

January 25, 2006

Mr. Donald K. Cobb  
Assistant Vice President - Nuclear Generation  
Detroit Edison Company  
6400 North Dixie Highway  
Newport, MI 48166

SUBJECT: FERMI 2 - ISSUANCE OF AMENDMENT RE: SECONDARY CONTAINMENT  
BYPASS AND MAIN STEAM ISOLATION VALVE LEAKAGES (TAC  
NO. MC7463)

Dear Mr. Cobb:

The Commission has issued the enclosed Amendment No. 169 to Facility Operating License No. NPF-43 for the Fermi 2 facility. The amendment consists of changes to the technical specifications (TSs) in response to your application dated June 29, 2005.

The amendment revises surveillance requirements (SR) 3.6.1.3.11 and 3.6.1.3.12 in TS 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)." Specifically, the amendment revises the combined secondary containment bypass leakage rate limit for all bypass leakage paths in SR 3.6.1.3.11 from 0.05 to 0.10  $L_a$  (the maximum allowable containment leakage rate) and the combined main steam isolation valve leakage rate limit for all four main steam lines in SR 3.6.1.3.12 from 150 to 250 standard cubic feet per hour.

A copy of our safety evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

*/RA/*

David H. Jaffe, Senior Project Manager  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-341

Enclosures: 1. Amendment No. 169 to NPF-43  
2. Safety Evaluation

cc w/encls: See next page

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\*No major changes to SE dated 12/8/05

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DETROIT EDISON COMPANY

DOCKET NO. 50-341

FERMI 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 169  
License No. NPF-43

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by the Detroit Edison Company (the licensee) dated June 29, 2005, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. NPF-43 is hereby amended to read as follows:

Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 169, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

Timothy J. Kobetz, Acting Chief  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: January 25, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 169

FACILITY OPERATING LICENSE NO. NPF-43

DOCKET NO. 50-341

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE

3.6-17

INSERT

3.6-17

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 169 FACILITY OPERATING LICENSE NO. NPF-43

DETROIT EDISON COMPANY

FERMI 2

DOCKET NO. 50-341

1.0 INTRODUCTION

By application to the Nuclear Regulatory Commission (NRC, Commission) dated June 29, 2005 (Agencywide Documents Access and Management System Accession No. ML051890085), the Detroit Edison Company (the licensee) requested changes to the technical specifications (TSs) for Fermi 2. The proposed changes would revise Surveillance Requirements (SRs) 3.6.1.3.11 and 3.6.1.3.12 in TS 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)." Specifically, the proposed amendment would revise the combined secondary containment bypass leakage rate limit for all bypass leakage paths in SR 3.6.1.3.11 from 0.05 to 0.10 L<sub>a</sub> (the maximum allowable containment leakage rate) and the combined main steam isolation valve (MSIV) leakage rate limit for all four main steam lines in SR 3.6.1.3.12 from 150 to 250 standard cubic feet per hour (scfh).

2.0 REGULATORY EVALUATION

The current Fermi 2 licensing basis includes a selective implementation of an alternative source term in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.67, for the design-basis loss-of-coolant accident (LOCA) and fuel-handling accident. The regulatory requirements for which the NRC staff based its acceptance for the subject license amendment request are the accident dose criteria in 10 CFR 50.67, as supplemented in Regulatory Position 4.4 of Regulatory Guide (RG) 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," and 10 CFR Part 50, Appendix A, General Design Criterion 19 (GDC 19), "Control Room," as supplemented by Section 6.4 of NUREG-0800, "Standard Review Plan [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants." Except where the licensee proposed a suitable alternative, the NRC staff utilized the regulatory guidance provided in the following documents in performing this review:

- RG 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors"
- SRP Section 15.0.1, "Radiological Consequence Analysis Using Alternative Source Terms"

The NRC staff also considered relevant information in the Fermi 2 Updated Final Safety Analysis Report and TSs.

