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Nuclear Operations

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NRC-96-0069

U. S. Nuclear Regulatory Commission
A Document Control Desk
ngton, D. C. 20555

References: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

2) NRC Generic Letter 94-01, "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators," dated May 31, 1994

3) Detroit Edison Letter to NRC, "Proposed Technical Specification Change (License Amendment) - Emergency Diesel Generator Action Statements, Surveillance Requirements and Reports," NRC-95-0124, dated November 22, 1995

4) NRC Letter to Detroit Edison, "Technical Specification Change Request - Emergency Diesel Generator Allowed Outage Time Extension (TAC No. M94171)," dated March 22, 1996

5) Detroit Edison Letter to NRC, "Response to Questions on Proposed Emergency Diesel Generator Technical Specification Change," NRC-96-0008, dated February 19, 1996

6) Detroit Edison Letter to NRC, "Response to NRC Letter on Emergency Diesel Generator Allowed Outage Time Extension (TAC No. M94171)," NRC-96-0041, dated April 19, 1996

7) Detroit Edison Letter to NRC, "Response to Probabilistic Safety Assessment Questions Related to Request for Increasing Emergency Diesel Generator Allowed Out of Service Time (TAC No. M94171)," NRC-96-0050, dated May 3, 1996

8) Detroit Edison Letter to NRC, "Response to Questions on Combustion Turbine Generator (CTG) 11 Unit Number 1 Reliability and System Refurbishment," NRC-96-0066, dated June 12, 1996

Subject: Revised Proposed Technical Specification Change (License Amendment) - Emergency Diesel Generator Action Statements, Surveillance Requirements and Reports (TAC No. M94171)

This letter modifies the proposed Technical Specification change involving Emergency Diesel Generator Action Statements, Surveillance Requirements and Reports contained in Reference 3.

The portion of the proposed amendment involving Surveillance Requirements 4.8.1.1.2.a, 4.8.1.1.3 and 4.8.1.2, Table 4.8.1.1.2-1 and Bases 3/4.8.1, 3/4.8.2 and 3/4.8.3 are unaffected by this revision. The requested changes and justifications contained in Reference 3 remain the same.

The proposed changes to Technical Specification Action Statements 3.8.1.1.b and 3.8.1.1.d are modified by this letter. Reference 3 proposed to extend the allowed out-of-service time for one onsite AC electrical power division from 72 hours to 7 days. The 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.

Detroit Edison and NRC representatives have addressed this request in References 3-8 and in numerous conference calls. As a result, Detroit Edison is modifying the proposed amendment to request that the allowed out-of-service time be extended from 72 hours to 7 days only for the condition when one Emergency Diesel Generator (EDG) in a division is out of service. The allowed out-of-service time for both diesel generators in a division will remain at 72 hours.

This submittal has also been modified to delete references to the evaluation of changes in the risk of core damage. These evaluations were performed using the plant's probabilistic Safety Assessment (PSA) model and are not considered necessary to justify the proposed change. Attachment 1 contains the revised justification for the proposed EDG allowed out-of-service time extension. The change is being justified based on 1) the depth in offsite and onsite power supplies, 2) the improved outage scheduling flexibility and shutdown safety if the 18 month diesel generator inspection is performed on-line, and 3) station blackout capability.

Detroit Edison hopes this revision to the proposed amendment will result in approval as soon as possible. Detroit Edison would like to take advantage of this Cost Beneficial Licensing Action before the upcoming refueling outage, which is currently scheduled to begin on September 29, 1996. The estimated savings figure of $27 million over the life of the plant discussed in Reference 3 remains valid for this revised proposal.

No new commitments are being made in this letter.

Detroit Edison requests that this amendment be approved with an implementation time period of "within 60 days."

Attachment 2 contains the proposed Technical Specification page revisions. It includes all pages modified by the requested amendment, including those unchanged from the Reference 3 request.

Detroit Edison has evaluated the proposed Technical Specification change against the criteria of 10CFR50.92 and determined that No Significant Hazards Consideration is involved. The Fermi 2 Onsite Review Organization has approved and the Nuclear Safety Review Group has reviewed the proposed Technical Specification and concurs with the enclosed determinations. In accordance with 10CFR50.91, Detroit Edison is providing a copy of this letter to the State of Michigan.

If you have any questions, please contact Lynne Goodman at (313) 586-4097.

