



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 44 TO FACILITY OPERATING LICENSE NO. NPF-43

DETROIT EDISON COMPANY

WOLVERINE POWER SUPPLY COOPERATIVE, INCORPORATED

FERMI-2

DOCKET NO. 50-341

1.0 INTRODUCTION

By letter dated November 16, 1989, the Detroit Edison Company (DECO or the licensee) requested amendment to the Technical Specifications (TS) appended to Facility Operating License No. NPF-43 for Fermi-2. The proposed amendment would revise TS Figure 3.2.3-2, Flow Correction ( $K_f$ ) factor. The figure was part of a previous license amendment application dated April 3, 1989, and issued by the NRC as Amendment No. 42 to the Fermi-2 Operating License and was recently found, on November 9, 1989, to be in error. Upon the discovery of this error, the licensee began a detailed review of Amendment No. 42 against its base-line documents. Particular attention was paid to figures. The following figures as submitted to the NRC in the original April 3, 1989, application were found to need modification to ensure the limits contained in the figures clearly express the limits required by the supporting analysis. The problems were either editorial or related to the clarity of the figure. The affected figures:

- Figure 3.2.1-3 Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) Versus Average Planar Exposure Reload Fuel Type BC318D
- Figure 3.2.1-4 Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) Versus Average Planar Exposure Reload Fuel Type BC318E
- Figure 3.2.3-1 BOC to 12,700 MWD/ST Minimum Critical Power Ratio (MCPR) Versus Tau At Rated Flow
- Figure 3.2.3-1A 12,700 MWD/ST to 13,700 MWD/ST Minimum Critical Power Ratio (MCPR) Versus Tau At Rated Flow
- Figure 3.2.3-1B 13,700 MWD/ST to ECC Minimum Critical Power Ratio Versus Tau At Rated Flow

Bases Section 2.0 and 3/4.1.3 were found to retain references to the Cycle 1 MCPR Safety Limit of 1.06. Also, Bases Section 2.1.1 refers to the GEXL correlation, which applied only to Cycle 1. New Bases pages are attached which

replace cycle-specific references with general references which are not cycle-specific. This is consistent with other Bases changes made in Amendment No. 42. Typographical and editorial errors were found in Bases Section 3/4.2.3 and Table B 3.2.1-1, the errors are corrected in the attached page changes.

In addition, typographical errors were found in the designation of fuel bundle types in Specification 3.2.4 and a reference to figures in Specification 4.2.3.1 was not changed to match the addition of new figures. The purpose of the November 16, 1989, application is to correct these errors.

## 2.0 EVALUATION

Each correction to the TS is addressed individually below.

### Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) Limit Figures

These figures provide the MAPLHGR limits, in units of KW/ft, as a function of Average Planar Exposure, in units of MWD/t. The information is presented graphically as a series of line segments. Each point where the segments connect is given in tabular format.

Two new fuel types, BC318D and BC318E, have been loaded at Fermi-2 for Cycle 2; therefore, two new MAPLHGR limit figures were proposed. These figures are Figures 3.2.1-3 and 3.2.1-4, respectively, in the April 3, 1989, application.

In both figures, one point specified for the joining of two line segments was not graphically plotted consistent with the tabular information. In both figures, the point tabularly indicated to be associated with 12,500 MWD/t was graphically plotted at 12,000 MWD/t. Further, the heading for the MWD/t column in both figures is incorrectly given as "MWD/" rather than the correct units of "MWD/t."

The GE Nuclear Energy Supplemental Reload Licensing Submittal (RLS), provided as an attachment to the April 3, 1989, application gives the results of the accident analysis which is the basis for these curves. This information is located in Item 17 on page 15 of the RLS. The analysis results correspond to the tabular data on the figures.

The November 16, 1989 submittal contained revised Figures 3.2.1-3 and 3.2.1-4 with the graphs replotted to correctly indicate the RLS information. A corrected heading for the Average Planar Exposure column of the table is also included.

The change does not reflect any change to the accident analysis which was reviewed and approved by the NRC in conjunction with Amendment No. 42. The change strictly corrects administrative errors made in the preparation of the April 3, 1989, application.

