



Wisconsin Electric POWER COMPANY
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March 26, 1980

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. NUCLEAR REGULATORY COMMISSION
Washington, D. C. 20555

Attention: Mr. Brian K. Grimes, Director
Emergency Preparedness Task Group

Gentlemen:

DOCKET NOS. 50-266 AND 50-301
ESTIMATES OF EVACUATION TIMES
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

As requested in your letter dated November 29, 1979, we are providing as an attachment to this letter the estimated evacuation times for the area surrounding the Point Beach Nuclear Plant, Units 1 and 2. These estimates were prepared utilizing the guidance provided in the enclosure to your letter. These estimates have been discussed with those local officials in the area of the Plant who are responsible for emergency planning. Copies of these estimates are being provided for information to the Wisconsin Division of Emergency Government and the Director of Emergency Government for Manitowoc County.

Very truly yours,

C. W. Fay, Director
Nuclear Power Department

Attachment

Copies to: Mr. Michael P. Early, Administrator
Wisconsin Division of Emergency Government

Mrs. Grace T. Brandl, Director
Manitowoc Office of Emergency Government

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Evacuation Time Estimates for the Area Surrounding the Point Beach Nuclear Plant

A. Determination of Evacuation Sectors

For evacuation time estimation purposes, the area in the vicinity of the Point Beach Nuclear Plant was divided into the sectors and areas shown in Figure 1.

The low population zone (LPZ) area approximates one 180° sector with a two mile radius as specified in the reporting format. A second 180° sector consists of the remainder of the two mile radius area over Lake Michigan.

The land area between the LPZ boundary and 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. For evacuation time estimation purposes, it was assumed that any two adjacent 45° sector areas could require evacuation simultaneously depending on the variability of wind direction. Potential combinations of 45° sectors and associated evacuation time estimates are listed in Table A. Table A includes two sets of evacuation time estimates: one set is an estimate for normal weather conditions; the other an estimate for adverse weather conditions.

B. Normal Weather Assumptions

In order to estimate evacuation times for normal weather conditions, the following assumptions were made:

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 be unimpeded by weather conditions.
2. All roads and streets in the area are serviceable.
3. Residents of the area are involved in their normal everyday activities.

C. 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:

1. The accident occurs immediately following a heavy snowstorm. An accident during a snowstorm would not require 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.
2. Plowing or salting of interstate and state highways and major county roads is in progress to the extent of minimum serviceability.

3. Lesser travelled county roads and local town roads and city streets have not been plowed.
4. All rural roads are accessible to police and emergency vehicles and private vehicles equipped with snow tires and/or chains.
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.

D. Evacuation Procedure Assumptions

The following evacuation procedure assumptions were made in calculating the estimated times:

1. All steps required in the Point Beach Nuclear Plant Emergency Plan have been implemented, including the notification of appropriate local and emergency government authorities.
2. The Manitowoc County Sheriff's Office and Division of Emergency Government have been mobilized and have established command posts.
3. Emergency personnel and vehicles are available and utilized as shown on Table A. The availability of up to 150 emergency and police vehicles and personnel was assumed for an accident requiring evacuation of the LPZ 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 the Sheriff's Department, the Wisconsin State Patrol, Two Rivers Police Department, State of Wisconsin Emergency Government, Manitowoc County Civil Defense and local firefighting agencies.
4. Establishment of traffic control measures to maintain the flow of traffic in the area and facilitate evacuation is 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.
5. The primary means of notifying residents would be by police and emergency vehicles driving in the area with "yelp" sirens on, mobile public address systems, and door-to-door personal contact.

6. Other means of notification to be used include broadcast media, telephones, and citizen band radio. Warnings to higher and lower echelons of government include telephone, radio, and wire systems of communication.
7. 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.
8. Most residents respond to instructions to tie a towel, handkerchief, or other form of signal to their door, gate or mailbox to indicate they have left the premises, thereby facilitating confirmation that evacuation has been completed.
9. School superintendents are alerted as part of the emergency mobilization process, and the required number of school buses are in the process of driving to or from schools or are on standby.
10. Residents evacuate the area principally by private automobile, with an average of about one vehicle per residence. Average driving speeds are assumed to be 25 miles per hour during normal conditions and 15 miles per hour during adverse weather.

