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 50-316 Donald C. Cook Nuclear Power Plant, Unit 2, Indiana & 05000316
 AUTH.NAME AUTHOR AFFILIATION
 DOLAN,J.E. Indiana & Michigan Electric Co.
 RECIP.NAME RECIPIENT AFFILIATION
 DENTON,H.R. Office of Nuclear Reactor Regulation

SUBJECT: Forwards evacuation time estimates in response to NRC 791129
 info request. Time required to evacuate schools & nursing
 homes under adverse & favorable conditions assumed to be
 2-h after notification & 4-h for hospitals.

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P. O. BOX 18
BOWLING GREEN STATION
NEW YORK, N. Y. 10004

April 1, 1980
AEP:NRC:00328

Donald C. Cook Nuclear Plant
Units Nos. 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74

RE: EVACUATION TIME ESTIMATES

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Denton:

This letter responds to Mr. Brian K. Grimes' letter of November 29, 1979, received on December 7, 1979. Mr. Grimes' letter requested information regarding emergency evacuation. A request for an extension of time to submit this answer was submitted to your office on January 23, 1980 via our letter No. AEP:NRC:00328A.

The attachment contains the evacuation time estimates prepared by the Office of Emergency Preparedness of the Berrien County Sheriff's Department.

Very truly yours,

John E. Dolan
John E. Dolan
Vice President

JED/ko
Attachment

cc: R. C. Callen
G. Charnoff
R. S. Hunter
R. W. Jurgensen
D. V. Shaller - Bridgman

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ATTACHMENT TO
AEP:NRC:00328

Background Information

The tables for favorable and adverse conditions provide the following information: Notification time, Public Preparation time, Movement time, Total Evacuation time, Confirmation time, and Evacuation plus Confirmation time for the given angular sectors having radii of 2, 5, 8, and 10 miles. These time estimates are based on past experience of the Berrien County Sheriff's Department (BCSD) evacuating its county, knowledge of the local area, and projected population distribution for 1985 based on the Donald C. Cook Nuclear Plant - FSAR Tables 2.1-6 and 2.1-7 which were extrapolated from 1970 Census data.

To develop the estimates, calculations were first made for 45° sectors. The estimates of Notification time assumed the use of the BCSD, and the Michigan State Police forces. The number of people notified per unit time was assumed to increase as each police department becomes fully mobilized during the evacuation process.

