure and inhalation	Relocation, access control, decontamination

EMERGENCY MEASURES

TABLE 6-3 (page 2 of 2)

STATE AND COUNTY AGENCIES POSSIBLE PROTECTIVE ACTIONS

ACCIDENT PHASE

EXPOSURE PATHWAY

EXAMPLES OF ACTIONS TO BE IMPLEMENTED

Long Term Phase 3
(over 30 days)*

Ingestion of food and water contaminated from the soil either by re-suspension or uptake through roots

Decontamination, condemnation or destruction of food, deep plowing, condemnation or alternate use of land

Whole body exposure from deposition material or inhalation of re-suspended material.

Relocation, access control, decontamination, deep plowing

Assessment Reporting

In the case of offsite consequences, the federal, state, and county agencies are immediately notified in accordance with the Emergency Plan. Predetermined criteria are used to recommend various protective actions for the population at risk.

(1) Emergency phase - Time period of majority of release and subsequent plume exposure.

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

(3) Long-Term Phase - Recovery period.

* "Typical" post-accident time periods.

EMERGENCY MEASURES

TABLE 6-4

REPRESENTATIVE SHIELDING FACTORS FROM GAMMA CLOUD SOURCE*

<u>Structure or Location</u>	<u>Shielding Factor</u> ⁽¹⁾	<u>Representative Range</u>
Outside	1.0	--
Vehicles	1.0	--
Wood-frame house ⁽²⁾ (no basement)	0.9	
Basement of wood house	0.6	0.1 to 0.7 ⁽³⁾
Masonry House (no basement)	0.6	0.4 to 0.7 ⁽³⁾
Basement of masonry house	0.4	0.1 to 0.5 ⁽³⁾
Large office or industrial building	0.2	0.1 to 0.3 ^(3, 4)

- (1) The ratio of the dose received inside the structure to the dose that would be received outside the structure.
- (2) A wood frame house with brick or stone veneer is approximately equivalent to a masonry house for shielding purposes.
- (3) This range is mainly due to different wall materials and different geometries.
- (4) The shielding factor depends on where the personnel are located within the building (e.g., the basement or an inside room).

*Taken from SAND 77-1725 (Unlimited Release)

EMERGENCY MEASURES

TABLE 6-5

SELECTED SHIELDING FACTORS FOR AIRBORNE RADIONUCLIDES*

Wood house, no basement	0.9
Wood house, basement	0.6
Brick house, no basement	0.6
Brick house, basement	0.4
Large office or industrial building	0.2
Outside	1.0

*Taken from SAND 77-1725 (Unlimited Release)

EMERGENCY MEASURES

TABLE 6-6

REPRESENTATIVE SHIELDING FACTORS FOR SURFACE DEPOSITED RADIONUCLIDES*

<u>Structure of Location</u>	<u>Representative Shielding Factor ⁽¹⁾</u>	<u>Representative Range</u>
1 m above an infinite smooth surface	1.00	--
1 m above ordinary ground	0.70	0.47-0.85
1 m above center of 50' road-ways, 50% decontaminated	0.55	0.4-0.6
Cars on 50' road:		
Road fully contaminated	0.5	0.4-0.7
Road 50% decontaminated	0.5	0.4-0.6
Road fully decontaminated	0.25	0.2-0.5
Trains	0.40	0.3-0.5
One and two-story wood-frame house (no basement)	0.4 ⁽²⁾	0.2-0.5
One and two-story block house (no basement)	0.2 ⁽²⁾	0.04-0.40
House basement, one or two walls fully exposed:	0.1 ⁽²⁾	0.03-0.15
One story, less than 2' of basement, walls exposed	0.05 ⁽²⁾	0.03-0.07
Two stories, less than 2' of basement, walls exposed	0.03 ⁽²⁾	0.02-0.05
Three- or four-story structures, 5,000 to 10,000 ft ² per floor:		
First and second floors	0.05 ⁽²⁾	0.01-0.08
Basement	0.01 ⁽²⁾	0.001-0.07
Multi-story structures >10,000 ft ² per floor:		
Upper floors	0.01 ⁽²⁾	0.001-0.02
Basement	0.005 ⁽²⁾	0.001-0.015

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

(2) Away from doors and windows.

*Taken from SAND 77-1725 (Unlimited Release)

EMERGENCY MEASURES

TABLE 6-7 (page 1 of 2)

USE OF PROTECTIVE EQUIPMENT AND SUPPLIES

<u>Equipment</u>	<u>Criteria for Issuance*</u>	<u>Storage Location</u>	<u>Means of Distribution</u>
a. <u>Respiratory Equipment:</u>			
1) Full-Face Respirator (Filter)** Protection Factor-50	For areas of airborne particulate activity only (Notes 3 and 4).	(a) RP Station	(a) Used as needed by reentry personnel (b) Issued under the control of Radiation Protection (c) Issue Full-Face Respirators and filters for OSRPF as needed from TSC / OSC Facility.
2) Continuous Flow Air- Line (Supplied Air, Regulated Air) Supply through SCBA Protection Factor - 1,000	(a) For areas of airborne particulate, iodine, gas activity, or combinations of same (Notes 2 and 4). (b) Not to be used in IDLH atmosphere.	(a) Control Room	(a) Used as needed by Control Room personnel (b) Issued under the control of Radiation Protection
3) Self-Contained Breathing Apparatus Protection Factor - 10,000	(a) Inhalation hazard during fire fighting (b) For areas of airborne particulate iodine, gas activity, or combination of same (Notes 1, 2 and 4). (c) Any time IDLH atmosphere is suspected or unknown chemical concentration.	(a) Control Room (b) TSC (OSC) (c) Fire Brigade Lockers	(a) Used as needed by reentry personnel, Control Room personnel, OR (b) Issued under the control of Radiation Protection

* Significance of qualifying notes must be recognized.

** The proper type of air-purifying filters, cartridges, and canisters with the respirator must be chosen for the hazard present in the atmosphere.

EMERGENCY MEASURES

TABLE 6-7 (page 2 of 2)

USE OF PROTECTIVE EQUIPMENT AND SUPPLIES

<u>Equipment</u>	<u>Criteria for Issuance*</u>	<u>Location</u>	<u>Means of Distribution</u>
b. Protective Clothing (Coveralls, Hoods, Boots, Gloves)	As needed in areas of known contamination	(a) Various areas of the plant (b) OSRPF	Used as needed by reentry personnel
c. Potassium Iodide for Thyroid Blocking	Reduce accumulation of radioactive iodine in the thyroid gland, used during a radiation emergency only	(a) Control Room (b) TSC (OSC) (c) OSRPF	Issued as needed under direction of RP personnel after approved by Emergency Director

NOTES

- (1) This type of respirator provides the greatest protection and is preferred emergency device in unknown or high airborne concentrations.
- (2) Limitations on occupancy in gaseous atmospheres will typically be governed by external dose limits.
- (3) Respirators with mechanical filters provide no protection against gaseous activity or in oxygen-deficient atmospheres.
- (4) Where airborne tritium is involved, filter type respirators are not suitable for protection. Supplied air apparatus (air line or self-contained) are not recognized as effective for concentrations greater than two times DAC.

EMERGENCY MEASURES

TABLE 6-8 (page 1 of 2)

GUIDELINES FOR PROTECTION AGAINST INGESTION OF CONTAMINATION

1.0 SURFACE CONTAMINATION

1.1 Action Levels

- 1.1.1 Projected gamma dose ≥ 2 rem.
- 1.1.2 Surface contamination levels $\geq 200 \mu\text{Ci}/\text{m}^2$ one hour post-accident.
- 1.1.3 Exposure rate ≥ 1 mR/hr at 1 meter above the ground one hour post-accident.

1.2 Recommended Protective Actions

- 1.2.1 Evacuate the affected area.
- 1.2.2 Restrict entry to contaminated offsite areas until radiation levels have decreased to state of Wisconsin approved levels.

2.0 FOOD AND WATER CONTAMINATION

2.1 Action Levels*

Nuclide**	Concentration in Milk or Water		Total Intake via All Food and Water Pathways		Pasture Grass (Fresh Weight)	
	Prev Level ($\mu\text{Ci}/\text{l}$)	Emerg Level ($\mu\text{Ci}/\text{l}$)	Prev Level (μCi)	Emerg Level (μCi)	Prev Level ($\mu\text{Ci}/\text{kg}$)	Emerg Level ($\mu\text{Ci}/\text{kg}$)
I-131	0.015	0.15	0.09	0.9	0.05	0.5
Cs-134	0.15	1.5	4.0	40.0	0.8	8.0
Cs-137	0.24	2.4	7.0	70.0	1.3	13.0
Sr-90	0.009	0.09	0.2	2.0	0.18	1.8
Sr-89	0.14	1.4	2.6	26.0	3.0	30.0

Prev = Preventive

Emerg = Emergency

* The preventive level corresponds to a 1.5 rem projected dose commitment to the thyroid or 0.5 rem projected dose commitment to the whole body, bone marrow, or any other organ. The emergency level corresponds to a 15 rem projected dose commitment to the thyroid or 5 rem projected dose commitment to the whole body, bone marrow, or any other organ.

** If other nuclides are present, Regulatory Guide 1.109 will be used to calculate the dose to the critical organ. Infants are the critical segment of the population.

Reference: U.S. EPA Publication EPA 400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, May 1992.

EMERGENCY MEASURES

TABLE 6-8 (page 2 of 2)

GUIDELINES FOR PROTECTION AGAINST INGESTION OF CONTAMINATION

2.2 Recommended Protective Actions

Preventive

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

Emergency

- Isolate food and water from its introduction into commerce after considering:
- a. Availability of other possible actions;
 - b. Importance of particular food in nutrition;
 - c. Time and effort to take action;
 - d. Availability of other foods.

EMERGENCY MEASURES

TABLE 6-9

MAXIMUM YEARLY ADMINISTRATIVE DOSE LEVELS¹

<u>Category</u>	<u>Max. Level</u>
1. All doses received in current year, TEDE ²	4.5 rem
2. The sum of the deep-dose equivalent and the committed dose equivalent to any organ other than the lens of the eye	45 rem
3. Eye dose equivalent	13.5 rem
4. Skin shallow-dose equivalent	45 rem
5. Extremity shallow-dose equivalent	45 rem

Notes:

1. Levels are from the Radiation Protection Procedure NP 4.2.14.
2. Total effective dose equivalent (TEDE) is the sum of the deep-dose equivalent (for external exposure) and the committed effective dose equivalent (for internal exposures).

EMERGENCY MEASURES

TABLE 6-10

GUIDANCE ON DOSE LIMITS FOR WORKERS PERFORMING EMERGENCY SERVICES ⁽¹⁾

Dose Limits (rem) ⁽²⁾	Activity	Condition
5	all	
10	protecting valuable property	lower dose not practicable
25	life saving or protection of large populations	lower dose not practicable
>25	life saving or protection of large populations	only on a voluntary basis to persons fully aware of the risks involved

(1) Levels are from EPA 400-R-92-001, manual of Protective Action Guides and Protective Actions for Nuclear Incidents

(2) Sum of external effective dose equivalent and committed effective dose equivalent to non pregnant adults from exposure and intake during an emergency situation. Workers performing services during emergencies should limit dose to the lens of the eye to three times the listed value and doses to any other organ (including skin and body extremities) to ten times the listed value. These limits apply to all doses from an incident, those received in unrestricted areas as members of the public during the intermediate phase of the incident.

EVACUATION TIME ESTIMATES FOR THE AREA
SURROUNDING THE POINT BEACH NUCLEAR
PLANT

1.0 DISCUSSION

The Point Beach Nuclear Plant (PBNP) is located in Manitowoc County, Wisconsin, approximately eight miles north of the city of Two Rivers, Wisconsin. The Emergency Planning Zone (EPZ) encompasses an approximate ten-mile radius around PBNP, including the towns of Mishicot and Two Rivers, and the Dominion Energy Kewaunee Power Station.

2.0 DETERMINATION OF EVACUATION SECTORS AND SUBAREAS

For evacuation time estimation purposes, the area in the vicinity of PBNP was divided into the sectors and areas shown in Figure 1. A depiction of major highways of the PBNP EPZ is shown in Figure 2.

2.1 Sectors

- 2.1.1 The 0- to 2-mile zone is one 180° sector with a 2-mile radius as specified in the reporting format. A second 180° sector consists of the remainder of the 2-mile radial area over Lake Michigan.
- 2.1.2 The land area between the 5-mile and 10-mile radius lines was divided into six 45° sectors in a manner that would avoid the bisection of the City of Two Rivers and the Village of Mishicot.
- 2.1.3 The EPZ is also divided into additional segments, each representing 22.5° sectors around the compass, that also represent wind directions.

2.2 Subareas

- 2.2.1 The State of Wisconsin Emergency Management has subdivided the EPZ into nine subareas that reflect a best match between geographic boundaries and two-, five-, and ten-mile radii around the plant.
- 2.2.2 It should be noted that Wisconsin Emergency Management (WEM) uses an subarea designation whereby subareas 2, 5N, 5W, and 5S were combined to form subarea 5.

EVACUATION TIME ESTIMATES FOR THE AREA
SURROUNDING THE POINT BEACH NUCLEAR
PLANT

2.3 Protective Action Recommendations

- 2.3.1 PBNP emergency response personnel will specify which sectors(s) and distance from PBNP (2-, 5-, or 10-miles) are affected; then make protective action recommendations to offsite state and risk county Emergency Managements based on the severity and nature of the emergency and weather conditions (e.g., wind strength and direction). The offsite Emergency Management Directors will implement protective action recommendations in accordance with their emergency plan requirements by subarea(s). The affected subareas are those subareas that are intersected by the affected sectors.
- 2.3.2 The set of possible combinations of affected subareas were compiled and are given in Table 1. These combinations are hereafter referred to as Evacuation Regions. Evacuation Regions 1 through 5 refers to those subareas for various radii but for all wind directions. Regions 6 through 11 refer to the affected subareas from 5 miles to the EPZ edge for various wind directions. Regions 12 through 17 refer to the affected subareas from 0 miles to the EPZ edge for various wind directions. A summary of the affected permanent population is also given in Table 1
- 2.3.3 Tables 2 and 3 includes sets of evacuation time estimates: Table 2 is an estimate for normal weather conditions. Table 3, an estimate for adverse weather conditions.

3.0 NORMAL WEATHER AND EVACUATION PROCEDURE ASSUMPTIONS

In order to estimate evacuation times for normal weather conditions, the following assumptions were made:

- 3.1 The accident occurs during normal weather conditions, e.g., a clear or cloudy day with low or moderate winds, such that traffic flow would not be impeded by weather conditions.
- 3.1.1 All roads and streets in the area are serviceable.
- 3.1.2 Residents of the area are involved in their normal everyday activities.
- 3.2 All steps required in the PBNP Emergency Plan have been implemented, including the notification of appropriate local and emergency government authorities.
- 3.3 The Manitowoc County Sheriff's Office and Wisconsin Emergency Management have been mobilized and have established command posts.

EVACUATION TIME ESTIMATES FOR THE AREA
SURROUNDING THE POINT BEACH NUCLEAR
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- 3.4 Emergency personnel and vehicles are available and utilized for an accident requiring evacuation of the 0- to 2-mile zone and a 90° sector area encompassing both the City of Two Rivers and the Village of Mishicot. In accordance with the Manitowoc County Evacuation Plan, notifying personnel would be drawn from various agencies; e.g., the Sheriff's Department, the Wisconsin State Patrol, Two Rivers Police Department, State of Wisconsin Emergency Management, and local firefighting agencies.
- 3.5 Establishment of traffic control measures to maintain the flow of traffic in the area and facilitate evacuation are assumed. These measures include the routing of rural traffic away from the City of Two Rivers and Village of Mishicot to reduce the potential for congestion problems. In the City of Two Rivers, maintenance of flow over the four bridges available for crossing the East and West Twin Rivers is also assumed.
- 3.6 The primary means of notifying residents would be by a fixed civil defense siren system, police and emergency vehicles driving in the area with "yelp" sirens on, mobile public address system, and door-to-door personal contact.
- 3.7 Other means of notification to be used include broadcast media, telephones, tone alert radio and citizen band radio. Warning to higher and lower echelons of government including telephone, radio, and wire systems of communication.
- 3.8 Evacuation takes place as the notification process progresses. A portion of the population will respond to broadcast media notifications and implement evacuation without personal contact notification.
- 3.9 School superintendents are alerted as part of the emergency mobilization process, and the required number of school buses to be used in the process of driving to or from schools are on standby.
- 3.10 Residents evacuate the area principally by private automobile, with an average of about 1.2 vehicle per residence.
- 3.11 The evacuation time estimates were developed assuming that all special facilities (e.g., schools, group homes) will be informed to evacuate at the same time as the general population.
- 3.12 Transport-dependent, including special needs individuals, would be evacuated by bus, van, ambulance, or other suitable means as coordinated by State and County, and municipal emergency preparedness officials.

EVACUATION TIME ESTIMATES FOR THE AREA
SURROUNDING THE POINT BEACH NUCLEAR
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4.0 ADVERSE WEATHER ASSUMPTIONS

In order to estimate evacuation times for adverse weather conditions, the following assumptions were made, based on the normal preparedness for snow conditions in Wisconsin.

- 4.1 The accident occurs immediately following a heavy snowstorm. An accident during a snowstorm would require approximately 25% additional time for evacuation. At the same time, it is recognized that radiological impact could be reduced due to radioiodine and particulate washout by snowfall or rainfall.
- 4.2 Plowing or salting of interstate and state highways and major county roads is in progress to the extent of minimum serviceability.
- 4.3 Lesser-traveled county roads and local town roads and city streets have not been plowed.
- 4.4 All rural roads are accessible to police and emergency vehicles and private vehicles equipped with snow tires and/or chains.
- 4.5 The residents of the area normally have their own snow removal equipment and have the capability to exit their own property during emergency situations in a reasonable time.

5.0 POPULATION DESCRIPTIONS

Regulatory guidance suggests that three population segments should be considered: permanent residents, transients, and special facility residents:

- 5.1 Permanent residents were defined as those individuals residing at a primary residence that is within the EPZ. There are approximately 22,885 people, 9,555 residences, and 11,420 vehicles.
- 5.2 Persons considered transients included tourists in various lodging accommodations (e.g., hotels, bed and breakfasts, etc.) and employees not residing in the EPZ, consisting of approximately 165 people and 80 vehicles. Other transients are persons located in parks and recreational areas, consisting of approximately 110 people with 30 vehicles in winter and 715 people and 220 vehicles in summer.
- 5.3 The special facility population included those residents confined to hospitals and nursing and group homes. There are approximately 180 people, including staff members.
- 5.4 School populations (students and staff) were considered part of the special facility population. There are approximately 4200 people, including staff members.

EVACUATION TIME ESTIMATES FOR THE AREA
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5.5 Employees in the EPZ consist of approximately 2980 on day shifts, 790 on night shifts, and 550 on weekend shifts. Adjusted person figures consist of approximately 1420 on day shifts, 380 on night shifts, and 275 on weekend shifts. The number of vehicles was approximated to the same numbers as adjusted person figures. The employee population figures were adjusted to reflect that some of the employees in EPZ workplaces commute into the EPZ and were not already counted in the permanent population.

6.0 EVACUATION TIME ESTIMATES

Trip generation times can be thought of as descriptions of how vehicles begin to move on the roadway network. In this study, it was assumed that no vehicles would begin evacuating for at least 30 minutes (maximum 15 minute notification time and 15 minute trip preparation time) after the declaration of an emergency.

It was assumed that the transient population would be informed of the evacuation within 30 minutes. While employees may be expected to remain at the workplace to facilitate workplace shutdowns, it was assumed that such activities would not last longer than 30 minutes. Other components of the transient population (i.e.; hotel and motel patrons) would likely act similarly.

Schools will be evacuated, at the Site Area Emergency level, directly to reception centers as soon as transportation resources arrive at the schools. It was assumed that bus mobilization times would be about an hour. Accordingly, the schools population could be expected to evacuate within ninety minutes of an evacuation decision.

6.1 For 0 to 2-Mile Zone

6.1.1 There are approximately 77 residences and 6 commercial or public buildings within the 0- to 2-mile zone. The estimated resident population of this area is 551 persons. By use of the civil defense siren system, those notifications would be completed in 15 minutes for both good and adverse weather conditions.

6.1.2 Evacuation would begin as notification progresses. Evacuation would take place principally by private automobile. With an average of 1.2 vehicle per residence and three vehicles per business or other uses, approximately 110 vehicles would be involved; hence, no traffic problems are anticipated. Using the civil defense siren system, evacuation of the zone could be completed 50 minutes after commencement of notification during good weather. During adverse poor weather, using the civil defense siren system, the evacuation should be complete within 80 minutes.

EVACUATION TIME ESTIMATES FOR THE AREA
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6.1.3 The estimated average total time to evacuate the zone is 55 minutes during normal conditions and 70 minutes during adverse poor weather conditions if the civil defense siren system is used. These estimates allow for the overlap of the types of activities (notification and implementation) involved.

6.2 For 2 to 5-Mile Zone

Evacuation time estimates for the evacuation regions (90° sectors and overlapping subareas) from the 2- to 5-mile range from 60 to 80 minutes during normal weather conditions, and 60 to 90 minutes during adverse weather conditions.

6.3 For 5 to 10-Mile Zone

For the evacuation regions (90° sectors and overlapping subareas) from 5 to 10 miles, the estimates range from 110 to 130 minutes during normal conditions and 120 to 170 minutes during adverse weather conditions.

7.0 EVACUATION ROUTE SEGMENT CAPACITIES

7.1 Capacity estimations were made for two-lane roads, multi-lane roads, multi-lane freeways, and freeway ramps. Estimates for roads and freeways were done on a "per lane" basis.

7.2 To represent the varying road types and geometries, roads were categorized in the following manner:

7.2.1 10-foot lanes with 1-foot shoulders

7.2.2 11-foot lanes with 2-foot shoulders

7.2.3 12-foot lanes with 6-foot shoulders

7.3 Estimates were made for both two-way and one-way traffic. Highway capacity was estimated to be 1,000 vehicles per hour per lane. Freeway capacity was estimated to be 1,692 vehicles per hour per lane and freeway ramp capacity was estimated to be 1,333 vehicles per hour.

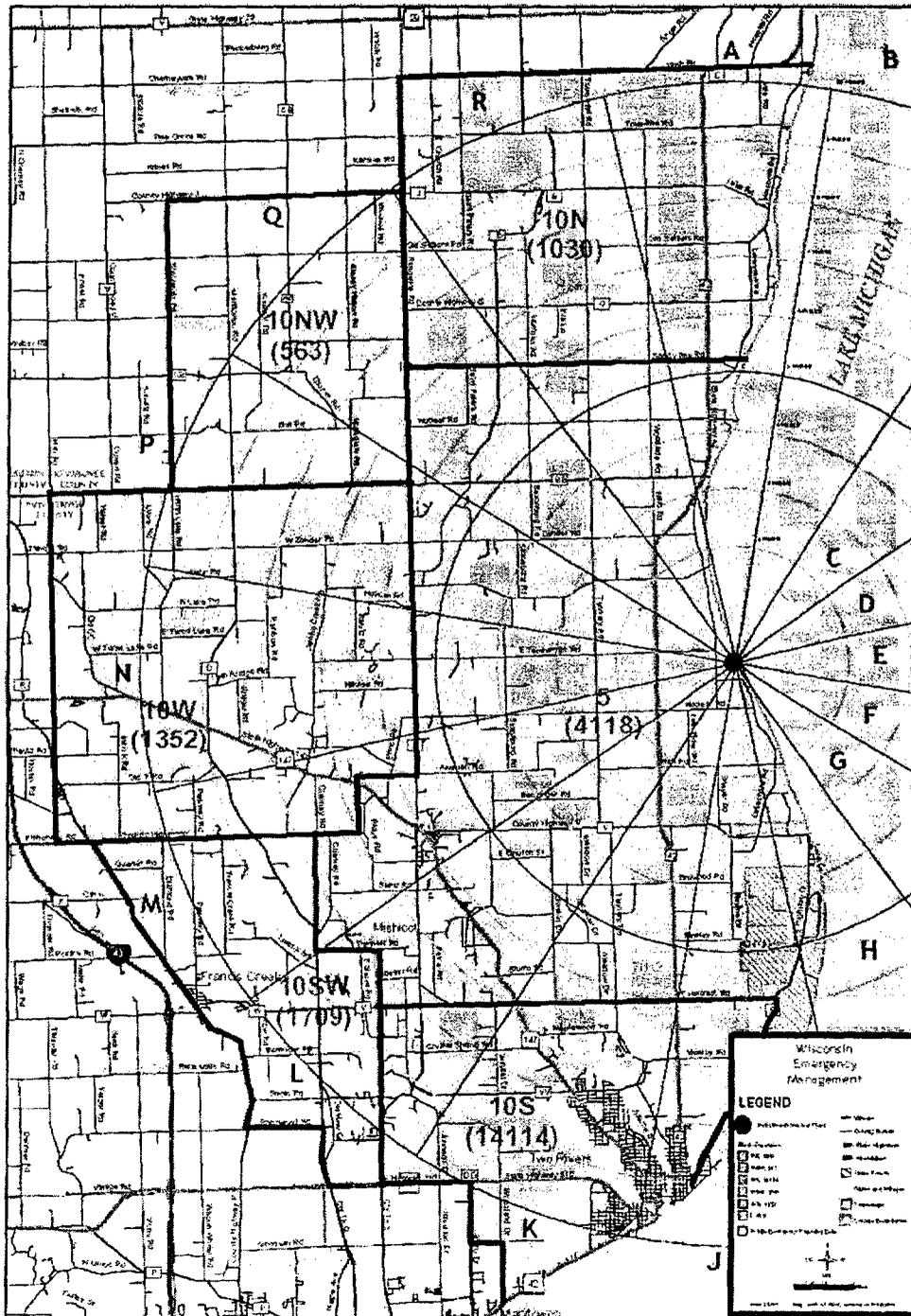
8.0 REFERENCES

Evacuation Time Estimate Study for the Point Beach Nuclear Plant Emergency Planning Zone (EPZ), TOMCOD, Inc., January 31, 2005

EVACUATION TIME ESTIMATES FOR THE AREA
SURROUNDING THE POINT BEACH NUCLEAR
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FIGURE 1
10-MILE EPZ SECTORS AND SUBAREAS

The Point Beach Nuclear Plant EPZ including major roadways, the nine subareas and the location of the Dominion Energy Kewaunee Power Station. The Wisconsin Emergency Management (WEM) uses an subarea designation whereby subareas 2, 5S, 5W, and 5N were combined to form subarea 5



EVACUATION TIME ESTIMATES FOR THE AREA SURROUNDING THE POINT
BEACH NUCLEAR PLANT

TABLE 1
EVACUATION REGIONS FOR THE POINT BEACH NUCLEAR PLANT EPZ

Evac. Region	Wind Direction	Affected Sectors	Affected Subareas					Affected Permanent Population					
			0-2 Miles	2-5 Miles	5 miles -EPZ Edge			0-2 Miles	2-5 Miles	5 miles -EPZ Edge	TOTALS		
1	0 - 2 miles		5						551			551	
2	2 - 5 miles			5						3567		3567	
3	5 - 10 miles				10N	10NW	10W	10SW	10S			18768	18768
4	2 - EPZ edge			5	10N	10NW	10W	10SW	10S		3567	18768	22335
5	0 - EPZ edge		5	5	10N	10NW	10W	10SW	10S	551	3567	18768	22886
6	S	R, A			10N							1030	1030
7	SSE	Q, R, A			10N	10NW						1593	1593
8	SE ESE	P, Q, R N, P, Q			10N	10NW	10W					2945	2945
9	E ENE NE	M, N, P L, M, N K, L, M				10NW	10W	10SW				3624	3624
10	NNE	J, K, L						10SW	10S			15823	15823
11	N NNE	H, J, K G, H, J							10S			14114	14114
12	S	R, A	5	5	10N					551	3567	1030	5148
13	SSE	Q, R, A	5	5	10N	10NW				551	3567	1593	5711
14	SE ESE	P, Q, R N, P, Q	5	5	10N	10NW	10W			551	3567	2945	7063
15	E ENE NE	M, N, P L, M, N K, L, M	5	5		10NW	10W	10SW		551	3567	3624	7742
16	NNE	J, K, L	5	5				10SW	10S	551	3567	15823	19941
17	N NNE	H, J, K G, H, J	5	5					10S	551	3567	14114	18232

EVACUATION TIME ESTIMATES FOR THE AREA SURROUNDING THE POINT
BEACH NUCLEAR PLANT

TABLE 2
SUMMER EVACUATION TIMES ESTIMATES (IN MINUTES) FOR SCENARIOS 1-8

Region	Scenarios							
	1	2	3	4	5	6	7	8
	Summer Weekend Midday Fair	Summer Weekend Midday Poor	Summer Weekend Evening Fair	Summer Weekend Evening Poor	Summer Weekday Midday Fair	Summer Weekday Midday Poor	Summer Weekday Evening Fair	Summer Weekday Evening Poor
1	50	50	50	50	60	70	50	60
2	60	70	60	70	70	80	70	70
3	110	110	110	120	120	130	120	130
4	120	120	110	130	120	150	130	140
5	120	120	110	130	120	150	130	140
6	40	50	40	50	50	60	50	60
7	50	50	50	50	60	60	60	70
8	50	60	50	60	70	70	60	60
9	60	60	60	60	70	80	70	70
10	100	110	120	110	110	110	90	100
11	90	100	90	100	110	110	90	90
12	50	50	60	70	50	60	50	60
13	50	50	50	60	60	60	60	70
14	50	60	50	60	70	70	60	60
15	60	60	60	60	70	80	70	70
16	100	120	100	110	120	120	90	100
17	90	100	90	110	120	120	90	90

EVACUATION TIME ESTIMATES FOR THE AREA SURROUNDING THE POINT
BEACH NUCLEAR PLANT

TABLE 3
WINTER EVACUATION TIMES ESTIMATES (IN MINUTES) FOR SCENARIOS 9-16

Region	Scenarios							
	9	10	11	12	13	14	15	16
	Winter Weekend Midday Fair	Winter Weekend Midday Poor	Winter Weekend Evening Fair	Winter Weekend Evening Poor	Winter Weekday Midday Fair	Winter Weekday Midday Poor	Winter Weekday Evening Fair	Winter Weekday Evening Poor
	1	50	60	50	60	60	80	50
2	60	70	60	70	70	90	70	80
3	120	130	120	120	130	170	130	150
4	140	140	120	130	120	220	160	190
5	140	140	120	130	120	220	160	190
6	40	50	40	50	50	60	50	60
7	50	50	50	50	60	60	60	70
8	50	60	50	60	70	70	60	60
9	60	60	60	60	70	80	70	70
10	100	110	110	120	120	120	100	110
11	100	100	100	100	110	110	90	90
12	50	50	60	70	50	60	50	60
13	50	50	50	60	60	60	60	70
14	50	60	50	60	70	70	60	60
15	60	60	60	60	70	80	70	70
16	120	130	120	140	130	150	110	110
17	120	120	120	130	120	150	110	110

August 29, 2005

NRC 2005-0112
10 CFR 50.54(q)

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Point Beach Nuclear Plant, Units 1 and 2
Dockets 50-266 and 50-301
License Nos. DPR-24 and DPR-27

Revision To Emergency Plan Implementing Procedures

In accordance with 10 CFR 50.54(q), Nuclear Management Company, LLC (NMC), evaluated eleven proposed procedure revisions to the Point Beach Nuclear Plant (PBNP) Emergency Plan Implementing Procedures (EPIPs). The evaluation concluded that the changes did not result in a decrease of the effectiveness of the PBNP Emergency Plan.

Enclosed are revisions to the following procedures:

- EPIP 1.1, "Course Of Actions," Revision 49, Issued July 29, 2005
- EPIP 1.2, "Emergency Classification," Revision 45, Issued July 29, 2005
- EPIP 1.2.1, "Emergency Action Level Technical Basis," Revision 0, Issued July 29, 2005
- EPIP 1.3, "Dose Assessment And Protective Action Recommendations," Revision 35, Issued July 29, 2005
- EPIP 1.3.1, "Dose Assessment Using RMS-SS," Revision 1, Issued July 29, 2005
- EPIP 1.3.2, "Dose Assessment Using Offsite Field Measurements," Revision 1, Issued July 29, 2005
- EPIP 1.3.3, "Dose Assessment Using Manual Calculations," Revision 1, Issued July 29, 2005

AV45

- EPIP 2.1, "Notifications - ERO, State And Counties, And NRC," Revision 34, Issued July 29, 2005
- EPIP 12.1, "Emergency Event De-Escalation or Termination," Revision 13, Issued July 29, 2005
- EPIP 12.2, "Recovery Implementation," Revision 18, Issued July 29, 2005

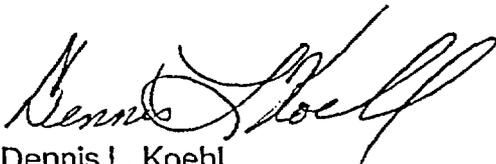
Also enclosed is Revision 124 to the EPIP Index, Issued July 29, 2005.

EPIP 1.4, "Credible Security Event," Revision 9, was also issued July 29, 2005. However, EPIP 1.4 is exempt from public disclosure in accordance with 10 CFR 2.390 and is only being provided to the Incident Response Center.

Personal privacy information has been redacted from the procedures being provided to the Document Control Desk.

A copy of the complete PBNP EPIP Manual, containing the revised procedures, is being provided to the NRC Region III Incident Response Center on CD-ROM.

This letter contains no new commitments and no revisions to existing commitments.



Dennis L. Koehl
Site Vice-President, Point Beach Nuclear Plant
Nuclear Management Company, LLC

Enclosures (11)

cc: Incident Response Center, Region III (copy of PBNP EPIP Manual on CD-ROM)
Resident Inspector, Point Beach Nuclear Plant, USNRC

EPIP 1.3

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

DOCUMENT TYPE: Technical

CLASSIFICATION: Safety Related

REVISION: 35

EFFECTIVE DATE: July 29, 2005

REVIEWER: Plant Operations Review Committee

APPROVAL AUTHORITY: Department Manager

PROCEDURE OWNER (title): Group Owner

OWNER GROUP: Emergency Preparedness

Verified Current Copy: _____
Signature Date Time

List pages used for Partial Performance

Controlling Work Document Numbers

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DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

1.0 PURPOSE

Several methods are available to project offsite dose due to a release of radioactive material during a declared plant event. This procedure provides instructions for using the computer application WEDAP, and actions to take if WEDAP is not available. These dose projections will be used to provide Protective Action Recommendations (PARs) to the State and Counties.

2.0 PREREQUISITES

2.1 Responsibilities

- 2.1.1 The Shift Manager (SM), as the Emergency Director in the Control Room, is responsible for the radiological dose assessment and protective action recommendations using prior to TSC/EOF activation and formal transfer of responsibilities to the Emergency Director in the EOF. If available, the SM may assign this task to the Operating Supervisor(s) or the Shift Technical Advisor (STA).
- 2.1.2 The Emergency Director in the EOF may delegate the performance of radiological release evaluation portion of this procedure to the Dose/PAR Coordinator. The Dose/PAR Coordinator will advise the Emergency Director of the need to escalate the emergency classification or change protective action recommendations based upon radiological conditions.
- 2.1.3 The Dose/PAR Coordinator is responsible for the continuing dose assessment and Protective Action Recommendations to the Emergency Director.
- 2.1.4 **IF** the Dose/PAR Coordinator is unable to perform radiological release evaluations,
THEN the Rad/Chem Coordinator in the TSC will assume this responsibility.

2.2 Equipment

- 2.2.1 Wisconsin Electric Dose Assessment Program (WEDAP)
- 2.2.2 Radiation Monitoring System-System Server (RMS-SS)
- 2.2.3 Plant Process Computer System (PPCS)

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 Complete this procedure regardless of changing plant conditions.
- 3.2 PARs are made to the State and Counties by the Shift Manager, or the Emergency Director depending on the status of emergency facility activation. The Dose/PAR Coordinator (or the Rad Chem Coordinator if the EOF is not activated), performs dose projections and monitors offsite radiological conditions, develops the associated PARs and provides the PARs and basis to the Emergency Director.

NOTE: If a PAR change is required the new PAR should include all previous and currently recommended sectors.

- 3.3 PARs are developed from current rather than forecasted weather conditions. PARs are revised due to actual weather condition changes (e.g., wind shift occurs or atmospheric stability class changes) only when a revised dose projection or offsite radiological condition results in a change in PAR.
- 3.4 If conditions that constitute KNOWN IMPEDIMENTS to EVACUATION exist, a Shelter rather than an Evacuation recommendation should be made. These are conditions which make evacuation of the public impractical. Conditions include Inclement Weather (ice/snow storms where driving would be dangerous), and known impacts on the ability to execute public evacuations (severe damage to roads/infrastructure, etc.). It is not the intent of this procedure to cause the Emergency Director and/or organization to obtain information not currently known to them.
- 3.5 Use a realistic estimate of release duration in these calculations whenever possible. **IF** the duration of the radiological release can **NOT** be determined from the current plant conditions, **THEN**, assume a duration of four hours.
- 3.6 **IF** the meteorological data can **NOT** be obtained from the PPCS or the control room instruments, **THEN** obtain the below data from any of the following sources using ETD 02:
- 3.6.1 Kewaunee Nuclear Power Plant
- 3.6.2 National Weather Service in Green Bay
- NOTE: Only wind speed, wind direction and lake breeze are available from the Two Rivers Coast Guard Station**
- 3.6.3 Two Rivers Coast Guard Station

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

3.6.4 Data to request

- a. Stability Class
- b. Wind Direction
- c. Wind Speed
- d. σ_{θ} (sigma theta) if greater than 3 mph, if available
- e. $\Delta T/\Delta H$ (lapse rate), if available

3.7 In some unlikely cases, it is possible for a radiological release to exceed the 10-mile EPZ. In such cases, additional PARs could be issued and tracking support provided if the counties so desire.

4.0 INITIAL CONDITIONS

4.1 EPIP 1.1, Course of Actions, in progress.

4.2 RMS or plant conditions suggest that a radiological release is in progress or anticipated.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

5.0 PROCEDURE

NOTE 1: Emergency Classifications and PARs shall be made to the State and Counties within 15 minutes of the emergency classification being declared, change in radiological release status, OR identification of a change in the required PAR.

NOTE 2: There are no PARs required for Site Area Emergency, Alert, or Unusual Event emergency classifications.

5.1 Protective Action Recommendations (PARs)

5.1.1 Determine PARs using Attachment A.

5.1.2 Determine downwind sections using Attachment B.

5.1.3 PARs shall be documented on the Nuclear Accident Reporting System (NARS) form from EPIP 1.1 or EPIP 2.1.

5.1.4 **IF** a release is occurring or is imminent, **THEN** radiological release evaluation and dose projection shall be completed using Section 5.2 as applicable to determine or revise the emergency classification and/or PAR.

5.2 Wisconsin Electric Dose Assessment Program (WEDAP)

NOTE 1: The "Source Term" and "Release Path" categories have drop-down menus to determine the severity of the event and should be opened to select the appropriate category for the event. When opened, each drop-down menu has been organized to list the options from the least severe to the most severe.

NOTE 2: IF WEDAP is NOT available in the Control Room, THEN go to EPIP 1.3.1, Dose Assessment Using RMS-SS, OR, IF WEDAP is NOT available in the EOF (TSC backup), THEN go to Attachment C, "Reinstallation of WEDAP Software."

5.2.1 Power up the designated personal computer (PC) using the master power switch to "boot up" into Windows NT, selecting "stand-alone" if presented with a selection of configurations during bootup, **DO NOT** "dial in" because WEDAP is a Level A application.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- 5.2.2 Log on to the PC using the PC number (label affixed to PC) as both the identification number and password, entering it in lower case.
- 5.2.3 Launch WEDAP by selecting "Business Applications – WEDAP" or the "WEDAP icon."
- 5.2.4 Select "Start" when prompted at WEDAP introduction screen.
- 5.2.5 Enter a "Title" for this dose assessment case to provide retrievability if the case is saved.
- 5.2.6 Click on "Data" on the toolbar and select the option "Case Basis."
- 5.2.7 Click on the appropriate "Accident Type" for the event.
- 5.2.8 Update **all** the data fields in the "Source Term" section.
- 5.2.9 Update **all** the data fields in the "Release Path" section.
- 5.2.10 Click "OK" to return to the summary page.
- 5.2.11 Verify details in the "Accident Data" section are based upon the data selected in Steps 5.2.5 - 5.2.9, returning to "Data" and "Case Basis" to make corrections if necessary.
- 5.2.12 Update "Reactor Shutdown Time" data field with the correct data if applicable.
- 5.2.13 Update "Release Start" by entering the time the release to environment began.
- 5.2.14 Update "Release End" by entering the correct data for an estimated time the release to environment will terminate.
IF release duration is unknown,
THEN use four hours as a default value.
- 5.2.15 Update the "Meteorological Data" section categories by clicking on each data field and selecting/entering the correct data:

NOTE: Normally meteorological data is available from PPCS. If PPCS is not available, then use alternate sources listed in Step 3.6.

- a. Met Date
- b. Stability Class (automatically updates "Building Wake" check box)

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

NOTE: Sigma theta is "STD. DEV." in Control Room, on Met/Forebay Lvl Recorder.

- c. Sigma Theta (Only key-in value from PPCS if stability class unavailable and >3 mph wind speed).

NOTE: Lapse rate is "Delta T" in Control Room, on Met/Forebay Lvl Recorder.

- d. Lapse Rate, $\Delta T/\Delta H$ (Only key-in value from PPCS if stability class is unavailable and <3 mph wind speeds)
- e. Precipitation (Yes/No)

NOTE 1: If PPCS is unavailable, compare inland and primary/backup tower wind direction indicators in Control Room, on Met/Forebay Lvl Recorder.

NOTE 2: Lake breeze conditions exist if the difference between actual wind direction values for inland and primary/backup meteorological towers is greater than 90°.

- f. Lake Breeze (Yes/No)
- g. Wind Speed
- h. Wind Direction

5.2.16 Verify the data on the WEDAP main screen and make corrections if appropriate.

5.2.17 Click on the "Calculate" icon to perform the final dose assessment calculations, which automatically updates the dose assessment data fields.

5.2.18 Review the dose assessment result tabs (a single click for simple data OR double-click for expanded data).

- a. Dose
- b. Dose Rate
- c. Event Classification
- d. PARs (must be evaluated against Attachment A)

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- 5.2.19 Compare the results of Step 5.2.18 against the current classification and PARs.

NOTE 1: If a PAR change is required the new PAR should include all previous and currently recommended sectors.

NOTE 2: In some cases (e.g., short-duration puff release, inclement weather), sheltering may be an appropriate recommendation. (Reference Step 3.4).

NOTE 3: Emergency Classifications and PARs shall be made to the State and Counties within 15 minutes of the emergency classification being declared, change in radiological release status, OR identification of a change in the required PAR.

NOTE 4: There are no PARs required for Site Area Emergency, Alert, or Unusual Event emergency classifications.

NOTE 5: Review Section 3.0 prior to revising the PAR.

- a. **IF** in the Control Room **AND** the result of this assessment is an escalation of classification and/or PARs,
THEN go to EPIP 1.1,
OR exit this procedure, if **NOT** an escalation.
- b. **IF** in the EOF (TSC backup) **AND** the result of this assessment is an escalation of classification and/or PARs,
THEN immediately inform the Emergency Director and assist with EPIP 2.1 for initiating notifications,
OR proceed to the next step for a continuous dose assessment if **NOT** an escalation:

NOTE 1: The "View" icon on the toolbar may be used to access additional tables and maps available for reference use.

NOTE 2: To save the data from a series of case assessments, click on "File," "Save Scenario File," and then relick on "File" and "Restart WEDAP" to start a new scenario with new cases.

- 5.2.20 Click on the "Print Case" icon to create a hard copy of the current case.
IF the printer connection is not established,
THEN go to EPIP 1.3, Attachment C, Step 2.0.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- 5.2.21 Click on the "Add Case" or "Insert Case" icon as appropriate to run the next dose assessment.
- a. Determine if this case is to be based upon a cumulative dose and change the field as appropriate.
 - b. Repeat Steps 5.2.5 - 5.2.20
 - c. **IF** time permits to run a more detailed dose assessment case, **THEN** implement the following steps:
 - Click on "Data," select the option "Equipment Status," enter the Unit affected, and update all the data fields in the "Equipment Status" section.
 - Click on "Data," select the option "Measured Data," and select one of the following options for entering values from **actual** data sources:
 - (a) "RMS Data - Manual Input" and update the field with the RMS monitors and readings in high alarm status.
 - (b) "Offsite Measurements - Isotopic Data" and update the fields with the correct data, including selecting the nuclides involved.
 - (c) "Offsite Measurements - Survey Reading" and update the fields with the correct data.
 - (d) "Isotopic Release Rate" and select the nuclides involved, updating with the correct data.

NOTE: Cases can be generated on actual event data or "what-if" scenarios.

- d. **IF** the case was built on a "what-if" scenario, **THEN** repeat Step 5.2.17, Step 5.2.18, and Step 5.2.20, **THEN** click on the "Delete Case" icon, **AND** repeat Step 5.2.21.
- e. **IF** the case was built on the actual events in progress, **THEN** repeat Steps 5.2.17 - 5.2.20.

Performed By:

_____/_____/_____
Performer (Print and Sign) Date / Time

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

6.0 REFERENCES

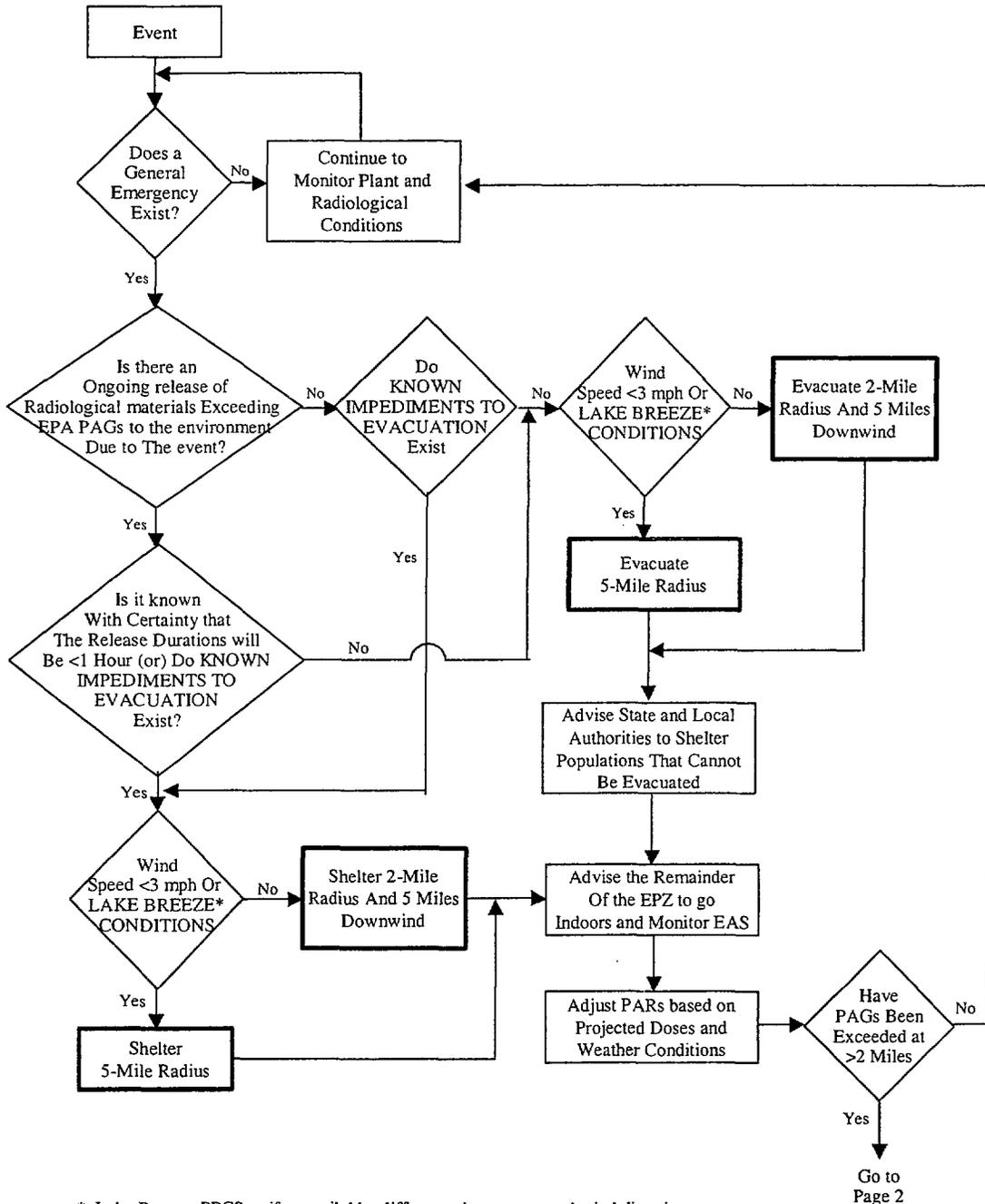
- 6.1 EDS Report to Wisconsin Electric Power Company concerning NUREG-0578, March 7, 1980.
- 6.2 EPIP 1.1, Course of Actions
- 6.3 EPIP 2.1, Notifications - ERO, State & Counties, and NRC
- 6.4 EPIP 1.3.1, Dose Assessment Using RMS-SS
- 6.5 ETD 02, Offsite Agency Call List.
- 6.6 NUREG/BR-0150, Volume 1, Revision 4, RTM-96, Response Technical Manual, Figures A-5 and A-6, March 1996.
- 6.7 Radiation Monitoring System Alarm Setpoint & Response Book
- 6.8 Radiological Engineer to Plant Manager/EP Coordinator memo dated June 13, 1988.
- 6.9 Reactor Engineer to Plant Manager memo dated April 6, 1984.
- 6.10 TID 14844, Calculation of Distance Factors for Power and Test Reactor Sites, March 23, 1962.
- 6.11 U. S. NRC Regulatory Guide 1.109, Calculation of Annual Doses to Man from Routine Release of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I, Revision 1, October 1977.
- 6.12 U. S. NRC Regulatory Guide 1.4, Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss-of Coolant Accident for Pressurized Water Reactors, Revision 2, June 1976.

