

Detroit
Edison

William S. Orser
Senior Vice President

Fermi 2
6400 North Dixie Highway
Newport, Michigan 48166
(313) 586-5201



Nuclear
Operations

August 1, 1990
NRC-90-0096

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

Reference: Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

Subject: Proposed Technical Specification Change
(License Amendment) - Emergency Core Cooling
System Actuation Instrumentation (3/4.3.3)

Pursuant to 10CFR50.90, Detroit Edison Company hereby proposes to amend Operating License NPF-43 for the Fermi 2 plant by incorporating the enclosed changes into the Plant Technical Specifications. The proposed change provides revised Emergency Core Cooling System (ECCS) Response Time requirements for the Low Pressure Coolant Injection (LPCI) mode of the Residual Heat Removal (RHR) system. The new Response Time requirements reflect the results of recalculation of the applicable accident analysis by General Electric.

Detroit Edison has evaluated the proposed Technical Specifications 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 Specifications and concurs with the enclosed determinations. In accordance with 10CFR50.91, Detroit Edison has provided a copy of this letter to the State of Michigan.

If you have any questions, please contact Mr. Gordon Nader at (313) 586-4513.

Sincerely,

Enclosure

cc: A. B. Davis
R. W. DeFayette
W. G. Rogers
J. F. Stang
Supervisor, Electric Operators, Michigan
Public Service Commission - J. Padgett

9008130077 900801
PDR ADOCK 05000341
P PDC

Adol
111

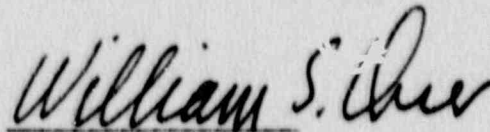
USNRC

August 1, 1990

NRC-90-0096

Page 2

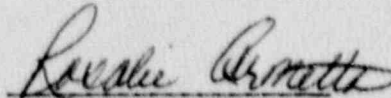
I, WILLIAM S. ORSER, do hereby affirm that the foregoing statements are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.



WILLIAM S. ORSER

Senior Vice President

On this 1st day of August, 1990, before me personally appeared William S. Orser, being first duly sworn and says that he executed the foregoing as his free act and deed.



Notary Public

ROSALIE A. ARMETTA

Notary Public, Monroe County, MI
My Commission Expires Jan. 11, 1992

INTRODUCTION

Fermi 2 Technical Specification 3/4.3.3, Emergency Core Cooling System (ECCS) Actuation Instrumentation, requires that ECCS Actuation Instrumentation channels have ECCS Response Times as shown in Table 3.3.3-3, ECCS Response Times. Included in Table 3.3.3-3 are response time requirements for the Low Pressure Coolant Injection (LPCI) mode of the Residual Heat Removal (RHR) System.

Specification 1.11 defines ECCS Response Time as the time interval from when the monitored parameter reaches the channel setpoint at the sensor until the ECCS equipment is capable of performing its safety function. Specifically included are the times involved for any required valve repositioning and emergency diesel generator (EDG) starting and loading.

LPCI operation provides protection to the core for the case of a large break Loss-of-Coolant Accident (LOCA). The protection provided by LPCI also extends to a small break LOCA in which systems with high-pressure makeup capability are unable to maintain reactor vessel water level, and the Automatic Depressurization System has operated to lower the reactor vessel pressure. The Core Spray System operates independently to achieve the same objectives.

Plant ECCS response must be evaluated under a broad spectrum of break sizes and locations. In addition, coincident Loss of Off-site Power (LOSP) and the occurrence of a worst single failure must be considered. The worst case event for those events where the LPCI mode of RHR is relied upon is the maximum large break LOCA (double ended recirculation line break) with LOSP and failure of the Division II DC power supply. This event is most limiting both in terms of consequences and in terms of time availability for LPCI response. Thus, it is clear that the plant analyses need to accurately reflect this event. The LPCI analysis has been recently recalculated for the following two reasons:

(1) While performing a modification to enhance LPCI Swing Bus to address a degraded voltage concern (this modification was the subject of Fermi 2 Licensee Event Report 87-045-01, dated November 6, 1989), it was determined that a five second time delay in the reenergization of the LPCI Swing Bus, which is required in some accident situations, had not been specifically accounted for in the accident analyses. Please note that an existing analysis at the time of this recognition contained enough conservatism to bound the 5 second Swing Bus time delay even though it did not specifically consider it. The accident situation which is applicable to reenergization of the LPCI Swing Bus is outlined below:

In the event of a break (LOCA) in one of the two reactor recirculation system loops, logic is provided to sense the broken

loop and to inject full LPCI flow into the unbroken loop from both Divisions of LPCI. Thus, the flow from the two LPCI divisions are interconnected by valving and dependent on individual valves whose failure could completely inhibit LPCI flow. Since electrical power to each LPCI Division is divisionally separated (Divisions I and II), Fermi 2 has a LPCI Swing Bus arrangement which permits essential LPCI/Recirculation system valves that could be disabled by a failure of a divisional electrical supply to be energized by either electrical division. Under IOSP conditions, the Swing Bus is normally reenergized from the Division II EDGs without further time delay when this power source becomes available. However, if this power source is not available because of a single failure, the logic to allow reenergization from the Division I EDGs has an inherent 5 second time delay.

Because this 5 second time delay was not specifically covered in the applicable analysis of record, Detroit Edison had General Electric recalculate the ECCS response time to allow for this additional time delay and to provide for additional margin, as described below.

(2) The second reason was to verify that delaying LPCI would not exceed the accident consequences of the most limiting analysis of record. This provides the technical justification for increasing the proposed LPCI Technical Specification (TS) response time contained in this proposal. This time response increase is requested to prevent unnecessary restrictions on plant operation. Currently Detroit Edison is in full compliance with its LPCI system response TS. However, some valve strokes, which collectively input into the LPCI System response time, are very close to their individual limits. Specifically, the current TS LPCI System response time of 43 seconds is achieved by restricting the maximum allowable stroke time of the recirculation pump discharge valves to 32 seconds. UFSAR Section 6.3.2.2.4.1 indicates the stroke time for these valves is between 27 and 33 seconds. However to meet LPCI response time we have reduced the upper limit from 33 to 32 seconds. Any future increase in response times could unnecessarily restrict plant operation.

A recalculation of the applicable analysis for the LPCI mode of RHR was performed delaying LPCI for an additional 12 seconds to specifically account for the loading time for reenergization of the LPCI Swing Bus, as discussed above, and to justify an increase in the response time. This revised analysis determined that the consequences of this accident scenario do not exceed the most limiting analysis of record. The most limiting analyses of record is associated with a LPCI injection valve failure which completely disables LPCI flow and thus relies on the Core Spray and High Pressure Coolant Injection Systems for core flooding. Therefore, the purpose of this proposal is to incorporate the excess margin afforded by this new analysis to prevent unnecessary restrictions on plant operation. It should not

be construed that this additional time would be used for operational justification of excessive equipment degradation. For example, the Inservice Testing Program (performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code) trends valve stroke times and has OPERABILITY provisions based on a valve's previous and current stroke times which must be satisfied. Please note that the added margin afforded by the proposed TS could also be utilized if a design change affected the LPCI System response time (e.g., increasing a valve's closing/opening stroke time). However, any design change which would affect time responses testing criteria would require a safety evaluation in accordance with 10CFR50.59.

EVALUATION

Detroit Edison had General Electric recalculate the appropriate ECCS accident response calculations accounting for a longer (by 12 seconds) LPCI injection time which conservatively bounds the additional 5 seconds required for the Swing Bus to be reenergized as previously described. This calculation uses an ECCS Evaluation Model in accordance with Appendix K to 10CFR50 to determine the Peak Cladding Temperature (PCT) of the reactor fuel. This PCT is compared to the acceptance criteria of 2200°F PCT specified in 10CFR50.46(b) (1).

The previous worst case PCT for events involving the response of the LPCI mode of RHR has increased from less than 1800°F to less than 1900°F when evaluated with a new response time of 55 seconds from the LOCA/LOSP event.

