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**Detroit Edison**  
A DTE Energy Company



June 15, 2007  
NRC-07-0034

10 CFR 50.90

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

- References:
- 1) Fermi 2  
NRC Docket No. 50-341  
NRC License No. NPF-43
  - 2) Detroit Edison Letter to NRC, "Proposed License Amendment Request to Extend the Completion Time for Technical Specification 3.8.1 for an Inoperable Emergency Diesel Generator," NRC-06-0040, dated July 12, 2006
  - 3) NRC letter dated June 5, 2007, "Fermi Unit 2 - Request for Additional Information Regarding Proposed License Amendment to Extend the Completion Time for Technical Specification 3.8.1 for an Inoperable Diesel Generator (TAC No. MD2618)"

Subject: Response to Request for Additional Information Regarding License Amendment Request for Extension of Completion Time for an Inoperable Emergency Diesel Generator

In Reference 2, Detroit Edison requested NRC approval of a proposed license amendment that requests an extension of the completion time for Fermi 2 Emergency Diesel Generators (EDGs) from 7 to 14 days.

During conference calls on June 1 and June 5, 2007, the NRC indicated that they would issue a follow-up request for additional information (Reference 3) necessary for NRC review of the proposed changes; NRC also requested that Detroit Edison's response document proposed regulatory commitments.

In addition, during NRC review, it was noted that the license amendment request required supporting information for removal of a footnote on Technical Specification page 3.8-3, added in Amendment 171 in support of a one-time extension of completion time for an inoperable EDG in January 2006.

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Enclosure 1 provides Detroit Edison's response to the NRC request for additional information. Enclosure 2 provides a list of regulatory commitments. Enclosure 3 provides supporting information for removal of the footnote.

The supplemental information provided in this letter does not impact the conclusions of the Determination of No Significant Hazards Consideration and Environmental Assessment presented in the July 12, 2006 submittal (Reference 2).

If you have any questions regarding this submittal, please contact Mr. Ronald W. Gaston at (734) 586-5197.

Sincerely,



Enclosures:

1. Response to Request for Additional Information
2. Regulatory Commitments
3. Supporting Information

cc: NRC Project Manager  
Reactor Projects Chief, Branch 4, Region III  
NRC Resident Office  
Regional Administrator, Region III  
Supervisor, Electric Operators,  
Michigan Public Service Commission

I, Joseph H. Plona, do hereby affirm that the foregoing statements are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.



J. H. Plona  
Site Vice President – Nuclear Generation

On this 15th day of June, 2007 before me personally appeared Joseph H. Plona, being first duly sworn and says that he executed the foregoing as his free act and deed.

  
Notary Public

CYNTHIA A. WISNIEWSKI  
NOTARY PUBLIC, STATE OF MI  
COUNTY OF WAYNE  
MY COMMISSION EXPIRES Mar 30, 2013  
ACTING IN COUNTY OF Monroe

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Electronic Licensing Library (ELL) (200 TAC)  
Information Management (140 NOC)  
Michigan Department of Environmental Quality  
Radiological Protection and Medical Waste Section  
NSRG Administrator (200 TAC)  
NRR Chron File

**ENCLOSURE 1 to  
NRC-07-0034**

**FERMI 2 NUCLEAR POWER PLANT**

**Response To Request For Additional Information**

## Response To Request For Additional Information

### RAI 1

Are Combustion Turbine Generators 11-2, 11-3, and 11-4 and the dedicated blackstart diesel generator included within the scope of the plant's implementation of the maintenance rule? If not, please describe how the plant tracks/monitors and maintains the reliability of these generators consistent with the values used in the plant-specific probabilistic risk assessment.

### RAI 1 Response

The dedicated blackstart diesel generator and CTGs 11-2, 11-3, and 11-4 are in the scope of the plant's implementation of the maintenance rule. Performance criteria that monitor the reliability and availability exist for these components.

### RAI 2

Explain the **numerical** bases for the "small" (vs. negligible) challenge to the Division 1 switchgear fire area when the "EDG" 14 is out of service.

### RAI 2 Response

A sensitivity analysis for the quantitative contribution of the completion time (CT) extension for fire scenarios in the Division 1 Switchgear Room is provided. This estimation used the CCDF (Conditional Core Damage Frequency) contribution from the IPEEE for this room and the RAW for the condition where EDG 14 (the most limiting EDG) is out of service and the frequency of the Transformer 64 initiator is multiplied by a factor of 10. It should be noted that the Transformer 64 initiator was determined to be the most applicable, since this initiator results in a non-recoverable loss of Division 1 power and the loss of the CTGs as a source of onsite power to the Division 1 loads.

The estimated increase in core damage probability for this fire area ( $\Delta\text{CDP}_{\text{fire-D1swgr}}$ ) is calculated via the following formula:

$$\Delta\text{CDP}_{\text{fire-D1swgr}} = (\text{CCDF}_{\text{IPEEE-D1swgr}} * \text{RAW}_{\text{EDG14-TF64x10}} - \text{CCDF}_{\text{IPEEE-D1swgr}}) * \Delta t_{\text{CT}} \quad (\text{Eqn 2-1})$$

where,

$\text{CCDF}_{\text{IPEEE-D1swgr}}$  is the IPEEE internal fire CDF for the Division 1 Switchgear Room.