7.0 BASES

- B-1 NUREG-0654, Revision 1, Supp. 3, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, July, 1996.
- B-2 Point Beach Nuclear Plant, Emergency Plan, Appendix J, Evacuation Time Estimates for the Area Surrounding the Point Beach Nuclear Plant.
- B-3 RIS 2004-13, Supplement 1, Consideration of Sheltering in Licensee's Range of Protective Action Recommendations, August 2004
- B-4 EPA 400-R-92-001, Manual of Protective Action Guidelines for Nuclear Incidents, May, 1992.

ATTACHMENT A
 PROTECTIVE ACTION RECOMMENDATIONS

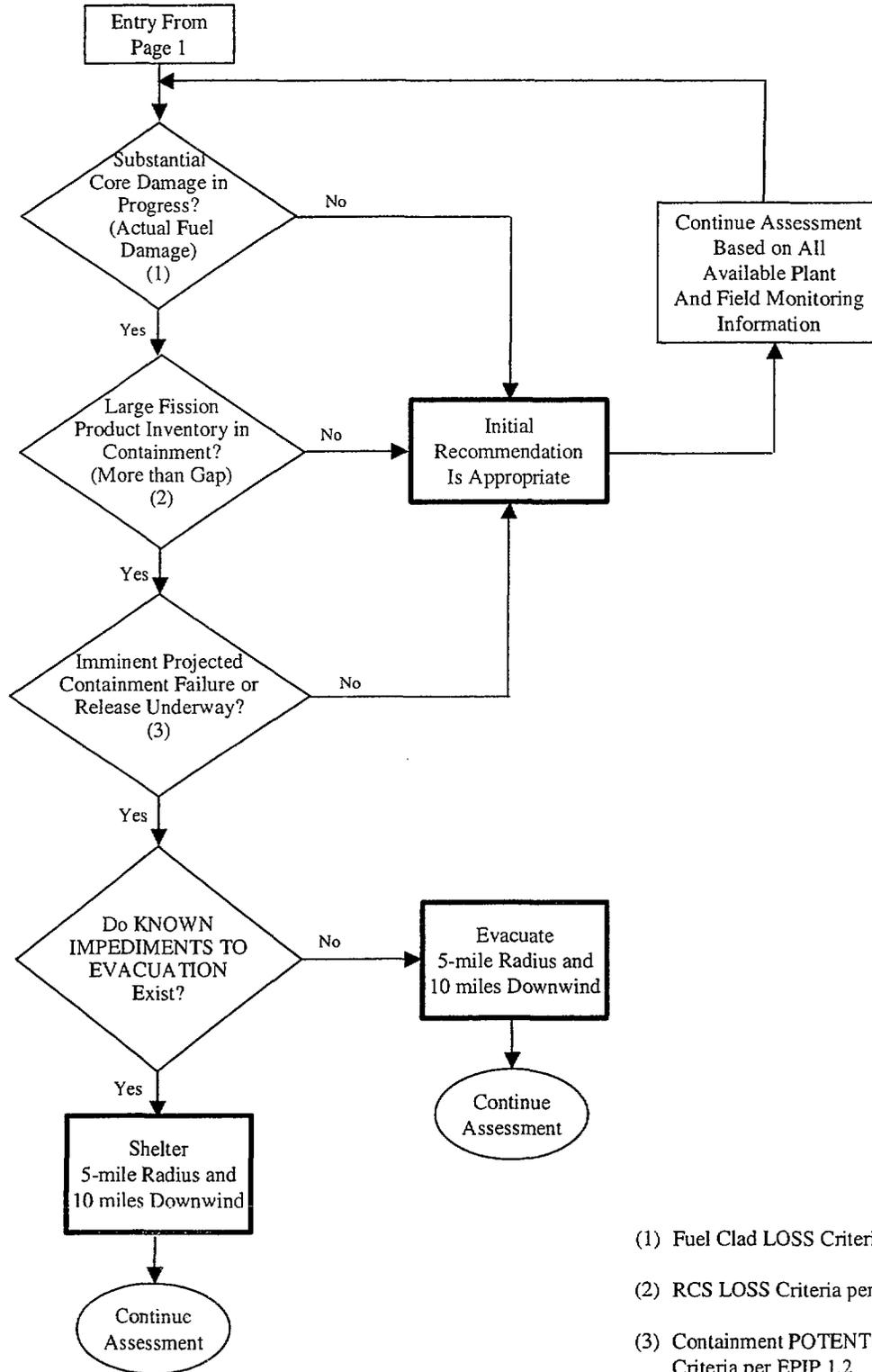
Page 1 of 2



* Lake Breeze: PPCS or if unavailable, difference between actual wind direction values for inland and near shore meteorological towers is greater than 90°.

ATTACHMENT A
 PROTECTIVE ACTION RECOMMENDATIONS

Page 2 of 2



- (1) Fuel Clad LOSS Criteria per EPIP 1.2
- (2) RCS LOSS Criteria per EPIP 1.2
- (3) Containment POTENTIAL LOSS Criteria per EPIP 1.2

ATTACHMENT B
 AFFECTED SECTORS BASED ON WIND DIRECTION

NOTE 1: If wind speed is less than three (3) mph or lake breeze conditions exist, then recommend protective actions for all sectors (360°) 0-5 miles. Lake breeze conditions exist if the difference between actual wind direction values for inland and near shore meteorological towers is greater than 90°.

<u>Wind Direction* (Degrees From)</u>	<u>Affected Downwind Sectors</u>
>351 – 9 (>351 – 369**)	H, J, K
>9 – 13 (>369 – 373**)	H, J, K, L
>13 – 32 (>373 – 392**)	J, K, L
>32 – 36 (>392 – 396**)	J, K, L, M
>36 – 54 (>396 – 414**)	K, L, M
>54 – 58 (>414 – 418**)	K, L, M, N
>58 – 77 (>418 – 437**)	L, M, N
>77 – 81 (>437 – 441**)	L, M, N, P
>81 – 99 (>441 – 459**)	M, N, P
>99 – 103 (>459 – 463**)	M, N, P, Q
>103 – 122 (>463 – 482**)	N, P, Q
>122 – 126 (>482 – 486**)	N, P, Q, R
>126 – 144 (>486 – 504**)	P, Q, R
>144 – 148 (>504 – 508**)	P, Q, R, A
>148 – 167 (>508 – 527**)	Q, R, A
>167 – 171 (>527 – 531**)	Q, R, A, B
>171 – 189 (>531 – 549**)	R, A, B
>189 - 193	R, A, B, C
>193 - 212	A, B, C
>212 - 216	A, B, C, D
>216 - 234	B, C, D
>234 - 238	B, C, D, E
>238 - 257	C, D, E
>257 - 261	C, D, E, F
>261 - 279	D, E, F
>279 - 283	D, E, F, G
>283 - 302	E, F, G
>302 - 306	E, F, G, H
>306 - 324	F, G, H
>324 - 328	F, G, H, J
>328 - 347	G, H, J
>347 - 351	G, H, J, K

* As read on PPCS or Control Room instruments.

** > 360° as read on chart recorder.

ATTACHMENT C
REINSTALLATION OF WEDAP SOFTWARE

1.0 NOTEBOOK PERSONAL COMPUTER (PC) ACCESS

The Wisconsin Electric Dose Assessment Program (WEDAP) is a resident of the hard drive of the Level A notebook personal computers (PC) in the Control Room and EOF (TSC as a backup) dose assessment areas.

1.1 **IF** the WEDAP directory and files are **NOT** found on the hard drive of the notebook PC in the EOF (TSC),
THEN the notebook PC must be recloned and WEDAP reinstalled using the CD-Roms located in the EOF (TSC) inventory cabinet.

1.1.1 Recloning the notebook PC

- a. Insert the cloning "Install" CD-Rom.
- b. Reboot the notebook PC.
- c. Wait for the prompt, following any instruction prompts given.

1.1.2 Installing WEDAP from the cloning CD.

- a. Insert the "WEDAP" application CD-Rom.
- b. Select the "Start Bar - Enterprise Applications - Application Install - Install/Update Application" (top choice).
- c. Click on "Install" to run the auto-install.

1.2 Return to EPIP 1.3, Step 5.2.1

OR IF WEDAP is still unavailable,
THEN go to EPIP 1.3.1, Dose Assessment Using RMS-SS.

2.0 PRINTING DATA TO LOCAL PRINTER IN THE EOF (TSC)

2.1 Ensure the laserjet printer in the EOF (TSC) is connected to the notebook PC via the printer cable and the printer is in the "ON" position.

2.2 From WEDAP, select "File - Print" **OR** the "Printer Icon" to print a case.

ATTACHMENT C
REINSTALLATION OF WEDAP SOFTWARE

- 2.3 Return to EPIP 1.3, Step 5.2.20 **IF** able to print.
- 2.4 **IF** still unable to print,
THEN reset the printer connection.
 - 2.4.1 Select "Start - Settings - Printers - HP LaserJet 4000" and verify the printer properties have LPT1 selected for the port connection.
 - 2.4.2 From WEDAP, select "File - Print" **OR** the "Printer Icon" to print a case.
 - 2.4.3 Return to EPIP 1.3, Step 5.2.20 **IF** able to print.
- 2.5 **IF** still unable to print,
THEN reinstall the printer drivers.
 - 2.5.1 Obtain the cloning "Install" CD-Rom from the EOF (TSC) inventory cabinet and place in the notebook PC while still logged on.
 - 2.5.2 Select Start - Settings - Printers
 - 2.5.3 Execute "Add Local Printer"
 - 2.5.4 Select "My Computer" and "Next" arrow
 - 2.5.5 Select "LPT1" local port and "Next" arrow
 - 2.5.6 At "Add Print Wizard" select "Have Disk...."
 - 2.5.7 At "Install From Disk" select "Browse..."
 - 2.5.8 When message of "A:\ Isn't Accessible" select "Cancel"
 - 2.5.9 At "Local File Window" Select "My Computer"
 - 2.5.10 Select "D:\Prntdrvs\1386\HP4000~1\PC16\Oemnt40.inf" **OR** other appropriate printer.
 - 2.5.11 Select "OK" at "Install from Disk"
 - 2.5.12 Select "HP LaserJet 4000 Series PCL 6" **OR** other appropriate printer and "Next" arrow.
 - 2.5.13 Name the printer HPLJ4000 **OR** other appropriate name and "Next" arrow

ATTACHMENT C
REINSTALLATION OF WEDAP SOFTWARE

- 2.5.14 Select "Not Shared" and "Next" arrow
 - 2.5.15 Select "Yes" to print a test page and "Finish" when completed
 - 2.5.16 Select the newly installed printer as the "Default"
 - 2.5.17 **IF** printer prints test page,
THEN retry printing per Attachment C, Step 2.2
 - 2.5.18 **IF** printer still does not print,
THEN initiate a call for computer support.
- 2.6 Return to EPIP 1.3, Step 5.2.20.

SECTION 6

6.0 EMERGENCY MEASURES

This section identifies the measures that shall be taken for each class of emergency. These measures are described in detail in specific KNPP Integrated Plant Emergency Operating Procedures (IPEOPs) and Emergency Plan Implementing Procedures (EPIPs).

These emergency measures include:

1. The recognition and declaration of an emergency classification (including verification).
2. Notification of the applicable agencies for each emergency classification (including verification).
3. Mobilization of the appropriate portions of the emergency response organization.
4. Assessment actions.
5. Corrective actions.
6. Protective actions.
7. Aid to affected personnel.

The following subsections describe these emergency measures.

6.1 ACTIVATION OF EMERGENCY RESPONSE ORGANIZATION (ERO)

The various classes of emergencies can occur individually or in some order of progression over a period of time. The emergency response organization shall be activated upon the decision of the Emergency Director. The emergency response organization consists of plant and corporate staff personnel who are readily available during normal working hours and on a call-in basis during other than normal working hours. These emergency response personnel are notified by the use of the plant public address system (Gai-tronics), telephones and radio pagers. The notification of the ERO personnel is illustrated in FIGURE 6-1. Activation of off-site emergency response organizations will be accomplished according to the severity of the emergency class. Specific Emergency Plan Implementing Procedures provide message formats for notification of off-site agencies as well as message verification procedures (see Section 6.8). The initial notification of supporting groups and agencies is shown in FIGURE 6-2.

6.2 ASSESSMENT ACTIONS

Continuous accident assessment is necessary throughout the duration of an emergency. Each emergency class will involve similar assessment methods, however, each classification necessitates a different magnitude of effort. The following subsections describe the methods, systems and equipment for assessing and monitoring actual or potential consequences resulting from an emergency.

6.2.1 In-Plant Monitoring

The Kewaunee Nuclear Power Plant is equipped with instrumentation for monitoring plant systems parameters and radioactive releases to the environment. Plant systems parameters include primary and secondary system pressures, temperatures, water levels, and flow rates. Radiological parameters include general area radiation levels and gaseous and liquid effluent activities. This instrumentation is capable of initiating the appropriate alarms or actuating control equipment when pre-established limits are reached. When this instrumentation indicates an actual or potential emergency condition, immediate steps will be taken to assess the situation and confirm the indications.

6.2.2 Source Term Evaluation

The appropriate EIPs describe the methods used to determine the extent of gaseous and liquid effluent releases. For gaseous effluent releases, the technique involves obtaining grab samples of the gaseous effluents being discharged from the Auxiliary or Shield Building Vent. The analysis of the samples is performed in the counting room or Radiological Analysis Facility to determine which isotopes are being discharged and concentrations of each. Samples can also be transported to the Point Beach Nuclear Plant (PBNP) Laboratory Facility for analysis.

Additionally, EIPs have been developed to determine concentrations or release rates of radionuclides by observing readouts and stack flow rates from Auxiliary and Shield Building Vent Stack SPING monitors. These monitors measure particulates, iodines, and noble gases.

Liquid effluent releases are determined by taking grab samples at appropriate points in the release path. These release paths may include the Steam Generator Blowdown, Liquid Rad Waste, Containment Fan Coil Cooling Water, Auxiliary Building Service Water and Turbine Building Sump. A Gamma scan is taken on these liquid samples to determine the quantity of isotopes present or being discharged.

Since source term evaluation relies on specific plant indications and instrumentation, and since it can be postulated that any combination of these plant indicators or instruments can be off-scale or inoperable, radiological environmental monitoring can be utilized to determine gaseous and liquid effluent releases. Environmental samples are obtained by environmental monitoring team within the plume exposure pathway. This environmental monitoring data can be used to calculate radiation exposures or determine source terms (see Subsection 6.2.4 for further details).

6.2.3 Dose Assessment

Accidents involving releases of radioactive materials to the environment require special methods of assessment to ensure that responses are appropriate for the protection of the population-at-risk, as well as plant personnel. The radiological assessment will include estimating whole body and thyroid doses for both site and off-site areas. However, as personnel, facilities, and information become available, more sophisticated analyses will be performed to determine the total integrated dose for the total population in the plume exposure pathway. These analyses will initially be the responsibility of the Radiological Protection Director at the Kewaunee Nuclear Power Plant. Dose assessment responsibilities will be transferred to the Environmental Protection Director upon activation of the Emergency Operations Facility for dose assessment functions. In addition, EIPs have been developed to not only allow for recognizing Unusual Event, Alert, Site Area Emergency and General Emergency EALs based upon radiation readouts from the Auxiliary Building Vent Monitors (see Chart A(2) of EPIP-AD-02), but also to provide for a protective action recommendation to be made based on the declared event and general plant conditions.

Dose projections will be prepared using plant effluent monitor data or grab sample results to project doses from releases of noble gases, iodines and particulates. Environmental radiological measurements and samples shall be used to confirm or adjust initial dose projections. These dose projections are one of the tools used to determine whether protective actions need to be recommended. The EIPs incorporate a computerized method for determining projected doses. This method is available on the network, stand-alone and laptop computers as appropriate for the Emergency Operations Facility and the Radiological Analysis Facility. Backup power is available in both of these facilities. The atmospheric dispersion factors, dose conversion factors, and isotopic concentrations or release rates are calculated using methods described in NUREG 1741. The atmospheric dispersion factors are calculated according to the stability class, wind speed, and distance from the plant. Dose projections are based on isotopic mixture predictions from the Westinghouse Owners Group response to NUREG 1150 and references TID 14844.

6.2.4 Field Monitoring

Field monitoring within the plume exposure pathway will be performed by Environmental Monitoring Team(s). Team members are trained to perform field surveys, air sampling and environmental sampling. Each team is provided with air sampling equipment, personnel dosimetry, radiological survey instruments, procedures, portable radios, and transportation. Methods for detecting and measuring radioiodine concentrations of $1 \times 10^{-7} \mu\text{Ci/cc}$ in air have been established.

The Site Boundary Facility (SBF) will serve as an equipment supply center for field monitoring activities. Teams will be deployed in a manner that will provide a preliminary estimate of plume exposure rates. An EPZ Grid Map referenced by grid coordinates will be utilized (see Appendix C, page C-5). The information collected will be forwarded to the Environmental Protection Director located at the Emergency Operations Facility. Sample analysis will be coordinated through the Radiological Analysis Facility using site facilities or facilities available through letter of agreement (see Appendix D).

6.2.5 Severe Accident Management

Analysis of severe accident events will be accomplished in a designated area of the Technical Support Center. A three-person analysis team comprised of a Team Leader, a core hydraulics specialist and an individual with operations knowledge will perform this function. Access to computer based plant-monitoring systems and access to information directly from the Control Room will be available. Pre-established severe accident event analysis guidelines as well as computational aids will be maintained and available in the Control Room and the Technical Support Center. In the early stages of an event, core damage assessment may be performed in the Emergency Operations Facility.

Using guidelines, computational aids, plant data, and other information, the team will formulate and recommend mitigating actions to the Emergency Director. The Emergency Director will facilitate consensus and provide final approval for the implementation of accident mitigative actions recommended by the Severe Accident Management Team.

Following the implementation of mitigating actions the Severe Accident Management Team will monitor the effect of those actions and, if needed, provide modifying or new recommendations.

6.3 CORRECTIVE ACTIONS

Corrective actions are taken to prevent or mitigate the serious consequences that could result from an emergency. Normal operating procedures as well as emergency operating procedures and Severe Accident Management Guidelines describe the corrective actions that can be used to place the plant in a safe and stable condition.

Operator training is a vital factor in ensuring that corrective actions are taken in an expeditious manner.

Instrumentation, control system monitors and the Radiation Monitoring System provide indications and readings needed by operators for safe operation of the plant. These systems provide the operator with the information and controls needed to start up, operate at power, shutdown the plant and initiate corrective actions.

When necessary, the following additional mitigating actions can be implemented during an emergency situation:

Fire Fighting

Strategies have been developed for fire fighting and fire protection in specific critical areas of the plant. Administrative procedures describe the fire protection organization and individual responsibilities. If outside support is needed, the City of Kewaunee Fire Department will be called in to assist in extinguishing the fire.

Damage Control and Repair

For minor emergencies, plant personnel will normally be able to handle cleanup, repair, and damage control. For major emergencies, the support of other NMC personnel or specialized outside contractors may be required to assist in damage control, cleanup, and repair operations.

6.4 PROTECTIVE ACTIONS

Protective actions are taken during or after an emergency situation to minimize or eliminate any hazards to the health and safety of plant personnel and the general public. Such actions taken at the site are the responsibility of NMC, while those taken off-site fall under the jurisdiction of the State of Wisconsin and other off-site emergency response organizations. The following subsections describe on-site and off-site protective actions.

6.4.1 Site

1. Notification and Response Times

If personnel assembly and accountability are required, all individuals at the site (including employees without emergency assignments, visitors and contractor and construction personnel) shall be notified of an emergency over the public address system and by the sounding of the plant siren. The best estimate for initial notification of all individuals at the site is expected to be within ten to twelve minutes of the occurrence of an emergency situation.

2. Personnel Accountability

Personnel accountability is the responsibility of the Site Protection Director with assistance from the Accountability Coordinators. During an emergency situation, which requires plant personnel to report to an assembly area, the Accountability Coordinators are responsible for ensuring that all personnel are accounted for and the results are reported to the Site Protection Director. The security force shall furnish a list of all visitors and construction workers to ensure complete accountability. If personnel are unaccounted for, teams shall be dispatched to locate, and if necessary, rescue the personnel. Personnel accountability can be accomplished within 30 minutes using the existing implementing procedure.

3. Site Access Control

Access to site areas is directed and controlled by the Site Protection Director. Individuals entering or leaving the site shall use the normal access/egress routes through the Security Building. If radiological conditions prohibit direct access to the plant through the Security Building, the Site Protection Director and the Radiation Protection Director, will determine and establish another location appropriate for the existing emergency conditions. After initial staffing of the emergency response facilities, authorization for non-emergency response organization personnel or non-plant badged personnel to enter or exit the site may be received from a director of the emergency response organization or the Shift Manager. Access control operations are described in the EPIPs.

4. Evacuation

Evacuation from the Kewaunee Nuclear Power Plant will depend on the nature of the emergency and the extent of the area affected. The Emergency Director will order the evacuation of plant personnel after careful consideration of the benefits and risks involved. The detailed responsibilities and functions of plant personnel during an evacuation are contained in the appropriate EPIP.

When an evacuation is ordered, personnel shall proceed to designated assembly areas and await further instructions.

A plant evacuation is considered when the conditions that require an evacuation are not confined to a plant building or when general area radiation levels outside the radiological controlled area exceed prescribed limits. In addition, a plant evacuation may be initiated if a hazard continues to increase in severity, or spreads, or the Emergency Director deems it necessary that nonessential personnel be evacuated from the plant. Transportation shall be provided by NMC (WPSC) or private vehicles. The Emergency Director and the Site Protection Director with the assistance of the Radiological Protection Director shall coordinate evacuation and monitoring activities with off-site officials. The evacuation EIPs take into consideration evacuation routes (primary and alternate routes) and alternatives for inclement weather and radiological conditions.

6.4.2 Off-Site

Required Protective Actions for off-site areas are discussed in the state and local plans. As stated, the plant will classify the incident and will notify the appropriate Federal, state and local authorities. The State plan has adopted the U.S. Environmental Protection Agency's Protective Action Guides for initiating actions to protect the health and safety of the public. These are provided in Table 6-1.

There are various types of actions that can be taken to protect the public. These include:

1. Taking shelter
2. Evacuation
3. Access control
4. Food, milk, water, and livestock distribution control
5. Individual protective actions (e.g., respiratory protection equipment and protective clothing)

The Environmental Protection Agency, Protective Action Guides serve as the basis for recommending protective actions to the public. The type, amount, and duration of the release and weather conditions must be considered when recommending protective actions. In particular, when considering the protective action options of sheltering and evacuation, plume travel time, evacuation time estimates, and shielding factors must be taken into account.

Projected doses to the public can be correlated to the dose ranges and accompanying recommended actions in Table 6-1.

The Emergency Response Manager and the Emergency Director have the responsibility to recommend protective actions to off-site authorities (see Section 5.2.1). However, implementation of the protective actions is at the discretion of the off-site authorities.

Protective Action Guidelines used by off-site authorities are described in Chapter E, "Protective Action Guides," found in the Wisconsin Department of Health and Family Services, Radiation Protection Section, "Nuclear Incident Response Plan."

6.5 USE OF PROTECTIVE EQUIPMENT AND SUPPLIES

Protective equipment and supplies shall be utilized to minimize external and internal radiological exposure and contamination to individuals at the site. These supplies include respiratory equipment, protective clothing and radioprotective salt (potassium iodide, KI). Details on the use of protective equipment and supplies are provided in the Kewaunee Nuclear Power Plant General Access Training Manual and the appropriate Emergency Plan Implementing Procedures.

6.5.1 Individual Respiratory Protection

Respiratory protection devices shall be issued as required to emergency teams entering areas of suspected or known high airborne radioactivity concentrations. Self-contained breathing apparatus shall be used in areas with oxygen deficient atmospheres or unknown conditions. Respiratory equipment is maintained at various assembly areas and emergency response facilities.

6.5.2 Protective Clothing

Protective clothing shall be issued as required to personnel working in areas of suspected or known radioactive contamination. Protective clothing includes items such as coveralls, plastic suits, plastic hoods, rubber gloves and plastic booties. The protective clothing is stored at the Radiation Protection Office, Radiological Analysis Facility, and the Site Boundary Facility.

6.5.3 Use of Radioprotective Drugs

The radioprotective salt, potassium iodide (KI), can be utilized to affect iodine saturation of the thyroid thus preventing the uptake and accumulation of radioactive iodine in the thyroid gland. The criteria for making KI available to NMC (WPSC) emergency response personnel depends on the projected absorbed dose to the thyroid and the severity and magnitude of the incident. Quantities of KI are available at the Technical Support Center, Control Room, and the Site Boundary Facility.

6.6 CONTAMINATION CONTROL MEASURES

Preventive measures shall be taken to minimize direct exposure to or ingestion of radioactive materials. These contamination control measures are described in detail in the Kewaunee Nuclear Power Plant General Access Training Manual and are summarized below in the following subsections.

6.6.1 Site

To avoid personnel contamination or the spread of contamination in the plant, contaminated areas shall be designated and clearly identified. Access to these areas shall be controlled and personnel shall use appropriate protective clothing and care to ensure that they neither contaminate themselves nor spread the contamination. Limits for contamination and required protective clothing guidelines are contained in the Kewaunee Nuclear Power Plant General Access Training Manual.

Drinking water and food supplies are not allowed in contaminated or potentially contaminated areas. If the potential for contamination exists in areas containing drinking water or food, the area and food/water shall be surveyed. If contamination is discovered, appropriate actions shall be taken based on the level and location of the contamination.

In general, contaminated areas and materials are permitted to return to normal use when these areas meet the contamination limits, which are applied to them under normal operating conditions. However, some areas and equipment may have to be returned to its original function prior to achieving these limits. In such cases, special precautions and measures will be taken to prevent personnel contamination and to limit the spread of contamination. These precautions include protective clothing, painting and covering the item/area.

6.6.2 Off-Site

For areas beyond the Site Boundary, the Wisconsin Department of Military Affairs, Division of Emergency Management with the resources of the Department of Health and Family Services, Radiation Protection Section, is responsible for assessment and evaluation and will determine which Protective Actions should be taken within the Emergency Planning Zones.

The State of Wisconsin Radiological Response Team(s) will identify levels and control access within the affected area. Other state agencies will take actions, as necessary, under the direction of the Administrator of the Division of Emergency Management, to assess and control dairy and agricultural products within the affected area. In addition, the Administrator of the Division of Emergency Management, assisted by the appropriate state agencies, will provide advisory information regarding the use of potentially affected home food and water supplies throughout the Ingestion Exposure Pathway EPZ. These state agencies will also be responsible for ensuring that contamination levels are below the established criteria before normal usage is restored. The Nuclear Management Company will inform the State of Wisconsin of any identified areas of surface contamination outside the protected area of the plant and within the EPZ.

6.7 AID TO AFFECTED PERSONNEL

Provisions have been made to assist personnel who are injured and/or have received high radiation exposures. Designated personnel have been trained in first aid and radiation emergency team procedures. First aid and decontamination facilities are available at the site. Additional assistance is available from off-site facilities and emergency transportation services. The following subsections describe the means for providing assistance for emergency response personnel at the Kewaunee Nuclear Power Plant.

6.7.1 Radiological Exposure Control

All reasonable measures shall be taken to control the radiation exposure to emergency response personnel providing rescue, first aid, decontamination, emergency transportation, medical treatment services, or corrective or assessment actions within applicable limits specified in 10CFR Part 20. Conditions and methods for permitting volunteers to receive emergency radiation exposures are described in Health Physics procedures. These procedures and associated training allow volunteers to make rapid decisions based upon a knowledge of potential risks associated with emergency level exposure and the benefits expected from the action.

1. Emergency Exposure Criteria for Personnel

The Emergency Director has the responsibility upon notification of an existing emergency to authorize plant and emergency response personnel to receive doses in excess of 10CFR Part 20 limits if necessary. This authorization is coordinated with the Radiological Protection Director. Table 6-1 contains the guidelines for emergency exposure criteria, which is consistent with the "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (EPA-400-R-92-001)".

2. Emergency Exposure Criteria for Airborne Concentration

In the event of a major radiation emergency, exposure to airborne concentrations of radioactivity shall be limited by the following:

- a. Whenever practicable, total internal exposure of any individual during an emergency should be limited to 40 DAC-hours.
- b. If emergency operations demand, total internal exposure of any individual shall be limited to 1,200 DAC-hours. This is equivalent to 3 Rem/CEDE internal radiation exposure.
- c. Respiratory protection devices shall be used whenever appropriate to control internal doses (see subsection 6.5 for details on the use of protective equipment and supplies). Potassium Iodide may be used, as deemed appropriate to supplement respiratory protective devices.
- d. Limits for exposure to Xe-133 and other noble gases are based on the Beta plus Gamma dose limits to the skin.

- e. An integrated exposure of 10,000 DAC-hours for nuclides with short effective half-lives is CEDE equivalent to a dose of 25 Rem and should be received only with the approval of the Emergency Director and concurrence from the Radiological Protection Director. Similar exposure to nuclides with long effective half-lives (> 1 day) are to be avoided and should be restricted to 1,200 DAC-hours as in "b" above.
- f. Personnel who have been exposed to more than 4,000 DAC-hours shall be removed from further emergency duty, whole-body counted, and referred to a physician for medical consultation.

3. Exposure Records and Control

In an emergency situation, dosimetry service for all emergency response personnel shall be provided on a 24-hour per day basis. It is the responsibility of the Radiological Protection Director and his designated personnel to establish and maintain the personnel monitoring program. Dosimetry will be issued in accordance with procedure HP-03.11, "Dosimetry Issuance and Record Keeping". Personnel monitoring devices will be issued from either the Security Building, the Radiation Protection Office, Radiological Analysis Facility or the Site Boundary Facility. For documentation purposes, exposure records shall be kept. This information shall be evaluated and utilized to determine emergency assignments and to assure that personnel do not exceed exposure guidelines. The EIPs shall detail the procedural steps for dosimetry issuance, record keeping, and personnel monitoring.

6.7.2 Decontamination

Decontamination of personnel, supplies, equipment and instruments shall be performed by following established radiation practices and procedures. Decontamination is conducted under the direction of the Radiological Protection Director. The action levels for determining the need for decontamination are specified in the appropriate EIPs. Radioactive waste shall be disposed of in accordance with established plant procedures.

Personnel decontamination will be performed primarily in the Personnel Decontamination Area, located in the Auxiliary Building and the Radiological Analysis Facility. These areas are equipped with a sink, a shower and the required cleaning agents for decontaminating personnel. Relocated site personnel can be decontaminated at the Site Boundary Facility. Decontamination supplies, spare clothing and contamination survey instruments are available at the Site Boundary Facility. In addition, equipment and instruments can be decontaminated in the plant decontamination room in the Auxiliary Building.

6.7.3 Medical Transportation

Vehicles are maintained at the plant to transport ill or personnel with minor injuries to off-site medical facilities if required. If immediate professional medical help is required, local ambulance services are available to assist in the transport of seriously injured personnel.

6.7.4 Medical Treatment

Arrangements have been made with the Aurora Medical Center for the medical treatment of plant personnel. Hospital personnel have been instructed and trained in the treatment and care of patients with contamination and radiation overexposure.

Ill or injured personnel transported to the Aurora Medical Center while in a contaminated condition shall be accompanied by a NMC (WPSC) or support person trained in radiological monitoring who will stay in attendance and maintain radiological control. Hospital equipment and supplies utilized in treating a contaminated patient shall be surveyed and decontaminated before being released in accordance with Health Physics procedures." University of Wisconsin Hospital and Clinics has agreed to serve as a referral source in the event of a serious radiation accident at the Kewaunee Nuclear Power Plant. Its services are available 24 hours a day for either consultation or treatment.

6.8 METHODS OF NOTIFICATION

This section outlines the general methodology for notifying the NRC and state and local emergency response organizations. It also describes the basic means that will be used to notify and provide general instructions to the general public living within the plume exposure pathway Emergency Planning Zone.

6.8.1 Nuclear Regulatory Commission (NRC) Notification

The NRC is notified in accordance with 10CFR Part 50.72, "Immediate Notification Requirements for Operating Nuclear Power Reactors" and 10CFR Part 20.2202, "Notification of Incidents". These documents include immediate and 24 hour notification requirements.

6.8.2 Notifications of Off-Site Agencies

Off-Site emergency response organizations shall be notified as appropriate depending on the nature and severity of the incident. The initial notification message to the appropriate state and local organizations shall contain information about the class of the emergency, whether a release is occurring, potentially affected population and areas, and whether protective measures may be necessary. Follow-up communication with off-site agencies shall consist of periodic messages, which contain the following information (if it is known and appropriate):

- a. Location of incident and name and telephone number (or communications channel identification) of caller;
- b. Date and time of incident;
- c. Class of emergency;
- d. Type of actual or projected release (airborne, waterborne, surface spill) and estimated duration and arrival time;
- e. Estimate of quantity of radioactive materials released or being released,
- f. Chemical and physical form of released material, including estimates of the relative quantities and concentrations of noble gases, iodines, and particulates;
- g. Prevailing weather (wind velocity, direction, temperature, atmospheric stability, presence, and form of precipitation);
- h. Actual or projected dose rates at Site boundary and projected integrated dose at Site boundary,
- i. Projected dose rates and integrated dose at about 2, 5, and 10 miles from the plant, including sector(s) (and/or counties) affected;
- j. Estimate of any surface radioactive contamination;
- k. Emergency response actions underway;
- l. Recommended emergency actions, including protective measures;
- m. Request for any needed support by off-site organizations; and
- n. Prognosis for worsening or termination of event based upon plant information.

Emergency Plan Implementing Procedures provide notification message formats, message authentication schemes for each emergency classification and verification of notification arrangements with each agency notified. In addition, the State of Wisconsin and Kewaunee and Manitowoc County emergency response plans have prepared text messages for informing the public of a nuclear power plant incident. These messages include instructions on protective actions and where to get additional emergency information. The follow-up messages from the Kewaunee Nuclear Power Plant to the appropriate state and county agencies will provide the supporting information for the prepared text messages.

6.8.3 Notification of General Public

Initial notification of the public will be accomplished by a combination of fixed sirens, Local Law Enforcement Agency (LLEA) mobile public address system, the Emergency Alerting System (EAS) and marine band radio broadcasts. This system covers essentially all of the Kewaunee Nuclear Power Plant emergency-planning zones, which effects both Manitowoc and Kewaunee Counties.

Because of the overlap of Kewaunee Nuclear Power Plant and Point Beach Nuclear Plant emergency planning zones, the fixed siren portion of the system is shared by both utilities. In total there are twenty-seven (27) fixed siren sites within the combined emergency planning zones.

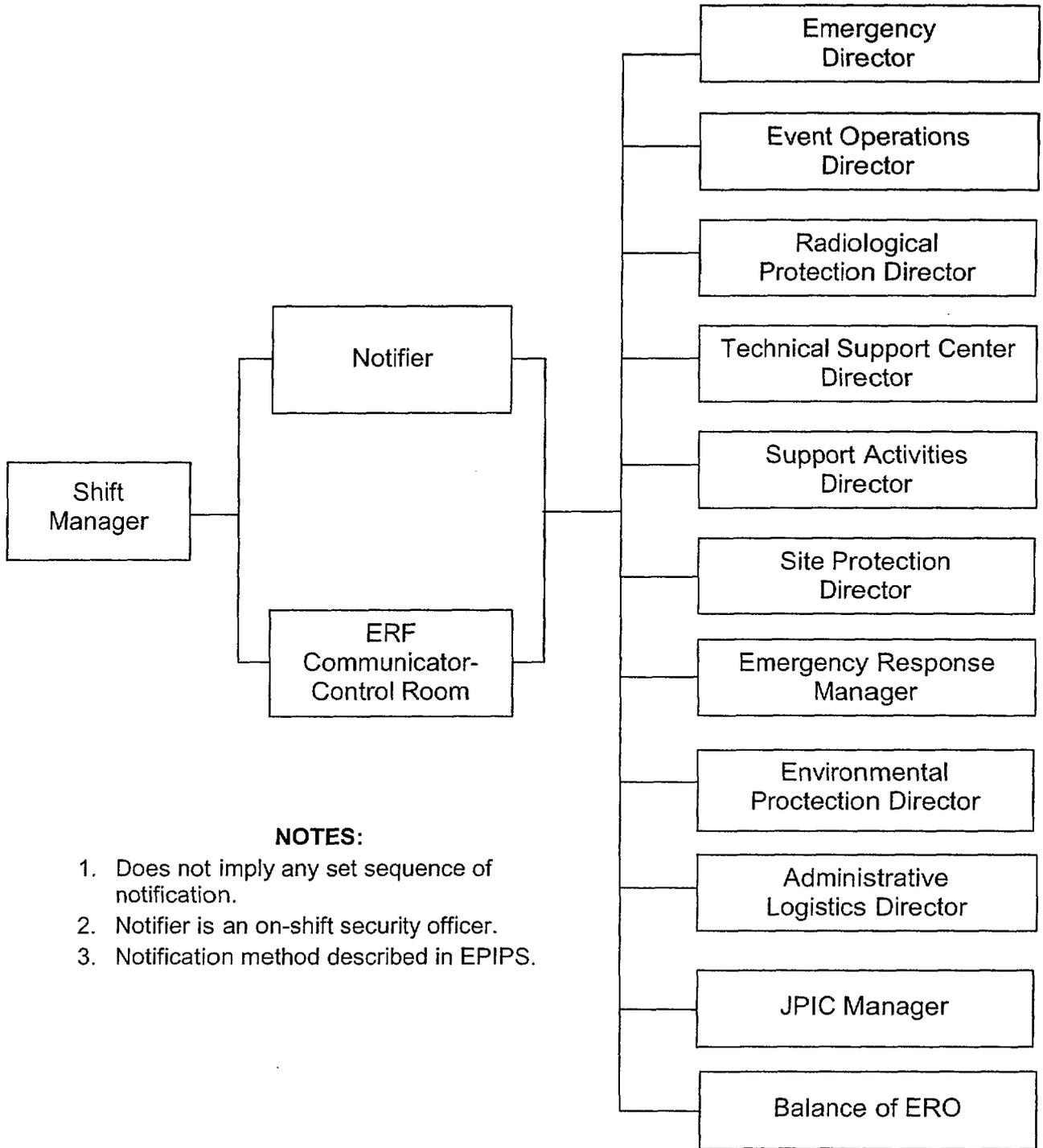
Essentially 100% of the Kewaunee Nuclear Power Plant emergency planning zone is covered by fixed sirens. Areas that are normally covered by fixed sirens that experience a siren temporarily out-of-service or experience a random activation failure will be covered by Local Law Enforcement Agency (LLEA) mobile public address system, which will travel prescribed routes at a slow rate of speed.

The activation of this system is the responsibility of the emergency governments for both Manitowoc and Kewaunee Counties and will be activated whenever an emergency situation at the Kewaunee Nuclear Power Plant requires public protective actions to be implemented.

The fixed siren portion of the system is able to be activated by the sheriff's office for both Manitowoc and Kewaunee Counties. The alerting sound produced should remind area residents to tune their radios to an EAS radio station. The sirens will be tested on a periodic basis.

An EAS message, which contains protective action recommendations and emergency information for the general public, will be broadcast. These broadcasts will occur in conjunction with the sounding of the siren.

FIGURE 6-1
PLANT AND CORPORATE NOTIFICATION

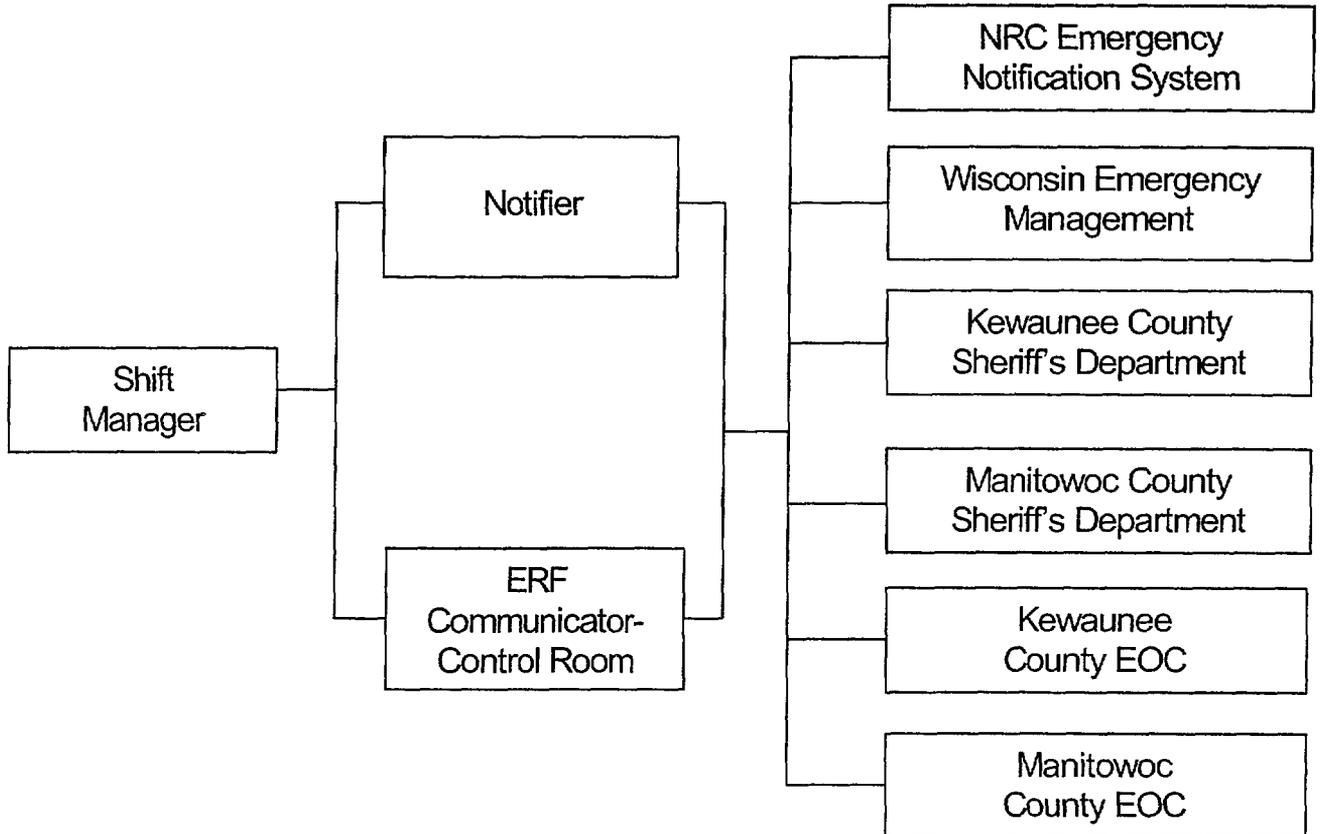


NOTES:

1. Does not imply any set sequence of notification.
2. Notifier is an on-shift security officer.
3. Notification method described in EPIPS.

FIGURE 6-2

INITIAL OFF-SITE NOTIFICATION



NOTES:

1. Does not imply any set sequence of notification.
2. Notifier is an on-shift security officer.
3. Notification method described in EPIPS.

TABLE 6-1
RECOMMENDED PROTECTIVE ACTIONS TO REDUCE WHOLE BODY AND
THYROID DOSE FROM EXPOSURE TO A GASEOUS PLUME
FOR THE GENERAL POPULATION

PROJECTED DOSE (REM) TO THE POPULATION	RECOMMENDED ACTIONS ^(a)	COMMENTS
TEDE < 1 Rem Thyroid < 5 Rem	No planned protective actions. ^(b) Monitor environmental radiation levels.	Previously recommended protective actions may be reconsidered or terminated.
TEDE > 1 Rem Thyroid > 5 Rem	Recommend evacuation in affected sectors. Monitor environmental radiation levels and adjust sectors recommended for evacuation based on these levels. Control access.	Seeking shelter would be an alternative, if evacuation were not immediately possible.
Projected Dose (Rem) to Emergency Team Workers		
TEDE < 5 Rem All other Organs < 50 Rem TODE	Control exposure of emergency workers to these levels except for those instances listed below. (Appropriate controls for emergency workers, include time limitations, respirators, and stable iodine.)	"All Other Organs", include; Skin Extremities, and Thyroid. Stable Iodine may be made available for use where predicted doses exceed 25 Rem to the thyroid. Although respirators and stable iodine should be used where effective to control dose to emergency team workers, thyroid dose may not be a limiting factor for lifesaving missions. For Environmental/Monitoring Teams refer to KR Dose "Maximum Doses at selected Distances" output screen. Check bone, lung thyroid doses.
TEDE < 10 Rem All other Organs < 100 Rem TODE	Emergency workers exposure should be controlled below these levels when their mission involves protecting valuable property.	
TEDE < 25 Rem All other Organs < 250 Rem TODE	Emergency workers exposure should be controlled below these levels when their mission involves life saving or protection of large populations.	
TEDE > 25 Rem All other Organs > 250 Rem TODE	Exposures above these levels to emergency workers will be on a voluntary bases only to persons fully aware of the risks involved.	

- (a) These actions are recommended for planning purposes. Protective action decisions at the time of the incident must take existing conditions into consideration. These conditions include containment activity, probability of containment failure, plume transport time, release duration, and any other pertinent conditions.
- (b) At the time of the incident, officials may implement low-impact protective actions consistent with maintaining radiation exposures as low as reasonably achievable.

Note: The source for this table is the Wisconsin Department of Health and Family Services, Radiation Protection Section, "Nuclear Incident Response Plan".

APPENDIX H

Evacuation Time Estimates

I. General

The evacuation time estimates for the Kewaunee Nuclear Plant were prepared based on current Nuclear Regulatory Commission Guidance. These estimates were prepared with assistance from the Kewaunee Sheriff's Department, the Manitowoc County Sheriff and their respective Emergency Management Directors.

The enclosed tables and maps include the estimated population involved, major evacuation routes and estimated times for evacuation.

The "Evacuation Time Estimate Study for the Kewaunee Nuclear Power Plant Emergency Planning Zone", prepared by TOMCOD Inc., (ETE) contains details values and on methodologies used in calculating values. The ETE is considered an addendum to this Emergency Plan maintained under a separate cover. The ETE is updated approximately every 10 years as census data is updated.

II. Responsibilities

The Governor, under a State of Emergency, would be responsible for issuing the evacuation order through Wisconsin Emergency Management. If circumstances warrant, due to rapid and substantial degradation of the level of safety at the plant, immediate evacuation may be requested by plant authorities to the County Sheriff, who may issue an evacuation order. It would be the responsibility of the County Executive and the County Emergency Management Office to coordinate all facets of the evacuation, utilizing all county, state and Federal agencies, as necessary.

The Kewaunee and Manitowoc County Emergency Management Directors will coordinate evacuation efforts such that the most effective evacuation plan is implemented using the combined resources of the two counties.

III. Concept of Operations

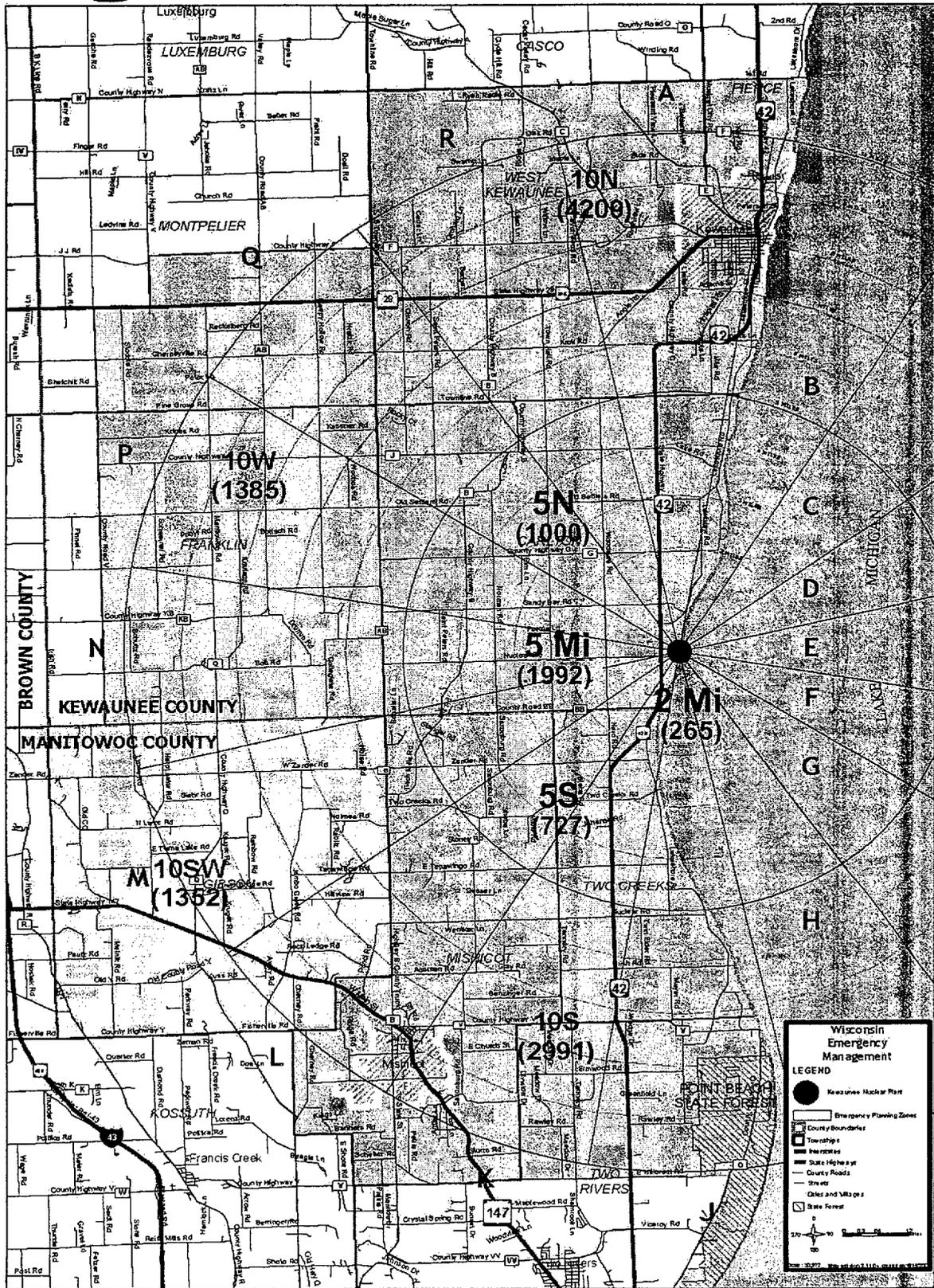
For specific details on how the evacuation operation would be carried out, please refer to the respective county Emergency Operations Plan, under "Evacuation."

