



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 88 TO FACILITY OPERATING LICENSE NO. NPF-43  
DETROIT EDISON COMPANY  
FERMI-2  
DOCKET NO. 50-341

1.0 INTRODUCTION

By letter dated November 16, 1989, as supplemented November 14, 1991, 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 revise the TS to require periodic leakage tests and visual inspection of the Control Room Emergency Filtration System to assure the integrity of the parts both internal and external to the Control Room. The application has been submitted pursuant to license Condition 2.C.(7) of the Fermi-2 Operating License No. NPF-42 and satisfies the requirements of this License Condition. Therefore, the deletion of License Condition 2.C.(7) is included in the proposed amendment. During the initial licensing of Fermi-2, concerns about the use of silicone sealant material as part of the joints on the duct work at the Control Room Emergency Filtration System (CREFS) outside of the main control room zone were raised by the NRC. The concerns dealt with the ability of the silicone sealant to perform its sealing function over the designed plant lifetime of 40 years. The resolution of these concerns, which are discussed in detail in Section 6.4.1 of the Fermi-2 Safety Evaluation Report (NUREG-0798), Supplement 5 and 6 (SSER 5 and 6), resulted in the issuance of the Fermi-2 Operating License (NPF-43) with License Condition 2.C.(7).

License Condition 2.C.(7) required DECO to either provide assurance that this concern would not significantly impact control room habitability or propose a TS for periodic leakage testing to assure the integrity of the external portions of the CREFS. DECO submitted a proposed TS for leakage testing by application dated November 16, 1989. In October 1991, NRC staff members visited Fermi-2 to review the proposed TS and the installed duct work. In response to NRC staff concerns raised during this visit, DECO submitted supplemental information in a letter dated November 14, 1991.

2.0 EVALUATION

The proposed periodic leakage test surveillance requirements consist of three parts. These are test method, acceptance criteria, and test frequency. Each aspect is evaluated below.



## 2.1 Test Method

The licensee proposed that a duct leakage test be performed on the Control Room Emergency Filtration System (CREFS). The test method would demonstrate the operability of the silicone sealant material used to assure leak tightness of the CREFS. The amendment proposed to perform testing of the CREFS in accordance with ANSI N510-1980. This document provided standards for the testing of emergency filtration systems at nuclear power plants. At the time of the 1989 application, this standard was the most recently available industry standard for this purpose.

In October 1991, the NRC staff visited the Fermi-2 site to obtain further information about the CREFS design and construction to aid in the review of the application. During the site visit, the staff and the licensee reviewed the applicability of a more recent standard to perform duct leakage testing on the CREFS, ASME N510-1989. The new standard made minor improvements to the 1980 standard and was determined to be applicable to the proposed TS. By letter dated November 14, 1991, the licensee proposed to utilize ASME N510-1989 for the duct leakage testing requirement to be performed under TS Section 4.7.2.1.h. The staff has reviewed the test method for the CREFS duct work and finds ASME N510-1989 as an acceptable test method which will provide adequate assurance that the silicone sealant will perform its intended function.

## 2.2 Acceptance Criteria

The CREFS duct silicone sealant inleakage will be tested as discussed above in accordance with ASME N510-1989. A test volume is created by blocking the CREFS duct at points at or outside the test boundary. The test procedure starts with an initial pressure of 125% of the pressure at which the leak rate is determined. The time for the pressure to decay to 75% of pressure of interest is determined. The decay time period is translated into a leak rate by application of a formula given in ASME N510-1989. The formula provides the leak rate in terms of the initial test temperatures and pressures, the test volume, and the gas constant for air.

The licensee has proposed acceptance criteria of 11 standard cubic feet per minute (SCFM) and 34 SCFM for maximum inleakage into the CREFS duct work during normal and failure mode operation of the CREFS, respectively. The original design basis has been updated by the licensee under the provisions of 10 CFR 50.59 to account for design changes which did not involve an unreviewed safety question, and power uprate, which have occurred since the original licensing of Fermi-2. The current dose calculations assume 35 SCFM unfiltered leakage for the first 30 minutes and 12 SCFM for the remainder of the 30 days. One SCFM of this inleakage is assigned to ingress and egress through vestibules at the Control Room doors. The licensee's evaluation of the Control Room dose under the new inleakage assumptions continues to show that the dose remains well below the GDC 19 criteria.

The proposed acceptance criteria for the surveillance test correspond to the assumed inleakage for the test conditions less the 1.0 SCFM inleakage assigned to ingress and egress. Thus, the acceptance criteria for test conditions associated with the first 30 minutes is 34 SCFM and the acceptance criteria



for test conditions associated with the remainder of the 30 days is 11 SCFM. The expected dose to operators is 1.72 rem whole body and 18.7 rem to the thyroid, assuming these leakage rates which is well below the criteria of 10 CFR Part 50, Appendix A, General Design Criteria (GDC) 19 and within the current design basis. Based upon the above, the staff finds the proposed acceptance criteria to be acceptable.

### 2.3 Test Frequency

The licensee has proposed that duct work with the silicone sealant to be leak tested as described above at a 36-month interval. This interval is based upon industry experience with silicone sealant of the type installed at Fermi-2. The 36-month interval is short enough to detect any degradation prior to the failure of the sealant.

To monitor the sealant during the proposed 36-month interval, the licensee has proposed an annual visual inspection of sealant. This testing will detect an unexpected degradation of the silicone sealant. During the site visit in October 1991, the NRC expressed concerns about the scope of the visual inspection program. By letter dated November 14, 1991, the licensee committed to expand the visual inspection program from the proposal in the November 16, 1989, letter to include in the TS additional sections of duct in the CREFS as identified in TS Section 4.7.2.2, which may experience inleakage but will receive filtration.

Based on the above and the licensee's commitment to expand the visual inspection program, the staff finds the proposed testing frequency to be acceptable. Therefore, based on the above evaluation, the staff finds the proposed changes to the TS and deletion of License Condition 2.C.(7) from the Fermi-2 Operating License are 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 CONSIDERATIONS

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 in 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 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 the amendment involves no significant hazards consideration and there has been no public comment on such finding (57 FR 2591). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 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 staff 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 regulation, 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.

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