



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENT NO. 19 TO FACILITY OPERATING LICENSE NO. NPF-43  
DETROIT EDISON COMPANY  
WOLVERINE POWER SUPPLY COOPERATIVE, INCORPORATED  
FERMI-2  
DOCKET NO. 50-341

1.0 INTRODUCTION

By letter dated April 20, 1988 (NRC-88-0105), the Detroit Edison Company (DECo or the licensee) requested amendment to the Technical Specifications (TSs) appended to Facility Operating License No. NPF-43 for Fermi-2. The proposed license amendment would change Technical Specification Table 4.3.1.1-1, "Reactor Protection System Instrumentation Surveillance Requirements," to delete the Daily Channel Check requirements of Note (g) for the Average Power Range Monitor Flow Biased Neutron Flux (APRM-FBNF) - High Scram Functional Unit.

Problems with the existing Note (g) were discovered as a result of the on-going Technical Specification review effort at Fermi-2. During a comparison of Fermi-2 Technical Specifications with other comparable Boiling Water Reactor (BWR) Technical Specifications, differences in the wording of this item were noted and investigated by the licensee. The existing provisions of Note (g) have not yet posed an operational problem at Fermi-2 since the correlation between recirculation drive flow and total core flow to determine "established core flow" is based upon the startup testing performed at 100% power and flow. Fermi-2 has not yet completed this portion of the startup tests and has, therefore, not yet made the comparisons covered by Note (g). When the correlation is established, the requirements of Note (g) will unnecessarily limit the operation of Fermi-2.

2.0 EVALUATION

A review of the various versions of BWR Technical Specifications shows that there are two general versions of the footnote. Neither of the two versions exactly matches the wording appearing in the BWR Standard Technical Specifications, nor do they match the wording appearing in the Fermi-2 Technical Specifications.

A number of concerns and/or events may have been considered when the note was incorporated in the Technical Specifications. These are:

- 1) Flow control valve crudding;
- 2) Jet pump beam cracking;

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- 3) Jet pump blockage;
- 4) Core crudding; and
- 5) Jet pump instrumentation problems.

The flow control valve crudding does not apply to Fermi-2 because Fermi-2 does not have flow control valves.

Jet pump beam cracking is already addressed by the requirements of Technical Specification 3/4.4.1.2 (Jet Pumps). The Surveillance Requirements for this Technical Specification (4.4.1.2) are stated as follows:

"Each of the required jet pumps shall be demonstrated OPERABLE prior to THERMAL POWER exceeding 25% of RATED THERMAL POWER and at least once per 24 hours by determining recirculation loop flow, total core flow, and diffuser-to-lower plenum differential pressure for each jet pump and verifying that no two of the following conditions occur when the recirculation pumps are operating at the same speed:

- a. The indicated recirculation loop flow differs by more than 10% from the established pump speed-loop flow characteristics.
- b. The indicated total core flow differs by more than 10% from the established total core flow value derived from recirculation loop flow measurements.
- c. The indicated diffuser-to-lower plenum differential pressure of any individual jet pump differs from the mean of all jet pump differential pressures in the same loop by more than 20% deviation from its normal deviation.

"If Jet Pump Beam Cracking was to occur, this surveillance check would recognize it. Failure to meet the acceptance criteria would then require a plant shutdown because the corresponding ACTION under 3.4.1.2 states, 'With one or more jet pumps inoperable, be in at least HOT SHUTDOWN within 12 hours.' Additional ACTION or surveillance under the RPS instrumentation Technical Specification should not be required."

In the unlikely event a jet pump becomes blocked or obstructed, the aforementioned jet pump surveillances would reveal this condition.

With respect to core crudding, General Electric has indicated that the change in m-ratio (core flow minus recirculation loop drive flow divided by recirculation loop drive flow) that might occur from beginning-of-cycle to end-of-cycle due to core crudding is so slight that this phenomenon is not considered to be a significant concern and that the resultant change in the m-ratio would have negligible impact on the APRM-FBNF trip setpoint. The m-ratio will be checked at least once per cycle using Reactor Engineering procedures. The recirculation flow units and APRM flow biased scram circuitry is checked periodically per required surveillances. These activities ensure that W (percent of rated recirculation drive flow) as required for Reactor Protection System (RPS) instrumentation, is accurate or conservative.

Finally, with respect to jet pump instrumentation problems, if any of the surveillances under 4.4.1.2 yield unacceptable results, a jet pump instrumentation problem would be suspected. Gross checks against other related instruments associated with the required jet pump surveillances would be performed to determine if it is indeed just an instrument problem. If an instrument problem is identified, then the necessary actions would be performed to restore the instrumentation to operable status. No concern with respect to the APRM-FBNF trip exists (assuming the APRM-FBNF instrumentation is operable as verified by the performance of its associated surveillances) because a jet pump instrument problem does not involve an actual change in the m-ratio.

The five concerns are adequately addressed by the RPS instrumentation surveillances, the recirculation flow unit surveillances, the jet pump surveillances and the check of the m-ratio. Jet pump beam cracking or jet pump blockage, which could cause a gross change in m-ratio are already covered by specific surveillance requirements. Changes to the m-ratio due to core crudding would be expected to be minimal over the course of the cycle. As such, the check of m-ratio at least once per cycle and the surveillance requirements for RPS and recirculation flow unit instrumentation provide assurance that the concerns associated with core crudding are adequately addressed. A requirement like Note (g) therefore, should not be included in the RPS instrumentation Technical Specification because the concerns described above do not require it.

As described above, adequate steps are taken without Note (g) to detect and take appropriate action for degradation in the amount of core flow resulting from a given recirculation loop flow. Therefore, we find the request to delete the Daily Channel Check for the APRM-FBNF signal and the associated Note (g) from Table 4.3.1.1-1 to be acceptable.

### 3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change in surveillance requirements. We have determined that this 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this 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 this amendment.

### 4.0 CONCLUSION

We have 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, and (2) such activities

will be conducted in compliance with the Commission's regulations, and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Dated: June 3, 1988