IV. References

Population distribution data was obtained from the following resources:

1. Evacuation Time Estimate Study (ETE) for the Kewaunee Nuclear Power Plant Emergency Planning Zone, Rev 0, prepared by TOMCOD, Inc,

Sub-areas with Population Distribution



**EVACUATION TABLE
KNPP/EPZ**

Table based on combination of evacuation subareas

Subarea	Evacuation Time Estimates for Given Scenario (in minutes)								
	1	2	3	4	5	6	7	8	17
2 Mile	50	60	60	70	60	60	50	60	100
2 Mile, 5N and 5S	50	70	70	70	60	70	60	60	150
2 Mile, 5N and 10N	90	110	100	100	130	140	100	120	350
2 Mile, 5N, 10N & 10W	120	130	130	140	160	180	110	120	360
2 Mile, 5N, 10W & 10SW	80	90	80	90	110	120	90	90	200
2 Mile, 5N, 10SW & 10S	140	140	130	150	150	150	100	110	210
2 Mile, 5S, 10SW & 10S	140	140	150	160	180	180	160	170	150
2 Mile, 5S, & 10S	140	140	150	150	180	180	170	170	150
Entire 10 Mile EPZ	160	170	150	150	200	230	160	150	360

Scenarios:

1. Summer, Weekend, Midday, Fair Weather
2. Summer, Weekend, Midday, Poor Weather
3. Summer, Weekend, Evening, Fair Weather
4. Summer, Weekend, Evening, Poor Weather
5. Summer, Weekday, Midday, Fair Weather
6. Summer, Weekday, Midday, Poor Weather
7. Summer, Weekday, Evening, Fair Weather
8. Summer, Weekday, Evening, Poor Weather
17. Summer, Weekend, Midday, Fair Weather (Trout Festival)

**EVACUATION TABLE
KNPP/EPZ**

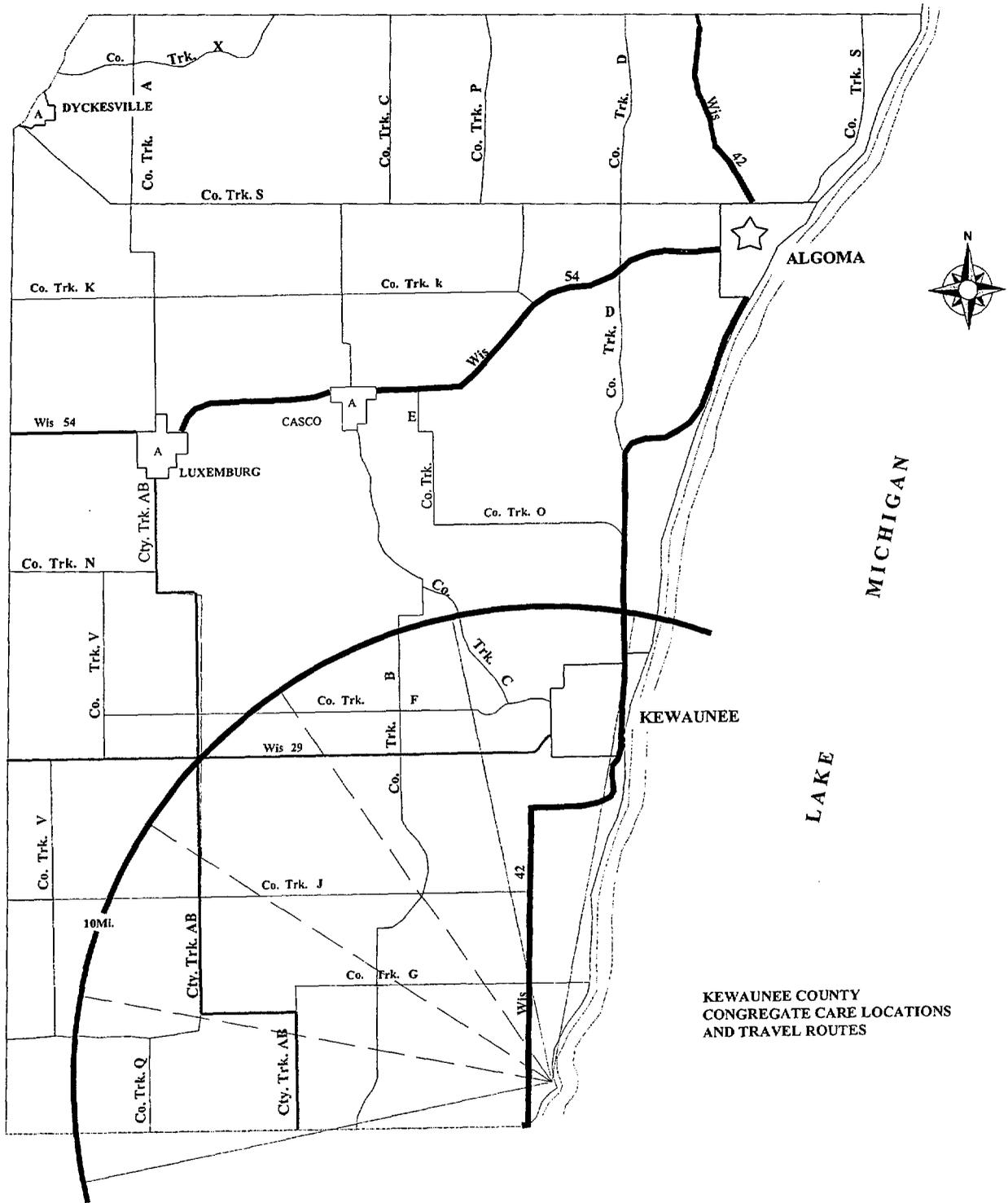
Table based on combination of evacuation subareas

Subarea	Evacuation Time Estimates for Given Scenario (in minutes)							
	9	10	11	12	13	14	15	16
2 Mile	60	90	70	90	60	100	60	60
2 Mile, 5N and 5S	60	90	70	100	60	100	60	90
2 Mile, 5N and 10N	90	160	100	140	130	200	100	140
2 Mile, 5N, 10N & 10W	120	130	130	140	170	200	110	140
2 Mile, 5N, 10W & 10SW	100	120	80	90	110	120	90	90
2 Mile, 5N, 10SW & 10S	140	150	130	180	150	190	100	110
2 Mile, 5S, 10SW & 10S	140	140	150	170	180	180	160	170
2 Mile, 5S, & 10S	140	140	150	160	180	180	170	170
Entire 10 Mile EPZ	170	190	180	200	210	330	160	170

Scenarios:

- 9. Winter, Weekend, Midday, Fair Weather
- 10. Winter, Weekend, Midday, Poor Weather
- 11. Winter, Weekend, Evening, Fair Weather
- 12. Winter, Weekend, Evening, Poor Weather
- 13. Winter, Weekday, Midday, Fair Weather
- 14. Winter, Weekday, Midday, Poor Weather
- 15. Winter, Weekday, Evening, Fair Weather
- 16. Winter, Weekday, Evening, Poor Weather

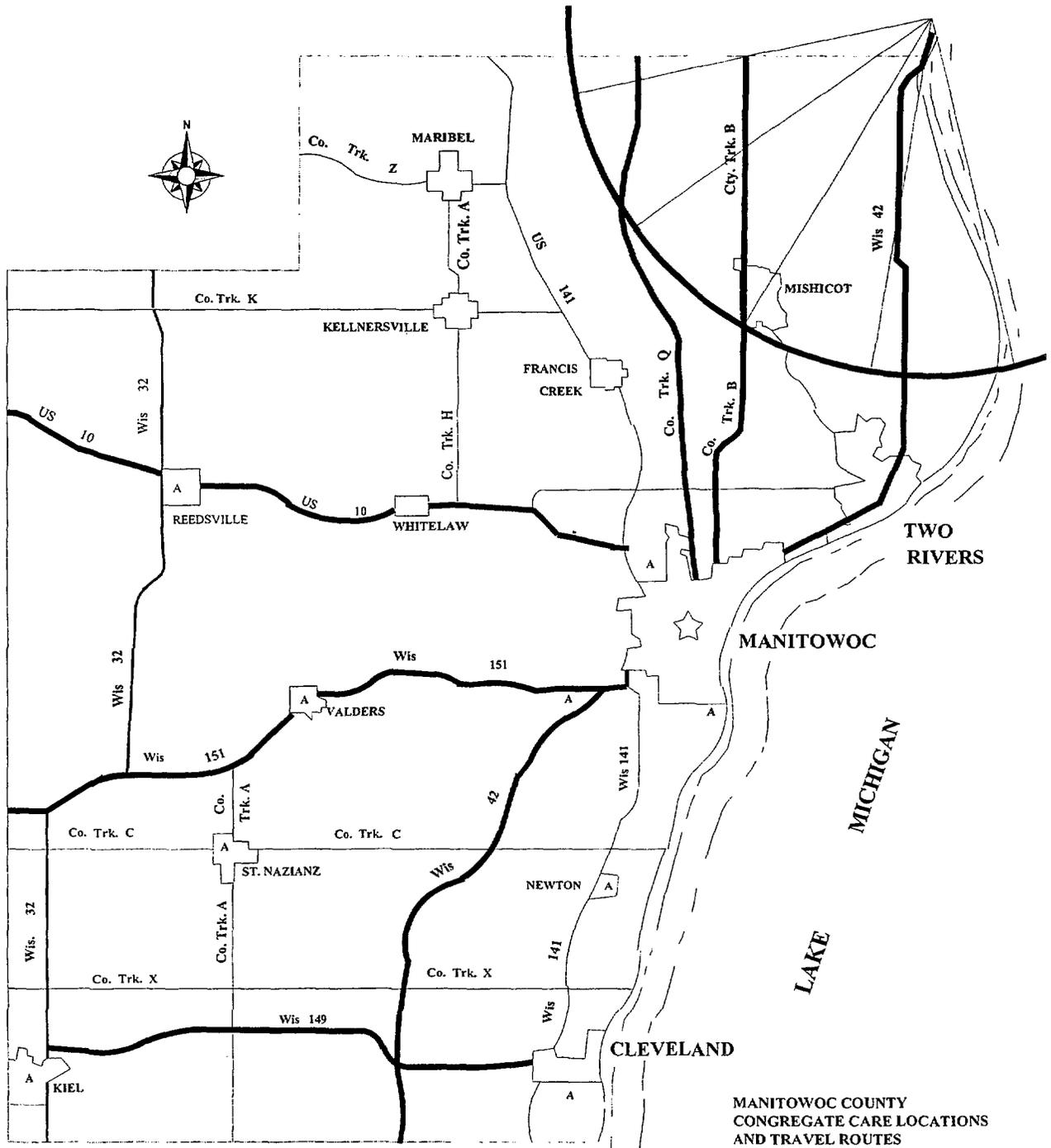
KEWAUNEE COUNTY EVACUATION MAP



THIS IS A SIMPLIFIED MAP OF KEWAUNEE COUNTY SHOWING THE TRAVEL ROUTES WITHIN AND AWAY FROM THE 10 MILE "RISK" AREA SURROUNDING KEWAUNEE NUCLEAR POWER PLANT. COUNTY AND STATE HIGHWAYS MAY BE USED TO TRAVEL FROM THE "RISK" AREA TO CONGREGATE CARE FACILITIES IN ALGOMA, CASCO, LUXEMBURG AND DYCKESVILLE. THE PUBLIC AND NON-PUBLIC SCHOOLS OF KEWAUNEE COUNTY WILL BE UTILIZED AS CONGREGATE CARE FACILITIES. THEY HAVE ADEQUATE EMERGENCY LIVING CAPABILITY TO ACCOMMODATE ALL OF THE "RISK" AREA.
 FOR DETAILS SEE KEWAUNEE COUNTY EMERGENCY OPERATIONS PLAN.

MANITOWOC COUNTY EVACUATION MAP

EP-FIG-033.vsd
Rev. 09/30/02



**MANITOWOC COUNTY
CONGREGATE CARE LOCATIONS
AND TRAVEL ROUTES**

THIS IS A SIMPLIFIED MAP OF MANITOWOC COUNTY SHOWING TRAVEL ROUTES WITHIN AND AWAY FROM THE 10 MILE "RISK" AREA SURROUNDING KEWAUNEE NUCLEAR POWER PLANT. COUNTY AND STATE HIGHWAYS MAY BE USED TO TRAVEL FROM THE "RISK" AREA TO CONGREGATE CARE FACILITIES IN MANITOWOC COUNTY, REEDSVILLE, VALDERS, ST. NAZIANZ, KIEL, NEWTON, AND CLEVELAND. PUBLIC AND NON-PUBLIC SCHOOLS OF MANITOWOC COUNTY WILL BE UTILIZED AS CONGREGATE CARE FACILITIES. THEY HAVE ADEQUATE EMERGENCY LIVING CAPABILITY TO ACCOMMODATE ALL OF THE "RISK" AREA. FOR DETAILS SEE MANITOWOC COUNTY EMERGENCY OPERATIONS PLAN.

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Kewaunee Nuclear Power Plant		Title Determining Protective Action Recommendations	
<i>Emergency Plan Implementing Procedure</i>		Date JAN 13 2005	Page 1 of 10
Reviewed By Dan Bouche		Approved By John Egdorf	
Nuclear Safety Related	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	PORC Review Required	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		SRO Approval Of Temporary Changes Required	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

1.0 Purpose

- 1.1 This procedure provides instructions for determining Protective Action Recommendations (PARs).

2.0 General Notes

- 2.1 The Shift Manager is the initial ED in all situations. Any transfer of this responsibility should be documented in the Shift Manager's log and communicated to all other directors.
- 2.2 Upon declaration of a plant emergency, the Emergency Director (ED) is initially responsible to provide off-site authorities with Protective Action Recommendations (PARs). When the Emergency Operations Facility (EOF) has been activated, this responsibility will be assumed by the Emergency Response Manager (ERM). This responsibility shall NOT be delegated.
- 2.3 To be most effective protective actions must be taken before or shortly after the start of a major release to the atmosphere. PARs must be determined and communicated as quickly as possible.
- 2.4 Communication of PARs should be in progress to state and local emergency government authorities within 15 minutes of the emergency being declared or as soon as possible without further compromise to plant or public safety.
- 2.5 As more information becomes available, the most current PAR should be reviewed and revised, as necessary, in accordance with Section 5.0 of this procedure.
- 2.6 Figure EPIPFG-AD-19-01, "Population Distribution by Geographical Sub Area" (or the EPZ wall board) may be used to picture and track areas for which a Protective Action Recommendation has been given.

3.0 Precautions and Limitations

- 3.1 PARs are normally implemented for affected populations within the 10-mile plume exposure pathway EPZ. However, do NOT ignore populations outside the 10-mile plume exposure pathway if projected doses or field readings indicate doses > 1 rem TEDE or > 5 rem thyroid.

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3.2 IF there is a PAR change due to a wind shift, THEN the new PAR should include the following as downwind sectors:

3.2.1 All downwind sectors from all previous PARs for this emergency, AND

3.2.2 All downwind sectors from the new PAR, AND

3.2.3 All downwind sectors through which the wind shift occurred.

3.3 PARs already implemented should never be withdrawn or reduced due to a wind shift.

3.4 Withdrawal or reduction of protective actions from areas where they have already been implemented is NOT advisable because of the potential for changing conditions and confusion.

3.5 Under normal conditions, evacuation of members of the general population should be initiated for most incidents at a projected dose of 1 rem. Sheltering may be preferable to evacuation as a protective action in some situations. Examples of situations or groups for which evacuation may NOT be appropriate at 1 rem include:

- a. The presence of severe weather,
- b. Competing disasters,
- c. Institutionalized persons who are not readily mobile, AND
- d. Local physical factors that impede evacuation.

4.0 Initial Conditions

4.1 The Emergency Director shall classify the emergency in accordance with EPIP-AD-02, "Emergency Class Determination," prior to the implementation of this procedure.

5.0 Procedure

Note

Adverse meteorology exists if:

1. The 10 AND 60 meter wind speed is less than 5 mph, AND
2. Delta T is greater than +2.4°F OR Sigma Theta is less than 3.01 degrees.
For current information: From a PPCS workstation go to Main Menu / EP Menu / TSC 2 Environmental / Radiation).

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5.1 Determine a default PAR for the declared emergency classification.

5.1.1 General Emergency

a. IF adverse meteorology exists, THEN recommend to off-site authorities using Form EPIPF-AD-07-01, "Event Notice," Box 10 to:

- [B] Evacuate ALL sectors (360°) out to 5 miles.

b. IF adverse meteorology does NOT exist, THEN recommend to off-site authorities using Form EPIPF-AD-07-01, "Event Notice," Box 10 to:

- [B] Evacuate ALL sectors (360°) out to 2 miles, AND

Note

To determine sectors in [B] include the downwind sector(s) from Form EPIPF-AD-07-01 Table 1.

- [B] Evacuate downwind sectors _____ out to 5 miles.

5.1.2 Site Area Emergency, Alert or Unusual Event

a. Immediate Planned Protective Action Recommendations from Form EPIPF-AD-07-01, "Event Notice," Box 10 for the general public are:

- [A] None

5.2 Verify that security has implemented EPIP-SEC-02, "Security Force Response to Emergencies."

5.3 Determine a PAR using dose projections results from EPIP-ENV-03C.

Note

A PAR from a dose projection may identify areas of concern beyond the default PAR. Any current default PAR should remain in place and be augmented with the information obtained from the dose projection, as necessary.

Note

Do NOT withdraw or reduce the default PAR based on dose projection results.

5.3.1 Obtain the most recent RASCAL dose projections for TEDE and thyroid doses from the Environmental Protection Director (EPD) or the Radiological Protection Director (RPD).

5.3.1.1 Compare the RASCAL dose projection results to EPIP-AD-19 Table 1.

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5.3.1.1.1 IF dose projection results meet the criteria in Column 1, THEN determine recommended protective actions (Column 2) considering the following:

- Plant conditions (past, present, projected)
- Radiological conditions
- Impact time
- Weather (current and forecasted)
- Evacuation time estimates using EPIP-AD-19 Table 2, "Evacuation Time Estimates (KNPP/EPZ)."

5.3.2 Upon determining recommended protective actions, immediately notify the ERM or ED.

5.3.3 IF projected doses meet the criteria in EPIP-AD-02 Chart A(1), THEN relay the identified classification criteria to the ERM or ED immediately.

5.4 Determine a PAR from field radiation dose rate survey results.

5.4.1 Obtain the most recent field radiation dose rate survey results from the Environmental Monitoring Team Coordinator (ENVCd) or RPD.

5.4.2 Determine the receptor exposure dose.

5.4.2.1 IF exposure duration is unknown, THEN multiply the field radiation dose rate for a given point by a default six (6) hours.

Field radiation dose rate x 6 hours = _____ receptor exposure dose

5.4.2.2 IF exposure duration is known, THEN multiply the field radiation dose rate for a given point times the known exposure duration.

Field radiation dose rate x Known exposure duration = _____ receptor exposure dose

5.4.3 Compare the receptor exposure dose, from Step 5.3.2, to EPIP-AD-19, Table 1.

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- 5.4.3.1 IF the receptor exposure dose meets the criteria in Column 1, THEN determine recommended protective actions (Column 2) considering the following:
- Plant conditions (past, present, projected)
 - Radiological conditions
 - Impact time
 - Weather (current and forecasted)
 - Evacuation time estimates using EPIP-AD-19 Table 2, "Evacuation Time Estimates (KNPP/EPZ)."
- 5.4.4 Upon determining recommended protective actions, immediately notify the ERM or ED.
- 5.4.5 IF field radiation dose rate survey results meet the criteria in EPIP-AD-02 Chart A(1), THEN relay the identified classification criteria to the ERM or ED immediately.
- 5.5 Determine a PAR from air sample or ground deposition sample results.
- 5.5.1 Obtain the most recent air sample or ground deposition sample results from the Environmental Monitoring Team Coordinator (ENVCd) or RPD.
- 5.5.2 Perform a dose projection as per EPIP-ENV-03C using the air sample or ground deposition sample results as inputs to the dose projection.
- 5.5.3 Use dose projection results to perform Step 5.2 of this procedure.
- 5.6 Complete Form EPIPF-AD-07-01 "Event Notice," to inform off-site authorities of any newly developed or revised/upgraded PAR.
- Note**
The following step will normally be performed only if the State Emergency Operations Center (EOC) in Madison has been activated.
- 5.6.1 If appropriate, instruct the State Radiological Coordinator Liaison (SRCL) to discuss the changes or potential changes in PARs with the State Radiological Coordinator (SRC) for the State of Wisconsin.
- 5.7 Submit the Form EPIPF-AD-07-01 "Event Notice," to the appropriate Communicator for transmission to off-site authorities.
- 5.8 IF dose projections indicate a potential dose to the thyroid of > 25 rem, THEN verify "Potassium Iodide Distribution," EPID-AD-18, is being implemented.

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5.9 IF dose projections or field readings indicate doses > 1 rem TEDE or > 5 rem thyroid to any population outside of the 10-mile plume exposure pathway EPZ, THEN report this immediately to the State and counties and if requested, provide assistance with *ad hoc* planning.

5.10 Repeat Steps 5.1, 5.2, 5.3, and 5.4 until the Final Conditions are met, see Section 6.0.

6.0 Final Conditions

6.1 Additional Protective Action Recommendations are no longer required when the plant emergency has been Terminated or Recovery Actions have begun and the responsible Director has suspended the use of EPIPs.

7.0 References

- 7.1 EPA-400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (May 1992)
- 7.2 NUREG/CR-2925, In-Plant Considerations for Optimal Off-site Response to Reactor Accidents (November 1982)
- 7.3 NUREG/CR-5247, Vol. 2, Rev. 2, RASCAL Version 2.1 Workbook (December 1994)
- 7.4 NUREG-0654, II.J.7 and II.J.8
- 7.5 U.S. Food and Drug Administration, 21CFR Part 1090
- 7.6 US-NRC RIS 2003-12, Clarification Of NRC Guidance For Modifying Protective Actions
- 7.7 EPIP-AD-02, Emergency Class Determination
- 7.8 EPIP-AD-18, Potassium Iodide Distribution
- 7.9 EPIP-SEC-02, Security Force Response to Emergencies
- 7.10 Form EPIPF-AD-07-01, Event Notice - Nuclear Accident Reporting System Form (NARS)

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8.0 Records

8.1 The following QA records and non-QA records are identified in this directive/procedure and are listed on the KNPP Records Retention Schedule. These records shall be maintained according to the KNPP Records Management Program.

8.1.1 QA Records

None

8.1.2 Non-QA Records

None

Column 1 PROJECTED DOSE (REM) TO THE POPULATION	Column 2 RECOMMENDED ACTIONS^(a)	Column 3 COMMENTS
TEDE < 1 rem Thyroid < 5 Rem	No planned protective actions. ^(b) Monitor environmental radiation levels.	If the conditions of Section 6.0 are satisfied, previously recommended protective actions may be reconsidered.
TEDE > 1 rem Thyroid > 5 rem	Recommend evacuation in affected sectors. Monitor environmental radiation levels and adjust sectors recommended for evacuation based on these levels. Control access.	Seeking shelter would be an alternative if evacuation were not immediately possible. ^(c)

Column 1 PROJECTED DOSE (REM) TO EMERGENCY TEAM WORKERS	Column 2 RECOMMENDED ACTIONS^(d)	Column 3 COMMENTS
TEDE < 5 rem All other Organs < 50 rem TODE	Control exposure of emergency workers to these levels except for those instances listed below. (Appropriate controls for emergency workers include time limitations, respirators, and stable iodine.)	“All other Organs” include: skin extremities and thyroid. Stable iodine may be made available for use where predicted doses exceed 25 rem to the thyroid. Although respirators and stable iodine should be used where effective to control dose to emergency team workers, thyroid dose may not be a limiting factor for lifesaving missions.
TEDE < 10 rem All other Organs < 100 rem TODE	Emergency workers exposure should be controlled below these levels when their mission involves protecting valuable property.	
TEDE < 25 rem All other Organs < 250 rem TODE	Emergency workers exposure should be controlled below these levels when their mission involves lifesaving or protection of large populations.	For Environmental/Monitoring Teams, refer to RASCAL “Maximum Doses at Selected Distances” output screen. Check bone, lung, and thyroid doses.

- (a) These actions are recommended for planning purposes. Protective action decisions at the time of the incident must take existing conditions into consideration. These conditions include containment activity, probability of containment failure, plume transport time, release duration, and any other pertinent conditions.
- (b) At the time of the incident, officials may implement low-impact protective actions in keeping with the principle of maintaining radiation exposures as low as reasonably achievable.
- (c) Sheltering may be the preferred protective action when it will provide protection equal to or greater than evacuation, based on consideration of factors such as source term characteristics, and temporal or other site specific conditions. If the release duration is expected to be less than the Estimated Evacuation Time and evacuation cannot be completed prior to the start of a release Sheltering should be considered.
- (d) These actions are recommended for planning purposes. Protective action decisions at the time of the incident must take existing conditions into consideration. These conditions include containment activity, probability of containment failure, plume transport time, release duration, and any other pertinent conditions.

EVACUATION TIME ESTIMATES (KNPP)

Table based on combination of evacuation subareas.

Subareas (Pop.)	Downwind Sectors	Evacuation Time Estimates for Given Scenario (in minutes)								
		1	2	3	4	5	6	7	8	17
2 Mile (265)	All	50	60	60	70	60	60	50	60	100
2 Mile, 5N and 5S (1992)	All	50	70	70	70	60	70	60	60	150
2 Mile, 5N and 10N (5474)	m, n, p, q, r, a, b	90	110	100	100	130	140	100	120	350
2 Mile, 5N, 10N & 10W (6859)	m, n, p, q, r, a, b	120	130	130	140	160	180	110	120	360
2 Mile, 5N, 10W & 10SW (4002)	l, m, n, p, q, r, a, b	80	90	80	90	110	120	90	90	200
2 Mile, 5S, 10SW & 10S (5335)	j, k, l, m, n	140	140	150	160	180	180	160	170	150
2 Mile, 5S, & 10S (3883)	j, k, l, m	140	140	150	150	180	180	170	170	150
Entire 10 Mile EPZ (11929)	All	160	170	150	150	200	230	160	150	360

Scenarios:

1. Summer, Weekend, Midday, Fair Weather
2. Summer, Weekend, Midday, Poor Weather
3. Summer, Weekend, Evening, Fair Weather
4. Summer, Weekend, Evening, Poor Weather
5. Summer, Weekday, Midday, Fair Weather
6. Summer, Weekday, Midday, Poor Weather
7. Summer, Weekday, Evening, Fair Weather
8. Summer, Weekday, Evening, Poor Weather
17. Summer, Weekend, Midday, Fair Weather (Trout Festival)

EVACUATION TIME ESTIMATES (KNPP)

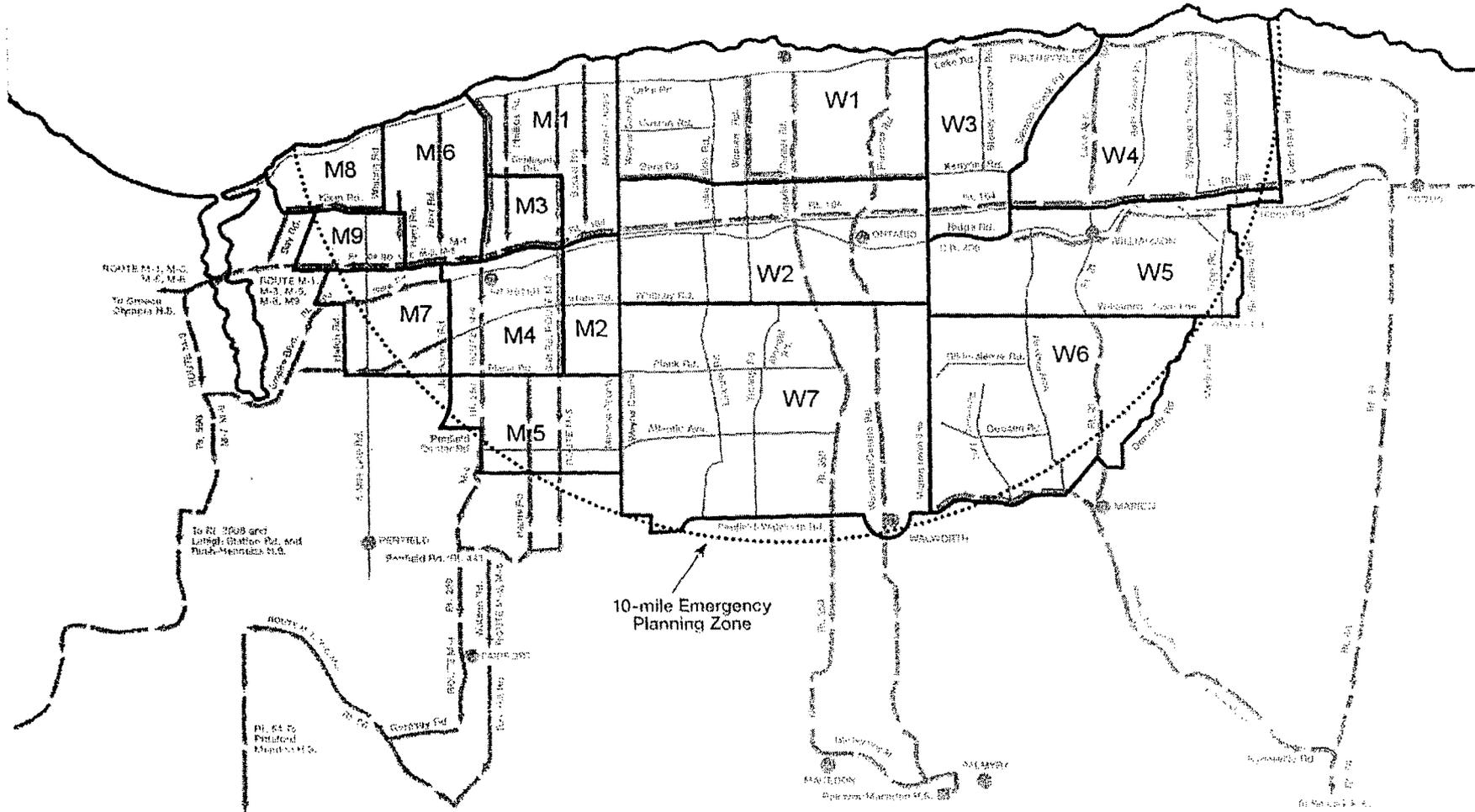
Table based on combination of evacuation subareas

Subareas (Pop.)	Downwind	Evacuation Time Estimates for Given Scenario (in minutes)							
	Sectors	9	10	11	12	13	14	15	16
2 Mile (265)	All	60	90	70	90	60	100	60	60
2 Mile, 5N and 5S (1992)	All	60	90	70	100	60	100	60	90
2 Mile, 5N and 10N (5474)	m, n, p, q, r, a, b	90	160	100	140	130	200	100	140
2 Mile, 5N, 10N & 10W (6859)	m, n, p, q, r, a, b	120	130	130	140	170	200	110	140
2 Mile, 5N, 10W & 10SW (4002)	l, m, n, p, q, r, a, b	100	120	80	90	110	120	90	90
2 Mile, 5S, 10SW & 10S (5335)	j, k, l, m, n	140	140	150	170	180	180	160	170
2 Mile, 5S, & 10S (3883)	j, k, l, m	140	140	150	160	180	180	170	170
Entire 10 Mile EPZ (11929)	All	170	190	180	200	210	330	160	170

Scenarios:

9. Winter, Weekend, Midday, Fair Weather
10. Winter, Weekend, Midday, Poor Weather
11. Winter, Weekend, Evening, Fair Weather
12. Winter, Weekend, Evening, Poor Weather
13. Winter, Weekday, Midday, Fair Weather
14. Winter, Weekday, Midday, Poor Weather
15. Winter, Weekday, Evening, Fair Weather
16. Winter, Weekday, Evening, Poor Weather

FIGURE 5.2 PRIMARY AND SECONDARY EVACUATION ROUTES



5.4.4.5 Decontamination:

A Radiation Protection procedure provides guidance for graduated measures to be used for decontamination. The objective of decontamination is to prevent the spread of radioactive material on the individual, to the environment or to other personnel and to reduce the resultant dose. Decontamination is essentially the removal of radioactive material and is performed starting with the highest level of contamination using the simplest procedures. Continued decontamination may show diminishing effectiveness and require a decision to stop or use more potent agents.

Decontamination kits, which contain items to decontaminate the skin and for wound cleansing, are available. Decontamination should continue until it is no longer effective but not so as to abrade skin. This procedure should be effective against iodine and other contaminants.

If personnel cannot be decontaminated to the limits of Procedure RP-SUR-PERS-DECON, "Personnel Decontamination", Radiation Management Consultants may be contacted.

Instruments are available to determine contamination levels of personnel or equipment and the effectiveness of decontamination. Waste drums are available as containers for radioactive waste and emergency clothing is available, if needed.

5.4.4.6 Offsite Authority Actions:

Offsite authorities will provide assistance as needed to protect the public. In the event a Site Area Emergency is declared, this may include activating the public notification system and providing information and periodic updates of the situation through the EAS (Emergency Alert System) and/or press briefings. Resources at primary response centers will be augmented by calling other emergency services to standby status and dispatching certain emergency personnel to initiate their functions (i.e. monitoring and communications). Information from the licensee, monitoring teams and weather stations will be continually evaluated with regard to changes in protective actions already initiated for the public, such as sheltering of people or milk animals. Monitoring results and any actions taken should be reported to the licensee and others having a need to know.

5.5 General Emergency:

The General Emergency will be declared when the conditions described in Section 3.5 exist. Actions associated with the General Emergency declaration are to: (1) initiate protective actions for the public as predetermined or as indicated by actual releases; (2) provide continuous assessment of information from Ginna Station and offsite measurements; (3) provide consultation with offsite authorities; and (4) keep the public informed through updates of the situation through the Joint Emergency News Center.

5.5.1 Company Actions:

A General Emergency requires that all actions prescribed for the Site Area Emergency (see Section 5.4) be implemented. The NRC, State of New York, and county authorities, who will already have been contacted for lower classifications, will now be updated.

The Emergency Coordinator (or EOF/Recovery Manager as appropriate) may request the assistance of offsite groups which could include Radiation Management Consultants, Company medical department, and Department of Energy, Brookhaven Radiological Assistance Program. Technical personnel from other Company departments and/or consultants will be called as needed.

The Emergency Coordinator (or EOF/Recovery Manager) has the responsibility to determine the magnitude and extent of the incident by evaluating information from the Control Room and the survey teams. This information will consist of instrumentation readings and any survey results available. He shall update the State and local authorities with new survey data and other information and recommend protective actions. Protective action recommendations, if dose projection information is available, will be based on the "Manual of Protective Action Guides and Protective Action for Nuclear Incidents" EPA-400-R-92-001, October 1991, U.S. Environmental Protection Agency. A summary of recommended actions is presented in Table 5.1.

Figure 5.3 provides the scheme for Predetermined Protective Action Recommendations based upon reaching a General Emergency and present wind conditions, and reflects an initial 2 mile radius and 5 miles downwind evacuation recommendation. This methodology is contained in EPIP 2-1, which also provides guidance for upgrading an initial PAR based on pertinent factors.

In making his recommendation for sheltering or evacuation, the Emergency Coordinator (or EOF/Recovery Manager) should evaluate the weather forecast in relation to changing winds and precipitation. He should also evaluate the calculated evacuation times (Appendix G) in relation to predicted start, length and termination of a release.

Emergency staff at Wayne and Monroe Counties and New York State shall determine, by evaluating the information given by the Emergency Coordinator (or EOF/Recovery Manager as appropriate), if area evacuation or sheltering is necessary, to what extent, and how to undertake protective action including evacuation. A projection of population distribution in the 10 mile plume exposure zone is included in Appendix F. A summary of evacuation time estimates for various conditions is provided in Appendix G.

All survey and sample analysis results will be retained by the Radiation Protection and Chemistry Manager for appropriate documentation. Formal reports shall be written and distributed as required by 10CFR20 and the Ginna Technical Specifications. Information concerning the offsite consequences of the incident and protective actions to protect the public will be coordinated in accordance with the New York State Radiological Emergency Plan and County Emergency Plans. A Company spokesperson in the JENC will release the information concerning the plant, plant safeguards and its employees, and assistance being provided to State and local authorities.

Severe Accident Management Guidelines (SAMG) entry conditions are defined in the Station Emergency Operating Procedures.

5.5.2 Offsite Authorities Actions:

All actions of paragraph 5.4.4.6 for Site Area Emergency will be reviewed and enacted for a General Emergency. All emergency personnel will have been activated and all response centers are operating. Information is evaluated and forwarded to the proper authorities and the public. Protective actions will be instituted as needed for the public and milk animals.

FIGURE 5.3
EVACUATION AREAS BY ZONES
PROTECTIVE ACTION RECOMMENDATIONS BY ERPA FOR GENERAL EMERGENCY CLASSIFICATION

Wind From (Degrees)	Initial Protective Action Recommendations (Evacuation based on 2 mile radius & 5 miles downwind)	Secondary Protective Action Recommendations* (Evacuation based on 5 mile radius & 10 miles downwind)
N 349 to 11	Evacuate:W (1,2,3) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3,5,6,7) M (1,2,4,5) and implement KI Plan Shelter: Remainder of EPZ
NNE 12 to 33	Evacuate:W (1,2) M (1) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3,6,7) M (1,2,3,4,5,6,7,9) and implement KI Plan Shelter: Remainder of EPZ
NE 34 to 56	Evacuate:W (1,2) M (1) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3,7) M (1,2,3,4,5,6,7,8,9) and implement KI Plan Shelter: Remainder of EPZ
ENE 57 to 78	Evacuate:W (1,2) M (1) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3,7) M (1,2,3,4,5,6,7,8,9) and implement KI Plan Shelter: Remainder of EPZ
E 79 to 101	Evacuate:W (1,2) M (1) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3) M (1,2,3,4,6,7,8,9) and implement KI Plan Shelter: Remainder of EPZ
ESE 102 to 124	Evacuate:W (1) M (1) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3) M (1,3,6,8,9) and implement KI Plan Shelter: Remainder of EPZ
SE 125 to 146	Evacuate:W (1) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3) M (1) and implement KI Plan Shelter: Remainder of EPZ
SSE 147 to 168	Evacuate:W (1) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3) M (1) and implement KI Plan Shelter: Remainder of EPZ
S 169 to 191	Evacuate:W (1) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3) M (1) and implement KI Plan Shelter: Remainder of EPZ
SSW 192 to 213	Evacuate:W (1) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3) M (1) and implement KI Plan Shelter: Remainder of EPZ
SW 214 to 236	Evacuate:W (1,3) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3,4) M (1) and implement KI Plan Shelter: Remainder of EPZ
WSW 237 to 258	Evacuate:W (1,3) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3,4,5) M (1) and implement KI Plan Shelter: Remainder of EPZ
W 259 to 281	Evacuate:W (1,3) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3,4,5,6) M (1) and implement KI Plan Shelter: Remainder of EPZ
WNW 282 to 303	Evacuate:W (1,2,3) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3,4,5,6,7) M (1) and implement KI Plan Shelter: Remainder of EPZ
NW 304 to 326	Evacuate:W (1,2,3) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3,4,5,6,7) M (1,2) and implement KI Plan Shelter: Remainder of EPZ
NNW 327 to 348	Evacuate: W (1,2,3) and implement KI Plan Shelter: Remainder of EPZ	Evacuate: W (1,2,3,4,5,6,7) M (1,2,5) and implement KI Plan Shelter: Remainder of EPZ

* Secondary Protective Actions are recommended when dose projections or field teams indicate ≥ 1 REM TEDE beyond 5 miles

5.6 Major Release to Lake Ontario or Deer Creek:

If a major release to the Lake Ontario or Deer Creek occurs which exceeds the Technical Specification limit or the limiting concentrations specified in 10CFR20, Appendix B, Table II, Column 2, at the point of discharge, the following actions shall be taken:

The release will be classified per EPIP 1-0, "Ginna Station Event Evaluation and Classification" and appropriate notifications will be made, if necessary, per the classification and corresponding procedures. The Ontario Water District will be notified. The waste discharge will be isolated, grab samples will be obtained, and dilution will be estimated in accordance with EPIP 1-16.

The Radiation Protection section will be instructed to monitor the Ontario Water District Station water.

TABLE 5.1 Recommended Protective Actions to Reduce Whole Body and Thyroid Dose

PROJECTED DOSE TO THE POPULATION	RECOMMENDED ACTION	COMMENTS
Total Whole Body < 1 REM*	No planned protective actions. Local authorities or State may issue an advisory to seek shelter and await further instructions. Monitor environmental radiation levels.	None.
Total Whole Body ≥ 1 REM*	Conduct evacuation.* Monitor environmental radiation levels and adjust area for mandatory evacuation based on these levels. Control access.	Evacuation (or for some situations, sheltering**) should be initiated at one REM. Seeking shelter would be an alternative if evacuation were not immediately possible.
Project Dose (REM) to Emergency Team Workers		
Total Whole Body ≥ 25 REM	Control exposure of emergency team members to these levels except for lifesaving mission. (Appropriate controls for emergency workers include time limitations, respirators and stable iodine.)	None.
Total Whole Body ≥ 75 REM	Control exposure of emergency team members performing lifesaving missions to this level. (Control of time of exposure will be most effective.)	None.

NOTES:

- The sum of the effective dose equivalent resulting from exposure to external sources and the committed effective dose equivalent incurred from all significant inhalation pathways during the early phase.
- ** Sheltering may be the preferred protective action when it will provide protection equal to or greater than evacuation, based on consideration of factors such as source term characteristics, and temporal or other site-specific conditions.

APPENDIX G

ANALYSIS OF EVACUATION TRAVEL TIMES

This Evacuation Time Estimate (ETE) is in strict compliance with NUREG-0654 and related guidelines. The ETE serves as one criterion for developing a Protective Action Decision (PAD). This appendix discusses the various components required to update the evacuation time estimates for the Ginna EPZ. These components are listed below:

- Evacuation Scenarios
- Weather Conditions
- Trip Generation
- Traffic Assignment
- Notification Time
- Mobilization Time
- Evacuation Travel Time Estimates
- Distribution of the Evacuation Population by Time
- Critical Roadway Links

A. Evacuation Scenarios

Evacuation travel time estimates are prepared to serve as a guide for local emergency coordinators in refining their emergency response plans and as an aid to local officials in selecting protective actions during an emergency. Evacuation travel time estimates were prepared for four distinct time-based scenarios and three distinct weather conditions for inclusion in the company's and Monroe and Wayne County RERP's.

These estimates assumed various partial as well as simultaneous evacuations of the entire EPZ. The weather scenarios included in the current Monroe and Wayne County RERP's are listed below.

Every Protective Action Recommendation (PAR) possibility for evacuation is modeled; additionally, the entire 2 mile, 5 mile and 10 mile evacuations are modeled.

Every evacuation scenario is run against the following time of year and weather conditions:

- Summer
 - Midweek and Weekend, Midday (School not in Session)
 - Good Weather
 - Rain
 - Midweek and Weekend, Evening (School not in Session)
 - Good Weather
- Winter
 - Midweek and Weekend, Midday
 - Good Weather
 - Rain
 - Snow
 - Midweek and Weekend Evening
 - Good Weather

These time-based scenarios were chosen and analyzed for the RERP's because they cover significantly different patterns of population distribution and transportation availability. Hence, the decision maker is provided with a tool for deciding the travel time required to evacuate various areas (sectors) or the entire EPZ under four different weather conditions and at different times of the day. These evacuation travel times are shown later in this section. A detailed description of the above scenarios is presented below.

Evacuation scenarios define the range of external conditions that could prevail at the time of an emergency (e.g., season, day-of-week, weather....).

Each "evacuation case" consists of calculating the ETE for one region under one scenario.

The total number of evacuation cases for Ginna is 35 regions x 12 weather scenarios which equals 420 ETE's. The regions are listed at the end of this Appendix in Table G-1.

The ETE will be calculated on the basis that the event escalates rapidly to the extent that the advisory to evacuate is virtually simultaneous with the alert.

100% of the population within the evacuation region will evacuate; a substantial percentage of the population outside of that region and outside the EPZ will also elect to voluntarily travel away from the plant.

ETE's were developed for each scenario. The process defines the region to be evacuated, identified demand (in vehicles), sub-divided into "time periods" to represent the variation of demand over time. Then, highway link capabilities were estimated based on field survey observations and on scenario-based weather conditions.

The ETE is the elapsed time for the evacuating traffic originating within the evacuation region to leave the region.

Population estimates are based upon 2000 Census date, projected to year 2003. The county specific projections are based upon growth rates estimated by comparing 1990 and 2000 Census data. Estimates of employees who commute into the EPZ are based upon the New York State Journey to Work Database, applied to the year 2000 employment data stratified on an ERPA basis. Specific major employers were also considered. Demographic data was adapted from telephone surveys conducted in Nine Mile Point EPZ due to similarity to the Ginna EPZ.

The ETE assumed 100% evacuation of the impacted region, 50% evacuation of other EPZ areas within indicated downwind distance and 35% evacuation of population within remaining areas inside the EPZ. This is displayed in Figure G-1 at the end of this Appendix..

Evacuation Regions take the form of circles or of "keyhole" configuration consisting of a circle and a sector expanding to 5 or 10 miles from the plant. The EPZ is subdivided into Emergency Response Planning Areas. Regions consist of groups of contiguous ERPAs.

The evacuation travel time depends primarily on the relationship between Traffic Demand and Highway Capacity.

When Demand exceeds over some time period, travel speed declines and the traffic environment exhibits queuing (stop-and-go), which is characteristic of congested conditions. Traffic does move, but slowly.

B. Weather Conditions

NUREG-0654 stipulates that two weather conditions, normal and adverse, be considered in the evacuation travel time analysis; however, local weather conditions in the Rochester area, particularly during the winter, suggest that two types of adverse weather conditions be considered when estimating evacuation times. Normal weather has been termed as good weather and adverse weather has been broken out into two categories -- "rainy weather" and "snowy weather". A brief synopsis of each is summarized below:

- Good Weather - Weather conditions exist that do not impede traffic flow. Good weather excludes rain, snow, fog, and ice on roadways.
- Rainy Weather - Weather conditions exist that will impede traffic flow such as rain, fog, or a light snow which may result in a wet or lightly covered road surface. The evacuation roadway network is passable during weather conditions such as these, albeit at a reduced ability to facilitate traffic.
- Snowy Weather - Snowy weather will be defined as the worst possible weather conditions when the evacuation roadway network is passable. These conditions would exist when the roads are covered and/or packed with snow, when plowed snow is located at the roadway's edge which makes it difficult to move stalled vehicles off the road, when melting snow helps to make the road surface slippery or ice covered, and when drifting snow blocks roads. The ability of the evacuation roadway network to facilitate traffic during adverse weather conditions is less than during rainy weather.

The effects of these weather conditions on the roadway capacities, and hence the evacuation travel time estimates, have been discussed earlier in Section III.

It is assumed that everyone within an ERPA that is issued an Advisory to evacuate will, in fact, respond in general accord with the planned routes.

It is assumed that no early dismissal to home of school children is contemplated. According to county policy, school children are not to be released to their parents on school grounds. All students will be evacuated to the reception centers assigned to the schools, and then released to their parents as they arrive at the reception centers. Sufficient bus resources are identified to handle 100% of the students in one wave.

"Voluntary evacuation" occurs when people in areas of the EPZ not ordered to evacuate nevertheless chose to do so. Within the annular ring defined by the distance to be evacuated (5-miles or 10-miles downwind), 50% of the people not advised to evacuate are assumed to evacuate within the same time-frame. Between the annular ring, defined by the extent of the downwind evacuation order out to the EPZ boundary, it is assumed that 35% of the people will voluntarily evacuate. This is graphically presented at the end of this Appendix in Figure G-2.

C. Trip Generation

For each traffic zone included in an ERPA, the number of evacuation trips generated by that traffic zone was estimated by trip type. The number of trips varied significantly by scenario. For example, for the Summer, Midweek, Midday Scenario, large numbers of evacuation trips were attributable to transient employees working in the EPZ. However, for the Summer, Weekend, Midday Scenario, this same trip type (employees) was much less significant because most businesses are closed.

The number of trips for each traffic zone was based on population and vehicle occupancy data. For example, if a traffic zone has a nursing home with 120 ambulatory and 15 wheelchair-bound residents, and if the facility owns one 10-passenger wheelchair van, then five vehicle trips would be generated by the nursing home (three buses provided by a bus company with 40 passengers each to evacuate the ambulatory population, and one facility-owned van and one other 5-passenger wheelchair van would be provided by a bus company to evacuate the wheelchair bound residents).

Vehicle trips generated by each zone were then converted to passenger car equivalents (PCEs) for traffic assignment purposes. Buses were weighted as the equivalent of two cars, since their primary impact would be one of increased roadway space during a slow, congested evacuation condition.

D. Traffic Assignments

The assignment of the evacuation vehicles generated by each traffic zone over designated evacuation routes was performed by a computer model developed specifically for evacuation planning studies. The model loads the network and computes the travel and delay times for all zones being analyzed in any given Sector.

This computer model is based on a static traffic assignment procedure which assumes instantaneous loading of the evacuation network and concurrent vehicular demand on all roadway segments. Although this procedure is not an exact simulation of vehicle movement during an evacuation, the static traffic assignment (which has been accepted by the Federal Emergency Management Agency) results in evacuation travel time estimates which closely resemble those of a dynamic model. A detailed description of the static traffic assignment algorithm, and the results of the comparison between static and dynamic assignment is presented in Appendix H of the full ETE report for the Ginna 10-mile Emergency Planning Zone.

