

Detroit
Edison

Douglas R. Gipson
Senior Vice President
Nuclear Generation

Fermi 2
6400 North Dixie Highway
Newport, Michigan 48166
(313) 586-5249

February 19, 1996
NRC-96-0008

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

- References:
- 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43
 - 2) Detroit Edison Letter to NRC, NRC-95-0124 "Proposed Technical Specification Change (License Amendment) - Emergency Diesel Generator Action Statements, Surveillance Requirements and Reports", dated November 22, 1995

Subject: Response to Questions on Proposed Emergency Diesel Generator
Technical Specification Change

Detroit Edison proposed to change the allowed out-of-service time for one onsite AC electrical power division from 72 hours to 7 days in Reference 2. Currently, Technical Specification (TS) Action statement 3.8.1.1.b establishes a 72 hour Action when one or two diesel generators (EDGs) are out-of-service in one division of onsite AC electrical power. This change was proposed on the basis of 1) the small impact of the extended allowed out-of-service time on plant risk during operations; 2) the improved outage scheduling flexibility and shutdown risk if the 18 month diesel generator inspection is performed on-line; 3) the depth in offsite power supplies; and 4) station blackout capability.

On January 31, 1996, a conference call was held between Detroit Edison and NRC representatives on the proposed Technical Specification change. Detroit Edison was requested to document the responses to six specific questions which were discussed during the conference call and to provide updated EDG unavailability information. The requested information is attached. Detroit Edison personnel would be willing to address any further questions or meet with NRC representatives on this change. As stated in Reference 2, approval of this proposed change is requested by May 31, 1996 in order to support the schedule for inspections prior to the next refueling outage.

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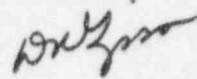
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To arrange a meeting or visit, or if there are further questions please contact
Lynne Goodman at (313) 586-4097.

Sincerely,



Enclosure

cc: T. G. Colburn
M. J. Jordan
H. J. Miller
A. Vogel
Supervisor, Electric Operators, Michigan
Public Service Commission, J. R. Padgett

NRC Question 1:

The licensee should verify that the required systems, subsystems, trains, components, and devices that depend on the remaining diesel generator as a source of emergency power are operable before removing an EDG for preventive maintenance. In addition, positive measures should be taken to preclude subsequent testing or maintenance activities on these systems, subsystems, trains, components, and devices while an EDG is inoperable.

Response to Question 1:

Detroit Edison normally verifies the required systems, subsystems, trains, components and devices that depend on the remaining division of diesel generators (EDGs) as their source of emergency power are operable before removing an EDG from service for preventive maintenance. The Fermi 2 Technical Specifications require this verification be performed within 2 hours after a diesel generator becomes inoperable. Note that at Fermi 2, there are 2 diesel generators per division of electrical power. The loads on each of the divisions are split between the 2 EDGs. Either Division 1 or Division 2 has the capability to supply the ESF AC power loads required for safe shutdown.

Positive measures are taken to preclude subsequent testing or maintenance activities on the systems and components required to be verified operable by Technical Specification Action Statement 3.8.1.1.c. At Fermi 2, planned work activities are currently scheduled over a 13 week schedule. The schedule is normally divisionalized, with Division 1 equipment work and testing scheduled during some weeks, Division 2 scheduled during other weeks. This philosophy is covered in the Daily Scheduling Program Guidelines. Additionally, per the guidelines, the effect of adding additional work to the schedule during a system outage that would remove additional or redundant equipment from services is evaluated from a Technical Specification and risk standpoint prior to that equipment being removed from service.

Also, maintenance activities that would render required equipment in the other division inoperable would require hot shutdown within 12 hours in accordance with Technical Specification Action Statement 3.8.1.1.c.

NRC Question 2:

The AAC power source should have a capacity equal to or greater than the capacity of the EDG that will be out for the extended AOT. The licensee should verify before taking one EDG out for an extended period, that the AAC power source is functional

(i.e., it is verified that the AAC power source is capable of starting and achieving steady-state voltage and frequency in sufficient time) and that the AAC power source is capable of being connected to the safety bus associated with the inoperable EDG, and verifying this capability of being connected to the safety bus every shift thereafter.

Response to Question 2:

As discussed in the conference call on January 31, 1996, the alternate AC source is a combustion turbine generator (CTG11-1) with a capacity of greater than an EDG and large enough to handle Division 1 safe shutdown loads. Credit is taken for the CTG for Appendix R and station blackout scenarios. It is required to be operable by the Appendix R Technical Specification Section 3.7.11. It is a manually started unit and so cannot fulfill starting and automatic loading functions of the EDGs. CTG11-1 is capable of and proceduralized to supply all Division 1 safe shutdown loads. Its capability to supply Division 2 loads has not been specifically evaluated or tested. Each EDG has a continuous rating of 2850 kW (2.85 MW), while the CTG has a capacity of approximately 16 MW.

