

February 22, 1988

Docket No. 50-341

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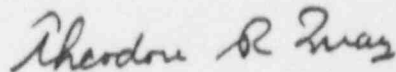
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Dear Mr. Sylvia:

SUBJECT: SAFETY EVALUATION FOR TMI TASK ACTION PLAN ITEM II.K.3.28, FERMI-2
(TAC NO. 57543)

The enclosed Safety Evaluation addresses the Nuclear Regulatory Commission staff review of the Fermi-2 TMI Action Plan Item II.K.3.28 as provided by your submittals of February 6 and May 26, 1987. Our review concludes that you have adequately verified functional capability of the accumulators for the Fermi-2 Automatic Depressurization System (ADS) valves and thereby satisfy the requirements of TMI Action Item II.K.3.28. This completes our work under TAC No. 57543.

Sincerely,



Theodore R. Quay, Project Manager
Project Directorate III-1
Division of Reactor Projects - III, IV, V
& Special Projects

Enclosure:
As stated

cc w/encl:
See next page

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WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATING TO TMI ACTION ITEM II.K.3.28
DETROIT EDISON COMPANY
FERMI-2
DOCKET NO. 50-341

INTRODUCTION

Based on the requirements of NUREG-0737, Item II.K.3.28, Fermi-2 Automatic Depressurization System (ADS) valves, accumulators, and associated equipment and instrumentation must be demonstrated to meet the requirements specified in the plant's Final Safety Analysis Report (FSAR) and have the capability to perform their functions during and following exposure to hostile environments, taking no credit for non-safety-related equipment or instrumentation. Additionally, air (or nitrogen) leakage through the valves must be accounted for in order to assure that enough inventory of compressed gas is available to cycle ADS valves. Since ADS is a part of the emergency core cooling system (ECCS), it must also perform its function for the long-term period of 100 days following an accident, unless otherwise justified.

EVALUATION

In its submittals of February 6 and May 26, 1987 responding to the staff's requests for additional information, the licensee stated that each accumulator receives pneumatic pressure from a safety-grade source. This supply is normally fed from the nitrogen supply system, with Division I Non-Interruptible Control Air System (NIAS) immediately available as a backup supply for this pneumatic supply. This pneumatic supply also has a qualified connection located outside of the secondary containment to permit bottled nitrogen to be supplied as an additional backup.

Further, each accumulator has sufficient storage capacity to allow five actuations of the pilot valve and its associated S/RV at a drywell pressure of 2 psig. This provides adequate pneumatic storage to cover interruptions if the pneumatic supplies are switched from the normal to the emergency backup sources.

To ensure proper reactor core cooling under all circumstances, including a postulated failure of ADS, reactor pressure relief can still be provided by operation of the non-ADS S/RVs. This ensures that the low pressure systems can be actuated with a HPCI failure and one additional single failure of the ADS since any single failure affecting ADS will not impair remote operation of the eight non-ADS S/RVs.

There is a separate, fully qualified pneumatic supply to these eight non-ADS S/RVs that allows these valves to be operated as a backup to the ADS for reactor pressure relief. This separation system is similar to the ADS S/RV pneumatic supply, except it does not include NIAS as one of its supply sources.

Although the accumulators are not designed to meet the long-term capability requirement of 100 days following an accident, the licensee stated that a fully qualified pneumatic supply system with its backup as described in the above would enable the ADS accumulator to meet this criterion. The staff finds this alternate to be acceptable.

The licensee also stated that in sizing the accumulator, consideration of leakage from the accumulator and valve operator was included. However, normal leakage from this system is so small, 0.016 scfm or 0.008 percent of supply per minute, that it had essentially no influence on the size of the accumulator.

The licensee stated that the ADS S/RVs are supplied by the Division I pneumatic supply system. This system is provided with a qualified connection outside the secondary containment. Specifically, the connection is located on the outside north wall of the Reactor Building near the northwest corner. In addition, a second qualified connection is located on the outside south wall of the Reactor Building. This connection interfaces with the Division II pneumatic supply system which provides pneumatic force to the eight non-ADS S/RVs. With both of these connections located on the outside wall of the Reactor Building, access is made easier and personnel exposure minimized. This response is considered acceptable.

The licensee also provided the number of times and the length of time each of the ADS pneumatically controlled valves is capable of cycling using only the accumulator inventory (based on the following drywell pressure) as follows: for atmospheric pressure, each accumulator has sufficient capacity for 2 actuations per hour for a total of 72 hours. For 70 percent of the design pressure, each accumulator has a sufficient capacity for 2 actuations per hour for a total of 24 hours. For the staff's information, the capability of each ADS accumulator is given as 19.6 cubic ft. (146.6 gallons). This response is considered acceptable.

The licensee has also confirmed that the system had been analyzed and qualified to be capable of performing its design function during and following exposure to a harsh environment and/or a seismic event, with no credit being taken for non-safety-related equipment and instrumentation to account for any leakage. This response is considered acceptable.

As to the surveillance tests on the ADS accumulator system and backup system, the licensee stated that the Fermi-2 Technical Specifications (Section 4.5.1.d) require a channel functional test to be performed once every 31 days on the low pressure alarm for the pneumatic supply to the ADS accumulators and a system functional test performed once per 18 months. This response satisfies the staff's request for additional information.

The licensee further stated that the Technical Specifications do not require any ADS leak test. This is acceptable to the staff for the reasons that the leakage expected from the system is insignificant, as stated previously, and that a qualified backup system to the ADS accumulator is available when needed.

CONCLUSION

Based on the information provided by the licensee and the staff's evaluation performed, as presented in the above, the staff concludes that the licensee has adequately verified functional capability of the accumulators for the Fermi-2 ADS valves and thereby satisfies the requirements of TMI Action Item II.K.3.28.