E. Notification Time

The Ginna EPZ is served by a siren notification system that meets the acceptable design objectives specified in Appendix 3 of NUREG-0654. This siren system covers the entire EPZ. Tone alert radios (emergency alert receivers) are also provided to public and private schools, daycare centers, nursery schools, local police departments, and major employers located in the EPZ. The Counties' evacuation plans contain backup notification procedures such as route alerting in the event of a siren or tone alert system malfunction.

The Planning Basis Assumption for the calculation of the ETE is a rapidly accelerating accident (fast-breaking or immediate General Emergency) that requires evacuation. It is assumed that the general population will begin the task of preparing to evacuate within 10 minutes of siren alert. A rapidly escalating accident scenario assumes that the general population will evacuate over the same time frame as do the school children, the transi-dependent population, and the special facility population.

F. Confirmation Time

Mobilization time represents the time required by evacuees to perform all their necessary preparatory activities prior to starting the trip.

G. Components of the Evacuation Travel Time

The estimates of evacuation travel time include public preparation time, terminal time, and roadway travel time. Each is discussed as follows:

1. Public Preparation Time - Public preparation time during an evacuation can vary significantly. For example, patrons staying at hotels are capable of preparing to evacuate in a shorter time frame than permanent residents who are likely to have many issues to attend to. Therefore, preparation time for hotel patrons has been assumed to be shorter than that for permanent residents.

The evacuation of the Maplewood Nursing Home will require additional preparation time. Staff officials estimate they need approximately one hour to have all residents ready to load onto transportation made available by outside agencies.

2. Terminal Time - The terminal time for vehicles departing from home represents the time to drive via local residential streets and collector roads in a traffic zone to the first link of the pre-designated primary evacuation route.

For bus routes, terminal time is comprised of inbound travel time, time to travel the emergency bus route, and loading time at pickup points for transit dependant people. Inbound travel time varies depending upon the evacuation scenario.

3. Roadway Travel Time - The roadway travel time is the amount of time required for all vehicles to traverse the entire length of their evacuation route to the edge of the 10-mile radius in the EPZ, depending upon the evacuation ordered. The time depends on both normal operating speeds on the road and on delays due to congestion (where the vehicle volumes approach or exceed the capacity of the roadway at a particular location). Hence, the roadway travel time is the amount of time beginning when the first vehicle enters the evacuation route, assuming normal operating speeds, until the last vehicle leaves the sector, taking into account reduced speeds attributable to congestion.

It is assumed that everyone within the group of ERPA's forming a Region that is issued an Advisory to Evacuate will, in fact, respond in general accord with the planned routes.

Other assumptions are:

- No early dismissal of school children occurs.
- According to County policy, school children are not to be released to their parents on school grounds. All students will be evacuated to the reception centers assigned to the schools and then released to their parents as they arrive at the reception centers. Sufficient bus resources are identified to accommodate 100 percent of the students in one wave.
- A portion of those households with access to a vehicle will evacuate without waiting arrival home of all commuters. Data from the telephone survey indicates that approximately 40 percent of households with commuters, who have other vehicles available for evacuation, will not wait for the commuter to arrive home before leaving the area.
- Normal traffic flow will be assumed present at the start of the emergency.
- Access Control Points (ACP) will be staffed within approximately one hour following the siren notifications, to divert traffic attempting to enter the EPZ. Earlier activation of ACP locations would delay returning commuters.

H. Evacuation Travel Time Estimates

The evacuation travel time estimates developed for the Ginna EPZ are in accordance with the implementation procedures and other operational strategies indicated in the Monroe and Wayne County RERP's. The implementation procedures include provisions such as pre-designated evacuation routes for all ERPA's, prioritized traffic control locations and predetermined emergency bus routes with designated pickup points for the public.

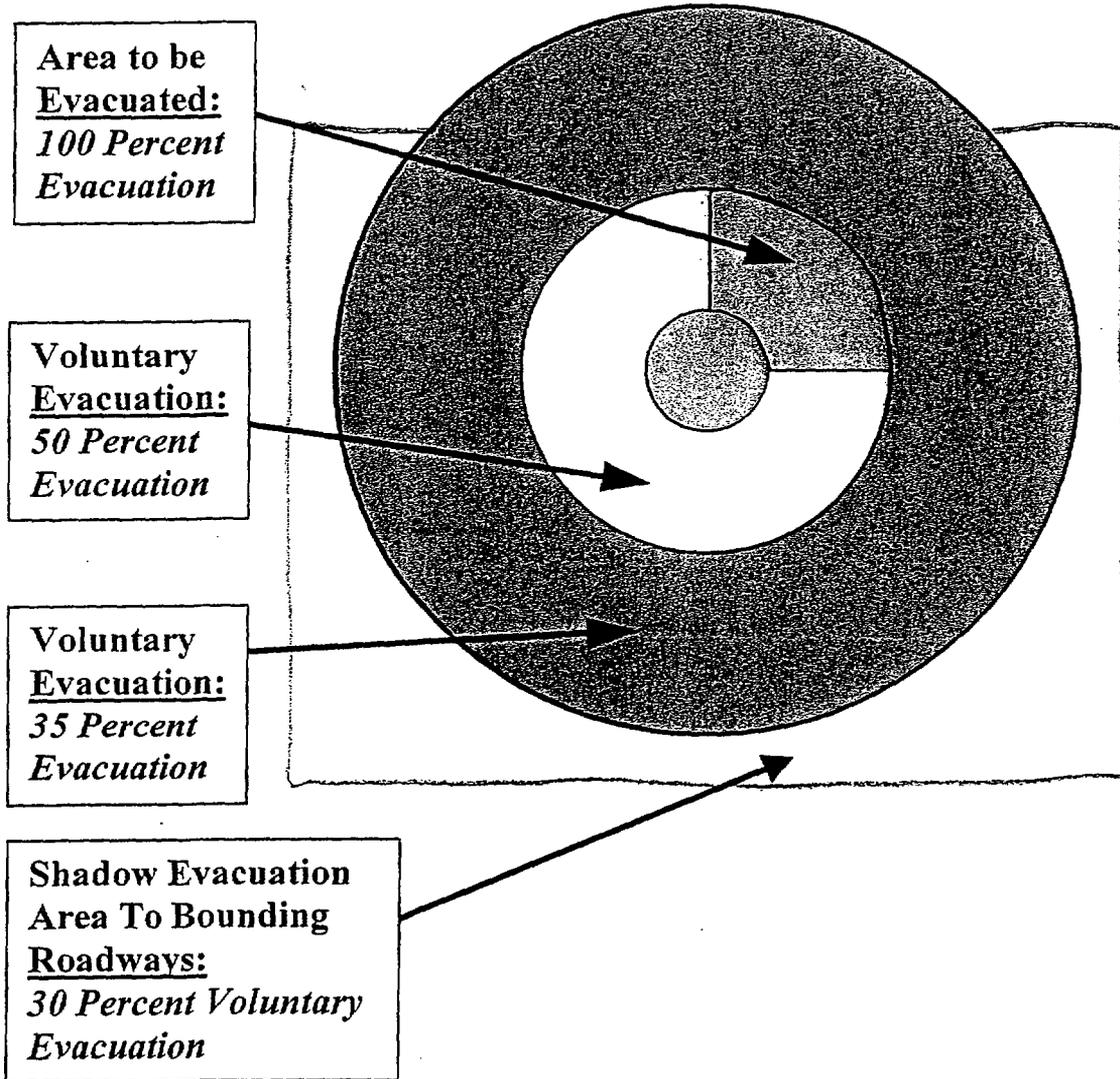
Table G-1 DEFINITION OF EVACUATION REGIONS

REGION	ERPA IN MONROE	ERPA IN WAYNE	DESCRIPTION	ERPA IN REGION
R1		W1	2 MILE RING	W1
R2	M1	W1-W3	5 MILE RING	M1, W1-W3
R3	M1-M9	W1-W7	Full EPZ	M1-M9, W1-W7
			2 MILE RING AND SECTOR TO 5 MILE	
R4		W1, W2, W3	N	W1, W2, W3
R5	M1	W1, W2	NNE	M1, W1, W2
R6	M1	W1, W2	NE	M1, W1, W2
R7	M1	W1, W2	ENE	M1, W1, W2
R8	M1	W1, W2	E	M1, W1, W2
R9	M1	W1	ESE	M1, W1
R10		W1	SE	W1
R11		W1	SSE	W1
R12		W1	S	W1
R13		W1	SSW	W1
R14		W1, W3	SW	W1, W3
R15		W1, W3	WSW	W1, W3
R16		W1, W3	W	W1, W3
R17		W1, W3	WNW	W1, W3
R18		W1, W3	NW	W1, W3
R19		W1, W3	NNW	W1, W3

Table G-1 DEFINITION OF EVACUATION REGIONS
(Continued)

REGION	ERPA IN MONROE	ERPA IN WAYNE	DESCRIPTION	ERPA IN REGION
			5 MILE RING AND SECTOR TO EPZ BOUNDARY	
R20	M1 M2, M4, M5	W1-W3, W5-W7	N	M1, M2, M4, M5, W1-W3, W5-W7
R21	M1-M5, M6, M7, M9	W1-W7, W6, W7	NNE	M1-M5, M6, M7, M9, W1-W3, W6, W7
R22	M1-M9	W1-W3, W7	NE	M1-M9, W1-W3, W7
R23	M1-M9	W1-W3, W7	ENE	M1-M9, W1-W3, W7
R24	M1, M2, M3, M4, M6-M9	W1-W3	E	M1, M2, M3, M4, M6-M9, W1-W3
R25	M1, M3, M6, M8, M9	W1-W3	ESE	M1, M3, M6, M8, M9, W1-W3
R26	M1	W1-W3	SE	M1, W1-W3
R27	M1	W1-W3	SSE	M1, W1-W3
R28	M1	W1-W3	S	M1, W1-W3
R29	M1	W1-W3	SSW	M1, W1-W3
R30	M1	W1-W3, W4	SW	M1, W1-W3, W4
R31	M1	W1-W4, W5	WSW	M1, W1-W4, W5
R32	M1	W1-W5, W6	W	M1, W1-W5, W6
R33	M1	W1-W6, W7	WNW	M1, W1-W6, W7
R34	M1, M2	W-W7	NW	M1, M2, W1-W7
R35	M1, M2, M5	W1-W3, W4, W5-W7	NNW	M1, M2, M5, W1-W3, W4, W5-W7

Figure G-2 SHADOW EVACUATION METHODOLOGY



GINNA STATION

CONTROLLED COPY NUMBER 23

PROCEDURE NO. EPIP 1-18

REV. NO. 9

DISCRETIONARY ACTIONS FOR EMERGENCY CONDITIONS



RESPONSIBLE MANAGER

04/28/05

EFFECTIVE DATE

Category 1.0

This procedure contains 18 pages

EPIP 1-18**DISCRETIONARY ACTIONS FOR EMERGENCY CONDITIONS****1.0 PURPOSE**

1.1 The purpose of this procedure is to provide additional measures to be considered along with those pre-planned actions that are identified in the NERP and Implementing Procedures. This procedure can be implemented due to severe weather, HAZMAT events, security events or any other unforeseen event where actions need to be taken to protect employees or equipment.

2.0 RESPONSIBILITY

2.1 Emergency Preparedness will be available to assist in coordinating recommendations to the Plant Management.

2.2 The Shift Manager, Management or TSC responders can implement this procedure.

3.0 REFERENCES

3.1 Developmental References

3.1.1 Effect of Hurricane Andrew on the Turkey Point Nuclear Generating Station from August 20-30, 1992 - NRC/INPO.

3.1.2 Industry Guidance for Responding to the NRC's October 6, 2001, Safeguards Advisory - NEI, dated November 16, 2001.

3.2 Implementing References

3.2.1 EPIP 1-0, Ginna Station Event Evaluation and Classification.

3.2.2 EPIP 1-5, Notifications

3.2.3 EPIP 1-6, Site Evacuation

3.2.4 EPIP 1-7, Accountability of Personnel

3.2.5 EPIP 1-8, Search and Rescue Operations

3.2.6 EPIP 1-9, TSC Activation

3.2.7 EPIP 1-11, Survey Center Activation

3.2.8 EPIP 3-1, EOF Activation

- 3.2.9 EPIP 3-3, Immediate Entry
- 3.2.10 EPIP 4-7, Public Information Organization Staffing
- 3.2.11 EPIP 5-7, Emergency Organization
- 3.2.12 ER-SEC Series Procedures (relative to Security Events)
- 3.2.13 EPG-2, Emergency Response Organization
- 3.2.14 ER-SC.9 , Security Event Plan
- 3.2.15 SAG-4, Inject Into Containment
- 3.2.16 SAG-5, Reduce Fission Product Release
- 3.2.17 SAG-6, Control Containment Conditions
- 3.2.18 SAG-7, Reduce Containment Hydrogen
- 3.2.18 S-9 Series Procedures (relative to the Spent Fuel Pool)

4.0 PRECAUTIONS

None.

5.0 PREREQUISITES

- 5.1 Events which pose a threat, or possible threat, of hazardous conditions to employee or public safety are imminent or in progress.

6.0 ACTIONS

NOTE: THE RECOMMENDATIONS ARE POSSIBLE ACTIONS TO BE TAKEN. SINCE EACH EVENT IS UNIQUE, NOT ALL RECOMMENDATIONS HAVE TO BE IMPLEMENTED.

6.1 Notifications

- 6.1.1 To staff the facilities, notify Emergency Preparedness per EPIP 1-5, Attachment 6, to contact the appropriate responders.
- 6.1.2 For events involving offsite assistance (e.g., fire, law enforcement, EMS, HAZMAT), notifications will be made using EPIP 1-5, Attachment 5.

6.2 Communications

6.2.1 Internal

6.2.1.1 Use the plant page to inform the plant employees of conditions.

6.2.1.2 Refer to EPIP 1-5 "Notifications" for notifications of NERP responders, offsite notifications and specialized notifications.

6.2.1.3 Refer to EPIP 1-6 for "Site Evacuation" notifications.

6.2.1.4 Use e-mail to inform specific groups (e.g., Ginna G-Ops, Ginna All Employees, Nuclear Emergency Responders) of events or conditions.

6.2.1.5 Responders with Alpha Pagers (Operations Management, Emergency Preparedness) can also be notified via e-mail.

6.2.1.6 Use the E-Plan telephone directory and emergency contact cards to assist in contacting various responders, management and support personnel.

6.2.1.7 Fax machines can also be used to relay information to groups of individuals at specific locations (e.g. TSC, EOF, JENC)

6.2.1.8 Radio communication from the Control Room can be used to contact the TSC, EOF, Survey Center, Operators, Security and the Fire Brigade. Additional radio communications are available through local law enforcement, fire departments or ambulance companies.

6.2.1.9 If no other means to communicate outside of Ginna is available, use the satellite telephone located in the TSC locker (instructions for use inside phone case) to contact Emergency Preparedness per EPIP 1-5, Attachment 6, and have EP conduct notifications.

6.2.1.10 Alternate notification methods can be delegated (EP personnel, managers) who carry copies of EPG-2 and laminated "emergency contact cards".

6.3 External

6.3.1 EPIP 1-5 "Notifications" provides instruction for notification to Wayne County, Monroe County, New York State and the NRC. Actions taken are normally coordinated from the Control Room via RECS line or commercial telephone (including fax).

6.3.2 Alternate external communication systems are available in the TSC, Simulator, Survey Center and EOF via RECS line, commercial phone and cell phone.

6.3.3 Alternate notification methods can be delegated to EP personnel who carry copies of EPIP 1-5 and laminated "emergency contact cards". Information to contacted personnel should also include specific contacts for fire and emergency services support and reporting location (in coordination with Security and Fire/Safety).

6.4 **Assembly/Accountability Process**

6.4.1 Consider implementing EPIP 1-6 "Site Evacuation", to evacuate employees from the site. Security will implement EPIP 1-7 "Accountability" to ensure that all employees are accounted for.

6.4.2 If employees need to be moved off plant property, direct them to the EOF.

6.4.3 If hazardous conditions prevent employees and emergency responders from responding directly to the site, direct them to respond to the EOF. After assembling at the EOF, TSC assessment functions can remain at the EOF if the site will be inaccessible for a long period of time.

6.4.3.1 When the situation is stable and it is safe for responders to report to the site, the site response personnel staged at the EOF should respond to the site.

6.4.3.2 Consider reporting to the Survey Center and initiate EPIP 3-3, Immediate Entry, to access the site.

6.4.4 Consider designation of alternate supervision to perform accountability if Security is unable to perform this function due to the event.

6.5 **Command and Control**

6.5.1 Refer to EPIP 1-9 "TSC Activation" and EPIP 3-1 "EOF Activation" for facility activation and transfer of command and control.

6.5.2 A near-site incident "command post" may need to be established to allow coordination of onsite response activities such as communications, accident assessment/mitigation, accountability, search and rescue, coordination with fire and medical services, and staging should the Control Room, TSC, OSC or other facilities become inaccessible.

6.5.3 Wayne County Emergency Management has a mobile command post that may be utilized.

6.5.4 If a near-site incident "command post" is established, communication with the EOF should be established to provide resources to the site.

6.5.5 Access to the plant protected area is described in procedure EPIP 3-3, "Immediate Entry".

6.6 Search and Rescue

6.6.1 Implement EPIP 1-8, "Search and Rescue Operations" to find missing individuals.

6.7 Plant Assessment and Mitigation

6.7.1 Consider the following procedures to address assessment and mitigation of an event:

- AP-CR.1
- EOPs
- ER-Fire series
- ER-SC series
- ER-SEC series
- EIPs
- SAMGs

6.7.2 Remote accident assessment may depend upon the availability of PPCS data and/or communication with the site. Computer terminals are located in the following areas to assist with assessment:

- Training Center
- Warehouse
- EOF
- JENC

6.7.3 Consider the use of fax machines located in various Ginna emergency facility locations as well as town offices, fire halls, ambulance halls and local businesses.

6.8 Dose Assessment/PARs

6.8.1 EPIP 2-series procedures provide instruction for obtaining meteorological data from multiple sources for performing dose assessment and protective action recommendations.

6.8.2 Dose Assessment can be performed in the CR, TSC or EOF with support from environmental survey teams deployed from the Survey Center or EOF.

6.8.3 Consider staging survey team personnel at the designated staging area (e.g., EOF) if the Survey Center is unavailable.

6.9 Exposure control and distribution of KI for emergency responders

6.9.1 TLD's and Self-Reading dosimetry for on site Security are maintained in the guardhouse and are obtained at the beginning of each shift.

- 6.9.2 Ginna Security, National Guard and NYS Police will be issued Self-Reading dosimeters and TLD's at the Alert level.
- 6.9.3 TLD's and Self-Reading dosimetry for offsite agencies assigned to the site is maintained in the Owner Controlled Area Checkpoint and will be obtained at the Alert level.

NOTE: THE EMERGENCY COORDINATOR WILL CONSULT WITH NYS AND COUNTY EMERGENCY MANAGEMENT VIA THE EOF PRIOR TO ISSUING KI TO OFFSITE AGENCY PERSONNEL ASSIGNED TO GINNA STATION (NATIONAL GUARD, NYS POLICE, FIRE, EMS, ETC).

- 6.9.4 Refer to EPIP 2-9, "Administration of Potassium Iodide (KI)", for distribution of KI to all emergency responders (offsite agency and Ginna).
- 6.9.5 Additional supplies of KI are located in the Technical Support Center and Survey Center.
- 6.9.6 Radiation Protection will determine the type of dosimetry to be issued and supply it to unassigned Local Law Enforcement, Fire and EMS upon their arrival to Ginna Station during an emergency.
- 6.9.7 Decontamination of emergency responders, vehicles and equipment should be accomplished at Ginna Station if conditions allow. If decontamination must be performed away from the site, County facilities such as Emergency Worker Personnel Monitoring Facilities are available by coordinating with County Representatives in the EOF and County EOC's.
- 6.9.8 Rochester General Hospital or Newark Wayne Community Hospital also have decontamination rooms that may be utilized as necessary. Refer to A-7 for notification to the hospital should decontamination be required at their facility.
- 6.9.9 The following table describes exposure control considerations for emergency workers at Ginna Station.

Emergency Response Exposure Control Considerations

	TLD's Provided	SRD's Provided	Dosimetry Inventory	KI Distribution
Ginna Security Guards	YES	YES	Some within protected area Some in OCA Checkpoint	EC Decision Consult with State and County's
National Guard	YES	YES	OCA Checkpoint	EC Decision Consult with State and County's
State Police	YES	YES	OCA Checkpoint	EC Decision Consult with State and County's
Coast Guard	Responsible for their own dosimetry	Responsible for their own dosimetry	Responsible for their own dosimetry	
Law Enforcement	YES EPIP 1-18 Supply upon entry if time permits	Escort will monitor SRD if the situation allows	Available from RP Department	Same policy as public policy
Fire	YES EPIP 1-18 Supply upon entry	Escort will monitor SRD	Available from RP Department	Same policy as public policy
EMS	YES EPIP 1-18 Supply upon entry	Escort will monitor SRD	Available from RP Department	Same policy as public policy

6.10 Public Information

- 6.10.1 EPIP 4-series procedures provide instruction on Joint Emergency News Center (JENC) operation and Public Information.
- 6.10.2 Security will be further pressured by media requests to approach the site. Offsite agencies will be required to restrict access to plant area. Public Relations and government agencies are to stress the JENC as the central clearinghouse for public information.
- 6.10.3 Consider activation of the Public Inquiry and Media Monitoring portion of the JENC. Provide information to the JENC to provide information to the public and spouses of Ginna personnel.

6.11 Relocation

- 6.11.1 Consider the establishment of alternate work locations for "non-essential" site personnel.
- 6.11.2 Contact Corporate Information Services (IS) at ext. 4300 to provide communications to the newly established work locations.
- 6.11.3 Consider relocation of Survey Team Equipment, in accordance with EPIP 1-11, to the EOF if the Survey Center is unuseable. Contact a Maintenance Assessment Manager listed in EPG-2 to make arrangements to transport equipment to the alternate location.
- 6.11.4 Each Ginna department should consider identification of business critical information and equipment needed for recovery such as drawings, procedures, vendor manuals, survey equipment.

6.12 Alternate AC and DC Power

- 6.12.1 Implement existing ER series procedures to the extent practical to restore power.
- 6.12.2 Technical Assessment Manager refer to Attachment 1, Alternate AC and DC Power Supplies and Table 1, Equipment Ratings.
- 6.12.3 Technical Assessment Manager and Operations Assessment Manager discuss options and impact on 10CFR50.54(x).
- 6.12.4 Provide recommendations to the Emergency Coordinator for implementation.

6.13 Back-up Mechanical Pump Capability

- 6.13.1 Implement existing ER series procedures to the extent possible to restore equipment.
- 6.13.2 Implement existing SC series procedures to the extent possible to respond to the event and enlist offsite support.
- 6.13.3 Technical Assessment Manager refer to Table 1, Equipment Ratings, and Table 2, Back-up Mechanical Pump Capability.
- 6.13.4 Technical Assessment Manager and Operations Assessment Manager discuss options for use of onsite vs. Offsite pumping capabilities and the impact on 10CFR50.54(x).
- 6.13.5 Provide recommendations to the Emergency Coordinator for implementation.

6.14 Fission Product Scrubbing from a Failed Containment

- 6.14.1 Reference existing Severe Accident Management Guidelines (SAMGs) SAG-4, SAG-5, SAG-6 and SAG-7 to the extent practical.
- 6.14.2 Technical Assessment Manager refer to Attachment 2, Fission Product Scrubbing From A Failed Containment, and Table 2, Back-up Mechanical Pump Capability.
- 6.14.3 Technical Assessment Manager and Operations Assessment Manager discuss options, reactivity monitoring requirements and the impact on 10CFR50.54(x).
- 6.14.4 Provide recommendations to the Emergency Coordinator for implementation.

6.15 Emergency Spent Fuel Pit Cooling

- 6.15.1 Implement existing S-9 series procedures to the extent practical to restore SFP cooling.
- 6.15.2 Technical Assessment Manager refer to Attachment 3, Emergency Spent Fuel Pool Cooling.
- 6.15.3 Technical Assessment Manager and Operations Assessment Manager discuss options and impact on 10CFR 50.54(x).
- 6.15.4 Provide recommendations to the Emergency Coordinator for implementation.

6.16 Emergency Containment Cooling

- 6.16.1 Implement existing S-23.2.3, Containment Mini Purge System Operation, or AP-SW.1 or AP-SW.2 to the extent possible to restore containment cooling. If unable to restore containment cooling, then continue with the following steps.
- 6.1.6.2 Technical Assessment Manager, refer to Attachment 6, Emergency Containment Cooling.
- 6.16.3 Technical Assessment Manager and Operations Assessment Manager, discuss options and impact on 10 CFR 50.54(x).
- 6.16.4 Provide recommendations to the Emergency Coordinator for implementation.

7.0 Attachments

- 1. Alternate AC and DC Power Supplies
- 2. Fission Product Scrubbing From A Failed Containment
- 3. Emergency Spent Fuel Pool Cooling
- 4. Table 1, Equipment Ratings
- 5. Table 2, Back-up Mechanical Pump Capability
- 6. Emergency Containment Cooling

ALTERNATE AC AND DC POWER SUPPLIES

Following is a list of possible first response actions that could be taken to mitigate loss of power to equipment on site. Level of response varies depending on the magnitude of the loss of existing on-site power supplies, availability of distribution equipment (buses, panels, etc.), and what equipment needs to be supplied.

At this time, contacts have been made with outside suppliers to determine potential availability, but no arrangements have been made with them to provide the backup equipment. An evaluation of the timeliness of our needs must be completed, and then we can recommend specific actions to put a plan in place. Costs associated with having generators, cable, and transformers available on demand can be determined at that time, and those costs will vary with response time required.

Alternate AC Power Supplies:

1. Diesel Generators can be cross-tied between systems depending on where the need is and what is available. Cable to run directly to motor loads or buses, again depending on condition and need, would be taken from our warehouse procured from local suppliers, including RG&E. Attached equipment data provides equipment ratings of existing generators, and the requirements of loads that may need to be supplied.
2. 480 volt power may be supplied from the 12 kv overhead distribution line that comes onto the site from the east. A small transformer exists (300 kva rating) near the Nuclear Assessment building, and a separate transformer could be brought on-site to provide power if the line was still energized.
3. Bring separate diesel generator(s) on site, and connect at buses or directly to loads as conditions and needs warrant. A 1000 kw size is assumed to be adequate for a first response action, which would allow a combination of loads as selected by Operations from the attached list. Portable units can be made available on short notice, depending on immediate availability from: Wegmans (1300 kw unit), Aggreko out of Albany, Penn-Detroit out of Syracuse. Wegmans, if available, could be here in approximately two hours, Aggreko or Penn would take up to eight hours.
4. For 120 VAC instrument loads, portable generators of 5 kw available at local retail stores would be adequate to power up individual instrument buses, racks, or the ABELIP and IBELIP racks locally if needed. This would supply a minimum amount of instrumentation to monitor shutdown parameters.

Alternate DC Power Supplies:

1. Using existing on-site DC, capability to cross-tie to TSC battery/TSC battery charger. However, condition of interties or SR DC distribution system may preclude this. Cables can be run from TSC batteries to required loads or load centers.
2. Use of Security UPS battery is not recommended as it should be reserved for security systems.

ALTERNATE AC AND DC POWER SUPPLIES (Continued)

3. Portable DC power supplies used by maintenance are AC powered and can provide enough DC to supply individual panels locally.
4. Larger DC power supplies, or battery chargers, can be obtained from suppliers and set up where needed, assuming 480 VAC supply power available.
5. Movement of a 125 VDC battery string of adequate size would most likely be impractical. However, such batteries exist and would be available from outside suppliers and could be moved here in approximately 8 hours as a last resort.

Other Equipment:

Valves can be hand operated. It would not normally be reasonable to run power to individual valves. If a panel or MCC can be picked up, then the valve would be powered.

Offsite Power Equipment Supplier Contacts:**480 Volt Diesel Generators**

Wegmans 1300 kw generator
Contact: Wegmans Security Center (585) 429-3030

Aggreko, Inc. (Albany area) 1250 kw - 1750 kw
Contact: Mike Smith (518) 235- 9604, [REDACTED]

Penn-Detroit Diesel 60 kw - 1400 kw
Contact: Kurt Schultz (315) 451-3840

120 VAC Power

Grounds Maintenance 5 kva generator
Contact: Keith Merkel

Chase Pitkin Webster 2.5 kva - 10 kvs portable generators
(585) 872-4010

125 VDC Power Supplies

JM Schaeffer (Syracuse)
Contact: Carl Phillips (315) 463-5223

Cable or Transformers not on-site

Contact RG&E Energy Control Center (585) 724-8944

Prepared By: Paul Swift 4/21/05

FISSION PRODUCT SCRUBBING FROM A FAILED CONTAINMENT

With respect to fission product scrubbing from a failed containment, SAMGs SAG-4, SAG-5, SAG-6 and SAG-7 provide instructions to inject into containment, reduce releases, control conditions and reduce hydrogen. If they unsuccessful, then an external pump and water source, such as a fire truck, will be used but it is not always prudent to spray water into an area if the core has melted. In addition, if the core hasn't melted but there is a loss of cooling accident (LOCA), you're now spraying unborated water into the sump, which may cause reactivity issues.

The TSC Technical Assessment Manager will provide some guidance for Scrubbing A Failed Containment, with increased monitoring of reactivity.

- For the scenario where there is a hole in the outside of containment and an accident (LOCA) going on inside, we would want the pumper truck to cover the opening with a "light rain type" of spray pattern similar to what comes out of the containment spray nozzles. We would not want just a concentrated stream directed at the opening.
- If guidance on drop size is desired, UFSAR 6.2.2.2.6 specifies 1000 microns or about .04" diameter drops.
- Depending on the hole size and orientation on the structure, we would like to aim the spray to minimize to the extent practical direct water entry into the containment so as not to potentially cause sump boron concentration concerns.

EMERGENCY SPENT FUEL POOL COOLING

NOTE: IF ACCESS IS LIMITED INTO THE AUXILIARY BUILDING AND EMERGENCY MAKE-UP WATER INTO THE SPENT FUEL POOL (SFP) IS DESIRED, THE FOLLOWING STEPS WILL SUPPLY FIRE WATER INTO THE SFP VIA THE SFP SKIMMER PIPING LOCATED IN THE INTERMEDIATE BUILDING HOT SIDE.

NOTE: USE OF THE FOLLOWING METHOD OF MAKE-UP TO THE SFP IS FOR EMERGENCY CONDITIONS ONLY. IT HAS THE POTENTIAL TO VIOLATE ITS LCO 3.7.12 REQUIREMENTS AND, HENCE, 10CFR505.54(X) SHOULD BE CONSIDERED IF TAKING THIS ACTION.

1. Obtain key number 79 for the EOP locker (gray locker on the top floor of Turbine Building on the east wall near the Auxiliary Operator Office). Get the pool piece to connect a 1 - 1/2" fire hose to a 2" - 150 pound flange.
2. Ensure SFP skimmer pump is secured.
3. Close V-788B.
4. Remove blank flange from piping immediately upstream of V-788B (IB Hot Side near door to Auxiliary Building).
5. Connect the fire hose from an available supply (Hose Reel 21 on the North wall of the Primary Sample Room is preferred if available) to flange immediately upstream of V-788B using fittings obtained in step 1.
6. Open fire water supply valve (V-5199T if using Hose Reel 21) slowly to supply water to SFP.
7. Verify fire water pump running.
8. If possible, visually verify water make-up to SFP directly or via security camera 30.
9. Monitor available remote SFP indication (i.e., R-5, AR-K-29).

TABLE 1 - EQUIPMENT RATINGS

Diesel Generator A and B 1950 KW (Continuous)
(480 Volt) 2250 KW (2 hours)
2300 KW (½ hour)

TSC Diesel Generator 260 KW
(480 Volt)

Security Diesel Generator 135 KW
(480 Volt)

Motor	Rated HP	Max. Loading	KW
Safety Injection Pumps	350 HP	368 HP	291
RHR Pumps	200	173	139
Containment Fans	300	256	205
Service Water Pumps	300	308	246
Containment Spray Pumps	200	220	183
CCW Pumps	150	150	124
Aux. Feedwater Pumps	250	280	223
Standby AFW Pumps	300	300	249
Charging Pumps	150	150	124
Spent Fuel pool Pump B	100	100	75
Spent Fuel Pool Pump Spare Skid (600 gpm @ 65# D/P)	50	57	42

120 VAC Instrument Power

Equipment	Rating	Max. Load
Instrument Bus feed (Inverters, CVTs)	7.5 kva	6.4 kw
Twinco Panels (fed from Twinco CVTs)	2 kva	1.7 kw

TABLE 1 - EQUIPMENT RATINGS
(Continued)

Equipment	Capacity	Normal Load A	Normal Load B
Battery Chargers A1, B1	200 amps	55 amps	50 amps
Battery Chargers A2, B2	150 amps	50 amps	30 amps
TSC Battery Charger	500 amps	95 amps	
Vital Batteries BYCA, BYCB	1495 amp-hrs	N/A	
TSC Battery	2880 amp-hrs	N/A	
Security Battery	250 amp-hrs	N/A	

TABLE 2 - BACK-UP MECHANICAL PUMP CAPABILITY

UTILIZATION & DEMAND								
Source	GPM	TDAFWP Oil Hx (GPM)	SBAFWP (GPM)	Containment Recirc Fan (GPM)	Spent Fuel Pool Hx "A" (GPM)	CCW Hx (GPM)	D/G Hx (GPM)	Fission Product Scrubbing (GPM)
Onsite Fire Pump (3)	2,000	25	200	1,050	600	3,500 (2)	277/400 (1)	500/1,000 (onsite monitor nozzles)
Ontario Water Authority (D/G back-up)	1,500	(1) DA-ME-98-138 (2) Maximum flow as per design basis. Actual GPM may be significantly less. (3) Assumption both pumps in service (1) one dedicated for fire suppression only.						
Available through Wayne County 911 Center Refer to SC-3.3.2, Attachment C, for complete resource list								
Fire Dept. Drafting Discharge Canal (limited to one pumper)	1,250							
Portable Pumps (discharge canal)	500							
Tanker Truck Relay portable Pond	1,250							
Portable Hydrant/Relay	1,000							

EMERGENCY CONTAINMENT COOLING

NOTE: THE FOLLOWING IS GUIDANCE FOR THE TSC. IF THIS CONTINGENCY IS REQUIRED, SPECIFIC DIRECTION WILL BE CASE DEPENDENT AND PROVIDED BY THE TSC.

ALIGNMENT OF THE EAST SW HEADER

NOTE: THIS WILL ALIGN COOLING WATER TO EITHER THE A OR THE B CNMT RECIRC FAN AND TDAFW PUMP SUCTION.

1. Isolate east header y closing valves 4623, 4627, 4628, 4625 and 4756
2. Have fitters remove 16" diameter blind flange on east side and drain header.
3. Have fitters install pre-staged flange, in IB sub-basement, to the east header.
4. Run hose(s) from either the S-15 drain connection, if fire trucks are hooked up to the building connections, or directly from trucks. The hose(s) can be run down the hatch near the MDAFW pumps. Hook hose(s) to connections on flange (2 - 2 ½" connections available.)
5. Pressurize lines and line up an available fan cooler. (Opening V-4627 will give you flow to the A CNMT recirc fan. Opening V4628 will give you flow to the B CNMT recirc fan.) Trip open 4561 or 4562.

ALIGNMENT OF THE WEST SW HEADER

NOTE: THIS WILL ALIGN COOLING WATER TO EITHER THE C OR D CNMT RECIRC FAN.

1. Isolate west header by closing valves 4626, 4639, 4663, 4664, 4640, 4642 and 4641.
2. Have fitters remove 16" diameter blind flange on west side and drain header.
3. Have fitters install a pre-staged flange, in IB sub-basement, to the west header.
4. Run hose(s) from either the S-15 drain connection, if fire trucks are hooked up to the building connections, or directly from the trucks. The hose(s) can be run down the hatch near the MDAFW pumps. Hook hose(s) to connection on flange (2 - 2½" connections.)
5. Pressurize lines and line up an available fan cooler. (Opening V-4641 will give you flow to the C CNMT recirc fan. Opening V-4642 will give you flow to the D CNMT recirc fan.) Trip to open 4561 or 4562.

GINNA STATION

CONTROLLED COPY NUMBER 23

PROCEDURE NO. EPIP 1-17

REV. NO. 7

PLANNING FOR ADVERSE WEATHER



RESPONSIBLE MANAGER

03/11/05

EFFECTIVE DATE

Category 1.0

This procedure contains 6 pages

EPIP 1-17**PLANNING FOR ADVERSE WEATHER****1.0 PURPOSE**

- 1.1 This procedure provides actions for the Nuclear Operations Group to consider for preparation of the site and personnel for severe weather at Ginna Station. ER-SC.1 does not have to be entered to use this procedure.
- 1.2 This procedure may still be of some limited use if severe weather was not forecasted but conditions deteriorate without warning.

2.0 RESPONSIBILITY

- 2.1 Emergency Preparedness is responsible for coordinating recommendations for the Nuclear Operations Group (NOG).

3.0 REFERENCES**3.1 Developmental References**

- 3.1.1 Florida Power & Light Company, Turkey Point Units 3 and 4, EPIP 20106 - Natural Emergencies (8/11/92)
- 3.1.2 INPO SOER 02-01, Severe Weather
- 3.1.3 INPO SOER 01-01, Severe Storm Results in SCRAM of Three Units and Loss of Safety System Functions Due to Partial Plant Flooding
- 3.1.4 NUREG-1474, Effect of Hurricane Andrew on the Turkey Point Nuclear Generating Station from August 0-30, 1992

3.2 Implementing References

- 3.2.1 EPIP 1-0, Ginna Station Event Evaluation and Classification.
- 3.2.2 ER-SC.1, Adverse Weather
- 3.2.3 A-52.9, Overtime Work Policy For Operations Personnel
- 3.2.4 A-52.10, Overtime Work Policy For Key Maintenance Personnel
- 3.2.5 10 CFR50.54, Conditions of License

4.0 PRECAUTIONS

None.

5.0 PREREQUISITES

- 5.1 Severe weather is forecasted for the Rochester area by means of a weather warning by WOKR weather service or the National Weather Service (NWS). Reliable information on approaching severe weather disturbances is expected to be available from:
- a. WHAM weather service
 - b. Contract meteorological services
 - c. National Weather Service
- 5.2 Weather conditions at the site have degraded or may be degraded to the point that plant personnel and normal plant activities may be affected.

6.0 ACTIONS

NOTE: IN THE EVENT THAT SEVERE WEATHER IS FORECASTED FOR THE ROCHESTER AREA, THE FOLLOWING ACTIONS SHOULD BE TAKEN AS APPROPRIATE. THE RECOMMENDATIONS ARE POSSIBLE ACTIONS TO BE TAKEN. SINCE EACH WEATHER EVENT IS UNIQUE, NOT ALL RECOMMENDATIONS HAVE TO BE IMPLEMENTED. EACH MANAGER SHOULD CHOOSE THE APPROPRIATE ACTIONS BASED IN THE FORECAST.

- 6.1 Recommendations to the Plant Manager:
- 6.1.1 Tie down or move to a more secure location, equipment and other items that may be dislodged by the forecasted weather.
 - 6.1.2 Perform communications checks of all emergency communication systems in the TSC, EOF, Control Room and Survey Center.
 - 6.1.3 Ensure all portable radios are operational and all spare batteries are fully charged.
 - 6.1.4 Coordinate the following:
 - a. Obtain and properly store the necessary supplies for Operations, Maintenance, Security, and support personnel staying on site during the storm. Consider the following supplies:
 1. food items
 2. water, beverages
 3. paper plates, cups
 4. plastic utensils
 5. paper towels
 6. soap

- b. Make arrangements for obtaining portable bedding as required by the amount of staff expected to remain on site through the storm.
 - c. Ensure medical support (staff) and adequate medical supplies are available.
 - d. For personnel safety, consider the need for the following plant announcements:
 - stop all outside activities
 - remain away from glass windows
 - seek shelter in lower elevations of the plant
 - report to your supervisor to perform a "head count" for your work group
 - limit travel between buildings.
- 6.1.5 Make arrangements for personnel who might be required to support the plant during and immediately following the storm to be available and onsite.
- 6.1.6 If food service is going to be required to support long term operations, contact the Ginna cafeteria staff.
- Contact: [REDACTED]
Home: [REDACTED]
Cellular: [REDACTED]
- 6.1.7 Consult with Emergency Preparedness personnel to inform the state and counties of the circumstances and to provide additional support as necessary.
- 6.1.8 Consult with corporate officials on arranging for support personnel and equipment to be transported to the site after passage of the severe weather.
- 6.1.9 Volunteers who remain at the plant during the severe weather should be identified and accounted for.
- 6.1.10 All unnecessary personnel and all visitors in the Protected Area should be advised to leave when a severe weather warning is issued for the area, assuming that sufficient time is available to reach a safe location. Otherwise, provide them with protection onsite.
- 6.1.11 Release non-essential personnel in a phased, controlled manner as the severe weather preparations are completed or as personal circumstances dictate. Ensure release of personnel is far enough in advance of severe weather to allow personnel to arrive safely at their homes and avoid any undue traffic congestion. During or after the severe weather, contact the county emergency managers to determine road conditions to ensure the safety of personnel arriving or departing the site.
- 6.1.12 Order all unnecessary work stopped.

- 6.1.13 During and following the storm, plant management may use 10CFR50.54(x). Examples would be to suspend fire watches and security patrols.
- 6.1.14 Establish a shift schedule for the additional response personnel that are providing continuous plant support.
- 6.1.15 Brief the Nuclear Operations Group (NOG) response personnel who will remain onsite and corporate executives on the severe weather, safety precautions, expected duties, potential problems, contingencies and communications systems using e-mail and telephone calls.
- 6.1.16 Prior to the forecasted storm, perform walkdowns of the plant exterior and site with key managers to inspect for and reduce potential missiles.
- 6.1.17 Consider assembling all personnel in the power block or other safe location prior to the arrival of the severe weather. If unexpected severe weather occurs, consider establishing a point of contact for each building so that if an emergency exists, and assistance is needed, it can be coordinated promptly. This should include the white house, simulator, training center, warehouse and manor house.
- 6.1.18 Ensure appropriate notifications are made when its safe to return to work.
- 6.2 Recommendations to the Maintenance Manager:
 - 6.2.1 Ensure scaffolding that would be exposed to high winds is removed or secured.
 - 6.2.2 Survey construction sites to ensure all light material is either tied down, secured or placed indoors.
 - 6.2.3 Secure electrical services to temporary facilities, if necessary.
 - 6.2.4 If time permits, disassemble and remove temporary and portable buildings or structures that could be damaged by strong winds.
 - 6.2.5 Solicit volunteers for round-the-clock staffing maintenance activities. Attempt to resolve any personal considerations. Follow guidelines in A-52.10. If there are conflicts, bring them to the attention of the Plant Manager.
 - 6.2.6 Designate storm duty vehicles. Establish location for storm duty vehicles inside a protected area. Ensure these vehicles are serviced and refueled.
- 6.3 Recommendations to the Operations Manager:
 - 6.3.1 Determine, if it is necessary, to position operators in buildings that would be inaccessible because of the inability to move between buildings during the height of the severe weather. This will ensure that they will be available to take corrective action if failures occur during the severe weather (i.e., screenhouse).

- 6.3.2 Make arrangements for sufficient Operations personnel who might be required to be at the plant during and immediately following the storm in order to provide the necessary coverage. Follow guidelines in A-52.9. If there are conflicts, bring them to the attention of the Plant Manager.
- 6.3.3 If the operator rounds on outside equipment are to be temporarily suspended during the severe weather, have the shift supervisor document the decision.
- 6.3.4 If appropriate, perform an operability run on each emergency diesel generator.
- 6.3.5 Suspend unnecessary water usage. (i.e. AVT regenerations).
- 6.3.6 Fill the condensate storage tanks and demineralized water storage tanks.
- 6.3.7 Verify battery chargers and applicable station vital batteries are operational.
- 6.3.8 Ensure that adequate inventories of hydrogen and nitrogen are available to accommodate a unit shutdown and subsequent startup.
- 6.3.9 Review procedures that might be required as a result of the storm (e.g. loss of offsite power).
- 6.3.10 Notify Emergency Preparedness to increase siren system surveillance to ensure possible out of service sirens are identified.
- 6.3.11 If appropriate, perform a test of the security and TSC diesels.
- 6.3.12 Make permissible liquid and gaseous releases before the severe weather arrives; waste water and waste gas inventories should be at a minimum.
- 6.3.13 Ensure adequate inventories of chemicals (such as boric acid, ammonia, hydrazine) are available and staged.
- 6.3.14 Suspend all fuel movement, if applicable; place all refueling equipment in a safe condition.
- 6.3.15 Arrange to have fuel oil storage tanks for the emergency diesel generators topped off.
- 6.4 Recommendations to the Radiation Protection and Chemistry Managers:
 - 6.4.1 Ensure that all batch radioactive release permits are completed so waste tank inventories are at a minimum, prior to the onset of severe weather.

- 6.4.2 Instruct radiation protection personnel to inspect outside areas for radioactive materials that need to be stored inside or protected from severe weather. The radioactive waste stored on site is to be adequately protected from the elements. This will prevent the spread of low level radioactive waste during the severe weather.
- 6.4.3 Make arrangements for sufficient personnel to be at the plant during the storm in order to provide the necessary coverage for a time period during which the plant may be inaccessible.
- 6.4.4 Ensure adequate make up water is available.
- 6.5 Recommendations to the Security Manager:
 - 6.5.1 If time permits prior to the severe weather, ensure that all visitors have been asked to leave the site.
 - 6.5.2 Account for all personnel who are to remain on site.
 - 6.5.3 Make arrangements for sufficient security personnel who might be required to support the plant during and immediately following the severe weather to be available and onsite.
 - 6.5.4 Determine if and when security patrols outside are to be temporarily suspended during the storm. Document this decision.
- 6.6 Post Storm Assessment
 - 6.6.1 Plant management should assess the impact of the severe weather on plant safety and determine whether to remain at power or, if the plant is shutdown, to restart.
 - 6.6.2 Ginna Emergency Preparedness will contact Monroe and Wayne County Emergency Management Offices to determine the status of offsite emergency preparedness and will report to plant management.
 - 6.2.2.1 Emergency Preparedness group should verify operability of siren system and individual sirens by performing silent testing as required. Further assessment of siren equipment and power to sites should be performed at siren locations that may have been physically damaged, to the extent deemed appropriate for the severity and region of the storm.
 - 6.6.3 Plant management will keep the NRC informed of actions and status.
- 7.0 Attachments

None.

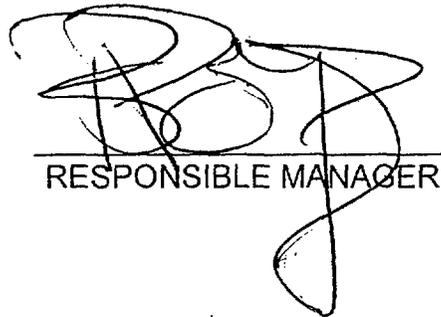
GINNA STATION

CONTROLLED COPY NUMBER 03

PROCEDURE NO. EPIP 2-1

REV. NO. 22

PROTECTIVE ACTION RECOMMENDATIONS



RESPONSIBLE MANAGER

01/21/05

EFFECTIVE DATE

CATEGORY 1.0

THIS PROCEDURE CONTAINS 12 PAGES

EPIP 2-1PROTECTIVE ACTION RECOMMENDATIONS1.0 PURPOSE:

- 1.1 The purpose of this procedure is to provide guidance to the Shift Supervisor, Emergency Coordinator or EOF/Recovery Manager in making protective action recommendations to offsite authorities.

2.0 RESPONSIBILITY:

- 2.1 The Shift Supervisor, Emergency Coordinator (TSC) or EOF/Recovery Manager is responsible for making protective action recommendations to Wayne County, Monroe County and New York State, depending on command and control status.
- 2.2 The decision to implement any protective actions is solely the responsibility of the local authorities.

3.0 REFERENCES:

3.1 Developmental References

3.1.1 Nuclear Emergency Response Plan

3.1.2 EPA-400, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (1991)

3.1.3 Evacuation Travel Time Estimates - Ginna Emergency Planning Zone, February 2004.

3.1.4 NUREG/BR - 0150 Response Technical Manual (RTM-93)

3.1.5 Food and Drug Administration (FDA) "Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies", December 2001.

3.1.6 NUREG-1633, "Assessment of the Use of Potassium Iodide (KI) as a Supplemental Public Protective Action During Severe Reactor Accidents".

3.1.7 NRC RIS 2003-12 "Clarification of NRC Guidance for Modifying Protective Actions"

3.2 Implementing References

3.2.1 EPIP 1-0, Ginna Station Event Evaluation and Classification

- 3.2.2 EPIP 1-5, Notification
- 3.2.3 EPIP 2-3, Emergency Release Rate Determination
- 3.2.4 EPIP 2-4, Emergency Dose Projections - Manual Method
- 3.2.5 EPIP 2-18, Control Room Dose Assessment
- 3.2.6 EPIP 2-5, Emergency Dose Projections - Personal Computer Method
- 3.2.7 EPIP 2-6, Emergency Dose Projections - MIDAS Program

4.0 **PRECAUTIONS:**

None.

5.0 **PREREQUISITES:**

None.

6.0 **INSTRUCTIONS:**

NOTE: PROTECTIVE ACTION RECOMMENDATIONS (PARs) WILL ONLY REFLECT GINNA RECOMMENDATIONS, NOT ACTIONS IMPLEMENTED BY OFFSITE OFFICIALS.

- 6.1 Obtain the event classification using EPIP 1-0.
- 6.2 **UNUSUAL EVENT, ALERT and SITE AREA EMERGENCY.**
 - 6.2.1 Report on EPIP 1-5, Attachment 3a, Item 7:
 - A. No need for protective actions outside the site boundary.**
- 6.3 **GENERAL EMERGENCY**
 - 6.3.1 Protective Action Recommendations shall be issued with the initial declaration of a General Emergency.
 - 6.3.2 Using Attachment 1, Page 1 of 2, and the current wind direction, determine the initial ERPAs to be evacuated. The Counties will implement their KI plans for any evacuated ERPA. Any ERPA not evacuated will be sheltered.
 - 6.3.3 Record in EPIP 1-5, Attachment 3a, Item 7, the Protective Actions Recommended.