$\Delta t_{CT}$  is the Technical Specification allowed completion time interval (14 days).

$RAW_{EDG14-TF64 \times 10}$  is the Risk Achievement Worth for the condition where EDG 14 is out of service and the Transformer 64 initiator is multiplied by a factor of 10 (demonstrating margin) and is calculated by the formula:

$$RAW_{EDG14-TF64 \times 10} = CDF_{EDG14-TF64 \times 10} / CDF_{base} \quad (\text{Eqn 2-2})$$

where,

$CDF_{EDG14-TF64 \times 10}$  is the condition where EDG 14 is out of service and the Transformer 64 initiator is multiplied by a factor of 10.

$CDF_{base}$  is the baseline "with maintenance" model CDF.

Substituting Equation 2-2 into Equation 2-1, the result becomes:

$$\Delta CDP_{fire-D1swgr} = (CCDF_{IPEEE-D1swgr} * (CDF_{EDG14-TF64 \times 10} / CDF_{base}) - CCDF_{IPEEE-D1swgr}) * \Delta t_{CT} \quad (\text{Eqn 2-3})$$

Substituting numerical values from the IPEEE and the quantifications to determine the RAW (performed using a 1E-9 truncation limit) into the above equation:

$$\Delta CDP_{fire-D1swgr} = (4.51E-6yr^{-1} * (2.39E-5yr^{-1} / 1.05E-5yr^{-1}) - 4.51E-6yr^{-1}) * 14d / 365.25d/yr$$

$$\Delta CDP_{fire-D1swgr} = 2.2E-7$$

This value is below the RG 1.177 threshold for a LOW core damage probability (5.0E-7). If this result is added to the result from the Individual Plant Examination for internal events (1.6E-7), the result is still below the RG 1.177 threshold.

It should be noted that the above analysis is conservative, since most of the IPEEE fire scenarios for this area result in a loss of a limited set of equipment that does not result in a loss of Division 1 offsite and/or onsite power to the 4kV busses. The frequency for the scenarios that do result in the loss of power to the 4kV busses is much lower than for the scenarios which damage a more limited set of equipment. The conservative nature of the screening and assessment methodology inherent in the IPEEE is another source of conservatism for this analysis.

During the course of evaluating this RAI, a cable run was identified that was not a part of the IPEEE target set for the Division 1 Switchgear Room. This cable run supplies offsite power to the busses in the Division 2 Switchgear Room. These cables are approximately 13 feet east of the nearest switchgear. Since the switchgear doors are on the north and

south faces of the switchgear, fire energy would be dissipated in those directions, and would not damage these cables. An analysis was performed by the site fire protection engineers that determined this cabling would remain available for fixed fire sources and transient combustibles in this room and, therefore, would not be a target component for a realistic fire scenario in this compartment. The "bounding scenario" for this area as described in the IPEEE, therefore, bounds the realistic fire scenarios in this zone.

The other fire compartments were qualitatively evaluated in the IPEEE as having a negligible effect on plant risk, since most of the individual fire scenarios in these compartments result in a configuration where at least one division of offsite power and the CTGs are available for mitigation of the event.

### **RAI 3**

Of the fire zones that were screened out of the individual plant examination of external events, fire analysis based on a fire core damage frequency less than  $1E-6$ , could a fire in any of these zones cause both a loss of offsite power and damage to a train of equipment needed for safe shutdown? If so, please describe the impact of the extended EDG completion time on the fire risk assessment for these areas.

### **RAI 3 Response**

Of those zones that "screened out," there are six zones in which a fire could cause a total loss of offsite power. Fires in these zones were also assumed to result in damage affecting equipment needed for safe shutdown. However, as described below, sufficient equipment is maintained free of fire damage to maintain safe shutdown capability assuming a single EDG is out of service.

The specific fire scenarios and/or locations involved are: 08AB (Cable Tray Area), 02AB (Mezzanine/Cable Tray Area), RADWST (Radwaste Building), TB3B and TB3B1 (Turbine Building), and YARD (outside area).

The 02AB and 08AB fire zones contain no credible ignition sources other than those from hot work or transient combustibles. Procedural controls place restriction on transient combustible ignition sources and prescribe requirements for performing hot work activities. In addition, fire detection and automatic fire suppression is provided for these areas. The combination of the lack of significant fixed ignition sources and the fire ignition control measures are considered adequate to preclude a credible fire event from damaging cables in this compartment in the IPEEE.

Fire Zone 02AB contains cables supporting both divisions of safe shutdown equipment. For the design basis (Appendix R) fire in the 02AB fire zone, one division of safe shutdown equipment is maintained free of fire damage, and that division and its EDGs are credited for the safe shutdown analysis. However, due to the lack of ignition sources

combined with fire detection and automatic suppression in this area, fire damage affecting safe shutdown capability is not considered credible. In addition, a best estimate analysis (used for PRA) shows that safe shutdown can be achieved with a single EDG should equipment supported by the other division of EDGs be unavailable.