Sincerely,

Robert McKean

Attachments

cc: A. J. Kugler
M. J. Jordan
H. J. Miller
D. V. Pickett
A. Vegel
Supervisor, Electric Operators, Michigan
Public Service Commission, J. R. Padgett

I, ROBERT MCKEON, 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.

Robert McKeon
ROBERT MCKEON
Assistant Vice President and Manager
Operations

On this 21st day of June, 1996 before me personally appeared Robert McKeon, being first duly sworn and says that he executed the foregoing as his free act and deed.

SHARON K. BUCKLEY
Notary Public, Monroe County, MI
My Commission Expires Sept. 22, 2000

Sharon K Buckley
Notary Public

ATTACHMENT 1

DESCRIPTION AND EVALUATION OF

PROPOSED TECHNICAL SPECIFICATION CHANGE TO

EMERGENCY DIESEL GENERATOR

ACTION STATEMENTS

INTRODUCTION

This evaluation describes and provides the justification for the proposed change in allowed out-of-service time contained in the Emergency Diesel Generator Action Statements. The purpose of this proposed change is to modify Technical Specification 3/4.8.1 to:

Increase the allowed out-of-service time for one diesel generator from 72 hours to 7 days.

The specific articles to be revised are as follows:

Action Statement 3.8.1.1.b is being revised. Currently, it specifies an allowed out-of-service time of 72 hours whether one or both EDGs are inoperable in one of the required divisions of onsite AC electrical power. Otherwise, the plant is to be in at least hot shutdown within the next 12 hours and cold shutdown within the following 24 hours. Other actions to be taken are also specified. The proposed change does not affect the other compensatory actions. It increases the allowed out-of-service time to 7 days if one EDG is inoperable in one of the required divisions of onsite AC electrical power.

Action Statement 3.8.1.1.d which covers the situation when both divisions of onsite AC electrical power are inoperable is being revised. The time frame for restoring one division to operable status is not changed. The time frame for restoring the second division is revised to match the proposed Action Statement 3.8.1.1.b. One of the diesel generators in the remaining inoperable division is required to be restored within 72 hours and both divisions are required to be restored within 7 days of the initial loss. Additionally, Action Statement 3.8.1.1.d is reformatted to improve its usability.

EVALUATION

Description of Fermi 2 Offsite and Onsite AC Power

Fermi 2 Technical Specification 3.8.1.1 requires two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system.

Offsite power is available for the auxiliary power requirements of Fermi 2 and is comprised of two physically independent circuits supplied at two different voltage levels, 345kV and 120kV.

Three (3) transmission lines, named for the stations they connect to (Swan Creek, Luzon, and Shoal), provide 120kV power from the Detroit Edison Electrical System

to the 120kV Switchyard located at the Fermi 1 site. The 120kV Switchyard is an arrangement of buses, breakers, disconnects, transformers, and transmission lines which connect the Combustion Turbine Generators (CTGs located at Fermi 1), and Fermi 2 Division 1 Engineered Safety Feature (ESF) and Balance of Plant (BOP) loads with the Detroit Edison Electrical System. Only one (1) of the above redundant 120kV lines is required to comply with Fermi 2 Technical Specifications in supplying one of the two required physically independent offsite circuits.

Two (2) transmission lines, Brownstown No. 2 and Brownstown No. 3 (previously identified as Brownstown No. 1 in Ref 3), provide 345kV power from the Detroit Edison Electrical System to the 345kV Switchyard located at the Fermi 2 site. The 345kV Switchyard is an arrangement of buses, breakers, disconnects, transformers, and transmission lines which connect the Fermi 2 Main Turbine Generator (MTG-2) and Fermi 2 Division 2 ESF and BOP loads with the Detroit Edison Electrical System. Fermi 2 exports its generating capability via MTG -2, interconnecting via the 345 kV Switchyard to the Detroit Edison Electrical System. Only one (1) of the above redundant 345 kV lines is required to comply with Fermi 2 Technical Specifications in supplying one of the two required physically independent offsite circuits.

The Fermi 2 Class 1E distribution system consists of two physically and electrically independent and redundant power trains, Division 1 and Division 2, supplying electrical power to safety-related equipment. The ESF buses are divided into two (2) divisions, with different offsite power sources to each division, as discussed above. Each of the two (2) ESF divisions, Division 1 and 2, consist of four (4) separate buses. The loads on each ESF division are split between two (2) Emergency Diesel Generators. Either Division 1 or Division 2 has the capability and the capacity to supply the ESF AC power loads required for safe shutdown.

