

Detroit
Edison

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November 16, 1989
NRC-89-0215

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

- References:
- 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43
 - 2) Detroit Edison Letter to NRC, NRC-89-0209,
"Control Room Emergency Filtration System,
License Condition", dated September 27, 1989
 - 3) Detroit Edison Letter to NRC, NRC-88-0185,
"Proposed Technical Specification Change
(License Amendment) - Control Room
Emergency Filtration System (3/4.7.2)",
dated December 22, 1988
 - 4) Detroit Edison Letter to NRC, EF2-72039,
"Clarification of Position on Silicone
Duct Sealant and Other Issues", dated
January 8, 1985

Subject: Proposed Technical Specification Change
(License Amendment) - Control Room Emergency
Filtration System (3/4.7.2)

Pursuant to 10CFR50.90, Detroit Edison Company hereby proposes to amend Operating License NPF-43 for the Fermi 2 plant by incorporating the enclosed changes into the Plant Technical Specifications. The proposed changes provide surveillance requirements for periodic leakage testing and visual inspection of the Control Room Emergency Filtration System to assure the integrity of those portions of the system external to the Control Room. This application for amendment is submitted pursuant to License Condition 2.C(7) of the Fermi 2 Operating License and satisfies the requirements of this License Condition. Therefore, the deletion of License Condition 2.C(7) is included in this proposal.

Detroit Edison has evaluated the proposed Technical Specifications against the criteria of 10CFR50.92 and determined that no significant hazards consideration is involved. The Fermi 2 Onsite Review Organization has approved and the Nuclear Safety Review Group has reviewed the proposed Technical Specifications and concurs with the enclosed determinations. In accordance with 10CFR50.91, Detroit Edison has provided a copy of this letter to the State of Michigan.

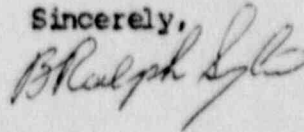
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If you have any questions, please contact Mr. Glen Ohlemacher at (313) 586-4275.

Sincerely,

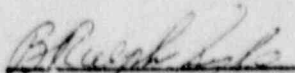


Enclosure

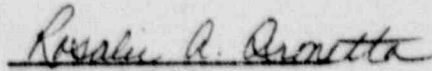
cc: A. B. Davis
R. W. Defayette
W. G. Rogers
J. F. Stang
Supervisor, Advanced Planning and Review Section,
Michigan Public Service Commission

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I, B. RALPH SYLVIA, do hereby affirm that the foregoing statements are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.


B. RALPH SYLVIA
Senior Vice President

On this 16th day of November, 1989, before me personally appeared B. Ralph Sylvia, being first duly sworn and says that he executed the foregoing as his free act and deed.


Notary Public

ROSALIE A. ARMETTA
Notary Public, Monroe County, MI
My Commission Expires Jan. 11, 1992

INTRODUCTION

During the initial licensing of Fermi 2, concerns about the use of silicone sealant on duct work in 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) Supplements 5 and 6 (SSER 5 and 6), resulted in the issuance of the Fermi 2 Operating License (NPF-43) with Condition 2.C(7).

Condition 2.C(7) reads as follows:

(7) Control Room Habitability (Section 6.4.1, SSER #6)

Prior to startup following the first refueling outage, DECo shall provide assurance to the NRC staff that potential contamination pathways through those portions of the control room air-conditioning system which are external to the control room zone will not have a significant adverse impact on control room habitability, or will propose a technical specification which provides for periodic leakage testing to assure the integrity of those external portions of the control room air-conditioning system.

As discussed in Reference 2, Detroit Edison has decided to follow the option provided in the License Condition to propose a Technical Specification for periodic leakage testing. This proposal provides the required Technical Specification.

To provide additional assurance that unexpected degradation of the silicone does not occur between leakage tests, Detroit Edison is proposing a surveillance requirement for visual inspection of accessible portions of the ductwork of concern. The proposed surveillance will require an annual inspection to verify that the silicone sealant has not undergone cracking, debonding, or other abnormal degradation.

This proposal satisfies the provisions of License Condition 2.C(7). Therefore, deletion of this condition from the license is proposed.

EVALUATION

The proposed periodic leakage test surveillance requirement consists of three parts. These are: test method, acceptance criteria, and test frequency. Each aspect is evaluated individually below. The proposed visual inspection requirements are evaluated in conjunction with the discussion of the proposed leakage test frequency.