The normal conduct of business at Fermi 2, as described in the response to question 1, is to determine what other equipment is inoperable prior to removing an EDG from service. This includes checking that CTG11-1 is available before intentionally removing a diesel generator from service for maintenance. This is an administrative check, not a specific test of the CTG. On a monthly basis, CTG11-1 is started to ensure it remains operable.

NRC Question 3:

The probabilistic safety assessment should be evaluated for technical adequacy and acceptability. The calculated CDF for SBO sequences with the extended EDG AOT should be less than or equal to $1.6\text{E-}5/\text{reactor-year}$. The calculated CDF for all sequences with the extended EDG AOT should be less than or equal to the Commission goal of $1.0\text{E-}4/\text{reactor-year}$.

Response to Question 3:

The probabilistic safety assessment (PSA) evaluation supporting the amendment request was reviewed technically before the request was submitted. The base PSA model uses plant specific data for determining diesel unavailability. A value of 0.5% was used in the base PSA model to reflect the actual unavailability experienced due to maintenance and testing. Assuming a linear correspondence between allowed out-of-service time (AOT) and actual maintenance time, an increase of 7/3 or an

unavailability of 1.2%, could be used to assess the risk associated with an extension of the diesel AOT to 7 days.

Applying a linear extrapolation is the approach used by Peach Bottom in their request and approval of a 14 day diesel AOT. However, Detroit Edison decided to evaluate a more conservative scenario. Rather than linearly extrapolating the diesel unavailability, an additional 7 day outage every 16 months of operation, was assumed for each diesel. This increased the maintenance and testing unavailability contribution to the total failure rate of each diesel by 1.9%.

With the 1.9% maintenance/testing unavailability, applied to the total diesel failure rate, the calculated core damage frequency (CDF) for all SBO sequences was more than a factor of ten below the $1.6\text{E-}5/\text{reactor-year}$ criteria. Likewise, the calculated total CDF for the extended EDG AOT evaluation was more than a factor of ten below the Commission goal of $1.0\text{E-}4/\text{reactor-year}$.

NRC Question 4:

The overall unavailability of the EDG should not exceed the value that was used in the PRA supporting the proposed AOT. Also, the EDG unavailability should be monitored and controlled in accordance with the maintenance rule.

Response to Question 4:

The Fermi 2 IPE submitted used a computed conditional success probability of 93.8% for an Emergency Diesel Generator (EDG) given all support is available. Conditional success probability is a measure that a diesel is available for operation and that it will start and run for its desired mission time. Mathematically, conditional probability represents the product of availability and reliability, with both terms being variables in the equation. For example, one extreme case could assume 100% reliability with an acceptable unavailability of 6.2%.

The current Maintenance Rule performance criteria for the EDG includes a conditional success probability greater than 95%. This is more restrictive than the PSA value of 93.8%.

Monitoring of EDG unavailability will be performed by a comparison of the actual EDG performance to the performance criteria for the EDG established in the Maintenance Rule. This activity will assure that the reliability/unavailability of the EDGs will satisfy the Maintenance Rule performance criteria.

NRC Question 5:

Any component testing or maintenance that increases the likelihood of a plant transient should be avoided; plant operation should be stable during the EDG AOT. (This could include consideration of degraded or out-of-service balance-of-plant equipment).

Response to Question 5:

Detroit Edison normally limits concurrent work during EDG outages based on judgment and risk considerations. This includes work that would increase the likelihood of a plant transient. This would not include small planned power adjustments. The scheduling guidelines also specifies that activities that significantly increase the likelihood of plant transients or safety system actuations should not be performed on line. This includes work on BOP systems that poses a significant opportunity to create plant transients.

NRC Question 6:

Voluntary entry into an Limiting Conditions for Operations (LCO) action statement should not be scheduled when adverse weather is expected.

Response to Question 6:

Prior to removing an EDG from service for planned maintenance, Detroit Edison normally considers whether any severe weather is predicted. If severe weather is expected or electrical instability is probable, voluntary maintenance would normally be deferred.

Additional Information Requested EDG Unavailability:

EDG unavailability refers to the period of time the EDGs are unable to perform their required functions when required.

Average unavailability was:

1991 - 0.44%	1993 - 0.26%	1995 - 0.24%
1992 - 0.19%	1994 - 0%	