

March 22, 1996

Mr. Douglas R. Gipson  
Senior Vice President  
Nuclear Generation  
Detroit Edison Company  
6400 North Dixie Highway  
Newport, Michigan 48166

SUBJECT: TECHNICAL SPECIFICATION CHANGE REQUEST - EMERGENCY DIESEL GENERATOR  
ALLOWED OUTAGE TIME EXTENSION (TAC NO. M94171)

Dear Mr. Gipson:

The staff has reviewed your November 22, 1995, application related to the subject request. A teleconference was held on January 31, 1996, with members of your staff to obtain additional information related to your request. Your letter of February 19, 1996, provided a formal response to our questions. After reviewing your response to our questions, we have determined that we will need the additional information contained in enclosures 1 and 2 to complete our review. Enclosure 1 provides staff guidance on the development of a probabilistic safety assessment (PSA) to support proposed changes of this type plus specific questions related to your request. As discussed with Mr. Newkirk of your staff, we would like to discuss your response to these questions during an onsite working level meeting in the next few weeks. We will coordinate with Mr. Newkirk to arrange the schedule for this meeting. We would then request a written response to follow.

In order for our review to remain on schedule, we request that you provide written responses to the questions in enclosure 2 within 30 days of receipt of this letter or sooner, if practicable. We recognize that this will not allow for completion of our review by your requested date of March 31, 1996; however, a quick response will facilitate our review.

Should you have any questions on this matter, please contact me at (301) 415-1341.

This requirement affects nine or fewer respondents and, therefore, is not subject to the Office of Management and Budget review under P.L. 96-511.

Sincerely,

Original signed by:  
Timothy Colburn, Sr. Project Manager  
Project Directorate III-1  
Division of Reactor Projects - III/IV  
Office of Nuclear Reactor Regulation

- Enclosures: 1. Risk-Based Request for Additional Information  
2. Request for Additional Information

Docket No. 50-341

cc w/encl: See next page

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RISK-BASED REQUEST FOR ADDITIONAL INFORMATION  
ON THE FERMI 2 APPLICATION FOR TECHNICAL SPECIFICATIONS CHANGE  
ON EMERGENCY DIESEL GENERATOR ALLOWED OUTAGE TIME EXTENSION

**BACKGROUND**

With regard to Technical Specifications (TS) changes, the NRC staff expects licensees to utilize a three-tier approach in proposing risk-based modifications and associated amendments.

In the first tier, the licensee is expected to determine the change in plant operational risk (specifically, the change in core damage frequency (CDF) and core damage probability) as a result of the proposed TS modification and discuss its significance. In addition, in order to better understand the impact of the amendment on containment performance, the staff expects the licensee to perform an analysis of the large early release frequency (LERF) under the modified TS conditions and discuss the results or, if applicable, an analysis of offsite consequences.

In the second tier, it is intended for the licensee to provide reasonable assurance that risk-significant plant equipment outage configurations will not occur while the plant is subject to the limiting condition for operation (LCO) proposed for modification.

The purpose of the third tier is to assure that, before performing maintenance activities including removal of any equipment from service, the licensee performs a thorough assessment of the overall impact on safety functions of related TS activities, as required by the Maintenance Rule (10 CFR 50.65). This should be an intrinsic part of all maintenance scheduling.

The staff's review consists of an assessment of (1) the appropriateness of licensee activities in each tier, (2) the applicability of the licensee's probabilistic risk assessment (PRA) methodology to support the proposed TS change, and (3) an evaluation of the impact of the proposed TS change on plant operational risk and containment performance, and the adequacy of the licensee's proposed compensatory measures.

The staff's final recommendation will be contingent upon the licensee's commitment to the compensatory measures, insights and findings based on the PRA model, and the adequacy of relevant portions of the licensee's program to meet the requirements of the maintenance rule, which will be in effect as of July 1996.

