The Detroit Edison Company
One Energy Plaza, Detroit, MI 48226-1279

10 CFR 52.79

September 30, 2009
NRC3-09-0029

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington DC 20555-0001

References: 1) Fermi 3
Docket No. 52-033
2) Letter from Jerry Hale (USNRC) to Jack M. Davis (Detroit Edison), "Request for Additional Information Letter No. 11 Related to the SRP Sections 02.02.03, 02.04.02, 02.04.13, and 13.03 for the Fermi 3 Combined License Application," dated August 19, 2009

Subject: Detroit Edison Company Response to NRC Request for Additional Information Letter No. 11

In the referenced letter, the NRC requested additional information to support the review of certain portions of the Fermi 3 Combined License Application (COLA). The responses to the following Requests for Additional Information (RAIs) are provided as Attachments 1 through 20 of this letter:

- RAI Question 02.02.03-1 Evaluation of Potential Accidents
- RAI Question 02.02.03-2 Evaluation of Potential Accidents
- RAI Question 02.02.03-3 Evaluation of Potential Accidents
- RAI Question 02.02.03-4 Evaluation of Potential Accidents
- RAI Question 02.02.03-5 Evaluation of Potential Accidents
- RAI Question 02.02.03-6 Evaluation of Potential Accidents
- RAI Question 02.04.02-2 Floods
- RAI Question 02.04.13-7 Accidental Release of Radioactive Liquid Effluents in Ground and Surface Waters

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- RAI Question 13.03-017-01 Emergency Planning
- RAI Question 13.03-017-02 Emergency Planning
- RAI Question 13.03-017-03 Emergency Planning
- RAI Question 13.03-017-04 Emergency Planning
- RAI Question 13.03-017-05 Emergency Planning
- RAI Question 13.03-017-06 Emergency Planning
- RAI Question 13.03-017-07 Emergency Planning
- RAI Question 13.03-017-08 Emergency Planning
- RAI Question 13.03-017-09 Emergency Planning
- RAI Question 13.03-017-10 Emergency Planning
- RAI Question 13.03-017-11 Emergency Planning
- RAI Question 13.03-017-12 Emergency Planning

Information contained in these responses will be incorporated into a future COLA submission as described in the RAI response.

If you have any questions, or need additional information, please contact me at (313)235-3341.

I state under penalty of perjury that the foregoing is true and correct. Executed on the 30th day of September 2009.

Sincerely,

Peter W. Smith, Director
Nuclear Development – Licensing & Engineering
Detroit Edison Company

Attachments: 1) Response to RAI Letter No. 11(Question No. 02.02.03-1)
2) Response to RAI Letter No. 11(Question No. 02.02.03-2)
3) Response to RAI Letter No. 11(Question No. 02.02.03-3)
4) Response to RAI Letter No. 11(Question No. 02.02.03-4)
5) Response to RAI Letter No. 11(Question No. 02.02.03-5)
6) Response to RAI Letter No. 11(Question No. 02.02.03-6)
7) Response to RAI Letter No. 11 (Question No. 02.04.02-2)
8) Response to RAI Letter No. 11 (Question No. 02.04.13-7)
9) Response to RAI Letter No. 11 (Question No. 13.03-017-01)
10) Response to RAI Letter No. 11 (Question No. 13.03-017-02)
11) Response to RAI Letter No. 11 (Question No. 13.03-017-03)
12) Response to RAI Letter No. 11 (Question No. 13.03-017-04)
13) Response to RAI Letter No. 11 (Question No. 13.03-017-05)
14) Response to RAI Letter No. 11 (Question No. 13.03-017-06)
15) Response to RAI Letter No. 11 (Question No. 13.03-017-07)
16) Response to RAI Letter No. 11 (Question No. 13.03-017-08)
17) Response to RAI Letter No. 11 (Question No. 13.03-017-09)
18) Response to RAI Letter No. 11 (Question No. 13.03-017-10)
19) Response to RAI Letter No. 11 (Question No. 13.03-017-11)
20) Response to RAI Letter No. 11 (Question No. 13.03-017-12)
21) Proposed COLA Part 10 Table 2.3-1 Revisions

cc: Jack M. Davis, Senior Vice President and Chief Nuclear Officer
Mark Tonacci, NRC Fermi 3 Project Manager
Stephen Lemont, NRC Fermi 3 Environmental Project Manager
Fermi 2 Resident Inspector
NRC Region III Regional Administrator
NRC Region II Regional Administrator
Supervisor, Electric Operators, Michigan Public Service Commission
Michigan Department of Environmental Quality
Radiological Protection and Medical Waste Section

Attachment 1
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3404)

RAI Question No. 02.02.03-1

NRC RAI 02.02.03-1

RG 1.206 provides guidance regarding the information that is needed to ensure potential hazards in the site vicinity are identified and evaluated to meet the siting criteria in 10 CFR 100.20 and 10 CFR 100.21. The Fermi 3 FSAR Table 2.2-202 listed the propane amounts on premises for the facilities Meijer Distributions Inc.; TWB Company, LLC; and Rockwood Landfill, but did not provide an analysis of the potential explosion hazard. Please provide the propane explosion scenario analysis and present the results of the evaluation for these sources in the Fermi 3 FSAR Section 2.2.3.1.1.

Response

The propane explosion scenario was analyzed using the methodology of Regulatory Guide (RG) 1.91. RG 1.91 provides guidance for evaluations of explosions postulated to occur on transportation routes near nuclear power plants. As described in Section B, fifth paragraph, of RG 1.91, a TNT mass equivalence is used to determine the safe separation distance. That is, RG 1.91 states:

> "The concept of TNT equivalence, i.e., finding the mass of substance in question that will produce the same blast effect as a unit mass of TNT, has long been used in establishing safe separation distances for solid explosives. A test program is required to establish that equivalence. For solid substances more efficient in producing blast effects than TNT, equivalents are known by the manufacturers. For solid substances not intended for use as explosives but subject to accidental detonation, it is conservative to use a TNT equivalence of one in establishing safe standoff distances, i.e., use the cargo mass in Equation (1)."

Based on Regulatory Guide (RG) 1.91, the minimum safe separation distance for a specified mass of TNT is determined using the following relationship:

$$R \geq kW^{1/3} \qquad \text{Equation (1) from RG 1.91}$$

Where:

R = Distance in feet from an exploding charge of W pounds of TNT
k = 45 (when R is expressed in terms of feet and W is expressed in terms of pounds)
W = Pounds of TNT

The TNT equivalent for propane was calculated assuming a TNT mass equivalence of 240%. RG 1.91, Section B, sixth paragraph states:

> "A reasonable upper bound to the blast energy potentially available based on experimental detonations of confined vapor clouds is a mass equivalence of 240 percent. A detailed analysis of possible accident scenarios for particular sites, including consideration of the actual cargo, site topography, and prevailing meteorological conditions may justify a lower yield. But, when establishing safe stand-off distances independent of site conditions, use of an upper bound is prudent.

For determining the safe stand-off distance for the off-site propane storage, the reasonable upper bound of 240% is used.

The minimum safe distance resulting from a propane vapor cloud at the Meijer Distributions Inc.; TWB Company, LLC; and Rockwood Landfill facilities using the distance and container size values from the FSAR, Table 2.2-202, and the methodology provided in RG 1.91 is shown in the following Table:

Determination of Safe Stand-Off Distances
For Off-Site Propane Storage Locations

Facility	Distance miles, (ft*)	Largest Container (lb)	TNT Equivalent (lb x 2.4)	Safe Stand-Off Distance	Ratio Actual Distance/ Safe Stand-Off Distance
Meijer Distribution	4 (21,120)	99,999 lb	239,998	2796 ft	7.5
TWB Company	4.5 (23,760)	4,500 lb	10,800	995 ft	23.9
Rockwood Landfill	4.5 (23,760)	9,999 lb	23,998	1298 ft	18.3

*5,280 ft = 1 mile

As shown in the above Table, the propane quantities stored at the three facilities are located much farther away than the calculated minimum safe stand-off distance determined using the guidance in RG 1.91.

The potential explosion of a propane vapor cloud and description of the method used to analyze the vapor cloud explosion hazard will be added to Fermi 3 FSAR Section 2.2.3.1.2.

Proposed COLA Revision

Please refer to the Proposed COLA Revision section of RAI 02.02.03-2 of this letter for the details pertaining to the COLA Revision.

Attachment 2
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3404)

RAI Question No. 02.02.03-2

NRC RAI 02.02.03-2

RG 1.206 provides guidance regarding the information that is needed to ensure potential hazards in the site vicinity are identified and evaluated to meet the siting criteria in 10 CFR 100.20 and 10 CFR 100.21. The Femi 3 FSAR Sections 2.2.3.1.1 and 2.2.3.1.2 address the safe separation distance between the hydrogen and oxygen storage area and nearest safety-related structure to be 229 m (750 ft) for the potential explosion and flammable vapor cloud explosion hazard. However, there is no analysis or discussion presented in FSAR as to how this safe separation distance is determined. Please provide the analysis/discussion for the calculation of the safe separation distance.

Response

In Fermi FSAR Section 2.2.3.1.1, the safe separation distance between the hydrogen and oxygen storage area and nearest safety-related structure is calculated using methods based on EPRI Document No. NP-5283-SR-A, "Guidelines for Permanent BWR Hydrogen Water Chemistry Installations – 1987 Revision". Appendix B of the guidelines in EPRI Document No. NP-5283-SR-A provides an evaluation report recommending separation distances based on stored quantities and building design factors.

The method in EPRI Document No. NP-5283-SR-A is based on a reinforced concrete wall at least 18 inches thick, a tensile steel factor between 0.12 ksi and 0.3 ksi, and the minimum static lateral load capacities for the tornado region the plant is located in per Regulatory Guide (RG) 1.76.

The ESBWR DCD shows that the outer walls for the ESBWR safety-related structures are at least 18 inches thick. The analysis assumes a tensile steel factor of 0.12 ksi (lower end of range in EPRI Document No. NP-5283-SR-A). The lower value for the tensile steel factor results in a larger safe separation distance. RG 1.76, "Design –Basis Tornado and Tornado Missiles for Nuclear Power Plants," Revision 1, Figure 1, indicates that the Fermi site is located within Tornado Intensity Region I. NUREG/CR-2642, "Capacity of Nuclear Power Plant Structures to Resist Blast Loadings," dated September 1983, Section 6, states:

> "A conservative static capacity can be based upon the required design pressure drop for the tornado zone in which the plant is sited."

For Tornado Region I, the design pressure drop is 3.0 psi. Therefore, a static capacity of 3.0 psi is used in the analysis.

Based on these input values, the minimum safe separation distance for the hydrogen and oxygen storage area is 229 m (750 ft) from the nearest safety-related structure.

Proposed COLA Revision

Proposed markup to Sections 2.2.3.1.1 and 2.2.3.1.2 are included. These markups contain descriptions of the methods and references to the document source for those methods used to evaluate the safe separation distance requirements.

Markup of Detroit Edison COLA
(following 4 pages)

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA Revision 2. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

in manufacturing and industrial processes that are the most likely candidates to use hazardous materials.

EF3 COL 2.0-6-A

2.2.3 Evaluation of Potential Accidents

The consideration of a variety of potential accidents, and their effects on Fermi 3 or its operation, is included in this section. The types of potential accidents examined include: explosions, flammable vapor clouds (delayed ignition), aircraft hazards, toxic chemicals, fires, collisions with intake structures, and liquid spills near the intake.

2.2.3.1 Determination of Design Basis Events

2.2.3.1.1 Explosions

The nearest highways on which explosive materials could be transported are Interstate 75 and 275, which are a minimum distance of 6.4 km (4 mi) from the Fermi site (Figure 2.2-201). According to Regulatory Guide (RG) 1.91, the separation between the interstates and Fermi site is within the safe distance criteria; therefore potential explosions on the interstate are not considered design basis events.

The nearest railway on which explosive materials could be transported is the Canadian National Railway, located a minimum distance of 5.6 km (3.5 mi) from the Fermi site (Figure 2.2-201). According to RG 1.91, the separation between the main railway line and Fermi site is within the safe distance criteria, therefore potential explosions on the railway are not considered design basis events.

The nearest waterway on which explosive materials could be transported is the West Outer Channel, located a minimum distance of 8 km (5 mi) from the Fermi site (Figure 2.2-201). Consistent with RG 1.91, the separation between the waterway and Fermi site is within the safe distance criteria, therefore potential explosions on a barge on the waterway are not considered design basis events.

The nearest storage tank farm for explosive gases is the bulk gas storage facility for the Hydrogen Water Chemistry and General Hydrogen systems. Table 2.2-203 lists the maximum quantity of explosive (hydrogen) liquid/gas stored at this location. The hydrogen and oxygen storage area will be located a minimum of 229 m (750 ft) from the nearest safety-related structure.

Insert 1

2.2.3.1.2 Flammable Vapor Clouds (Delayed Ignition)

The largest potential effect from the nearby residential and commercial natural gas service pipelines might occur in the form of a natural gas leak and subsequent limited impact explosion. Potential explosions from the pipeline would not pose a danger to the safe operation of the plant, due to the size and location of the pipeline.

The nearest storage tank farm for flammable gases is the bulk gas storage facility for the Hydrogen Water Chemistry and Generator Hydrogen systems. Table 2.2-203 lists the maximum quantities of flammable gas (hydrogen) and gas that supports combustion (oxygen) stored at Fermi site. The safe separation distance between the hydrogen and oxygen storage area and the nearest safety-related structures is 229 m (750 ft).

The method used to evaluate the safe separation for hydrogen gas storage is in FSAR Section 2.2.3.1.1.

Insert 2 →

~~The nearest storage of flammable liquids is 5.5 km (3.4 mi) away where diesel fuel and gasoline are stored (Table 2.2-202). The potential explosion of an individual tank is well below the limits specified in RG 1.91. The potential formation and detonation of a flammable vapor cloud is not a design basis event due to the size and distance of the tanks.~~

2.2.3.1.3 Aircraft Hazards

Regulatory Guide 1.206 and NUREG-0800 state that the risks due to aircraft hazards should be sufficiently low. Further, aircraft accidents that could lead to radiological consequences in excess of the exposure guidelines of 10 CFR 50.34 (a) (1) with a probability of occurrence greater than an order of magnitude of 10^{-7} per year should be considered in the design of the plant.