NOTE: ONCE AN ERPA HAS BEEN RECOMMENDED TO EVACUATE, THAT RECOMMENDATION WILL CONTINUE. AN ERPA PAR STATUS CANNOT BE CHANGED FROM “EVACUATE” TO “SHELTER”.

6.3.4 After the initial PAR has been made, re-evaluate the PARs based on the following to determine if secondary PARs are required or if initial PARs need to be modified.:

- a. Dose Assessment*
- b. Survey Team data*
- c. EPA Protective Action Guidelines (Attachment 2)
- d. Wind shifts

* = If exposures in non-evacuated areas indicate that evacuation is warranted, use Attachment 1 page 2 of 2 to expand Protective Action Recommendations to an evacuated area of 5 mile radius and 10 miles downwind.

6.3.5 If the EPA guidelines for evacuation or sheltering are exceeded beyond the 10 mile emergency planning zone and protective actions are required, specify the areas using roads, rivers, bodies of water or town boundaries.

6.3.6 If an ERPA is recommended for evacuation and the county decides to shelter the ERPA instead, the KI plan should still be implemented for that ERPA.

6.3.7 The Evacuation Travel Time Estimate information (Attachment 3) is used by offsite agencies to determine the correct Protective Action Decision (PAD).

It is assumed by everyone within an ERPA that is issued an Advisory to Evacuate will, in fact, respond in general accord with the planned routes.

It is assumed that no early dismissal to home of school children is contemplated. According to county policy, school children are not to be released to their parents on school grounds. All students will be evacuated to the reception centers assigned to the schools and then released to their parents as they arrive at the reception centers. Sufficient bus resources are identified to handle 100% of the students in one wave.

“Voluntary Evacuation” occurs when people in areas of the EPZ not ordered to evacuate, nevertheless choose to do so. Within the annular ring defined by the distance to be evacuated (5-miles or 10miles downwind), 50% of the people not advised to evacuate are assumed to evacuate within the same time frame. Between the annular ring, defined by the extent of the downwind evacuation order out to the EPZ boundary, it is assumed that 35% of the people will deliberately evacuate. This is graphically presented in Attachment 4.

"Shadow Evacuation" occurs when people in areas outside the EPZ choose to relocate during the course of the evacuation. These people can use the same roads as evacuees from the EPZ and can potentially delay evacuees from leaving the area at risk. The shadow evacuation is in Monroe County. It is an area southwest of the EPZ. It is defined by the edge of the EPZ boundary out to Interstate 590, Irondequoit Bay and State Road 31 out to the Monroe-Wayne County line. It is assumed that 30% of the people will evacuate voluntarily. This is graphically presented in Attachment 5.

6.3.8 In the event that there are questions about ERPA populations, use the table below to provide information:

<u>ERPA</u>	<u>Population</u>	<u>ERPA</u>	<u>Population</u>
W-1	3,877	M-1	3,973
W-2	6,043	M-2	482
W-3	1,081	M-3	359
W-4	2,227	M-4	6,965
W-5	3,976	M-5	1,324
W-6	2,181	M-6	6,893
W-7	4,579	M-7	7,624
		M-8	3,100
		M-9	<u>3,930</u>
Wayne County Totals	23,964	Monroe County Totals	34,650

7.0 **ATTACHMENTS:**

1. Evacuation Areas by Zones
2. Projected Dose to the Population and Recommended Actions
3. Evacuation Times Estimates
4. Assumed Evacuation Response within the EPZ
5. Ginna EPZ and Shadow Region
6. Emergency Response Planning Areas (ERPAs)

**EVACUATION AREAS BY ZONES
PROTECTIVE ACTION RECOMMENDATIONS BY ERPA FOR
GENERAL EMERGENCY CLASSIFICATION**

Wind From	(Degrees)	Initial Protective Action Recommendations (Evacuation based on 2 mile radius & 5 miles downwind)
N	349 to 11	Evacuate: W (1,2,3) and implement KI plan Shelter: All remaining ERPAs
NNE	12 to 33	Evacuate: W (1,2) M (1) and implement KI plan Shelter: All remaining ERPAs
NE	34 to 56	Evacuate: W (1,2) M (1) and implement KI plan Shelter: All remaining ERPAs
ENE	57 to 78	Evacuate: W (1,2) M (1) and implement KI plan Shelter: All remaining ERPAs
E	79 to 101	Evacuate: W (1,2) M (1) and implement KI plan Shelter: All remaining ERPAs
ESE	102 to 124	Evacuate: W (1) M (1) and implement KI plan Shelter: All remaining ERPAs
SE	125 to 146	Evacuate: W (1) and implement KI plan Shelter: All remaining ERPAs
SSE	147 to 168	Evacuate: W (1) and implement KI plan Shelter: All remaining ERPAs
S	169 to 191	Evacuate: W (1) and implement KI plan Shelter: All remaining ERPAs
SSW	192 to 213	Evacuate: W (1) and implement KI plan Shelter: All remaining ERPAs
SW	214 to 236	Evacuate: W (1,3) and implement KI plan Shelter: All remaining ERPAs
WSW	237 to 258	Evacuate: W (1,3) and implement KI plan Shelter: All remaining ERPAs
W	259 to 281	Evacuate: W (1,3) and implement KI plan Shelter: All remaining ERPAs
WNW	282 to 303	Evacuate: W (1,2,3) and implement KI plan Shelter: All remaining ERPAs
NW	304 to 326	Evacuate: W (1,2,3) and implement KI plan Shelter: All remaining ERPAs
NNW	327 to 348	Evacuate: W (1,2,3) and implement KI plan Shelter: All remaining ERPAs

EPIP 2-1:6

EVACUATION AREAS BY ZONES
 PROTECTIVE ACTION RECOMMENDATIONS BY ERPA FOR
 GENERAL EMERGENCY CLASSIFICATION

Wind From	(Degrees)	Initial Protective Action Recommendations (Evacuation based on 2 mile radius & 5 miles downwind)	Secondary Protective Action Recommendations (Evacuation based on 5 mile radius & 10 miles downwind)
N	349 to 11	Evacuate: W (1, 2, 3) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3, 5, 6, 7) M (1, 2, 4, 5) and implement KI plan Shelter: All remaining ERPAs
NNE	12 to 33	Evacuate: W (1, 2) M (1) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3, 6, 7) M (1, 2, 3, 4, 5, 6, 7, 9) and implement KI plan Shelter: All remaining ERPAs
NE	34 to 56	Evacuate: W (1, 2) M (1) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3, 7) M (1, 2, 3, 4, 5, 6, 7, 8, 9) and implement KI plan Shelter: All remaining ERPAs
ENE	57 to 78	Evacuate: W (1, 2) M (1) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3, 7) M (1, 2, 3, 4, 5, 6, 7, 8, 9) and implement KI plan Shelter: All remaining ERPAs
E	79 to 101	Evacuate: W (1, 2) M (1) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3) M (1, 2, 3, 4, 6, 7, 8, 9) and implement KI plan Shelter: All remaining ERPAs
ESE	102 to 124	Evacuate: W (1) M (1) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3) M (1, 3, 6, 8, 9) and implement KI plan Shelter: All remaining ERPAs
SE	125 to 146	Evacuate: W (1) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3) M (1) and implement KI plan Shelter: All remaining ERPAs
SSE	147 to 168	Evacuate: W (1) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3) M (1) and implement KI plan Shelter: All remaining ERPAs
S	169 to 191	Evacuate: W (1) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3) M (1) and implement KI plan Shelter: All remaining ERPAs
SSW	192 to 213	Evacuate: W (1) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3) M (1) and implement KI plan Shelter: All remaining ERPAs
SW	214 to 236	Evacuate: W (1, 3) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3, 4) M (1) and implement KI plan Shelter: All remaining ERPAs
WSW	237 to 258	Evacuate: W (1, 3) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3, 4, 5) M (1) and implement KI plan Shelter: All remaining ERPAs
W	259 to 281	Evacuate: W (1, 3) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3, 4, 5, 6) M (1) and implement KI plan Shelter: All remaining ERPAs
WNW	282 to 303	Evacuate: W (1, 2, 3) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3, 4, 5, 6, 7) M (1) and implement KI plan Shelter: All remaining ERPAs
NW	304 to 326	Evacuate: W (1, 2, 3) and implement KI plan Shelter: All remaining ERPAs	Evacuate: W (1, 2, 3, 4, 5, 6, 7) M (1, 2) and implement KI plan Shelter: All remaining ERPAs
NNW	327 to 348	Evacuate: W (1, 2, 3) and implement KI plan	Evacuate: W (1, 2, 3, 4, 5, 6, 7) M (1, 2, 5) and implement KI plan

* Secondary Protective Actions are recommended when dose projections or field teams indicate ≥ 1 REM TEDE beyond 5 miles.

PROJECTED DOSE TO THE POPULATION AND RECOMMENDED ACTIONS

PROJECTED DOSE TO THE POPULATION	RECOMMENDED ACTIONS	COMMENTS
Total Whole Body < 1 REM*	No planned protective actions. Local authorities or State may issue an advisory to seek shelter and await further instructions. Monitor environmental radiation levels.	None.
Total Whole Body \geq 1 REM* Committed Dose Equivalent to the thyroid (child) \geq 5 REM.	Conduct evacuation.* Monitor environmental radiation levels and adjust area for mandatory evacuation based on these levels. Control access. Implement KI plan.	Evacuation (or for some situation, sheltering**) should be initiated at one REM. Seeking shelter would be an alternative if evacuation were not immediately possible.
Project Dose (REM) to Emergency Team Workers		
Total Whole Body 25 REM	Control exposure of emergency team members to these levels except for lifesaving mission. (Appropriate controls for emergency workers include time limitations, respirators and stable iodine.)	None.
Total Whole Body 75 REM	Control exposure of emergency team members performing lifesaving missions to this level. (Control of time of exposure will be most effective.)	None.

NOTES:

- * The sum of the effective dose equivalent resulting from exposure to external sources and the committed effective dose equivalent incurred from all significant inhalation pathways during the early phase.
- ** Sheltering may be the preferred protective action when it will provide protection equal to or greater than evacuation, based on consideration of factors such as source term characteristics and temporal or other site-specific conditions.

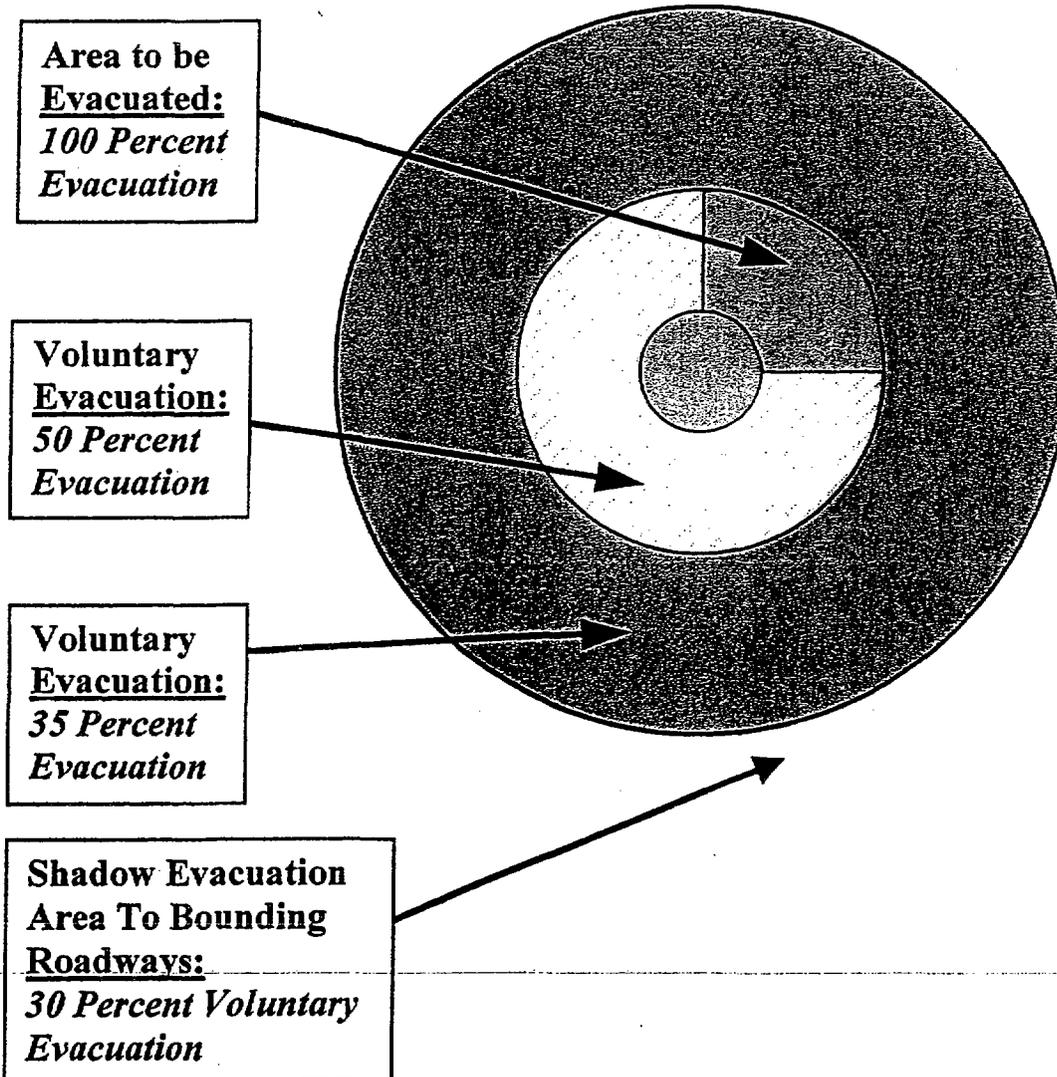
Evacuation Time Estimate for Initial Protective Action Recommendations
 Evacuated Area is a 2 mile radius and 5 miles downwind
 Time to Clear the Indicated Area of 95% of the Affected Population

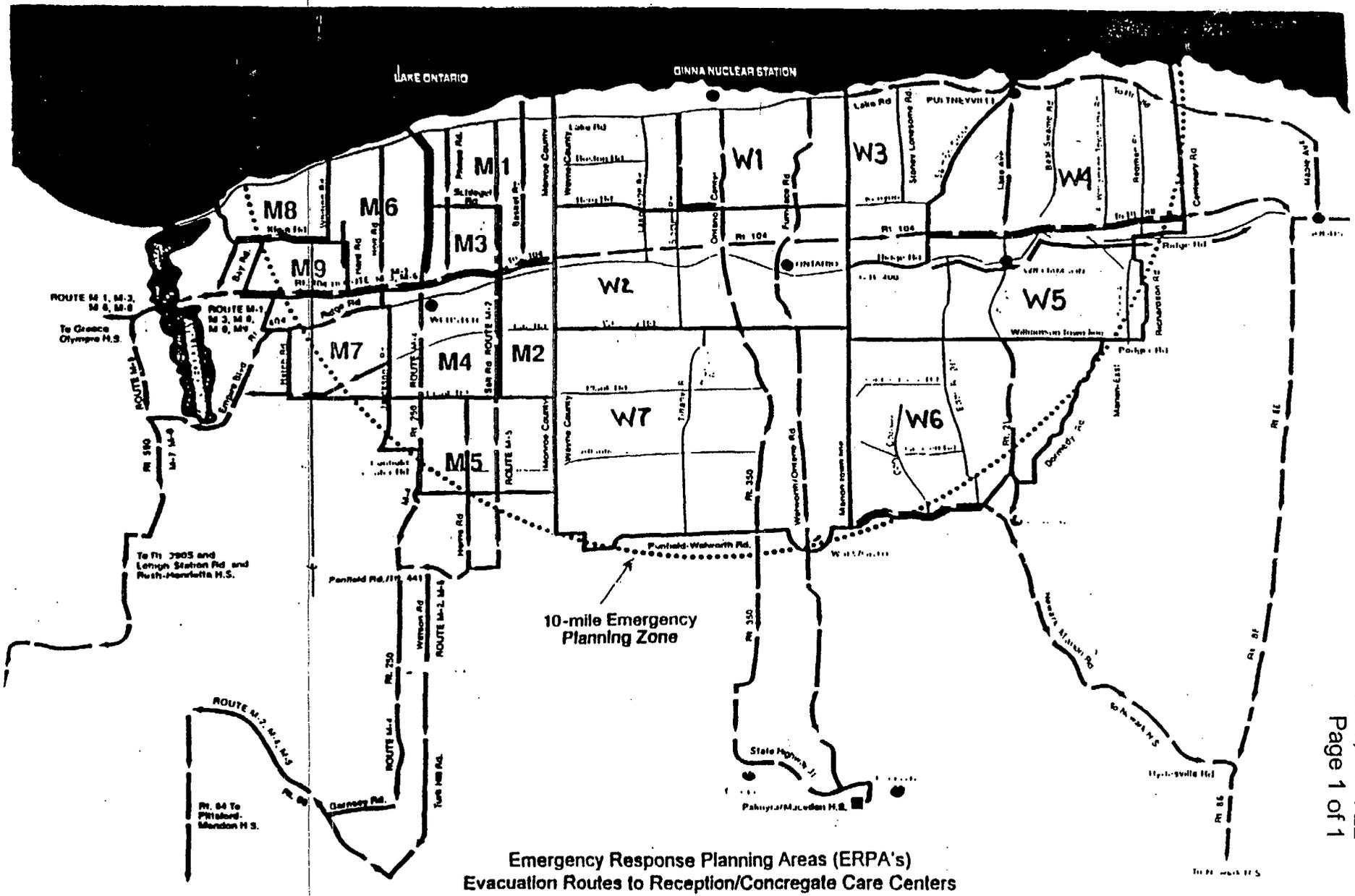
Evacuated Areas All ERPA's not evacuated are to be sheltered		Summer		Summer		Summer	Winter			Winter			Winter
		Midweek		Weekend		Midweek Weekend	Midweek			Weekend			Midweek Weekend
		Midday		Midday		Evening	Midday			Midday			Evening
Region	ERPA's	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather
N 349 to 11	W-1,2,3	2:05	2:10	1:50	1:50	1:50	2:05	2:10	2:20	1:50	1:50	2:15	1:50
NNE 12 to 33	W-1,2 M-1	2:30	2:35	1:50	1:50	1:45	2:15	2:35	3:35	1:50	1:50	2:15	1:45
NE 34 to 56	W-1,2 M-1	2:30	2:35	1:50	1:50	1:45	2:15	2:35	3:35	1:50	1:50	2:15	1:45
ENE 57 to 78	W-1,2 M-1	2:30	2:35	1:50	1:50	1:45	2:15	2:35	3:35	1:50	1:50	2:15	1:45
E 79 to 101	W-1,2 M-1	2:30	2:35	1:50	1:50	1:45	2:15	2:35	3:35	1:50	1:50	2:15	1:45
ESE 102 to 124	W-1 M-1	2:15	2:50	1:45	1:50	1:45	2:15	2:45	3:25	1:45	1:50	2:15	1:45
SE 147 to 168	W-1	2:25	2:25	2:05	2:10	2:05	2:25	2:25	2:50	2:05	2:10	2:50	2:05
SSE 147 to 168	W-1	2:25	2:25	2:05	2:10	2:05	2:25	2:25	2:50	2:05	2:10	2:50	2:05
S 169 to 191	W-1	2:25	2:25	2:05	2:10	2:05	2:25	2:25	2:50	2:05	2:10	2:50	2:05
SSW 192 to 213	W-1	2:25	2:25	2:05	2:10	2:05	2:25	2:25	2:50	2:05	2:10	2:50	2:05
SW 214 to 236	W-1,3	2:25	2:25	2:05	2:10	2:05	2:25	2:25	2:50	2:05	2:10	2:50	2:05
WSW 237 to 258	W-1,3	2:25	2:25	2:05	2:10	2:05	2:25	2:25	2:50	2:05	2:10	2:45	2:05
W 259 to 281	W-1,3	2:25	2:25	2:05	2:10	2:05	2:25	2:25	2:50	2:05	2:10	2:45	2:05
WNW 282 to 303	W-1,2,3	2:25	2:25	2:05	2:15	2:05	2:25	2:25	2:50	2:05	2:15	2:45	2:05
NW 304 to 326	W-1,2,3	2:25	2:25	2:05	2:15	2:05	2:25	2:25	2:50	2:05	2:15	2:45	2:05
NNW 327 to 348	W-1,2,3	2:25	2:25	2:05	2:15	2:05	2:25	2:25	2:50	2:05	2:15	2:45	2:05

Evacuation Time Estimate for Secondary Protective Action Recommendations
(Implemented when dose projections or field teams indicate ≥ 1 REM TEDE beyond 5 miles)
Evacuated Area is a 5 mile radius and 10 miles downwind
Time to Clear the Indicated Area of 95% of the Affected Population

Evacuated Areas All ERPA's not evacuated are to be sheltered		Summer		Summer		Summer		Winter			Winter			Winter
		Midweek		Weekend		Midweek		Midweek			Weekend			Midweek
		Midday		Midday		Evening		Midday			Midday			Evening
Region	ERPA's	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	
N 349 to 11	W-1,2,3,5,6,7 M-1,2,4,5	2:40	3:00	2:00	2:10	1:55	2:45	3:00	3:35	2:00	2:10	2:40	1:55	
NNE 12 to 33	W-1,2,3,6,7 M-1,2,3,4,5,6,7,9	5:10	5:35	3:05	3:25	2:50	5:15	5:45	6:45	3:10	3:25	4:30	2:50	
NE 34 to 56	W-1,2,3,7 M-1,2,3,4,5,6,7,8,9	5:20	5:45	3:25	3:45	3:05	5:30	5:55	6:55	3:20	3:40	4:40	3:05	
ENE 57 to 78	W-1,2,3,7 M-12,3,4,5,6,7,8,9	5:20	5:45	3:25	3:45	3:05	5:30	5:55	6:55	3:20	3:40	4:45	3:05	
E 79 to 101	W-1,2,3 M-1,2,3,4,6,7,8,9	5:20	5:45	3:25	3:45	3:05	5:30	5:55	6:55	3:20	3:40	4:45	3:05	
ESE 102 to 124	W-1,2,3 M-1,3,6,8,9	4:35	5:00	3:05	3:20	2:40	4:40	5:00	5:55	3:00	3:20	4:05	2:40	
SE 147 to 168	W-1,2,3 M-1	2:45	2:55	1:50	1:50	1:50	2:50	3:15	4:15	1:50	1:55	2:20	1:50	
SSE 147 to 168	W-1,2,3 M-1	2:45	2:55	1:50	1:50	1:50	2:50	3:15	4:15	1:50	1:55	2:20	1:50	
S 169 to 191	W-1,2,3 M-1	2:45	2:55	1:50	1:50	1:50	2:50	3:15	4:15	1:50	1:55	2:20	1:50	
SSW 192 to 213	W-1,2,3 M-1	2:45	2:55	1:50	1:50	1:50	2:50	3:15	4:15	1:50	1:55	2:20	1:50	
SW 214 to 236	W-1,2,3,4 M-1	2:45	2:55	1:50	1:50	1:50	2:50	3:15	4:15	1:50	1:55	2:20	1:50	
WSW 237 to 258	W-1,2,3,4,5 M-1	2:45	2:55	1:50	1:55	1:50	2:45	3:10	4:15	1:50	1:55	2:25	1:50	
W 259 to 281	W-1,2,3,4,5,6 M-1	2:40	2:50	1:50	1:55	1:50	2:40	3:05	4:05	1:50	1:55	2:25	1:50	
WNW 282 to 303	W-1,2,3,4,5,6,7 M-1	2:40	2:50	2:00	2:10	1:55	2:35	3:00	4:00	1:55	2:05	2:35	1:55	
NW 304 to 326	W-1,2,3,4,5,6,7 M-1,2	2:40	2:55	1:55	2:05	1:55	2:45	3:00	3:40	1:55	2:05	2:35	1:55	
NNW 327 to 348	W-1,2,3,4,5,6,7 M-1,2,5	2:40	2:55	1:55	2:05	1:55	2:35	3:00	3:50	1:55	2:05	2:35	1:55	

ASSUMED EVACUATION RESPONSE WITHIN THE EPZ





Emergency Response Planning Areas (ERPAs)
Evacuation Routes to Reception/Congregate Care Centers



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE

587 Aero Drive
Buffalo, NY 14225

A - 10

January 14, 2005

Mr. Peter Polfleit
Corporate Nuclear Emergency Planner
Constellation Energy/Ginna Nuclear Power Plant
1503 Lake Road
Ontario, NY 14519

Dear Mr. Polfleit:

The National Weather Service in Buffalo, NY is committed to provide meteorological support, upon request, in the event of an accident or other declared emergency occurring at any nuclear power facility within its County Warning Area. This support, resources permitting, will normally be in the form of site specific forecasts of wind, temperature and precipitation at the surface and aloft. All forecasts would normally be coordinated through local and state emergency management agencies.

In addition, upon request and resources permitting, our office would assign a meteorologist to serve as a coordinator at an Emergency Operations Facility. The meteorologist would act as a liaison between National Weather Service forecasters and emergency response officials to expedite requests and dissemination of the site specific weather forecasts.

In order to provide the best possible support to the Ginna facility, our office should be notified of any alert or emergency as soon as possible. In the event we are unable to provide the necessary support, the National Weather Service Forecast Office in Cleveland, OH will provide back-up. The following *unlisted* telephone numbers are available for your use:

National Weather Service Forecast Office, Buffalo NY
(716) 565-0013
(716) 565-0014
(716) 565-9002 (FAX)

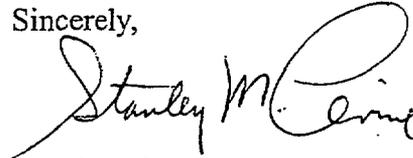
National Weather Service Forecast Office, Cleveland OH
(216) 265-2380
(216) 265-2381
(216) 265-2371 (FAX)

Requests for activation of the NOAA Weather Radio warning alarm and the Emergency Alert System (EAS) Specific Message Area Encoder (SAME) at Rochester during an emergency should be coordinated through local and New York State Emergency Management officials using the procedures specified in existing Memoranda of Understanding.



Finally, the National Weather Service Forecast Office in Buffalo will participate in all Federal and New York State observed exercises and the associated pre-exercise drills.

Sincerely,

A handwritten signature in black ink that reads "Stanley M. Levine". The signature is written in a cursive style with a large, looping initial "S".

Stanley M. Levine
Warning Coordination Meteorologist

cc: W/ER1x1 - Richard Watling
WCM, WFO CLE - Gary Garnet
Operations Planning Officer, Monroe OEP - S. Macaluso

APPENDIX F

EVACUATION TIME ESTIMATES

for the

James A. FitzPatrick/Nine Mile Point

Emergency Planning Zone

(NUREG 0654 II.J.8, II.J.10a,m)

The Evacuation Time Estimates (ETEs) for the James A. FitzPatrick/Nine Mile Point Emergency Planning Zone, August 2003, prepared by KLD Associates Inc. have been submitted under separate cover but is considered to be incorporated as part of this document by reference. Additionally, the requirements of NUREG 0654 II.J.10a, for maps of evacuation routes are included within the context of the ETEs.

6. DEMAND ESTIMATION FOR EVACUATION SCENARIOS

An evacuation "case" defines the combination: Evacuation Region and Evacuation Scenario. The definitions of "Region" and "Scenario" are as follows:

- | | |
|----------|---|
| Region | A grouping of contiguous evacuation ERPAs, that forms a "keyhole" sector-based area, or circular area within the EPZ, that must be evacuated in response to a radiological emergency. |
| Scenario | A combination of circumstances, including time of day, day of week, season, and weather conditions. Scenarios define the members of, and response times for the affected population groups. |

A total of 51 Evacuation Regions were defined which encompass all the groupings of ERPA considered. These Regions are defined in Table 6-1. The ERPA configurations are identified in Figure 6-1. Each keyhole sector-based area consists of a central circle centered at the Nine Mile Point/JA Fitzpatrick Nuclear Facility (NMP), and three adjoining sectors, each with a central angle of 22.5 degrees. These sectors extend to a distance of 5 miles from NMP (Regions R4 to R27), or 10 miles (Regions R28 to R51). The azimuth of the center sector defines the orientation of these Regions.

A total of 14 Scenarios were evaluated for all Regions (714 cases). Table 6-2 is a description of all Scenarios.

Each combination of evacuation region and accident scenario implies a specific population to be evacuated. Table 6-3 presents the percentage of each population group assumed to evacuate with each scenario. Table 6-4 presents the actual population and vehicle counts for each scenario that were used for the simulation.

Table 6-1. Definition of Evacuation Regions

Region	ERPAs in Region		Region	ERPAs in Region	
R1	1,2,3,26,27	2 mile			
R2	1-6,9-12,26,27	5 mile			
R3	1-29	Full EPZ			
	Evacuation to 5 Miles	Wind From		Evacuation to EPZ Boundary	Wind From
R4	1-3,26,27	214 to 222	R28	1-3,14,26,27,29	214 to 222
R5	1-3,26,27	223 to 233	R29	1-3,14,26,27,29	223 to 233
R6	1-3,7,26,27	234 to 240	R30	1-3,7,14,15,26,27,29	234 to 240
R7	1-4,7,26,27	241 to 254	R31	1-3,4,7,14,15,26,27,29	241 to 254
R8	1-4,7,26,27	255 to 262	R32	1-3,4,7,14-17,26,27,29	255 to 262
R9	1-4,7,9,26,27	263 to 278	R33	1-3,4,7-9,14-17,26,27,29	263 to 278
R10	1-5,7,9,26,27	279 to 292	R34	1-5,7-9,14-18,26,27,29	279 to 292
R11	1-5,7,9,10,26,27	293 to 305	R35	1-5,7-10,14-18,26,27,29	293 to 305
R12	1-5,7,9,10,26,27	306 to 311	R36	1-5,7-10,14-20,26,27,29	306 to 311
R13	1-5,7,9,10,26,27	312 to 332	R37	1-5,7-10,14-20,26,27	312 to 332
R14	1-5,9-11,26,27	333 to 340	R38	1-5,8-11,15-21,25-27	333 to 340
R15	1-5,9-11,26,27	341 to 349	R39	1-5,8-11,17-21,24-27	341 to 349
R16	1-3,5,6,9-11,26,27	350 to 356	R40	1-3,5,6,8-13,18-22,24-27	350 to 356
R17	1-3,5,6,9-11,26,27	357 to 12	R41	1-3,5,6,9-13,18-27	357 to 12
R18	1-3,5,6,10,11,26,27	13 to 20	R42	1-3,5,6,10-13,18-27	13 to 20
R19	1-3,5,6,10,11,26,27	21 to 51	R43	1-3,5,6,10-13,19-28	21 to 51
R20	1-3,5,6,11,26,27	52 to 56	R44	1-3,5,6,11-13,19-24,26-28	52 to 56
R21	1-3,5,6,11,26,27	57 to 61	R45	1-3,5,6,11-13,19,21-24,26-28	57 to 61
R22	1-3,6,11,26,27	62 to 70	R46	1-3,6,11-13,19,21-24,26-28	62 to 70
R23	1-3,6,26,27	71 to 89	R47	1-3,6,12,13,21-24,26-28	71 to 89

R24	1-3,6,26,27	90 to 95	R48	1-3,6,26-28	90 to 95
R25	1-3,26,27	96 to 114	R49	1-3,26-28	96 to 114
R26	1-3,26,27	115 to 146	R50	1-3,26-28	115 to 146
R27	1-3,26,27	147 to 213	R51	1-3,26-29	147 to 213

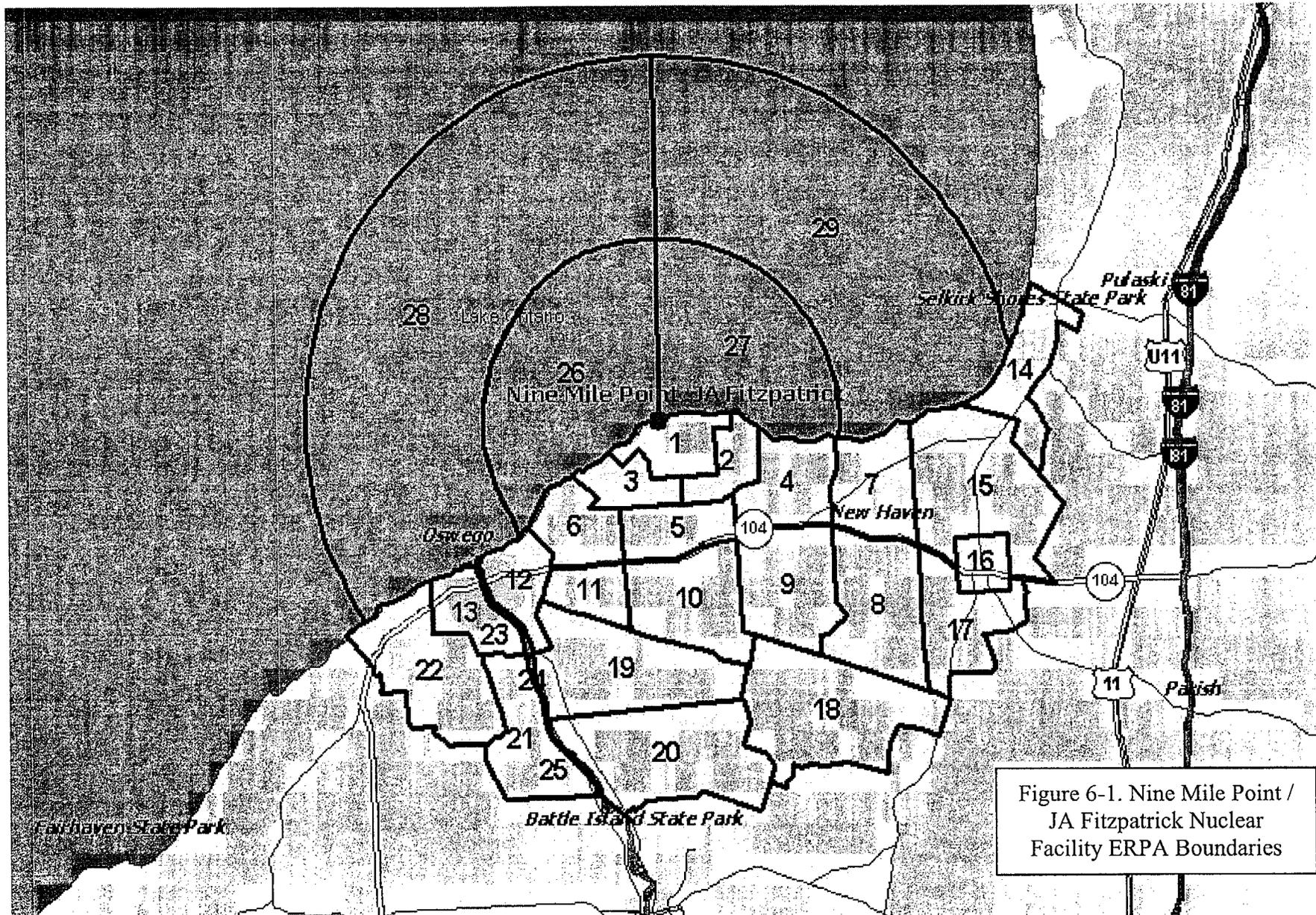


Figure 6-1. Nine Mile Point / JA Fitzpatrick Nuclear Facility ERPA Boundaries

Table 6-2. Evacuation Scenario Definitions

Scenario	Season	Day of Week	Time of Day	Weather	Special Events	Comments
1	Summer	Midweek	Midday	Good	None	Residents are at home or at work; employees are at 100% of mid-week work force; 50% of peak transient population is present; schools are not in session.
2	Summer	Midweek	Midday	Rain	None	As above. Sudden rain occurs.
3	Summer	Weekend	Midday	Good	None	Most residents are based at home; employees are at 40% of mid-week work force; 100% of transient population is present; schools are not in session.
4	Summer	Weekend	Midday	Rain	None	As above. Sudden rain occurs
5	Summer	Midweek, Weekend	Evening	Good	None	Residents are at home; employees (including shift workers) are at 10% of mid- week peak; 30% of transient population is present.
6	Winter	Midweek	Midday	Good	None	Residents are at home or at work; employees are at 100% of mid-week work force; 40% of peak transient population is present; schools are in session.
7	Winter	Midweek	Midday	Rain	None	As above. Sudden rain occurs
8	Winter	Midweek	Midday	Snow	None	As above. Snow is present requiring driveway clearance.
9	Winter	Weekend	Midday	Good	None	Most residents are based at home; employees are at 40% of mid-week work force; 40% of peak transient population is present; schools are not in session.
10	Winter	Weekend	Midday	Rain	None	As above. Sudden rain occurs
11	Winter	Weekend	Midday	Snow	None	As above. Snow is present requiring driveway clearance.
12	Winter	Midweek, Weekend	Evening	Good	None	Residents are at home; employees (including shift workers) are at 9% of mid- week peak; 20% of transient population is present.
13	Summer	Weekend	Midday	Good	Classic Weekend	As Scenario 3 with additional special event population
14	Summer	Midweek	Midday	Good	Harborfest	As Scenario 1 with additional special event population

Table 6-3. Percent of Population Groups for Various Scenarios

Scenarios	Residents	Employees	Transients	Shadow	Special Events	School Buses	Transit Buses	External Through Traffic
1	100%	100%	50%	40%	0%	30%	100%	100%
2	100%	100%	50%	40%	0%	30%	100%	100%
3	100%	40%	100%	34%	0%	0%	100%	100%
4	100%	40%	100%	34%	0%	0%	100%	100%
5	100%	25%	30%	33%	0%	0%	100%	60%
6	100%	100%	40%	40%	0%	100%	100%	100%
7	100%	100%	40%	40%	0%	100%	100%	100%
8	100%	100%	40%	40%	0%	100%	100%	100%
9	100%	40%	40%	34%	0%	30%	100%	100%
10	100%	40%	40%	34%	0%	30%	100%	100%
11	100%	40%	40%	34%	0%	30%	100%	100%
12	100%	25%	20%	33%	0%	0%	100%	60%
13	100%	40%	100%	34%	50%	0%	100%	100%
14	100%	25%	100%	33%	100%	0%	100%	100%

Residents
Employees
Transients
Shadow

Households of EPZ residents
 EPZ employees who live outside of the EPZ.
 People who are in the EPZ at the time of an accident for recreational or other (non-employment) purposes.
 Residents and employees in the shadow region (outside of the EPZ) who will spontaneously decide to relocate during the evacuation. The basis for the values shown is a 30% relocation of shadow residents along with a proportional percentage of shadow employees. The percentage of shadow employees is computed using the scenario-specific ratio of EPZ employees to residents.

Special Events
School and Transit Buses
External Through Traffic

Additional vehicles in the Oswego area associated with a Classic Weekend and Harborfest.
 Vehicle-equivalents present on the road during evacuation servicing schools and transit-dependent people.
 Traffic on local highways and major arterial roads at the start of the evacuation. This traffic is stopped by access control at about 1:00 after the evacuation begins.

Table 6-4. Vehicle Estimates for
Various Combinations of Regions and Scenarios

Scenarios	Residents	Employees	Transients	Shadow	Special Events	School Buses	Transit Buses	External Traffic	Total Scenario Vehicles
1	19,014	7,066	1,662	3,303	-	92	253	5,508	36,995
2	19,014	7,066	1,662	3,303	-	92	253	5,508	36,995
3	19,014	2,826	3,324	2,810	-	-	253	5,508	33,735
4	19,014	2,826	3,324	2,810	-	-	253	5,508	33,735
5	19,014	1,767	997	2,686	-	-	253	3,305	28,022
6	19,014	7,066	1,330	3,303	-	306	253	5,508	36,877
7	19,014	7,066	1,330	3,303	-	306	253	5,508	36,877
8	19,014	7,066	1,330	3,303	-	306	253	5,508	36,877
9	19,014	2,826	1,330	2,810	-	92	253	5,508	31,833
10	19,014	2,826	1,330	2,810	-	92	253	5,508	31,833
11	19,014	2,826	1,330	2,810	-	92	253	5,508	31,833
12	19,014	1,767	665	2,686	-	-	253	3,305	27,690
13	19,014	2,826	3,324	2,810	6,100	-	253	5,508	39,835
14	19,014	1,767	3,324	2,686	12,200	-	253	5,508	44,752

Residents
Employees
Transients
Shadow

Households of EPZ residents

EPZ employees who live outside of the EPZ.

People who are in the EPZ at the time of an accident for recreational or other (non-employment) purposes.

Residents and employees in the shadow region (outside of the EPZ) who will spontaneously decide to relocate during the evacuation. The basis for the values shown is a 30% relocation of shadow residents along with a proportional percentage of shadow employees. The percentage of shadow employees is computed using the scenario-specific ratio of EPZ employees to residents.

Special Events
School and Transit Buses

Additional vehicles in the Oswego area associated with a Classic Weekend and Harborfest.

Vehicle-equivalents present on the road during evacuation servicing schools and transit-dependent people. The numbers shown are double the actual number of buses on the road since the data presented is in units of vehicle-equivalents (1bus = 2 autos) We conservatively place some school buses on the road during the summer, midweek period and the winter, weekend period

External Through Traffic

Traffic on local highways and major arterial roads at the start of the evacuation. This traffic is stopped by access control at about 1:00 after the evacuation begins.

7. GENERAL POPULATION EVACUATION TIME ESTIMATES (ETE)

This section presents the current results of the computer analyses using the IDYNEV System. These results cover the 51 Evacuation Regions within NMP EPZ and the 14 Evacuation Scenarios, discussed in Section 6.

The ETE for each Evacuation Case are presented in Tables 7-1A through 7-1D. These tables present the estimated time to clear the indicated population percentages from the Evacuation Regions. These tabulated values of ETE are obtained by interpolating from PCDYNEV output, which are generated at 30-minute intervals, then rounded to the nearest 5 minutes. Exhibit 1 is a sample use of these tables.

We define “voluntary evacuees” as people who live in ERPAs within the EPZ, for which an Order to Evacuate has not been issued, yet who nevertheless, elect to evacuate. We define “shadow movement” as the movement of people from areas *outside* the EPZ for whom no protective action recommendation has been issued. Both voluntary evacuation and shadow movement are assumed to take place over the same time frame as the evacuation from within the assigned Evacuation Region.

The ETE for NMP addresses the issue of voluntary evacuees in the manner shown in Figure 7-1. Within the circle defined by the furthest radial extent of the Evacuation Region, 50 percent of the population in ERPAs outside the Evacuation Region who are not advised to evacuate, are assumed to do so. Within the annual ring extending from the radial extent of the Evacuation Region (if less than 10 miles), to the EPZ boundary, it is assumed that 35 percent of the population will elect to evacuate.

Figure 7-2 presents the area identified as the “Shadow Region”. This Region extends from the southern boundary of the EPZ to the southern city limits of Fulton in the area of New York State Routes 481 and 48. This area was selected because these routes are major evacuation routes for the City of Oswego and the City of Fulton is densely populated in the area surrounding these state routes. Thus, traffic generated within this Shadow Region, traveling away from the NMP location, has a potential for impeding evacuating vehicles from within the Evacuation Region. We assume that the traffic volumes emitted within the Shadow Region corresponds to 30 percent of the residents plus a proportionate number of employees in that region. All ETE calculations include this shadow traffic movement.

Exhibit 1
Utilization of Tables 7-1A through 7-1D

In the event of an emergency requiring a protective action recommendation, the following procedure is used.

1. Identify the season (Summer or Winter)
2. Identify the Day of the Week (Midweek, Weekend)
(Note: Schools are in session generally during Winter, Midweek periods.)
3. Identify the Time of Day (Midday, Evening)
4. Identify the Weather Conditions (Good Weather, Rain, Snow with Passable Roads)
5. Identify the furthest extent of the protective action recommendation (2-miles, 5-miles, EPZ Boundary)
6. Identify the direction the wind is heading from
7. Knowing wind direction and extent of protective action needs, identify the region to be evacuated
8. Identify the Evacuation Percentile of Interest (50, 90, 95, or 100th percentile)
9. Go to Table 7-1A for a 50th percentile evacuation time, Table 7-1B for a 90th percentile evacuation time, Table 7-1C for a 95th percentile evacuation time, or Table 7-1D for a 100th percentile evacuation time
10. Identify the row of interest by matching the region with the region number on the table
11. The season, day of week, time of day, and weather conditions identify the column of interest
12. Evacuation times are read from the intersection of the row and the column selected from the table.

