

## Fermi3CEm Resource

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### **Docket ID NRC-2008-0566**

Draft Environmental Impact  
Statement for Combined License (COL)  
for Enrico Fermi Unit 3  
report number: NUREG-2105

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### **The Proposed Fermi 3 Radiological Emergency Response Plan Lacks Adequate Resources and Planning to Evacuate Monroe, County and Southeastern Michigan**

1.)

During severe winter weather, current road clearing capabilities are woefully inadequate and must be upgraded in surrounding areas.

This inadequacy is common knowledge in the Community of Monroe as exhibited by the attached letter to the editor of the Monroe Evening News dated January 21, 2009 from John Pipis, Monroe. And from Article published at MonroeNews.com on Feb 1, 2009 entitled: Road-plowing plan in works.

Both of these documents demonstrate and document the contention above with regard to the Emergency Evacuation and Radiological Emergency Response Plan. They are attached to this document.

2.)

Emergency planning should extend at least 50 miles, and should include the surrounding major population centers of Detroit/Windsor, Toledo, and Ann Arbor. Current evacuation routes are too narrow, and must be expanded to accommodate a mass exodus in the event of a major accident or attack. While the Emergency Evacuation documents identify staffing needs for an evacuation. The procurement of these resources are dubious. It has not been demonstrated that they actually exist other than on paper. *i.e.* all the funding cuts relating to road work has rippled throughout the all services.

3.)

Lack of attention in the Environmental Report document to the feasibility of the existing Emergency Evacuation Plan for Fermi II

during the construction phase of the proposed Fermi III. During a construction phase of several years, the report projects a workforce of 2900 workers (4.4.1) who are not expected to re-locate from their current homes, and states that many of these workers will drive 50 miles, and some, up to 70 miles to the work site. In this report there is no mention of the current Evacuation Plan – let alone that it will even work with such a large number of vehicles on the road. Those who live near Fermi during the construction of Fermi II experienced high traffic volume on Dixie Highway at shift change times. When construction related to Fermi 3 coincides with Fermi 2 outage swell of workers, a combined traffic volume of 5,000 vehicles is reported by DTE as possible.

In Chapter 4, "Environmental Impacts of Construction" (DTE Energy, Fermi 3 Combined License Application, Part 3: Environmental Report, Revision 0, September 2008). From 4.4.2.4, referring to the Pijawka study: "Traffic congestion, however, was found to be a serious problem at most sites." No follow-up or response to this statement, which cites a "serious problem" to be expected during the construction phase. This lack of response to the "serious problem" of traffic congestion is a glaring omission in the report.

There are two main routes from the Fermi site to I-75:

- .
  - > Fermi Drive via Dixie Highway to Exit 15, a distance of 5 miles, the first two miles two lanes and the last three miles (nearest to I-75) three lanes;

- .
  - > Fermi Drive to Dixie Highway à Post Road à War Road à Nadeau Road à I-75 Exit 18, a distance of 6 miles along two-lane local and primary roads.

There are other routes extending northeasterly toward the down river communities of Wayne County.

Dixie Highway is the main road into and out of the Fermi site and, in the case of an emergency, would be the main exit route for approximately 10,000 people who live between Dixie Highway and the Lake Erie shoreline as well as several thousand more who live on the opposite side of the highway.

The Jefferson public school system near Fermi lacks an adequate school bus fleet to perform an emergency evacuation. The Jefferson Schools District does not have enough buses and drivers to evacuate the entire student population in a single run. North Elementary School, Jefferson Middle School, Jefferson High School are all less than 3 miles from the Fermi 2 site and from the proposed Fermi 3. Sodt Elementary School 3.5 miles away, and Hurd Road Elementary School within the 5-mile radius. In the absence of Fermi 2 and proposed Fermi 3 Emergency Evacuation preparedness on such a scale would not be necessary.

Potassium iodide tablets, along with instructions for proper usage,

should be distributed regularly within the 50 mile emergency planning zone, as should emergency evacuation plan instructions. It is necessary to have immediate access to Potassium iodide in order to prevent thyroid ingestion / uptake. Currently Potassium Iodide tablets are not readily available.

The following mitigation measures are requested to be taken and that full funding be provided to implement them. A thorough study of all measures necessary to protect the public may indicate the need for further mitigation measures.