NUREG-0800, Section 3.5.1.6, "Aircraft Hazards," provides three acceptance criteria for the probability of aircraft accidents to be less than 10^{-7} per year:

A. The plant-to-airport distance D is between 5 and 10 statute mi, and the projected annual number of operations is less than 500 D^2, or the plant-to-airport distance D is greater than 10 statute mi, and the projected annual number of operations is less than 1000 D^2

B. The plant is at least 5 statute mi from the nearest edge of military training routes, including low-level training routes, except for those associated with usage greater than 1000 flights per year, or

2.2-204 Lake Carriers' Association, "The Source For Information About U.S. – Flag Great Lakes Shipping", http://www.lcaships.com/, accessed 11 December 2007.

2.2-205 Lloyd's List, "Ports of the World 2007, Volume 3", Published by Lloyd's MIU, Port of Monroe, 2006.

2.2-206 Michigan Department of Transportation, "Michigan's Railroad System, Detroit Area Inset", http://www.michigan.gov/documents/MDOT_Official_Rail_130897_7.pdf, accessed 23 January 2008

2.2-207 National Transportation Safety Board, NTSB Website, "Aviation Accident Database & Synopses", accidents in last 40 years for Newport, MI, http://www.ntsb.gov/ntsb, accessed 6 March 2008.

2.2-208 National Transportation Safety Board, NTSB Website, "Aviation Accident Database & Synopses", accidents in last 40 years for Detroit, MI, http://www.ntsb.gov/ntsb, accessed 6 March 2008.

2.2-209 AirNav: KDTW – Detroit Metropolitan Wayne County Airport, Detroit, Michigan, USA, Website, FAA Information (Effective 10 April 2008), http://www.airnav.com/airport/KDTW, accessed 17 April 2008.

2.2-210 Monroe County Industrial Development Corporation, "Industrial Properties", http://www.monroecountyidc.com/, accessed 9 October 2007.

2.2-211 NUREG/CR-2650, Allowable Shipment Frequencies for the Transport of Toxic Gases Near Nuclear Power Plants, October 1982.

2.2-212 NFPA 422, Guide for Aircraft Accident/Incident Response Assessment, 2004.

2.2-213 EPRI NP-5283-SR-A, Guidelines for Permanent BWR Hydrogen Water Chemistry Installations - 1987 Revision, 1987

2.2-214 NUREG/CR-2462, Capacity of Nuclear Power Plant Structures to Resist Blast Loadings, September 1983.

Insert 1:
The safe separation distance between the hydrogen and oxygen storage area and nearest safety-related structure is calculated using the method based upon EPRI recommended methods in Appendix B of Document No. NP-5283-SR-A, "Guidelines for Permanent BWR Hydrogen Water Chemistry Installations – 1987 Revision" (Reference 2.2-213). The EPRI method used is based on a reinforced concrete wall at least 18 inches thick, a tensile steel factor between 0.12 ksi and 0.3 ksi, and the minimum static lateral load capacities for the tornado intensity region the plant is located in per RG 1.76. To be conservative a tensile steel factor of 0.12 ksi was used. Section 6 of NUREG/CR-2462, "Capacity of Nuclear Power Plant Structures to Resist Blast Loadings" (Reference 2.2-214) states that a conservative static capacity can be based on the required design pressure drop for the tornado intensity region in which the plant is sited. As Fermi 3 is located in Tornado Intensity Region I (as shown in RG 1.76) the minimum static lateral load capacity is 3.0 psi based on the design pressure drop in Figure 7 of NUREG/CR-2462 (Reference 2.2-214).

Insert 2:
The nearest storage of flammable liquids is 5.5 km (3.4 mi) away where diesel fuel and 300 gallons of gasoline are stored (Table 2.2-202). The next closest storage of flammable liquids is 99,999 lbs of propane, 6.4 km (4 mi) away (Table 2.2-202). 99,999 lbs of propane is also the largest storage volume of flammable liquids (Table 2.2-202). Using the method of RG 1.91 for safe separation distance based on TNT equivalence, and a mass equivalence of 240% for the formation of vapor clouds, the safe separation distance for the 99,999 lbs of propane is 852.2 m (2,796 ft), and 224.3 m (736 ft) for the 300 gallons of gasoline. The potential explosion of an individual tank containing flammable liquids is well below the limits specified in RG 1.91. The potential formation and detonation of a flammable vapor cloud is not a design basis event due to the size and distance of the tanks.

Attachment 3
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3404)

RAI Question No. 02.02.03-3

NRC RAI 02.02.03-3

RG 1.206 provides guidance regarding the information that is needed to ensure potential hazards in the site vicinity are identified and evaluated to meet the siting criteria in 10 CFR 100.20 and 10 CFR 100.21. The Fermi 3 FSAR Table 2.2-203 listed two 8000 gallon gasoline underground storage tanks adjacent to southeast corner of building 24. Please provide the potential explosion hazard of tanker trucks that deliver gasoline to these tanks.

Response

The Fermi 3 FSAR Table 2.2-203 indicates that there are two 8,000 gallon gasoline underground storage tanks. In further review there is only one 8,000 gallon underground gasoline storage tank, with two dispensing islands (gas pumps). The underground storage tank is currently located adjacent to the holding pond, one dispensing island is located adjacent to the south of the underground storage tank, and the second dispensing island is located adjacent to southeast corner of Fermi 2 Building No. 24. Fermi 3 FSAR Table 2.2-203 will be revised to reflect the single tank and its location.

Fermi 3 FSAR Section 2.2.2.5 Description of Highways states:

> "Petroleum products are delivered to the site from Dixie Highway via Fermi Drive in transport trucks."

The current location of the gasoline storage tank will be moved when Fermi 3 is constructed because the current location creates interference with Fermi 3 construction activities. The gasoline storage tank and tanker truck access will be relocated to a safe distance from Fermi 3. The safe separation distance for the gasoline storage tank and tanker truck access is determined using the methodology of Regulatory Guide (RG) 1.91 for explosions postulated to occur on transportation routes near nuclear power plants. RG 1.91 uses a TNT mass to determine the safe separation distance. Per RG 1.91:

> "The concept of TNT equivalence, i.e., finding the mass of substance in question that will produce the same blast effect as a unit mass of TNT, has long been used in establishing safe separation distances for solid explosives. A test program is required to establish that equivalence. For solid substances more efficient in producing blast effects than TNT, equivalents are known by the manufacturers. For solid substances not intended for use as explosives but subject to accidental detonation, it is conservative to use a TNT equivalence of one in establishing safe standoff distances, i.e., use the cargo mass in Equation (1)."

Based on Regulatory Guide (RG) 1.91, the minimum safe separation distance for an amount of TNT equivalent is determined using the following relationship:

$$R \geq kW^{1/3}$$ Equation (1) from RG 1.91

Where:

R = Distance in feet from an exploding charge of W pounds of TNT
k = 45 (when R is expressed in terms of feet and W is expressed in terms of pounds)
W = Pounds of TNT

The TNT equivalent for the gasoline tanker truck was calculated assuming a TNT mass equivalence of 240%. RG 1.91, Section B, sixth paragraph states:

> "A reasonable upper bound to the blast energy potentially available based on experimental detonations of confined vapor clouds is a mass equivalence of 240 percent. A detailed analysis of possible accident scenarios for particular sites, including consideration of the actual cargo, site topography, and prevailing meteorological conditions may justify a lower yield. But, when establishing safe stand-off distances independent of site conditions, use of an upper bound is prudent.

For determining the safe stand-off distance for the gasoline tanker truck, the reasonable upper bound of 240% is used.

The analysis was done using a 10,000 gallon tanker truck. The 10,000 gallon tanker truck size is based on the U.S. Department of Energy's Energy Information Administration publication Number DOE/EIA-X049, April 2008, "Where Does My Gasoline Come From?" which states:

> "After shipment through the pipeline, gasoline is typically held in bulk storage terminals that often service many companies. At these terminals, the gasoline is loaded into tanker trucks destined for various retail gas stations. The tanks in these trucks, which can typically hold up to 10,000 gallons, usually have several compartments, enabling them to transport different grades of gasoline or petroleum products."

The minimum safe distance resulting from a gasoline vapor cloud resulting from an accident involving a 10,000 gallon tanker truck is 2,367 ft (721.4 m). This is a conservative minimum safe separation distance calculation because it assumes that the explosion is due to the entire tanker's cargo spill and vaporizing with no absorption into the ground and does not take any credit from shielding that would be provided from non-safety-related structures.

The safe separation distance for the location of the gasoline storage tank based on a potential explosion of a gasoline vapor cloud due to a tanker accident and the method used to establish that distance will be added to Fermi 3 FSAR Section 2.2.3.1.2. Table 2.2-203 will also be revised to reflect the single gasoline storage tank, the current location of the tank, and indicate that the tank location will be moved to a safe separation distance from Unit 3.

Proposed COLA Revision

Proposed markup to Section 2.2.3.1.2 is included. This markup contains a description of the methods and references used to evaluate the safe separation distance requirements for the gasoline storage tanks and tanker truck access. The markup also contains the revised description of the quantity and location of the underground gasoline storage tank.

Markup of Detroit Edison COLA
(following 3 pages)

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA Revision 2. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

2.2.3.1.2 Flammable Vapor Clouds (Delayed Ignition)

The largest potential effect from the nearby residential and commercial natural gas service pipelines might occur in the form of a natural gas leak and subsequent limited impact explosion. Potential explosions from the pipeline would not pose a danger to the safe operation of the plant, due to the size and location of the pipeline.

The nearest storage tank farm for flammable gases is the bulk gas storage facility for the Hydrogen Water Chemistry and Generator Hydrogen systems. Table 2.2-203 lists the maximum quantities of flammable gas (hydrogen) and gas that supports combustion (oxygen) stored at Fermi site. The safe separation distance between the hydrogen and oxygen storage area and the nearest safety-related structures is 229 m (750 ft).

The nearest storage of flammable liquids is 5.5 km (3.4 mi) away where diesel fuel and gasoline are stored (Table 2.2-202). The potential explosion of an individual tank is well below the limits specified in RG 1.91. The potential formation and detonation of a flammable vapor cloud is not a design basis event due to the size and distance of the tanks.

Insert 1 →

2.2.3.1.3 Aircraft Hazards

Regulatory Guide 1.206 and NUREG-0800 state that the risks due to aircraft hazards should be sufficiently low. Further, aircraft accidents that could lead to radiological consequences in excess of the exposure guidelines of 10 CFR 50.34 (a) (1) with a probability of occurrence greater than an order of magnitude of 10^{-7} per year should be considered in the design of the plant.

NUREG-0800, Section 3.5.1.6, "Aircraft Hazards," provides three acceptance criteria for the probability of aircraft accidents to be less than 10^{-7} per year:

A. The plant-to-airport distance D is between 5 and 10 statute mi, and the projected annual number of operations is less than 500 D^2, or the plant-to-airport distance D is greater than 10 statute mi, and the projected annual number of operations is less than 1000 D^2

B. The plant is at least 5 statute mi from the nearest edge of military training routes, including low-level training routes, except for those associated with usage greater than 1000 flights per year, or

Table 2.2-203 Fermi Onsite Chemical Storage Locations and Quantities (Sheet 2 of 5) [EF3 COL 2.0-5-A]

Chemical/Material (Formula/Trade/State)	Location (1)	No. x Quantity
	Fermi 2 Chemicals (Continued)	
Fuel Oil / #2 Diesel Fuel	Southwest of Fermi 1 adjacent to South Lagoon;	845,970 gallons
	In RHR Complex;	168,000 (4 tanks at 42,000 gallons)
	In RHR Complex;	2,200 (4 tanks at 550 gallons)
	North of Auxiliary Boiler House;	159,000 gallons
	Adjacent to Holding Pond;	6,000 gallons
	Southwest of 120 Kv Mat;	3,000 gallons (5 tanks at 600 gallons)
	South side of NOC Building (West of back entrance);	500 gallons
	North side of GSW Pump House;	275 gallons
Gasoline (underground storage tank)	~~Adjacent to southeast corner of Building 24;~~ Adjacent to Holding Pond	~~2 x 8,000 gallon tanks~~ 1 x 8,000 gallon tank (tank to be relocated to a safe separation distance from Unit 3)
Hazardous Waste Accumulation/Storage Areas	Building H	15,000 gallons
	Fermi 1	Approximately 1,000 ft^3
Hydrogen (gas), Compressed	Southside Turbine Building	214,000 scf in 10 containers
Hydrogen (liquid), Cryogenic	Doxy Road, Gate 5	20,000 gallons (administratively controlled to <10,000 pounds)
Insulation Oil	Outside GSW Pump House, OSB (across from CST & CRT tanks), Turbine Building (across from AIB Building), Outside Circ Water Pump House, and Reactor Building;	5 x 70 gallon tanks
	Spare Transformer Storage Facility	ELIN = 22,670 gallons
	GTOC Parking Lot	GE = 26,000
Lubrication Oil	Peaker Pad;	6,800 gallons (4 units at 1,700 gallons)
	Outside Control House;	280 gallons (4 transformers at 70 gallons);
	Inside the protected area	105,000 gallons

Insert 1:
Table 2.2-203 indicates that one 8,000 gallon underground gasoline storage tank is currently located on the Fermi site. Section 2.2.2.5 indicates that the tanker truck refueling access road used in Fermi Drive. Construction of the new Fermi 3 unit will require the underground gasoline storage tank to be moved from the current location. The minimum safe separation storage distance and the nearest Fermi 3 safety-related structure is determined using the method of RG 1.91 for safe separation distance based on TNT equivalence, and a mass equivalence of 240% for the formation of vapor clouds. The minimum safe separation distance is determined using a 10,000 gallon gasoline tanker truck which bounds the storage capacity of the individual underground gasoline storage tank. The underground gasoline storage tank will be located such that the tank and the gasoline tanker truck access area are a minimum of 721.4 m (2367 ft) from the nearest Fermi 3 safety-related structure.

Attachment 4
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3404)

RAI Question No. 02.02.03-4

NRC RAI 02.02.03-4

RG 1.206 provides guidance regarding the information that is needed to ensure potential hazards in the site vicinity are identified and evaluated to meet the siting criteria in 10 CFR 100.20 and 10 CFR 100.21. The potential toxic chemicals identified from onsite sources are addressed and summarized in the Fermi 3 FSAR Section 2.2.3.1.4.1 and Table 2.2-205. Of these chemicals, some are analyzed by the applicant for potential control room habitability, but the information in the FSAR is limited. Please provide a discussion of how the analyses are performed and what the resulting concentrations of chemicals are in order to demonstrate that the calculated chemical concentration is lower than the respective chemical limiting concentration (toxicity limit). Include a discussion of the model used, modeling assumptions, input values, and calculated chemical concentrations at the intake and inside the control room. This information is required for the staff's review and independent confirmatory analysis for toxic chemicals for control room habitability.