For a fire in zone 08AB, safe shutdown is achieved using provisions relying on CTG 11-1. EDGs are not credited for safe shutdown for a fire in this zone.

In the RADWST scenario, the standby feedwater (SBFW) system is assumed not to be functional. However, adequate mitigating equipment (for example, Residual Heat Removal (RHR), RHR Service Water (RHRSW), High Pressure Coolant Injection (HPCI), and Reactor Core Isolation Cooling (RCIC)) and electrical support necessary to achieve safe shutdown is available in the event that a single EDG is out of service for the extended Completion Time. It should be noted that both divisions of onsite power will still be available for mitigation (via the remaining EDG in the division where the single EDG has been removed from service and in the opposite division of ESF power where both EDGs are available).

In the TB3B scenario (the most limiting of the turbine building scenarios in question), the SBFW system is assumed not to be functional. However, adequate mitigating equipment (for example, RHR, RHRSW, HPCI, and RCIC) and electrical support necessary to achieve safe shutdown is available in the event that a single EDG is out of service for the extended Completion Time. It should be noted that both divisions of onsite power will still be available for mitigation (via the remaining EDG in the division where the single EDG has been removed from service and in the opposite division of ESF power where both EDGs are available).

In the YARD scenario, the power feed from the CTGs to the SBFW system (and therefore the SBFW system itself) is assumed to be unavailable. However, adequate mitigating equipment (for example, RHR, RHRSW, HPCI, and RCIC) and electrical support necessary to achieve safe shutdown is available in the event that a single EDG is out of service for the extended Completion Time. It should be noted that both divisions of onsite power will still be available for mitigation (via the remaining EDG in the division where the single EDG has been removed from service and in the opposite division of ESF power where both EDGs are available).

**ENCLOSURE 2 to  
NRC-07-0034**

**FERMI 2 NUCLEAR POWER PLANT**

**Regulatory Commitments**

### **Regulatory Commitments**

No elective maintenance or testing that affects the reliability of the train associated with the EDGs in the other division will be scheduled during the extended Completion Time. If any such testing and maintenance activities must be performed while the extended Completion Time is in effect, a 10 CFR 50.65(a)(4) evaluation will be performed.

The EDG extended Completion Time will not be entered for preplanned maintenance if severe weather conditions are expected.

The EDG extended Completion Time will not be entered for preplanned maintenance if grid stress conditions are expected to be high, resulting in a significant potential for the grid to become unstable or unable to supply post trip offsite power minimum voltages.

The system load dispatcher will be contacted at least once per day to ensure no significant grid perturbations are expected during the extended Completion Time. The system operator will inform the plant operator if conditions change during the extended Completion Time (e.g., unacceptable voltages could result due to a trip of the nuclear unit).

Elective testing or maintenance of safety systems and important non-safety equipment including offsite power systems (i.e., station service transformers) that significantly increases the likelihood of a plant transient or loss of offsite power will not be scheduled concurrently with planned EDG outages utilizing the extended Completion Time. Elective operation of the plant that significantly increases the likelihood of a plant transient or loss of offsite power will not be scheduled concurrently with planned EDG outages utilizing the extended Completion Time. In addition, no discretionary switchyard maintenance will be allowed. If any such testing or maintenance activities must be performed while the extended Completion Time is in effect, a 10 CFR 50.65(a)(4) evaluation will be performed.

Steam-driven High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) systems will be controlled as "protected equipment," and will not be taken out of service for planned maintenance while an EDG is out of service for planned maintenance utilizing the extended Completion Time.

**ENCLOSURE 3 to  
NRC-07-0034**

**FERMI 2 NUCLEAR POWER PLANT**

**Supporting Information**

### **Supporting Information**

During license amendment review, it was noted that the license amendment request required supporting information for removal of a footnote on Technical Specification page 3.8-3.

This information modifies Detroit Edison's original submittal, NRC-07-0040 (Reference 2), Enclosure 1, Evaluation of the Proposed License Amendment Request:

Add to 1.0 Description: The footnote at the bottom of Technical Specification (TS) page 3.8-2 and the asterisk (\*) in the Completion Time column of Required Action A.6 are removed. The footnote reads "*\*The 7 day allowed outage time of Technical Specification 3.8.1 Condition "A" Required Action A.6 which was entered on January 30, 2006, at 0200 hours, may be extended one time by an additional 7 days to complete repair and testing of EDG 12.*" This footnote is no longer required.

Add to 2.0 Proposed Change, Condition A discussion: The footnote at the bottom of TS page 3.8-2 and the asterisk (\*) in the Completion Time column of Required Action A.6 are removed.

### **Technical Analysis**

Since the one-time use of this footnote has expired, this change is administrative in nature. This change does not impact the conclusions of the Determination of No Significant Hazards Consideration and Environmental Assessment presented in the July 12, 2006 submittal (Reference 2) as supplemented April 25, 2007 (Reference 3), and May 23, 2007 (Reference 4).