Example:

Sunday, August 14, at 2PM in rain, Region 14 has been selected. The scenario is therefore (Summer, Weekend, Midday, Rain), or Column 4 on the tables. The ETE are:

50 th Percentile	0:45	Table 7-1A
90 th Percentile	1:25	Table 7-1B
95 th Percentile	1:40	Table 7-1C

Figure 7-1A. Time to Clear The Indicated Area of 50 Percent of the Affected Population

Region	Summer		Summer		Summer	Region	Winter			Winter			Winter	Region	Summer	Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Weekend Classic Weekend	Weekend Harbor Fest
	Midday		Midday		Evening		Midday			Midday			Evening		Midday	Midday
Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Good Weather	Good Weather
Entire 2-Mile, 5-Mile Circles and EPZ																
R01	0:40	0:45	0:40	0:40	0:45	R01	0:40	0:45	0:45	0:40	0:40	0:50	0:45	R01	0:40	0:45
R02	1:05	1:10	1:00	1:00	1:00	R02	1:05	1:10	1:25	1:00	1:00	1:25	0:55	R02	1:20	2:30
R03	1:15	1:20	1:10	1:15	1:10	R03	1:25	1:30	1:50	1:10	1:15	1:35	1:10	R03	1:45	2:30

Figure 7-1A. Time to Clear The Indicated Area of 50 Percent of the Affected Population

Region	Summer		Summer		Summer	Region	Winter			Winter			Winter	Region	Summer	Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Weekend Classic Weekend	Weekend Harbor Fest
	Midday		Midday		Evening		Midday			Midday			Evening		Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather		Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather		Good Weather	Good Weather
Regions Extending to 5-Miles																
R04	0:40	0:45	0:40	0:40	0:45	R04	0:40	0:45	0:45	0:40	0:40	0:50	0:45	R04	0:40	0:45
R05	0:40	0:45	0:40	0:40	0:45	R05	0:40	0:45	0:45	0:40	0:40	0:50	0:45	R05	0:40	0:45
R06	0:50	0:55	0:45	0:45	0:45	R06	0:50	0:55	1:00	0:45	0:45	0:55	0:45	R06	0:45	0:45
R07	1:05	1:05	0:45	0:50	0:50	R07	1:05	1:10	1:20	0:45	0:50	1:05	0:50	R07	0:45	0:50
R08	1:05	1:05	0:45	0:50	0:50	R08	1:05	1:10	1:20	0:45	0:50	1:05	0:50	R08	0:45	0:50
R09	1:05	1:10	0:45	0:50	0:50	R09	1:05	1:10	1:20	0:45	0:50	1:05	0:50	R09	0:45	0:50
R10	1:00	1:05	0:45	0:50	0:45	R10	1:00	1:05	1:20	0:45	0:50	1:05	0:50	R10	0:45	0:50
R11	1:00	1:05	0:45	0:50	0:50	R11	1:05	1:05	1:20	0:50	0:50	1:10	0:50	R11	0:50	0:50
R12	1:00	1:05	0:45	0:50	0:50	R12	1:05	1:05	1:20	0:50	0:50	1:10	0:50	R12	0:50	0:50
R13	1:00	1:05	0:45	0:50	0:50	R13	1:05	1:05	1:20	0:50	0:50	1:10	0:50	R13	0:50	0:50
R14	0:55	0:55	0:45	0:45	0:45	R14	0:55	0:55	1:10	0:45	0:45	1:05	0:45	R14	1:00	1:40
R15	0:55	0:55	0:45	0:45	0:45	R15	0:55	0:55	1:10	0:45	0:45	1:05	0:45	R15	1:00	1:40
R16	0:50	0:50	0:45	0:45	0:45	R16	0:50	0:50	1:00	0:45	0:45	1:00	0:45	R16	0:55	1:30
R17	0:50	0:50	0:45	0:45	0:45	R17	0:50	0:50	1:00	0:45	0:45	1:00	0:45	R17	0:55	1:30
R18	0:50	0:50	0:45	0:45	0:45	R18	0:50	0:50	1:00	0:45	0:45	1:00	0:45	R18	1:00	1:45
R19	0:50	0:50	0:45	0:45	0:45	R19	0:50	0:50	1:00	0:45	0:45	1:00	0:45	R19	1:00	1:45
R20	0:50	0:50	0:45	0:45	0:45	R20	0:50	0:50	0:55	0:45	0:45	1:00	0:45	R20	1:05	2:20
R21	0:50	0:50	0:45	0:45	0:45	R21	0:50	0:50	0:55	0:45	0:45	1:00	0:45	R21	1:05	2:20
R22	0:45	0:50	0:45	0:45	0:45	R22	0:50	0:50	0:55	0:45	0:45	0:55	0:45	R22	1:05	2:30
R23	0:45	0:45	0:40	0:45	0:45	R23	0:45	0:45	0:50	0:45	0:45	0:55	0:45	R23	0:40	0:50
R24	0:45	0:45	0:40	0:45	0:45	R24	0:45	0:45	0:50	0:45	0:45	0:55	0:45	R24	0:40	0:50
R25	0:40	0:45	0:40	0:40	0:45	R25	0:40	0:45	0:45	0:40	0:40	0:50	0:45	R25	0:40	0:45
R26	0:40	0:45	0:40	0:40	0:45	R26	0:40	0:45	0:45	0:40	0:40	0:50	0:45	R26	0:40	0:45
R27	0:40	0:45	0:40	0:40	0:45	R27	0:40	0:45	0:45	0:40	0:40	0:50	0:45	R27	0:40	0:45

Figure 7-1A. Time to Clear The Indicated Area of 50 Percent of the Affected Population

Region	Summer		Summer		Summer	Region	Winter			Winter			Winter	Region	Summer	Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Weekend Classic Weekend	Weekend Harbor Fest
	Midday		Midday		Evening		Midday			Midday			Evening		Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather		Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather		Good Weather	Good Weather
Regions Extending to EPZ Boundary																
R28	0:40	0:40	0:45	0:45	0:40	R28	0:40	0:40	0:45	0:40	0:40	0:50	0:45	R28	0:40	0:40
R29	0:40	0:40	0:45	0:45	0:40	R29	0:40	0:40	0:45	0:40	0:40	0:50	0:45	R29	0:40	0:40
R30	0:50	0:55	0:50	0:50	0:45	R30	0:55	0:55	1:00	0:45	0:45	0:55	0:45	R30	0:45	0:45
R31	1:05	1:05	0:50	0:55	0:50	R31	1:05	1:10	1:15	0:50	0:50	1:00	0:50	R31	0:50	0:50
R32	1:05	1:05	0:50	0:55	0:50	R32	1:05	1:10	1:15	0:50	0:50	1:05	0:50	R32	0:50	0:50
R33	1:05	1:10	0:50	0:55	0:50	R33	1:05	1:10	1:20	0:50	0:55	1:05	0:50	R33	0:50	0:50
R34	1:05	1:05	0:50	0:55	0:50	R34	1:05	1:10	1:20	0:50	0:50	1:10	0:50	R34	0:50	0:50
R35	1:05	1:10	0:50	0:55	0:50	R35	1:05	1:10	1:20	0:50	0:55	1:10	0:50	R35	0:50	0:55
R36	1:10	1:15	0:55	0:55	0:55	R36	1:10	1:15	1:30	0:55	0:55	1:15	0:55	R36	0:55	1:00
R37	1:10	1:15	0:55	0:55	0:55	R37	1:10	1:15	1:30	0:55	0:55	1:15	0:55	R37	0:55	1:00
R38	1:10	1:10	0:55	0:55	0:55	R38	1:10	1:10	1:25	0:55	0:55	1:15	0:55	R38	1:00	1:10
R39	1:10	1:15	0:55	0:55	0:55	R39	1:10	1:15	1:30	0:55	0:55	1:15	0:55	R39	1:00	1:10
R40	1:15	1:20	1:05	1:05	1:00	R40	1:20	1:25	1:45	1:05	1:10	1:30	1:05	R40	1:25	1:35
R41	1:10	1:15	1:00	1:05	1:00	R41	1:15	1:20	1:40	1:05	1:10	1:25	1:05	R41	1:25	1:35
R42	1:10	1:15	1:05	1:10	1:05	R42	1:20	1:25	1:45	1:05	1:10	1:30	1:05	R42	1:25	1:40
R43	1:10	1:20	1:10	1:15	1:05	R43	1:20	1:25	1:50	1:10	1:15	1:35	1:10	R43	1:35	1:50
R44	1:10	1:15	1:10	1:15	1:05	R44	1:20	1:25	1:45	1:10	1:15	1:35	1:10	R44	1:35	1:50
R45	1:15	1:15	1:10	1:15	1:10	R45	1:20	1:25	1:45	1:10	1:15	1:35	1:10	R45	1:45	2:20
R46	1:15	1:15	1:10	1:15	1:10	R46	1:20	1:25	1:45	1:10	1:15	1:35	1:10	R46	1:45	2:20
R47	1:10	1:15	1:10	1:15	1:05	R47	1:20	1:25	1:45	1:10	1:15	1:35	1:10	R47	1:30	1:55
R48	0:45	0:45	0:40	0:45	0:45	R48	0:45	0:45	0:50	0:45	0:45	0:55	0:45	R48	0:40	0:50
R49	0:40	0:45	0:40	0:40	0:45	R49	0:40	0:45	0:45	0:40	0:40	0:50	0:45	R49	0:40	0:45
R50	0:40	0:45	0:40	0:40	0:45	R50	0:40	0:45	0:45	0:40	0:40	0:50	0:45	R50	0:40	0:45
R51	0:40	0:45	0:40	0:40	0:45	R51	0:40	0:45	0:45	0:40	0:40	0:50	0:45	R51	0:40	0:45

Figure 7-1B. Time to Clear The Indicated Area of 90 Percent of the Affected Population

Region	Summer		Summer		Summer	Region	Winter			Winter			Winter	Region	Summer	Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Weekend Classic Weekend	Weekend Harbor Fest
	Midday		Midday		Evening		Midday			Midday			Evening		Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather		Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather		Good Weather	Good Weather
Entire 2-Mile, 5-Mile Circles and EPZ																
R01	1:25	1:25	1:15	1:20	1:20	R01	1:25	1:25	1:40	1:15	1:20	1:40	1:20	R01	1:15	1:20
R02	2:30	2:40	2:40	2:55	2:20	R02	2:30	2:35	3:05	2:25	2:40	3:10	2:15	R02	3:30	6:35
R03	3:00	3:20	3:15	3:35	3:00	R03	3:10	3:25	4:05	3:00	3:15	3:45	3:00	R03	4:40	6:35

Figure 7-1B. Time to Clear The Indicated Area of 90 Percent of the Affected Population

Region	Summer			Summer			Region	Winter			Winter			Region	Summer	
	Midweek		Weekend	Midweek	Weekend	Evening		Midweek		Weekend	Midweek	Weekend	Evening		Weekend	Weekend
	Midweek		Weekend	Midweek	Weekend	Evening		Midweek		Weekend	Midweek	Weekend	Evening		Weekend	Weekend
	Midweek		Weekend	Midweek	Weekend	Evening		Midweek		Weekend	Midweek	Weekend	Evening		Weekend	Weekend
Region	Good Weather	Rain	Good Weather	Rain	Good Weather	Region	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Region	Good Weather	Good Weather
Regions Extending to 5-Miles																
R04	1:25	1:25	1:15	1:20	1:20	R04	1:25	1:25	1:40	1:15	1:20	1:40	1:20	R04	1:15	1:20
R05	1:25	1:25	1:15	1:20	1:20	R05	1:25	1:25	1:40	1:15	1:20	1:40	1:20	R05	1:15	1:20
R06	2:00	2:10	1:20	1:25	1:25	R06	2:00	2:10	2:20	1:20	1:25	1:50	1:25	R06	1:20	1:25
R07	2:10	2:25	1:25	1:30	1:25	R07	2:10	2:25	2:30	1:25	1:35	1:55	1:25	R07	1:25	1:25
R08	2:10	2:25	1:25	1:30	1:25	R08	2:10	2:25	2:30	1:25	1:35	1:55	1:25	R08	1:25	1:25
R09	2:05	2:25	1:25	1:30	1:25	R09	2:10	2:20	2:30	1:25	1:35	1:55	1:25	R09	1:25	1:25
R10	2:05	2:15	1:25	1:35	1:25	R10	2:10	2:15	2:35	1:30	1:35	2:00	1:25	R10	1:30	1:25
R11	2:10	2:15	1:25	1:35	1:30	R11	2:10	2:15	2:30	1:30	1:35	2:00	1:30	R11	1:30	1:50
R12	2:10	2:15	1:25	1:35	1:30	R12	2:10	2:15	2:30	1:30	1:35	2:00	1:30	R12	1:30	1:50
R13	2:10	2:15	1:25	1:35	1:30	R13	2:10	2:15	2:30	1:30	1:35	2:00	1:30	R13	1:30	1:50
R14	1:50	1:55	1:25	1:25	1:25	R14	1:50	2:00	2:15	1:25	1:25	1:55	1:25	R14	2:55	6:15
R15	1:50	1:55	1:25	1:25	1:25	R15	1:50	2:00	2:15	1:25	1:25	1:55	1:25	R15	2:55	6:15
R16	1:45	1:50	1:25	1:25	1:25	R16	1:45	1:50	2:10	1:25	1:25	1:55	1:25	R16	2:50	6:15
R17	1:45	1:50	1:25	1:25	1:25	R17	1:45	1:50	2:10	1:25	1:25	1:55	1:25	R17	2:50	6:15
R18	1:40	1:40	1:25	1:25	1:25	R18	1:40	1:45	2:05	1:25	1:25	1:55	1:25	R18	3:00	6:20
R19	1:40	1:40	1:25	1:25	1:25	R19	1:40	1:45	2:05	1:25	1:25	1:55	1:25	R19	3:00	6:20
R20	1:35	1:35	1:20	1:20	1:25	R20	1:35	1:40	2:00	1:20	1:20	1:50	1:25	R20	3:10	6:30
R21	1:35	1:35	1:20	1:20	1:25	R21	1:35	1:40	2:00	1:20	1:20	1:50	1:25	R21	3:10	6:30
R22	1:35	1:35	1:20	1:20	1:25	R22	1:35	1:35	2:00	1:20	1:20	1:50	1:25	R22	3:15	6:35
R23	1:30	1:30	1:20	1:20	1:20	R23	1:30	1:30	1:50	1:20	1:20	1:45	1:20	R23	1:20	1:45
R24	1:30	1:30	1:20	1:20	1:20	R24	1:30	1:30	1:50	1:20	1:20	1:45	1:20	R24	1:20	1:45
R25	1:25	1:25	1:15	1:20	1:20	R25	1:25	1:25	1:40	1:15	1:20	1:40	1:20	R25	1:15	1:20
R26	1:25	1:25	1:15	1:20	1:20	R26	1:25	1:25	1:40	1:15	1:20	1:40	1:20	R26	1:15	1:20
R27	1:25	1:25	1:15	1:20	1:20	R27	1:25	1:25	1:40	1:15	1:20	1:40	1:20	R27	1:15	1:20

Figure 7-1B. Time to Clear The Indicated Area of 90 Percent of the Affected Population

Region	Summer			Summer			Region	Winter			Winter			Region	Summer	Summer
	Midweek		Weekend	Midweek	Weekend	Evening		Midweek		Weekend	Midweek	Weekend	Evening		Weekend	Weekend
	Midweek		Weekend	Midweek	Weekend	Evening		Midweek		Weekend	Midweek	Weekend	Evening		Weekend	Weekend
	Midweek		Weekend	Midweek	Weekend	Evening		Midweek		Weekend	Midweek	Weekend	Evening		Weekend	Weekend
Region	Good Weather	Rain	Good Weather	Rain	Good Weather	Region	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Region	Good Weather	Good Weather
Regions Extending to EPZ Boundary																
R28	1:25	1:25	1:30	1:40	1:20	R28	1:25	1:25	1:40	1:15	1:15	1:35	1:20	R28	1:15	1:20
R29	1:25	1:25	1:30	1:40	1:20	R29	1:25	1:25	1:40	1:15	1:15	1:35	1:20	R29	1:15	1:20
R30	2:10	2:20	1:35	1:45	1:25	R30	2:10	2:20	2:35	1:30	1:40	2:00	1:25	R30	1:30	1:25
R31	2:20	2:25	1:40	1:50	1:30	R31	2:20	2:35	2:50	1:40	1:45	2:10	1:30	R31	1:40	1:30
R32	2:25	2:30	1:45	1:55	1:40	R32	2:25	2:35	2:45	1:45	1:55	2:20	1:40	R32	1:45	1:40
R33	2:25	2:35	1:45	1:55	1:40	R33	2:25	2:35	2:50	1:45	1:55	2:20	1:40	R33	1:45	1:40
R34	2:20	2:25	1:45	1:55	1:40	R34	2:20	2:25	2:40	1:45	1:50	2:15	1:40	R34	1:45	1:40
R35	2:20	2:25	1:45	1:55	1:40	R35	2:20	2:30	2:40	1:45	1:50	2:20	1:40	R35	1:45	1:50
R36	2:20	2:25	1:50	2:00	1:45	R36	2:20	2:30	2:45	1:50	1:55	2:25	1:45	R36	2:05	2:35
R37	2:20	2:25	1:50	2:00	1:45	R37	2:20	2:30	2:45	1:50	1:55	2:25	1:45	R37	2:05	2:35
R38	2:25	2:30	1:55	2:05	1:50	R38	2:25	2:30	2:55	1:55	2:05	2:30	1:50	R38	2:25	3:30
R39	2:25	2:30	1:55	2:05	1:50	R39	2:25	2:30	2:50	1:55	2:00	2:30	1:50	R39	2:30	3:35
R40	2:40	2:55	2:45	3:00	2:35	R40	3:00	3:15	3:50	2:30	2:50	3:15	2:30	R40	4:05	5:45
R41	2:35	2:55	2:45	3:00	2:35	R41	3:00	3:15	3:50	2:35	2:50	3:15	2:35	R41	4:05	5:45
R42	2:40	3:00	2:50	3:05	2:40	R42	3:00	3:20	3:55	2:40	2:55	3:20	2:35	R42	4:10	5:50
R43	2:50	3:05	3:00	3:15	2:50	R43	3:10	3:25	4:05	2:45	3:00	3:30	2:45	R43	4:20	5:55
R44	2:50	3:10	3:00	3:20	2:50	R44	3:10	3:25	4:05	2:50	3:00	3:30	2:45	R44	4:20	6:00
R45	3:00	3:20	3:15	3:35	2:55	R45	3:10	3:25	4:05	3:00	3:15	3:45	2:55	R45	4:40	6:25
R46	3:00	3:20	3:15	3:35	3:00	R46	3:10	3:25	4:05	3:00	3:15	3:45	2:55	R46	4:40	6:30
R47	3:00	3:15	3:15	3:35	3:00	R47	3:10	3:25	4:05	3:00	3:15	3:45	3:00	R47	4:10	5:15
R48	1:30	1:30	1:20	1:20	1:20	R48	1:30	1:30	1:50	1:20	1:20	1:45	1:20	R48	1:20	1:45
R49	1:25	1:25	1:15	1:20	1:20	R49	1:25	1:25	1:40	1:15	1:20	1:40	1:20	R49	1:15	1:20
R50	1:25	1:25	1:15	1:20	1:20	R50	1:25	1:25	1:40	1:15	1:20	1:40	1:20	R50	1:15	1:20
R51	1:25	1:25	1:15	1:20	1:20	R51	1:25	1:25	1:40	1:15	1:20	1:40	1:20	R51	1:15	1:20

Figure 7-1C. Time to Clear The Indicated Area of 95 Percent of the Affected Population

Region	Summer		Summer		Summer	Region	Winter			Winter			Winter	Region	Summer	Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Weekend Classic Weekend	Weekend Harbor Fest
	Midday		Midday		Evening		Midday			Midday			Evening		Midday	Midday
Good Weather	Rain	Good Weather	Rain	Good Weather	Region	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Region	Good Weather	Good Weather	
Entire 2-Mile, 5-Mile Circles and EPZ																
R01	1:40	1:40	1:25	1:25	1:30	R01	1:40	1:40	2:05	1:25	1:25	1:55	1:30	R01	1:25	1:30
R02	2:50	3:05	3:05	3:25	2:40	R02	2:50	3:05	3:35	2:45	3:00	3:35	2:35	R02	3:55	7:05
R03	3:30	3:55	3:40	4:05	3:25	R03	3:30	3:50	4:30	3:25	3:45	4:15	3:20	R03	5:15	7:05

Figure 7-1C. Time to Clear The Indicated Area of 95 Percent of the Affected Population

Region	Summer		Summer		Summer	Region	Winter			Winter			Winter	Region	Summer	Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Weekend Classic Weekend	Weekend Harbor Fest
	Midday		Midday		Evening		Midday			Midday			Evening		Midday	Midday
Good Weather	Rain	Good Weather	Rain	Good Weather	Region	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Region	Good Weather	Good Weather	
Regions Extending to 5-Miles																
R04	1:40	1:40	1:25	1:25	1:30	R04	1:40	1:40	2:05	1:25	1:25	1:55	1:30	R04	1:25	1:30
R05	1:40	1:40	1:25	1:25	1:30	R05	1:40	1:40	2:05	1:25	1:25	1:55	1:30	R05	1:25	1:30
R06	2:15	2:25	1:30	1:40	1:30	R06	2:10	2:25	2:40	1:30	1:40	2:05	1:30	R06	1:30	1:30
R07	2:20	2:40	1:35	1:45	1:40	R07	2:25	2:40	2:50	1:40	1:45	2:10	1:40	R07	1:40	1:40
R08	2:20	2:40	1:35	1:45	1:40	R08	2:25	2:40	2:50	1:40	1:45	2:10	1:40	R08	1:40	1:40
R09	2:20	2:40	1:35	1:45	1:40	R09	2:20	2:35	2:50	1:35	1:45	2:10	1:40	R09	1:35	1:40
R10	2:20	2:25	1:35	1:45	1:40	R10	2:25	2:30	2:55	1:40	1:45	2:10	1:40	R10	1:40	1:40
R11	2:25	2:30	1:40	1:45	1:45	R11	2:25	2:30	2:50	1:40	1:45	2:15	1:45	R11	1:40	2:20
R12	2:25	2:30	1:40	1:45	1:45	R12	2:25	2:30	2:50	1:40	1:45	2:15	1:45	R12	1:40	2:20
R13	2:25	2:30	1:40	1:45	1:45	R13	2:25	2:30	2:50	1:40	1:45	2:15	1:45	R13	1:40	2:20
R14	2:05	2:10	1:35	1:40	1:35	R14	2:00	2:10	2:25	1:35	1:40	2:10	1:35	R14	3:20	6:55
R15	2:05	2:10	1:35	1:40	1:35	R15	2:00	2:10	2:25	1:35	1:40	2:10	1:35	R15	3:20	6:55
R16	2:00	2:05	1:35	1:35	1:35	R16	1:55	2:05	2:20	1:30	1:35	2:10	1:35	R16	3:20	6:55
R17	2:00	2:05	1:35	1:35	1:35	R17	1:55	2:05	2:20	1:30	1:35	2:10	1:35	R17	3:20	6:55
R18	1:55	1:55	1:35	1:35	1:35	R18	1:55	2:00	2:15	1:30	1:35	2:10	1:40	R18	3:25	7:00
R19	1:55	1:55	1:35	1:35	1:35	R19	1:55	2:00	2:15	1:30	1:35	2:10	1:40	R19	3:25	7:00
R20	1:55	1:55	1:30	1:30	1:30	R20	1:55	1:55	2:15	1:30	1:30	2:05	1:30	R20	3:30	7:05
R21	1:55	1:55	1:30	1:30	1:30	R21	1:55	1:55	2:15	1:30	1:30	2:05	1:30	R21	3:30	7:05
R22	1:55	1:55	1:30	1:30	1:30	R22	1:55	1:55	2:15	1:30	1:30	2:05	1:30	R22	3:35	7:05
R23	1:45	1:45	1:30	1:30	1:30	R23	1:45	1:45	2:10	1:30	1:30	2:00	1:30	R23	1:25	1:55
R24	1:45	1:45	1:30	1:30	1:30	R24	1:45	1:45	2:10	1:30	1:30	2:00	1:30	R24	1:25	1:55
R25	1:40	1:40	1:25	1:25	1:30	R25	1:40	1:40	2:05	1:25	1:25	1:55	1:30	R25	1:25	1:30
R26	1:40	1:40	1:25	1:25	1:30	R26	1:40	1:40	2:05	1:25	1:25	1:55	1:30	R26	1:25	1:30
R27	1:40	1:40	1:25	1:25	1:30	R27	1:40	1:40	2:05	1:25	1:25	1:55	1:30	R27	1:25	1:30

Figure 7-1C. Time to Clear The Indicated Area of 95 Percent of the Affected Population

Region	Summer		Summer		Summer	Region	Winter			Winter			Winter	Region	Summer	Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Weekend Classic Weekend	Weekend Harbor Fest
	Midday		Midday		Evening		Midday			Midday			Evening		Midday	Midday
Good Weather	Rain	Good Weather	Rain	Good Weather	Region	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Region	Good Weather	Good Weather	
Regions Extending to EPZ Boundary																
R28	1:35	1:35	1:40	1:55	1:25	R28	1:35	1:40	2:00	1:25	1:25	1:55	1:30	R28	1:25	1:25
R29	1:35	1:35	1:40	1:55	1:25	R29	1:35	1:40	2:00	1:25	1:25	1:55	1:30	R29	1:25	1:25
R30	2:30	2:40	1:45	1:55	1:35	R30	2:30	2:40	3:00	1:45	1:50	2:15	1:35	R30	1:45	1:35
R31	2:40	2:45	1:50	2:00	1:40	R31	2:30	2:50	3:10	1:50	1:55	2:20	1:40	R31	1:50	1:40
R32	2:45	2:55	1:55	2:15	1:50	R32	2:45	3:00	3:10	2:00	2:10	2:35	1:50	R32	2:00	1:50
R33	2:45	3:05	2:00	2:15	1:55	R33	2:50	3:05	3:20	2:00	2:15	2:40	1:55	R33	2:00	1:50
R34	2:40	2:50	1:55	2:10	1:55	R34	2:40	2:50	3:10	2:00	2:10	2:35	1:55	R34	2:00	1:50
R35	2:40	2:50	1:55	2:10	1:55	R35	2:40	2:55	3:10	2:00	2:10	2:35	1:55	R35	2:00	2:05
R36	2:40	2:50	2:05	2:20	2:00	R36	2:40	2:55	3:10	2:05	2:15	2:45	2:00	R36	2:20	3:00
R37	2:40	2:50	2:05	2:20	2:00	R37	2:40	2:55	3:10	2:05	2:15	2:45	2:00	R37	2:20	3:00
R38	2:45	3:00	2:15	2:25	2:10	R38	2:45	2:55	3:25	2:15	2:25	2:55	2:10	R38	2:55	4:25
R39	2:40	2:55	2:20	2:25	2:10	R39	2:40	2:55	3:15	2:15	2:25	2:50	2:10	R39	2:55	4:30
R40	3:10	3:35	3:25	3:50	3:10	R40	3:25	3:45	4:20	3:10	3:25	4:00	3:10	R40	4:55	6:35
R41	3:15	3:40	3:25	3:50	3:15	R41	3:25	3:45	4:25	3:15	3:30	4:00	3:10	R41	4:55	6:35
R42	3:20	3:45	3:30	3:55	3:15	R42	3:25	3:50	4:25	3:15	3:30	4:05	3:10	R42	4:55	6:35
R43	3:25	3:50	3:35	4:00	3:20	R43	3:30	3:50	4:30	3:20	3:40	4:10	3:15	R43	5:00	6:40
R44	3:30	3:50	3:35	4:00	3:20	R44	3:30	3:50	4:30	3:25	3:40	4:10	3:20	R44	5:00	6:45
R45	3:30	3:55	3:40	4:05	3:20	R45	3:30	3:50	4:30	3:25	3:45	4:15	3:20	R45	5:10	7:00
R46	3:30	3:55	3:40	4:05	3:25	R46	3:30	3:50	4:30	3:25	3:45	4:15	3:20	R46	5:15	7:00
R47	3:30	3:45	3:40	4:00	3:20	R47	3:30	3:45	4:25	3:25	3:45	4:15	3:20	R47	4:40	5:55
R48	1:45	1:45	1:30	1:30	1:30	R48	1:45	1:45	2:10	1:30	1:30	2:00	1:30	R48	1:25	1:55
R49	1:40	1:40	1:25	1:25	1:30	R49	1:40	1:40	2:05	1:25	1:25	1:55	1:30	R49	1:25	1:30
R50	1:40	1:40	1:25	1:25	1:30	R50	1:40	1:40	2:05	1:25	1:25	1:55	1:30	R50	1:25	1:30
R51	1:40	1:40	1:25	1:25	1:30	R51	1:40	1:40	2:05	1:25	1:25	1:55	1:30	R51	1:25	1:30

Figure 7-1D. Time to Clear The Indicated Area of 100 Percent of the Affected Population

Summer		Summer		Summer	Region	Winter			Winter			Winter	Region	Summer	Summer	
Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Weekend Classic Weekend	Weekend Harbor Fest	
Midday		Midday		Evening		Midday			Midday			Evening		Midday	Midday	
Good Weather	Rain	Good Weather	Rain	Good Weather		Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather		Good Weather	Good Weather	Good Weather
Entire 2-Mile, 5-Mile Circles and EPZ																
R01	2:20	2:20	1:50	1:50	1:50	R01	2:20	2:20	2:30	1:50	1:50	2:20	1:50	R01	1:50	1:50
R02	3:20	3:40	3:45	4:10	3:05	R02	3:20	3:40	4:10	3:05	3:35	4:10	2:55	R02	4:55	7:45
R03	4:30	4:55	4:20	4:50	4:00	R03	4:30	4:45	5:35	4:10	4:30	5:05	4:00	R03	6:55	8:20

Figure 7-1D. Time to Clear The Indicated Area of 100 Percent of the Affected Population

Region	Summer		Summer		Summer	Region	Winter			Winter			Winter	Region	Summer	Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Weekend Classic Weekend	Weekend Harbor Fest
	Midday		Midday		Evening		Midday			Midday			Evening		Midday	Midday
Good Weather	Rain	Good Weather	Rain	Good Weather	Region	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Region	Good Weather	Good Weather	
Regions Extending to 5-Miles																
R04	2:20	2:20	1:50	1:50	1:50	R04	2:20	2:20	2:30	1:50	1:50	2:20	1:50	R04	1:50	1:50
R05	2:20	2:20	1:50	1:50	1:50	R05	2:20	2:20	2:30	1:50	1:50	2:20	1:50	R05	1:50	1:50
R06	2:35	2:50	1:45	1:45	1:45	R06	2:30	2:55	3:05	1:45	1:45	2:30	1:45	R06	1:45	1:45
R07	2:35	2:55	2:00	2:00	2:05	R07	2:40	2:55	3:10	2:00	2:05	2:30	2:05	R07	2:00	2:05
R08	2:35	2:55	2:00	2:00	2:05	R08	2:40	2:55	3:10	2:00	2:05	2:30	2:05	R08	2:00	2:05
R09	2:35	3:00	1:45	1:50	2:05	R09	2:40	2:55	3:10	1:45	1:50	2:30	2:05	R09	1:45	2:05
R10	2:40	2:50	1:45	2:00	2:05	R10	2:45	2:50	3:25	2:05	2:05	2:30	2:05	R10	2:05	2:05
R11	2:45	2:55	1:45	2:15	2:05	R11	2:45	3:00	3:20	1:45	2:15	2:30	2:05	R11	1:45	3:45
R12	2:45	2:55	1:45	2:15	2:05	R12	2:45	3:00	3:20	1:45	2:15	2:30	2:05	R12	1:45	3:45
R13	2:45	2:55	1:45	2:15	2:05	R13	2:45	3:00	3:20	1:45	2:15	2:30	2:05	R13	1:45	3:45
R14	2:20	2:20	2:05	2:15	1:45	R14	2:20	2:30	2:45	1:45	2:15	2:30	1:45	R14	4:00	7:40
R15	2:20	2:20	2:05	2:15	1:45	R15	2:20	2:30	2:45	1:45	2:15	2:30	1:45	R15	4:00	7:40
R16	2:15	2:20	2:05	2:05	2:05	R16	2:15	2:30	2:40	1:40	2:05	2:30	2:05	R16	4:00	7:45
R17	2:15	2:20	2:05	2:05	2:05	R17	2:15	2:30	2:40	1:40	2:05	2:30	2:05	R17	4:00	7:45
R18	2:20	2:20	2:05	2:05	2:15	R18	2:20	2:20	2:35	1:40	2:05	2:30	2:15	R18	4:00	7:45
R19	2:20	2:20	2:05	2:05	2:15	R19	2:20	2:20	2:35	1:40	2:05	2:30	2:15	R19	4:00	7:45
R20	2:20	2:20	1:45	1:45	1:40	R20	2:20	2:20	2:30	1:45	1:40	2:30	1:45	R20	4:00	7:40
R21	2:20	2:20	1:45	1:45	1:40	R21	2:20	2:20	2:30	1:45	1:40	2:30	1:45	R21	4:00	7:40
R22	2:25	2:25	1:40	1:40	1:45	R22	2:25	2:30	2:30	1:40	1:40	2:30	1:45	R22	4:00	7:40
R23	2:25	2:25	1:40	1:40	1:40	R23	2:30	2:30	2:30	1:40	1:40	2:30	1:40	R23	1:40	2:10
R24	2:25	2:25	1:40	1:40	1:40	R24	2:30	2:30	2:30	1:40	1:40	2:30	1:40	R24	1:40	2:10
R25	2:20	2:20	1:50	1:50	1:50	R25	2:20	2:20	2:30	1:50	1:50	2:20	1:50	R25	1:50	1:50
R26	2:20	2:20	1:50	1:50	1:50	R26	2:20	2:20	2:30	1:50	1:50	2:20	1:50	R26	1:50	1:50
R27	2:20	2:20	1:50	1:50	1:50	R27	2:20	2:20	2:30	1:50	1:50	2:20	1:50	R27	1:50	1:50

Figure 7-1D. Time to Clear The Indicated Area of 100 Percent of the Affected Population

	Summer			Summer			Region	Winter			Winter			Region	Summer	Summer	
	Midweek		Weekend	Midweek	Midweek			Weekend	Midweek	Midweek		Weekend	Midweek		Weekend	Classic Weekend	Harbor Fest
	Midday		Midday	Evening	Midday			Midday	Evening	Midday		Midday	Evening		Midday		Midday
Region	Good Weather	Rain	Good Weather	Rain	Good Weather	Region	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Region	Good Weather	Good Weather	
Regions Extending to EPZ Boundary																	
R28	2:25	2:25	1:55	2:15	1:50	R28	2:25	2:25	2:35	2:00	2:00	2:30	1:50	R28	2:00	1:50	
R29	2:25	2:25	1:55	2:15	1:50	R29	2:25	2:25	2:35	2:00	2:00	2:30	1:50	R29	2:00	1:50	
R30	3:05	3:15	2:05	2:15	1:45	R30	2:55	3:20	3:40	2:05	2:15	2:40	1:45	R30	2:05	1:45	
R31	3:05	3:15	2:05	2:20	2:05	R31	2:55	3:20	3:45	2:05	2:20	2:40	2:05	R31	2:05	2:05	
R32	3:15	3:25	2:15	2:35	2:05	R32	3:15	3:35	3:45	2:15	2:40	3:05	2:05	R32	2:15	2:05	
R33	3:20	3:40	2:20	2:45	2:10	R33	3:20	3:40	4:00	2:20	2:45	3:10	2:10	R33	2:20	2:10	
R34	3:20	3:35	2:25	2:45	2:10	R34	3:25	3:35	4:00	2:25	2:45	3:15	2:10	R34	2:25	2:10	
R35	3:20	3:40	2:25	2:45	2:15	R35	3:25	3:45	4:00	2:25	2:50	3:15	2:15	R35	2:25	3:45	
R36	3:20	3:40	2:40	3:00	2:30	R36	3:25	3:45	4:00	2:35	2:50	3:15	2:30	R36	3:00	3:40	
R37	3:20	3:40	2:40	3:00	2:30	R37	3:25	3:45	4:00	2:35	2:50	3:15	2:30	R37	3:00	3:40	
R38	3:20	3:40	3:00	3:25	3:00	R38	3:20	3:35	4:10	3:00	3:10	3:45	3:00	R38	3:55	7:45	
R39	3:20	3:30	3:00	3:25	3:00	R39	3:20	3:30	4:00	3:00	3:10	3:45	3:00	R39	3:55	7:45	
R40	4:25	4:50	4:20	4:50	4:00	R40	4:30	4:45	5:35	4:10	4:30	5:05	4:00	R40	6:55	8:20	
R41	4:25	4:50	4:20	4:50	4:00	R41	4:30	4:45	5:35	4:10	4:30	5:05	4:00	R41	6:55	8:20	
R42	4:25	4:50	4:20	4:50	4:00	R42	4:30	4:45	5:35	4:10	4:30	5:05	4:00	R42	6:55	8:20	
R43	4:25	4:50	4:20	4:50	4:00	R43	4:30	4:45	5:35	4:10	4:30	5:05	4:00	R43	6:55	8:20	
R44	4:30	4:55	4:20	4:45	4:00	R44	4:30	4:45	5:35	4:10	4:30	5:05	4:00	R44	6:55	8:15	
R45	4:25	4:45	4:20	4:45	4:00	R45	4:30	4:40	5:25	4:10	4:30	5:00	4:00	R45	6:30	8:15	
R46	4:30	4:45	4:20	4:45	4:00	R46	4:30	4:40	5:30	4:05	4:30	5:00	4:00	R46	6:30	8:15	
R47	4:20	4:40	4:15	4:45	4:00	R47	4:20	4:40	5:25	4:05	4:30	5:00	4:00	R47	5:45	7:25	
R48	2:25	2:25	1:40	1:40	1:40	R48	2:30	2:30	2:30	1:40	1:40	2:30	1:40	R48	1:40	2:10	
R49	2:20	2:20	1:50	1:50	1:50	R49	2:20	2:20	2:30	1:50	1:50	2:20	1:50	R49	1:50	1:50	
R50	2:20	2:20	1:50	1:50	1:50	R50	2:20	2:20	2:30	1:50	1:50	2:20	1:50	R50	1:50	1:50	
R51	2:20	2:20	1:50	1:50	1:50	R51	2:20	2:20	2:30	1:50	1:50	2:20	1:50	R51	1:50	1:50	

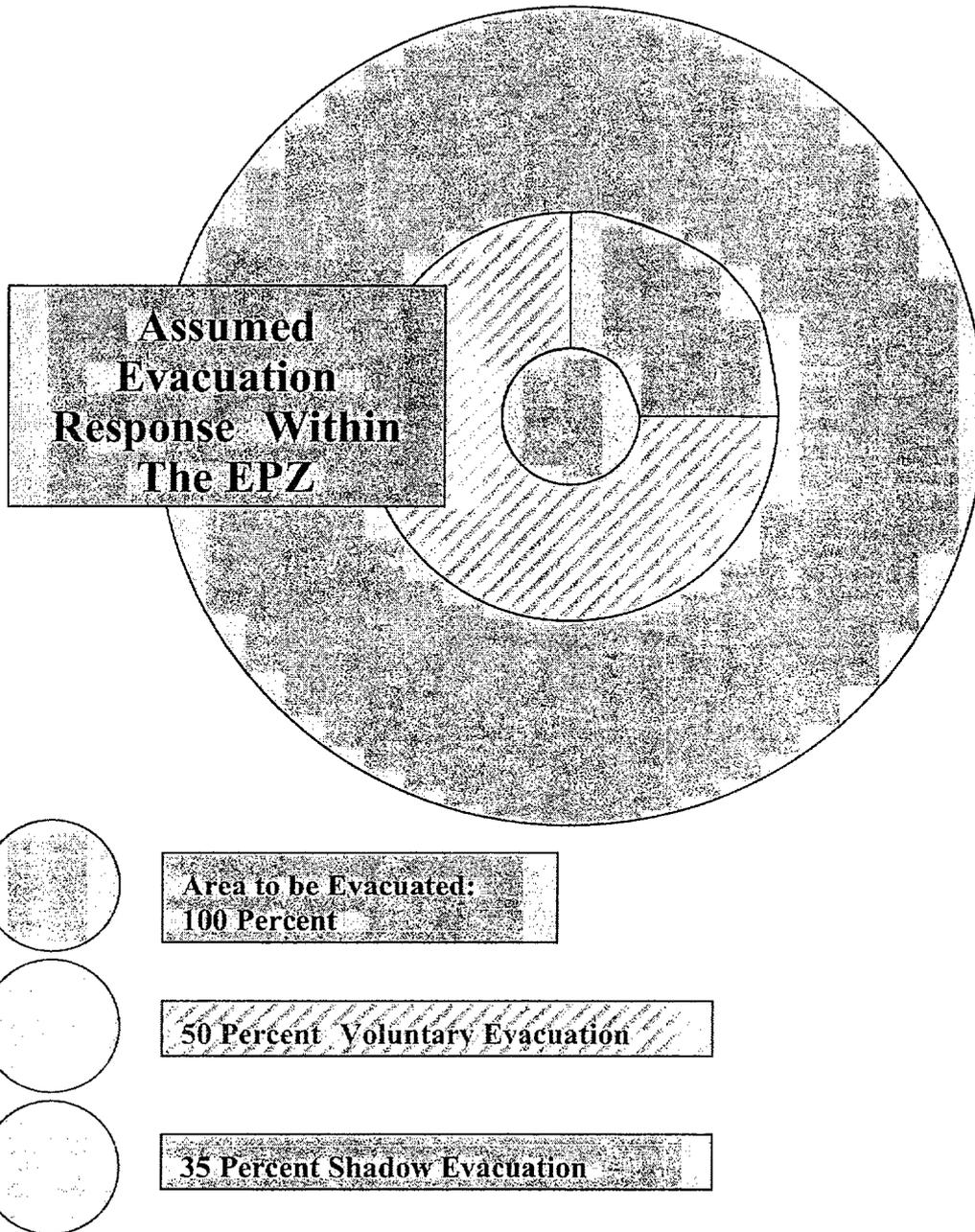


Figure 7-1. Evacuation Response Within the EPZ.

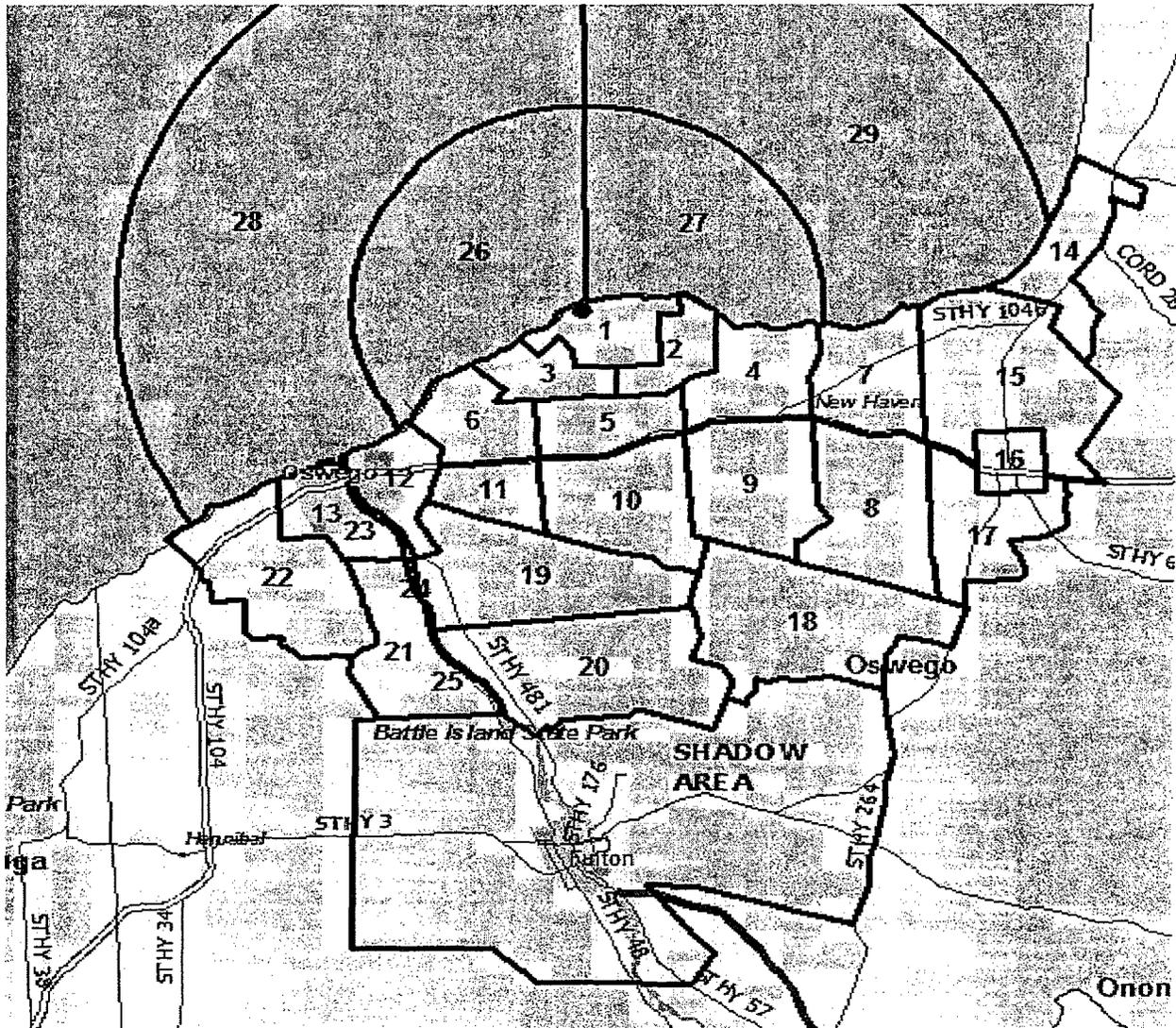


Figure 7-2. Shadow Region

NINE MILE POINT NUCLEAR STATION
EMERGENCY PLAN IMPLEMENTING PROCEDURE

EPIP-EPP-08

REVISION 15

OFF-SITE DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATION

TECHNICAL SPECIFICATION REQUIRED

Approved by:
G. L. Detter



Manager Security and Emergency Preparedness

12/15/03
Date

Effective Date: 12/19/2003

PERIODIC REVIEW DUE DATE: SEPTEMBER 2004

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1.0 PURPOSE

To provide the methods for determining meteorology data, release rates, dose assessment and protective actions during accident conditions at Nine Mile Point.

2.0 PRIMARY RESPONSIBILITIES

2.1 The Station Shift Supervisor/Emergency Director (SSS/ED):

2.1.1 Ensures meteorological data acquisition, release rate determination, and dose assessment are performed during the initial stages of an emergency to support development of Protective Action Recommendations (PARs)

2.1.2 Approves PARs and ensures their timely issue to the State and County

2.2 The Emergency Director/Recovery Manager (ED/RM) approves PARs prior to their transmittal to the State and County, following EOF activation.

2.3 The Radiation Assessment Manager (RAM) is responsible to the TSC Manager for managing the onsite radiological monitoring and assessment aspects of the station during an emergency, following TSC activation.

2.4 Chemistry Technicians perform release rate assessments, obtain meteorological data, and develop PARs, prior to EOF activation.

2.5 The Offsite Dose Assessment Manager (ODAM) manages the offsite dose aspects of an emergency in order to assess the radiological consequences to the public, following EOF activation.

2.6 The Radiological Assessment Staff is responsible to the ODAM for obtaining meteorological data, determining source term, performing dose assessment, and developing PARs, following EOF activation.

3.0 PROCEDURE

3.1 Dose Assessment and Protective Action from the Control Room

CAUTION

Calculation involving the determination of release rates and/or protection action shall be self-checked for accuracy.

3.1.1 Chemistry Technician Actions

- a. Review and complete (as appropriate) EPIP-EPP-23 Attachment 8.

3.1.1 (Cont)

- b. Consult the SSS/ED on plant conditions and possible release paths. If a General Emergency has been declared, assist SSS/ED in making Protective Action Recommendations based on plant conditions using Attachment 1.
- c. Access EDAMS computer using Attachment 2.
- d. Obtain meteorological data using Attachment 3 (each 15 minutes).
- e. Assess effluent monitor readings and conditions.
- f. Determine release rates using Attachment 4.
 1. Sum all release points from the same elevation (ground or elevated).
 2. Calculate the total release rate from combined ground and elevated sources using the workspace on Attachment 1.
- g. Compare the release rate to the Table 1.1 values.
- h. Use Attachment 1 flowchart and advise SSS/ED of any PARs recommended by the flowchart.

NOTE: A release (tube leak) from the Emergency Condenser (EC) Vent is considered an unmonitored atmospheric release. An out of plant survey is needed to determine actual Release Rate.

- i. Compare monitor readings and calculated release rates to ODCM limits using Attachment 4A.
- j. IF an unmonitored atmospheric release is suspected or known to be in progress, then assist the SSS/ED in the following actions:
 1. Advise the SSS/ED to expedite the dispatch of Radiation Protection (RP) Technician. Request assistance of the unaffected Unit or J.A. Fitzpatrick if needed.
 2. The RP Technician should be dispatched to potential plume centerline (wind direction (degrees) $\pm 180^\circ$ = plume centerline), as close to the site boundary as practical. See Attachment 1, Figure 1.4 for Site boundary location.
 3. IF readings indicate > 1 Rem/hr based on field survey perform the actions indicated in Attachment 1.

3.1.1 (Cont)

- k. Assist the SSS/ED in completing the Part 1 Notification Fact Sheet.
- l. Continue to monitor meteorological data, changes in effluent conditions or conditions that might lead to abnormal radiological effluents (or changes to PARs).
- m. When contacted by EOF Dose Assessment Staff, provide briefing on:
 - Status of any radiological releases
 - Dose assessments efforts to date
 - Impending or actual PARs

3.1.2 SSS Actions

- a. Verify that the Chemistry Technician is performing dose assessment and protective action development in a timely fashion and in accordance with Attachment 1.
- b. Assess any release rates or monitor readings provided by the Chemistry Technician against the Emergency Action Levels (EAL).
- c. Review AND approve PARs recorded on the Notification Fact Sheet Part 1, as required. Use ERPA map in Attachment 1 if desired.

3.2 Dose Assessment and Protective Actions from the EOF

3.2.1 Offsite Dose Assessment Manager (ODAM) Actions

- a. IF at any time the initiating conditions listed in Attachment 1 are met, THEN perform the actions listed in that attachment.
- b. Perform actions as indicated in EPIP-EPP-23.
- c. Verify Environmental Survey Sample Team Coordinator has been assigned and is:
 1. Preparing for the dispatch of downwind survey teams.
 2. Aware of Meteorologist availability.

3.2.1 (Cont)

- d. Perform or have performed the following:
 - 1. Obtain meteorology data using Attachment 3 of this procedure.
 - 2. Obtain effluent monitor readings and calculate release rate using Attachment 4 of this procedure.
 - 3. Perform dose assessment calculations and PARs using Attachment 5 of this procedure.
- e. Interface with State and County representatives in the EOF.
 - 1. Keep State/County representatives informed of confirmed data and results.
- f. Complete Part 2 Notification Fact Sheet in accordance with EPIP-EPP-23.

NOTE: A release (tube leak) from the Emergency Condenser (EC) Vent is considered an unmonitored atmospheric release. An out of plant survey is needed to determine actual Release Rate.

- g. Constantly reassess effluent monitors (release rate) and meteorological data for changes. Perform new dose assessment as needed. Develop new PARs and/or verify the adequacy of PARs already made.
- h. As Downwind Survey Team (DST) becomes available, utilize it to verify release rates. If these refined release rates differ significantly from those calculated from effluent monitor readings, reperform dose assessment using refined release rates.
- i. Provide data for the Part 1 Notification Fact Sheet as requested.
- j. Provide ED/RM with pertinent information as needed.
 - 1. Changing radiological conditions that may lead to PARs.
 - 2. Protective actions for site staff.
- k. Maintain Chronological Release Rate Log (see Attachment 5.1).

3.2.2 EOF Dose Assessment Staff

- a. IF at any time the initiating conditions listed in Attachment 1 are met, THEN perform the actions listed in that attachment.
- b. Perform actions as indicated in EPIP-EPP-23.
- c. Perform any actions as requested by the ODAM, including:
 - Obtaining meteorological data (Attachment 3)
 - Obtaining release rate data (Attachment 4)
 - Performing dose assessment and protective action recommendations (Attachment 5)

4.0 DEFINITIONS

- 4.1 **CDE_T**. Committed dose equivalent to the thyroid for the child.
- 4.2 **EDAMS**. Emergency Dose Assessment Modeling System. A PC-based computer program that calculates release rates, doses and protective actions, and obtains meteorological data for emergencies.
- 4.3 **MMS**. Meteorological Monitoring System. Consists of the dedicated computer, main, backup and inland towers and software. Stores and edits site meteorological data.
- 4.4 **RADDOSE**. A subprogram of EDAMS, it performs the dose assessment functions during emergencies.
- 4.5 **SHELTERING**. A protective action whose benefit is to bring the public to a heightened state of awareness. No dose reduction is assumed for sheltering.
- 4.6 **TEDE**. Total Effective Dose Equivalent.

