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July 27, 1984

Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Re: Catawba Nuclear Station
Units 1 and 2
Docket Nos. 50-413 and 50-414

Dear Mr. O'Reilly:

Pursuant to 10 CFR 50.55e, please find attached a Significant Deficiency Report No. SD 413-414/84-18.

Very truly yours,

Hal B. Tucker

LTP/rhs

Attachment

cc: Director
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

NRC Resident
Catawba Nuclear Station

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Catawba Nuclear Station

Report Number: SD 413-414/84-18

Report Date: July 27, 1984

Facility: Catawba Nuclear Station, Units 1&2

Identification of Deficiency: Transamerica Delaval Inc. furnished four diesels for the Catawba Nuclear Station with the possibility of residual stresses in the type AN piston skirts.

Initial Report: On June 28, 1984, Mr Virgil Brownlee of the NRC Region II, Atlanta, Georgia office was notified of this deficiency by Mr L M Coggins, Mr J M Lines, Mr T L Utterback, and Mr R D Carroll of Duke Power Company, Charlotte, NC 28242.

Supplier and/or Components: Transamerica Delaval Inc. of Oakland, California, manufactured and supplied the type AN piston skirts that were initially installed in the four Catawba diesels and are designated 1A, 1B, 2A and 2B.

Description of Deficiency: Four type AN piston skirts were found to have cracks adjacent to the piston pin bosses. These cracks are approximately vertical, and appear to initiate on the inside of the skirt where a circumferential reinforcing rib intersects the piston pin boss. The largest crack, on diesel generator 1A-cylinder 3L, penetrates the piston wall and is about 3 to 4 inches long on the outside. These cracks were visually located during an inspection, following and extended operational test of diesel generator 1A, and verified by dye penetrant and ultrasonic testing.

Analysis of Safety Implication: An extensive failure analysis of the cracked

type AN piston skirts is now being performed by Failure Analysis Associates (FaAA) as part of the TDI Owners Group program. This program includes determination of residual and applied stresses, fractography, and metallurgical evaluations.

Once the failure analysis is completed, the Analysis of Safety Implication issue can be addressed, and this is expected to be by September 27, 1984.

Corrective Action: The cracked type AN piston skirts in the Catawba 1A diesel did not cause any operational problems, and 12 of the 16 skirts were free of cracks. However, all of the Unit 1 piston skirts will be replaced with improved design type AE skirts. The AE skirts have been stress relieved and include improved design features such as a thicker reinforcing rib and better rib to piston boss intersection details. These improvements are expected to adequately reduce stresses and the propensity for cracking in the area which experienced cracking at Catawba. In addition, the type AE skirts also incorporate the latest improvements in the stud boss region, which has been a problem area in earlier piston designs at the skirt to head transition.

The decision regarding the replacement of the Unit 2 AN skirts with the AE skirts, will be made following the completion of the failure analysis by Failure Analysis Associates.

A final report addressing the Unit 2 piston skirts and the safety implication will submitted by January 15, 1985. Unit 1 skirts are in place for diesel 1A and diesel 1B skirts will be in place by September 14, 1984.