Four (4) EDGs, each connected to their respective ESF Buses, provide an emergency source of power upon loss of the offsite power sources. In the event of a loss of offsite power, each EDG will receive an automatic start signal. Load shedding and bus isolation will occur automatically. Following load shed and bus isolation, each EDG output breaker will automatically close, energizing the associated ESF Buses. Essential loads will then be automatically connected to their respective ESF Buses sequentially.

Four (4) Combustion Turbine Generators (CTGs) at the Fermi 1 site can be used to supply power to Division 1 ESF Buses when a loss of offsite and onsite power occurs (Station Blackout). CTG 11 Unit 1 is designed with a black start capability. Plant procedures provide for operation of the CTGs and the Electrical System under station blackout conditions. CTG 11 Unit 1 has sufficient capability to supply Division 1

station blackout safe shutdown loads. CTG 11 Unit 1 fulfills the function of an Alternate AC source required by the station blackout rule.

The Fermi 2 Electrical Power System is described in the Fermi 2 Updated Final Safety Analysis Report (UFSAR) Section 8. The safety related function of the EDGs is to provide an onsite standby source of AC electrical power to shut down and maintain the reactor in a safe condition under all conditions including a Loss of Coolant Accident (LOCA) coincident with a Loss of Offsite Power (LOOP) event.

To summarize, there are five transmission lines providing offsite power to Fermi 2. Any one of these lines is capable of providing power to supply loads necessary for safe shutdown capability. There are four EDGs, two per division. Either division of EDGs has the capability to supply the AC loads needed for safe shutdown. Additionally, there are four CTGs that can supply power to Division 1. Each CTG has blackstart capability. One CTG has enough capacity to supply safe shutdown loads needed in response to a station blackout event.

Evaluation of Increase in Allowed Out-of-Service Time for One Emergency Diesel Generator

This submittal proposes to change the allowed out-of-service time for one EDG from 72 hours to 7 days. This change is proposed on the basis of 1) the depth in offsite and onsite power sources, 2) the improved outage schedule flexibility if the 18 month EDG inspection is performed on-line, 3) the expected decrease in critical path time in outages starting with the sixth refueling outage and decrease in outage cost starting with the fifth refueling outage if the 18 month inspection is performed on-line, 4) the improvement in shutdown risk if EDG inspections are performed with the plant on-line vs. shutdown, and 5) that CTG 11 Unit 1 has been analyzed and proceduralized to fulfill emergency power needs during a station blackout event.

Effect on EDG Availability

Currently, the availability and reliability for the Fermi 2 EDGs are high. Fermi 2 is committed to a 0.95 target reliability for the EDGs. Actual reliability exceeds 95%. The Fermi 2 Nuclear Generation Business Plan Reports monitor the total unavailability of the EDGs. EDG unavailability refers to the period of time the EDGs are unable to perform their required function when required. Between 1991 and 1993 Fermi 2 maintained an average unavailability of approximately 0.3 % for the EDGs. The unavailability for 1994 was 0%, however, during much of 1994, not all EDGs were required to be functional due to the extended plant shutdown. During 1995, the average unavailability was 0.24%.

Information was gathered by the Maintenance Rule Task Force from January 1991 to September 1995, relating to EDG Unavailability due to Functional Failures. The data shows the highest rolling 12 month EDG unavailability due to functional failures over this time period ranged from 0.01 % for the best performing EDG to 0.41% for the worst performer.

Detroit Edison estimates that with the proposed Technical Specification changes in effect, the average planned hours of unavailability per EDG will increase by about 96 hours during each operating cycle. Therefore, the increase in planned unavailability as a result of the proposed Technical Specification changes, will be small. Monitoring of EDG unavailability will continue to receive attention after this change is implemented.

The main reason Detroit Edison is requesting this amendment is in order to perform the 18 month diesel inspection on-line. A 7 day out-of-service time will allow the inspection to be done on-line since the inspection is expected to take about 4 days (96 hours). Even if the increased time out-of-service is assumed to take 7 days for each diesel generator, the additional unavailability expected for each EDG would be 7 days each cycle. The total unavailability would then be expected to be about 1.7%. No additional unplanned out-of-service time is expected as a result of the longer time period in the Action statement, since most periods of unavailability are considerably less than the existing 72 hours out-of-service time in Technical Specifications. Neither extending the allowable out-of-service time nor performing the 18 month inspections on-line should negatively impact the performance of the diesel, so the unplanned unavailability should not increase. The total unavailability should only be increased by the additional planned on-line maintenance.