E. Evacuation Time Estimates for the Low Population Zone (LPZ)

1. Notification of Residents

There are approximately 66 residences and 8 commercial or public buildings within the offsite precautionary plan LPZ boundary. The estimated resident population of this area is 265 persons. Assuming 15 emergency or police vehicles available and notification time of about 5 minutes per residence, or commercial or public building, approximately 25 minutes would be required to complete the notification process under normal conditions. During adverse weather conditions, approximately 60 minutes would be required to complete the notification process (see Table A).

2. Implementation of Evacuation

Evacuation would begin as notification progresses. Evacuation would take place principally by private automobile. With an average of one vehicle per residence and three vehicles per business or other uses, approximately 90 vehicles would be involved; hence no traffic problems are anticipated. It is estimated that each residence would be evacuated approximately 30 minutes after notification during normal conditions and within 60 minutes under adverse weather conditions. Evacuation of the offsite precautionary plan area could be completed approximately 50 minutes after commencement of notification

during normal conditions. During adverse weather conditions this evacuation is estimated to require approximately 110 minutes.

3. Confirmation of Evacuation

As part of the notification process, residents would be instructed to tie a towel, handkerchief, or other form of signal to their door, gate or mailbox to indicate that they have left the premises. Assuming that 15 vehicles are available and that confirmation takes about 3 minutes per residence, approximately 15 minutes would be required to complete the confirmation process within the LPZ boundary under normal conditions and 30 minutes during adverse weather conditions.

4. Estimated Total Evacuation Time for LPZ

The estimated total time to evacuate the LPZ is 55 minutes during normal conditions and 120 minutes or 2 hours during adverse weather conditions. These estimates allow for the overlap of the three types of activities (notification, implementation, and confirmation) involved.

F. 90° Sector Areas

For estimating the evacuation times for the 90° sector areas it is assumed that two adjacent 45° sector areas (see Figure 1) would require evacuation simultaneously. The various potential combinations of the six 45° sector areas are listed in Table A. Separate evacuation time estimates are shown for the LPZ to 5 mile radius and the 5 to 10 mile radius areas. Evacuation time estimates for the City of Two Rivers and the Village of Mishicot are also presented in parenthetical format for the 90° sectors of the 5 to 10 mile radius area within which they are located. Also shown in Table A are evacuation time estimates for a special area, the Point Beach State Forest, located about 3 miles south-southeast of the Point Beach Nuclear Plant.

Evacuation time estimates for the 90° sectors from the LPZ to 5 miles range from 1.0 hour to 1.25 hours during normal weather conditions and 2.0 hours to 2.5 hours during adverse weather conditions. For the 90° sectors from 5 to 10 miles, the estimates range from 1.7 hours to 4.0 hours during normal conditions and 3.3 hours to 4.0 hours during adverse weather conditions.

G. Special Facilities

It is estimated that the Point Beach State Forest could be evacuated in 2.5 hours during a peak use period when up to 1,200 persons could be using the forest campgrounds, picnic, beach, hiking trails, and

other facilities. In adverse weather only approximately 100 persons are estimated to use the Point Beach State Forest, and they could be evacuated in one hour.

The Two Rivers Community Hospital has indicated a preference for sheltering-in-place. Hence no special evacuation provisions are required for this facility.

Table A
Evacuation Times Estimates for the Area Near the Point Beach Nuclear Plant

