

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, EPIPs 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 EPIPs 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 1×10^{-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

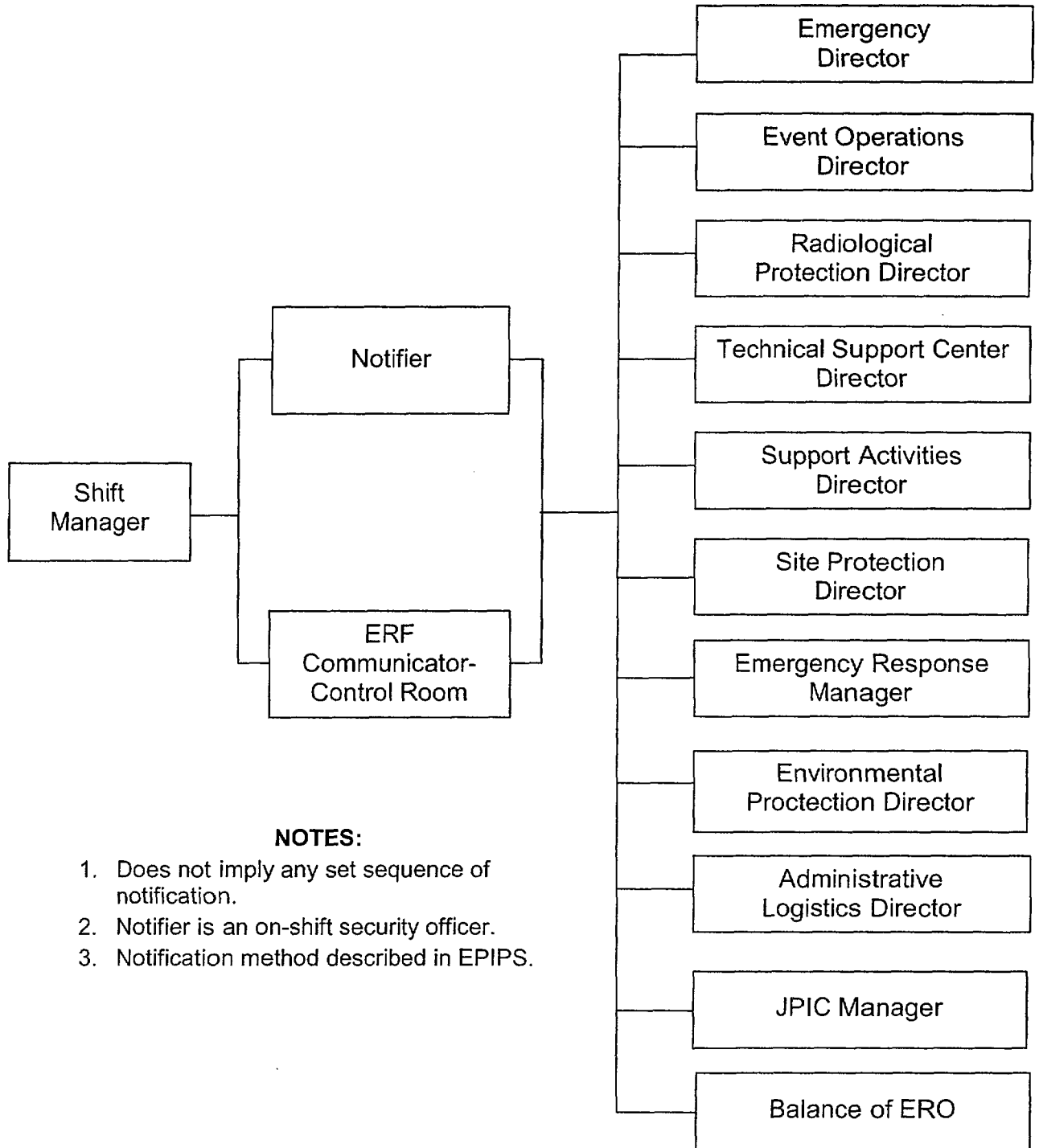
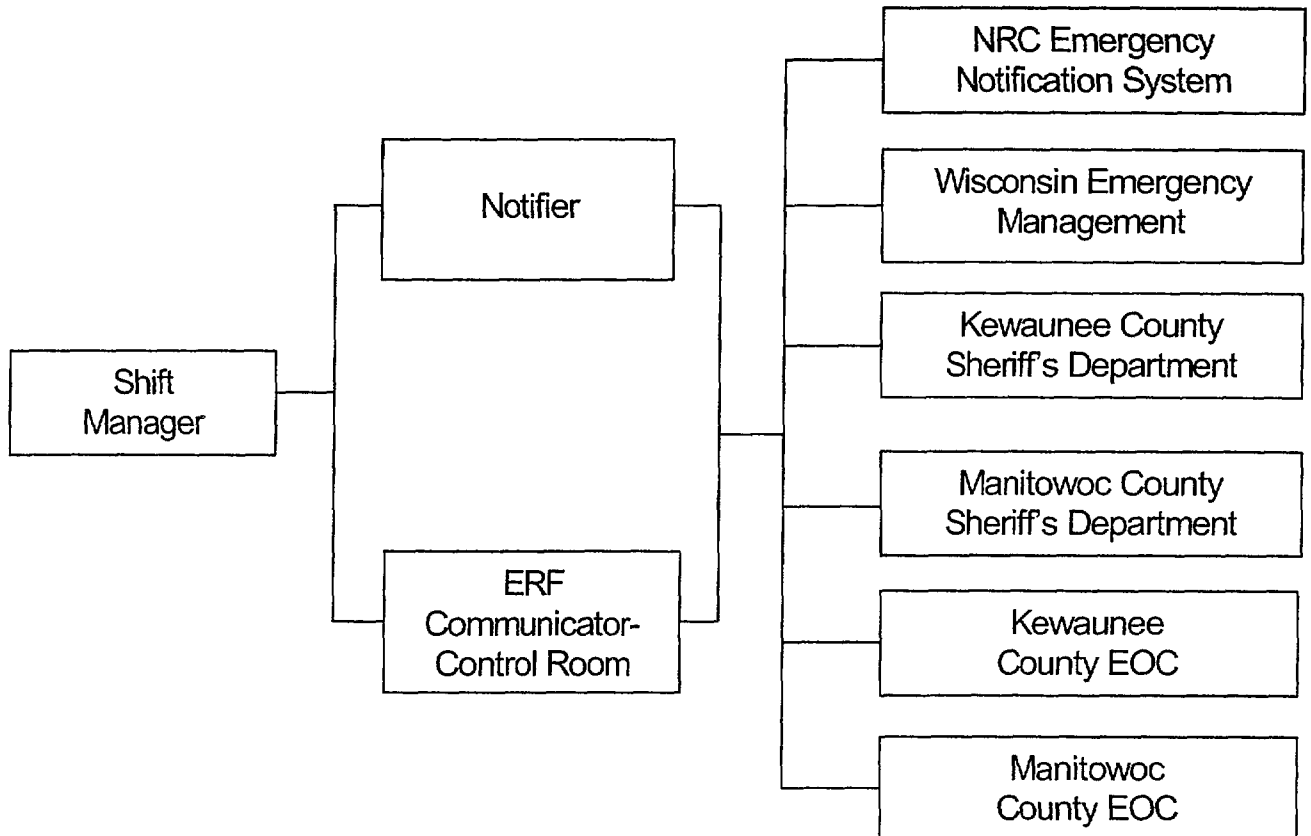