Response

Please refer to the Response in RAI 02.02.03-5 of this letter for the details pertaining to the response of the above request.

Proposed COLA Revision

Please refer to the Proposed COLA Revision section of RAI 02.02.03-5 of this letter for the details pertaining to the COLA Revision.

Attachment 5
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3404)

RAI Question No. 02.02.03-5

NRC RAI 02.02.03-5

RG 1.206 provides guidance regarding the information that is needed to ensure potential hazards in the site vicinity are identified and evaluated to meet the siting criteria in 10 CFR 100.20 and 10 CFR 100.21. In Fermi 3 FSAR Section 2.2.3.1.4.2, the applicant stated "only potentially toxic chemicals require evaluation". Please provide the list of all toxic chemicals evaluated. For large quantities of chemicals on site, provide rationale and how RG 1.78 methodology is applied for evaluating and screening out the following chemicals: sodium hypochlorite, hydrofluosilicic acid, anhydrous ammonia, propane and sulfuric acid (Fermi 3 FSAR Table 2.2-202). If RG 1.78 methodology was not used, describe and justify the methodology employed.

Response

General Discussion

Potential stationary toxic chemical hazards in the site vicinity (on-site and off-site) were evaluated per Regulatory Guide 1.78 (RG 1.78), "Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release" Revision 1, dated December 2001. Based on the guidance in RG 1.78, the following series of steps were used to evaluate potential toxic chemical hazards:

- Consistent with Regulatory Position C.1.1 chemicals stored or situated at distances greater than 5 miles from Fermi 3 were not considered. FSAR Table 2.2-202 identifies the off-site hazardous materials located within a five mile radius of Fermi 3 by location, chemical and stored quantity.

- Consistent with Regulatory Position C.1.1 hazardous chemicals stored on-site within 0.3 miles of the control room in a quantity greater than 100 pounds are considered in the evaluation. FSAR Table 2.2-203 identifies the chemicals stored on-site by chemical, location and quantity.

- Consistent with Regulatory Position C.1.1 where there are several chemical containers, only the failure of the largest container is considered unless the containers are interconnected such that a failure of one container can result in the release from several containers.

- Consistent with RG 1.78, Regulatory Position C.1.1 small quantities for laboratory use, 20 pounds or less, are exempt and not considered in the evaluation.

- Consistent with Regulatory Position 3.2 for chemicals that are not gases at 100°F and normal atmospheric pressure but are liquids with vapor pressures in excess of 10 torr, flashing and boiloff are considered to determine the rate of release to the atmosphere. Conversely, for chemicals that are not gases at 100°F and normal atmospheric pressure and the vapor pressure is less than 10 torr, the chemical is not considered. This is consistent with the U.S. Environmental Protection Agency (EPA), which has long

utilized 10 mm of mercury (mm Hg), (i.e., 10 torr) as a threshold vapor pressure for regulated substances. In particular, the EPA's "List of Regulated Substances and Thresholds for Accidental Release Prevention; Requirements for Petitions under Section 112(r) of the Clean Air Act as Amended," in its Section IV, "Discussion of Comments on Major Regulatory Changes" describes a public comment regarding EPA's former use of a lower "Vapor Pressure Cut-off" with these words:

> "EPA has decided to set the vapor pressure criterion at the higher level of 10 mm Hg. In selecting this new vapor pressure cut-off, the Agency examined the substances on the proposed list that have vapor pressures of less than 10 mm Hg and compared the rate of volatilization expected in a large release to the rate expected for substances with a vapor pressure greater than 10 mm Hg. As expected, volatilization rates increase with increasing vapor pressure and increasing pool sizes. The Agency believes that a timely facility response after the onset of an accidental release will likely limit the amount that could volatilize for substances with vapor pressures lower than 10 mm Hg, thereby reducing the potential public or off-site impact. The Agency believes that a greater amount of substances with vapor pressures above 10 mm Hg is likely to be volatilized and released, even after a timely facility response occurs, potentially causing off-site impacts. The Agency also reviewed accident history and production volume information on the substances that would be delisted at this vapor pressure. This review has led the Agency to conclude that the accident histories or production volumes associated with the delisted substances do not warrant their listing under this rulemaking at this time."

The EPA's Code of Federal Regulations are contained in 40CFR. In particular, 40CFR68 Subpart F on "Regulated Substances for Accidental Release Prevention" indicates the 10 torr threshold quantity for regulated substances as follows:

> ". . . if the concentration of the regulated substance in the mixture is one percent or greater by weight, but the owner or operator can demonstrate that the partial pressure of the regulated substance in the mixture (solution) under handling or storage conditions in any portion of the process is less than 10 millimeters of mercury (mm Hg), the amount of the substance in the mixture in that portion of the process need not be considered when determining whether more than a threshold quantity is present at the stationary source."

The original NRC Regulatory Guide 1.78 and the more recent Revision 1 both contain the 10 torr vapor pressure as an apparent threshold similar to that of the EPA. We interpret the 10 torr vapor pressure in Regulatory Guide 1.78 as an intended threshold value for consideration because of its similarity to the EPA criterion.

Based on the above screening criteria, several of the potential chemical hazards did not require further evaluation. That is, the chemicals were "screened out". If further evaluation was necessary, the following approach was taken.

- Consistent with Regulatory Position 3.1 toxicity limits (where used) are based on the immediately dangerous to life and health (IDLH) exposure level concept.

- The initial evaluation, for chemicals not screened out as described above, uses the simplified methodology in RG 1.78, Appendix A. The key inputs to the simplified methodology are as follows:

  o The distance from the control room and the amount of the chemical are identified in FSAR Tables 2.2-202 and 2.2-203.
  o The control room air exchange rate is 0.4 volumes per hour.
  o A Pasquill stability category of "G" is used.

- For chemicals where the results using RG 1.78 Appendix A were not acceptable, more detailed analysis was performed using the HABIT computer code.

Specific Discussion and Results

The attached Table 1 identifies all of the chemicals considered in the evaluation of potential chemical hazards. Table 1 identifies the chemical, the location (on-site and/or off-site) and how the chemical was dispositioned.

As shown in the attached Table 1, all of the potential hazards except for Carbon Dioxide and Nitrogen were able to be screened out or evaluated using the simplified methodology in RG 1.78, Appendix A.

The Carbon Dioxide Tank is associated with Fermi 3. The Liquid Nitrogen tank is associated with Fermi 2. The Carbon Dioxide Tank and the Nitrogen Tank are analyzed using the HABIT computer code. The inputs and assumptions used in the HABIT analysis are summarized in the attached Table 2.

Liquid Nitrogen

Nitrogen (an asphyxiant), was evaluated using the NRC's HABIT code and associated EXTRAN and CHEM modules based on postulated instantaneous release. Two different release scenarios are considered; i.e., a tank burst and a tank leak. In the tank burst scenario, all the contents of the tank are instantaneously released. For the tank leak scenario, the nitrogen is leaked out of the tank at a constant mass flow rate until the tank is empty at an assumed time of 10 seconds. Contents were treated as puff instantaneous gaseous releases varying the following inputs:

Stability Class varied from Class A through G
Wind Speed varied between 0.1 to11. 1 m/s in 1 m/s increments
Air Temperature varied between -19°C and 32.4°C in 6 evenly distributed increments

Several sensitivity cases were run for the tank rupture and the tank leak cases to capture the range of input values.

The CHEM module was used to credit the effects of intake and dilution within the control room atmosphere during the plume passage. The assumptions and inputs used for calculating concentrations at the control room intake and in the control room for the HABIT analyses are listed in Table 2, near the end of this RAI response.

The threat from nitrogen is by displacement of oxygen. No specific acceptance criterion is provided in RG 1.78, Revision 1. Nitrogen is not a toxicity hazard. Nitrogen only impacts control room habitability when it displaces sufficient quantities of air that that oxygen levels in the room decrease below a specified threshold. Consistent with RG 1.78, Section B, asphyxiating chemicals are considered if they result in an oxygen-deficient atmosphere as defined by the Occupation Safety & Health Administration (OSHA). Consistent with OSHA 63:1152-1300, "Respiratory Protection," an oxygen-deficient atmosphere is defined as less than 19.5% oxygen by volume. Assuming that the oxygen content of normal air is 20.9%, the nitrogen concentration in the control room must reach 87.76 g/m^3.

The limiting results from the liquid nitrogen tank burst and tank leak scenarios are shown in the following table. For each release scenario, the results show the maximum nitrogen concentration at any time in the control room, the maximum nitrogen concentration at the end of the run, the maximum nitrogen concentration at any time at the control room intake, and the maximum nitrogen concentration at the control room intake at the end of the run.

Liquid Nitrogen Tank Release Limiting Results

Release Scenario	Max CR Conc (g/m^3)	Max CR End Conc (g/m^3)	Max Intake Conc (g/m3)	Max Intake End Conc (g/m3)
Tank Burst	0.1900595	0.1833172	264.00	0.63
Tank Leak	0.1900595	0.1833172	264.00	0.63

As shown in the above table, the maximum nitrogen concentration reached in the control room is well below the maximum allowable concentration of 87.76 g/m^3.

Carbon Dioxide

Carbon dioxide was evaluated using the NRC's HABIT code and associated modules as a conservative measure based on postulated instantaneous release. Two different release scenarios are considered; i.e., a tank burst and a tank leak. In the tank burst scenario, all the contents of the tank are instantaneously released. For the tank leak scenario, the nitrogen is leaked out of the tank at a constant mass flow rate until the tank is empty at an assumed time of 10 seconds. Contents were treated as puff instantaneous gaseous releases using the EXTRAN module. The CHEM module was used to credit the effects of intake and dilution within the control room atmosphere during the plume passage.

Several sensitivity cases were run for the tank rupture and the tank leak cases to capture the range of input values.

The assumptions and inputs used for calculating concentrations at the control room intake and in the control room for the HABIT analyses are listed in Table 2, attached. RG 1.78 provides carbon dioxide IDLH value of 40,000 ppm, 7360 mg/m^3.

The limiting results from the carbon dioxide tank burst and tank leak scenarios are shown in the following table. For each release scenario, the results show the maximum carbon dioxide concentration at any time in the control room, the maximum carbon dioxide concentration at the end of the run, the maximum carbon dioxide concentration at any time at the control room intake, and the maximum carbon dioxide concentration at the control room intake at the end of the run.

Carbon Dioxide Tank Release Limiting Results

Release Scenario	Max CR Conc (mg/m^3)	Max CR End Cone (mg/m^3)	Max Intake Cone (mg/m^3)	Max Intake End Conc (mg/m^3)
Tank Burst	156.27509	151.8231	391,000	190
Tank Leak	237.393	233.06	210,000	190

As shown in the above table, the maximum carbon dioxide concentration reached in the control room is well below the stated limit of 7360 mg/m^3.

Proposed COLA Revision

FSAR Section 6.4 currently provides a more detailed discussion of the methodology used for the toxic chemical analysis. For clarification, FSAR Section 2.2.3.1.4.1 and Section 2.2.3.1.4.2 will be updated to include reference to Section 6.4 for the evaluation. A proposed mark-up is attached.

Table 1
Chemicals Considered

Chemical	Location	How Dispositioned
Anhydrous Ammonia	Off-Site (22,000 lbs at 4 miles from Fermi 3)	Based on the methodology in RG 1.78, Appendix A, a maximum acceptable quantity at the identified location is 233,100 pounds, which exceeds the amount stored at the off-site location.
Carbon Dioxide	On-Site	Analyzed using the HABIT computer code.
Chlorine	Off-Site (1,000 lbs at 2.1 miles, largest single container is 150 lbs)	Based on the methodology in RG 1.78, Appendix A, a maximum acceptable quantity at the identified location is 11,700 pounds, which exceeds the amount stored at the off-site location.
Diesel Fuel Oil	On-Site (Several Locations)	Not a toxic hazard. Not an explosive hazard due to extremely low vapor pressure.
Ethylene Glycol	On-Site	Ethylene Glycol is not a gas at 100°F and normal atmospheric pressure and the vapor pressures is less than 10 torr. Thus, Ethylene Glycol is not a potential chemical hazard.
Freon	On-Site (Associated with Fermi 2)	Freon is located in several locations associated with Fermi 2. One location is outside of the Fermi 2 structures (on the Auxiliary Building Roof). Even if the entire quantity of freon from one of the systems (single largest container) were to be released directly into the Fermi 3 control room, the resultant oxygen level would still be at acceptable levels. This is very conservative as it takes no credit for dispersion between the release point at Fermi 2 and the Fermi 3 Control Room (approximately 1100 feet). Other potential sources of freon are located within the Fermi 2 structures. A release of freon inside the Fermi 2 structures would first disperse inside of the structure(s) prior to release. This source would then be further dispersed as it migrates towards the Fermi 3 control room. Any resultant freon in the control room would not adversely impact the Fermi 3 control room operators.

