

August 20, 1998

Mr. Douglas R. Gipson  
Senior Vice President  
Nuclear Generation  
Detroit Edison Company  
6400 North Dixie Highway  
Newport, MI 48166

SUBJECT: FERMI 2 - ISSUANCE OF AMENDMENT RE: REVISING SURVEILLANCE  
REQUIREMENTS ASSOCIATED WITH CONTAINMENT OXYGEN AND  
HYDROGEN MONITORS (TAC NO. MA1422)

Dear Mr. Gipson:

The Commission has issued the enclosed Amendment No. 125 to Facility Operating License  
No. NPF-43 for the Fermi 2 facility. The amendment consists of changes to the Technical  
Specifications in response to your application dated April 2, 1998 (NRC-98-0057).

The amendment revises Technical Specification 3.3.7.5 to permit entering Operational  
Conditions 1 and 2 prior to completion of Surveillance Requirements for the primary containment  
hydrogen and oxygen monitors in order to establish the conditions necessary (inerted  
containment) to properly perform the calibrations. The amendment also allows an increase in  
the frequency of the calibration for the oxygen monitors from once every 18 months to quarterly  
and corrects the nomenclature for the hydrogen and oxygen monitors in tables 3.3.7.5-1 and  
4.3.7.5-1.

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,

Original signed by:

Andrew J. Kugler, Project Manager  
Project Directorate III-1  
Division of Reactor Projects - III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-341

Enclosures: 1. Amendment No. 125 to NPF-43  
2. Safety Evaluation

cc w/encl: See next page  
DISTRIBUTION: See attached page

DOCUMENT NAME: G:\WPDOCS\FERMI\FE-A1422.AMD

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	PM:PD31	E	LA:PD31	E	C:HCB	E	OGC:AB	D:PD31	E
NAME	AKugler: <i>ajk</i>		CJamerson <i>CJ</i>		JWermiel <i>JW</i>		R Bachmann	CACarpenter <i>CA</i>	
DATE	7/31/98		7/31/98		08/04/98		08/6/98	08/19/98	

OFFICIAL RECORD COPY

9808210267 980820  
PDR ADOCK 05000341  
P PDR

9808210267

DATED: 8/20/98

AMENDMENT NO. 125 TO FACILITY OPERATING LICENSE NO. NPF-43 - FERMI 2

Docket File (50-341)

PUBLIC

E. Adensam (EGA1)

C. Jamerson

A. Kugler

J. Wermiel

OGC

G. Hill (2)

W. Beckner

ACRS

B. Burgess, RIII

SEDB (TLH3)

August 20, 1998

Mr. Douglas R. Gipson  
Senior Vice President  
Nuclear Generation  
Detroit Edison Company  
6400 North Dixie Highway  
Newport, MI 48166

SUBJECT: FERM 2 - ISSUANCE OF AMENDMENT RE: REVISING SURVEILLANCE  
REQUIREMENTS ASSOCIATED WITH CONTAINMENT OXYGEN AND  
HYDROGEN MONITORS (TAC NO. MA1422)

Dear Mr. Gipson:

The Commission has issued the enclosed Amendment No. 125 to Facility Operating License  
No. NPF-43 for the Fermi 2 facility. The amendment consists of changes to the Technical  
Specifications in response to your application dated April 2, 1998 (NRC-98-0057).

The amendment revises Technical Specification 3.3.7.5 to permit entering Operational  
Conditions 1 and 2 prior to completion of Surveillance Requirements for the primary containment  
hydrogen and oxygen monitors in order to establish the conditions necessary (inerted  
containment) to properly perform the calibrations. The amendment also allows an increase in  
the frequency of the calibration for the oxygen monitors from once every 18 months to quarterly  
and corrects the nomenclature for the hydrogen and oxygen monitors in tables 3.3.7.5-1 and  
4.3.7.5-1.