FIGURE 6-2

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 KRDOSE "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

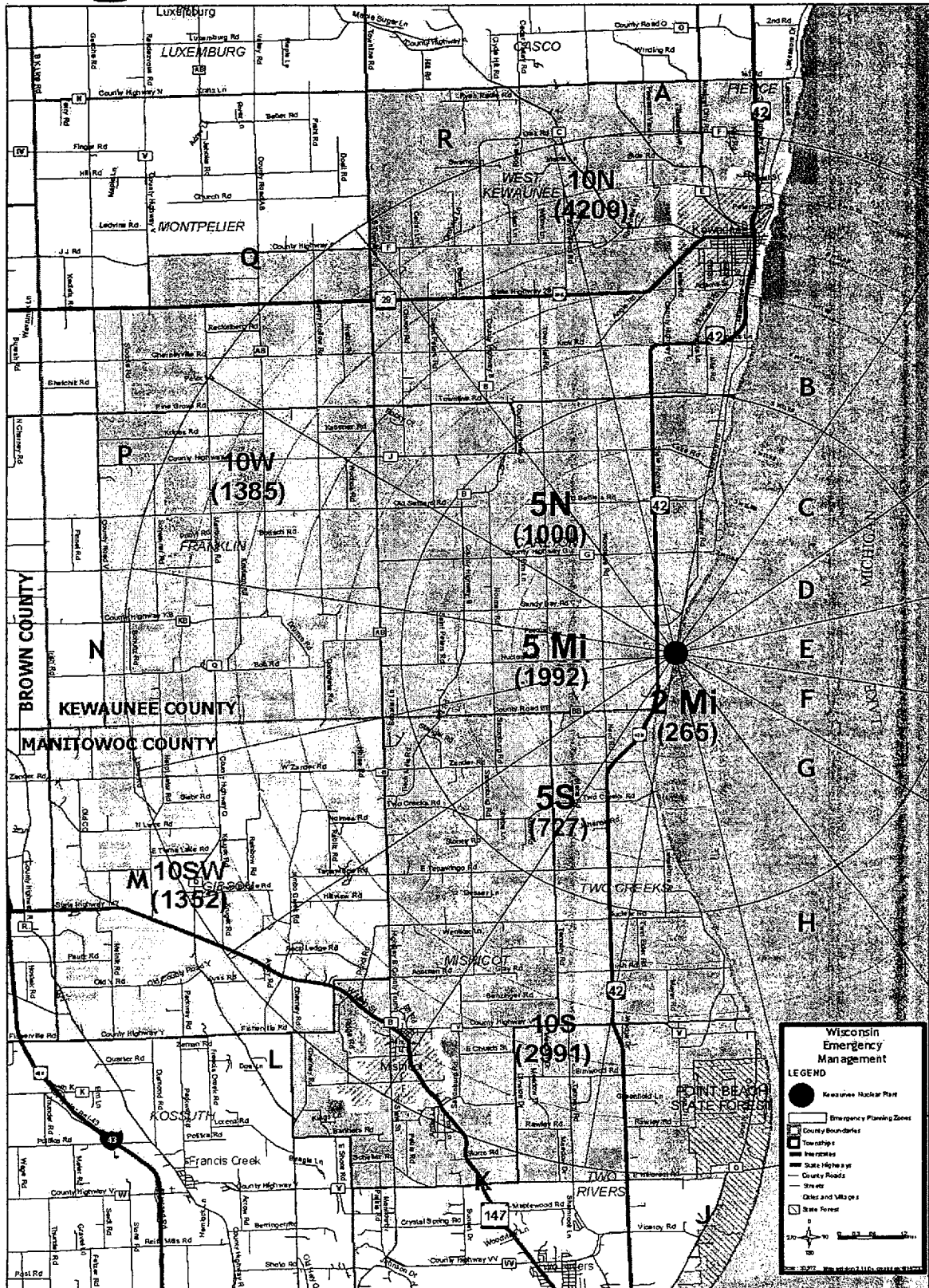
For specific details on how the evacuation operation would be carried out, please refer to the respective county Emergency Operations Plan, under "Evacuation."

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

	Evacuation Time Estimates for Given Scenario (in minutes)								
Subarea	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