Test Method

The proposed duct leakage testing is specified to be performed in accordance with ANSI N510-1980. This document provides the industry standards for the testing of emergency filtration systems at nuclear power plants. Included are acceptable methods for duct leak testing. Since ANSI N510-1980 provides the most recent industry standard for testing of the type proposed, Detroit Edison believes it is acceptable to reference the standard in this surveillance requirement. Further, this is consistent with other CREFS surveillance requirements, such as system flow rate verification, which reference ANSI N510-1980.

The surveillance requirement must also specify the test pressures of concern. In this case, there are four ducts of concern. Each duct must be tested at two pressures; one pressure represents the maximum negative pressure expected for that duct during normal system operation, the other pressure represents the maximum negative pressure expected for that duct during operation with a single failure of a damper. The single damper failure chosen is the one that results in the greatest negative pressure in all four ducts of concern. These test conditions, rather than the specific pressures for each duct, are listed in the Specification. Specifying that the test pressures be at or more negative than the maximum negative pressure expected for each of the four specific duct sections of concern during normal system operation and during operation with a single damper failure assures that the tests will be conducted at the appropriate pressures while eliminating the need for future Technical Specification changes if the normal operating pressure in a specific duct changes over the life of the plant. The calculations performed for test pressures for the first refueling outage are contained in Attachment 1.

Acceptance Criteria

Leakage into the subject ducts would provide a path of unfiltered air inleakage into the Control Room. Currently, the calculations for radiological dose to Control Room personnel assume a 10 standard cubic foot per minute (scfm) inleakage from all sources averaged over the 30-day period. This calculation, as documented in Section 6.4.1 of SSER5, resulted in a dose of 16.1 rem to the thyroid, which is well below the criteria of General Design Criteria (GDC) 19 of 10CFR50 Appendix A. The GDC 19 criteria is 5 rem whole body exposure or the equivalent. The NRC Standard Review Plan (NUREG-0800) Section 6.4

provides 30 rem thyroid dose as a standard for meeting the GDC 19 criteria.

To support the establishment of appropriate acceptance criteria for this surveillance requirement, Detroit Edison has recalculated the dose to the Control Room personnel based upon new unfiltered air inleakage assumptions. The same methodology and other assumptions used by the NRC staff in the pre-operating license review were used in these calculations, with the exception of the dose conversion factors for iodine. The more recently established values were used, which are contained in Regulatory Guide 1.109, Revision 1, October 1977. Details on the dose calculation are found in the attached Design Calculation 5107 (Attachment 2).

In addition to unfiltered inleakage due to duct leakage, unfiltered air may enter the Control Room due to the openings of Control Room doors for ingress and egress during the 30-day period. The Fermi 2 Control Room has vestibules installed in the doorways which are used for normal ingress and egress. Although other doors penetrate the Control Room envelope, these doors would not normally be used under accident conditions. Detroit Edison has determined that a leakage of 1.0 scfm averaged over the 30-day period can be conservatively assigned to the opening of Control Room access doors. This is based upon calculations of air exchange during periodic use of the doors.

The Fermi 2 CREFS consists of redundant, divisional, fans and dampers and non-redundant passive flow paths. The failure of a damper can cause significantly increased negative pressures in the subject ductwork. However, this occurrence will be readily detected by the Control Room operator from Control Room indication and alarms. For this reason, the duration of CREFS operation in this "failure mode" is

limited to 30 minutes. At that time it is assumed that the operator shifts to the operable division of the CREFS. The calculations performed assume the single damper failure occurs at the worst point in the scenario, which is at the time of accident initiation.

The Fermi 2 accident analysis, in general, allows credit to be taken for operator action following time periods ranging from 10 minutes to 30 minutes. For conservatism, 30 minutes is designated as the time required for the operator to detect the damper failure and shift CREFS operation to the unaffected division of active components.

The revised control room dose calculations, which include the calculations for in-leakage for doors as well as for duct in-leakage, are attached as Attachment 2. The assumed combined inleakage for the four ducts under both the normal and failure modes of CREFS operation correspond to the acceptance criteria for the proposed leakage testing.

Test Frequency

Detroit Edison is proposing that this duct leakage testing be performed at least once per 36 months. This interval corresponds to every second refueling outage.

In Reference 4, Detroit Edison provided the NRC staff with information concerning the properties of silicone sealant. This information included that silicone sealant has an expected 40-year life at 202°F and that the sealant is qualified for 1×10^7 rad environments. The temperature and radiation levels at Fermi 2 for this application are well below these levels.