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,

Original signed by:

Andrew J. Kugler, Project Manager  
Project Directorate III-1  
Division of Reactor Projects - III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-341

Enclosures: 1. Amendment No. 125 to NPF-43  
2. Safety Evaluation

cc w/encl: See next page  
DISTRIBUTION: See attached page

DOCUMENT NAME: G:WPDOCS\FERMI\FE-A1422.AMD

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	PM:PD31	E	LA:PD31	E	C:HCB	E	OGC-45	D:PD31	E
NAME	AKugler: <i>ajk</i>		CJamerson <i>CJ</i>		JWermiel <i>JW</i>		<i>R. Bushman</i>	CACarpenter <i>CC</i>	
DATE	7/31/98		7/31/98		08/04/98		08/6/98	08/19/98	

OFFICIAL RECORD COPY



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

August 20, 1998

Mr. Douglas R. Gipson  
Senior Vice President  
Nuclear Generation  
Detroit Edison Company  
6400 North Dixie Highway  
Newport, MI 48166

SUBJECT: FERMI 2 - ISSUANCE OF AMENDMENT RE: REVISING SURVEILLANCE  
REQUIREMENTS ASSOCIATED WITH CONTAINMENT OXYGEN AND  
HYDROGEN MONITORS (TAC NO. MA1422)

Dear Mr. Gipson:

The Commission has issued the enclosed Amendment No. 125 to Facility Operating License No. NPF-43 for the Fermi 2 facility. The amendment consists of changes to the Technical Specifications in response to your application dated April 2, 1998 (NRC-98-0057).

The amendment revises Technical Specification 3.3.7.5 to permit entering Operational Conditions 1 and 2 prior to completion of Surveillance Requirements for the primary containment hydrogen and oxygen monitors in order to establish the conditions necessary (inerted containment) to properly perform the calibrations. The amendment also allows an increase in the frequency of the calibration for the oxygen monitors from once every 18 months to quarterly and corrects the nomenclature for the hydrogen and oxygen monitors in tables 3.3.7.5-1 and 4.3.7.5-1.

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,

A handwritten signature in black ink, appearing to read "Andrew J. Kugler".

Andrew J. Kugler, Project Manager  
Project Directorate III-1  
Division of Reactor Projects - III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-341

Enclosures: 1. Amendment No. 125 to NPF-43  
2. Safety Evaluation

cc w/encl: See next page

Mr. Douglas R. Gipson  
Detroit Edison Company

Fermi 2

cc:

John Flynn, Esquire  
Senior Attorney  
Detroit Edison Company  
2000 Second Avenue  
Detroit, Michigan 48226

Drinking Water and Radiological  
Protection Division  
Michigan Department of  
Environmental Quality  
3423 N. Martin Luther King Jr Blvd  
P. O. Box 30630 CPH Mailroom  
Lansing, Michigan 48909-8130

U.S. Nuclear Regulatory Commission  
Resident Inspector's Office  
6450 W. Dixie Highway  
Newport, Michigan 48166

Monroe County Emergency Management  
Division  
963 South Raisinville  
Monroe, Michigan 48161

Regional Administrator, Region III  
U.S. Nuclear Regulatory Commission  
801 Warrenville Road  
Lisle, Illinois 60532-4351

Norman K. Peterson  
Director, Nuclear Licensing  
Detroit Edison Company  
Fermi 2 - 280 TAC  
6400 North Dixie Highway  
Newport, Michigan 48166



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

DETROIT EDISON COMPANY

DOCKET NO. 50-341

FERMI 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 125  
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 April 2, 1998, 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.

9808210270 980820  
PDR ADOCK 05000341  
P PDR

9808210270

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. 125 , and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. DECo shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance with full implementation within 90 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Andrew J. Kugler, Project Manager  
Project Directorate III-1  
Division of Reactor Projects - III/IV  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: August 20, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 125

FACILITY OPERATING LICENSE NO. NPF-43

DOCKET NO. 50-341

Replace the following pages of the Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change.

