April 21, 1992

Docket Nos. 50-369
and 50-370

Mr. T. C. McMeekin
Vice President, McGuire Site
Duke Power Company
12700 Hagers Ferry Road
Huntersville, North Carolina 28078-8985

Dear Mr. McMeekin:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING McGUIRE INDIVIDUAL PLANT EXAMINATION (TAC NOS. M74430/M74431)

The NRC staff is reviewing Duke Power Company's Individual Plant Examination (IPE) submitted for the severe accidents assessment for McGuire Nuclear Station, Units 1 and 2. We find that we need additional information in order to complete our review of the section discussing your proposed resolution to Generic Issue 130, "Essential Service Water System Failures at Multi-Unit Sites." Accordingly, please respond to the questions identified in the enclosure. If you have any questions concerning this request, please contact me at (301) 504-1479.

This request affects fewer than ten respondents and is, therefore, not subject to Office of Management & Budget review under P.L. 96-511.

Sincerely,

/s/

Timothy A. Reed, Project Manager
Project Directorate II-3
Division of Reactor Projects-I/II
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

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Enclosure:
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ENCLOSURE

COMMENTS/NRC QUESTIONS ON THE PROPOSED RESOLUTION OF GENERIC ISSUE 130 McGUIRE INDIVIDUAL PLANT EXAMINATION (IPE) SUBMITTAL

1. COMMENTS

The initiating frequency was derived by constructing the fault tree for the ESW system of one unit, that is, two ESW pumps and the corresponding trains. The dominant failure mode is represented by the failure of the ESW pumps, one pump fails to run (1.5E-04/hr) and the other fails to start on demand (2.4E-03) resulting in a yearly frequency of 3.2E-03/yr. It is not clear without seeing the complete analysis if other important failure modes were considered or not.

The operating experience of the U.S. PWR population indicates that the failures or malfunctioning of the ESW pumps contribute only one component to the failure modes and others such as intake problems, external causes (weather, flood), and electrical interdependencies may also significantly affect the operation of the system.

QUESTION

How did the McGuire analysis take into account these effects and what fraction of the initiating frequency represents such failures, if any?

2. COMMENTS

Failures involving the intake structures represent common mode failures for a number of systems. Specifically, given intake failure, the ESW system on both units would be affected, as well as the backup from the Containment Ventilation Cooling (RV) system. For example, if it is assumed that 5% of the initiating frequency represents common mode failures, the CDF contribution becomes .05*3.0E-03*2.0E-01*1.0E-01= 3.0E-06/yr, where 3.0E-03/yr is the initiator and 2.E-01 is the failure to activate SSF seal cooling (see page B-5 of the McGuire Report) and the last 1.0E-01 represents the failure to switch to the Standby Pond. The RV backup and the other unit cross-connection are assumed unavailable due to the common mode failures.

Therefore, these common mode type failures may contribute a larger fraction of the total initiating frequency. In some cases they may be as much as 30% of a total with the corresponding increase in the CDF (this would extrapolate at McGuire to around 1.0E-05/yr). It is recognized that plant-specific features may reduce this type of contribution.

QUESTION

How does the ESW model and initiating frequency take into account common mode failures, especially at the intake level?

3. COMMENTS

The Technical Specification improvements are envisioned to improve the availability of the ESW system when one of the units are in Mode 5 or 6. The ESW system unavailability is indicated to be 2.0E-05, but this seems to be based on data derived from power operation. For example, the test and maintenance of one train is 1.4E-02 while at power. However, this value may be substantially higher during shutdown (0.1-0.2).

For example, assuming that the maintenance unavailability is 0.2, the fraction of shutdown time in a year is about 0.3 (i.e., 70% capacity factor), the CDF would be Initiator*Loss of RV*Loss of SSF seal*shutdown*Maintenance=3.0E-03*1.0E-01*2.,0E-01*0.2=3.6E-06/yr.

In addition, simultaneous maintenance on both ESW trains is also a possibility decreasing the probability of using the crosstie for recovery.

QUESTION

What is the maintenance unavailability of an ESW train in shutdown? Do they perform simultaneous two-train maintenance in shutdown? Is the crosstie used to provide SW flow from the operating unit to the shutdown unit, and if so, what is the probability or the time fraction of use?

4. COMMENTS

The operator has to reestablish RCP seal cooling within 10 minutes following its loss.

QUESTION

What information provides the basis for the operator to determine seal cooling loss? (seal temperature?) What kind of actions have to be performed to put the backup seal cooling system (SSF) in operation? Is this system manually operated?

5. COMMENTS

The operators are trained to limit electrical motor operation without cooling.

QUESTION

Electrical motors may run for an extended period of time without cooling. However, the safety injection (SI) pump bearing oil is cooled by the RN system directly. In case of a loss of RN system coupled with a loss of backup RV system and the failure of the RCP seals, a small LOCA may result. The SI pumps may automatically start upon decreasing pressure and may be damaged in a short time period without RN cooling. Are the operators made aware of this problem or will they react simply on high bearing temperature alarms?

6. **COMMENTS**

The AFW system may be limited in water supply given an extended loss of RN event.

QUESTION

Do the procedures recognize the limited supply of the AFW system and how are the operators trained to cope with this type of event? Did the IPE estimate the CDF contribution of this type of event (extended loss of RN and limited FW supply to AFW)?

7. **COMMENTS**

The overall CDF contains the RN as a support system.

QUESTION

What is the contribution of the RN system to the overall CDF as a support system that is from sequences not initiated by RN loss?