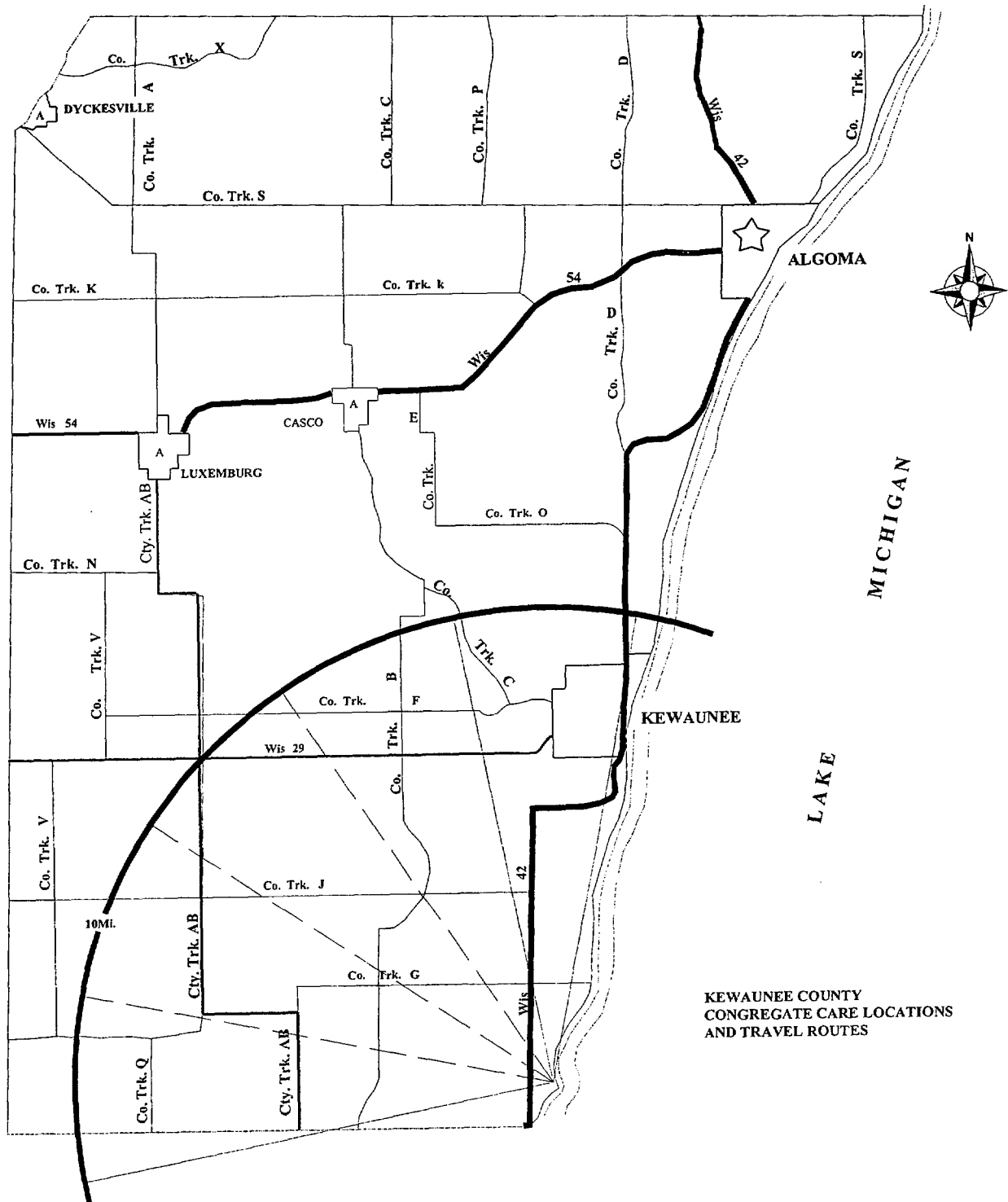
Table based on combination of evacuation subareas

	Evacuation Time Estimates for Given Scenario (in minutes)							
Subarea	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