In addition, two sections of the ductwork of concern were leak tested per ANSI N510-1980 in August 1984. The results, when compared to similar tests performed recently in October 1989, shows that the leakage characteristics of the ducts have not significantly changed in the intervening 62 months.

The above information indicates that, once tested, the ductwork and the associated sealant should be expected to maintain their integrity for the proposed 36 month surveillance test interval. However; the concern that, once the sealant reaches its end of life, the material will rapidly deteriorate must be addressed.

Firstly, the duct longitudinal seams in question were braze welded prior to the application of the sealant. Thus, the sealant acts as a backup to the weld and if the sealant completely failed the leakage characteristics of the ductwork is not expected to be appreciably changed. However, since the application of sealant was an accepted construction practice at the time of Fermi 2's construction, the ducts were never leak tested without the sealant applied. Consequently, the effect of complete sealant failure cannot be quantified.

For this reason, Detroit Edison is proposing an additional visual inspection program (Surveillance Requirement 4.7.2.2) for the silicone sealant on the ductwork of concern which is accessible during normal plant operation. This sealant will be visually inspected for deterioration annually. Since the accessible seams are representative of all the seams of concern (the environment of all seams is the same), the additional inspections will provide additional assurance that an onset of general deterioration of the silicone sealant between tests does not go undetected.

Since the appropriate course of action for a finding from these visual inspections depends on the nature of the finding, the proposed surveillance requires that the intended course of action be provided to the NRC staff in a Special Report within 14 days of the finding. The nature of the finding could require a more prompt reporting requirement to be invoked, and any actions necessary to assure safe plant operation will be taken regardless of the time frame for the Special Report.

Finally; if, notwithstanding the above, the leakage characteristics of the ductwork of concern were to deteriorate the following conservatisms exist to mitigate the consequences:

- 1) The ductwork of concern is located in the enclosed Auxiliary Building and is therefore not directly in the radioactive plume created by the accident scenario. (See Figure 1)
- 2) Some portions of the ductwork do not experience negative pressures unless significant filter loading occurs. This condition is not expected to occur.
- 3) There exists a margin of 11.3 rem to the thyroid between the results of the new Control Room dose calculation (18.7 rem thyroid) and the GDC 19 criteria (30 rem thyroid).

For these reasons, Detroit Edison believes the proposed surveillance intervals to be acceptable.

SIGNIFICANT HAZARDS CONSIDERATION

In accordance with 10CFR50.92, Detroit Edison has made a determination that the proposed amendment involves no significant hazards considerations. To make this determination, Detroit Edison must establish that operation in accordance with the proposed amendment would not: 1) involve a significant increase in the probability or consequences of an 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.

The proposed change to include surveillance requirements to assure the integrity of those portions of the Control Room Emergency Filtration System (CREFS) external to the Control Room does not:

- 1) Involve a significant increase in the probability or consequences of an accident previously evaluated. The new surveillance requirements act to give assurance that the radiation dose to Control Room personnel is maintained below the criteria of General Design Criteria (GDC) 19 of 10CFR50 Appendix A as previously evaluated. As such, the change acts to ensure that the consequences of previously evaluated accidents remain as evaluated. The CREFS is not associated with any accident initiating mechanism; therefore, the probability of any previously evaluated accident is unchanged.
- 2) Create the possibility of a new or different kind of accident from any accident previously evaluated. The change provides verification that passive features of the CREFS are not degrading. The proposed leakage test must be performed when the

ductwork to be tested is permitted by the Technical Specifications to be out-of-service, or the ACTION statement for CREFS will apply. Therefore, the test does not affect the ability of the CREFS to operate in the normal or emergency mode when required. Conduct of the proposed inspections does not affect the normal or emergency modes of CREFS operation. The proposal does not result in any modification of system or plant design. Therefore, the proposal does not create any new accident initiating mechanisms.

- 3) Involve a significant reduction in a margin of safety. The change assures that the radiation dose to Control Room personnel during accident conditions remain below GDC 19 criteria over the plant lifetime. In so doing, the change acts to maintain the margin of safety.

Based on the above, Detroit Edison has determined that the proposed amendment does not involve a significant hazards consideration.