Chemical	Location	How Dispositioned
Halon	On-Site (Associated with Fermi 2)	Halon is used as a fire suppression agent in several rooms at Fermi 2. The Halon systems are equipped with automatic isolation which limits any release. Therefore, a halon release at Fermi 2 will not adversely impact the Fermi 3 control room operators.
HEDP	On-Site	HEDP is not a toxic hazard. There is not an established IDLH for HEDP.
Hydrochloric Acid	On-Site (Associated with Fermi 1)	Hydrochloric acid is a liquid at normal atmospheric conditions. Any vapors released would initially be dispersed inside the associated Fermi 1 structure. The current plan is for Fermi 1 to be completely dismantled prior to operation of Fermi 3. Assuming this is the case, then the source would also be removed prior to Fermi 3 operation.
Fluoride (Hydrofluosilicic Acid)	Off-Site (1500 gallon tank at 2.1 miles from Fermi 3)	Hydrofluosilicic Acid is considered since fluoride is listed as a potentially hazardous chemical by NIOSH with a IDLH of 250 mg/m^3. Based on the methodology in RG 1.78, Appendix A, a maximum acceptable quantity of fluoride at the identified location is 97,500 pounds, which exceeds the amount of Hydrofluosilicic Acid stored at the off-site location.
Hydrogen and Oxygen	On-Site	Hydrogen and oxygen were evaluated for flammability and explosion hazards (more limiting than any toxicity hazards). The adequacy of separation between hydrogen and oxygen supplies and the Unit 3 control room is based on separation distances for postulated catastrophic releases from cryogenic liquid storage vessels and postulated pipe ruptures per the Electric Power Research Institute Report EPRI NP-5283-SR-A, Guidelines for Permanent BWR Hydrogen Water Chemistry Installations, 1987 Revision. Potential explosion of hydrogen is addressed in FSAR Section 2.2.3.1.1 and in response to RAI 02.02.03-3.
Nitrogen	On-Site	Analyzed using the HABIT computer code.
Nalco 3D TRASAR® 3DT 177	On-Site	Nalco 3D TRASAR® 3DT 177 contains phosphoric acid (with an IDLH toxicity limit of 1000 mg/m^3) and is identified as needing a disposition for toxicity. The Nalco 3D TRASAR® 3DT 177 MSDS indicates inhalation is

Chemical	Location	How Dispositioned
		not a likely route of exposure, with no adverse effects expected. Any expected mechanical dispersion action would result in formation of local mists with only nearby deposition, with negligible control room exposure.
Propane	On-Site Off-Site (99,999 lbs at 4 miles from Fermi 3)	Current on-site locations will be relocated prior to operation of Fermi 3. That is the current locations are within the site area impacted by the construction of Fermi 3. Possible new locations are specified based on maximum allowable tank volumes determined using the methodology in RG 1.78, Appendix A. At the off-site locations, based on the methodology in RG 1.78 methodology, a maximum acceptable quantity at the identified location is more than 4 million pounds, which exceeds the amount currently stored. The analysis for the potential explosion of an off-site propane tank is discussed in the response to RAI 02.02.03-1.
Propylene Glycol	On-Site	Propylene Glycol is not a gas at 100°F and normal atmospheric pressure and the vapor pressures is less than 10 torr. Thus, Propylene Glycol is not a potential chemical hazard.
Sodium Hypochlorite	On-Site Off-Site	Sodium hypochlorite is considered since chlorine is listed as a hazardous chemical in Regulatory Guide (RG) 1.78 and NUREG/CR-6624. As shown on the associated MSDS, sodium hypochlorite has a vapor pressure less than 10 mm Hg (10 Torr), and thus, is not a potential chemical hazard.
Sodium Bisulfite	On-Site	Sodium bisulfite is not a toxic hazard. There is not an established IDLH for sodium bisulfite.
Sodium Sulfite (2.2% solution)	On-Site	Sodium sulfite is not a toxic hazard. There is not an established IDLH for sodium sulfite.
Sulfuric Acid	On-Site (Associated with Fermi 2) Off-Site	Sulfuric Acid is not a gas at 100°F and normal atmospheric pressure and the vapor pressures is less than 10 torr. Thus, Sulfuric Acid is not a potential chemical hazard.

Chemical	Location	How Dispositioned
Disodium and Trisodium Phosphate	On-Site	Disodium and Trisodium Phosphate are not a toxic hazard. There are not established IDLH values for disodium or trisodium phosphate.
Varsol 18	On-Site	Varsol 18 is not a gas at 100°F and normal atmospheric pressure and the vapor pressures is less than 10 torr. Thus, Varsol 18 is not a potential chemical hazard.

Table 2
Inputs and Assumptions Used in Toxic Gas Analysis

Nitrogen Analysis HABIT Inputs

Concentration Units	g/m^3
Release Type	Gas Tank burst, Gas Tank leak
Initial Mass	18,370.8 kg
Release Rate	1837.1 kg/sec (tank leak case)
Release Height	-00.0 m
Storage Temperature	-19°C to 32.4°C in 6 evenly distributed increments
Distance to Intake	335.28 m
Intake Height	-00.0 m
Wind Speed	0.1 m/s to 11.1 m/s, 1 m/s increments
Atmospheric Stability Class	A through G, in seven increments
Air Temperature	-19°C to 32.4°C in 6 evenly distributed increments
Atmos. Pressure	741.21 mm Hg
Molecular Weight	28.01 g/mole

Nitrogen HABIT CHEM Module Inputs

0	Effluent Vertical velocity m/s
0	Effluent flow rate (m^3/s)
0	Release height (m)
4	Building height (m)
4	Building cross sectional Area (m^2)
0.25	Horizontal Distance to receptor (m)
0	Air intake height (m)
0	Windspeed (m/s)
0	Vertical dispersion class
0	Horizontal dispersion class
0.25	Flow rate from unfiltered intake source #1 (m^3/s)
0	Flow rate from unfiltered intake source #2 (m^3/s)
0	Bottled air flow rate (m^3/s)
0	Flow rate from filtered intake source #1 (m^3/s)
0 0 0	Filter efficiencies #1, (Elem., Org., Part.)(fraction)
0	Flow rate from filtered intake source #2 (feeds recirc, m^3/s)
0 0 0	Filter efficiencies #2, (Elem., Org., Part.)(fraction)
0	Recirculation flow rate (m3/s)
0 0 0	Recirc. filter efficiencies , (Elem., Org., Part.)(fraction)
0	Control room occupancy factor
	CONTROL ROOM VOLUME = 2208.714 (m**3)

Table 2 (Continued)
Inputs and Assumptions Used in Toxic Gas Analysis

Nitrogen Analysis Assumptions

1. Tank Rupture assumes full tank mass (40,5000 lbm = 18,370.8 kg) instantaneous release as gas, with release and intakes at conservatively the same elevation, separated by 335.28 meters.
2. Concentration analyzed at control room intake and in the control room. Concentrations inside of the control room are, as would be expected, significantly lower than the maximum concentration at the intake.
3. Threat is by displacement of oxygen. No specific acceptance criterion in RG 1.78 or supporting NUREG/CR-6624.
4. HABIT was run with an extremely conservative assumption that the nitrogen is released instantly as a vapor cloud. Concentrations are determined at the control room intake using the EXTRAN module, and in the Control Room using the CHEM module.
5. For the HABIT runs, all potential atmospheric stability classes were assumed. Sensitivity analyses run for a range of flow rates from 0.1 to 11.1 m/s in 1 m/s increments.

Table 2 (Continued)
Inputs and Assumptions Used in Toxic Gas Analysis

Carbon Dioxide HABIT Analysis Inputs

Concentration Units	g/m^3
Release Type	Gas Tank burst, Gas Tank leak
Initial Mass	3336.2 kg
Release Rate	333.6 kg/sec (tank leak case)
Release Height	-00.0 m
Storage Temperature	-19°C to 32.4°C in 6 evenly distributed increments
Distance to Intake	152.4 m
Intake Height	-00.0 m
Wind Speed	0.1 m/s to 11.1 m/s, 1 m/s increments
Atmospheric Stability Class	A through G, in seven increments
Air Temperature	-19°C to 32.4°C in 6 evenly distributed increments
Atmos. Pressure	741.21 mm Hg
Molecular Weight	44.01 g/mole

Carbon Dioxide HABIT CHEM Module Inputs

0	Effluent Vertical velocity m/s
0	Effluent flow rate (m^3/s)
0	Release height (m)
4	Building height (m)
4	Building cross sectional Area (m^2)
0.25	Horizontal Distance to receptor (m)
0	Air intake height (m)
0	Windspeed (m/s)
0	Vertical dispersion class
0	Horizontal dispersion class
0.25	Flow rate from unfiltered intake source #1 (m^3/s)
0	Flow rate from unfiltered intake source #2 (m^3/s)
0	Bottled air flow rate (m3/s)
0	Flow rate from filtered intake source #1 (m^3/s)
0 0 0	Filter efficiencies #1, (Elem., Org., Part.)(fraction)
0	Flow rate from filtered intake source #2 (feeds recirc, m^3/s)
0 0 0	Filter efficiencies #2, (Elem., Org., Part.)(fraction)
0	Recirculation flow rate (m^3/s)
0 0 0	Recirc. filter efficiencies , (Elem., Org., Part.)(fraction)
0	Control room occupancy factor
	CONTROL ROOM VOLUME = 2208.714 (m3)

Table 2 (Continued)
Inputs and Assumptions Used in Toxic Gas Analysis

Carbon Dioxide HABIT Analysis Assumptions

1. Tank Rupture case assumes full tank concentration of 800 gallons (7355 lbs = 3336.2 kg) instantaneous release as gas with release and intake elevations at conservatively the same elevation, separated by 152.4 meters.
2. Concentration analyzed at control room intake and in the control room. Concentrations inside of the control room are, as would be expected, significantly lower than the maximum concentration at the intake.
3. RG 1.78 provides Carbon Dioxide Immediately Dangerous to Life or Health (IDLH) value of 40,000 ppm (7.36 g/m^3).
4. HABIT was run with an extremely conservative assumption that the carbon dioxide is released instantly as a vapor cloud. Concentrations are determined at the control room intake using the EXTRAN module, and in the Control Room using the CHEM module.
5. For the HABIT runs, all potential atmospheric stability classes were assumed. Sensitivity analyses run for a range of flow rates from 0.1 to 11.1 m/s in 1 m/s increments.

Markup of Detroit Edison COLA
(following 3 pages)

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA Revision 2. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

The number of flights per year on V10-176-188 is bounded by the number of flights on V383, therefore a value of 60,179 is used; the average number of flights per day is 165:

$C = 4 \times 10^{-10}$
$w = 8 \text{ mi} + 2 \times (1 \text{ mi}) = 10 \text{ mi}$
$N = 60{,}179$
$A = 0.030 \text{ sq. mi.}$
$P_{FA} = 4 \times 10^{-10} \times 60{,}179 \times (0.030/10) = 7.2 \times 10^{-8} << 10^{-7}$

This accident probability is within the NUREG-0800 guidelines of less than 10^{-7} per year. No further analysis or discussion of potential aircraft hazards is necessary.

2.2.3.1.4 Toxic Chemicals

The potential accidental release of toxic chemicals is considered to evaluate the habitability of the main control room. Chemicals require evaluation if they are within 500 m (0.3 mi) of the main control room in a quantity of 45.4 kg (100 lbs) or greater, according to Regulatory Guide 1.78. Hazardous or potentially toxic chemicals within 8 km (5 mi) of the site also require evaluation; however, chemicals beyond an 8 km (5 mi) radius of the site do not require analysis. Mobile sources of chemicals within 8 km (5 mi) require analysis if a sufficient frequency of shipments exists.

2.2.3.1.4.1 Onsite Sources of Toxic Chemicals – Fermi 2 & 3

Onsite chemicals are listed in Table 2.2-203, including chemicals at Fermi 2 and Fermi 3. Chemicals that could pose a possible toxic, flammable, or explosive hazard to Fermi 3 are shown in Table 2.2-205, ~~toxic chemicals analysis is summarized~~.

Insert 1 Here.

2.2.3.1.4.2 Offsite Stationary Sources of Toxic Chemicals

Insert 2 Here.

Offsite chemicals within an 8-km (5-mi) radius of the Fermi site are listed in Table 2.2-202. Only potentially toxic chemicals require evaluation.

The nearest location containing potentially toxic or hazardous chemicals is the Berlin Township Water Treatment Plant, 3.4 km (2.1 mi) northwest of Fermi 3. This location contains chlorine; however, no further analysis is required based on RG 1.78. Meijer Distribution also contains several chemicals that were evaluated and screened out using the criteria in RG

1.78 primarily because it is located approximately 6.4 km (4 mi) from the Fermi site.

None of the other nearby facilities identified makes use of significant amounts of toxic chemicals which would be of concern for control room habitability analysis.

Insert 1

Table 2.2-205 shows that the majority of the chemicals are not toxic. For chemicals with immediately dangerous to life or health (IDLH) values listed in this table, the effects of toxic vapors or gases and their potential for incapacitating the Fermi 3 control room operators are evaluated and the results are presented in Section 6.4.

Insert 2

For chemicals with immediately dangerous to life or health (IDLH) values listed in this table, the effects of toxic vapors or gases and their potential for incapacitating the Fermi 3 control room operators are evaluated and the results are presented in Section 6.4.

Attachment 6
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3407)

RAI Question No. 02.02.03-6

NRC RAI 02.02.03-6

RG 1.206 provides guidance regarding the information that is needed to ensure potential hazards in the site vicinity are identified and evaluated to meet the siting criteria in 10 CFR 100.20 and 10 CFR 100.21. In Fermi 3 FSAR Section 2.2.3.1.4.3, the applicant stated without further discussion "Transportation of toxic chemicals in the vicinity is not a concern for Fermi 3 control room habitability analysis". Please provide the basis for this statement, its rationale, and the methodology applied to reach this conclusion. The information is needed for staff's review and independent confirmatory analysis.

Response

Regarding the transportation of toxic chemicals, the Fermi 3 FSAR, Section 2.2.3.1.4.3, states:

> "The consideration of the transportation of potentially toxic chemicals within an 8-km (5-mi) radius of the Fermi site is required. Evaluation of the transportation of toxic chemicals, within a five mile radius of the site, is required based on frequency. Frequent shipments are defined as exceeding 10 per year for truck shipments, 30 per year for rail shipments, and 50 per year for barge shipments, per NUREG/CR-2650 (Reference 2.2-211).
>
> Potentially toxic chemicals are transported on the Canadian National Railway lines. Based on the criteria in Reference 2.2-211, potential release of toxic chemicals from railway traffic does not require further analysis.
>
> Transportation of toxic chemicals in the vicinity is not a concern for Fermi 3 control room habitability analysis."

NRC Regulatory Guide (RG) 1.78, "Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release," RG 1.78 Regulatory Position C.1.2 provides the following screening criteria:

- If hazardous chemical are known or projected to be shipped by rail, water, or road routes outside a 5-mile radius, the shipments need not be considered.

- If the shipments are within a 5-mile radius, estimates of the frequencies of these shipments should be considered. Mobile sources need not be considered further if the total shipment frequency for all hazardous chemicals; i.e., all hazardous chemicals considered as a singular cargo category without further distinction of the nature of these chemicals, does not exceed the specified number by traffic type. Frequent shipments are defined as exceeding 10 per year for truck shipments, 30 per year for rail shipments, and 50 per year for barge shipments,

- Frequent shipment; i.e., shipments exceeding the specified number by traffic type, need not be considered in the analysis if the quantity of hazardous chemicals is less than the

quantity shown in the table in Appendix A (adjusted for the appropriate toxicity limit, meteorology, and control room air exchange rate).

For release of hazardous chemicals from frequently shipped mobile sources in quantities that do not meet the screening criteria, detailed analysis should be performed for control room habitability.

FSAR Figure 2.2-201 shows the industries and transportation routes within 5 miles of Fermi 3. As shown, the transportation routes within the 5 mile radius are the following:

- Interstate Highway 75 (I-75) connecting with Interstate Highway 275 at 4.1 miles from Fermi 3 (FSAR Section 2.2.1).

- Dixie Highway at 1.2 miles from the Fermi 2 reactor (Environmental Report Section 2.2.3.2).