Sector or Area	Estimated Resident Population	Est. No. of Residences	Est. No. of Vehicles	Pol. & Emg. Vehicles Total Traffic			Notif. Time	Normal Weather Conditions Estimate Estimated Evacuation Time			Adverse Weather Conditions Estimate Estimated Evacuation Time			
				Avail	Ctrl.	Notif.		Impl. Time	Conf. Time	Est. Total Evac. Time	Notif. Time	Impl. Time	Conf. Time	Total Evac. Time
L.P.Z.	265	75	90	27	12	15	25 min	52 min	15 min	55 min/1 hr	60 min	110 min	30 min	120 min/2.0 hrs
90° Sector Areas														
<u>LPZ-5 mi Radius</u>														
NW to N	250	62	67	30	15	15	25 min	50 min	15 min	55 min/1.0 hr	50 min	110 min	30 min	120 min/2.0 hrs
W to NW	440	110	120	30	15	15	40 min	65 min	25 min	75 min/1.25 hrs	90 min	140 min	50 min	150 min/2.5 hrs
SW to WNW	430	108	120	30	15	15	40 min	65 min	25 min	75 min/1.25 hrs	90 min	140 min	50 min	150 min/2.5 hrs
S to SSW	425	107	120	30	15	15	40 min	65 min	25 min	75 min/1.25 hrs	90 min	140 min	50 min	150 min/2.5 hrs
SSE to SSW	300	75	80	30	15	15	25 min	50 min	15 min	55 min/1.0 hr	60 min	110 min	30 min	120 min/2.0 hrs
90° Sector Areas														
<u>5-10 Mile Radius</u>														
NW to N	1,275	320	350	40	10	30	60 min	85 min	40 min	1 hr 10 min/1.7 hrs	130 min	180 min	60 min	200 min/3.3 hrs
W to NW	2,245	565	600	40	10	30	100 min	125 min	60 min	1 hr 25 min/2.7 hrs	200 min	250 min	100 min	270 min/4.5 hrs
SW to WNW	3,820	1,280	1,350	55	15	40	140 min	165 min	70 min	2 hr 10 min/3.5 hrs	280 min	330 min	120 min	390 min/6.5 hrs
Rural	(3,320)	(830)	(850)	(40)	(10)	(30)	(140 min)	(165 min)	(70 min)	(210 min)	(210 min)	(330 min)	(120 min)	(390 min)
Mishicot	(1,500)	(450)	(500)	(15)	(5)	(10)	(50 min)	(80 min)	(40 min)	(90 min)	(60 min)	(150 min)	(60 min)	(170 min)