### 3.0 TECHNICAL EVALUATION

The NRC staff reviewed the regulatory and technical analyses related to the radiological consequences of design-basis accidents performed by the licensee in support of its proposed license amendment. Information regarding these analyses was provided in Section 4.0 of Enclosure 1 to the submittal. The NRC staff reviewed the assumptions, inputs, and methods used by the licensee to assess the impacts of the proposed license amendment.

To determine the impact of the increased TS allowable secondary containment bypass leakage and MSIV leakage, the licensee revised the radiological consequences analysis of the Fermi 2 design-basis LOCA. The licensee used RG 1.183 guidance to perform the analysis. With the exception of the assumptions on secondary containment bypass leakage, MSIV leakage and control room envelope unfiltered inleakage, the licensee's revised analysis uses modeling, methodology, assumptions and computer codes identical to those approved in Fermi 2 Amendment 160, issued September 28, 2004, related to the alternate radiological source term methodology.

The licensee's revised LOCA dose analysis evaluated the doses, both offsite (at the emergency area boundary (EAB) and low population zone (LPZ)) and in the control room, for the three following leakage pathways:

- leakage from the containment
- leakage past the MSIVs
- leakage from emergency core cooling systems outside containment

The results for each pathway are added together to give a total dose for the LOCA.

The proposed increased combined leakage rate of  $0.10 L_a$  for secondary containment bypass leakage is an input to the containment leakage pathway calculation. The proposed increased combined MSIV leakage rate for all four main steam lines equal to 250 scfh, and the unchanged MSIV leakage rates through any one steam line of 100 scfh are inputs to the MSIV leakage pathway calculation. The licensee also proposed to decrease the design-basis limit for control room envelope inleakage from 600 cubic feet per minute (cfm) to 300 cfm. The control room envelope inleakage rate is an input to all three leakage pathway calculations for the control room dose.

In the revised LOCA dose analysis for this license amendment request, the licensee assumed that the primary containment leak is at the TS allowable leak rate of 0.5 percent of its atmospheric contents by weight per day (weight percent/day) for the first 24 hours. This leak rate is assumed to be reduced by 50 percent to 0.25 weight percent/day for the remainder of the 30-day accident duration. Leakage from the primary containment will collect in the free volume of the secondary containment and be released to the environment, either through the ventilation system exhaust or through leakage. Assumptions on the operation of the standby gas treatment system to process the leakage into the secondary containment, and the post-LOCA suppression pool pH analysis, are the same as previously found acceptable in Amendment 160. To incorporate the proposed change to SR 3.6.1.3.11, 10 percent of the

primary containment leak rate ( $0.10 L_a$ ) is assumed to bypass the secondary containment and enter the environment as a ground level release. This assumption is in accordance with RG 1.183 guidance for the LOCA analysis, and is acceptable.

Fermi 2 takes credit for deposition of the aerosol and elemental forms of iodine in portions of the main steam piping. This credit was previously found acceptable by the NRC staff in its safety evaluation for Amendment 160. The methodology and assumptions for the iodine deposition model are the same as previously approved, with the exception of the assumed leakage in each main steam line. The licensee's revised LOCA analysis assumed that the released fission products are dispersed throughout the drywell free volume and that there is no mixing between the drywell and torus air space volumes for the first 2 hours, after which there is complete mixing between the volumes. To minimize credit for iodine deposition in the main steam piping, the licensee assumed that the two shortest steam lines (lines B and D) have the maximum flow rate of 100 scfh, while the next shortest line (line A) has the remaining 50 scfh. No leakage is assumed for the remaining steam line (line C). These MSIV leak rates are assumed to be constant for the first 24 hours and are reduced to 50 percent of the initial rate for the remainder of the 30-day accident period. This reduction in MSIV leakage rate after 24 hours was previously found acceptable by the NRC staff in the safety evaluation for Amendment 160. Each of the steam lines is modeled to have two deposition nodes, from the reactor pressure vessel (RPV) nozzle to the inboard MSIV, and from the inboard MSIV to the third MSIV. Since a main steam line rupture could be an initiator for a LOCA, no deposition credit is assumed for the inboard node of line B, which is the longer piping segment between the RPV and the first MSIV in one of the two shortest lines.