However, the most limiting PCT for the large break LOCA/LOSP still occurs for an event where the LPCI mode of RHR does not respond. This is the case where a postulated LPCI injection valve failure causes the LPCI mode of RHR to completely fail. This case is unaffected by the new considerations discussed above and thus the most limiting PCT remains unchanged at 2084°F. Further, the new response time had no effect upon the calculational results in regards to the remaining acceptance criteria of 10CFR50.46(b) because the most limiting PCT was not exceeded.

This proposal requests a LPCI Response Time change from 43 seconds to 55 seconds. Detroit Edison does not believe that a single failure has to be assumed when determining response time testing acceptance criteria. However, we believe that this situation must be fully analyzed to determine its effects, as described above, and the Technical Specifications should reflect available excess margin afforded by the reanalysis to prevent unnecessary restrictions on plant operations.

ECCS Response Time Testing requirements in accordance with Technical Specification Definition 1.11 specify that times for diesel generator starting and loading, and valve repositioning must be considered but

does not state that a single failure needs to be considered. Response Time Testing is intended to verify the timeliness of ECCS system response under normal LPCI operation not abnormal operation. Thus, the proposed time does not include the 5 seconds required to reenergize the Swing Bus to its alternate post accident power supply because the single failure which causes the Swing Bus to switch is not assumed in the response time testing acceptance criteria.

While Detroit Edison does not believe that a single failure is required when determining response time testing acceptance criteria, we believe that a single failure should be assumed for the bounding LPCI analysis. LPCI is initiated by a high drywell pressure signal or a reactor water level 1 signal. General Electric analyses conservatively assume that the later initiation signal (level 1) initiates LPCI; thus, the reanalysis is based on a complete failure of the high drywell pressure signal. This failure delays the initiation of LPCI more than the delay from a single failure which causes the Swing Bus transfer and is therefore the bounding failure.

In summary, ample margin of over 300°F remains between the new PCT value for the LPCI mode of RHR and the 10CFR50.46(b)(1) criteria of 2200°F. Additionally, the most limiting PCT (2084°F) for the event of concern remains unchanged. For these reasons, Detroit Edison believes the proposed change to be acceptable.

SIGNIFICANT HAZARDS CONSIDERATION

In accordance with 10CFR50.52, 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 change to the Response Time criteria of Technical Specification Table 3.3.3-3 for the Low Pressure Coolant Injection (LPCI) of the Residual Heat Removal (RHR) System does not:

- 1) Involve a significant increase in the probability or consequences of an accident previously evaluated. The maximum Peak Cladding Temperature (PCT) for cases where the LPCI mode of RHR responds when calculated using an ECCS Evaluation Model in accordance with Appendix K of 10CFR50 increases from less than 1800°F to less than 1900°F. The most limiting PCT of 2084°F remains unchanged since the most limiting case remains one where the LPCI mode is assumed to completely fail. Since adequate margin to the 10CFR50.46(b)(1) PCT acceptance criteria of 2200°F exists and

the results regarding the remaining criteria of 10CFR50.46(b) are unchanged, the consequences of previously evaluated accidents are not significantly increased. The change does not affect the manner of plant operation or involve a plant modification and therefore does not affect the probability of any previously evaluated accident.

- 2) Create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed change does not alter the manner of plant operation or involve a plant modification. Rather, the change reflects a reevaluation of the plant ECCS performance using a revised response time for the LPCI mode of RHR. Therefore, the change involves no new accident modes.
- 3) Involve a significant reduction in a margin of safety. Since the most limiting PCT remains unchanged, the proposal does not involve a reduction in the margin of safety. Additionally, the proposed change does not alter the manner of plant operation or involve a physical modification to the plant.

Based on the above, Detroit Edison has determined that the proposed amendment does not involve a significant hazards consideration.

ENVIRONMENTAL IMPACT

Detroit Edison has reviewed the proposed Technical Specification changes against the criteria of 10CFR51.22 for environmental considerations. The proposed change does 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 do 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 evaluation 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 proposed amendments will not be inimical to the common defense and security or to the health and safety of the public.