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July 31, 1984

Mr. James G. Keppler
Regional Administrator
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Byron Station Units 1 and 2
Braidwood Station Units 1 and 2
10 CFR 50.55(e) 30 day Report
Steam Generator Snubber Failure
NRC Docket Nos. 50-454/455 and
50-456/457

References (a): R. L. Spessard letter to Cordell Reed dated June 22, 1983

(b): W. S. Little letter to Cordell Reed dated February 6, 1984

(c): E. D. Swartz letter to J. G. Keppler dated February 23, 1984

Dear Mr. Keppler:

On June 28, 1984, the Commonwealth Edison Company notified Mr. Isa T. Yin of your office of a deficiency reportable pursuant to 10 CFR 50.55(e) concerning the unsatisfactory operation during qualification testing of the Steam Generator Snubbers supplied by the Boeing Company for our Byron and Braidwood Stations. For your tracking purposes, this deficiency was assigned Number 84-05 for Byron Station and Number 84-11 for Braidwood Station.

This letter fulfills the thirty day reporting requirements of 10 CFR 50.55(e) regarding this matter, and is considered to be an interim report because sufficient information is not available at this time to provide a definitive report. Our delay in submittal of this report was discussed with Mr. Duane Danielson of your office on July 26, 1984.

DISCUSSION

The Commonwealth Edison Company purchased the Steam Generator Snubbers for use at our Byron and Braidwood Stations from the Boeing Engineering and Construction Company. The Reference (a) Byron Station Inspection Report No. 50-454/83-20; 50-455/83-17

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and the Reference (b) Byron Station Inspection Report No. 50-454/84-08; 50-455/84-06 expressed the Region III concerns relative to these snubbers including the adequacy of the existing qualification testing originally performed by the Boeing Company. Reference (c) documented the Commonwealth Edison position relative to the adequacy of the qualification testing in question, and committed to perform additional snubber qualification testing in order to resolve the Region III concerns. Consultant Specification No. 120 "Testing Services for Steam Generator Snubbers" was developed and subsequently reviewed by the Region, and an award was made to ITT Grinnell in Warren, Ohio, to perform the requisite testing. The ITT Grinnell Test Procedure SPS-8416-1-0 and its subsequent revisions were also reviewed by the Region.

DESCRIPTION OF DEFICIENCY

During initial testing by ITT Grinnell in their Warren, Ohio facilities, three Boeing Steam Generator Snubbers supplied by Commonwealth Edison failed to meet testing criteria requirements. The failure of three snubbers to meet the bleed rate criteria in tension was caused by excessive leakage past the high pressure rod seals on each of the three snubbers. Additionally, one snubber also failed to meet the bleed rate criteria in compression due to excessive leakage out the end cap.

The cause of the seal leakage has yet to be determined. ITT Grinnell is in the process of a complete tear down and critical dimension check of the parts within these three snubbers along with five additional snubbers supplied to ITT Grinnell. The results of this review will be made available to the Region upon completion. However, this failure mode analysis is not considered to be critical to technically resolving this matter because of the re-design and re-qualification efforts currently underway as discussed below.

ANALYSIS OF SAFETY IMPLICATIONS

The function of the Steam Generator Snubbers are two-fold. These snubbers allow movement of the Steam Generators due to thermal expansion and contraction of the Reactor Coolant System (RCS) during normal operation. Additionally, these snubbers resist movement of the Steam Generators during a Design Basis Event to ensure that the ASME Code allowable stresses of the RCS are not exceeded. The snubbers control the undesirable movement of the Steam Generators resulting from seismic shock and/or pipe rupture loading. Failure of the snubbers to meet test specification requirements appears to indicate that the snubbers tested would not resist design loads during a Design Basis Event, thus exceeding the ASME Code allowable stresses of the RCS.

CORRECTIVE ACTION TAKEN

ITT Grinnell is in the process of performing a critical dimension check on the parts of eight Boeing snubbers, and reviewing this information in an attempt to determine the cause for the excessive seal leakage. At the direction of Region III, this evaluation is being well-documented.

Due to the schedule constraints imposed by our Byron Unit 1 fuel load requirements, ITT Grinnell has been directed by Commonwealth Edison to propose an alternate front and rear seal design for the Boeing snubbers. A meeting was held on July 27, 1984 between ITT Grinnell, Mr. Isa T. Yin of Region III, and Commonwealth Edison with its Consultants to discuss and review this proposed seal arrangement. At this meeting, concerns of Mr. Isa T. Yin were discussed. Various issues including those concerning welding versus machining, stress analysis, piston ring bypass, seal arrangements, use of Viton seal material and fluid interaction, qualification testing, QA program requirements and fluid filtration were reviewed in detail and resolved. At the conclusion of this meeting, Mr. Yin recommended that we proceed with the proposed design. Formal approval by the Commonwealth Edison Company for ITT Grinnell to proceed with implementing the new front and rear seal arrangements and refurbishing eight Boeing snubbers to accommodate the requirements of our Byron Unit 1 is expected to be given this week.

Miller Fluid Power located in Bensenville, Illinois, as a sub-vendor to ITT Grinnell, will be performing the precision machining required to implement the new design. Upon completion of machining, these parts will be shipped back to, and assembled by ITT Grinnell in Warren, Ohio. Upon completion of assembly, each of the eight snubbers will be subjected to full functional testing. The qualification test procedure previously provided to the Region for review has been revised and was given to Mr. Yin during the July 27, 1984 meeting.

The following agreements were additionally reached during the meeting:

1. A piston ring bypass test will be performed on one snubber in both compression and tension. (Final functional testing will additionally demonstrate the amount of bypass.)

2. The use of Viton as a permanent seal material is still under review. Information concerning its use in similar applications, and its recommended life and maintenance will be provided to the Region. Discussions concerning surveillance requirements will follow as appropriate.

3. The Program Plan for this modification work will be submitted to the Region defining the various organizations involved and their responsibilities for design interface.

4. Requirements for additional filtration of the snubber DC 200 fluid will be re-reviewed.

Although it is uncertain at this time whether a definitive conclusion will be reached concerning the cause for the Boeing Steam Generator Snubber seal failures, a supplemental report will be provided to your office addressing the results of our review in this area, along with our evaluation of the procurement and prototype testing of the Boeing snubbers. Additionally, we will provide a status update concerning ITT Grinnell activities associated with the first eight snubber units, and our resultant plans for the remaining snubber requirements for Byron Unit 2 and Braidwood Units 1 and 2. Our current schedule for delivery of the first eight qualified snubbers for use at Byron Unit 1 is during the last week in August, 1984.

We will continue to keep Mr. Isa T. Yin appraised of developments in this matter, and we anticipate submittal of a supplemental report by September 1, 1984. In the interim, please address any questions that you or your staff may have concerning this matter to this office.

Very truly yours,

E. Douglas Swartz
Nuclear Licensing Administrator

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cc: I. T. Yin
RIII Resident Inspector - Byron
RIII Resident Inspector - Braidwood

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