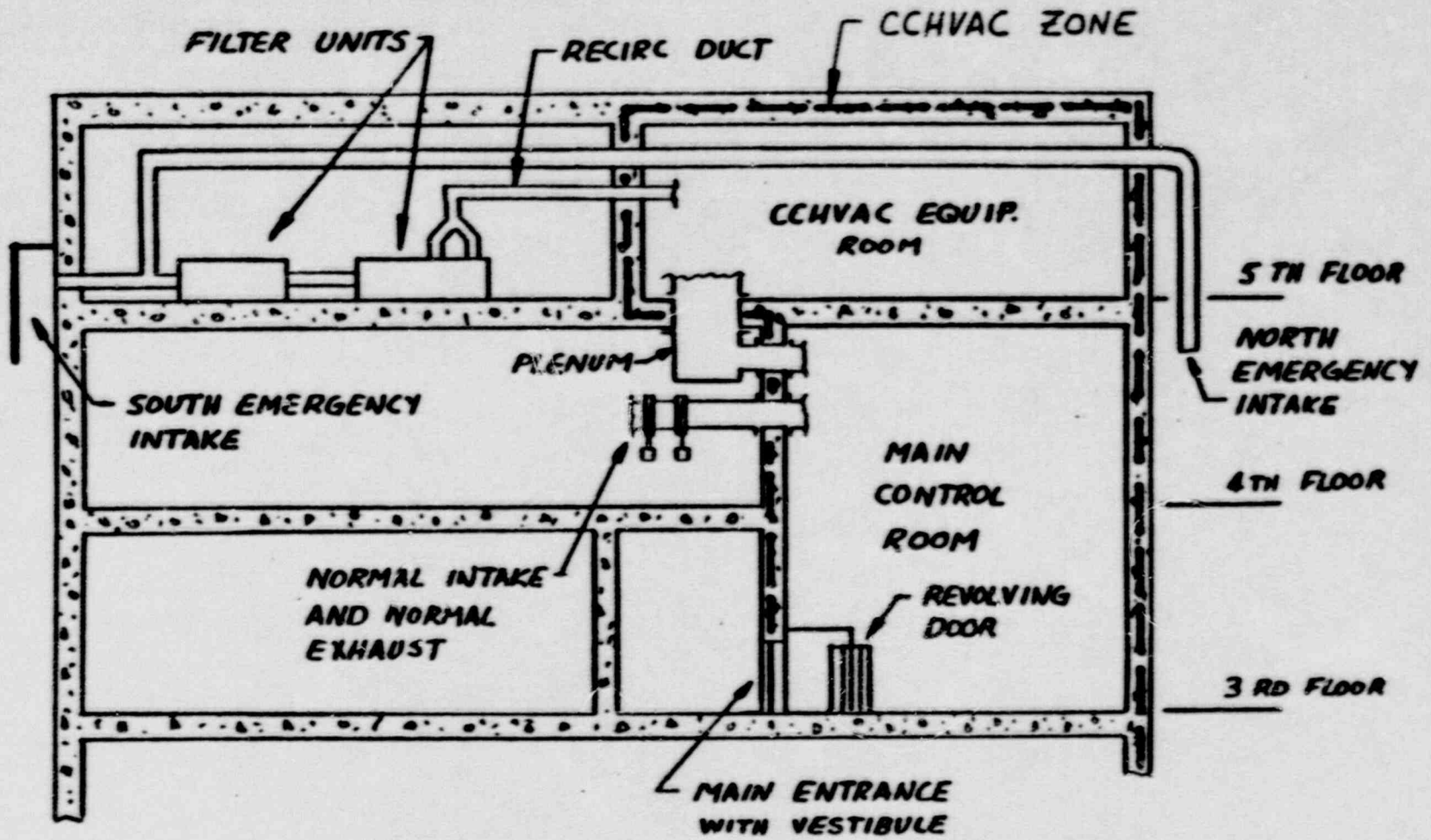
ENVIRONMENTAL IMPACT

Detroit Edison has reviewed the proposed Technical Specification changes against the criteria of 10CFR51.22 for environmental considerations. The proposed change does not involve a significant hazards consideration, nor significantly change the types or significantly increase the amounts of effluents that may be released offsite, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, Detroit Edison concludes that the proposed Technical Specifications do meet the criteria given in 10CFR51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement.

CONCLUSION

In Reference 3, Detroit Edison submitted a proposal to change the CREFS Technical Specification to make improvements in usability and clarity. The attached proposed Technical Specification change is based upon the current Fermi 2 Technical Specifications. The proposed Technical Specification changes for the Reference 3 proposal which includes the provisions of this proposal are also attached.

Based on the evaluation above: 1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and 2) such activities will be conducted in compliance with the Commission's regulations and proposed amendments will not be inimical to the common defense and security or to the health and safety of the public.



FERMI-2 AUXILIARY
BUILDING

FIGURE 1