- Canadian National Railway and Norfolk Southern Railway, both at 3.5 miles from Fermi 3 (FSAR Section 2.2.1)

- As shown on FSAR Figure 2.2-201 the West Outer Shipping Channel and the East Outer Shipping Channel are outside of the 5 mile radius from Fermi 3. Furthermore, the Port of Monroe is also outside of the 5 mile radius from Fermi 3.

FSAR Figure 2.2-201 also shows the industrial facilities that are located within a 5 mile radius from Fermi 3. FSAR Table 2.2-202 shows the off-site hazardous materials at these industrial facilities, including shipment information such as mode of transportation, shipment frequency and the largest shipment.

To be conservative it is assumed that the largest shipment for any of the facilities shown in Table 2.2-202 is transported on the Dixie Highway. This is conservative as it is the closest transportation route to Fermi 3. This is also considered to be conservative as facilities such as Meijer Distribution would receive shipments via the highway routes that provide a more direct supply route than the Dixie Highway. The potentially hazardous chemicals shown in Table 2.2-202 are as follows:

Chemical	**Location Used At**	**Maximum Shipment Amount**
Fluoride (Hydrolfluosilicic Acid)	Frenchtown Township Water Treatment Plant	1,250 gallons
Chlorine	Berlin Township Wastewater Treatment Plant	600 lbs (4 cylinders max at 150 lbs pre cylinder)
Anhydrous Ammonia	Meijer Distribution	1200 gallons

The methodology in RG 1.78, Appendix A, along with the following inputs to determine maximum allowable quantities of these chemicals on the Dixie Highway.

- Consistent with RG 1.78, Regulatory Position 3.1, toxicity limits are based on the immediately dangerous to life and health (IDLH) exposure level concept.

- The initial evaluation, for chemicals not screened out as described above, uses the simplified methodology in RG 1.78, Appendix A. The key inputs to the simplified methodology are as follows:

    - The distance from the control room is taken at the closest distance from the Dixie Highway.
    - The amount of each chemical is taken from FSAR Tables 2.2-202; shown in the above Table.
    - The control room air exchange rate is 0.4 volumes per hour.
    - A Pasquill stability category of "G" is used. This is used for conservatism.

Using this method, the maximum allowable quantity for each chemical is as follows:

Chemical	IDLH (mg/m^3)	Maximum Allowable Quantity (lbs)
Fluoride (Hydrolfluosilicic Acid)	250	20,220
Chlorine	30	2,426
Anhydrous Ammonia	210	16,985

The maximum allowable quantities determined based on not exceeding the IDLH are all greater than the shipment amount on the Dixie Highway.

Transportation of larger quantities of potentially hazardous materials on the nearby interstate highways was also considered. An accident involving a tanker truck carrying the maximum expected quantity of either anhydrous ammonia or chlorine was considered. These chemicals were considered based on usage in the general area and toxicity relative to other potential hazards. The tank truck capacities for chlorine and anhydrous ammonia are shown in the following table:

Chemical	Maximum Shipment Amount
Chlorine	22 Tons
Anhydrous Ammonia	11,500 gallons (~60,000 pounds)

The transportation accident is postulated to occur at the closest point from the interstate highway (I-75) to Fermi 3; 4.1 miles per the previous discussion from the FSAR. The methodology from RG 1.78, Appendix A, is used to determine the maximum quantity that could be spilled at 4.1

miles and not exceed the IDLH at the Fermi 3 control room. The evaluation shows that maximum shipment amounts on the interstate highways are less than the quantities determined based on not exceeding the associated IDLH.

In summary, as shown above, a transportation accident on Dixie Highway or the Interstate will not adversely impact the Fermi 3 control room operators.

Proposed COLA Revision

None

Attachment 7
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3570)

RAI Question No. 02.04.02-2

NRC RAI 02.04.02-2

During the site audit, DTE indicated that storm orientation and size adjustment was not conducted in the derivation of the probable maximum precipitation (PMP) in the FSAR. Additionally, the derivation of PMP for the Swan Creek watershed is not clear in the FSAR. There is no discussion that orientation and size was addressed during the determination of the PMP.

Please provide additional discussion and/or justification that the PMP water depth provided in the FSAR would meet the methodology specified in method HMR52.

Response

FSAR Section 2.4.3.1 states,

> "The PMP was developed according to the procedures outlined in HMR No. 51, No. 52, and No. 53. The PMP values were estimated based on the size and shape of the Swan Creek Watershed drainage area, in accordance with the procedures outlined in HMR no. 52."

The analysis of the PMP in the Swan Creek Watershed is performed based on HMR 51; which does not include storm orientation and size adjustment. It has been determined that using HMR 51 provided conservative results.

The local PMP is performed based on HMR 51 and HMR 52. FSAR section 2.4.2.3 states,

> "HMR No. 52 lists the multiplying factors to convert the 26 km^2 (10 mi^2) area PMP values to relative 2.6 km^2 (1 mi^2) PMP values."

HMR 52 was used to obtain the multiplication factors for shorter durations, specifically the 5 minute duration assumed for the site. The resulting PMP depths can be found in Table 2.4-211.

A snowmelt analysis was performed in response to RAI 3354. As part of this analysis, PMP calculations were refined using the HMR 52 software. The HMR 52 software follows HMR 52 guidelines. Storm orientation and size, and other parameters including watershed shape and spatial distribution of the PMP were taken into account in the refined PMP calculations used in the snowmelt analysis. For a complete description of the snowmelt analysis, including inputs and assumptions used for the updated PMP calculations, refer to the response to RAI 3354.

Proposed COLA Revision

FSAR Section 2.4.3.1 will be updated to clarify that the regional PMP values were determined in accordance with the procedures outlined in HMR No. 51. The proposed mark-up is attached.

Markup of Detroit Edison COLA
(following 1 page)

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA Revision 2. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

gauge 04163500, which is a 61.6 km^2 (23.8 mi^2) watershed near Utica, MI. Data recorded from 1954 through 1966 was used for these estimates. The Swan Creek 10 percent, 2 percent, 1 percent, 0.5 percent, and 0.2 percent peak flow rates are estimated to be 70, 100, 120, 130, and 140 m^3/s (2500, 3700, 4100, 4600, and 5000 cfs), respectively (Reference 2.4-244).

Other streams and rivers near the Fermi site include Stony Creek, about 5 km (3 mi) southwest, the River Raisin about 9.6 km (6 mi) southwest, and the Huron River about 9.25 km (5.75 mi) north. These water bodies are far enough away from the site that even the most severe flooding would not cause a potential hazard to Fermi 3.

On site flooding due to runoff is covered in Subsection 2.4.2. Seismic information is discussed in detail in Subsection 2.5.1. Seismic events are not expected to have an impact on flooding at the site.

2.4.3.1 Probable Maximum Precipitation

The PMF of Swan Creek was determined based on PMP estimates. The PMP was developed according to the procedures outlined in Hydrometeorological Reports (HMR) No. 51, ~~No. 52, and No. 53~~ (Reference 2.4-236). The PMP values were estimated based on the size ~~and shape~~ of the Swan Creek Watershed drainage area, in accordance with the procedures outlined in HMR No. ~~52~~ 51.

HMR No. 51 data used to generate depth-area-duration curves consisted of historical precipitation maps based on 6 to 72-hour rainfall storms for various watershed areas located east of the 105^{th} meridian. The evaluated watershed areas ranged from 26 to 26,000 km^2 (10 to 10,000 mi^2). The Swan Creek Watershed depth-area-duration curves from 6 to 72-hour rainfall storms were produced by interpolating this data.

As indicated in ANSI/ANS-2.8-1992, an antecedent storm condition was assumed. Furthermore, the isohyetal pattern was oriented over the watershed to obtain the maximum precipitation volume over the entire drainage area. The evaluation yielded a PMP of 79.8 cm (31.4 inches) for the watershed. Table 2.4-216 presents the PMP values for the Swan Creek Watershed.

Guidance from ANSI/ANS-2.8-1992 was followed in determining the time distribution of the PMP. The incremental PMP values were grouped in a critical time sequence that represented the most significant potential rainfall impact within the watershed. This sequence was chosen based

Attachment 8
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3422)

RAI Question No. 02.04.13-7

NRC RAI 02.04.13-7

The staff has reviewed the FSAR Section 2.4.13, Accidental Releases of Radioactive Liquid Effluents in Ground and Surface Water. In accordance with 100.20(c) and 52.79(a)(1)(iii), the NRC staff requests additional explanation and justification for the selection of the release point in the accidental release analysis. The applicant identified the release point as the Radwaste Building in FSAR Section 2.4.12. The applicant should provide a discussion for its rationale for selecting distances to potential receptors from the center of the Reactor Building, or else provide a transport analysis based on the actual release point that is assumed. Additionally, the applicant should provide justification that the use of the porosity of 1% is appropriate in the transport analysis.

Response

In response to NRC RAI 02.04.13-1 and RAI 02.04.13-6 (Detroit Edison Letter to the NRC, NRC3-09-0026, dated September 1st, 2009), Detroit Edison provided a description, including proposed mark-ups to the FSAR, Section 2.4.13, of a revised analysis of the potential accidental releases of radioactive liquid effluents in ground water.

In response to RAI 02.04.13-6, Detroit Edison described the process that was used to determine the models for the analysis. As described in the response to RAI 02.04.13-6, the potential source of release of radioactive liquid is from the radwaste building, and not the reactor building. Two different possible receptors are considered in the analysis. As described in the response to RAI 02.04.13-6,

> "The distances from the source to each receptor are conservatively selected. For the path from the radwaste building to the well off-site to the west, the source location is assumed to be the closest western side of the radwaste building. For the path from the radwaste building to Lake Erie, the source is assumed to be the closest eastern edge of the radwaste building."

Therefore, in the revised analysis, the distances from the source (radwaste building) to each postulated receptor is modeled conservatively.

In the response to RAI 02.04.13-6, Detroit Edison provided additional justification, including source documentation, for the porosity values used in the analysis.

Proposed COLA Revision

No update to the COLA is required for this RAI. COLA updates were provided as part of the responses to RAI 02.04.13-1 and RAI 02.04.13-6 (Detroit Edison Letter to the NRC, NRC3-09-0026, dated September 1st, 2009).

Attachment 9
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3410 Revision 1)

RAI Question No. 13.03-017-01

NRC RAI 13.03-017-01

NUREG-0800, "Standard Review Plan," Table 14.3.10-1, "Emergency Planning Generic Inspections, Tests, Analyses, and Acceptance Criteria," describes an acceptable set of generic emergency planning ITAAC. The following generic ITACC items were not included in Table 2.3-1, "ITAAC For Emergency Planning" in Part 10 "ITAAC" of the COL Application for Fermi unit 3: EP Program Elements 1.1, 2.1, 8.1 (Acceptance criteria 8.1.2, 8.1.3 and 8.1.5), 8.2 (Acceptance criteria 8.2.2 and 8.2.4), 8.3, 8.4, 8.5, 8.6, 9.5, 9.6, 10.2, 10.3, 10.4, 11.1, 11.2, 11.3, 11.4, 12.1, 12.2, 12.3, 14.1, 15.1, 16.1 and 17.1. Provide missing ITAAC elements or an explanation for why the missing ITAAC are not required.

Response

Detroit Edison will revise the proposed Emergency Planning ITAAC Table 2.3-1 to include ITAAC 1.1 and 2.1 recommended in Reg. Guide 1.206. Table 2.3-1 will be renumbered to match the numbering scheme provided in Table C.II.1-B1 Emergency Planning—Generic Inspection, Test, Analysis, and Acceptance Criteria (EP-ITAAC) in Reg. Guide 1.206.

Reg. Guide 1.206 Acceptance Criterion 8.1.2 states, "the TSC is close to the control room, and the walking distance from the TSC to the control room does not exceed two minutes. [Advanced communication capabilities may be used to satisfy the two minute travel time.] [The COL applicant will adopt design certification criteria, if applicable, or otherwise specify TSC location.]"

As provided in Reg. Guide 1.206, Detroit Edison has adopted the ESBWR design criteria for the TSC. The proposed Acceptance Criterion 8.1.3 (currently numbered Acceptance Criteria 5.1.3 in Rev. 0 of the COLA Part 10 Table 2.3-1) addresses this guidance by requiring confirmation that the TSC has been located in the Electrical Building, as specified in the ESBWR DCD.

Reg. Guide 1.206 Acceptance Criterion 8.1.3 states, "the TSC has comparable habitability with the control room under accident conditions. [The COL applicant will adopt design certification criteria, if applicable, or otherwise identify specific capabilities.]"

As noted in Reg. Guide 1.206, Detroit Edison has adopted the ESBWR design criteria for the TSC. Detroit Edison has determined that certain aspects related to the ESBWR design must be verified and provided specific Acceptance Criteria to address the equipment requirements needed to ensure the TSC has been built to DCD specifications. Specifically, the following Acceptance Criteria are provided in Table 2.3-1:

8.1.4 (currently numbered Acceptance Criteria 5.1.4 in Rev. 0 of the COLA Part 10 Table 2.3-1) A report exists that confirms the TSC includes radiation monitors and a ventilation system with a high efficiency particulate air (HEPA) and charcoal filter.

8.1.5 (currently numbered Acceptance Criteria 5.1.5 in Rev. 0 of the COLA Part 10 Table 2.3-1) A report exists that confirms a back-up electrical power supply is available for the TSC.

Reg. Guide 1.206 Acceptance Criterion 8.1.5 states, "the TSC has the means to receive, store, process, and display plant and environmental information, and to initiate emergency measures and conduct emergency assessment. [The COL applicant will adopt design certification criteria, if applicable, or otherwise identify specific capabilities.]"

As provided in Reg. Guide 1.206, Detroit Edison has adopted the ESBWR design criteria for the TSC. Detroit Edison has included a proposed new Acceptance Criterion 8.1.6 in Table 2.3-1, as suggested by Reg. Guide 1.206.

As provided in Reg. Guide 1.206 Acceptance Criterion 8.2.2, Detroit Edison has proposed new Acceptance Criteria related to EOF habitability design specifications provided in subsection II.H.1.d of the Fermi 3 Emergency Plan (Table 2.3-1, Acceptance Criteria 8.2.2, 8.2.3, 8.2.4)

Proposed new Acceptance Criteria 8.3, 8.4, 8.5, 8.6, 9.5, 9.6, 10.2, 10.3, 10.4, 11.1, 11.2, 11.3, 11.4, 12.1, 12.2, 12.3, 14.1.3, 15.1, 16.1, and 17.1 addressing those suggested by Reg. Guide 1.206 have been included in Table 2.3-1.