REMOVE

3/4 3-61  
3/4 3-63

INSERT

3/4 3-61  
3/4 3-63

TABLE 3.3.7.5-1

ACCIDENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>REQUIRED NUMBER OF CHANNELS</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE OPERATIONAL CONDITIONS</u>	<u>ACTION</u>
1. Reactor Vessel Pressure	2	1	1, 2	80
2. Reactor Vessel Water Level	2	1	1, 2	80
a. Fuel Zone	2	1	1, 2	80
b. Wide Range	2	1	1, 2	80
3. Suppression Chamber Water Level	2	1	1, 2	80
4. Suppression Chamber Water Temperature	2	1	1, 2	80
5. Suppression Chamber Air Temperature	2	1	1, 2	80
6. Suppression Chamber Pressure	2	1	1, 2	80
7. Drywell Pressure, Wide Range	2	1	1, 2	80
8. Drywell Air Temperature	2	1	1, 2	80
9. Primary Containment Oxygen Concentration	2	1	1, 2	83
10. Primary Containment Hydrogen Concentration	2	1	1, 2	80
11. Safety/Relief Valve Position Indicators	1*/valve	1*/valve	1, 2	80
12. Containment High Range Radiation Monitor	2	2	1, 2, 3	81

\*Pressure switch

TABLE 4.3.7.5-1

ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>APPLICABLE OPERATIONAL CONDITIONS</u>
1. Reactor Vessel Pressure	M	R	1, 2
2. Reactor Vessel Water Level			
a. Fuel Zone	M	R	1, 2
b. Wide Range	M	R	1, 2
3. Suppression Chamber Water Level	M	R	1, 2
4. Suppression Chamber Water Temperature	M	R	1, 2
5. Suppression Chamber Air Temperature	M	R	1, 2
6. Suppression Chamber Pressure	M	R	1, 2
7. Drywell Pressure, Wide Range	M	R	1, 2
8. Drywell Air Temperature	M	R	1, 2
9. Primary Containment Oxygen Concentration	M	Q#	1, 2
10. Primary Containment Hydrogen Concentration	M	Q*#	1, 2
11. Safety/Relief Valve Position Indicators	M	R	1, 2
12. Containment High Range Radiation Monitor	M	R**	1, 2, 3

\*Using sample gas containing:

- a. One volume percent hydrogen, balance nitrogen.
- b. Four volume percent hydrogen, balance nitrogen.

\*\*CHANNEL CALIBRATION shall consist of an electronic calibration of the channel, not including the detector, for range decades above 10 R/hr and a one point calibration check of the detector below 10 R/hr with an installed or portable gamma source.

# The provisions of Specification 4.0.4 are not applicable provided that the surveillance is completed for one channel within 72 hours and for both channels within seven days after exceeding 15% of RATED THERMAL POWER.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 125 TO FACILITY OPERATING LICENSE NO. NPF-43

DETROIT EDISON COMPANY

FERMI 2

DOCKET NO. 50-341

1.0 INTRODUCTION

By letter dated April 2, 1998, the Detroit Edison Company (DECo or the licensee) requested an amendment to the Technical Specifications (TS) appended to Facility Operating License No. NPF-43 for Fermi 2. The proposed amendment would permit entering Operational Conditions 1 and 2 prior to completion of Surveillance Requirements for the primary containment hydrogen and oxygen monitors in order to establish the conditions necessary (inerted containment) to properly perform calibrations. Also, the amendment would allow an increase in the calibration frequency for the oxygen monitors from once every 18 months to quarterly and correct the nomenclature for the hydrogen and oxygen monitors in tables 3.3.7.5-1 and 4.3.7.5-1.