The conservatively estimated total future EDG unavailability of about 1.7% is still less than the estimated nuclear industry average EDG maintenance unavailability during operation of 2% as documented in NUREG/CR-5994, "Emergency Diesel Generator: Maintenance and Failure Unavailability, and Their Risk Impacts," 1994.

Shutdown Safety

Another way of evaluating the effect of the change on plant safety is to address the impact on shutdown safety. While the impact on shutdown safety was not quantitatively evaluated, there are qualitative observations that can be made. Per NUREG/CR-5994, the risk impact of EDG maintenance during power operation and many stages of shutdown are comparable. This is especially true for the early stages of an outage (e.g., before the refueling stage is reached).

Since Fermi 2 has 4 diesel generators, one diesel generator is out-of-service for much of a refueling outage for maintenance, inspection, or testing. Detroit Edison's

shutdown safety philosophy is currently based on a defense in depth approach. One goal is to maintain EDGs in both divisions of onsite AC electrical power in an operable status whenever possible. If the 18 month inspection is performed on-line, EDG availability during outages will significantly improve.

Outage scheduling flexibility will also improve if the EDGs are not required to be out-of-service as much as currently during an outage. Other surveillance testing and maintenance will be easier to schedule with improved EDG availability during outages. The increased flexibility will help in scheduling future refueling outage activities to be more efficient and improve shutdown safety.

On-Line Maintenance

Performing the periodic EDG inspections on-line will result in a more balanced allocation of component maintenance tasks between power operation and refueling outages. During power operation, management and maintenance will be able to focus more on the preparations and successful implementation of the EDG inspection, since it will be a major planned activity rather than one of many refueling outage tasks. Detroit Edison will have more flexibility in selecting personnel to perform the maintenance and more flexibility in scheduling the EDG outage to avoid simultaneous outages of risk significant equipment.

Detroit Edison controls the combinations of risk significant systems that may be scheduled for on-line maintenance. References 5 and 6 discuss on-line maintenance further, including that the availability of CTG 11 Unit 1 will be checked prior to removing an EDG from service. Detroit Edison committed, in Reference 6, to verify that the Alternate AC source is functional before removing an EDG from service for a planned extended period and every 8 hours thereafter.

Preplanning is performed for on-line maintenance, including staging of materials and parts to reduce the likelihood of delays during on-line maintenance activities. Work is scheduled to minimize the out-of-service time so that important equipment can be returned to service promptly. Normally, work on EDGs is performed around the clock if the EDG is out-of-service while the plant is operating.

With one or both EDGs in one AC electrical power division inoperable, Action statement 3.8.1.1.c delineates the additional conditions that must be satisfied to permit plant operation to continue. Action 3.8.1.1.c requires a verification that all required systems, subsystems, trains, components, and devices that depend on the remaining onsite AC electrical power division as a source of emergency power are operable. Otherwise, reactor shutdown is required. Scheduling of EDG maintenance or inspections will be in accordance with plant processes to evaluate work on

equipment important to risk and to ensure the requirements of Action 3.8.1.1.c are met. Both of these methods help insure performing the periodic diesel generator inspection on-line will have a negligible impact on public health and safety.

Changes Since Original Out-of-Service Time Was Established

There have been changes since original licensing both in plant capability and method of evaluating risk to plant safety. In response to the station blackout rule, Detroit Edison established the capability of coping with a station blackout, which is the loss of all offsite power concurrent with turbine trip and unavailability of the onsite emergency AC power system. This capability is described in Section A.1.155 of the Updated Final Safety Analysis Report. As described earlier, CTG 11 Unit 1 has black start capability and can provide power to Division 1 ESF loads needed during a station blackout event.

Looking at plant safety while the reactor is shutdown has received increased attention over the years. Detroit Edison evaluates planned outage activities to determine if established defense in depth goals are met. Considerable attention is placed on availability of electrical power. Additionally, the industry trend towards shorter outages makes the importance of evaluating equipment availability greater and minimizing unnecessary out-of-service time more important.