The proposed changes to Table 2.3-1 are shown in the attached mark-up.

Proposed COLA Revision

Attachment 21 of this letter contains the proposed COLA Part 10 mark-up of Table 2.3-1.

Attachment 10
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3410 Revision 1)

RAI Question No. 13.03-017-02

NRC RAI 13.03-017-02

Table 2.3-1 Acceptance Criterion 2.1.1 does not include language regarding notification of State and local agencies within 15 minutes. The corresponding NUREG-0800, Table 14.3.10-1, Acceptance Criteria 5.1 describes the ability to notify the State and local agencies within 15 minutes. Revise Acceptance Criterion 2.1.1 to be consistent with Table 14.3.10-1 Acceptance Criterion 5.1 or propose an acceptable alternative.

Response

Detroit Edison will include the 15 minute criteria in Acceptance Criteria 5.1.1 (currently numbered Acceptance Criteria 2.1.1 in Rev. 0 of the COLA Part 10 Table 2.3-1) in a future revision to COLA Part 10 Table 2.3-1.

Proposed COLA Revision

Attachment 21 of this letter contains the proposed COLA Part 10 mark-up of Table 2.3-1.

Attachment 11
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3410 Revision 1)

RAI Question No. 13.03-017-03

NRC RAI 13.03-017-03

Table 2.3-1 Acceptance Criterion for program element 3.1 describes the communication tests to be performed between ERFs. The tests described are not consistent with the capabilities described in Table 14.3.10-1 of NUREG-0800. The corresponding NUREG-0800 Acceptance Criteria for program element 6.1 describes communications capabilities among the control room, TSC, EOF, principal State and local EOCs, and radiological field assessment teams. Revise program element 3.1 to be consistent with Table 14.3.10-1 Acceptance Criterion 6.1 or propose an acceptable alternative.

Response

Detroit Edison will revise Program Element 6.1 (currently numbered Program Element 3.1 in Rev. 0 of the COLA Part 10 Table 2.3-1) in a future revision to COLA Part 10 Table 2.3-1. 1 to be consistent with Program Element 6.1 in Table C.II.1-B1 of Reg. Guide 1.206

Proposed COLA Revision

Attachment 21 of this letter contains the proposed COLA Part 10 mark-up of Table 2.3-1.

Attachment 12
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3410 Revision 1)

RAI Question No. 13.03-017-04

NRC RAI 13.03-017-04

Table 2.3-1 Acceptance Criterion 4.1 describes a Joint Information Center that has space for a limited number of news media. NUREG-0800, Table 14.3.10-1, corresponding Acceptance Criteria 7.1 states the applicant will specify the number of news media to be accommodated. Identify the specific number of news media accommodated in Acceptance Criterion 4.1 in the COL Application to be consistent with NUREG-0800 Acceptance Criterion 7.1 or propose an acceptable alternative.

Response

Fermi 3 plans to use the Monroe Community College (MCC) cafeteria as an Emergency News Center (ENC). As noted in the Fermi 2 SSER, Emergency Planning Evaluation, (see excerpt in Enclosure 1), Fermi 2 utilizes the MCC cafeteria as an ENC. The Joint Public Information Center (JPIC) is located near the ENC. The ENC is expected to hold as many as 500 news media personnel.

Detroit Edison will revise Acceptance Criterion 7.1(currently numbered Acceptance Criteria 4.1 in Rev. 0 of the COLA Part 10 Table 2.3-1) to be consistent with Acceptance Criterion 7.1 in Table C.II.1-B1 of Reg. Guide 1.206.

Proposed COLA Revision

Attachment 21 of this letter contains the proposed COLA Part 10 mark-up of Table 2.3-1.

Enclosure 1
NRC3-09-0029

Excerpt from Fermi 2 SSER (NUREG-0798)
(following 1 page)

Emergency Plan Evaluation

The Detroit Edison public education and information program is summarized in the emergency plan. Details of the program are contained in a separate document, the Emergency Communications Plan. Information will be provided to the public regarding how they will be notified in the event of an emergency and what their actions should be. This information will include (1) educational information on radiation, (2) contact for additional information, (3) protective measures (e.g., sheltering, evacuation routes, reception/care centers, and maps), and (4) special instructions for the handicapped. The information will be mailed at least annually to each dwelling in the plume exposure pathway EPZ.

The public information brochures have not yet been submitted to the NRC for NRC and FEMA review. The staff will require that draft brochures be submitted for review and comment before fuel loading and that the brochures be distributed to the public before plant operation above 5% of rated power.

Other means for providing information to the public will include advertisements placed in local newspapers at least once a year, presentations at school programs, and speeches at community meetings. Transients in the plume exposure EPZ will be reached by the posting of information notices in such places as motels, trailer camps, park entrances, and other locations.

Arrangements have been made with the Monroe County Community College (about 10 mi southwest of the plant) for the use of the school cafeteria as an emergency news center in the event of a serious emergency condition. The cafeteria can accommodate up to 500 persons. Initially there will be 25 telephone lines dedicated for use by media representatives, and arrangements have been made with the local telephone company to expand the number of lines to 500 within several days if necessary. Provisions have also been made for a near-site emergency news center in the nuclear operations center (NOC), which will accommodate up to 50 news media personnel. The NOC is approximately I mi southwest of the plant on owner-controlled property and is the same building in which the emergency operations facility is located.

The company has designated the Vice President - Engineering and Construction, or his delegate, as the spokesperson for Detroit Edison in the event of an emergency. This spokesperson and his staff will be in communication with designated personnel in the onsite emergency response facilities. Information will be released to the news media by the spokesperson through the joint public information center (JPIC). The JPIC is located near the emergency news center at the Monroe County Community College. Public information officers from the company as well as from Federal, State, and local organizations will coordinate their activities at the JPIC. A rumor control office will also be established in conjunction with the JPIC.

Detroit Edison will conduct an annual program to acquaint the news media with the emergency plans and information concerning radiation.

The following item requires resolution:

-Submit draft public information brochures for NRC and FEMA review before fuel loading and commit to distribute the brochures to the public before operation above 5% of rated power.

Attachment 13
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3410 Revision 1)

RAI Question No. 13.03-017-05

NRC RAI 13.03-017-05

Table 2.3-1 Acceptance Criterion 5.1.1 describes a TSC of 1,875 square feet. NUREG-0800, Table 14.3.10-1, corresponding Acceptance Criteria 8.1.1 describes a TSC consistent with NUREG-0696, which details 75 square feet per person. The Fermi plan describes a TSC capable of supporting 26 people, which equates to 1,950 square feet. Revise the TSC square footage value or, explain the difference between Acceptance Criterion 5.1.1 TSC square footage in the COL Application and NUREG-0800 Acceptance Criterion 8.1.1.

Response

According to the ESBWR DCD, Revision 5, Chapter 13, the Technical Support Center (TSC) is of sufficient size to support 26 people addressing guidance in Section 2 of NUREG-0696, which suggests a minimum staffing of 25 people. The dimensions of the TSC can be found in the ESBWR DCD, Revision 5, Chapter, Figure 1.2-26.

The original value of 1,875 square feet was used in Acceptance Criterion 8.1.1 (currently numbered Acceptance Criteria 5.1.1 in Rev. 0 of the COLA Part 10 Table 2.3-1) to be consistent with the R-COLA, which was based on guidance of approximately 25 people. Detroit Edison does not intend to deviate from the standard plant design. Acceptance Criterion 8.1.1 (currently numbered Acceptance Criteria 5.1.1 in Rev. 0 of the COLA Part 10 Table 2.3-) will be revised to demonstrate sufficient space to support the required number of people as described in the DCD.

Proposed COLA Revision

Attachment 21 of this letter contains the proposed COLA Part 10 mark-up of Table 2.3-1.

Attachment 14
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3410 Revision 1)

RAI Question No. 13.03-017-06

NRC RAI 13.03-017-06

Table 2.3-1 Acceptance Criterion 5.2.1 describes an EOF of 2,625 square feet. NUREG-0800, Table 14.3.10-1 corresponding Acceptance Criteria 8.2.1 describes an EOF consistent with NUREG-0696, which details 75 square feet per person. The Fermi plan describes an EOF capable of supporting 40 people which equates to 3,000 square feet. Revise the EOF square footage value or, explain the difference between Acceptance Criterion 5.2.1 EOF square footage in the COL Application and NUREG-0800 Acceptance Criterion 8.2.1.

Response

The original value of 2,625 square feet was used in Acceptance Criterion 8.2.1 (currently numbered Acceptance Criteria 5.2.1 in Rev. 0 of the COLA Part 10 Table 2.3-1) to be consistent with the R-COLA, which is based on NUREG-0696 guidance to accommodate 35 people. However, the R-COLA and Detroit Edison do not have the same size Emergency Office Facility (EOF), nor the requirement to support the same number of people within the EOF. Acceptance Criterion 8.2.1(currently numbered Acceptance Criteria 5.2.1 in Rev. 0 of the COLA Part 10 Table 2.3-1) will be revised to demonstrate sufficient space (consistent with NUREG-0696) to support the number of people described in the Fermi plan.

Proposed COLA Revision

Attachment 21 of this letter contains the proposed COLA Part 10 mark-up of Table 2.3-1.

Attachment 15
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3410 Revision 1)

RAI Question No. 13.03-017-07

NRC RAI 13.03-017-07

Table 2.3-1 Acceptance Criterion 5.2.3 describes tests to be performed to demonstrate communications capabilities of the EOF. NUREG-0800, Table 14.3.10-1 corresponding Acceptance Criteria 8.2.3 describes communications capabilities among the control room, TSC, NRC, and State and local agencies. Revise Acceptance Criterion 5.2.3 to be consistent with Table 14.3.10-1 Acceptance Criterion 8.2.3 or propose an acceptable alternative.

Response

Detroit Edison's proposed ITAAC Acceptance Criterion 8.2.6 (currently numbered Acceptance Criteria 5.2.3 in Rev. 0 of the COLA Part 10 Table 2.3-1) will be revised for consistency with Reg. Guide 1.206 Table C.II.1-B1 to include confirmation of voice transmission and reception between the EOF, Control Room, TSC, and the following organizations: NRC, State of Michigan, Monroe County, and Wayne County.

Proposed COLA Revision

Attachment 21 of this letter contains the proposed COLA Part 10 mark-up of Table 2.3-1.

Attachment 16
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3410 Revision 1)

RAI Question No. 13.03-017-08

NRC RAI 13.03-017-08

Table 2.3-1 Acceptance Criterion 6.2.1 is missing a description of being able to determine the magnitude of a release of radioactive materials based on plant system parameters and effluent monitors. NUREG-0800, Table 14.3.10-1 corresponding Acceptance Criteria 9.2 describes the ability to determine the magnitude of a release of radioactive materials based on plant system parameters and effluent monitors. Revise Acceptance Criterion 6.2.1 to be consistent with Table 14.3.10-1 Acceptance Criterion 9.2 or propose an acceptable alternative.

Response

Detroit Edison will revise Acceptance Criterion 9.2 (currently numbered Acceptance Criteria 6.2.1 in Rev. 0 of the COLA Part 10 Table 2.3-1) to be consistent with Acceptance Criterion 9.2 in Table C.II.1-B1 of Reg. Guide 1.206.

Proposed COLA Revision

Attachment 21 of this letter contains the proposed COLA Part 10 mark-up of Table 2.3-1.

Attachment 17
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3410 Revision 1)

RAI Question No. 13.03-017-09

NRC RAI 13.03-017-09

Table 2.3-1 Acceptance Criterion 6.3 ends with the words "...for various radiological conditions." NUREG-0800, Table 14.3.10-1 corresponding Acceptance Criteria 9.3 ends with the words "...for various meteorological conditions." Revise Acceptance Criterion 6.3 to be consistent with Table 14.3.10-1 Acceptance Criterion 9.3 or propose an acceptable alternative.

Response

Detroit Edison will correct the error in Table 2.3-1 to end with the wording, "for various meteorological conditions."

Proposed COLA Revision

Attachment 21 of this letter contains the proposed COLA Part 10 mark-up of Table 2.3-1.

Attachment 18
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3410 Revision 1)

RAI Question No.13.03-017-10

NRC RAI 13.03-017-10

Table 2.3-1 Acceptance Criterion 6.4 describes a test to be performed to demonstrate the ability to communicate meteorological data to the control room, TSC and EOF. NUREG-0800, Table 14.3.10-1 corresponding Acceptance Criteria 9.4 describes the need to demonstrate the ability to communicate meteorological data to the control room, TSC, EOF, offsite NRC center and State. Revise Acceptance Criterion 6.4 to be consistent with Table 14.3.10-1 Acceptance Criterion 9.4 or propose an acceptable alternative.

Response

Detroit Edison will revise Acceptance Criterion 9.4 (currently numbered Acceptance Criteria 6.4 in Rev. 0 of the COLA Part 10 Table 2.3-1) to include the offsite NRC center and the State of Michigan as suggested by Reg. Guide 1.206 Table C.II.1-B1 corresponding Acceptance Criterion 9.4.

Proposed COLA Revision

Attachment 21 of this letter contains the proposed COLA Part 10 mark-up of Table 2.3-1.

Attachment 19
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3410 Revision 1)

RAI Question No. 13.03-017-11

NRC RAI 13.03-017-11

Table 2.3-1 Acceptance Criterion 6.7 is missing the description of a means to compare estimated integrated dose from the projected and actual dose rates results to the EPA protective action guides (PAGs). NUREG-0800, Table 14.3.10-1 corresponding Acceptance Criteria 9.9 describes the need for a means to compare estimated integrated dose from the projected and actual dose rates results to the EPA protective action guides (PAGs). Revise Acceptance Criterion 6.7 to be consistent with Table 14.3.10-1 Acceptance Criterion 9.9 or propose an acceptable alternative.

Response

Detroit Edison will revise Acceptance Criterion 9.9 (currently numbered Acceptance Criteria 6.7 in Rev. 0 of the COLA Part 10 Table 2.3-1) to be consistent with Reg. Guide 1.206 Table C.II.1-B1 corresponding Acceptance Criterion 9.9.

Proposed COLA Revision

Attachment 21 of this letter contains the proposed COLA Part 10 mark-up of Table 2.3-1.