## REQUESTED QUESTIONS

Three sets of questions that correspond to these three tiers have been developed as follows:

### (A) Tier 1

#### (a) Probabilistic safety assessment (PSA, or PRA)

The staff is concerned that the extensions of emergency diesel generator (EDG) allowed outage times (AOTs) may increase the mean CDF for the station blackout (SBO) events and impact resolution of the SBO issue. Provide the calculated CDF for SBO sequences without the proposed AOT extension and the CDF for SBO sequences with the proposed AOT extension. Also provide the overall reliability and unavailability of the EDGs used in the PRA to calculate the CDFs for the SBO sequences requested.

Is Fermi 2 capable of cross-connecting the Division 1 engineered safety feature (ESF) buses with the Division 2 ESF buses? If yes, explain how. Is it modeled in the Fermi 2 PRA? How long does it take to establish the cross-tie? How much credit is taken?

Please explain how Fermi 2 maintains combustion turbine generator 11-1's (CTG 11's) high level of reliability and availability. Is the CTG hardened against severe weather? How much credit has been taken with respect to CTG 11-1's ability to decrease the conditional CDF?

What are the success criteria for the SBO condition at Fermi 2? Can any one EDG mitigate SBO? Is this modelled in the PRA? Please explain.

What review of the PRA has been made to ensure that the PRA represents the as-built, as-operated plant, and contains the fine structure (resolution) necessary to evaluate the proposed TS requirements? Were any changes made to the PRA due to such reviews?

Your current PRA is said to be different from your individual plant examination (Rev. 1 submitted on September 22, 1993). Explain any major differences. Among those differences, is there anything related to SBO sequences?

Please provide the truncation cutoff used to quantify the plant CDF changes. In particular, indicate what efforts were made to avoid underestimation when the impact calculated was negligible or nonexistent.

Provide a discussion of the loss-of-offsite power events at your facility.

Please describe the peer reviews performed on your PRA. Indicate which reviews were performed in-house versus those performed by outside consultants. Summarize their overall conclusions.

(b) Quantitative results

Please provide the following calculations and quantitative PRA results due to the AOT extension:

(1) Change in average CDF ( $\Delta m(\text{CDF})$ ):

$m(\text{CDF})$  = average CDF (per year)

$m_2(\text{CDF})$  = The conditional  $m(\text{CDF})$  with the proposed 7-day AOT in place

$m_1(\text{CDF})$  = The original  $m(\text{CDF})$  with the current 3-day AOT in place

Therefore,  $\Delta m(\text{CDF}) = m_2(\text{CDF}) - m_1(\text{CDF})$

(2) Change in instantaneous CDF ( $\Delta \text{CDF}_i$ ):

$\text{CDF}_i(2)$  = The conditional CDF when the plant is in the AOT

$\text{CDF}_i(1)$  = The CDF when the plant is not in the AOT

$i$  = a particular AOT configuration

Therefore,  $\Delta \text{CDF}_i = \text{CDF}_i(2) - \text{CDF}_i(1)$

(3) Change in conditional core damage probability ( $\Delta \text{CCDP}$ ):

$\text{CCDP}(2)$  = The CCDP while the plant is in the AOT

$\text{CCDP}(1)$  = The CCDP while the plant is not in the AOT

Therefore,  $\Delta \text{CCDP} = \text{CCDP}(2) - \text{CCDP}(1)$

(4) Change in large early release frequency ( $\Delta \text{LERF}$ )

$\text{LERF}(2)$  = LERF with proposed AOT in place

$\text{LERF}(1)$  = LERF with current AOT in place

Therefore,  $\Delta \text{LERF} = \text{LERF}(2) - \text{LERF}(1)$

What are the projected average corrective maintenance and preventive maintenance downtimes for EDGs used in your calculations? Explain how they are obtained. Have you performed any sensitivity analyses

on your corrective maintenance and preventive maintenance downtimes that affect the risk results in the previous question? If so, please discuss insights gleaned from the study.

Have you performed any sensitivity analysis for this requested AOT change? If so, discuss how your results ensure the PRA results in your application are robust and away from a "cliff" or sudden increase in the risk profile.

(B) Tier 2

Given the AOT plant configuration, what does your PRA indicate are the other risk-significant systems? Is the significance the same for each EDG, or EDG combination? Please explain the results.