Mitigation Remedy:

- .> widen to three lanes, upgrade and pave the above-cited access routes from the Fermi site to I-75 as well as other routes to points north;
- provide salt storage in the immediate vicinity for Monroe County Road Commission application during snowy and icy weather;
- provide at least two sets of three extra Monroe County Road Commission snow plows/salt spreaders (total 6) along with operators (12), to be stationed in the immediate vicinity during winter months to keep routes clear during winter weather; DTE must provide the Monroe County Road Commission with Garages with three snow plows each at both ends of the North Dixie Highway. To provide financial resources for 24 hour staffing of those snow plows and garages. This will allow for adequate snow removal, for North Dixie highway as well as the immediate roads necessary for an Emergency Evacuation.
- provide the Jefferson Schools District with enough buses and drivers to evacuate the entire student population in a single run – North Elementary School, Jefferson Middle School and Jefferson High School (all less than three miles from the Fermi II site), Sodt Elementary School (~3.5 miles), and Hurd Road Elementary School (within the 5-mile radius);
- provide additional full-time staffing for Monroe County Sheriff coverage for traffic and crowd control in the event of an emergency requiring evacuation.
- Build separate road access to service 5,000 plus vehicles related to construction and refueling outages at the Fermi site. Residents should not be forced to compete with workers for access to evacuation routes. Workers should be evacuated on separate additional route designed to mitigate impact of inadequate evacuation routes.
- Provide Potassium Iodide tablets to individual homes within 50 mile radius so that there immediate access to block thyroid uptake. Provide these whether the proposed Fermi 3 goes forward or not. They are needed because of the existence of Fermi 2.
- The financial burden of these upgrades must be borne by Detroit Edison Company as they are the proponent of the proposed Fermi 3. It is the existence of the Fermi 2 and the proposed Fermi 3 which necessitates these resources be made whole.

## Special Events

### 1. River Raisin Jazz Festival

A special event scenario (Scenario 13) is considered for the River Raisin Jazz Festival. The River Raisin Jazz Festival is held each summer at St. Mary's Park in the City of Monroe. This year's festival is scheduled for August 8<sup>th</sup> through 10<sup>th</sup>. The festival typically attracts as many as 50,000 people. Based on discussions with the director of the Monroe County Tourism & Convention Department, at most 20,000 people will be in the park for this event at any given time. He also indicated that 2/3 of these people are coming to the event from out of the area. Vehicle occupancies range from 1 to 4 persons per vehicle; we assume 3 people per vehicle. There are 1,300 public parking spaces available. People also park along local streets and in private parking lots. There are approximately 13,350 additional people (20,000 x 2/3) and 4,450 additional vehicles for this scenario. The additional vehicles are loaded on the analysis network on the links in the vicinity of St. Mary's Park.

### 2. Construction

A special event scenario (Scenario 14) which represents a typical summer, midweek, midday with construction workers at the FNPP site constructing the new unit (Fermi 3) when an emergency occurs at Fermi 2, is considered. Based on discussions with Black & Veatch, the peak construction will be in the Year 2018, with a workforce of 2,900 construction workers. The workforce will be split equally between two 10 hour shifts; thus there will be as many as 1,450 construction workers at a given time. We also assume that refueling of Fermi 2 will be occurring for this scenario. There are 1,500 additional workers needed for refueling, also split equally between two shifts. The average vehicle occupancy of 1.02 workers per vehicle is used to estimate the additional vehicle demand. A new access road from the FNPP site to Dixie Highway is considered in this study, based on the information provided. It is assumed that a traffic signal is present at the intersection of Dixie Highway and the new access road. Those workers present for construction of the new unit will use the existing access road (Enrico Fermi Drive), while the refueling workers and the Fermi 2 employees will use the new access road. There are a total of 1,425 vehicles loaded onto Enrico Fermi Drive for this scenario, and 1,175 vehicles (735 for refueling employees and 440 for those commuting into the EPZ to work at Fermi 2) loaded onto the new access road. There are a total of 2,160 additional vehicles for this special event. Permanent resident population and shadow population are extrapolated to 2018 for this scenario.

### 3-17

The computation of ETE assumes that a portion of the population within the EPZ but outside the impacted region, will elect to "voluntarily" evacuate. In addition, a portion of the population in the Shadow Region beyond the EPZ that extends a distance of 15 miles from FNPP, will also elect to evacuate. These voluntary evacuees could impede those who are evacuating from within the impacted region. The impedance that could be caused by voluntary evacuees is considered in the computation of ETE for the impacted region.