The licensee's assumptions on the piping temperatures, credited piping volumes and surface areas, and the assumption of well-mixed deposition nodes are the same as previously approved in Amendment 160. The licensee uses the model described in Appendix A of AEB-98-03, "Assessment of Radiological Consequences for the Perry Pilot Plant Application Using the Revised (NUREG-1465) Source Term," December 9, 1998, for the deposition of aerosols. The modeling of elemental iodine deposition is based on the same formulation. Table 8 of the licensee's June 29, 2005, submittal provides the effective removal efficiencies for aerosol and elemental iodine deposition used in the licensee's LOCA dose analysis. The values used for lines A and B are the same as previously found acceptable, and the new values for line D are calculated using the same methodology. The NRC staff finds that the modeling of the iodine deposition in the main steam lines for the revised LOCA dose analysis is consistent with the model that was previously approved, and is, therefore, acceptable.

The licensee had previously assumed 600 cfm of unfiltered inleakage into the control room envelope. Tracer gas testing of the Fermi 2 control room envelope indicated that less than 100 cfm of unfiltered inleakage would enter the control room envelope in the emergency ventilation configuration. Therefore, the licensee conservatively assumed 300 cfm of control room envelope unfiltered inleakage in the revised LOCA dose analysis. The NRC staff finds this assumption acceptable, based on the results of the tracer gas test.

The licensee used version 3.03 of the RADTRAD radiological consequences computer code, which is described in NUREG/CR-6604, "RADTRAD: A Simplified Model for RADionuclide Transport and Removal And Dose Estimation." This is the same computer code that the NRC staff uses in its confirmatory analyses. Because the licensee provided printouts of the RADTRAD input files they used in their LOCA dose analyses, and because of the limited

number of changes compared to the approved dose analysis, the NRC staff did not perform independent confirmatory analyses. The NRC staff's finding of acceptability was based on a review of the RADTRAD input files and the dose analysis model, assumptions and input information provided in the licensee's June 29, 2005, submittal. The NRC staff finds that the licensee's LOCA analysis, including the increased secondary bypass leakage, increased MSIV leakage, and decreased control room envelope unfiltered inleakage, follows RG 1.183 guidance, and is, therefore, acceptable.

The licensee's calculations gave total LOCA dose results that are within the 10 CFR 50.67 dose criteria of 25 rem for the maximum 2-hour total effective dose equivalent (TEDE) to an individual located at the EAB and the 30-day TEDE to an individual at the outer boundary of the LPZ, and the 5 rem TEDE to an individual in the control room for 30 days. The licensee's calculation TEDE results are 8.73 rem at the EAB, 4.54 rem at the LPZ and 3.76 rem in the control room, including the gamma shine dose.

In conclusion, as described above, the NRC staff reviewed the assumptions, inputs, and methods used by the licensee to assess the radiological impacts of increasing the TS allowable combined secondary containment bypass leakage rate limit and combined MSIV leakage rate limit at Fermi 2. The NRC staff concludes that the licensee used analysis methods and assumptions consistent with the conservative regulatory requirements and guidance identified in Section 2.0 above. The NRC staff compared the doses estimated by the licensee to the applicable criteria identified in Section 2.0 above and concludes that the licensee's estimates of the EAB, LPZ, and control room doses will continue to comply with these criteria. Accordingly, the proposed revisions to Fermi 2 SR 3.6.1.3.11 and 3.6.1.3 are acceptable.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Michigan State official was notified of the proposed issuance of the amendment. The State official had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes 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 and surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that 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 the amendment involves no significant hazards consideration and there has been no public comment on such finding (70 FR 48203). Accordingly, the 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 the amendment.

## 6.0 CONCLUSION

The Commission has 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, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: M. Hart

Date: January 25, 2006

Fermi 2

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