### Minimum Critical Power Ratio (MCPR) Versus Tau at Rated Flow Limit Figures

Amendment No. 42 issued three figures, each for a specific period of core life (measured in MWD/ST), which provide MCPR operating limits as a function of a variable, tau. Tau, is defined in Specification 3.2.3 and is a measure of the control rod scram speed performance as related to that assumed in the General

Electric analysis. Since scram times can be less conservative than that assumed in the analysis, but still within those allowed by the Technical Specifications, the MCPR operating limits is adjusted conservatively upward when necessary by referring to these figures.

MCPR versus tau curves are provided in each figure for four possible operating conditions. These conditions are combinations of Control Cell Core (CCC) or non-CCC operating modes, and the availability of turbine bypass capability or moisture separator reheater.

The nomenclature associated with Curve C and curve D, which appears on each of these figures, was found to be unclear as proposed in the April 3, 1989, application and as issued in Amendment No. 42. The nomenclature is proposed to more clearly indicate which equipment is assumed to be out-of-service for the two curves. Previously, the terminology "without a piece of equipment" was used to mean "with the equipment out-of-service." The proposal is strictly editorial and makes no change to the intent or application of the curves.

On Figure 3.2.3-1, the MCPR value for tau equal to 1.0 for the merged Curve A and B is not given on the figure. This point corresponds to a MCPR of 1.32. This value is the "Option A" most limiting pressurization event for the exposure range "BOC2 to EOC2 - 2000 MWD/St" located on RLS page 13.

On all three figures, Curve B is a hybrid of two limiting events. One is the non-pressurization event of a rod withdrawal error which has a limiting MCPR of 1.30 for GEBX8EB fuel (see RLS page 13). The other is the pressurization event for the core exposure of concern which yielded Curve A. Thus, Curve B is a constant 1.30 for tau less than the tau for the point where the Curve A event becomes more limiting.

On Figures 3.2.3-1A and 3.2.3-1B a value of less than 1.30 appears to be indicated for a portion of Curve B which should be a constant 1.30. This occurs near the point where Curves A and B join. This proposal corrects Curve B for these two figures by indicating the correct value of 1.30 for the constant MCPR segments of Curve B.

In summary, all of the changes to the MCPR limit figures are either editorial or corrections of administrative errors in the plotting of RSL supplied data points. There is no change in the underlying accident analysis which was reviewed and approved by the NRC in conjunction with Amendment No. 42.

#### Flow Correction ( $K_f$ ) Factor

Flow Correction ( $K_f$ ) Factor as a function of Core Flow (%) is provided in Figure 3.2.3-2. The Operating Limit MCPR determined from the use of Figure 3.2.3-1, 3.2.3-1A, or 3.2.3-1B (depending on core exposure) is multiplied by  $K_f$ . This increases the MCPR limit further to account for a potential Reactor Recirculation Pump Runout transient. Since the severity of this transient depends on the Flow Control Mode and, if in manual mode, the Scoop Tube Set Point Calibration, five curves are provided to account for the possible configuration.

As discussed above under Introduction, these figures were incorrectly drawn in the preparation of the April 3, 1989, application. The sole change to these figures is to provide the correct curves.

The new  $K_f$  values were made necessary for Cycle 2 due to the application of the GEXL-PLUS critical power correlation to the Cycle 2 reload licensing analyses. The Cycle 1 analysis used the GEXL correlations. Both correlations provide a means to relate bundle critical power, that power which leads to transient boiling, to parameters which can be sensed and provided to the plant process computer.

The sole purpose of the proposed change is to correct an administrative error made in the preparation of the April 3, 1989, application. No change to the underlying accident analysis has been made.

#### Administrative Errors

Amendment No. 42 revised Specification 3.2.4 to indicate separate Linear Heat Generation Rate (LHGR) limits for different fuel bundle types. In Amendment No. 42, bundle types BCR183 and BCR233 were incorrectly identified as BCR183 and BCR233. Also, in Specification 4.2.3.1 reference to Figure 3.2.3-1 was not changed to include new Figures 3.2.3-1A and 3.2.3-1B. The new figures were created by the specification of MCPR limits based upon core exposure. Specification 4.2.3.1 is proposed to be changed in a manner similar to that approved in Amendment No. 42 for Specification 4.2.3.2 to ensure that all of the curves are referenced.