### 5.)

Voluntary evacuation is considered as indicated in the accompanying Figure 2-1. Within the circle defined by the distance to be evacuated but outside the Evacuation Region, 50 percent of the people not advised to evacuate are assumed to evacuate within the same time-frame. In the

annular area between the circle defined by the central "key-hole" of the Evacuation Region and the EPZ boundary, it is assumed that 35 percent of people will voluntarily evacuate. In the area between the EPZ boundary and a 15-mile annular area centered at the plant (the "Shadow Region"), it will be assumed that 30 percent of the people will evacuate voluntarily. Sensitivity studies explored the effect on ETE, of increasing the percentage of voluntary evacuees in the "Shadow Region". See Appendix

### 2.3 Study Assumptions

1. The Planning Basis Assumption for the calculation of ETE is a rapidly escalating accident that requires evacuation, and includes the following:
  - a. Advisory to Evacuate is announced coincident with the siren notification.
  - b. Mobilization of the general population will commence within 10 minutes of the Advisory to Evacuate.
  - c. ETE are measured relative to the Advisory to Evacuate.
2. It is assumed that everyone within the group of PAA forming a Region that is issued an Advisory to Evacuate will, in fact, respond in general accord with the planned routes.
3. It is further assumed that:
  - a. Schools may be evacuated prior to notification of the general public, if possible.
  - b. 62 percent of households in the EPZ have at least one commuter, 64 percent of which await the return of a commuter before beginning their evacuation trip, based on the telephone survey results.
4. The ETE will also include consideration of "through" (External-External) trips during the time that such traffic is permitted to enter the evacuated Region. "Normal" traffic flow is assumed to be present within the EPZ at the start of the emergency.
5. Access Control Points (ACP) will be staffed within approximately 90 minutes of the siren notifications, to divert traffic attempting to enter the EPZ. Earlier activation of ACP locations could delay returning commuters. It is assumed that no vehicles will enter the EPZ after this 90 minute mobilization time period.
6. Traffic Control Points (TCP) within the EPZ will be staffed over time, beginning at the Advisory to Evacuate. Their number and location will depend on the Region to be evacuated and personnel resources available. It is assumed that drivers will act rationally, travel in the directions identified in the plan (as documented in the public information material), and obey all control devices and traffic guides.
7. Buses will be used to transport those without access to private vehicles:
  - a. If schools are in session, transport (buses) will evacuate students directly to the assigned Reception Centers and host schools.
  - b. Schoolchildren, if school is in session, are given priority in assigning transit vehicles.
  - c. Bus mobilization time is considered in ETE calculations.
  - d. Analysis of the number of required "waves" of transit vehicles used for evacuation is presented.
8. It is reasonable to assume that some of transit-dependent people will rideshare with family, neighbors, and friends, thus reducing the demand for

buses. We assume that the percentage of people who rideshare is 50 percent. This assumption is based upon reported experience for other emergencies<sup>2</sup>. The remaining transit-dependent portion of the general population will be evacuated to reception centers by bus.

9. Two types of adverse weather scenarios are considered. Rain may occur for either winter or summer scenarios. In the case of rain, it is assumed that the rain begins at about the same time the evacuation advisory is issued. Thus transient populations are not affected. That is, no weather-related reduction in the number of transients who may be present in the EPZ is assumed.

Snow may occur in winter scenarios. Transient population reductions are not assumed for snow scenarios. Further, it is assumed that roads are passable and that the appropriate agencies are plowing the roads as they would normally.

Adverse weather scenarios affect roadway capacity, free flow highway speeds and the time required to mobilize the general population. The factors assumed for the ETE study are:

10. School buses used to transport students are assumed to have the capacity to transport 70 children per bus for elementary schools, and 50 children per bus for middle and high schools. Transit buses used to transport the transit-dependent general population are assumed to transport an average of 30 people per bus.

Institute for Environmental Studies, University of Toronto, THE MISSISSAUGA EVACUATION FINAL REPORT, June 1981. The report indicates that 6,600 people of a transit-dependent population of 8,600 people shared rides with other residents; a ride share rate of 76% (Page 5-10).

<sup>3</sup> Agarwal, M. et. Al. Impacts of Weather on Urban Freeway Traffic Flow Characteristics and Facility Capacity, Proceedings of the 2005 Mid-Continent Transportation Research Symposium, August, 2005.

Scenario

Highway

Capacity\*

Free Flow

Speed\*

Mobilization

Time

Rain<sub>3</sub> 90% 90% No Effect

Snow<sub>3</sub> 80% 80%

Clear driveway before leaving home (Source: Telephone

Survey)

\*Adverse weather capacity and speed values are given as a percentage of good weather conditions. Roads are assumed to be passable.

#### 7.1 Voluntary Evacuation and Shadow Evacuation

We define "voluntary evacuees" as people who are within the EPZ in Protective Action Areas (PAA) located outside the Evacuation Region, for which an Advisory to Evacuate *has not* been issued, yet who nevertheless elect to evacuate. We define "shadow evacuation" as the movement of people from areas *outside* the EPZ for whom no protective action recommendation has been issued. Both voluntary and shadow evacuation are assumed to take place over the same time frame as the evacuation from

within the impacted Evacuation Region.

The ETE for FNPP addresses the issue of voluntary evacuees as discussed in Section 2.2 and displayed in Figure 7-1 (same as Figure 2-1). Figure 7-2 presents the area identified as the Shadow Evacuation Region. This region extends radially from the boundary of the EPZ to a distance of 15 miles from FNPP.

