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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 12 TO FACILITY OPERATING LICENSE NO. NPF-69

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR POWER STATION, UNIT NO. 2

DOCKET NO. 50-410

1.0 INTRODUCTION

The licensee, Niagara Mohawk Power Corporation (NMPC), in its letter of January 13, 1989, requested a revision to the technical specifications (TS) for Nine Mile Point Unit 2 (NMP-2). The proposed amendment relates to TS. Section 3/4.4 reactor coolant system.

2.0 DISCUSSION

As stated in the licensee's application, the recirculation system consists of two parallel external loops, each containing a recirculation pump and motor, suction and discharge block valves, flow control valve, and the connecting piping to the reactor vessel. Each external recirculation loop takes suction from the vessel downcomer annulus via the recirculation pump and delivers drive flow to multiple nozzles on the vessel shell from which internal piping conducts the flow to the jet pump inlets. This driving flow will cause the jet pumps to pump additional water from the vessel annulus. The combined flow will then pass through the reactor core.

Section 4.4.1.2 provides the surveillance requirements for demonstrating that all jet pumps are operable. Verification of jet pump operability is required to verify that operation is consistent with the licensing basis. In order to determine jet pump operability, it is necessary to perform certain performance measurements, compare these measurements against established nominal data, and look for a deviation from nominal as an indication of a potential problem. These performance measurements (Surveillance Requirements) are designed to detect the significant degradation in jet pump performance that would precede failure.

Surveillance Requirements 4.4.1.2.a.2 and 4.4.1.2.b.2 compare indicated total core flow against established core flow derived from recirculation loop drive flow measurements, with a differential of 10% or greater being unacceptable. This performance measurement has been determined by General Electric testing (Service Information Letter No. 330, dated June 9, 1980) to be relatively insensitive to jet pump degradation. This Technical Specification amendment revises the requirement so that it now compares

indicated jet pump loop flow to the established jet pump loop flow-recirculation pump drive flow characteristic with a differential of 10% or greater being unacceptable. Surveillance Requirements 4.4.1.2.a.2 applies this criterion to both loops while in two-loop operation, and 4.4.1.2.b.2 applies the criterion to the operating loop while in single recirculation loop operation.

Surveillance Requirements 4.4.1.2.a.3 and 4.4.1.2.b.3 compare the indicated diffuser-to-lower plenum differential pressure of any individual jet pump to established patterns with a differential of 10% being unacceptable. The 10% allowable differential currently in the Technical Specifications is incorrect and is not in conformance with the guidelines of General Electric Service Information Letter No. 330. The Service Information Letter recommends that an allowable differential of 20% be used when comparing individual jet pump diffuser differential pressure to established normal patterns. Continued use of the 10% differential figure could provide incorrect evidence of jet pump degradation resulting in an unwarranted shutdown, thus having a negative impact on plant availability and capacity factor.

The proposed TS changes differentiate the terms recirculation loop drive flow and jet pump flow as used in the TS. The term recirculation loop flow has been used throughout the TS to identify both recirculation loop drive flow and jet pump loop flow. The dual use of the term has caused operator confusion.

In the recirculation system TS many design parameters were included as preliminary value which were to be finalized after the start-up tests. The start-up tests are now completed and hence the preliminary values have been changed to the values derived from the start-up tests.

3.0 EVALUATION

The staff's evaluation of the specific changes follows.

TS 3.4.1.1.a.1.t and 4.4.1.1.1.1.C

The recirculation loop drive flow for 100% core flow at 100% thermal power is given as 41,000 GPM as a design estimate for 2-loop operation. Start-up tests have determined the loop drive flow to be 41,800 GPM. An analysis, using start-up test data, has shown no internals flow induced vibration at loop drive flow less than 45,000 GPM. The maximum recirculation loop drive flow change to 41,800 GPM is acceptable.

The note "the actual value will be established during the start-up test program" is no longer applicable since the tests are already completed. The proposed change to delete the note is acceptable.

The term "recirculation loop flow" is changed to "recirculation loop drive flow" for more clarity. This is acceptable.

TS 3.4.1.1.a.1.g

The term "recirculation loop flow" is changed to "jet pump loop flow" to indicate the surveillance for single loop operation. The jet pump loop flow measurement is indicative of the core flow under these conditions. Hence, it is more applicable and therefore acceptable.

The notes are changed to indicate that the values are derived from the start-up tests. This is acceptable.

TS 4.4.1.2

The licensee proposes replacing the current surveillance requirement for jet pump operability, which is based on established recirculation loop flow, and total core flow with another criterion recommended in SIL 330-1 based on jet pump loop flow. Since this is reported to be a more effective indicator of jet pump performance, we find this proposed change acceptable.

The proposed change to the specified acceptable deviation from patterns established for individual jet pump diffuser to lower plenum differential pressure from 10% to 20% is consistent with the recommendation of both NUREG/CR-3052 and SIL 330 which established 20% as an acceptable indication of jet pump operability. Thus, the TS changes in Sections 4.4.1.2.a.(3) and 4.4.1.2.b.(3) are acceptable.

TS 3.4.1.3. and 3.4.1.4

The term "recirculation loop flow" is changed to "jet pump loop flow" for more clarity. This is acceptable.

TS 3/4.4.1

The Bases is revised to define the recirculation drive flow and the jet pump flow. This is acceptable.

4.0 SUMMARY

The staff has reviewed the proposed technical specifications changes for NMP-2 to modify the surveillance requirements for determination of jet pump operability and other changes. We have determined that the proposed changes will assure improved surveillance of jet pump operability based on methods previously approved by the staff, and are therefore acceptable. The clarification of terminology in regard to recirculation loop drive flow and jet pump flow will reduce the chances of misinterpretation of TS requirements.

ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation or use of the facility components located within the restricted areas as defined in 10 CFR 20 and changes to the surveillance requirements. The staff has determined that this 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 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 Sec 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.

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 these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: November 30, 1989

PRINCIPAL CONTRIBUTOR:

G. Thomas