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*DmB*

March 11, 1985

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

Subject: Byron Generating Station Units 1 and 2  
Braidwood Generating Station Units 1 and 2  
10 CFR 50.55(e) Final Report  
Energy Absorbing Material  
NRC Docket Nos. 50-454/455 and 50-456/457

References (a): D.H. Smith letter to J.G. Keppler dated  
November 29, 1984

Dear Mr. Keppler:

Reference (a) provided the 30-day report of a deficiency reportable pursuant to a CFR 50.55(e) regarding the crush strength of energy absorbing material (EAM) used in pipe whip restraints. This letter provides information concerning the resolution of the issue and is considered to be a final report. For tracking purposes, this deficiency was assigned numbers 84-07 at Byron and 84-19 at Braidwood.

Corrective Action Taken

Hexcel has provided two reports on the evaluation of the energy absorbing material (EAM) piece which showed the most significant reductions in crush strength. After a metallographical examination of the sections cut from the crushed specimen, Hexcel concluded that the low crush strength was attributable to non-uniform content of braze alloy in the specimen tested. Hexcel also performed a review of their records for all EAM material supplied to the Byron/Braidwood Stations and manufactured using their original brazing process. Their conclusion is that there was a Quality Control system problem with respect to two core blocks, both of which showed low crush strength during 1984 testing. Hexcel believes that this problem was isolated to only these two core blocks. However, rather than attempting to verify Hexcel's claim regarding the adequacy of all other EAM core blocks manufactured using their original brazing process, we have taken the following steps to resolve the problems with respect to the Byron/Braidwood Stations.

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1. Westinghouse Designed Restraints

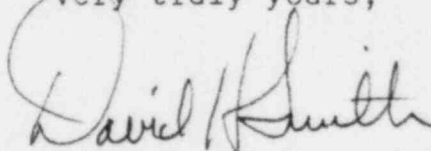
Hexcel informed us that the EAM used in Westinghouse designed restraints was manufactured using their current brazing process. Although this process is not considered suspect by Hexcel, we requested them to test a number of specimens from a typical core block manufactured using the current brazing process to evaluate the material variability within the core block. Hexcel has submitted a report providing the results of these tests which show that, based on 18 specimens tested, the variation is +8.86% to -6.95% from the average. This variation is within the procurement specification requirements for Byron/Braidwood.

2. Sargent & Lundy Designed Restraints

- a. We had submitted our analysis for elimination of arbitrary intermediate pipe breaks to NRR for their review. NRR has accepted our analysis, and therefore, all restraints associated with these intermediate breaks are no longer required.
- b. After deleting the restraints associated with intermediate pipe breaks, there are 21 restraints in each unit at the Byron/Braidwood Stations which utilize EAM. As we informed you in Reference (a), we plan to replace the EAM for these 21 restraints. The replacement material will be manufactured by Hexcel using their current brazing process. At Byron Unit 1, this replacement has already been accomplished; at other units, the replacement is in progress.
- c. In order to address the issue of material variability for the replacement material, the number of production tests has been increased to five specimens from each core block of material. Furthermore, these specimens are required to be taken from different locations in the core block to establish representative variability.

Please address any questions that you or your staff may have concerning this matter to this office.

Very truly yours,



David H. Smith  
Nuclear Licensing Administrator

cc: NRC Resident Inspector - Byron  
NRC Resident Inspector - Braidwood  
Director of Inspection and Enforcement  
United States Nuclear Regulatory Commission  
Washington, DC 20555