For the systems you identified in the previous question, how would you ensure that no risk-significant plant equipment outage configurations would occur while the plant is subject to the LCO proposed for modification? Are the bases for this assurance reflected in your procedures or TS?

Have you thoroughly reviewed your TS to see if there are needs for any other changes to your TS or TS bases (in addition to the TS amendment items you are currently requesting) because of your request of EDG extension from 3 to 7 days? Please identify any TS changes made to ensure that the plant will not enter any risk-significant plant configuration while in the AOT.

(C) Tier 3

Are you capable of performing a "real-time" assessment of the overall impact on safety functions of related TS activities before conducting maintenance activities including removal of any equipment from service? Please explain how this tool, or other processes, will be used to ensure that risk-significant plant configurations will not be entered during the AOT?

Explain how you are going to address the issue of configuration and control, consistent with the maintenance rule, i.e., evaluate the impact of maintenance activities on plant configurations.

REQUEST FOR ADDITIONAL INFORMATION  
REGARDING TO THE TECHNICAL SPECIFICATION  
AMENDMENT REQUEST ON EMERGENCY DIESEL GENERATOR  
ALLOWED OUTAGE TIME EXTENSION  
FERMI 2

1. In your submittal of November 22, 1995, you proposed to extend the allowed outage time (AOT) from 3 days to 7 days for each emergency diesel generator (EDG) in order to perform preventive maintenance (PM) and corrective maintenance (CM). The extending EDG AOT for PM such as the 18-month manufacturer-recommended inspection could be beneficial as it involves teardowns or preplanned PM or modifications that could extend beyond the original AOT. However, it appears that the 3 day AOT has been adequate for CM (for example, an inoperable EDG) in the past. It is not clear now why the 7-day AOT time period is needed for CM. Please state your reason for extending your current CM for the EDG AOT. Your response should also include instances where your current AOT was insufficient to perform CM.
2. The staff has recently granted an extension of an EDG AOT to a plant that has installed a weather-protected tie-line from a hydro station used as an alternate ac (AAC) source which will be substituted for the inoperable EDG during the extension. The extension was granted based on the licensee's commitment to meet the following conditions. Except as noted, provide a discussion of how you would address each condition listed below as related to Fermi 2.
  - a. The Technical Specifications (TS) should include verification that the required systems, subsystems, trains, components, and devices that depend on the remaining EDGs as a source of emergency power are operable before removing an EDG for PM. In addition, positive measures should be provided to preclude subsequent testing or maintenance activities on these systems, subsystems, trains, components, and devices while the EDG is inoperable. This was described in Fermi's 2/19/96 letter.
  - b. The overall unavailability of the EDG should not exceed the value that was used in the probabilistic risk assessment (PRA) supporting the proposed AOT. Also, the EDG unavailability should be monitored and controlled in accordance with the maintenance rule performance goals. This discussion was provided in Fermi's 2/19/96 letter.
  - c. Before taking an EDG out for an extended period, the AAC source should be verified: (1) that it is functional; (2) that the power source is capable of being connected to the safety bus associated with the inoperable EDG; and (3) that this capability of being connected to the safety bus associated with the inoperable EDG is verified once every 8 hours (shift) thereafter.

- d. Voluntary entry into a limiting condition for operation (LCO) action statement to perform PM should be contingent upon a determination that the decrease in plant safety is small enough and the level of risk to the plant will be acceptable for the period and is warranted by operational necessity, not by convenience.
  - e. Voluntary entry into an LCO action statement should not be abused by repeated entry into and exit from the LCO.
  - f. Removal from service of safety systems and important nonsafety equipment, including offsite power sources, should be minimized during the outage of the EDG for PM. This discussion was provided in Fermi's 2/19/96 letter.
  - g. Voluntary entry into an LCO action statement should not be scheduled when adverse weather is expected. This discussion was provided in Fermi's 2/19/96 letter.
3. When an EDG is taken out of service, is it assumed that the whole engineered safety feature electrical power division is inoperable for the purpose of calculating the increase in CDF? If not, why not?
  4. Provide the current EDG reliability data and the major electrical component failure rates used in the PRA.