2.0 EVALUATION

2.1 Background

The hydrogen and oxygen monitors are part of the primary containment monitoring system (PCMS). The PCMS hydrogen and oxygen monitors provide control room operators with information regarding hydrogen and oxygen concentration following an accident. As described in the Updated Final Safety Analysis Report, the hydrogen and oxygen (H<sub>2</sub>/O<sub>2</sub>) monitoring system consists of two divisions, each division including one channel for each parameter. The H<sub>2</sub>/O<sub>2</sub> system continuously samples the containment atmosphere during Operational Conditions 1 and 2 when required to be operable by the TS. One division is normally aligned to the drywell, with the other division aligned to the torus.

During power operation, the Fermi 2 containment is inerted with nitrogen gas as required by TS to maintain a deliberately low concentration of oxygen in the containment atmosphere. Because the containment is inerted, the oxygen concentration is the limiting parameter for preventing the accumulation of an explosive gas mixture in the event of a loss-of-coolant accident (LOCA). The hydrogen and oxygen concentrations are monitored during operation and following a LOCA by the primary containment hydrogen and oxygen monitors and are displayed in the control room.

During plant shutdown for refueling and maintenance, the containment is de-inerted with air (approximately 20 percent oxygen) to permit personnel access. TS currently require the hydrogen monitors be calibrated quarterly and the oxygen monitors be calibrated once every

9808210271 980820  
PDR ADOCK 05000341  
P PDR

9808210271

18 months. Normally, these calibrations occur during plant operation with the containment inerted. However, if the plant is in an outage when the surveillance lapses, the monitors would be calibrated with the containment de-inerted. As reported in Licensee Event Report 97-004, the oxygen monitors exhibited a zero-shift when calibrated in an environment other than a nitrogen environment. Thus, if the monitor is calibrated while operating in a de-inerted environment during an outage, the monitor would be inaccurate and inoperable as soon as the transition is made to an inerted environment when the containment is inerted on startup.

The hydrogen and oxygen monitors each utilize an electrochemical cell. The electrochemical cells contain electrodes and an electrolyte. A membrane separates the electrolyte from the gas sample. The electrodes, electrolyte, and membrane are selected to make the cell responsive to a particular gas of interest (e.g., hydrogen or oxygen). The cell produces a voltage which is a function of the concentration of the gas of interest in the electrolyte. Because the sample gas diffuses through the cell membrane into the electrolyte, the concentration of a particular gas in the electrolyte is proportional to the concentration of that gas in the sample. The sample gas continuously flows through an outer chamber and is normally directly exposed to the cell membrane through the inner chamber. During calibration, the calibration gas is injected into the inner chamber, displacing the sample gas which continues to flow through the outer chamber. Thus, the cell membrane sees only the calibration gas during calibration. The licensee stated that the calibration itself is controlled by the instrument's microprocessor which determines the appropriate calibration factors that correlate cell output to calibration gas concentration, including compensation for temperature of the sample gas that continues to flow during the calibration cycle.

The licensee stated that testing conducted at Fermi demonstrated that it is possible to adequately calibrate the oxygen monitors with the containment de-inerted by simulating an inerted environment by purging the instrument with humidified nitrogen for approximately 8 hours before running the calibration. Although it is possible to calibrate the instrument in this manner, this method of calibration places greater reliance on manual operations. For example, the nitrogen purge gas pressure must be manually set to match the normal sample gas pressure to provide for accurate calibration. While possible, the licensee stated that this method is neither considered to be practical nor desirable.

## 2.2 Proposed Change

Specification 4.0.4 requires that surveillance requirements be completed prior to entry into an operational condition where the subject equipment is required to be operable. The licensee proposed an exception to Specification 4.0.4 for the hydrogen and oxygen monitors calibration. The licensee-proposed TS exception for the hydrogen and oxygen monitors reads as follows:

The provisions of Specification 4.0.4 are not applicable provided that the surveillance is completed for one channel within 72 hours and for both channels within seven days after exceeding 15% of RATED THERMAL POWER.

In addition, TS Table 4.3.7.5-1 specifies the "Channel Calibration" for the Drywell Oxygen Concentration to be at 18-month intervals. The licensee proposed to increase the calibration frequency for the oxygen monitoring channel from once every 18 months to quarterly.