Attachment 20
NRC3-09-0029

Response to RAI Letter No. 11
(eRAI Tracking No. 3410 Revision 1)

RAI Question No. 13.03-017-12

NRC RAI 13.03-017-12

Table 2.3-1 Acceptance Criterion 8.1.2.1 and 8.1.2.2 describe the conduct of the required licensee full participation evaluated exercise to be successfully performed prior to 5% reactor power. Missing from the description is the use of the term "successful" as it applies to ERO ERF staffing and performance. NUREG-0800, Table 14.3.10-1 corresponding Acceptance Criteria 14.1.2 states that the ERO ERF staffing and performance needs to be found "successful." Revise Acceptance Criterion 8.1.2.1 and 8.1.2.2 to be consistent with Table 14.3.10-1 Acceptance Criterion 14.1.2 or propose an acceptable alternative.

Response

The phrase used in Reg. Guide 1.206, Table C.II.1-B1 Acceptance Criteria 14.1.2, "and they successfully performed their assignments," is subjective. Objectively, exercise performance "success" will based on the absence of any noted deficiencies. Accordingly, Acceptance Criterion 14.1.2.1 (currently numbered Acceptance Criteria 8.1.2.1 in Rev. 0 of the COLA Part 10 Table 2.3-1) in Table 2.3-1 will be revised to indicate that emergency response personnel were mobilized to fill response positions *and there were no uncorrected onsite exercise deficiencies.* Similarly, Acceptance Criterion 14.1.2.2 (currently numbered Acceptance Criteria 8.1.2.2 in Rev. 0 of the COLA Part 10 Table 2.3-1) will be revised to indicate that emergency response personnel performed their assigned responsibilities *and there were no uncorrected onsite exercise deficiencies.* These revised Acceptance Criteria can be objectively evaluated during and exercise and appropriately documented for ITAAC closure.

Proposed COLA Revision

Attachment 21 of this letter contains the proposed COLA Part 10 mark-up of Table 2.3-1.

Attachment 21
NRC3-09-0029

Proposed COLA PART 10 Table 2.3-1 Revisions

Markup of Detroit Edison COLA
(following 21 pages)

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA Revision 2. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

Table 2.3-1 ITAAC For Emergency Planning			
Planning Standard	**EP Program Elements**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1.0 Assignment of Responsibility – Organizational Control			
10 CFR 50.47(b)(1) – Primary responsibilities for emergency response by the nuclear facility licensee, and by State and local organizations within the EPZs have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principle response organization has staff to respond and to augment its initial response on a continuous basis.	1.1 The staff exists to provide 24-hour per day emergency response and manning of communications links, including continuous operations for a protracted period. [A.1.e, A.4] ITAAC Element addressed in COL EP II.A.1.b, II.A.1.e	1.1 An inspection of the implementing procedures or staffing rosters will be performed.	1.1 A report exists that confirms emergency plan implementing procedures provide for 24-hour per day emergency response staffing and manning of communications links, including continuous operations for a protracted period.

Table 2.3-1 ITAAC For Emergency Planning			
Planning Standard	**EP Program Elements**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
2.0 Onsite Emergency Organization			
10 CFR 50.47(b)(2) – On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available, and the interfaces among various onsite response activities and offsite support and response activities are specified.	2.1 The staff exists to provide minimum and augmented on-shift staffing levels, consistent with Table B-1 of NUREG-0654/FEMA-REP-1, Rev. 1. [B.5, B.7] ITAAC Element addressed in COL EP II.B.3, II.B.4, II.B.6, Table II.B-1	2.1 An inspection of the implementing procedures or staffing rosters will be performed.	2.1 A report exists that confirms emergency plan implementing procedures provide minimum and augmented on-shift staffing levels, consistent with Table II.B-1 of the Fermi 3 Emergency Plan.

Table 2.3-1 ITAAC For Emergency Planning			
Planning Standard	**EP Program Elements**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
3.0 Emergency Response Support and Resources			
10 CFR 50.47(b)(3) – Arrangements for requesting and effectively using assistance resources have been made, arrangements to accommodate State and local staff at the licensee's near-site Emergency Operations Facility have been made, and other organizations capable of augmenting the planned response have been identified.	Not used. Provided for consistency with Reg. Guide 1.206 Table C.II.1-B1 Emergency Planning—Generic Inspection, Test, Analysis, and Acceptance Criteria (EP-ITAAC) ITAAC numbering scheme.	Not used. Provided for consistency with Reg. Guide 1.206 Table C.II.1-B1 Emergency Planning—Generic Inspection, Test, Analysis, and Acceptance Criteria (EP-ITAAC) ITAAC numbering scheme.	Not used. Provided for consistency with Reg. Guide 1.206 Table C.II.1-B1 Emergency Planning—Generic Inspection, Test, Analysis, and Acceptance Criteria (EP-ITAAC) ITAAC numbering scheme.

Table 2.3-1
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Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
~~14~~.0 Emergency Classification System			
10 CFR 50.47(b)(4) – A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.	~~14~~.1 A standard emergency classification and emergency action level (EAL) scheme exists, and identifies facility system and effluent parameters constituting the bases for the classification scheme. [D.1**] [**D.1 corresponds to NUREG-0654/FEMA-REP-1 evaluation criteria.] ITAAC element addressed in: COL EP II.D.1~~, Appendix 3~~	~~14~~.1 An inspection of the control room, technical support center (TSC), and emergency operations facility (EOF) will be performed to verify that they have displays for retrieving facility system and effluent parameters that constitute the bases for the classification scheme in Emergency Plan Implementing Procedure, "Emergency Classification. ~~identified in the following list of EALs (Reference Appendix 3, Part 5, Emergency Plan)~~ ~~Abnormal Rad Levels/Radiological Effluents: AU1, (EALs 1,2), AU2, AA1 (EALs 1, 2), AA2, AA3, AS1 (EALs 1), AG1 (EAL 1)~~ ~~Cold Shutdown Refueling System Malfunction CU1, CU2, CU3, CU4, CU7, CU8, CA1, CA4, CS1, CG2~~ ~~Fission Product Barrier Thresholds:~~ ~~Fuel Clad Barrier Thresholds Values:~~ ~~1. Reactor Vessel Water Level.~~ ~~2. Primary Containment Radiation Monitoring~~ ~~3. Other Indications~~ ~~RCS Barrier Threshold Values:~~ ~~1. Primary Containment Pressure~~ ~~2. Reactor Vessel Water Level~~ ~~3. RCS Leak Rate~~ ~~4. Primary Containment Radiation Monitoring.~~ ~~Containment Barrier Threshold Values:~~ ~~1. Primary Containment Conditions~~ ~~2. Primary Containment Isolation Failure or Bypass~~ ~~3. Primary Containment Radiation Monitoring~~ ~~Hazards or Other Conditions Affecting Plant Safety: HU1 (EAL 2), HA1 (EALs 1,2)~~ ~~System Malfunction: SU1, SU4 (EAL 1), SU8, SA1, SA2, SA4, SS1, SS2, SS3, SS6, SG1, SG2~~	~~14~~.1.1 A report exists that confirms the specific parameters identified in the EALs listed in ITA Section ~~14~~.1 have been retrieved and displayed in the control room, TSC, and EOF. ~~14~~.1.2 A report exists that confirms the ranges available in the control room, TSC, and EOF encompasses the values for the specific parameters identified in the EALs listed in ITA Section ~~14~~.1.

Table 2.3-1
ITAAC For Emergency Planning

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
~~2~~5.0 Notification Methods and Procedures			
10 CFR 50.47(b)(5) – Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and follow-up messages to response organizations and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.	~~2~~5.1 The means exist to notify responsible State and local organizations within 15 minutes after the licensee declares an emergency. [E.1] ITAAC element addressed in: COL EP II.E.1	~~2~~5.1 A test will be performed of the capabilities.	~~2~~5.1.1 A report exists that confirms communications have been established via Ringdown Phone System among the control room, the State of Michigan, Monroe County, and Wayne County within 15 minutes after an emergency has been declared.
	~~2~~5.2 The means exist to notify emergency response personnel. [E.2] ITAAC element addressed in: COL EP II.E.1	~~2~~5.2 A test will be performed of the capabilities.	~~2~~5.2 A report exists that confirms notification to the Fermi 3 emergency response organization has been performed.
	~~2~~5.3 The means exists to notify and provide instructions to the populace within the plume exposure EPZ. [E.6] ITAAC element addressed in: COL EP II.E.2 & E.5	NOTE: The means to notify and provide instructions to the populace within the plume exposure EPZ is addressed by Acceptance Criteria ~~8~~14.1.1.2.	

Table 2.3-1 ITAAC For Emergency Planning			
Planning Standard	**EP Program Elements**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
~~3~~6.0 Emergency Communications			
10 CFR 50.47(b)(6) – Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.	~~3~~6.1 The means exist for communications among the control room, TSC, EOF, principal State, and local, ~~and provincial~~ emergency operations centers (EOCs), and radiological emergency teams. [F.1.d] ITAAC element addressed in: COL EP II.F.1 .A & B	~~3~~6.1 A test will be performed of the capabilities.	~~3.1.1 A report exists that confirms communications have been established among the control room, OSC, and TSC.~~ ~~3.1.2 A report exists that confirms communications have been established among the control room, TSC, and EOF.~~ ~~3~~6.1.~~3~~ 1 A report exists that confirms communications via the Ringdown Phone System have been established among the Control Room, TSC, EOF, State of Michigan, Monroe County, Wayne County, and the Province of Ontario, Canada. ~~3~~6.1.~~4~~ 2 A report exists that confirms communications have been established between the TSC and radiological monitoring teams.
	~~3~~6.2 The means exist for communications from the control room, TSC, and EOF to the NRC headquarters and regional office EOCs (including establishment of the Emergency Response Data System (ERDS) between the onsite computer system and the NRC Operations Center.) [F.1.f] ITAAC element addressed in: COL EP II.F.1.A.5	~~3~~6.2 A test will be performed of the capabilities.	~~3~~6.2 A report exists that confirms communications have been established from the control room, TSC, and EOF to NRC Headquarters and Region III EOCs, and an access port for ERDS is provided.

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Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
47.0 Public Education and Information			
10 CFR 50.47(b)(7) – Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.	47.1 The licensee has provided space which may be used for a limited number of the news media at the near-site Emergency Operations Facility (EOF) [G.3.b] ITAAC element addressed in: COL EP II.G.3 & 4	47.1 An inspection of the Joint Information Center will be performed to verify that space is provided for a limited number of the news media.	47.1 A report exists that confirms that the Joint Information Center has space for ~~a limited number of news media~~approximately 500 news media personnel.

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Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
~~5~~8.0 Emergency Facilities and Equipment			
10 CFR 50.47(b)(8) – Adequate emergency facilities and equipment to support the emergency response are provided and maintained.	~~5~~8.1 The licensee has established a technical support center (TSC) and onsite operations support center (OSC). [H.1] ITAAC element addressed in: COL EP II.H.1 .b & c	~~5~~8.1.1 An inspection of the as-built TSC and OSC will be performed.	~~5~~8.1.1 A report exists that confirms the TSC had at least ~~174~~ 182 square meters (~~1875~~ 1950 square feet) of floor space. ~~5~~8.1.2 A report exists that confirms the following communications equipment has been provided in the TSC and voice transmission and reception have been accomplished: • NRC systems: Emergency Notification System (ENS), Health Physics Network (HPN), Reactor Safety Counterpart Link (RSCL), Protective Measures Counterpart Link (PMCL), Management Counterpart Link (MCL) • Dedicated telephone to EOF • Dedicated telephone to control room • Dedicated telephone to OSC ~~5~~8.1.3 A report exists that confirms the TSC has been located in the Electrical Building. ~~5~~8.1.4 A report exists that confirms the TSC includes radiation monitors and a ventilation system with a high efficiency particulate air (HEPA) and charcoal filter. ~~5~~8.1.5 A report exists that confirms a back-up electrical power supply is available for the TSC. 8.1.6 A report exists that confirms reception, storage, processing, and display of plant and environmental information used to initiate emergency measures and conduct emergency assessment has been accomplished at the TSC. ~~5~~8.1.~~6~~ 7 A report exists that confirms the OSC is in a location separate from the control room. ~~5~~8.1.~~7~~ 8 A report exists that confirms the following communications equipment has been provided in the OSC and voice transmission and reception have been accomplished: • Dedicated telephone to control room • Dedicated telephone to TSC • Plant page system (voice transmission only)

Table 2.3-1 ITAAC For Emergency Planning			
Planning Standard	**EP Program Elements**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	~~5~~8.2 The licensee has established an emergency operations facility (EOF). [H.2] ITAAC element addressed in: COL EP II.H.1.d	~~5~~8.2 An inspection of the EOF will be performed.	~~5~~8.2.1 A report exists that confirms the EOF ~~has at least 243~~is greater than 279 square meters (~~2,625~~3000 square feet). 8.2.2 A report exists that confirms the EOF includes shielding with a protection factor of 20. 8.2.3 A report exists that confirms the EOF includes HVAC system with HEPA filters. 8.2.4 A report exists that confirms the EOF includes portable airborne radioactivity and area radiation monitors with local alarm capability. ~~5~~8.2.~~2~~ 5 A report exists that confirms voice transmission and reception have been accomplished between the EOF and TSC. ~~5~~8.2.~~3~~ 6 A report exists that confirms voice transmission and reception have been accomplished ~~via the Ringdown Phone System among~~between the EOF, the Control Room, TSC, and the following organizations: NRC, the State of Michigan ~~EOC~~, ~~the~~ Monroe County ~~EOC~~, and ~~the~~ Wayne County ~~EOC~~. 8.2.7 A report exists that acquisition, display and evaluation of radiological, meteorological, and plant system data pertinent to determining offsite protective measures has been accomplished at the EOF..
	8.3 The means exists to initiate emergency measures, consistent with Appendix 1 of NUREG-0654/FEMA-REP-1, Rev. 1. [H.5] ITAAC Element addressed in: COL EP II.H.4	8.3 An analysis of emergency plan implementing procedures will be performed.	8.3 A report exists that confirms emergency plan implementing procedures provide a process to initiate emergency measures, consistent with emergency plan implementing procedures.

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Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
	8.4 The means exists to acquire data from, or for emergency access to, offsite monitoring and analysis equipment. [H.6] ITAAC Element addressed in: COL II. C.3, II.H.1.d, II.H.4.a, II.H.4.b. II.H.5.b	8.4 An analysis of emergency plan implementing procedures will be performed.	8.4 A report exists that confirms emergency plan implementing procedures provide a methodology to acquire data from, or for emergency access to, offsite monitoring and analysis equipment.
	8.5 The means exists to provide offsite radiological monitoring equipment in the vicinity of the nuclear facility. [H.7] ITAAC Element addressed in: COL II.H.2 & II.H.6	8.5 An analysis of emergency plan implementing procedures will be performed.	8.5 A report exists that confirms emergency plan implementing procedures provide for offsite radiological monitoring equipment in the vicinity of Fermi 3.
	8.6 The means exists to provide meteorological information, consistent with Appendix 2 of NUREG-0654/FEMA-REP-1, Rev. 1. [H.8] ITAAC Element addressed in: COL II.H.7	8.6 An analysis of emergency plan implementing procedures will be performed.	8.6 A report exists that confirms emergency plan implementing procedures include provisions for obtaining meteorological information, consistent with section II.H.7 of the Fermi 3 Emergency Plan.