Traffic generated within this Shadow Evacuation Region, traveling away from the plant, has the potential for impeding evacuating vehicles from within the Evacuation Region. We assume that the traffic volumes emitted within the Shadow Evacuation Region correspond to 30 percent of the residents there plus a proportionate number of employees in that region. All ETE calculations include this shadow traffic movement.

## 7.2 Patterns of Traffic Congestion During Evacuation

Figures 7-3 through 7-6 illustrate the patterns of traffic congestion that arise for the case when the entire EPZ (Region R03) is advised to evacuate during the summer, weekend, midday period under good weather conditions (Scenario 3).

Traffic congestion, as the term is used here, is defined as Level of Service (LOS) F.

LOS F is defined as follows (2000 HCM):

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.

This definition is general and conceptual in nature, and applies primarily to uninterrupted flow. Levels of Service for interrupted flow facilities vary widely in terms of both the user's perception of service quality and the operational variables used to describe them. All highway "links" which experience LOS F at the indicated times are delineated in these Figures by a heavy red line; all others are lightly indicated. Congestion develops in areas with high population density and at traffic bottlenecks. Figure 7-3 presents the traffic congestion patterns at 30 minutes after the Advisory to Evacuate (ATE). The approach to I-275 from Carleton, I-75 northbound, the approach to I-75 from North Dixie Highway, and all major evacuation routes leading out of the City of Monroe (I-75 southbound, Michigan Highway 50 westbound, US-24 southbound and Michigan Highway 125 southbound) are congested at this time.

Figure 7-4 presents the traffic congestion patterns at the peak of congestion, 1 hour after the ATE. Congestion intensifies within the City of Monroe and within Carleton. Congestion propagates upstream along I-75 northbound and I-75 southbound. US Turnpike/Jefferson Ave is congested northbound traveling out of the EPZ. US Highway

24 northbound and the approaches to US 24 are also congested in Flat Rock. The congestion patterns at 2 hours after the ATE are displayed in Figure 7-5. The patterns are similar to those at 1 hour, though the congestion in Carleton and northbound on US Turnpike/Jefferson Ave is beginning to dissipate. At 3 hours after the ATE (Figure 7-6), all of the congestion in the northern portion of the EPZ has cleared. Congestion still persists on the major evacuation routes leaving the City of Monroe. Congestion is also observed leaving Sterling State Park and approaching I-75 southbound along Dixie Highway. The last path to clear is the approach to southbound I-75 from Laplace Rd in Monroe, which clears at 3 hours and 30 minutes after the ATE.

There is significant congestion within the City of Monroe; however, this congestion does not persist beyond the 4 hour mobilization time period (5 hours for snow scenarios). Therefore, the ETE is driven by the mobilization activities of the evacuating population. As a result, it is recommended that the 95<sup>th</sup> percentile ETE (Table 7-1C) be used when making protective action decisions.

### 7.3 Evacuation Rates

Another format for displaying the dynamics of evacuation is depicted in Figure 7-7. This plot indicates the rate at which traffic flows out of the indicated areas for the case of an evacuation of the entire EPZ (Region R03) under the indicated conditions. Appendix J presents these plots for all Evacuation Scenarios for Region R03.

As indicated in Figure 7-7, there is typically a long "tail" to these distributions. Vehicles evacuate an area slowly at the beginning, as people respond to the Advisory to Evacuate at different rates. Then traffic demand builds rapidly (slopes of curves increase). When the system becomes congested, traffic exits the EPZ at rates somewhat below capacity until some evacuation routes have cleared. As more routes clear, the aggregate rate of egress slows since many vehicles have already left the EPZ. Towards the end of the process, relatively few evacuation routes service the remaining demand.

This decline in aggregate flow rate, towards the end of the process, is characterized by these curves flattening and gradually becoming horizontal. Ideally, it would be desirable to fully saturate all evacuation routes equally so that all will service traffic near capacity levels and all will clear at the same time. For this ideal situation, all curves would retain the same slope until the end – thus minimizing evacuation time. In the real world, this ideal is generally unattainable reflecting the variation in population density and in highway capacity within the EPZ.

The time-varying external circumstances are represented as Evacuation Scenarios, each described in terms of the following factors: (1) Season (Summer, Winter); (2) Day of Week (Midweek, Weekend); (3) Time of Day (Midday, Evening); and (4) Weather (Good, Rain, Snow). Two special event scenarios were considered: the River Raisin Jazz Festival in St. Mary's Park in the City of Monroe, and the construction on Fermi 3 during refueling of Fermi 2 in the Year 2018.

Thank you for your review

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