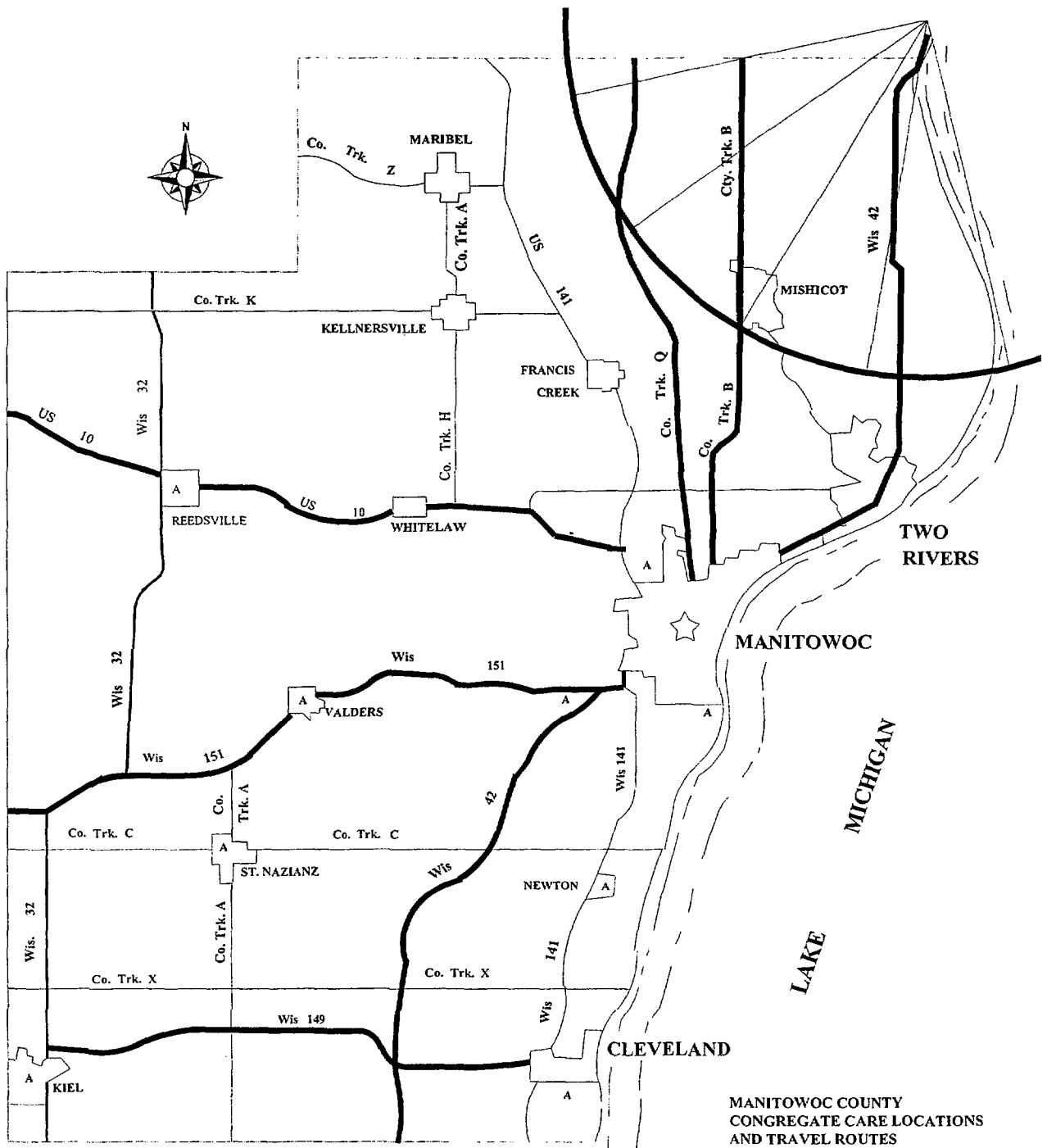


KEWAUNEE COUNTY
CONGREGATE CARE LOCATIONS
AND TRAVEL ROUTES

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



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.

WISCONSIN PUBLIC SERVICE CORP. Kewaunee Nuclear Power Plant <i>Emergency Plan Implementing Procedure</i>		No.	EPIP-AD-19	Rev.	U		
		Title	Determining Protective Action Recommendations				
		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.

WISCONSIN PUBLIC SERVICE CORP. Kewaunee Nuclear Power Plant <i>Emergency Plan Implementing Procedure</i>	No.	EPIP-AD-19	Rev.	U
	Title	Determining Protective Action Recommendations		
	Date	JAN 13 2005	Page 2 of 10	

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:

- The presence of severe weather,
- Competing disasters,
- Institutionalized persons who are not readily mobile, AND
- 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:

- The 10 AND 60 meter wind speed is less than 5 mph, AND
- 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).

WISCONSIN PUBLIC SERVICE CORP. Kewaunee Nuclear Power Plant <i>Emergency Plan Implementing Procedure</i>	No.	EPIP-AD-19	Rev.	U
	Title	Determining Protective Action Recommendations		
	Date	JAN 13 2005	Page 3 of 10	

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.

WISCONSIN PUBLIC SERVICE CORP. Kewaunee Nuclear Power Plant <i>Emergency Plan Implementing Procedure</i>	No.	EPIP-AD-19	Rev.	U
	Title	Determining Protective Action Recommendations		
	Date	JAN 13 2005	Page 4 of 10	

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.

WISCONSIN PUBLIC SERVICE CORP. Kewaunee Nuclear Power Plant <i>Emergency Plan Implementing Procedure</i>	No.	EPIP-AD-19	Rev.	U
	Title	Determining Protective Action Recommendations		
	Date	JAN 13 2005	Page 5 of 10	

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.

WISCONSIN PUBLIC SERVICE CORP. Kewaunee Nuclear Power Plant <i>Emergency Plan Implementing Procedure</i>	No.	EPIP-AD-19	Rev.	U
	Title	Determining Protective Action Recommendations		
	Date	JAN 13 2005	Page 6 of 10	

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)

WISCONSIN PUBLIC SERVICE CORP. Kewaunee Nuclear Power Plant <i>Emergency Plan Implementing Procedure</i>	No.	EPIP-AD-19	Rev.	U
	Title	Determining Protective Action Recommendations		
	Date	JAN 13 2005	Page 7 of 10	

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.)	<p>“All other Organs” include: skin extremities and thyroid.</p> <p>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.</p> <p>For Environmental/Monitoring Teams, refer to RASCAL “Maximum Doses at Selected Distances” output screen. Check bone, lung, and thyroid doses.</p>
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.	

- (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