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

10 CFR 52.79

December 21, 2009
NRC3-09-0050

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

References: 1) Fermi 3
Docket No. 52-033
2) Letter from Jack M. Davis (Detroit Edison) to USNRC, "Detroit Edison Company Response to NRC Request for Additional Information Letters No. 1 and No. 2," NRC3-09-0001, dated February 16, 2009

Subject: Detroit Edison Company Supplemental Response to NRC Request for Additional Information (RAI) No. 19-1

In Reference 2, Detroit Edison submitted a response to NRC Request for Additional Information (RAI) No. 19-1. In subsequent conversations with the NRC staff regarding the response, Detroit Edison agreed to provide additional information regarding the loss of service water frequency information contained in the Fermi 3 Final Safety Analysis Report (FSAR), Appendix 19AA. The attachment to this letter provides a supplemental response to Question No. 2 of RAI No. 19-1 and is intended to replace the response provided in Reference 2 in its entirety.

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

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NRO

I state under penalty of perjury that the foregoing is true and correct. Executed on the 21st day of December, 2009.

Sincerely,

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

Attachment: Supplemental Response to Question No. 2 of NRC RAI No. 19-1

cc: Jerry Hale, NRC Fermi 3 Project Manager
Ilka Berrios, NRC Fermi 3 Project Manager
Bruce Olson, 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 to
NRC3-09-0050

Supplemental Response to Question No. 2 of NRC RAI No. 19-1
(eRAI Tracking No. 1747)

NRC RAI 19.1

2. FSAR Section 19.5, in support of the requirement of 10 CFR 52.79(a)(46) pertaining to the plant-specific probabilistic risk assessment (PRA), states the following: "The review of site- specific information and plant-specific design information determined that: (1) the DCD PRA bounds site-specific and plant-specific design parameters and design features, and (2) these parameters and features have no significant impact on the DCD PRA results and insights," The staff requests that the applicant justify the FSAR statements by providing the following: (1) describe the criteria used to determine whether or not site-specific and plant-specific design parameters and design features are bounded by the DCD PRA, and explain how the criteria were applied in the evaluation, (2) describe the quantitative criteria and the technical basis used to determine whether or not a site-specific or plant-specific design parameter or design feature has a significant impact on the DCD PRA results and insights, and (3) describe each of the site-specific and plant-specific design parameters and design features that were considered in the evaluation.

Detroit Edison Supplemental Response to Question No. 2

The ESBWR PRA evaluated the following site-specific considerations to develop bounding PRA parameters:

- Loss of Preferred Power (LOPP) frequency - to determine if the site has unusual off-site power availability problems. The LOPP frequency is divided into plant-centered, switchyard, grid-related, and weather-related initiating events.
- Loss of Service Water frequency - to determine if any unusual characteristics would apply to a particular site, with consideration to loss of ultimate heat sink, and the effects of extreme seasonal temperatures.
- Seismic fragilities - to determine whether the site specific design response spectra affects the ESBWR Seismic Margins Analysis (SMA) or the PRA. Note that High Confidence Low Probability of Failure (HCLPF) values will be confirmed as described in Section 19.2.3.2.4.
- Other Known Site-Specific Issues - to identify site-specific initiating events that are not identified in the ESBWR PRA, such as unique offsite consequence issues.

These parameters represent site-specific features that have the potential to affect the PRA. To ensure that the ESBWR PRA is a bounding standard design, the site-specific values for these parameters were reviewed.

The ESBWR LOPP frequencies are based on NUREG/CR-6890, "Reevaluation of Station Blackout Risk at Nuclear Power Plants Analysis of Loss of Offsite Power Events: 1986-2004." GEH obtained the Fermi 2 LOPP frequencies and compared them to the ESBWR frequencies to identify any outliers. The data shows that grid-related losses of power are significantly more frequent than plant-centered, switchyard, or weather-related losses of power. Although there is a variance in the values for the LOPP frequencies, GEH concluded that the Fermi 2 values are slightly lower than the ESBWR values, thus the range is acceptable. The conclusions in ESBWR DCD Section 19.2.3.1, "Risk from Internal Events," remain valid for the minor variances in LOPP frequencies.

The ESBWR Loss of Service Water frequency is based on NUREG/CR-5750, "Rates of Initiating Events at U. S. Nuclear Power Plants: 1987-1995." Loss of Service Water contributes less than one percent to the ESBWR Core Damage Frequency (CDF). Variances between the reported values depend on the design configuration (e.g., redundancy) of the current plants versus the ESBWR design, or external influences such as loss or degradation of heat sink. A review of the Fermi 3 design did not identify any site specific vulnerabilities that would cause the Loss of Service Water frequency to be higher than assumed in the ESBWR PRA. The Fermi 3 Plant Service Water System (PSWS) is designed so that neither a single active nor single passive failure results in a complete loss of plant component cooling and/or plant dependence on any safety-related system. This is achieved through the use of redundant components, automatic valves and piping cross-connects for increased reliability. Additional PSWS design features to improve system reliability include:

- The PSWS is designed for remote operation from the main control room (MCR), for ease of restoration of its function after a component failure without a plant operating mode or power level change, and to operate even during a Loss of Preferred Power (LOPP).
- The PSWS is designed to take suction from closed-cycle treated water systems and is not susceptible to raw water failure mechanisms (e.g., intake blockage). During normal operation the Circulating Water System supplies water to the PSWS. Makeup water to the Circulating Water System and the PSWS is provided from Lake Erie by the Plant Cooling Tower Makeup System. The PSWS is designed to operate for up to 7 days without makeup.
- The PSWS heat load is rejected to the Circulating Water System during normal operation, which is cooled by a Natural Draft Cooling Tower (Normal Power Heat Sink). Upon loss of the Circulating Water System, the PSWS heat load is rejected by the PSWS Mechanical Draft Cooling Towers (Auxiliary Heat Sink).
- During normal operation, one of two PSWS pumps per train is operating. The standby pump will automatically start upon detection of low PSWS pressure, loss of power to the operating pump, or a trip of the operating pump.
- The PSWS pumps each have a self-cleaning strainer which operates automatically. The pump discharge strainers have a remote manual override feature for their automatic cleaning cycle.

These items would reduce the Loss of Service Water frequency because of the redundant features included in the design and design features that minimize dependence on Lake Erie as a source of water for the PSWS. The conclusions in ESBWR DCD Section 19.2.3.1, "Risk from Internal Events," remain valid for the minor variances in Loss of Service Water frequencies.

The ESBWR design incorporates a seismic response spectrum that bounds the potential U.S. sites. The conclusions in ESBWR DCD Section 19.2.3.2.4, "Evaluation of External Event Seismic," remain valid for site-specific differences in seismic response.

There are no unusual terrain features that would affect meteorological data or plume dispersion. The conclusions in ESBWR DCD Section 19.2.5, "Summary of Overall Plant Risk Results and Insights," for offsite consequences remain valid for any potential differences between site features.

In addition to the bounding treatment of PRA parameters, there are no departures from the standard design in any systems considered in the PRA model. Therefore, there are no site-specific design features (and no shared systems) that affect the PRA because the boundary of the certified design covers all of the Structures Systems and Components (SSCs) necessary for the PRA.

The effect of outage planning and controls on the PRA is included in DCD Table 19.2-3, "Risk Insights and Assumptions," and is addressed through operational program procedures. This DCD Table states that the outage planning and control program is consistent with NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management." The implementation of outage planning procedures is described in FSAR Section 13.5.2.2.9, which states that procedures will provide guidance for the development of refueling and outage plans that will address the guidance described in NUMARC 91-06.

In summary, the ESBWR PRA provides a reasonable representation of the parameters and conditions that are specific to the Fermi site.

Proposed COLA Revision

Fermi 3 FSAR Appendix 19AA, "Summary of Plant-Specific PRA Review," will be revised to incorporate the supplemental response to this RAI. These changes are shown on the attached FSAR markup.

Markup of Fermi 3 FSAR

(Following 2 pages)

The attached markup represents Detroit Edison's good faith effort to show how the COLA will be revised in a future COLA submittal. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAI's, 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 somewhat different that as presented herein.

These parameters represent site-specific features that have the potential to affect the PRA. To ensure that the ESBWR PRA is a bounding standard design, the site-specific values for these parameters were reviewed.

The ESBWR LOPP frequencies are based on NUREG/CR-6890, "Reevaluation of Stations Blackout Risk at Nuclear Power Plants Analysis of Loss of Offsite Power Events: 1986-2004." The Fermi LOPP frequencies were compared to the ESBWR frequencies to identify any outliers. The data shows that grid-related losses are significantly more frequent than plant-centered, switchyard, or weather-related losses of power. Although there is a variance in the values for the LOPP frequencies, their range is acceptable. The conclusions in ESBWR DCD Section 19.2.3.1, Risk from Internal Events, remain valid for the minor variances in LOPP frequencies.

The ESBWR Loss of Service Water frequency is based on NUREG/CR-5750, "Rates of Initiating Events at U. S. Nuclear Power Plants: 1987-1995." Insert 1 ~~The contribution of Loss of Service Water is less than one percent of core damage frequency (CDF). Variances between the reported values depend on the design configuration (e.g., redundancy) of the current plants versus the ESBWR design, or external influences such as loss or degradation of heat sink. Although there is a variance in the values for the Loss of Service Water frequencies, their range is acceptable.~~ The conclusions in DCD Section 19.2.3.1, Risk from Internal Events, ~~also~~ remain valid for the minor variances in Loss of Service Water frequencies.

The ESBWR design incorporates a seismic response spectrum that bounds the potential U.S. sites. The conclusions in DCD Section 19.2.3.2.4, Evaluation of External Event Seismic, remain valid for site-specific differences in seismic response.

There are no unusual terrain features that would affect meteorological data or plume dispersion. The conclusions in DCD Section 19.2.5 for offsite consequences remain valid for any potential differences between site features.

Insert 1

Loss of Service Water contributes less than one percent to the ESBWR Core Damage Frequency (CDF). Variances between the reported values depend on the design configuration (e.g., redundancy) of the current plants versus the ESBWR design, or external influences such as loss or degradation of heat sink. A review of the Fermi 3 design did not identify any site specific vulnerabilities that would cause the Loss of Service Water frequency to be higher than assumed in the ESBWR PRA. The Fermi 3 Plant Service Water System (PSWS) is designed so that neither a single active nor single passive failure results in a complete loss of plant component cooling and/or plant dependence on any safety-related system. This is achieved through the use of redundant components, automatic valves and piping cross-connects for increased reliability. Additional PSWS design features to improve system reliability include:

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