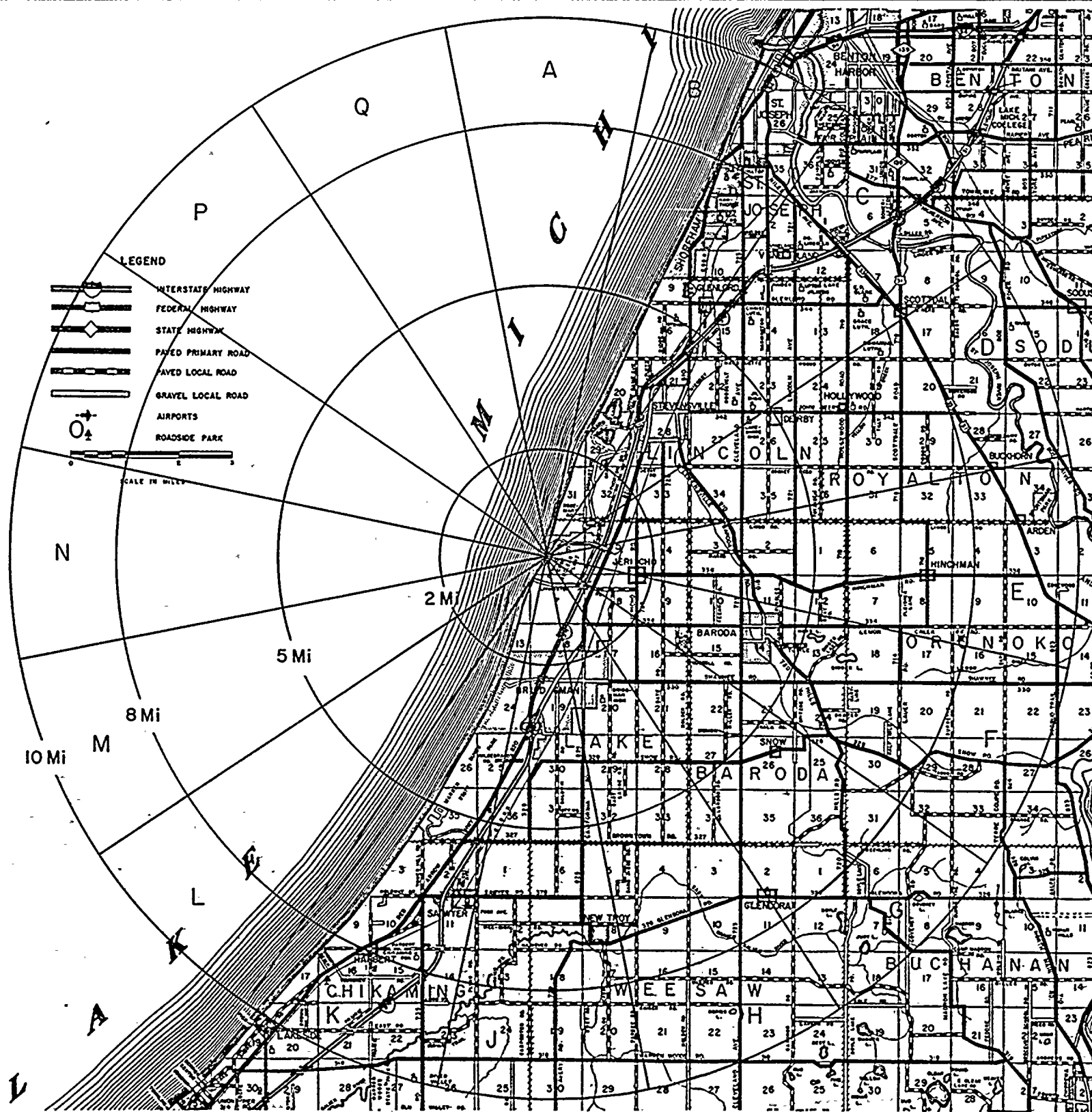
Although notification would be made via broadcasts on local radio stations, the Notification time estimates are based on positive assurance of notification through the use of emergency patrols by police vehicles. In each case, the time needed by the public to become prepared for evacuation (public preparation time) is assumed to be 20 minutes. Movement time estimates represent the time required for all people within a given sector to reach the outer edge from anywhere within the sector (See attached map for sector boundaries.)

The need for evacuation confirmation is a matter of great concern to the BCSD. The corresponding time estimates show that the need to re-enter an affected sector presents a large risk to BCSD personnel, since the time needed for confirmation increases the danger of overexposure to those BCSD personnel involved in it. Furthermore, the evacuation has, by then already taken place. The concerns for increased protection of BCSD personnel in ensuring a high degree of confidence during confirmation that the required evacuation has taken place, lead to what could be considered conservative estimates of the times required to confirm evacuation.

In general, to determine the evacuation time estimates, the BCSD considered the number of people required to leave a given sector, the distance of travel through the sector, the number of evacuation routes available per sector, and normal driving speeds for adverse and favorable conditions. In all cases, except one, adverse conditions are meant to imply adverse weather such as winter storms. The exception is in Sector K where the adverse condition is during the summer with Warren Dunes State Park at full capacity (approximately 22,000 people). This park is located about 5 miles southwest of the Donald C. Cook Nuclear Plant.



The time required to evacuate schools and nursing homes under both adverse or favorable conditions was assumed to be 2 hours after notification and preparation time, and the time required to evacuate hospitals was taken to be 4 hours, following notification and preparation time.



SECTOR BCDEFGHJ 180°
FAVORABLE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	3:30	5:00	5:00	5:00
Public Preparation Time	:20	:20	:20	:20
Movement Time	:15	:20	:40	:45
Total Evacuation Time	<u>4:05</u>	<u>5:40</u>	<u>6:00</u>	<u>6:05</u>
Confirmation Time	3:50	12:00	24:00	29:00
Evacuation plus Confirmation Time	<u>7:55</u>	<u>17:40</u>	<u>30:00</u>	<u>35:05</u>

SPECIAL CONSIDERATIONS -

(1)

SECTOR BCDE (90°)
FAVORABLE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	1:10	2:40	5:00	5:00
Public Preparation Time	:20	:20	:20	:20
Movement Time	:10	:15	:15	:35
Total Evacuation Time	<u>1:40</u>	<u>3:15</u>	<u>5:35</u>	<u>5:55</u>
Confirmation Time	2:00	7:00	14:00	17:00
Evacuation plus Confirmation Time	<u>3:40</u>	<u>10:15</u>	<u>19:35</u>	<u>22:35</u>