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Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
~~6~~9.0 Accident Assessment			
10 CFR 50.47(b)(9) – Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.	~~6~~9.1 The means exist to provide initial and continuing radiological assessment throughout the course of an accident. [I.2] ITAAC element addressed in: COL EP II.I.2, Appendix [4]	~~6~~9.1 A test of the emergency plan will be conducted by performing an exercise or drill to verify the capability to perform accident assessment.	~~6~~9.1 A report exists that confirms an exercise or drill has been accomplished including use of selected monitoring parameters identified in the EALs listed in ITA Section ~~14~~.1 to assess simulated degraded plant and initiate protective actions in accordance with the following criteria: A. Accident Assessment and Classification 1. Initiating conditions identified, EALs parameters determined, and the emergency correctly classified throughout the drill. B. Radiological Assessment and Control 1. Onsite radiological surveys performed and samples collected. 2. Radiation exposure to emergency workers monitored and controlled. 3. Field monitoring teams assembled and deployed. 4. Field team data collected and disseminated. 5. Dose projections developed. 6. The decision whether to issue radioprotective drugs to Fermi 3 emergency workers made. 7. Protective action recommendations developed and communicated to appropriate authorities.
	~~6~~9.2 The means exists to determine the source term of releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors. [I.3] ITAAC element addressed in: COL EP II.I.3, Appendix 4	~~6~~9.2 An analysis of emergency plan implementing procedures will be performed.	~~6~~9.2.~~1~~ A report exists that confirms a methodology has been established to determine source term of releases of radioactive materials within plant systems, and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors.

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Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
	~~6~~9.3 The means exists to continuously assess the impact of the release of radioactive materials to the environment, accounting for the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for various meteorological conditions. [I.4] ITAAC element addressed in: COL EP II.I.4, Appendix 4	~~6~~9.3 An analysis of emergency plan implementing procedures will be performed.	~~6~~9.3 A report exists that confirms a methodology has been provided to establish the relationship between effluent monitor readings and onsite and offsite exposures and contamination for various ~~radiological~~ meteorological conditions.
	~~6~~9.4 The means exists to acquire and evaluate meteorological information. [I.5] ITAAC element addressed in: COL EP II.I.5	~~6~~9.4 An inspection of the control room, TSC, and EOF will be performed to verify the availability of the following meteorological data is available: • Wind speed (at 10 m and 60 m) • Wind direction (at 10 m and 60 m) • Ambient air temperature (at 10 m and 60 m)	~~6~~9.4.1 A report exists that confirms the specified meteorological data was available at the control room, TSC, and EOF. 9.4.2 A report exists that confirms the specified meteorological data was transmitted to and received by the offsite NRC center and State of Michigan.
	9.5 The means exists to determine the release rate and projected doses if the instrumentation used for assessment is off-scale or inoperable. [I.6]	9.5 An analysis of emergency plan implementing procedures will be performed.	9.5 A report exists that confirms a methodology has been provided to determine the release rate and projected doses if the instrumentation used for assessment is off-scale or inoperable.
	9.6 The means exist for field monitoring within the plume exposure EPZ. [I.7]	9.6 An analysis of emergency plan implementing procedures will be performed.	9.6 A report exists that confirms emergency plan implementing procedures provide for field monitoring within the plume exposure EPZ.

Table 2.3-1 ITAAC For Emergency Planning			
Planning Standard	**EP Program Elements**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	~~6~~9.~~5~~7 The means exist to make rapid assessments of actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways, including activation, notification means, field team composition, transportation, communication, monitoring equipment, and estimated deployment times. [I.8] ITAAC element addressed in: COL EP II.I.7	~~6~~9.~~5~~7 An analysis of emergency plan implementing procedures will be performed.	~~6~~9.~~5~~7 A report exists that confirms a methodology has been established to provide rapid assessment of the actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways.
	~~6~~9.~~6~~8 The capability exists to detect and measure radioiodine concentrations in air in the plume exposure EPZ, as low as 10-7 µCi/cc (microcuries per cubic centimeter) under field conditions. [I.9] ITAAC element addressed in: COL EP II.I.8	~~6~~9.~~6~~8 A test of Fermi 3 field survey instrumentation will be performed to verify the capability to detect airborne concentrations as low as 1E-07 microcuries per cubic centimeters.	~~6~~9.~~6~~8 A report exists that confirms instrumentation used for monitoring I-131 to detect airborne concentrations as low as 1E-07 microcuries per cubic centimeters has been provided.
	~~6~~9.~~7~~9 The means exist to estimate integrated dose from the projected and actual dose rates, and for comparing these estimates with the EPA protective action guides (PAGs). [I.10] ITAAC element addressed in: COL EP II.I.9, Appendix 4	~~6~~9.~~7~~9 An analysis of emergency plan implementing procedures will be performed to verify that a methodology is provided to ~~establish means for relating contamination levels and airborne radioactivity levels to dose rates and gross radioactivity measurements for the following isotopes – Kr-88, Ru-106, I-131, I-132, I-133, I-134, I-135, Te-132, Xe-133, Xe-135, Cs-134, Cs-137, Co-144.~~estimate integrated dose from the projected or actual dose rates, and for comparing these estimates with the EPA protective action guides (PAGs).	~~6~~9.~~7~~9 A report exists that confirms ~~the means for relating contamination levels and airborne radioactivity levels to dose rates and gross radioactivity measurements for the specified isotopes has been established~~a methodology has been established to estimate integrated dose rates from projected and actual dose rates, and for comparing these estimates with the EPA PAGs..

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Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
~~7~~10.0 Protective Response			
10 CFR 50.47(b)(10) – A range of protective actions has been developed for the plume exposure EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure EPZ appropriate to the locale have been developed.	~~7~~10.1 The means exist to warn and advise onsite individuals of an emergency, including those in areas controlled by the operator, including:[J.1] 1. employees not having emergency assignments; 2. visitors; 3. contractor and construction personnel; and 4. other persons who may be in the public access areas, on or passing through the site, or within the owner controlled area. ITAAC element addressed in: COL EP II.J.1.	~~7~~10.1 A test of the onsite warning and communications capability will be performed during a drill or exercise.	~~7~~10.1.1 A report exists that confirms that, during a drill or exercise, notifications and instructions were provided to onsite workers and visitors, within the Protected Area, over the plant public announcement system. ~~7~~10.1.2 A report exists that confirms that, during a drill or exercise, audible warnings were provided to individuals outside the Protected Area, but within the Owner Controlled Area.
	10.2 The means exist to radiological monitor people evacuated from the site. [J.3]	10.2 An analysis of emergency plan implementing procedures will be performed.	10.2 A report exists that confirms emergency plan implementing procedures provide for radiological monitoring of people evacuated from the site.
	10.3 The means exists to notify and protect all segments of the transient and resident population. [J.10]	10.3 An analysis of offsite emergency plans will be performed.	10.3 A report exists that confirms State and local plans or procedures provide methods to notify and protect all segments of the transient and resident population.
	10.4 The means exists to register and monitor evacuees at relocation centers. [J.12]	10.4 An analysis of offsite emergency plans will be performed.	10.4 A report exists that confirms State and local plans or procedures provide methods to register and monitor evacuees at relocation centers.

Table 2.3-1 ITAAC For Emergency Planning			
Planning Standard	**EP Program Elements**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
11.0 Radiological Exposure Control			
10 CFR 50.47(b)(11) – Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity PAGs.	11.1 The means exists to provide onsite radiation protection. [K.2]	11.1 An analysis of emergency plan implementing procedures will be performed.	11.1 A report exists that confirms onsite procedures provide onsite radiation protection.
	11.2 The means exists to provide 24-hour-per-day capability to determine the doses received by emergency personnel and maintain dose records. [K.3]	11.2 An analysis of emergency plan implementing procedures will be performed.	11.2 A report exists that confirms onsite procedures provide for 24- hour-per-day capability to determine the doses received by emergency personnel and maintain dose records.
	11.3 The means exists to decontaminate relocated onsite and emergency personnel, including waste disposal. [K.5.b, K.7]	11.3 An analysis of emergency plan implementing procedures will be performed.	11.3 A report exists that confirms onsite procedures provide a methodology to decontaminate relocated onsite and emergency personnel, including waste disposal.
	11.4 The means exists to provide onsite contamination control measures. [K.6]	11.4 An analysis of emergency plan implementing procedures will be performed.	11.4 A report exists that confirms onsite procedures provide a methodology for onsite contamination control measures.

Table 2.3-1 ITAAC For Emergency Planning			
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12.0 Medical and Public Health Support			
10 CFR 50.47(b)(12) – Arrangements are made for medical services for contaminated, injured individuals.	12.1 Arrangements have been implemented for local and backup hospital and medical services having the capability for evaluation of radiation exposure and uptake. [L.1]	12.1 An analysis of letters of agreement will be performed.	12.1 A report exists that confirms arrangements have been implemented with Mercy Memorial Hospital in Monroe Michigan, and Oakwood Southshore Medical Center in Trenton, Michigan, for evaluation of radiation exposure and uptake.
	12.2 The means exists for onsite first aid capability. [L.2]	12.2 An analysis of emergency plan implementing procedures will be performed.	12.2 A report exists that confirms onsite procedures provide for onsite first aid capability.
	12.3 Arrangements have been implemented for transporting victims of radiological accidents, including contaminated injured individuals, from the site to offsite medical support facilities. [L.4]	12.3 An analysis of letters of agreement will be performed.	12.3 A report exists that confirms arrangements have been implemented for transporting victims of radiological accidents, including contaminated injured individuals, from the site to offsite medical support facilities.

Table 2.3-1 ITAAC For Emergency Planning			
Planning Standard	**EP Program Elements**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
13.0 Recovery and Reentry Planning and Post-Accident Operations			
10 CFR 50.47(b)(13) – General plans for recovery and reentry are developed.	Not used. Provided for consistency with Reg. Guide 1.206 Table C.II.1-B1 Emergency Planning—Generic Inspection, Test, Analysis, and Acceptance Criteria (EP-ITAAC) ITAAC numbering scheme.	Not used. Provided for consistency with Reg. Guide 1.206 Table C.II.1-B1 Emergency Planning—Generic Inspection, Test, Analysis, and Acceptance Criteria (EP-ITAAC) ITAAC numbering scheme.	Not used. Provided for consistency with Reg. Guide 1.206 Table C.II.1-B1 Emergency Planning—Generic Inspection, Test, Analysis, and Acceptance Criteria (EP-ITAAC) ITAAC numbering scheme.

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Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
~~8~~14.0 Exercises and Drills			
10 CFR 50.47(b)(14) – Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.	~~8~~14.1 Licensee conducts a full participation exercise to evaluate major portions of emergency response capabilities, which includes participation by each State, local and provincial agency within the plume exposure EPZ, and each State and provincial agency within the ingestion exposure EPZ. [N.1] ITAAC element addressed in: COL EP II.N.1.	~~8~~14.1 A full participation exercise (test) will be conducted within the specified time periods of Appendix E to 10 CFR Part 50.	~~8~~14.1.1.1 A report exists that confirms an exercise was conducted within the specified time periods of Appendix E to 10 CFR Part 50, onsite exercise objectives have been met, and there were no uncorrected onsite exercise deficiencies. ~~8~~14.1.1.2 A report exists that confirms exercise objectives, including specific acceptance criteria, addressed each of the following Emergency Planning (EP) Program Elements: • Emergency Classification • Notification and Emergency Communications • Emergency Public Information • Emergency Facilities and Equipment • Accident Assessment • Protective Response and Protective Action Recommendations • Radiological Exposure Control • Recovery and Re-Entry ~~8~~14.1.2.1 A report exists that confirms onsite emergency response personnel were mobilized to fill emergency response positions and there were no uncorrected onsite exercise deficiencies. ~~8~~14.1.2.2 A report exists that confirms onsite emergency response personnel performed their assigned responsibilities and there were no uncorrected onsite exercise deficiencies. 14.1.3 A report exists that confirms the exercise is completed within the specified time periods of Appendix E to 10 CFR Part 50, offsite exercise objectives have been met, and there are either no uncorrected offsite exercise deficiencies or a license condition requires offsite deficiencies to be addressed prior to operation above 5% of rated power.

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Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
15.0 Radiological Emergency Response Training			
10 CFR 50.47(b)(15) – Radiological emergency response training is provided to those who may be called upon to assist in an emergency.	15.1 Site-specific emergency response training has been provided for those who may be called upon to provide assistance in the event of an emergency. [O.1]	15.1 An inspection of training records will be performed.	15.1 A report exists that site-specific emergency response training has been provided for local fire departments, law enforcement, ambulance, and hospital personnel.

Table 2.3-1 ITAAC For Emergency Planning			
Planning Standard	**EP Program Elements**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
16.0 Responsibility for the Planning Effort: Development, Periodic Review, and Distribution of the Plan			
10 CFR 50.47(b)(16) – Responsibilities for plan development and review and for distribution of emergency plans are established, and planners are properly trained.	16.1 The emergency response plans have been forwarded to all organizations and appropriate individuals with responsibility for implementation of the plans. [P.5]	16.1 An inspection of the distribution letter will be performed.	16.1 A report exists that confirms the Fermi 3 Emergency Plan has been forwarded to the Michigan State Police, Michigan Department of Environmental Quality, Monroe County Emergency Management, and Wayne County Emergency Management.

Table 2.3-1 ITAAC For Emergency Planning			
Planning Standard	**EP Program Elements**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
17.0 Implementing Procedures			
10 CFR Part 50, App. E.V – No less than 180 days prior to the scheduled issuance of an operating license for a nuclear power reactor or a license to possess nuclear material, the applicant's detailed implementing procedures for its emergency plan shall be submitted to the Commission.	17.1 The licensee has submitted detailed implementing procedures for its emergency plan no less than 180 days prior to fuel load.	17.1 An inspection of the submittal letter will be performed.	17.1 A report exists that confirms the Detroit Edison has submitted detailed implementing procedures for the onsite emergency plan, to the NRC, no less than 180 days prior to fuel load.