UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

February 14, 1997

MEMORANDUM TO: Jack Roe, Director
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

FROM: Geoffrey E. Grant, Director
Division of Reactor Safety, Region III

SUBJECT: TECHNICAL ASSISTANCE REQUEST- POTENTIAL UNREVIEWED SAFETY QUESTIONS IDENTIFIED AT KEWAUNEE (AIT 97-004)

The purpose of this memorandum is to request NRR technical assistance in determining if the operation of the auxiliary feedwater system at the Kewaunee Nuclear Plant was consistent with the design and licensing bases for the plant. At issue is whether the conditions detailed in the attachment to this memo constituted unreviewed safety questions and whether license amendments are now required to restart the plant from its current outage. We have already conveyed these issues in a draft form of the attachment to Mr. Allen Hansen and Mr. Richard Laufer of your staff.

Attachment: As stated

cc w/att: [redacted] Hansen, NRR
R. Laufer, NRR

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Attachment

Kewaunee Technical Assistance Request

Region III has completed a safety system operations inspection (SOPI) at Kewaunee which exited on January 31, 1997. In the course of this inspection, two issues were identified which appeared to be unreviewed safety questions (USQ). Region III is requesting that you evaluate these two operating conditions and determine if either constitutes an unreviewed safety question. If so, these issues would need to be resolved prior to restarting the plant.

1. The inspectors identified that the individual auxiliary feedwater (AFW) pumps could not provide 200 gpm to the steam generators as described in the plant licensing basis.

   The Kewaunee Updated Final Safety Evaluation Report (UFSAR), Section 6.6, describes the two motor driven and one turbine driven AFW pumps as each being capable of 240 gpm. Up to 40 gpm provides continuous recirculation. Under Section 6.6 the UFSAR stated "The feedwater flow rate required to prevent thermal cycling of the tube sheet, and for removing residual heat is the same, about 160 gpm for the reactor (or 80 gpm per steam generator). A 200 gpm flow to the steam generators is therefore sufficient to fulfill the above functions."

   The Kewaunee Technical Specifications (TS) basis 3.4.b also contained the words quoted above. These words were added to the TS in Amendment 123, dated January 3, 1996. The licensee's staff maintained that the "margin of safety" for AFW pump capacity was contained in the conservatism in the Westinghouse analysis that established the 160 gpm figure. Thus, 160 gpm represented the higher bounding figure of some unknown margin. The plant staff reported that a subsequent computer analysis was run using 160 gpm, and design limits were not exceeded.

   The inspectors, however, concluded that the 160 gpm to 200 gpm pump capacity represented a margin of safety defined in the basis of the TS. 10 CFR 50.59 (a)(2) stated that a proposed change shall be deemed to involve an unreviewed safety question. . .(iii) if the margin of safety as defined in the basis for any technical specification is reduced. Calculations by the inspectors indicated that the worst pump condition would provide 182 gpm; however, instrument inaccuracies were not included which could lower the capacity further. The pump would still provide greater than 160 gpm. The licensee agreed that pump testing indicated that the 200 gpm could not be delivered to the steam generators against the highest potential pressure (the secondary relief valve setpoint plus accumulation).

   The licensee also stated that the 200 gpm figure had been used in their accident analyses. These may have been submitted to the NRC as part of reload analyses and utilized in licensing determinations.

2. The inspectors also identified that a modification to provide AFW pump protection may have introduced a potential unreviewed safety question. The modification installed a low discharge pressure pump trip. Inspectors identified that in the event of a faulted steam generator, a low discharge pressure would exist. If only two of

the three pumps automatically started, their output would not be sufficient to maintain the discharge pressure above the setpoint of the trip and both pumps would quickly trip off. The safety evaluation for the modification and station procedures did not recognize this as an expected result. The UFSAR, Section 6.6.3, stated that the pumps are capable of automatic starting and can deliver full auxiliary feedwater flow within one minute after the signal for pump actuation.

10 CFR 50.59(a)(2)(ii) stated that a USQ exists "if a possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report may be created." The inspectors concluded that the pumps tripping during an event was a possible malfunction not evaluated previously.

The licensee's staff believed that this condition was bounded by earlier reviews. A January 3, 1996 revision to the Technical Specifications, Amendment 123, authorized low power throttling of the AFW discharge valves and placing the pump control in the "pull out" position. The TS bases 3.4.b also indicated that this could have been acceptable at all power levels. In addition, the licensee also believed that this potential was reviewed in response to IE Bulletin 80-04 (See UFSAR Section 6.6); however, the pump trips did not exist at that time. In addition, the accident analysis in Chapter 14.2.5, "Steam Line Break," on page 14.2-30, considers a possible single failure as "one failure in the Auxiliary FW runout protection system." This implies that when the other single failure cases were analyzed, they included AFW runout protection pump trips. To the inspectors, these references were not specific enough to conclude that the reviews were bounding.