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June 10, 1988

Dr. J. Nelson Grace, Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, GA 30323

Subject: McGuire Nuclear Station
Catawba Nuclear Station
Docket Nos. 50-369 and 50-370; 50-413 and 50-414
NRC Bulletin No. 88-02
Rapidly Propagating Fatigue Cracks in
Steam Generator Tubes

Dear Dr. Grace:

My letters of March 24 and April 25, 1988 in response to NRC Bulletin 88-02 for the McGuire and Catawba Nuclear Stations submitted a response detailing the status of compliance with the Bulletin's specified actions, including a schedule for completion of the actions identified in Bulletin Items A and C for McGuire Units 1 and 2 and Catawba Unit 1 (note that as indicated in the March 24th response the Bulletin is for information only with respect to Catawba Unit 2). This Bulletin requested that Westinghouse designed nuclear power reactors with steam generators having carbon steel support plates implement actions specified therein to minimize the potential for a steam generator tube rupture event caused by a rapidly propagating fatigue crack such as occurred at North Anna Unit 1 on July 15, 1987.

Per a telephone conversation on May 25, 1988 between NRC and Duke Power Company, the NRC raised three specific concerns relative to Duke's response to the bulletin. In addition, the NRC indicated that there was a general concern as to whether Duke understood the significance of the issue addressed by the bulletin. Accordingly, the following additional information is provided in light of the above mentioned teleconference.

The NRC concerns raised are as follows:

1. Duke's implementation schedule for enhanced leak rate monitoring program.

2. Duke's schedule for overall bulletin response.

3. Duke's schedule for final report on McGuire Unit 2.

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Safety Significance Of Recirculating Steam Generator (RSG) Fatigue Cracks

Duke fully understands the significance of fatigue cracks with respect to their impact on plant safety. Our concern is demonstrated by the conservative approach being taken in addressing the issue. As soon as there was an understanding of the factors involved in the North Anna tube rupture, a preliminary review was undertaken at Duke. This review covered denting in the U-bend area and thermal-hydraulic considerations. A preliminary review of eddy current data indicated that no RSG's at Duke exhibited signs of classical denting (tube deformation) which would contribute to fatigue crack initiation and propagation. Discussions with consultants knowledgeable in the RSG thermal-hydraulic area indicated that the stability ratios for all Duke units were much less than those at North Anna due to low circulation ratios. This fact would also support a low probability of fatigue cracking in Duke Units. In spite of this preliminary evidence, Duke elected to take a conservative approach and follow all of the recommendations outlined in the bulletin. This was undertaken at considerable expense. The program currently underway was provided to you along with our proposed schedule in our letters dated March 24, 1988 and April 25, 1988.

Schedule for Implementation of an Enhanced Leak Rate Monitoring Program

Duke proposed that a formal document would be in place by June 24, 1988 (reference Duke's letter dated April 25, 1988). Duke presently trends primary to secondary leakage via continuous radiation monitors and chemistry radio nuclei sampling of the secondary coolant. The continuous radiation monitors are installed in locations which would allow early detection of a steam generator tube leak. The most important continuous monitor relative to steam generator tube leaks is the condensate steam air ejector (CSAE) monitor. The alarm setpoint on this CSAE monitor is such that relatively small changes in leak rate would cause an alarm. An alarm would initiate a response procedure requiring additional sampling and notification of appropriate station supervision. During the review of Bulletin 88-02, station personnel were made aware of the concerns for rapidly propagating fatigue cracks and of the bulletin requirements. In addition, Duke personnel are very sensitive to the importance of leak rate monitoring when fatigue cracking is suspected due to our experience in addressing Once Through Steam Generator corrosion assisted fatigue cracks.

Based on our current leak monitoring practices, our understanding of the relationship of leak rate to fatigue crack growth, our understanding of the significance of the North Anna event and our preliminary review of eddy current data and thermalhydraulic issues, Duke feels that the proposed June 24, 1988 date for implementation of an enhanced leak rate monitoring program does not significantly increase the risk of tube rupture events at our stations.

Note that the bulletin stated that if addressees cannot perform the suggested approach or meet the suggested schedule, they should justify to the NRC their alternative approaches and schedules. Duke feels that the need to implement a sound, auditable leak monitoring program which has been thoroughly reviewed from a technical and administrative standpoint and which addresses all of the criteria in the bulletin justifies the delay in implementation. This is especially true in light of the fact that we feel our current programs offer ample protection against the potential for tube rupture.

Proposed Bulletin Response Schedule

The Duke letters of March 24, 1988 and April 25, 1988 proposed a response schedule for the bulletin. This schedule reflected our ability to collect the information required, to conduct the detailed analysis required, and to ensure that upon implementation of the program the potential for tube rupture was eliminated. Note that this schedule complied with Bulletin requirements in that all analyses and programs were to be completed prior to the next scheduled unit start-up.

Proposed Schedule for McGuire Unit 2 (And Unit 1)

Duke proposed issuing a detailed report covering all aspects of the bulletin about three weeks after unit start-up. This schedule was based on a need to collect additional eddy current data during the outage. The detailed report documenting all data, analyses, methodology, results, etc., would be available per our proposed schedule. The data, however, will be analyzed and remedial action will be taken prior to unit start-up. In addition, the results and actions taken will be reported to the NRC (i.e. the NRC Resident Inspector) verbally prior to unit start-up, as committed to in the May 25, 1988 teleconference.

In conclusion, Duke is aware of the safety concerns raised by the bulletin and feels that a proactive and conservative approach is being taken. This has always been our practice in dealing with steam generator issues. The emphasis/attention Duke places on steam generators is reflected in the various steam generator related submittals made to the NRC in the past (e.g. Technical Specification 4.4.5.5 Steam Generator Tube Inservice Inspection Reports, recent McGuire Steam Generator F* Criteria Technical Specification amendments, etc.). Duke believes that the requirements of the Bulletin have been fully and conservatively met.

In view of various recent discussions between NRC and Duke Power Company concerning steam generators at all three of our nuclear sites (Oconee, McGuire, and Catawba), it is Duke's belief that the NRC does not have a clear understanding of our steam generator program. Accordingly, Duke would like to propose a meeting to be held in the near future to present our total steam generator operation and maintenance program in hopes of alleviating any further NRC concerns. Arrangements for such a meeting should be made through normal Licensing channels.

Finally, with regard to the April 25, 1988 submittal, please note that it inadvertently referenced the previous March 24, 1988 letter by an incorrect date ("April 25, 1988"). This error was previously discussed with Mr. Tom Peebles of your staff. Further, in order to avoid any confusion, it is stressed that the refueling outage dates of 7-13-89/2-5-90/1-2-90 for MNS U2, MNS U1, and CNS U1 respectively stated on Page 2 of the April 25, 1988 submittal are the next scheduled refueling outage dates following the target date refueling outages given in the submittal's attachment, and are not the next refueling outage dates from April 25, 1988 (these later outages would be used for completion of bulletin actions only if acquisition and evaluation of required data was not completed as shown on the submittal's attachment).

Should there be further questions concerning this matter or if the above discussed meeting is desired, please advise.

Very truly yours,

J. W. Hampton, for
Hal B. Tucker

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