June 9, 2010

Mr. Jack M. Davis
Senior Vice President and Chief Nuclear Officer
Detroit Edison Company
Fermi 2 – 210 NOC
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 35 RELATED TO SRP SECTION 2.3.5 FOR THE FERMI 3 COMBINED LICENSE APPLICATION

Dear Mr. Davis:

By letter dated September 18, 2008, Detroit Edison Company (Detroit Edison) submitted for approval a combined license application pursuant to 10 CFR Part 52. The U.S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter. To support the review schedule, you are requested to respond within 45 days of the date of this letter. If changes are needed to the safety analysis report, the staff requests that the RAI response include the proposed wording changes.

If you have any questions or comments concerning this matter, I can be reached at 301-415-8148 or by e-mail at jerry.hale@nrc.gov.

Sincerely,

/RA Janelle B. Jessie for:/

Jerry Hale, Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 052-033

eRAI Tracking Nos. 4740

Enclosure:
Request for Additional Information

June 9, 2010

Mr. Jack M. Davis
Senior Vice President and Chief Nuclear Officer
Detroit Edison Company
Fermi 2 – 210 NOC
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 35 RELATED TO SRP SECTION 2.3.5 FOR THE FERMI 3 COMBINED LICENSE APPLICATION

Dear Mr. Davis:

By letter dated September 18, 2008, Detroit Edison Company (Detroit Edison) submitted for approval a combined license application pursuant to 10 CFR Part 52. The U.S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter. To support the review schedule, you are requested to respond within 45 days of the date of this letter. If changes are needed to the safety analysis report, the staff requests that the RAI response include the proposed wording changes.

If you have any questions or comments concerning this matter, I can be reached at 301-415-8148 or by e-mail at jerry.hale@nrc.gov.

Sincerely,

/RA Janelle B. Jessie for:/

Jerry Hale, Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 052-033
eRAI Tracking Nos. 4740
Enclosure: Request for Additional Information
Distribution: RidsNroDnrlNge2
PUBLIC BHarvey, NRO JHale, NRO NGE 1/2 R/F SGreen, NRO
MTonacci, NRO MCarpentier, OGC RidsNroDserRsac SSamaddar,NRO
ADAMS Accession No. ML101600271 NRO-002

OFFICE	RSAC/TBR	RASC/BC	NGE1/PM
NAME	BHarvey	SSamaddar	JHale
DATE	5/17/10	5/19/10	5/24/10

***Approval captured electronically in the electronic RAI system. OFFICIAL RECORD COPY**

Request for Additional Information No. 4740 Revision 2

Fermi Unit 3
Detroit Edison
Docket No. 52-033
SRP Section: 02.03.05 - Long-Term Atmospheric Dispersion Estimates for Routine Releases
Application Section: FSAR 2.3.5

QUESTIONS for Siting and Accident Consequence Branch (RSAC)

02.03.05-3

This question is related to the applicant's supplemental responses to RAIs 02.03.03-1, 02.03.04-3, and 02.03.04-4 submitted in Detroit Edison letter NRC3-10-0015, dated March 30, 2010.

Question Summary

Discrepancies in wind speed and stability class frequency distributions discussed below create uncertainty as to which meteorological data set (1985-1989 versus 2002-2007) is most representative of long-term site conditions. Given the uncertainty in the data, please justify why the long-term (routine) atmospheric dispersion (X/Q) and deposition (D/Q) values should not be generated using both meteorological data sets and the more conservative resulting X/Q and D/Q values be presented in FSAR Section 2.3.5 and ER Section 2.7.6.2.

Details

As described in the supplemental response to RAI 02.03.04-3, the applicant reviewed the 2002-2007 data from the Fermi meteorological tower and found a number of hourly measurements to be improbable. The applicant removed these hourly measurements from its analysis and determined new joint frequency distributions (JFDs) with revised assumptions regarding wind directions during calm conditions. The applicant then used the new JFDs to update the long-term X/Q and D/Q estimates presented in FSAR Section 2.3.5 and ER Section 2.7.6.2. The updated long-term dispersion estimates were also computed using distances from the outer edge of a circle centered on the reactor building which encompasses the identified routine release points.

