

June 26, 2002

Mr. William T. O'Connor, Jr.
Vice President - Nuclear Generation
Detroit Edison Company
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: FERMI 2 - ISSUANCE OF AMENDMENT RE: ELIMINATION OF THE CHLORINE
DETECTION FUNCTION FROM THE CONTROL CENTER HEATING,
VENTILATION AND AIR CONDITIONING SYSTEM (TAC NO. MB4606)

Dear Mr. O'Connor:

The Commission has issued the enclosed Amendment No. 147 to Facility Operating License No. NPF-43 for the Fermi 2 facility. The amendment consists of changes to the Fermi 2 Updated Final Safety Analysis Report (UFSAR) and Technical Requirements Manual (TRM), which is incorporated by reference in the UFSAR, in response to your application dated February 21, 2002.

The amendment authorizes changes to the UFSAR and TRM to eliminate the chlorine detection function from the control center heating, ventilation and air conditioning system. Changes to the UFSAR are subject to the requirements of 10 CFR 50.59; however, the changes were submitted to the Nuclear Regulatory Commission for review and approval since they involve the elimination of an automatic action.

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/

John G. Lamb, Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-341

Enclosures: 1. Amendment No. 147 to NPF-43
2. Safety Evaluation

cc w/encls: See next page

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Fermi 2

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May 2001

DETROIT EDISON COMPANY

DOCKET NO. 50-341

FERMI 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 147
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 February 21, 2002, 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, by Amendment No. 147, Facility Operating License No. NPF-43 is hereby amended to authorize the elimination of the chlorine detection function from the control center heating, ventilation, and air conditioning system, as set forth in the license amendment application dated February 21, 2002, and evaluated in the associated safety evaluation by the Commission's Office of Nuclear Reactor Regulation. The licensee shall update the Updated Final Safety Analysis Report and the Technical Requirements Manual to reflect this change, as authorized by this amendment, and in accordance with 10 CFR 50.71(e).
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/

L. Raghavan, Chief, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Date of Issuance: June 26, 2002

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 147 FACILITY OPERATING LICENSE NO. NPF-43

DETROIT EDISON COMPANY

FERMI 2

DOCKET NO. 50-341

1.0 INTRODUCTION

By application dated February 21, 2002, the Detroit Edison Company (the licensee) requested changes to the Fermi 2 Updated Final Safety Analysis Report (UFSAR) and Technical Requirements Manual (TRM), which is incorporated by reference in the UFSAR. The proposed changes would revise the UFSAR and TRM to eliminate the chlorine detection function from the control center heating, ventilation and air conditioning (CCHVAC) system. Changes to the UFSAR are subject to the requirements of 10 CFR 50.59; however, the changes were submitted to the Nuclear Regulatory Commission for review and approval since they involve the elimination of an automatic action.

2.0 BACKGROUND

The Fermi 2 TRM currently includes Specification No. TR 3.3.10 for the operability requirements of two redundant chlorine detectors located in the normal ventilation air intake of the CCHVAC system. Upon detection of chlorine gas with CCHVAC operating in the normal mode, the detectors automatically place the system in the chlorine mode. In the chlorine mode, all outside air intake and exhaust dampers are closed to prevent ingress of toxic gas into the control center. The TRM specification is applicable at all times, except when the control room emergency filtration (CREF) system is operating in the recirculation mode. Operation in the recirculation mode will not result in toxic chlorine levels since all air is passed through the emergency make-up and recirculation filters before being discharged in the control center.

In the original plant design, it was assumed that a chlorine railroad tank car would be located on site for use in water treatment. Therefore, a chlorine detection system was added to the design of the CCHVAC system. The chlorine detection system was designed to protect the control room operators from toxic chlorine gas originating from a postulated chlorine leak. Instead of using a railroad tank car, 12 chlorine cylinders (1 ton each, located at the circulating water pump house about 1,000 feet from the control room) were used for onsite chlorine storage. In 1992, the use of chlorine was discontinued at Fermi 2. Since that time, chlorine has not been stored at the Fermi 2 site. The nearest significant source of an accidental chlorine release is from a postulated rupture of a 90-ton railroad tank car about 3.4 miles away from the Fermi 2 site.

The original Fermi 2 Operating License included Technical Specification (TS) 3.3.7.8, "Instrumentation – Chlorine Detection System." However, this TS requirement was relocated to the TRM per License Amendment No. 115, dated March 17, 1998. The basis for the relocation was NRC Generic Letter 95-10, "Relocation of Selected Technical Specifications Requirements Related to Instrumentation," dated December 15, 1995. The chlorine detection system was evaluated against the criteria in 10 CFR 50.36(c)(2)(ii) and it was determined that it did not meet this criteria for inclusion in the TSs. The Fermi 2 TRM is incorporated by reference in the UFSAR. A description of the chlorine detectors' automatic function and the abnormal operating procedures for the isolation of the control room, use of breathing apparatus, and other protective measures is included in UFSAR Sections 6.4, 7.3.5, 9.4.1, 12.2.2.1 and A.1.95. UFSAR Section A.1.95 states that the nearest source of an accidental chlorine release would be from the rupture of a 90-ton railroad tank car on the railroad northwest of Fermi 2.

3.0 EVALUATION

The NRC has previously issued license amendments approving the elimination of chlorine detection systems for several plants (Sequoyah, Units 1 and 2, dated October 30, 1987; Millstone, Unit 2, dated March 28, 1988; Shearon Harris, dated May 3, 1989; and Farley, Units 1 and 2, dated December 28, 1994).

Regulatory Guide (RG) 1.78, Revision 1, "Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release," dated December 2001, provides guidance in such areas as hazard screening, risk evaluation, control room habitability evaluation, protection measures, and emergency planning.