5.0 REFERENCES/COMMITMENTS

5.1 Technical Specifications

None

5.2 Licensee Documentation

5.2.1 NMP Unit 1 FSAR, Section XV

- a. Table XV-32
- b. Table XV-28
- c. Table XV-29
- d. Table XV-23
- e. Table XV-29d
- f. Section 1.3.1
- g. Section 2.1

5.2.2 NMP Unit 2 USAR, Section 15

- a. Table 15.6-15b
- b. Table 15.4-12
- c. Table 15.7-11
- d. Table 15.6-8
- e. Table 15.7-4
- f. Table 15.6-3
- g. Table 16.6-19

5.2.3 SEP, Nine Mile Point Nuclear Station Site Emergency Plan

5.2.4 NMPC Correspondence 96-MET-001 (Backup Tower Wind Speed Correction Factor)--

5.2.5 NMP Correspondence 96-MET-002 (Main Tower Wind Speed Correction Factor)

5.2.6 NMP Correspondence 96-MET-004 (Backup Tower Wind Direction Concerns)

5.2.7 NMP Correspondence 96-MET-003 (Discussion at DER C-95-0693)

5.2.8 NMP Correspondence 96-MET-005 (Main Tower 30' Sigma Theta Concern)

5.2.9 NMP Correspondence 97-MET-002 (Main Tower Wind Obstructions)

5.3 Standards, Regulations, and Codes

NUREG-0654, FEMA-REP-1, Rev 1, Supp 3, Criteria for Protective Action Recommendations for Severe Accidents

5.4 Policies, Programs, and Procedures

5.4.1 EPIP-EPP-07, Downwind Radiological Monitoring

5.4.2 EPIP-EPP-15, Emergency Health Physics Procedure

5.4.3 EPIP-EPP-23, Emergency Personnel Action Procedures

5.4.4 N2-CSP-LWS-M203, Monthly Liquid Release Dose Calculation

5.4.5 N1-CSP-M204, Liquid Release Dose Calculation

5.4.6 "Implementation of the use of KI as a protective action for the public", New York State EP Subcommittee Technical Issues Task Force, March 2003

5.5 Commitments

DER C-95-0693 (for Attachment 3)

6.0 RECORDS REVIEW AND DISPOSITION

6.1 The following records generated by this procedure shall be maintained by Records Management for the Permanent Plant File in accordance with NIP-RMG-01, Records Management:

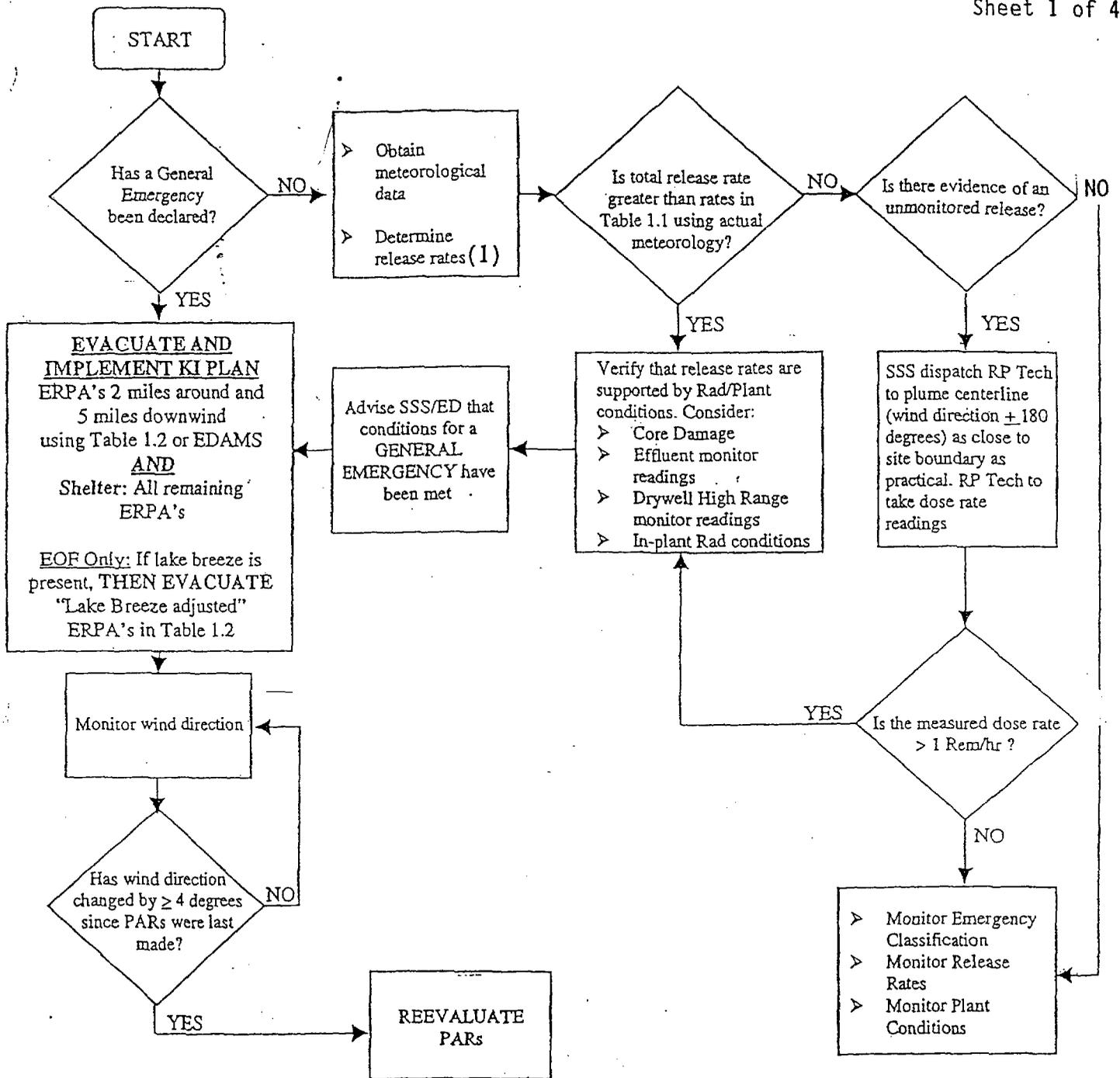
NOTE: For records generated due to an actual declared emergency only.

- Attachment 1, Initial Dose Assessment and Protective Actions
- Attachment 4, Release Rate Determination
- Attachment 5.1, Chronological Release Rate Log
- Attachment 5.2, EDAMS/RadDose Data Entry Form

6.2 The following records generated by this procedure are not required for retention in the Permanent Plant File:

NOTE: For records generated NOT due to an actual declared emergency only.

- Attachment 1, Initial Dose Assessment and Protective Actions
- Attachment 4, Release Rate Determination
- Attachment 5.1, Chronological Release Rate Log
- Attachment 5.2, EDAMS/RadDose Data Entry Form



(1) Use this formula if release has a ground AND elevated source:

$$\left[\frac{\text{Ground Release Rate (Ci/s)}}{\text{Table 1.1 Ground Release Rate (Ci/s)}} \right] + \left[\frac{\text{Elevated Release Rate (Ci/s)}}{\text{Table 1.1 Elevated release rate (Ci/s)}} \right] = \text{IF } \geq 1, \text{ A General Emergency Exists}$$

$$\left[\text{ } \right] + \left[\text{ } \right] = \text{ }$$

TABLE 1.1 - GENERAL EMERGENCY RELEASE RATES

Ground Release (Ci/s)				
Wind Speed (mi/h)	Stability Class			
	A	B/C	D	E/F/G
0-3	1333	213	119	38
4-6	3226	286	143	48
7-9	5556	526	250	83
10-13	7692	769	357	117
14-17	10753	1075	500	164
18-21	13514	1389	667	213
>21	16393	1667	833	256

Elevated Release (Ci/s)				
Wind Speed (mi/h)	Stability Class			
	A	B/C	D	E/F/G
0-3	2041	1124	3030	769
4-6	3703	909	769	769
7-9	5882	1515	1075	1250
10-13	7692	2083	1388	1724
14-17	11494	2857	1818	2273
18-21	14286	3704	2273	2778
>21	17241	4348	2632	3226

TABLE 1.2 - AFFECTED ERPAS

Wind Direction From	2 Miles Around and 5 Miles Downwind	Lake Breeze Adjusted (5 Mile Radius)
214 to 222	1, 2, 3, 26, 27	
223 to 233	1, 2, 3, 26, 27	4, 7
234 to 240	1, 2, 3, 7, 26, 27	4
241 to 254	1, 2, 3, 4, 7, 26, 27	9
255 to 262	1, 2, 3, 4, 7, 26, 27	9
263 to 278	1, 2, 3, 4, 7, 9, 26, 27	5
279 to 292	1, 2, 3, 4, 5, 7, 9, 26, 27	10
293 to 305	1, 2, 3, 4, 5, 7, 9, 10, 26, 27	
306 to 311	1, 2, 3, 4, 5, 7, 9, 10, 26, 27	
312 to 332	1, 2, 3, 4, 5, 7, 9, 10, 26, 27	6, 11
333 to 340	1, 2, 3, 4, 5, 9, 10, 11, 26, 27	6, 7, 12
341 to 349	1, 2, 3, 4, 5, 9, 10, 11, 26, 27	6, 7, 12
350 to 356	1, 2, 3, 5, 6, 9, 10, 11, 26, 27	4, 7
357 to 0	1, 2, 3, 5, 6, 9, 10, 11, 26, 27	4
0 to 12		
13 to 20	1, 2, 3, 5, 6, 10, 11, 26, 27	4, 9
21 to 51	1, 2, 3, 5, 6, 10, 11, 26, 27	9
52 to 56	1, 2, 3, 5, 6, 11, 26, 27	10
57 to 61	1, 2, 3, 5, 6, 11, 26, 27	10
62 to 70	1, 2, 3, 6, 11, 26, 27	10
71 to 89	1, 2, 3, 6, 26, 27	11
90 to 95	1, 2, 3, 6, 26, 27	5, 11, 12
96 to 114	1, 2, 3, 26, 27	6, 12
115 to 146	1, 2, 3, 26, 27	
147 to 213	1, 2, 3, 26, 27	

EOF Only beyond this line!

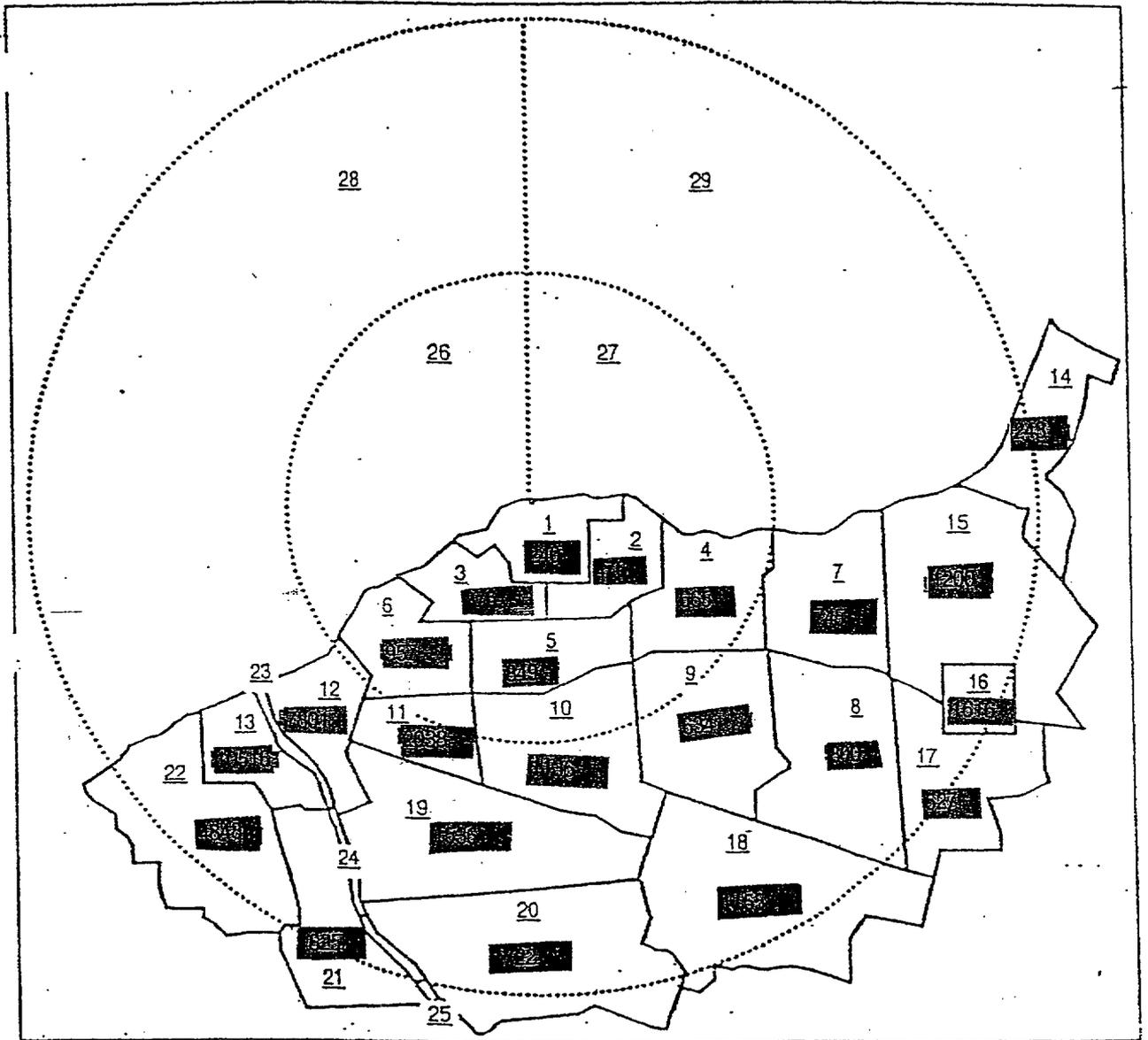
TABLE 1.3 - EPA 400 Protective Action Guidelines (EPA PAGs)

PAR	TEDE (rem)	CDE _r (rem)
Evacuate	> 1	> 5

FIGURE 1.4 - Site Boundary Map
Site Boundary Map



FIGURE 1.5 - ERPA Map



LEGEND

1 ERPA Number



ERPA Population

Emergency Response Planning Areas (ERPA)

with 2003 Population Estimates

1.0 EDAMS Computer

1.1 Ensure the system is powered up. If it is not, turn on the power to the EDAMS computer, monitor, printer, and modem if appropriate. After the computer boots:

1.1.1 Select the EDAMS icon on the desktop screen or from the Start Menu Programs.

1.1.2 Select the Login icon.

1.1.3 Select Continue or hit the enter key.

1.1.4 Select "Direct Connect to Met Data".

NOTES: 1. If the message "Invalid Selection" appears,

- Hit the Escape key

- Click Logoff icon (you may have to wait for it to "Timeout")

- Continue at 1.1.2

2. You will also get "Invalid Selection" if you attempt direct connect when you are already connected. To determine if you are already connected:

- Hit the escape Key, then

- Select Emergency Met Report icon

1.1.5 Once login is successful/complete, select OK.

1.1.6 Select appropriate icon.

1.1.7 When finished, log off the MMS by clicking the Logoff icon.

1.2 Communications Problems

1.2.1 If "Direct Connect to Met Data" fails repeat Step 1.1 "a" through "c" and then, select "Automatic Dial-In to Met Data" (Automatic dial will try 4 different numbers to connect).

1.2.2 If "Automatic Dial-In to Met Data" fails, select "Manual Dial-In to Met Data", and select "number to dial" from the drop down box. Repeat with different numbers as necessary.

1.2.3 If all attempts to login to the Meteorological Monitoring System fail, data will have to be obtained using backup methods as described in Attachment 3 of this procedure.

1.3 Computer Problems

1.3.1 Select the Logoff icon (you may have to wait for it to "Timeout")

1.3.2 Shut down/power off the computer and then reboot the computer

1.3.3 Repeat Section 1.1

a. If problems still exist use the backup computers as follows:

- Unit 1 backup EDAMS computer is the "Rounds" computer
- Unit 2 backup EDAMS computer is the STA's computer
- EOF backup EDAMS computer is the duplicate EDAMS computer

NOTE: The Rounds and STA computers are ONLY capable of "Direct Connect". Automatic or Manual Dial-in can not be used to obtain meteorological data.

2.0 EDAMS DOSE MODEL LIMITATIONS

2.1 A calculational limitation of the dose assessment model occurs when an extreme wind (direction) shift takes place. The model may not calculate doses in sectors that the plume skips over entirely within a single 15-minute calculation step.

2.2 EDAMS only allows the operation of one application at a time.

2.3 Dose rates and deposition rates reported by the model are the maximum for the sector, not necessarily the dose rate or deposition rate at the center of the sector. This avoids the situation of a narrow (stable) plume slipping between receptor points and being missed.

2.4 Deposition data reported is not intended for an environmental evaluation; its intent is to indicate areas of potentially high ground level concentrations.

ATTACHMENT 3: METEOROLOGICAL DATA ACQUISITION

1.0 OBTAINING METEOROLOGICAL DATA

1.1 Obtain ground/elevated meteorological data appropriate to the radiological release point in the order listed below. If no release is in progress, or the release path is unknown obtain the elevated data.

- A. EDAMS (see Section 2.0 of this Attachment)
- B. Strip chart recorder (see Section 3.0 of this attachment)
- C. Manual input from alternate sources (see Section 4.0 of this attachment)

NOTE: Data may be recorded in Table 3.7.

1.2 EOF only - Assume both Lake Breeze and Land Breeze exist. Confirm existence in accordance with Figures 3.2 and 3.3, if a meteorologist is present.

1.3 EOF only - If using the main tower and wind direction is between 0° and 100° or if using the backup tower and wind direction is between 220° and 270° notify the ESSTC and ODAM that the plume may arrive sooner than the wind speed would indicate.

1.4 Repeat Section 1.0 every 15 minutes.

2.0 USING EDAMS TO OBTAIN METEOROLOGICAL DATA

2.1 Log in the EDAMS computer in accordance with Attachment 2 of this procedure.

2.2 Select "Emergency Meteorological Report" to obtain meteorological data.

2.3 Select "Continue" or hit "Enter" key.

2.4 Select affected unit, and select Release Height.

2.5 Select OK or hit "enter" key.

2.6 Requery, if necessary.

2.7 Select "Print Met Data" to print the data, as required.

2.8 Determine whether to use ground or elevated data in accordance with Step 1.1.

2.9 Use data as obtained;

2.10 If data is not available through the EDAMS computer, proceed to Section 3.0.

3.0 USING STRIP CHART RECORDERS TO OBTAIN METEOROLOGICAL DATA

CAUTION

Do not use the LED readouts associated with the strip chart recorders.

NOTE: Use this method only if the method described in Section 2.0 of this attachment is unavailable. If the strip chart data is unavailable, proceed to Section 4.0.

3.1 Locate the chart recorders in the Unit 1 or 2 Control Rooms or the TSC.

- NOTES:**
1. Figure 3.4 shows a sample strip chart trace of air temperature, 100' ΔT , 200' ΔT , and $\sigma\theta$ and Figure 3.5 shows a sample of wind speed and wind direction data.
 2. A meteorologist may use the following steps or skills of the trade to obtain meteorological data.

3.2 Apply the hierarchy in accordance with Table 3.1 to determine what data to obtain.

TABLE 3.1

Parameter	Hierarchy	Elevated Release	Ground Release
Wind Speed & Direction	Primary	200' Main	30' Main
	Substitute	100' Main	
		JAF Backup	
		30' Main	200' Main
Stability	Primary	200' ΔT	100' ΔT
	Substitute	100' ΔT	200' ΔT
		200' $\sigma\theta^{(1)}$	30' $\sigma\theta^{(1)}$
		100' $\sigma\theta^{(1)}$	
		JAF Backup $\sigma\theta$	
		30' $\sigma\theta^{(1)}$	200' $\sigma\theta^{(1)}$

⁽¹⁾ If using 30', 100' or 200' $\sigma\theta$ stability, AND the wind is from a direction listed in Step 3.8, THEN substitute the next source of data in accordance with this step.

ATTACHMENT 3 (Cont)

- 3.3 If substitute data is to be used consult a meteorologist if available; otherwise use the data as obtained.
- 3.4 Determine wind direction as follows:
 - a. Locate the wind direction trace
 - b. Estimate the average wind direction over the last 15 minutes;
- 3.5 Determine wind speed as follows:
 - a. Locate the wind speed trace
 - b. Estimate the average wind speed over the last 15 minutes; data
- 3.6 Determine stability class as follows:
 - a. Locate the ΔT
 - b. Estimate the average ΔT over the last 15 minutes.
 - c. Compare ΔT values to the Stability Classification chart (Table 3.6).

AND Select the appropriate stability class (for 200' ΔT use column 6 and for 100' ΔT use column 4).
- 3.7 If ΔT values are not available, then locate the $\sigma\theta$ from the main or backup tower recorder in accordance with Table 3.1.
- 3.8 If using 30', 100', or 200' $\sigma\theta$ stability and the wind is reading from a direction listed below, substitute the next stability source in accordance with Table 3.1.

Main Tower $\sigma\theta$ Stability	Wind Direction
200'	030° to 096°
100'	030° to 077°
30'	035° to 076°

- 3.9 Compare the value of $\sigma\theta$ to Table 3.6 (Column 5)
 AND Select the appropriate stability class (column 3).
- 3.10 If using JAF Backup $\sigma\theta$ stability, the following adjustments should be made:

JAF Backup Tower Wind Direction	JAF Backup $\sigma\theta$ Stability Adjustment
232° to 246° or 270° to 281°	Add one stability class, such that: A→B B→C C→D D→E E→F F or G→G
247° to 269°	Add two stability class, such that: A→C B→D C→E D→F E, F or G→G

ATTACHMENT 3 (Cont)

- 3.12 If neither ΔT or $\sigma\theta$ is available, observe the wind direction trace (200' for elevated data or 30' for ground data or substitute per Table 3.1) over the last 15-minute period.
- 3.13 Estimate $\sigma\theta$ from the trace by dividing the horizontal deviation of the wind direction trace (over the last 15 minutes) by 6. To make reading the chart easier, you may want to advance the chart.
- 3.14 Compare this calculated $\sigma\theta$ value to Table 3.6 (column 5).
AND Select the appropriate stability class (column 3).

4.0 MANUAL INPUT FROM ALTERNATE SOURCES

NOTE: Use this data only if the methods described in Section 2.0 and 3.0 unavailable.

CAUTION

Data obtained by the following methods may not be site-representative and may introduce errors into dose assessments. A meteorologist should be consulted regarding the use of all substitute data. Use the data as obtained if a meteorologist is not available.

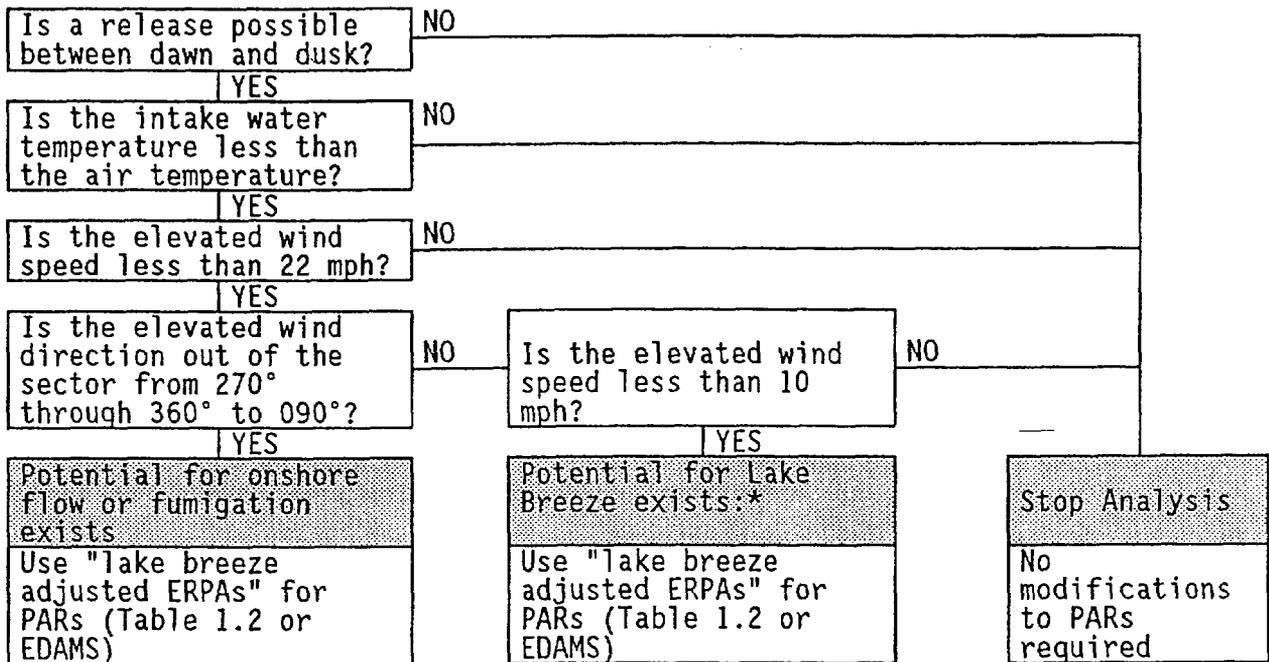
- 4.1— To obtain National Weather Service (NWS) Meteorological Data
 - a. Telephone the NWS in Buffalo at 800-462-7751 or 716-565-9001.
 - b. Request the current wind speed, direction, stability class, and temperature.
 - c. Use the data as follows:
 - 1. Wind speed = elevated and ground wind speed
 - 2. Wind Direction = elevated and ground wind direction
 - 3. Stability Class = elevated and ground stability classes
 - 4. Temperature = ambient temperature
- 4.2 EOF Only - (Directions for the following may be found at the EOF at the Meteorology Station.)
Other sources of meteorological data that may be utilized are:

- 1. SODAR
- 2. Other Meteorology towers
- 3. Commercial weather services
- 4. Meteorologist only - Characterization tables
- 5. Meteorologist only - Skills of the trade

FIGURE 3.2
Lake Breeze/On-Shore Flow and Fumigation Flow Chart

EOF only - Refer to the following step and the flowchart below to determine if a lake breeze is a possibility.

1. Obtain meteorological data in Section 1.0 of this attachment.
2. Obtain intake water temperature from Table 3.8, Meteorologist (if available), Unit 1 or Unit 2 process computer, Control Rooms or using EDAMS
3. Follow the flowchart answering the appropriate questions.

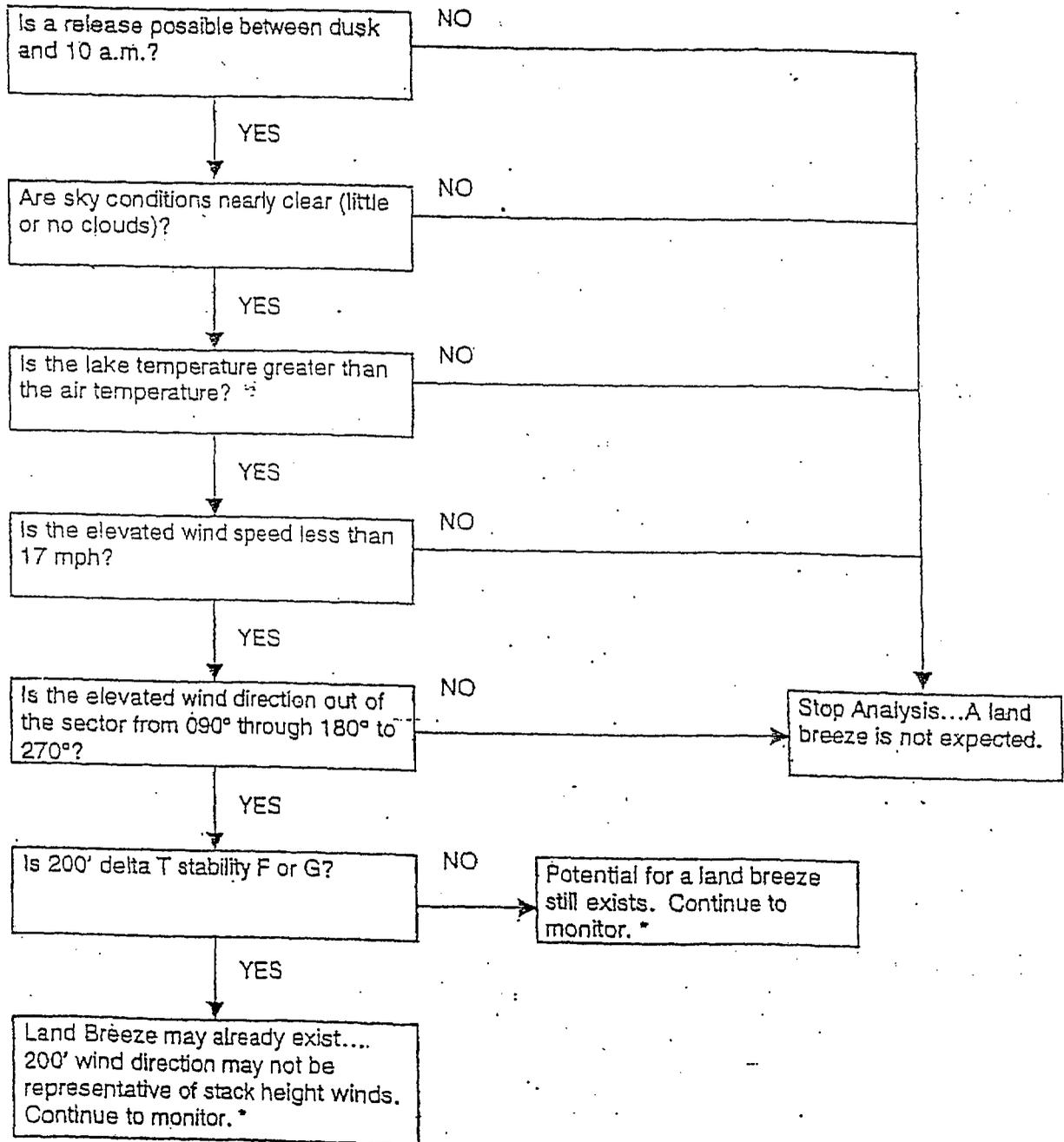


* **NOTE:** There is a potential for a shift in wind direction to 245° through to 065° if the lake breeze has not already formed.

**FIGURE 3.3
LAND BREEZE FLOW CHART**

EOF only - Refer to the flowchart below to determine if a land breeze is a possibility.

1. Obtain meteorological data in accordance with Section 1.0 of this Attachment.
2. Obtain lake temperature from Table 3.8, Meteorologist (if available). Unit 1 or 2 process computer, Control Rooms, or using EDAMS.
3. Follow the flowchart answering the appropriate questions.



*NOTE: There is a potential for a shift in wind direction to 090° through 180° to 270°.

FIGURE 3.4
Sample Air Temperature, Delta Temperature and Sigma Theta Trace
Control Room

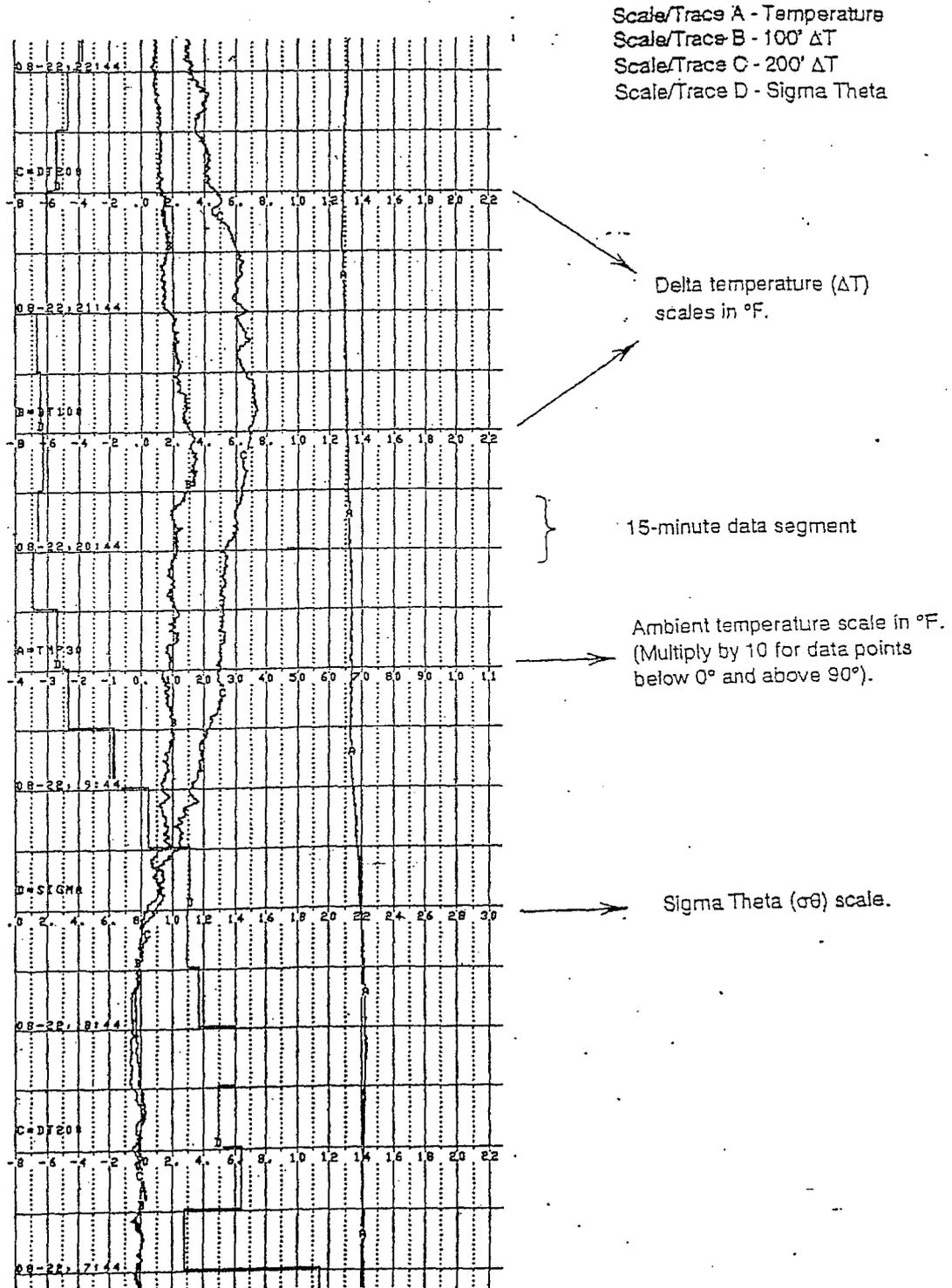


FIGURE 3.5
Sample Wind Speed and Wind Direction Trace
Control Room and TSC

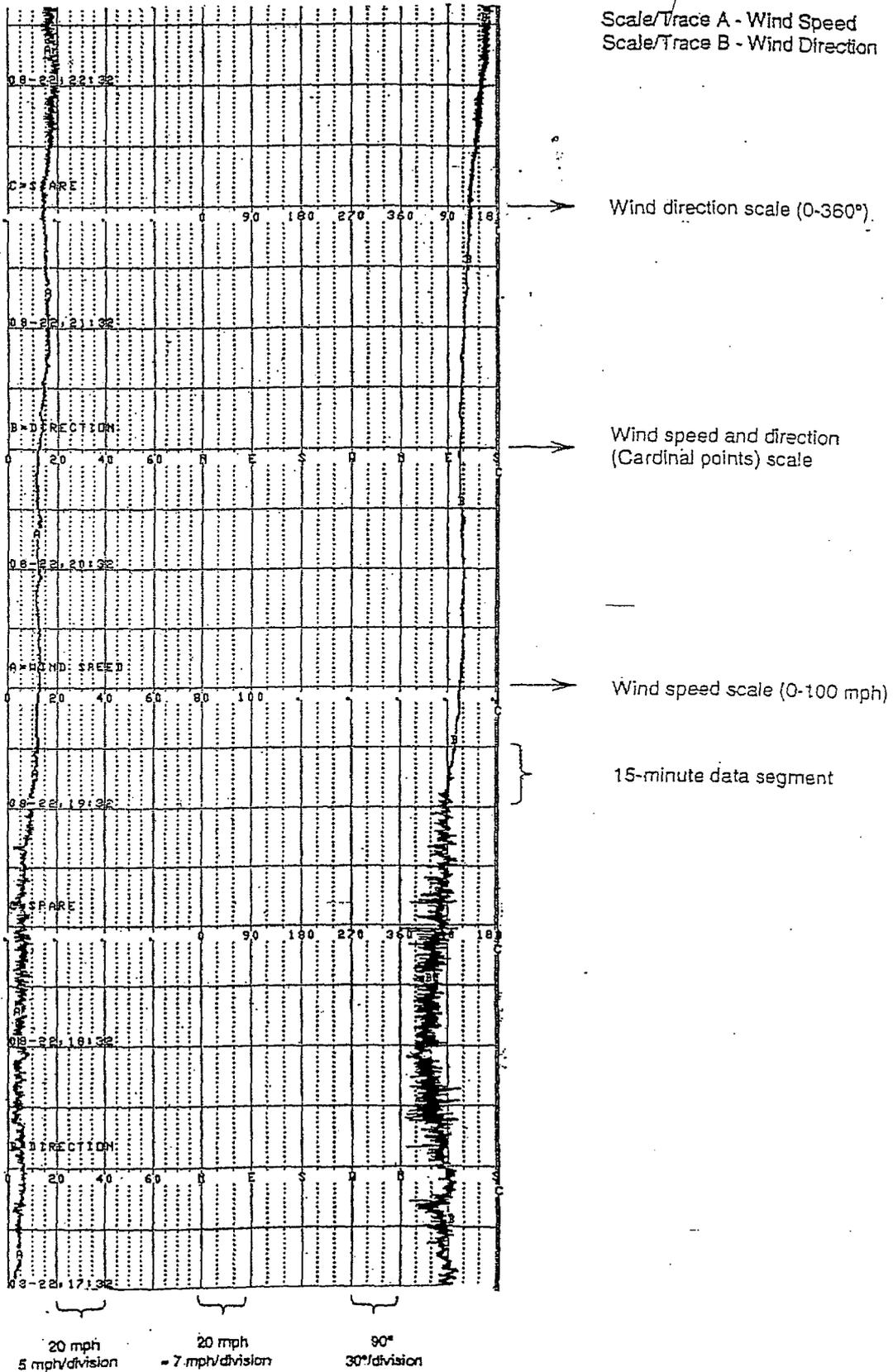


TABLE 3.6 - Stability Classification Chart

1	2	3	4	5
STABILITY CLASSIFICATION	STABILITY CLASS	TEMP CHANGE WITH HEIGHT, °F/72ft ⁽¹⁾ (100 ft. ΔT)	σ _θ DEGREES RANGE OF VALUES ⁽²⁾	TEMP CHANGE WITH HEIGHT, °F/168ft ⁽³⁾ (200 ft. ΔT)
Extremely Unstable	A	$\Delta T/\Delta Z \leq -0.75$	$22.5 \leq \sigma_{\theta}$	$\Delta T/\Delta Z \leq -1.75$
Moderately Unstable	B	$-0.75 < \Delta T/\Delta Z \leq -0.67$	$17.5 \leq \sigma_{\theta} < 22.5$	$-1.75 < \Delta T/\Delta Z \leq -1.57$
Slightly Unstable	C	$-0.67 < \Delta T/\Delta Z \leq -0.59$	$12.5 \leq \sigma_{\theta} < 17.5$	$-1.57 < \Delta T/\Delta Z \leq -1.38$
Neutral	D	$-0.59 < \Delta T/\Delta Z \leq -0.20$	$7.5 \leq \sigma_{\theta} < 12.5$	$-1.38 < \Delta T/\Delta Z \leq -0.46$
Slightly Stable	E	$-0.20 < \Delta T/\Delta Z \leq 0.59$	$3.8 \leq \sigma_{\theta} < 7.5$	$-0.46 < \Delta T/\Delta Z \leq 1.38$
Moderately Stable	F	$0.59 < \Delta T/\Delta Z \leq 1.58$	$2.1 \leq \sigma_{\theta} < 3.8$	$1.38 < \Delta T/\Delta Z \leq 3.69$
Extremely Stable	G	$1.58 < \Delta T/\Delta Z$	$\sigma_{\theta} < 2.1$	$3.69 < \Delta T/\Delta Z$

(1) Adjusted to correspond to the ΔT measured between the 30-foot and 100-foot levels on the main tower.
 (2) Note on symbol convention "3.8 ≤ σ_θ < 7.5" means that σ_θ is greater than or equal to 3.8 degrees but less than 7.5 degrees.
 (3) Adjusted to correspond to the ΔT measured between the 30-foot and 200-foot levels on the main tower.

ATMOSPHERIC STABILITY CHARACTERIZATION

- A. Mid-afternoon only, with clear skies or skies with very few thin clouds; late spring to early fall, winds usually are below 6 miles per hour.
- B. Late morning to mid-afternoon only, with clear or partly cloudy skies; mid spring to mid-fall, winds are usually below 9 miles per hour.
- C. Late morning to late afternoon only, with partly cloudy skies; spring through fall, wind usually are below 11 miles per hour.
- D. All daytime, with overcast or partly cloudy skies or early morning and late afternoon with clear or partly cloudy skies, all night time with overcast skies or partly cloudy year round, winds are moderate to high (greater than 6 miles per hour).
- E. Typically night time only, with thin overcast or partly cloudy skies, all year round, winds less than 10 miles per hour.
- F. Typically night time only, with clear to partly cloudy skies, all year round, winds less than 7 miles per hour.
- G. Typically night time only, with clear skies or very few thin clouds all year round, winds less than 5 miles per hour.

Table 3.8 - Lake Ontario Surface Temperature (°F)

Month	From	To	Temperature	Month	From	To	Temperature
January	1	11	37	July	18	22	67
January	12	23	36	July	23	28	68
January	24	31	35	July	29	31	69
February	1	6	35	August	1	4	69
February	7	25	34	August	5	11	70
February	26	28	33	August	12	18	71
March	1	8	33	August	19	26	70
March	9	27	34	August	27	31	69
March	28	31	35	September	1	1	69
April	1	11	35	September	2	8	68
April	12	20	36	September	9	14	67
April	21	27	37	September	15	19	66
April	28	30	38	September	20	24	65
May	1	2	38	September	25	28	64
May	3	6	39	September	29	30	63
May	7	9	40	October	1	1	63
May	10	12	41	October	2	4	62
May	13	15	42	October	5	7	61
May	16	18	43	October	8	9	60
May	19	21	44	October	10	11	59
May	22	24	45	October	12	13	58
May	25	27	46	October	14	15	57
May	28	30	47	October	16	17	56
May	31	31	48	October	18	19	55
June	1	2	48	October	20	21	54
June	3	4	49	October	22	23	53
June	5	7	50	October	24	26	52
June	8	9	51	October	27	29	51
June	10	11	52	October	30	31	50
June	12	13	53	November	1	1	50
June	14	15	54	November	2	4	49
June	16	17	55	November	5	7	48
June	18	19	56	November	8	10	47
June	20	21	57	November	11	13	46
June	22	23	58	November	14	16	45
June	24	25	59	November	17	20	44
June	26	27	60	November	21	24	43
June	28	29	61	November	25	29	42
June	30	30	62	November	30	30	41
July	1	1	62	December	1	4	41
July	2	4	63	December	5	10	40
July	5	8	64	December	11	18	39
July	9	12	65	December	19	30	38
July	13	17	66	December	31	31	37

Source: R.J. Ballentine, "Formulation And Testing Of An Index To Predict The Onset Of Lake Breezes Along The South Shore Of Lake Ontario" (May 1987).

ATTACHMENT 4: RELEASE RATE DETERMINATION

Sheet 1 of 8

1.0 METHOD

- a. Access the EDAMS Computer using Attachment 2 of this procedure.
- b. Select the "EDAMS" Icon.
- c. Select "Release Rate Calculations"
- d. IF Unit 1 was selected, go to Section 2.0 of this Attachment.
- e. IF Unit 2 was selected, go to Section 3.0 of this Attachment.
- f. Assess all calculated release rates or EC monitor readings against ODCM limits by implementing Attachment 4a.

2.0 UNIT 1 METHODS

2.1 OGESMS

- a. Select monitor (7, 8, 10a or 10b)

NOTE: Monitor 7 = indicator 112-07A
Monitor 8 = indicator 112-08A
Monitor 10a = indicator RN10A
Monitor 10b = indicator RN10B
- b. Enter time that reading was obtained (using 24 hour format)
- c. Enter monitor reading (cpm for monitors 7 or 8, cps for monitors 10a or 10b). Use J panel readings or the following computer points:
 - monitor 7, use E334
 - monitor 8, use E335
 - monitor 10a, use E488
 - monitor 10b, use E489
- d. Enter process computer calibration factor. If unavailable, use default values below:
 - 4.4E-8 for 7 or 8
 - 4.4E-7 for 10a or 10b
- e. Enter Stack Flow (kcfm). Use J Panel OR computer point C320 or calculate from Table 4.1.
- f. Hit the "F9" key.
- g. Print results.

2.2 Stack Teletector

- a. Enter the time that the reading was obtained (24-hour format).
- b. Enter the monitor reading (mrem/hr).
- c. Enter the calibration factor. If unavailable, use default value of 0.5.
- d. Enter Total Stack Flow (kcfm). Use J Panel or computer point C320 or calculate from Table 4.1.
- e. Hit the "F9" key.
- f. Print the results.

2.3 Grab Sample (Noble Gas)

CAUTION

In using grab samples to determine release rate, the results may be invalid if significant changes in source terms have occurred since the sample was taken.

- a. Enter the time that the reading was obtained (24-hour format).
- b. Enter total Noble Gas concentration ($\mu\text{Ci/cc}$) (for EDAMS) OR the concentration of each isotope ($\mu\text{Ci/cc}$)(for Raddose).
- c. Enter Total Stack Flow (kcfm). Use J Panel or computer point C320 or calculate from Table 4.1.
- d. Hit the "F9" Key.
- e. Print the results.

2.4 Back Calculation

NOTE: Use back calculation of downwind survey team data to determine release rate when no other method is available, AND to verify calculated release rates.

- a. If this method is to be used to make an initial determination of release rate, then back calculate using EDAMS (not Raddose). This value can then be input into Raddose in accordance with Attachment 5 of this procedure.
- b. Enter the time that the reading was obtained (24-hour format).
- c. Enter the wind speed (mi/hr). Use the method described in Attachment 3.
- d. Enter "E" for elevated/stack or "G" for ground/vent release.
- e. Enter the stability class (A-G).
- f. Enter the three foot closed window reading from the ion chamber (mRem/hr). If readings are in CPM, then convert using 3500 CPM = 1 mRem/hr, or other appropriate conversion constant for the detector being used.
- g. Enter the downwind distance that the above reading was obtained.
- h. Hit the "F9" key.
- i. Print the results.

2.5 UFSAR/USAR

CAUTION

This selection is only appropriate if no other sources of data are available (including downwind survey data) AND the accident conditions are identical to those described in the UFSAR for the accident selected.

NOTE: Input from the Control Room, TSC or EOF Technical Staff may be necessary to select the FSAR accident type that most closely describes the conditions being experienced.

- a. Select the accident being experienced or projected (Use Attachment 5, Table 5.1).
- b. Print results.

2.6 Containment High Range Monitor

- NOTES:**
1. This method is only valid if the monitor is able to "see" the release. Therefore, consult Operations personnel on the validity of monitor readings.
 2. The following may be used for this calculation:
 - Unit 1 primary containment free-air volume = 314,000 ft³
 - Tech Spec leakage from primary containment = ~1%/day
 - a. Enter the monitor ID or number (U-1 CHRRM 11,12; U-2 RMS 1A-1D)
 - b. Enter the time that the reading was obtained (24-hour format).
 - c. Enter the date that the reading was obtained.
 - d. Enter the time of reactor shutdown (24-hour format).
 - e. Enter the date that the reactor was shutdown.
 - f. Enter the monitor reading (rem/hr). Use J Panel computer point E467 or E468.
 - g. Enter the expected flow rate (kcfm) to the environment. Consult with Operations personnel if needed.
 - h. Hit the "F9" key.
 - i. Print results.

2.7 For liquid releases, consult NI-CSP-M204



3.0 UNIT 2 METHODS

3.1 GEMS

- a. Enter the time that the reading was obtained (24-hour format).
- b. Enter "S" if this is a stack reading or "V" if it is a vent reading.
- c. Enter monitor reading ($\mu\text{Ci/s}$). Use GEMS readings from SPDS display or the GEM recorder on (X10) 882 panel. If offscale (range $1\text{E}9 \mu\text{Ci/sec}$), use GEMS computer.
- d. Hit the "F9" key.
- e. Print results.

3.2 Grab Sample (Noble Gas)

CAUTION

In using grab samples to determine release rate, the results may be invalid if significant changes in source terms have occurred since sample was taken.

- a. Enter the time that the reading was obtained (24-hour format)
- b. Enter total Noble Gas reading ($\mu\text{Ci/cc}$) (for EDAMS) OR the concentration of each isotope ($\mu\text{Ci/cc}$)(for Raddose).
- c. Enter total stack or vent flow (kcfm). Calculate from Figure 4.2 or 4.3.
- d. Hit the "F9" Key.
- e. Print the results.

3.3 Back Calculation

Use Section 2.4 of this Attachment.

3.4 USAR

Use Section 2.5 of this Attachment.

3.5 Containment High Range Monitor

NOTES: 1. This method is only valid if the monitor is able to "see" the release. Therefore, consult Operations personnel on the validity of monitor readings.

2. The following may be used for this calculation:

- Unit 2 primary containment free-air volume = 497,000 ft³
- Tech Spec leakage from primary containment = ~1%/day

Use Section 2.6 of this Attachment. Monitor readings are available on the DRMS system, the SPDS display or the 880 panel.

3.6 For liquid releases, consult N2-CSP-LWS-M203



TABLE 4.1
UNIT 1 STACK: FAN CONFIGURATION

Fan	Nominal Flow (KCFM)	Computer Point	Workspace
Drywell Vent, Purge, and Fill Line	10		
Turbine Building High Speed Fan	170		
Turbine Building Low Speed Fan	120		
Reactor Building High Speed Fan	70		
Reactor Building Low Speed Fan	35		
Waste Building	8		
Waste Building Extension	5.3		
Offgas Building	6		
Reactor Building Emergency Ventilation	1.6		
RSSB Extension	10.25		
Total Stack Flow		C320	

TABLE 4.2
UNIT 2 STACK: FAN CONFIGURATION

Fan	Nominal Flow (KCFM)	Computer Point	Workspace
CST Room	2.2		
Stack Substructure	1.4		
Turbine Building - 1 fan	40		
Turbine Building - 2 fans	80		
Standby Gas Treatment	4		
Total Stack Flow			

**TABLE 4.3
UNIT 2 VENT: FAN CONFIGURATION**

Fan	Nominal Flow (KCFM)	Computer Point	Workspace
Turbine Building 250' and 306' Decon Rm Fan	3.3		
Radwaste Liner Fan	0.8		
Radwaste Tank Fan	4.9		
Radwaste Building - 1 fan	47.8		
Radwaste Building - 2 fans	95.6		
Aux Boiler	23		
Refueling Floor Above	70		
Refueling Floor Below	70		
Total Vent Flow			

ATTACHMENT 4A: DETERMINATION OF PERCENT OF ODCM RADIOLOGICAL RELEASE

Procedure:

1. Determine release rate in accordance with Attachment 4 of this procedure.
2. Enter release rate or monitor reading as appropriate and calculate % ODCM.

a. Unit 1 Stack release:

1. assume calculated stack release rates represent Noble Gas release rates
2. calculate:

$$\% \text{ ODCM} = \text{Noble Gas release rate (Ci/sec)} \times 8850 = \% \text{ ODCM} = \underline{\hspace{2cm}}$$

b. Unit 1 Emergency Condenser (EC) Vent release:

NOTE: (EC Vent is considered an unmonitored release)

1. calculate:

$$\% \text{ ODCM} = \text{EC Vent monitor reading (mr/hr)} \times 5 = \% \text{ ODCM} = \underline{\hspace{2cm}}$$

c. Unit 2 Stack release:

1. assume calculated stack release rates represent Noble Gas release rates
2. calculate:

$$\% \text{ ODCM} = \text{Noble Gas release rate (Ci/sec)} \times 1042 = \% \text{ ODCM} = \underline{\hspace{2cm}}$$

d. Unit 2 Vent release:

1. assume calculated stack release rates represent Noble Gas release rates
2. calculate:

$$\% \text{ ODCM} = \text{Noble Gas release rate (Ci/sec)} \times 3704 = \% \text{ ODCM} = \underline{\hspace{2cm}}$$

3. If there are multiple releases (release points) due to the same event, then SUM the % ODCM values to obtain the total % ODCM.
Total % ODCM =

4. IF Total % ODCM or % ODCM from any source is > 100% ODCM, THEN:

a. Advise the SSS/ED or the ODAM that a release that exceeds the ODCM has taken place.

b. (EOF Only) Initiate Part II Notification Fact Sheet, as directed by the ODAM, using EDAMS to generate the report as described in Attachment 5 Section 1.2.9, or complete by hand.