Bases Sections 2.0 and 3/4.1.3 were found to mention that the MCPR Safety Limit is 1.06, which was the Cycle 1 limit. These sections were not originally identified as needing changing. Elsewhere the term "Safety Limit MCPR" was inserted in the April 3, 1989, application where the specific value previously had been. These sections are now corrected to reference the Safety Limit MCPR. Also, since Bases Section 3/4.1.3 is being revised, the reference to Section 15B of the FSAR is being updated to Section 15 of the UFSAR (Updated Final Safety Analysis Report). A mention of the Cycle 1 GEXL analyses was inadvertently left in Bases Section 2.1.1. As discussed above, the GEXL-PLUS correlation was used for Cycle 2. The wording is being corrected to mention the "approved critical power correlation." On Bases Table B 3.2.1-1, the unit of area for a small break is listed as "ft" rather than "ft<sup>2</sup>". This is being corrected. The last administrative errors needing correction are in Bases Section 3/4.2.3. The word "extended" was mistyped in Amendment No. 42 as "extending." Additionally, the descriptions of the CCC operations mode and non-CCC mode need slight changes to match descriptions provided elsewhere in the Technical Specifications. These errors are being corrected.

Based on the above evaluation the staff finds the proposed changes are either administrative or editorial in nature. The technical analysis as presented in the April 3, 1989, application and reviewed and approved by the staff in Amendment No. 42 is not changed in anyway. Therefore, the staff finds the proposed changes to correct the TS pages are acceptable.

### 3.0 EMERGENCY CIRCUMSTANCES

In the November 16, 1989, letter the licensee requested that this amendment be proposed as an emergency because if the NRC does not process the application the licensee's restart schedule will be affected. Fermi-2 is currently shutdown for refueling and scheduled to commence reactor startup on November 20, 1989. Escalating above 25% power is scheduled to occur as soon as plant conditions allow.

As described above, the proposed changes correct or make clear Technical Specification limits associated with the Cycle 2 fuel loading. The affected Specifications are all applicable at greater than 25% rated thermal power. The licensee does not believe operation with applicable Technical Specifications which are non-conservatively incorrect is acceptable. In this case, the need for the amendment arose from the diligent investigation of a recently discovered discrepancy between the Technical Specifications for Cycle 2 and the process computer data for Cycle 2. Upon discovery of the need for a license amendment, the November 16, 1989 application was made in a prompt manner. Due to the schedule detailed above, adequate time for the usual 30 day period for public comment does not exist.

In accordance with 10 CFR 50.91(a)(5), the licensee has provided justification that it could not make a timely application and emergency circumstances do exist. Thus, the NRC staff does not believe that the licensee has abused the emergency provisions in this instance. Accordingly, the Commission has determined that there are emergency circumstances warranting prompt approval by the Commission.

### 4.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92 state that the Commission may make a final determination that a license amendment involves no significant hazards considerations, if operation of the facility, in accordance with the amendment would not:

- (1) Involve a significant increase in the probability or consequences of any 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.

This amendment has been evaluated against the standards in 10 CFR 50.92. It does not involve a significant hazards consideration based on the following:

- (1) The changes do not involve a significant increase in the probability or consequences of an accident previously evaluated (10 CFR 50.92(c)(1)) because there will be no physical changes to the facility and all operating procedures, limiting conditions for operation, limiting safety system settings, and safety limits currently delineated in the Technical Specifications remain unchanged.

- (2) The changes do not create the possibility of a new or different kind of accident from any previously analyzed or evaluated (10 CFR 50.92)(c)(2)) because neither plant operation or design are affected by the proposed changes. The proposed amendment creates no new accident scenario.
- (3) The change does not involve a significant reduction in a margin of safety (10 CFR 50.92(c)(3)) because there will be no physical changes to the facility and the requirements delineated in the current Technical Specifications for limiting conditions for operation, limiting safety system settings, and safety limits remain unchanged.

On the basis of the above consideration, the staff proposes to find that the changes do not involve a significant hazards consideration.

#### 5.0 STATE CONSULTATION

In accordance with the Commission's regulations, efforts were made to contact the Michigan State representative. The staff representative was contacted and had no comments.

#### 6.0 ENVIRONMENTAL CONSIDERATION

This amendment involves changes in a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. We have determined that this amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents which may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

#### 7.0 CONCLUSION

We have concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, (3) and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: November 21, 1989