The supplemental response to RAI 02.03.03-1 states that after a review of wind rose data spanning a period of over 30 years, the applicant concluded that the potential exists for recent wind speed measurements at the 10-meter elevation to be slower than the actual wind speeds at the 10-meter elevation due to trees located in the vicinity of the Fermi meteorological tower. The applicant further concluded that the slower wind speeds measured at the 10-meter elevation during 2002-2007 produces higher (more conservative) long-term X/Q and D/Q values as compared to faster actual wind speeds at the 10-meter elevation.

The staff disagrees with the assessment that slower wind speeds at the 10-meter elevation produce higher X/Q and D/Q values for mixed-mode (part-time ground, part-time elevated) releases. The applicant has modeled the reactor building/fuel building stack and the turbine building stack as mixed-mode releases pursuant to RG 1.111 because these two stacks are higher than the adjacent buildings. Regulatory position C.2.b of RG 1.111 states that mixed-mode releases can be considered to be elevated releases whenever the plume exit velocity is at least five times the horizontal wind speed at the height of the release. Because the wind speed provided as input to the XOQDOQ dispersion code

is measured at 10-meters, the code corrects the 10-meter wind speed to the stack height. Providing faster 10-meter elevation wind speeds as input to the XOQDOQ dispersion code decreases the percent of time the plume is assumed to be an elevated release, potentially resulting in higher X/Q and D/Q values.

The applicant provided a copy of the 1985-1989 data from the Fermi meteorological tower in its supplemental response to RAI 02.03.04-4. The staff generated a JFD from the 1985-1989 data for comparison with the new 2002-2007 JFD presented by the applicant in its supplemental response to RAI 02.03.04-3. The staff found the older JFD has a lower frequency of (1) slow wind speed conditions (the frequency of wind speeds less than 1.5 m/s increased from 9.1% in the 1985-1989 data to 17.0% in the 2002-2007 data) and (2) extremely unstable (stability class A) conditions (the frequency of extremely unstable conditions increased from 7.1% in the 1985-1989 data to 19.3% in the 2002-2007 data).

Consequently, the staff reran the XOQDOQ dispersion code with the 1985-1989 JFD to compare the results with applicant's revised 2002-2007 X/Q and D/Q values presented in the supplemental response to RAI 02.03.04-3. The staff found that its 1985-1989 X/Q and D/Q values were higher than the applicant's 2002-2007 X/Q and D/Q values for the two mixed-mode (reactor building/fuel building stack and the turbine building stack) release pathways for the reason cited above. The staff also found that some of its 1985-1989 X/Q and D/Q values for the ground-level (radwaste building stack) release pathway were also higher, probably due to the occurrence of more frequent extremely unstable conditions in the more recent 2002-2007 data set.

02.03.05-4

This question is related to the applicant's response to RAI 02.03.05-2. The staff finds the response to RAI 02.03.05-2 to be incomplete.

As discussed in the response to RAI 02.03.05-2, the overwater trajectories for the population living within 50 miles in the NE, ENE, E, SE, SSE, S and SSW sectors can range from 10 to 50 miles. Air trajectories over such extensive water surfaces could decrease atmospheric diffusion rates when compared with overland trajectories due to: (1) the generally smoother water surface decreasing the contribution to diffusion by mechanical turbulence and (2) cooler water temperatures (as compared to air temperatures) decreasing the contribution to diffusion from convectional turbulence (Reference: I. Van der Hoven, Atmospheric Transport and Diffusion at Coastal Sites, *Nuclear Safety,* 8(5): 490-499 (1967)).

a. Please revise FSAR Section 2.3.5 to discuss the impact of changes in surface temperature and roughness resulting from over-water trajectories on the resulting long-term (routine) atmospheric dispersion and deposition estimates. SRP 2.3.5 states that applicants should discuss the appropriateness of the atmospheric diffusion parameters (such as vertical plume spread or sigma z) used in estimating the consequences of routine releases out to a distance of 50 miles from the plant; modified plume spread parameters may need to be considered for unique terrain features such as large bodies of water. Figure 1 in RG 1.111 also states that the vertical dispersion coefficients presented in this figure may have to be modified for certain types of terrain such as over water.

b. Given the discussion provided above, please explain in more detail the following sentence proposed for FSAR Section 2.3.5.1: "Long term CHI/Q models are conservatively determined to apply broadly within compass sector and radial ring regions; thus, the very local impacts of over-

water wind trajectory changes will not have a significant impact on the CHI/Q values.” The staff is uncertain as to the intent and meaning of this sentence.