ATTACHMENT 5: REFINED DOSE ASSESSMENT AND PROTECTIVE ACTIONS

Sheet 1 of 6

1.0 DOSE ASSESSMENT

1.1 General Considerations

- 1.1.1 The dose assessment program is called RADDPOSE.
- 1.1.2 Meteorological data is automatically sent to RADDPOSE by the Meteorological Monitoring System (MMS). The user can use this data or manually input data.
- 1.1.3 Source term and release rate determination is identical to that described in Attachment 4.

1.2 Dose Assessment Procedure

NOTE: The dose assessment model has many capabilities beyond those used in this procedure. Use the "EDAMS Operators Manual" (available in the EOF) for further reference.

- 1.2.1 Log on to EDAMS computer using Attachment 2.
- 1.2.2 Select the affected Unit "Dose Assessment Model."
- 1.2.3 Utilize "EDAMS/RadDose Data Entry Form", Attachment 5.2, or equivalent.
- 1.2.4 Select "Begin New Incident" at the options.
- 1.2.5 Select "Yes" to erase all previous data when prompted.
- 1.2.6 Enter the following at the Accident Scenario Definition screen:
 - a. Reactor Trip Date. This is the date that the reactor scrambled or was manually tripped. IF the reactor is not shut down, enter tomorrow's date.
 - b. Reactor Trip Time (24-hour format). This is the time that the reactor scrambled or was manually tripped.
 - c. Release Date. This is the date that the release to the atmosphere began, or is projected to begin.
 - d. Release Time (24-hour format). This is the time that release to atmosphere began or is projected to begin.
 - e. Enter the lake temperature (deg F). If unknown, hit "Enter" and historical data will be entered.
 - f. Enter the initials of the user (two or three initials).
 - g. Verify entries, make any necessary changes, and select accept to continue.

1.2.7 Select "Enter/Edit Source Term Data" from the EDAMS main menu.

- NOTES:**
1. Use Attachment 4 to obtain the information needed to complete this section.
 2. The preferred source of release rate data is the actual isotopic distribution, if available.

a. Select the accident type that most closely matches the source term going to the environment. Use the table below as a guide.

Fuel Damage/Reduction Mechanism	Accident Type
None/none	LOCA
Minor (gap release)/SBGT or GTS	LOCA
Significant (grain boundary - melt)/none	DBA
Significant (grain boundary - melt)/SBGT or GTS	LOCA
Severe (melt)/SBGT or GTS	Severe Accident
Severe (melt)/none	Severe Accident

b. Select "Yes" for elevated releases OR "No" for ground releases when asked, "Is this release Elevated?".

NOTE: "Elevated" releases are releases from the stack. "Ground" releases are from any other release point.

1.2.7 (Cont)

- c. Select the "Method" used to determine the release rate by selecting the highlighted cell or by hitting the "F2" key and selecting.
1. Utilize Attachment 4 Section 2.0 for Unit 1 releases.
 2. Utilize Attachment 4 Section 3.0 for Unit 2 releases.
 - a. Enter correct Calibration Factor, if appropriate, then select "OK".
 - b. Enter appropriate Flow Rate and monitor reading.
- d. Select the Iodine release rate "Method" by selecting the highlighted cell or by hitting "F2" key. Utilize one of the following:
1. Grab Sample: This section can be used if concentrations ($\mu\text{Ci}/\text{cc}$) by isotope, and associate flow rate are available
 - a. obtain sample analysis results from TSC
 - b. enter concentration of each isotope
 - c. enter flow rate (cfm) associated with sample

NOTE: This method will override previously input Total Release Rate method
 2. Direct: This selection utilizes direct entry of the release rate (in Ci/Sec) obtained by any method, including the following
 - a) Use of downwind survey team data
 - 1) determine the representative I/NG ratio using field data and the methodology described in EPIP-EPP-07.
 - 2) multiply the NG or total release rate (obtained from Attachment 4) by the I/NG ratio.
 - 3) enter the Iodine release rate in the appropriate column.

1.2.7 (Cont)

3. Ratio: This selection utilizes the UFSAR/USAR I/NG ratio and multiplies it by the Total Release Rate.

Accident Type	I/NG Ratio	
	U1	U2
LOCA	5.59 E-4	2.23 E-4
DBA	8.2 E-4	1.97 E-2
Steam Line Break	7.64	33.5

4. UFSAR:

- e. Up to three Accident Types (and therefore three release paths) can be entered. To enter additional release paths, repeat Steps a - d above. When all applicable accident types have been entered, proceed to the next step.
- f. Upon completion of this screen, verify data and make any necessary changes before "Accept".

1.2.8

The user will be queried for the meteorological data required. Enter meteorological data as required:

- a. Select "Enter/Edit Meteorological Data", Elevated or Ground as appropriate.
- b. If the MMS is available, the data will be automatically displayed for the current time step.
 - 1. Select "Requery MMS".
 - 2. Select "Accept" as necessary.

1.2.8 (Cont)

- c. If the MMS is unavailable, then enter both ground and elevated met data obtained from alternate sources, as outlined in Attachment 3 of this procedure and select "Accept"

1.2.9 Select "Perform Calculations" from the EDAMS main menu.

NOTE: The purpose of the following steps is to determine the projected avoidable dose resulting from the incident.

CAUTION

Any calculations performed on actual data shall be verified. The ODAM may act as the checker for calculations performed by the Rad Assessment Staff.

- a. The map of the 10 mile Emergency Planning Zone (EPZ) will appear with centerline dose rates when the calculation is complete.
- b. Select "Continue" to go to the output menu.
- c. Select "Continue Calculations" from the output menu.
- d. Select "Perform Forecast" from the RADDPOSE main menu.
- e. Verify both meteorology and source term data as required.
- f. Enter "Forecast Period" (i.e. - release duration). Use 4 hours as a default value.
- g. Select "OK".
- h. Select "Yes" if a GE has been declared for any reason, OR "No" if GE has not been declared.
- i. After the forecast map appears "Continue" to go to the output menu.
- j. Select "Go to Report Menu".
- k. Select "Print 10-Mile ERPA Map".
- l. Select "Print Complete Dose/Dose Rate Report".
- m. Select "Print Notification Form Part 2", as directed by the ODAM, to print Part II Notification Fact Sheet.
- n. Attach results of Step 1.2.9.j and k to EDAMS/RadDose Data Entry Form, Attachment 5.2 or equivalent.

1.2.9 (Cont)

D. Verify that any results are supported by radiological and plant conditions. Consider:

- Core damage
- Drywell high range monitor readings
- Effluent monitor readings
- Inplant radiological conditions
- Containment hydrogen monitor readings

p. If the next 15 minute interval is part of the forecast for ERPAs/towns/etc., where the plume has not yet arrived at those locations, add data to the next projection.

1.3 If it is desired to utilize EDAMS to track near real-time doses, then perform the following steps:

CAUTION

The results of this step shall NOT be utilized to determine PARs.

- 1.3.1 Enter accident, source term and meteorological data in accordance with Steps 1.2.1 through 1.2.8 of this attachment.
- 1.3.2 Select "Perform Calculations" from the EDAMS main menu.
- 1.3.3 Enter meteorological and source term data at 15 minute intervals.
- 1.3.4 Determine dose at any time by viewing the displayed 10 mile ERPA map.

2.0 REFINED PROTECTIVE ACTIONS

- 2.1 These actions are initiated for the purpose of verifying the adequacy of PARs made using Attachment 1 of this procedure OR to develop PARs using projected doses obtained from Attachment 5, Step 1.2.9 of this procedure.
- 2.2 In determining PARs based on dose assessment, carefully consider factors such as release duration and Evacuation Travel Time Estimates (ETTE). (For example, puff releases may yield doses in excess of Protective Action Guidelines for an evacuation, but the plume will pass before an evacuation could be completed). ETTEs are available in the EOF.
- 2.3 If evacuation is recommended for an ERPA, Then the recommendation shall include implementation of the KI Plan.

NOTE: County and State PARs take many factors into account that NMP procedures do not (i.e. - road conditions, special population needs, evacuation scenarios, and shelter vs evacuation doses). Therefore, differences in PARs may occur. The ODAM must account for differences in PARs, when those differences exist. This can be accomplished via consultation with County and State representatives in the EOF as to the assumptions used in their dose calculations and PAR development.

2.3 Obtain dose projection for each ERPA.

2.3.1 PARs are listed on the 10 mile ERPA map obtained per Attachment 5, Step 1.2.9. j.

2.3.2 The following criteria are used in determining the PAR for each ERPA.

PAR	TEDE (rem)	CDE _r (rem)
Evacuate	> 1	> 5

2.3.3 Record the PAR for each ERPA on the Part 1 Notification Form and give to the ED/RM for approval.

2.3.4 PARs that have been made previously must be accounted for when PARs are revised. For example, if a PAR to evacuate an ERPA was previously made to the State/County and that PAR does not appear on a revised map from 1.2.9.j, that PAR must still be included on the revised recommendation to the State/County. Once a PAR is transmitted to the State/County, it shall not be changed.

2.3.5 If projected doses exceed values listed in Attachment 5 Step 2.3.2 for distances greater than 10 miles, PARs shall be made using convenient geographic boundaries (such as townships).

TABLE 5.1 - FSAR/USAR ACCIDENT TYPE

Accident Type	Noble Gas Release Rate (Ci/s)	Iodine Release Rate (Ci/s)	Analyzed Release Point
Unit 1:			
DBA Loss of Coolant	5.50E+0	4.53E-3	Elevated
Control Rod Drop	2.51E+1	6.03E-5	Elevated
Refueling Accident	3.78E-2	3.84E-5	Elevated
Steam Line Break	6.36E+0	4.86E+1	Ground
Loss of Coolant (Realistic)	1.79E-3	1.00E-6	Elevated
Unit 2:			
DBA Loss of Coolant	1.03E+1	2.03E-1	Elevated
Control Rod Drop	4.22E-2	4.70E-4	Ground
Refueling Accident	1.77E+1	1.65E-1	Ground
Steam Line Break	3.64E+0	1.22E+2	Ground
Rad Gas Waste System Leak	4.06E+0	0.00	Ground
Instrument Line Failure	0.00	2.17E-2	Ground
Fuel Cask Drop	2.06E+0	2.68E-3	Ground
Loss of Coolant (Realistic)	1.05E-2	2.38E-5	Elevated

EDAMS/RadDose Input Form (Unit 1)

Date/Time completed: _____ / _____

Actual What if

Source Term Data:

<u>Scenario Definition</u>							
Reactor trip: Date: _____ Time: _____		Release began: Date: _____ Time: _____		Release duration: _____ (hrs)			
<u>Source Term Data:</u>							
Pathway #1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 (circle)		<input type="checkbox"/> Elevated <input type="checkbox"/> Ground					
<u>Total release rate definition</u>							
Select accident: <input type="checkbox"/> Containment DBA <input type="checkbox"/> Control Rod Drop <input type="checkbox"/> Refueling Accident <input type="checkbox"/> Steam Line Break <input type="checkbox"/> LOCA (realistic)							
<input type="checkbox"/> Svr Accident Source Term							
OGESMS Reading _____ <input type="checkbox"/> cpm <input type="checkbox"/> cps Cal Factor <input type="checkbox"/> default or _____ Stack flow rate (kcfm) _____	Stack Teletector Reading Time _____ Reading (mr/hr) _____ Cal Factor _____ Stack flow (kcfm) _____	Grab Sample Sample flow (kcfm) _____ Attach printout <input type="checkbox"/>	Direct _____ Ci/sec	UFSAR <input type="checkbox"/>	Containment HR Rad Monitor ID _____ Monitor Rdg _____ R/hr Flow _____ Kcfm	Back Calc 3' CW _____ mr/hr* Reading distance _____ mi Reading bearing _____ deg * mr/hr x 3500 = cpm	Svr Accdnt <u>Sprays:</u> <input type="checkbox"/> on <input type="checkbox"/> off <u>Filters:</u> <input type="checkbox"/> on <input type="checkbox"/> off <u>Leak Rate:</u> <input type="checkbox"/> 0.1%/day <input type="checkbox"/> 100%/day <input type="checkbox"/> 100%/hour <u>Hold-up Time</u> <input type="checkbox"/> 0.5 hour <input type="checkbox"/> 2-12 hours <input type="checkbox"/> 24 hours
<u>RadDose release rate definition</u>							
Grab Sample Attach printout <input type="checkbox"/>	Ratio <input type="checkbox"/>	UFSAR <input type="checkbox"/>	Direct _____ Ci/sec Or Total RR or Noble Gas RR x I/NG ratio = Ci/sec workspace: _____ x _____ = _____				

(Additional pathways may be entered using additional sheets)

Source Term entry							
Pathway #1 2 3 (circle) <input type="checkbox"/> Elevated <input type="checkbox"/> Ground							
Total release rate definition							
Select accident: <input type="checkbox"/> Containment DBA <input type="checkbox"/> Control Rod Drop <input type="checkbox"/> Refueling Accident <input type="checkbox"/> Steam Line Break <input type="checkbox"/> LOCA (realistic)							
<input type="checkbox"/> Svr Accident Source Term							
OGESMS	Stack Teletector	Grab Sample	Direct	UFSAR	Containment HR Rad	Back Calc	Svr Accdnt
Reading _____ <input type="checkbox"/> cpm <input type="checkbox"/> cps Cal Factor <input type="checkbox"/> default or _____ Stack flow rate (kcfm) _____	Reading Time _____ Reading (mr/hr) _____ Cal Factor _____ Stack flow (kcfm) _____	Sample flow (kcfm) _____ Attach printout	_____ Ci/sec	<input type="checkbox"/>	Monitor ID _____ Monitor Rdg _____ R/hr Flow _____ Kcfm	3' CW _____ mr/hr* Reading distance _____ mi Reading bearing _____ deg * mr/hr x 3500 = cpm	Sprays: <input type="checkbox"/> on <input type="checkbox"/> off Filters: <input type="checkbox"/> on <input type="checkbox"/> off Leak Rate: <input type="checkbox"/> 0.1%/day <input type="checkbox"/> 100%/day <input type="checkbox"/> 100%/hour Hold-up Time <input type="checkbox"/> 0.5 hour <input type="checkbox"/> 2-12 hours <input type="checkbox"/> 24 hours

Iodine release rate definition			
Grab Sample	Ratio	UFSAR	Direct
Attach printout <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____ Ci/sec Or Total RR or Noble Gas RR x I/NG ratio = Ci/sec workspace: _____ x _____ = _____

Meteorological Data:

Use actual data Use data below

	Wind Speed (m/hr)	Wind from (degrees)	Delta Temp (F)	Sigma Theta (Degrees)	Stability Class	Air Temp (F)	Precip Rate (in/15 min)
Ground Data							
Elevated Data							

EDAMS/RadDose Input Form (Unit 2)

Date/Time completed: _____ / _____

Actual What if

Source Term Data:

Scenario Definition					
Reactor trip: Date: _____ Time: _____		Release began: Date: _____ Time: _____		Release duration: _____ (hrs)	
Source Term Entry					
Pathway #1 <input type="checkbox"/> Elevated, <input type="checkbox"/> Ground					
Total release rate definition					
Select accident: <input type="checkbox"/> Containment DBA <input type="checkbox"/> Control Rod Drop <input type="checkbox"/> Refueling Accident <input type="checkbox"/> Steam Line Break <input type="checkbox"/> LOCA <input type="checkbox"/> Svr Accident Source Term					
<input type="checkbox"/> Rad Gas Waste System Leak <input type="checkbox"/> Instrument Line Break <input type="checkbox"/> Fuel Cask Drop					
GEMS	Grab Sample	Direct	USAR	Containment HR Rad	Back Calc
_____ μ Ci/sec	Sample flow (kcfm) _____ Attach printout	_____ Ci/sec	<input type="checkbox"/>	Monitor ID _____ Monitor Rdg _____ R/hr Flow _____ Kcfm	3' CW _____ mr/hr* Reading distance _____ mi Reading bearing _____ deg * mr/hr x 3500 = cpm
Iodine release rate definition					
Grab Sample	Ratio	USAR	Direct		
Attach printout <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____ Ci/sec Or Total RR or Noble Gas RR x I/NG ratio = Ci/sec workspace: _____ x _____ = _____		

(additional pathways may be entered on the reverse side)

Pathway #2 <input type="checkbox"/> Elevated <input type="checkbox"/> Ground					
Total release rate definition					
Select accident: <input type="checkbox"/> Containment DBA <input type="checkbox"/> Control Rod Drop <input type="checkbox"/> Refueling Accident <input type="checkbox"/> Steam Line Break <input type="checkbox"/> LOCA <input type="checkbox"/> Svr Accident Source Term <input type="checkbox"/> Rad Gas Waste System Leak <input type="checkbox"/> Instrument Line Break <input type="checkbox"/> Fuel Cask Drop					
GEMS _____ μ Ci/sec	Grab Sample Sample flow (kcfm) _____ Attach printout	Direct _____ Ci/sec	USAR <input type="checkbox"/>	Containment HR Rad Monitor ID _____ Monitor Rdg _____ R/hr Flow _____ Kcfm	Back Calc 3" CW _____ m/hr* Reading distance _____ mi Reading bearing _____ deg * m/hr x 3500 = cpm
Iodine release rate definition					
Grab Sample Attach printout <input type="checkbox"/>	Ratio <input type="checkbox"/>	USAR <input type="checkbox"/>	Direct _____ Ci/sec Or Total RR or Noble Gas RR x I/NG ratio = Ci/sec workspace: _____ x _____ = _____		

Meteorological Data:

Use actual data Use data below

	Wind Speed (m/hr)	Wind from (degrees)	Delta Temp (F)	Sigma Theta (Degrees)	Stability Class	Air Temp (F)	Precip Rate (in/15 min)
Ground Data							
Elevated Data							

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT NUCLEAR STATION
EMERGENCY PLAN IMPLEMENTING PROCEDURE

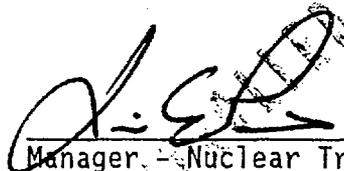
EPIP-EPP-26

REVISION 01

NATURAL HAZARD PREPARATION AND RECOVERY

TECHNICAL SPECIFICATION REQUIRED

Approved by:
L. E. Pisano



Manager - Nuclear Training

14 Nov 00
Date

THIS IS A FULL REVISION

Effective Date: 11/27/2000

PERIODIC REVIEW DUE DATE NOVEMBER, 2001

LIST OF EFFECTIVE PAGES

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1.0 PURPOSE

To provide guidance on the preparation for, response to and recovery from natural hazards that may affect Nine Mile Point or the ability to implement the site emergency plan.

1.1 Applicability

This procedure applies to any severe natural events, which may include but are not limited to:

- Snow events of sufficient magnitude (actual or projected) to impede access to site for greater than several hours.
- Other severe weather events that result in, or may have resulted in widespread or significant damage to electrical transmission/distribution system, offsite buildings or residences or blocking a major roadway.
- Earthquakes, flooding or any other natural phenomena that causes significant damage to any site structure.

2.0 PRIMARY RESPONSIBILITIES

2.1 Emergency Preparedness should

- 2.1.1 Maintain sufficient supplies, equipment and procedures to meet the personal needs of the Emergency Response Organization.
- 2.1.2 Apprise the on-duty Emergency Director/Recovery Manager (ED/RM) of any impending natural hazards.

2.2 Station Shift Supervisor/Emergency Director (SSS/ED) should

- 2.2.1 Assesses conditions against emergency action levels and, if necessary, declares an emergency.
- 2.2.2 Initiates actions to assess and mitigate the consequences of severe natural events.

2.3 Emergency Director/Recovery Manager (ED/RM) should

- 2.3.1 Determine Emergency Response Organization (ERO) staffing strategy.
- 2.3.2 Determine degree of Site Emergency Plan (SEP) implementation, if any.

3.0 PROCEDURE

3.1 Notification

3.1.1 Notification may be received from:

- Site Meteorologist
- Emergency Preparedness
- National Weather Service Radio
- State/County Emergency Management
- NMPC Power Control
- J. A. FitzPatrick
- Direct Observation

3.1.2 Any site personnel receiving reports of actual or potential severe natural events shall notify the SSS at Unit 1 or Unit 2.

3.1.3 Upon receipt of notifications the SSS shall proceed to Step 3.2.

3.2 Determination of Applicability

3.2.1 If the actual or projected severe natural event meets any Emergency Action Level (EAL) in EPIP-EPP-01 or EPIP-EPP-02, then the SSS shall declare the emergency, and activate the emergency plan in accordance with EPIP-EPP-18.

3.2.2 If an emergency is declared in response to the actual or potential natural hazard, the SSS/ED (before EOF activation) or ED/RM (after EOF activation) should decide on the appropriate level of response using Attachment 1 as a guide.

3.2.3 If no immediate emergency is declared but the potential exists for a response to the severe natural event, the SSS should:

- a. Contact the on-call ED/RM and Emergency Preparedness on-call staff and request the Attachment 1 be performed.
- b. On-call ED/RM should call in emergency response organization staff as appropriate.

3.3 Preventative and Mitigating Actions

The SSS, SSS/ED or ED/RM should perform the actions in Attachment 1, if determined to be appropriate.

3.4 Recovery from Natural Hazards

IF: a natural hazard or event has resulted in ANY of the following conditions:

- Significant damage to the site
- Extensive offsite power outages
- Blockage of major roads due to fallen trees, wires or debris

THEN: implement Attachment 2.

3.4.1 The SSS or SSS/ED should implement Attachment 2, Step 1.0.

3.4.2 The ED/RM should direct implementation of Attachment 2, Step 2.0.

4.0 DEFINITIONS

Natural Hazard is any natural phenomena that may result in widespread (not localized) damage to dwellings, power/communications lines and road systems.

5.0 REFERENCES AND COMMITMENTS

5.1 Licensee Documentation

Nine Mile Point Site Emergency Plan

5.2 Technical Specifications

None

5.3 Standards, Regulations, Codes

5.3.1 10CFR50.72, Immediate Notification Requirements for Operating Nuclear Power Reactors

5.3.2 NUREG-0654, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants

5.3.3 NRC Information Notice, IN 93-53

5.4 Policies, Programs and Procedures

- 5.4.1 EPIP-EPP-01, Classification of Emergency Conditions at Unit 1
- 5.4.2 EPIP-EPP-02, Classification of Emergency Conditions at Unit 2
- 5.4.3 EPIP-EPP-18, Activation and Direction of the Emergency Plan
- 5.4.4 EPIP-EPP-20, Emergency Notifications
- 5.4.5 EPIP-EPP-25, Emergency Reclassification and Recovery
- 5.4.6 EPIP-EPP-30, Prompt Notification System Problem Response
- 5.4.7 EPMP-EPP-02, Emergency Equipment Inventories and Checklists

5.5 Commitments

<u>Sequence Number</u>	<u>Commitment Number</u>	<u>Description</u>
None		

6.0 RECORD REVIEW AND DISPOSITION

6.1 The following records generated by this procedure shall be maintained by Nuclear Records Management for the Permanent Plant File in accordance with NIP-RMG-01, "Records Management".

NOTE: This section only applies when records are generated as the result of an actual emergency declared at Nine Mile Point.

- Any records, logs or notes

6.2 The following records generated by this procedure are not required for retention in the Permanent Plant File.

NOTE: This section only applies when records are generated as the result of activities other than actual events (such as drills and training).

- Any records, logs or notes

LAST PAGE

**ATTACHMENT 1:
PREPARATION AND RESPONSE TO NATURAL HAZARDS**

Name:	Date:	Unit <input type="checkbox"/> 1 <input type="checkbox"/> 2
-------	-------	--

- NOTE:**
1. All steps should be performed.
 2. Use N/A or N/R if appropriate.
 3. Maintain a log documenting other activities

Complete N/A

PREPARATION

1. Determine need for adding or retaining additional staff. (It may be appropriate to retain 1 or 2 ERO teams on site if the projected hazard may impede access to site)

2. If it is decided to retain staff, and if time allows, allow staff to accommodate personal and family needs. Staff may go home for this and return before travel or access is impeded

3. Contact Emergency Preparedness and have them:
 - Obtain, or verify adequacy of food, water, personal supplies, and bedding
 - Ensure medical support and adequate medical supplies are available
 - Perform communications checks of system in accordance with EPMP-EPP-02

4. Verify with Control Rooms that:
 - Walkdown of plant/environs are conducted, as necessary, inspecting for potential missiles
 - Any equipment or materials outside are removed or secured (if high winds are anticipated)

MITIGATION

1. Flooding/High Water Considerations
 - a. Obtain sandbags and water pumps, if required. Contact Oswego County Emergency Management (591-9150) for assistance, if necessary

 - b. If flooding is expected, ensure the sewage treatment plant is in a stable condition. Contact Unit 1 Chemistry to verify this

**ATTACHMENT 1:
PREPARATION AND RESPONSE TO NATURAL HAZARDS**

Name:	Date:	Unit <input type="checkbox"/> 1 <input type="checkbox"/> 2
-------	-------	--

Complete N/A

MITIGATION (continued)

2. Heavy Snow

- a. Ensure that snow removal equipment and operators are available and pre-staged

3. Other Hazards

- a. Protect phone rooms from high water
- b. Ensure portable radios are available in all emergency facilities
- c. Establish a "family phone" in each emergency facility and distribute this number to staff in each facility. Family of staff may use this number for personal contact

ATTACHMENT 2: RECOVERY FROM NATURAL HAZARDS

Name:	Date:	Unit <input type="checkbox"/> 1 <input type="checkbox"/> 2
-------	-------	--

- NOTE:**
1. All steps should be performed.
 2. Use N/A or N/R if appropriate.
 3. Maintain a log documenting other activities

RECOVERY ACTIONS - ONSITE Complete N/A

1. Verify safe conditions before requiring personnel to go outside or to travel to/from site
2. Ensure plant structures and equipment are surveyed for damage
3. Direct EP to verify availability and operability of equipment and facilities necessary to implement the Site Emergency Plan

NOTE: Major loss of communications, dose assessment or notification capability may meet 10CFR50.72 notification requirements.

4. Utilize EPIP-EPP-25 for developing a recovery plan, if needed

RECOVERY ACTIONS - OFFSITE

1. Establish communication with County and State Emergency Management agencies using methods described in EPIP-EPP-20
2. Direct Emergency Preparedness to work with County and State Emergency Management agencies to verify the following:
 - a. Operational status of prompt notification system (sirens, tone alert radios, emergency alert system) using EPIP-EPP-30 as a guide
 - b. Status of roadways and major evacuation routes (using current evaluation travel time estimates as a guide)

ATTACHMENT 2: RECOVERY FROM NATURAL HAZARDS

Name:	Date:	Unit <input type="checkbox"/> 1 <input type="checkbox"/> 2
-------	-------	--

Complete N/A

c. Capability of required emergency facilities, including:

- New York State Fairground Reception Center
- Congregate Care Center
- Personnel Monitoring Center
- Oswego County Emergency Operations Center

d. Availability of transportation resources (buses, medical transport)

e. Availability of offsite responders

3. Determine the need to contact FEMA regarding the findings from the previous step

NOTE: FEMA may make a determination as to whether the health and safety of the public could be ensured in the event of an emergency at NMP.

6.7.2 Offsite Protective Actions (NUREG 0654 II.E.6, II.E.7, II.J.8)

a. Protective Actions Within Oswego County (NUREG 0654 II.J.8)

The responsibility for actions to protect offsite individuals rests with the County of Oswego and the New York State Department of Health as described in the New York State Radiological Emergency Preparedness Plan.

The NYS Department of Health is responsible for evaluating information obtained from the NMPNS and/or other sources and recommending appropriate offsite protective actions to the SEMO/OCEMO.

The principal offsite local coordinating agency for providing response to radiological emergencies in the vicinity of the NMPNS is the OCEMO. The entire 10-mile Emergency Planning Zone is contained within Oswego County.

A detailed study has been conducted of the status and capacities of roads, traffic patterns and demography within the 10-mile radius Emergency Planning Zone. This study includes the estimated times to evacuate all or specific segments of the population, identifies potential problem areas and provides contingencies for dealing with adverse conditions. The time estimates for various scenarios were performed: 1) Nighttime, normal weather; 2) Nighttime, adverse weather; 3) School in session, normal weather; 4) School in session, adverse weather. This study, "Evacuation Travel Estimates (ETE) for the James A. FitzPatrick/Nine Mile Point Emergency Planning Zone" is referenced in this Site Emergency Plan, Appendix F and was used in the development of detailed evacuation plans by the OCEMO. The ETE meets the criteria established in NUREG-0654.

b. Oswego County Prompt Notification System (NUREG 0654 II.J.10.c)

The physical and administrative means for alerting and warning the population of an incident at the Nine Mile Point Nuclear Station is described in detail in EPMP-EPP-08 and the Oswego County Radiological Emergency Response Plan.

The responsibility for activation of the Prompt Notification System (PNS) rests with the Chairman of the Oswego County Legislature or designee. The Oswego County Emergency Management Office administratively activates the warning system and supplies appropriate emergency messages to the Emergency Alert System (EAS) station serving the jurisdiction in accordance with the provisions of their emergency response plans. Siren activation equipment is located at the OCEMO and the Oswego County 911 Center.

The PNS consists of:

- Outdoor sirens (for heavily populated areas).
- Tone-alert radios (for less populated areas) activated by the National Weather Service.
- Mobile public address/siren systems (as back-ups to the above).
- Emergency Alert System.

This system meets NUREG-0654 and FEMA-REP-10 design and testing criteria. System design and testing requirements are detailed in Wyle Research Report WR 82-26 "Qualification of the Oswego County Prompt Notification System".

c. Protective Action Guides and Recommendation of Protective Action Recommendations (NUREG 0654 II.J.7, II.J.10.m)

Protective Action Guides (PAG's) identify protective actions to be taken prior to or following a significant release of radioactive material. They are based on the projected radiological dose, or dose commitment to individuals in the general public. PAGs for the "plume phase" have been established by the US Environmental Protection Agency.

The numerical guides for TEDE and CDE_T (child) dose to the general public are listed below. The procedure used by NMPNS personnel in determining the appropriate protective action recommendation is detailed in EPIP-EPP-08.

Protective Action Guidelines Early or Plume Phase		
	TEDE (rem)	CDE_T (rem)
Shelter	0.1 - 1	0.5 -5
Evacuate	>1	>5

The following principles guide the formulation of PARs for the NMPNS:

- Initial dose assessment (from the Control Room) does not take specific factors such as road condition, weather, evacuation travel time estimates or shelter vs. evacuation dose into account. New York State and Oswego County may take these factors into consideration, given that they have this information available to them. Refined dose assessment (from the EOF) does take these factors into account.
- No radiological protection factor is taken for sheltering. The purpose of sheltering is to bring the population at risk to a high state of readiness, should evacuation be needed.
- If determined to be appropriate by New York State or Oswego County Officials, Thyroid prophylaxis may be provided to the general public.

ENTERGY NUCLEAR OPERATIONS, INC.
JAMES A. FITZPATRICK NUCLEAR POWER PLANT
EMERGENCY PLAN IMPLEMENTING PROCEDURE

DOSE ASSESSMENT CALCULATIONS
EAP-4
REVISION 34

APPROVED BY: *[Signature]*
RESPONSIBLE PROCEDURE OWNER

DATE: 11/25/03

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FIRST ISSUE

FULL REVISION

LIMITED REVISION

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PERIODIC REVIEW DUE DATE: MAY 2008

REVISION SUMMARY SHEET

REV. NO.

- 34 • Revised section 5.2.3.q to state that once PARS have been established for evacuation, they will not be downgraded until the emergency is terminated - closure of CR-JAF-2003-3166.
- Added note to 5.2.3.B.
- 33 • Added note in section 5.2.3.K.7 that discusses steps that need to be repeated for on going releases.
- ADDED NOTE IN SECTION 5.2.3.P.10 TO ENSURE THAT PROPER STEPS ARE TAKEN FOR FORECASTED DOSE RATES.
- Added section 5.2.3.P.11 to give instructions if the release is ongoing.
- 32 • Add "onsite and in-plant" to section 4.2 for clarity
- Added met data access method for simulator
- Incorporated several notes into procedure steps in section 5.2.3.Q and 5.2.3.A
- Add direction to section 5.2.3.Q regarding ERPAs for evacuation - utilizing both the model and the flowchart, and the concern for lake/land breeze considerations.
- Change the title of section 5.4 to read USING MONITOR READINGS TO ESTIMATE WHEN A PAR WILL BE REACHED BASED ON PROJECTED DOSE
- Added direction in 5.4 for use of TEDE dose.
- Added note in section 5.4 to reference attachment 7 for calculations.
- Incorporated cautions into boxes and added wording regarding notifying offsite agencies within 15 minutes of PAR changes.
- Added Section 5.5.
- Modified Attachment 1 and 2 to add a caution in the GE section for 15 minute notification requirements.
- Add caution for lake/land breeze on Attachment 2.
- Updated Attachment 4 with current 2001 population estimates ERPA'S
- Change to Attachment 5 to add lines to the 3-inch section for data recording.
- Added attachment 6.
- Add attachment 7.
- Added attachment 8.

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1.0 PURPOSE

To provide the methods for performing dose assessment and determining protective actions during accident conditions at James A. FitzPatrick Nuclear Power Plant.

2.0 REFERENCES

2.1 Performance References

2.1.1 EAP-4.1, RELEASE RATE DETERMINATION

2.1.2 EAP-5.3, ONSITE/OFFSITE DOWNWIND SURVEYS AND ENVIRONMENTAL MONITORING

2.1.3 EAP-42, OBTAINING METEOROLOGICAL DATA

2.2 Developmental References

2.2.1 EAP-4.1, RELEASE RATE DETERMINATION

2.2.2 EAP-5.3, ONSITE/OFFSITE DOWNWIND SURVEYS AND ENVIRONMENTAL MONITORING

2.2.3 EAP-42, OBTAINING METEOROLOGICAL DATA

3.0 INITIATING EVENTS

3.1 A General Emergency has been declared

OR

3.2 A vented gaseous release exceeds alarm setpoints

OR

3.3 An unmonitored gaseous release is suspected or underway.

4.0 RESPONSIBILITIES

4.1 Shift Manager/Emergency Director (SM/ED)

The SM/ED is responsible for ensuring that Protective Action Recommendations (PARs) are developed in accordance with this procedure.

4.2 TSC Rad Support Coordinator (TSC RSC)

The TSC RSC is responsible to the Emergency Director for managing the radiological monitoring and assessment aspects on-site and in-plant during an emergency and of those functions specified in Step 4.3 until relieved of those functions by the EOF.

4.3 EOF Rad Support Coordinator (EOF/RSC)

The EOF/RSC is responsible to the Emergency Director for managing the radiological monitoring and assessment aspects offsite during an emergency.

4.4 Dose Assessment Coordinator (DAC)

The DAC is responsible for managing the offsite dose aspects of an emergency, in order to assess the radiological consequences to the public.

4.5 Chemistry Technician/Rad Protection Technician

The on-shift chemistry technician is responsible to the Emergency Director for conducting dose assessment from the control room and assisting the SM/ED with information related to offsite notification and protective action recommendations. The on-shift radiation protection technician is responsible to the SM/ED for conducting surveys as directed.

5.0 PROCEDURE**5.1 Control Room Dose Assessment and Protective Action Recommendations**

Utilize Attachment 1, Initial Protective Actions, for control room dose assessment and protective action recommendations.

5.2 Augmented Dose Assessment

Dose projection shall be completed using the EDAMS computer located in the Control Room, Technical Support Center or Emergency Operations Facility as follows:

5.2.1 General Information

A. Locations

EDAMS software and hardware is located as follows:

LOCATION	HARDWARE	PRINTERS	METE DATA CONNECTION
Control Room	Personal Computer and Monitor	HP LaserJet	Direct Connect
Technical Support Center	Personal Computer and Monitor	Seiko D-Scan, HP LaserJet	Direct Connect
Emergency Operations Facility #1	Personal Computer and Monitor	Seiko D-Scan, HP LaserJet	Direct Connect OR Dial-up Modem
Emergency Operations Facility #2	Personal Computer and Monitor	HP LaserJet	Direct Connect OR Dial-up Modem

B. Computer problems

IF at any time problems are experienced with the computer, MOVE to another location that has the EDAMS software and continue.

C. The dose assessment program is called RADDPOSE V and is part of the EDAMS package.

D. Meteorological data is automatically sent (via direct connect or modem) to RADDPOSE V and EDAMS by the Meteorological Monitoring System (MMS). The user can use this data or manually input meteorological data.

E. Source term and release rate determination is discussed in procedure EAP-4.1.

F. Software documentation is available for the EDAMS code and is maintained by the Emergency Planning Coordinator.

5.2.2 EDAMS Dose Model Limitations

- A. The EDAMS menu from the EDAMS icon only allows the operation of one DOS application at a time.
- B. Dose rates and deposition rates reported by the model are the maximum for the sector; not necessarily the dose rate or deposition rate at the center of the sector. This avoids the situation of a narrow (stable) plume slipping between receptor points and being missed.
- C. Deposition data reported is not intended for an environmental evaluation; its intent is to indicate areas of potentially high ground level concentrations.
- D. Forecast mode results may at times exceed real-time results; this is due to the forecast mode having a greater internal time step.
- E. A calculation limitation of the dose assessment model occurs when an extreme wind (direction) shift takes place. The model may not calculate doses in sectors that the plume skips over entirely within a single 15 minute interval advection step.

5.2.3 Dose Assessment Using EDAMS Computer

NOTE: The dose assessment model has many capabilities beyond those used in this procedure. Utilize the "EDAMS Operators Manual" for further reference.

CAUTION:

Protective Action Recommendations (PARs) must be transmitted to the State and County within 15 minutes of declaring an Emergency, changing emergency classification, or changing Protective Action Recommendations.

- A. **IF** during the course of dose assessment, the dose to the population is projected to exceed 1 Rem TEDE or 5 Rem CDE Thyroid, **THEN** immediately advise the ED that the General Emergency criteria have been met.

5.2.3 cont'd

NOTE: Attachment 1 may be used to develop protective action recommendations from the TSC/EOF prior to EDAMS becoming available.

- B. Use Attachment 2 Augmented Dose Assessment Protective Actions, for guidance when performing dose assessment activities at the TSC or EOF.
- C. Ensure that the black switch on the CR and TSC meteorological panels is positioned to the Niagara Mohawk (B) position.
- D. Energize the EDAMS computer power strip to provide power to the computer, monitor, and printer.
- E. Ensure the modem is ON (powered on).
- F. Select the "Login" icon from the EDAMS icons and select "Continue" at the plant picture screen.
- G. Select the appropriate menu item based on your location as follows:

<u>Location:</u>	<u>Menu Choice:</u>
CR	Direct connect to Met Data
TSC	Direct connect to Met Data
EOF	Direct connect OR Automatic Dial-in to Met Data
Simulator	Automatic Dial-in to Met Data
- H. When the login routine finishes, close the login window screen by selecting "OK".
- I. From the EDAMS icons, select JAF Raddose-V.
- J. Select "Continue" at the plant picture screen.
- K. From the Raddose-V start up menu, select "Begin New Incident."

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5.2.3 cont'd

L. At the Raddose-V Accident Scenario Definition screen, enter the following information:

1. Reactor Trip Date - date the reactor was scrammed or shutdown.
2. Reactor Trip Time (24-hour format) - time the reactor was scrammed or shutdown.
3. Release Date - date the release to atmosphere began, or is projected to begin.
4. Release Time (24-hour format) - time the release to atmosphere began, or is projected to begin.
5. Lake Surface Temp (Degrees F) - Enter the known lake surface temperature, or use the historical default value provided.
6. Operator Initials - Enter 2 or 3 initials, then press ENTER.
7. Select "Accept" to accept and continue.

NOTE: Steps M-P must be repeated for ongoing releases to ensure that "forecasted" dose will account for dose from both the existing release rate, AND dose from the plume established in the environment from previous time steps.

M. At the Raddose-V main menu, select "Enter/Edit Source Term Data."

N. At the Raddose-V Source Term Data Entry Screen, proceed as follows:

1. Utilize Attachment 6, DOSE ASSESSMENT ACCIDENT TYPE SELECTION FLOWCHART as a guide to determine the most appropriate accident type.
2. Select "Accident Type" by pressing the "F2" key, or by using the mouse, then choosing the accident type which most closely matches current conditions. Your selection determines which default isotopic mix is used for upcoming calculations (refer to Attachment 3, Analyzed Accident Types).

5.2.3.N. cont'd

3. When asked, "Is this release Elevated?" select "Yes" for elevated releases or "No" for ground releases. (A stack release is elevated; all other releases are ground releases.)

NOTE: Back calculation cannot be used on first time step.

4. Select the "Method" used to determine the release rate by pressing the "F2" key, or by using the mouse, then choosing the appropriate method based on available information.
 5. Select the Iodine release rate "Method" by hitting the "F2" key, or by using the mouse. Enter the "Monitor Reading" and "Release Rate" if required.
 6. Up to three Accident Types (three release paths) can be entered by using the down arrow key (↓) to select type 2 and 3.
 7. When the source term data entry screen has been completed, select "Accept" to accept data and return to the Raddose-V main menu.
- O. At the Raddose-V main menu, the menu bar will highlight the appropriate elevated and/or ground meteorological data choices based on your input in step M.2.
1. If direct met data input is being used, the appropriate ground and/or elevated met data will automatically be displayed for the current time step.
 2. Select "Accept" to accept data, OR select "Requery MMS" to update the met data.
 3. IF met data is not available via the MMS, THEN enter met data obtained from alternate sources, as outlined in EAP-42, OBTAINING METEOROLOGICAL DATA.

5.2.3 cont'd

NOTE: To determine an estimated monitor reading to reach a PAG, refer to step 5.4

P. At the Raddose-V main menu, select "Perform Calculations."

1. The map of the 10-mile Emergency Planning Zone (EPZ) will appear with centerline dose rates after the model has calculated the actual model doses.

NOTE: This data SHOULD NOT be used for PARs. PARs should be based on forecast data, which will be the dose to be avoided by the protective action.

2. Select "Continue" to continue.
3. At the Raddose-V output menu, select "Continue Calculations".
4. At the Raddose-V main menu, select "Perform a Forecast".

NOTE: A new time step must be added to perform a forecast.

5. Verify meteorology and source term data as required. Select "Accept" to accept.
6. Enter "Forecast Period" (i.e. release duration). Use 4 hours as a default value. Select "OK".
7. When asked, "Has a General Emergency been declared?" enter "Yes" or "No".
8. The forecast mode map will be displayed, including TEDE and CDE thyroid doses, and PARs. Select "Continue" to continue.
9. Select "Go to Report Menu".
10. Select "Print Complete Dose/Dose Rate Report".

5.2.3 cont'd

NOTE: Performance of the following step is necessary to ensure that "forecasted" dose will account for dose from both the current release rate, AND dose from the plume established in the environment from previous time steps.

11. IF the release is ongoing, THEN add a new time step, AND repeat the "Calculation" and "Forecast" actions described in steps M-P.

NOTE: County and State Protective Action Recommendations (PARs) take many factors into account that NMP/JAF procedures do not (i.e., road conditions, special population needs, Evacuation Travel Time Estimates, evacuation scenarios, and shelter vs. evacuation doses). Therefore, differences in PARs may occur. The Rad Support Coordinator must account for differences in Protective Action Recommendations when those exist. PARs should not be modified to match County or State PARs without justification.

CAUTION:

Protective Action Recommendations (PARs) must be transmitted to the State and County within 15 minutes of declaring an Emergency, changing emergency classification, or changing Protective Action Recommendations.

- Q. Protective Action Recommendations (PARs)
 1. Since the Nine Mile Point/J.A. FitzPatrick (NMP/JAF) Site is contained in ERPA 1, any recommendation made for ERPA 1 must also apply to all NMP/JAF personnel not required to be onsite for the emergency.
 2. The RADDPOSE model factors in meteorological conditions such as lake/land breeze that the Attachment 2 flowchart does not. Therefore, the model needs to be considered even during situations where no release is occurring.

5.2.3.Q. cont'd

3. The EDAMS RADDOSE V program will recommend PARs for each ERPA, based upon the dose assessment (in forecast mode).
 - a. Ensure that both the RADDOSE ERPAs recommended for Evacuation, and the Attachment 2 ERPAs recommended for evacuation are considered when developing PARs.
 - b. For ERPAs recommended by RADDOSE for evacuation, ensure that both Dose PARs and Plant PARs are included.
4. Initiate or revise PARs based upon this recommendation (and previous recommendations, if made).
5. Wind shifts and/or decreases in release rate could result in revised PARs being developed that "drop" one or more ERPAs from evacuation recommendations. HOWEVER, revised PARs must contain all previously identified ERPAs recommended for evacuation, as well as any newly identified ERPAs for evacuation, i.e.:
 - a. Do NOT delete ERPAs from a PAR that previously recommended the ERPA for evacuation.
 - b. There is no practical method to recall an evacuation recommendation and attempting this could cause undue confusion on the part of the public.
6. The only time it would be appropriate to attempt to recall a PAR for evacuation of an ERPA, would be if an error was made and recognized prior to the County taking action to implement the PAR.
 - a. In this case it would be appropriate for the Emergency Director to immediately contact the County and discuss the issue.

5.2.3 cont'd

R. Notification

1. Record the revised PAR for each ERPA on the Part 1 Notification Form (EAP-1.1, Attachment 1) and give to the ED for approval.
2. Record PARs on Attachment 4 map or wall displays in the TSC or EOF, if appropriate.

S. Update the RADDPOSE-V Model at 15-minute intervals or as directed by the Dose Assessment Coordinator.

5.3 Downwind Survey Dose Estimates

- 5.3.1 Use Attachment 5, Downwind Survey Worksheet, to record field data transmitted to the dispatch center.
- 5.3.2 Projected Deep Dose Equivalent (DDE) is approximately equal to TEDE Projected Dose
 - A. Use field information recorded on the Downwind Survey Worksheet, Attachment 5, to perform projected dose calculations.
 - B. Obtain the estimated duration of release from the Emergency Director and record it on Attachment 5. If it is unknown, use 4 hours as a first estimate.
 - C. Complete the calculations, as shown, on Attachment 5 to determine DDE projected doses for each sampling location.
- 5.3.3 CDE Thyroid Projected Dose
 - A. Use field information recorded on the Downwind Survey Worksheet, Attachment 5, to perform CDE Thyroid Projected Dose.
 - B. Obtain the estimated duration of release from the Emergency Director and record it on Attachment 5.

5.3.3 cont'd

- C. Calculate the I-131 concentration in accordance with Attachment 5.
- D. Complete the calculations, as shown, on Attachment 5 to determine thyroid rate and CDE thyroid projected doses for each location for which data has been recorded.

5.3.4 Results

- A. Provide the results of the DDE and CDE thyroid projected dose calculations from steps 5.3.2 and 5.3.3 to the individual tasked with calculating protective action recommendations.

5.4 Using monitor readings to estimate when a PAR will be reached based on projected dose

NOTE: Attachment 7 may be utilized to perform the following calculations:

- 5.4.1 To determine the estimated monitor reading needed to reach a **Child Thyroid dose** of 5rem CDE, perform the following:
 - A. Perform a forecast using EDAMS;
 - B. Divide the Child Thyroid CDE dose (forecasted), by the release point monitor reading (mr/hr, cpm, cps);
 - C. Divide the result from 5.4.1.B into 5 rem. This result becomes the estimated monitor reading corresponding to 5rem CDE for the forecast duration, based on the inputted flow rate, monitor reading and meteorology at the time the data was taken.
 - D. To determine the estimated monitor reading needed to reach a **TEDE dose** of 1 rem, perform the following:
 - 1. Perform a forecast using EDAMS;
 - 2. Divide the TEDE dose (forecasted), by the release point monitor reading (mr/hr, cpm, cps);
 - 3. Divide the result from 5.4.2.B into 1 rem. This result becomes the estimated monitor reading corresponding to 1rem CDE for the forecast duration, based on the inputted flow rate, monitor reading and meteorology at the time the data was taken.

5.5 Proactive Action Recommendations (PARs) beyond 10 miles

- 5.5.1 If projected doses exceed the following values at 10 miles;

EPA Protective Action Guidelines	
TEDE (Rem)	CDEt (Rem)
>1	>5

Then PARs need to be developed beyond the 10 mile EPZ. PARs can be developed using the EDAMs routine that calculates Dose Rates at a point of interest.

- 5.5.2 Chose several points of interest that will encompass the postulated plume beyond the 10 miles (bound the plume). Determine the dose rate. Multiply the dose rate by the expected duration of the release to determine the TEDE or CDEt. Make additional PARs based on this data and by using existing geo-political boundaries (i.e. towns, cities, etc.). List those recommendations on the Part 1 form or provide additional detail on supplemental forms. If PARs extend beyond the border of Oswego County request assistance from NY State staff to make proper notifications.

6.0 ATTACHMENTS

1. INITIAL PROTECTIVE ACTIONS - Pull out color flowchart
2. AUGMENTED DOSE ASSESSMENT AND PROTECTIVE ACTIONS - Pull out color flowchart
3. ANALYZED ACCIDENT TYPES
4. 2001 POPULATION ESTIMATES EMERGENCY RESPONSE PLANNING AREAS
5. DOWNWIND SURVEY WORKSHEET
6. DOSE ASSESSMENT ACCIDENT TYPE SELECTION FLOWCHART
7. CALCULATION FORM WHEN USING MONITOR READINGS TO ESTIMATE WHEN A PAR WILL BE REACHED BASED ON PROJECTED DOSE
8. SOURCE TERM ENTRY FOR FIRST 15 MINUTE TIME STEP OF A REFUEL ACCIDENT WHEN BUILDING ISOLATION HAS OCCURRED AND THE RELEASE IS THROUGH THE STACK
9. SOURCE TERM FOR A REFUEL ACCIDENT THAT RESULTS IN AN UNFILTERED RELEASE PATHWAY