SPECIAL CONSIDERATIONS -

(7)

SECTOR FGJ (90°)
FAVORABLE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	1:20	2:20	4:00	5:00
Public Preparation Time	:20	:20	:20	:20
Movement Time	:10	:20	:20	:20
Total Evacuation Time	<u>1:50</u>	<u>3:00</u>	<u>4:40</u>	<u>5:40</u>
Confirmation Time	1:50	5:00	10:15	12:00
Evacuation plus Confirmation Time	<u>2:40</u>	<u>8:00</u>	<u>14:55</u>	<u>17:40</u>

SPECIAL CONSIDERATIONS -

(7)

SECTOR BC (45°)
FAVORABLE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	0:20	1:30	3:30	4:15
Public Preparation Time	:20	:20	:20	:20
Movement Time	:10	:15	:15	:35
Total Evacuation Time	<u>:50</u>	<u>2:05</u>	<u>4:05</u>	<u>5:10</u>
Confirmation Time	1:00	4:00	7:45	10:00
Evacuation plus Confirmation Time	<u>1:50</u>	<u>6:05</u>	<u>11:50</u>	<u>15:10</u>

SPECIAL CONSIDERATIONS -

Memorial Hospital (9.25 miles away)
Oles Homestead for the Aged
Park Wayne Manor
Shoreham Terrace

(7)

SECTOR DE (450)
FAVORABLE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	:50	1:10	2:30	2:45
Public Preparation Time	:20	:20	:20	:20
Movement Time	:10	:15	:15	:15
Total Evacuation Time	<u>1:20</u>	<u>2:30</u>	<u>3:05</u>	<u>3:20</u>
Confirmation Time	1:00	3:00	6:15	7:00
Evacuation plus Confirmation Time	<u>2:20</u>	<u>5:30</u>	<u>9:20</u>	<u>10:20</u>

SPECIAL CONSIDERATIONS -

Fancher Adult Foster Care

(1)

SECTOR FG (45°)
FAVORABLE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	:50	1:10	2:00	2:15
Public Preparation Time	:20	:20	:20	:20
Movement Time	:10	:15	:15	:20
Total Evacuation Time	<u>1:20</u>	<u>1:45</u>	<u>2:35</u>	<u>2:55</u>
Confirmation Time	:50	3:00	5:00	6:00
Evacuation plus Confirmation Time	<u>2:10</u>	<u>4:45</u>	<u>7:35</u>	<u>8:55</u>

SPECIAL CONSIDERATIONS -

Gateway, Inc.(Nursing home)

(7)

SECTOR HJ (45°)
FAVORABLE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	:50	1:00	2:00	2:45
Public Preparation Time	:20	:20	:20	:20
Movement Time	:10	:20	:20	:20
Total Evacuation Time	<u>1:20</u>	<u>1:40</u>	<u>1:40</u>	<u>3:25</u>
Confirmation Time	1:00	2:00	5:15	6:00
Evacuation plus Confirmation Time	<u>2:20</u>	<u>3:40</u>	<u>6:55</u>	<u>9:25</u>

SPECIAL CONSIDERATIONS -

Bethany Retirement Home
Jordan's Rest Home
Lake Valley Adult Foster Care

(7)

SECTOR K (22.5°)
FAVORABLE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	:25	:50	2:00	2:30
Public Preparation Time	:20	:20	:20	:20
Movement Time	:15	:15	:15	:15
Total Evacuation Time	<u>1:00</u>	<u>1:25</u>	<u>2:35</u>	<u>3:05</u>
Confirmation Time	:45	1:00	1:45	4:00
Evacuation plus Confirmation Time	<u>1:45</u>	<u>2:25</u>	<u>4:20</u>	<u>7:05</u>

SPECIAL CONSIDERATIONS -

Warren Dunes

(7)

SECTOR BCDEFGHJ 180°
ADVERSE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	3:50	5:00	6:00	6:00
Public Preparation Time	:20	:20	:20	:20
Movement Time	:20	1:00	1:15	1:30
Total Evacuation Time	<u>4:30</u>	<u>6:20</u>	<u>7:35</u>	<u>7:50</u>
Confirmation Time	7:20	23:00	35:00	45:00
Evacuation plus Confirmation Time	<u>11:50</u>	<u>29:20</u>	<u>42:35</u>	<u>52:50</u>