Lastly, the NRC and industry have recognized the benefit of modifying regulatory requirements to reduce costs when the impact on safety is small. The change proposed in this application meets this criteria.

Other Plants

The proposed EDG out-of-service time can be compared to other units' EDG out-of-service times. There are approximately 40 nuclear units that have a 7 day or greater allowed out-of-service time for one EDG. The majority of these units have 2 EDGs per unit (or 3 or less EDGs per 2 unit station which has shared EDG(s)), rather than the Fermi 2 configuration of 2 EDGs per division of onsite AC power.

At the time of licensing, Fermi 2 configured its AC electrical power Technical Specification similar to standard Technical Specifications by establishing Action Statements on the basis of a division being out of service. This proposal reflects the nonstandard design at Fermi in that there are 2 EDGs per division and that the impact of one being out of service is less than both being out of service.

SIGNIFICANT HAZARDS CONSIDERATION

The revised determination evaluates the impact of all the changes requested by the

Reference 3 proposal, as modified by this letter. In accordance with 10CFR50.92, Detroit Edison has made a determination that the proposed amendment involves no significant hazards considerations. To make this determination, Detroit Edison must establish that operation in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated, or (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety.

The proposed amendment will increase the allowed out-of-service time for one diesel generator, remove the provisions for accelerated testing and special reports, and revise the Bases due to these changes.

1. The proposed changes do not involve a significant increase in the probability or consequences of an accident. Changing the out-of-service time, surveillance frequency and reporting requirements for emergency diesel generators (EDGs) will not affect the initiation of an accident, since EDGs are not associated with any accident initiation mechanism. The proposed changes will not impact the plant design or method of EDG operation. The increased EDG out-of-service time will not significantly increase the consequences of an accident since the remaining EDGs required to be operable during the extended out-of-service time are more than sufficient to supply safe shutdown loads should an accident and loss of offsite power occur. Performing the EDG inspections during plant operations could improve safety during plant outages by decreasing the amount of work requiring the EDGs to be out-of-service during outages. Deleting the accelerated testing provisions will not affect the consequences of an accident since the implementation of a maintenance and monitoring program for EDGs consistent with the provisions of the maintenance rule will assure EDG performance as discussed in Generic Letter 94-01. Deleting reporting requirements has no impact on consequences of an accident since reporting has no accident effect. Based on the amount of electrical system redundancy, the sufficiency of remaining EDGs to handle safe shutdown loads, and the potential improvement in plant safety during outages, this change will not result in a significant increase in the probability or consequences of an accident.

2. The proposed changes do not create the possibility of a new or different accident from any previously evaluated. The proposed changes do not modify the plant design or method of diesel operation. Therefore, no new accident initiator is introduced, nor is a new type of failure created. For these reasons, no new or different type of accident is created by these changes.

3. The proposed changes do not involve a significant reduction in a margin of safety. Since implementation of a maintenance program for the EDGs consistent with the Maintenance Rule will ensure that high EDG performance standards are maintained, the accelerated testing schedule is not needed to maintain the margin of safety. Deleting reporting requirements has no impact on safety or margin of safety. Increasing the allowed out-of-service time for one EDG will slightly increase EDG unavailability during plant operation. However, this change does not impact the redundancy of offsite power supplies, the allowed out-of-service time if both divisions of power are not operable, or the ability to cope with a station blackout event. This request also does not change the Action statement for AC electrical power systems required when the plant is shutdown. The remaining EDGs required to be operable during the extended out-of-service time are more than sufficient to supply safe shutdown loads. Enabling the diesel generator inspections to be performed on-line will improve safety while shutdown by reducing required EDG out-of-service time during outages. For these reasons, the proposed changes do not involve a significant reduction in the margin of safety.

ENVIRONMENTAL IMPACT

Detroit Edison has reviewed the proposed Technical Specification changes against the criteria of 10CFR51.22 for environmental considerations. The proposed changes do not involve a significant hazards consideration, nor significantly change the types or significantly increase the amounts of effluents that may be released offsite, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, Detroit Edison concludes that the proposed Technical Specifications meet the criteria given in 10CFR51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement.

CONCLUSION

Based on the evaluations above: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the proposed amendment will not be inimical to the common defense and security or the health and safety of the public.

Detroit Edison requests that the proposed license amendment be effective within 60 days of approval by the Commission.

ATTACHMENT 2

PROPOSED

TECHNICAL SPECIFICATION

CHANGES