The licensee has recently performed a survey of the Fermi 2 site and nearby industrial, commercial, and transportation facilities in the vicinity of the site to determine stationary and mobile sources of chlorine. The licensee determined that no chlorine is stored onsite and no significant amounts are stored in facilities within 5 miles of the site. The Berlin Wastewater Treatment facility near Trombly Road is the primary chlorine user within the 5-mile radius. This facility is located about 2 miles north of the Fermi 2 site. It receives and stores an insignificant amount of chlorine in the form of up to four 150-pound cylinders. This amount of chlorine is easily screened out from further consideration based on the screening criteria in Regulatory Position 1.1 of RG 1.78, Revision 1.

The nearest railroad track to the Fermi 2 site is the Canadian National Shore Line Subdivision (previously called Detroit and Toledo Shore Line Railroad), which passes approximately 3.4 miles from the site at the closest point. Two other railroad tracks operated by the Norfolk Southern Railway (formerly Conrail or Penn Central Railroad) pass approximately 3.5 and 3.8 miles from the site at their closest points. Liquid chlorine shipments typically involve about 485 railcars per year on the Canadian National Shore Line Subdivision Railway, and about 350 railcars per year on the Norfolk Southern Railway. The chlorine shipments utilize 90-ton railroad tank cars.

There is one chlorine packaging plant in Michigan, JCI Jones Chemicals, Inc., located in the city of Riverview about 12 miles north of the Fermi 2 site. It packages chlorine in 150-pound cylinders or 1-ton containers. An accidental release of a 1-ton container at the closest point of the nearby I-75 Interstate Highway (about 4.1 miles from the site) is easily screened out from further consideration based on the screening criteria in Regulatory Position 1.2 of RG 1.78, Revision 1.

There is no barge traffic within 5 miles of the plant on Lake Erie. The U.S. Coast Guard confirmed that cargo shipping lanes are more than 5 miles away from the Fermi 2 site.

Based on the results of the licensee's survey, the only viable risk of reaching toxic chlorine levels in the Fermi 2 control room is from an accident involving a 90-ton railroad car which results in the release a significant amount of chlorine and is carried over to the control center HVAC air intake by prevailing winds blowing toward the site. RG 1.78, Revision 1, encourages licensees to use risk evaluations for cases where hazardous chemical releases do not meet the screening criteria in the RG. A risk evaluation was performed by the licensee to calculate the probability of significant control room chlorine concentrations as a result of this postulated railroad tank car accident.

NUREG/CR-6624, "Recommendations for Revision of Regulatory Guide 1.78," provides the railcar accident probability based on the most recent statistics as $6.0E-07$ per railcar-mile. It also provides a conditional release (spill) probability of 0.15 for rail cars. The NUREG further states that accidents involving a spill of less than 10 percent of the cargo would not represent a significant hazard to control room operators and recommends a probability of 0.5 for spills of at least 10 percent of the cargo. Based on these estimates, the probability of a significant spill was determined by the licensee by combining the probability of a railcar accident with the conditional release probability and the probability for a spill of at least 10 percent of the cargo. The licensee calculated a probability of $4.5E-08$ per railcar-mile.

In order for the Fermi 2 control room to be impacted, the winds must be blowing toward the site and airborne chlorine concentrations must be sufficient upon arrival of the chlorine plume at the CCHVAC air intake to cause toxic levels in the control room.

Meteorological data from the years 1997 to 2000 was used by the licensee to determine wind speeds and directions. The licensee assumed that all chlorine rail traffic occurs on the closest railroad track. The railroad track length within the 5-mile radius of the Fermi site was divided by the licensee into segments corresponding to the applicable 16 wind direction sectors. Using an average ambient air temperature of 90-degrees Fahrenheit at the time of the assumed release, the licensee determined that a maximum of 21.77 percent of the liquid chlorine in the 90-ton rail car would immediately flash to vapor. The licensee stated that the 90-degree temperature is a very conservative estimate of the 95th percentile maximum area temperature. The diffusion equation for instantaneous puff release was used by the licensee to calculate the chlorine concentrations at the Fermi 2 control room air intake. For conservatism by the licensee, the air intake was assumed to be at ground level.

The probability of an adverse control room impact was determined by the licensee by combining the probability of certain wind speed and direction in a sector (adjusted for plume width) with the probability of a railcar chlorine spill multiplied by the railroad segment length and the annual traffic. The licensee integrated over all railroad segments, wind sectors, wind speeds, wind directions and atmospheric stability classes E, F, and G.

The total overall probability of a chlorine railcar accident and spill resulting in a control room toxic concentration of 10 parts per million, as defined in RG 1.78, Revision 1, was calculated by the licensee to be $8.4E-07$ per year. The RG states that a release that has the potential to result in a significant concentration in the control room need not be considered for further detailed evaluation if the release is at a low frequency (i.e., $1.0E-06$ per year or less). Therefore, the railcar accident risk evaluation meets this criterion in Regulatory Position 2 of the RG for Fermi 2.

The licensee's evaluation is based on several conservative assumptions and does not take credit for manual operator action to isolate the control room upon detecting chlorine odor or upon offsite notification. It also takes no credit for use of the emergency breathing air system by the operators in the control room.

Based on the arguments, the licensee reasons that the elimination of the chlorine detection system from the UFSAR and TRM will not result in a significant reduction in the margin of safety for the plant since both onsite and offsite accidental releases of chlorine gas which could affect plant operators are not credible events. The NRC staff has reviewed the licensee's evaluation and finds the evaluation 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. 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 (67 FR 18643). 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: J. Lamb

Date: June 26, 2002