SPECIAL CONSIDERATIONS -

SECTOR BCDE (90°)
ADVERSE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	1:40	4:55	6:00	6:00
Public Preparation Time	:20	:20	:20	:20
Movement Time	:20	:30	:30	1:15
Total Evacuation Time	2:20	5:45	6:50	7:35
Confirmation Time	4:00	14:00	22:00	26:30
Evacuation plus Confirmation Time	<u>6:20</u>	<u>19:45</u>	<u>28:50</u>	<u>34:05</u>

SPECIAL CONSIDERATIONS -

SECTOR FGJ (90°)
ADVERSE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	2:10	3:30	6:00	6:00
Public Preparation Time	:20	:20	:20	:20
Movement Time	:20	:30	:45	:45
Total Evacuation Time	<u>2:50</u>	<u>4:20</u>	<u>7:05</u>	<u>7:05</u>
Confirmation Time	3:20	8:45	13:30	18:15
Evacuation plus Confirmation Time	<u>6:10</u>	<u>13:05</u>	<u>20:35</u>	<u>25:20</u>

SPECIAL CONSIDERATIONS -

(1)

SECTOR BC (45°C)
ADVERSE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	:40	3:30	6:30	7:00
Public Preparation Time	:20	:20	:20	:20
Movement Time	:20	:30	:30	1:15
Total Evacuation Time	<u>1:20</u>	<u>4:20</u>	<u>7:20</u>	<u>8:35</u>
Confirmation Time	2:00	8:00	15:00	17:00
Evacuation plus Confirmation Time	<u>3:20</u>	<u>12:20</u>	<u>22:20</u>	<u>25:35</u>

SPECIAL CONSIDERATIONS -

Memorial Hospital
Oles Homestead for the Aged
Park Wayne Manor
Shoreham Terrace

SECTOR DE (45°)
ADVERSE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	1:00	1:25	3:00	3:15
Public Preparation Time	:20	:20	:20	:20
Movement Time	:20	:25	:30	:30
Total Evacuation Time	<u>1:40</u>	<u>2:10</u>	<u>3:50</u>	<u>4:05</u>
Confirmation Time	2:00	6:00	7:00	9:30
Evacuation plus Confirmation Time	<u>3:40</u>	<u>8:10</u>	<u>10:50</u>	<u>13:35</u>

SPECIAL CONSIDERATIONS -

Fancher Adult Foster Care

SECTOR FG (45°)
ADVERSE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	1:00	1:45	3:00	3:30
Public Preparation Time	:20	:20	:20	:20
Movement Time	:20	:25	:30	:45
Total Evacuation Time	<u>1:40</u>	<u>2:30</u>	<u>4:50</u>	<u>4:35</u>
Confirmation Time	2:00	6:15	6:30	10:00
Evacuation plus Confirmation Time	<u>3:40</u>	<u>8:45</u>	<u>11:20</u>	<u>14:35</u>

SPECIAL CONSIDERATIONS -

Gateway, Inc.

SECTOR HJ (45°)
ADVERSE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	1:10	1:45	3:00	3:20
Public Preparation Time	:20	:20	:20	:20
Movement Time	:10	:30	:45	:45
Total Evacuation Time	<u>1:40</u>	<u>2:35</u>	<u>4:05</u>	<u>4:25</u>
Confirmation Time	1:20	2:30	7:00	8:15
Evacuation plus Confirmation Time	<u>3:00</u>	<u>5:05</u>	<u>11:05</u>	<u>12:40</u>

SPECIAL CONSIDERATIONS -

Bethany Retirement Home
Jordan's Rest Home
Lake Valley Adult Foster Care

SECTOR K (22.5°)
ADVERSE CONDITIONS

	2 Mi	5 Mi	8 Mi	10 Mi
Notification Time	:40	1:00	2:30	3:00
Public Preparation Time	:20	:20	:20	:20
Movement Time	:25	1:15	1:15	1:15
Total Evacuation Time	<u>1:25</u>	<u>2:35</u>	<u>4:05</u>	<u>4:35</u>
Confirmation Time	1:15	1:30	2:30	6:00
Evacuation plus Confirmation Time	<u>2:40</u>	<u>4:05</u>	<u>6:35</u>	<u>10:35</u>

SPECIAL CONSIDERATIONS -

Warren Dunes