POOR ORIGINAL

Table A cont'd

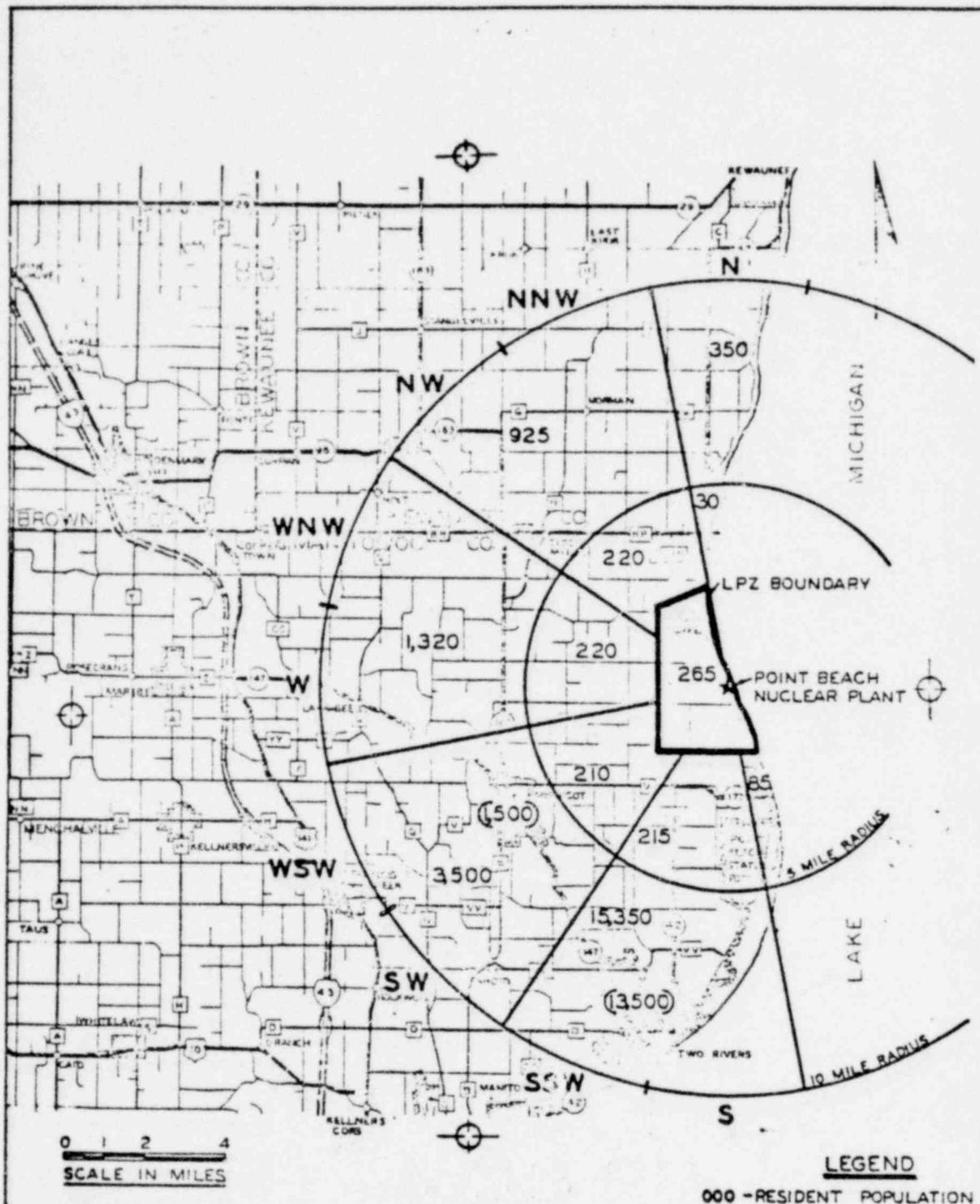
Sector or Area	Estimated Resident Population	Est. No. of Residences	Est. No. of Vehicles	Pol. & Eng. Vehicles			Notif. Time	Normal Weather Conditions Estimate			Adverse Weather Conditions Estimate			
				Total Traffic Avail	Ctrl.	Notif.		Estimated Evacuation Time			Estimated Evacuation Time			
								Impl. Time	Conf. Time	Est. Total Evac. Time	Notif. Time	Impl. Time	Conf. Time	Total Evac. Time
90° Sector Areas														
5-10 mile radius (cont'd)														
S to WSW	18,850	5,210	5,500	95	25	70	160 min	210 min	120 min	240 min/4.0 hrs	300 min	450 min	120 min	480 min/8.0 hrs
Rural	(3,850)	(900)	(1,000)	(40)	(10)	(30)	(160 min)	(185 min)	(80 min)	(240 min)	(300 min)	(370 min)	(120 min)	(420 min)
Mishicot	(1,500)	(450)	(500)	(15)	(5)	(10)	(40 min)	(80 min)	(40 min)	(90 min)	(60 min)	(160 min)	(60 min)	(170 min)
Two Rivers	(13,500)	(3,800)	(4,000)	(40)	(10)	(30)	(100 min)	(210 min)	(120 min)	(240 min)	(150 min)	(450 min)	(120 min)	(480 min)
SSE to SSW	15,350	4,265	4,500	70	20	50	120 min	210 min	120 min	240 min/4.0 hrs	200 min	450 min	120 min	480 min/8.0 hrs
Rural	(1,850)	(465)	(500)	(30)	(10)	(20)	(120 min)	(145 min)	(60 min)	(190 min)	(200 min)	(300 min)	(80 min)	(330 min)
Two River	(13,500)	(3,800)	(4,000)	(40)	(10)	(30)	(100 min)	(210 min)	(120 min)	(240 min)	(150 min)	(450 min)	(120 min)	(480 min)
Special Area														
Point Beach State Forest Campgrounds 5-10 miles	Est. Total Persons	Est. No. Campsites	Est. No. Vehicles											
SSE to SSW	up to 1,200	150	250	9	2	7**	90 min	min	60 min	150 min/2.5 hrs	15 min	50 min	10 min	60 min***/1 hr

* Estimated maximum State Forest occupancy

** State Forest Ranger and staff

*** Only about 100 persons and 30 vehicles maximum assumed to be in the State Forest during adverse weather conditions.

POOR ORIGINAL



RESIDENT POPULATION IN THE VICINITY
 OF
 POINT BEACH NUCLEAR PLANT

FIGURE 1

POOR ORIGINAL