The licensee also proposed to revise the nomenclature in Tables 3.3.7.5-1 and 4.3.7.5-1. Specifically, the oxygen monitor would be changed from "Drywell Oxygen Concentration" to "Primary Containment Oxygen Concentration" and, "Drywell Hydrogen Concentration" to "Primary Containment Hydrogen Concentration."

### 2.3 Evaluation

The primary containment oxygen monitors provide information to the control room operators to ensure the detection of oxygen concentrations in the primary containment so that actions can be initiated, if necessary, to prevent the accumulation of an explosive gas mixture. The monitors are also used to verify the adequacy of mitigating actions. Normally, these monitors are calibrated during plant operation with the containment inerted. However, if the plant is in an outage when the surveillance lapses, these monitors would be calibrated with the containment de-inerted. As discuss above, the oxygen monitors would exhibit a zero-shift when calibrated in other than a nitrogen environment. Thus, if the monitor is calibrated while operating in a de-inerted environment during an outage, the monitor would be inaccurate and inoperable as soon as the transition is made to an inerted environment when the containment is inerted on startup. In addition, while it is possible to calibrate the oxygen monitors with the containment de-inert, this method is considered impractical and undesirable.

Although the hydrogen monitor is unaffected by this zero-shift phenomenon, the hydrogen and oxygen monitors are both part of the PCMS using the same sample loop. The calibrations are conducted in parallel by the same surveillance procedure. Separating the calibrations would result in the monitors being made inoperable twice, once for each calibration.

Limiting Condition for Operation 3.6.6.2 requires inerting of the primary containment during plant startup be completed within 24 hours after thermal power is greater than 15 percent rated thermal power (RTP). Since the potential for a LOCA at or below 15 percent RTP wherein significant quantities of hydrogen would be generated is relatively small, it is reasonable to allow the initial calibration of the containment oxygen and hydrogen monitors during plant startup to be delayed until containment inerting activities have been completed.

Currently, with both channels inoperable, the allowed out-of-service time for both the oxygen and hydrogen monitors is 48 hours; and with one channel inoperable, the allowed out-of-service time for the hydrogen and oxygen monitors is 7 days and 30 days, respectively. The licensee proposed that the maximum duration beyond the time when the containment is required to be inerted be limited to 48 hours for calibration of one channel and 7 days (more restrictive for the oxygen monitors) to complete both channels. In addition, the proposed exception to Specification 4.0.4 for the hydrogen and oxygen monitors calibration provision is necessary only if the plant is in an extended outage where the surveillance lapses. The licensee expects this to be an infrequent occurrence. Based on the above, the staff finds the proposed Specification 4.0.4 exception that requires the completion of the calibration of one channel within 72 hours and the second channel within 7 days after exceeding 15 percent RTP acceptable.

Table 4.3.7.5-1 currently requires calibration of the primary containment oxygen monitors at 18-month intervals. However, the licensee stated that the vendor recommends quarterly

calibration. The staff has reviewed the information provided by the licensee and concludes that the proposed surveillance interval change from once every 18 months to quarterly for the primary containment oxygen monitors would not have a significant effect on safety and, therefore, is acceptable.

Currently, TS Tables 3.3.7.5-1 and 4.3.7.5-1 refer to the drywell hydrogen concentration and the drywell oxygen concentration. However, as discussed above, the hydrogen and oxygen monitors continuously sample the containment atmosphere during Operational Conditions 1 and 2 when required to be operable by the TS. One division is normally aligned to the drywell, with the other division aligned to the torus. To eliminate the potential confusion over number of channels of each instrument and the normal alignment, the licensee proposed to revise the tables to refer to primary containment oxygen concentration and primary containment hydrogen concentration. The staff considers this to be an editorial change and concludes that it is acceptable.

### 3.0 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.

### 4.0 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 changes surveillance requirements. The 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 (63 *FR* 19968). 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.

### 5.0 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: A. Kugler

Date: August 20, 1998