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VIRGINIA ELECTRIC AND POWER COMPANY, RICHMOND, VIRGINIA 23261

July 19, 1979

Mr. James P. O'Reilly, Director
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Serial No. 235B
PSE&C/GLP:mac:wang
Docket No. 50-339

Dear Mr. O'Reilly:

On May 4, 1979, we sent an interim report to Region II concerning failure of Inside Recirculation Spray Pump Motors at North Anna. We indicated that a final report would be made as soon as modifications and testing were completed on the motors.

We have modified and tested all of the motors which are available for testing at this time. We have completed tests on 4 motors from our Surry Power Station (2 per unit) and on 2 from North Anna Unit 2. All 6 of these motors performed well within their allowable bearing temperature range during the eight runs that were made on each motor under full load conditions. The remaining motors to be modified are in North Anna Unit 1, however, these motors were tested successfully for 12 hours with their existing lower motor bearings, but will be modified to be in conformance with the new design. The modification will be made to these motors during the first refueling of North Anna Unit 1.

As we described in our earlier 5 day report April 11, 1979, Serial No. 255, the root of the bearing problem appeared to be inadequate clearance in the double row ball bearing which is used as a guide and a thrust bearing on the lower end of the motor. Since we could not obtain a double row bearing with adequate clearance from any bearing manufacturer within a short time frame, it was decided that the bearings must be changed to an MRC single row angular contact split inner ring bearing which is a standard stock item from MRC and has ratings exceeding the original. The first motor to be fitted with the new bearing was tested at the General Electric facility in San Jose with good success, the motor was then shipped to Bingham Willamette Pump Company where it was tested on a pump similar to the ones used at North Anna and Surry. The test at Bingham was also successful up to 100% load on the motor, the motor was then loaded to 108% and after one and one-half hours, rubbing was detected where the shaft passes through the end shield. The cause of the rubbing appeared to be the slinger ring on the lower end of the motor. The ring was then lowered away from the end shield and the 108% load test was completed successfully. However, after the motor had been returned to San Jose and dismantled, indications were that the shaft had been rubbing the end shield itself thereby creating frictional heating of the shaft at that point.

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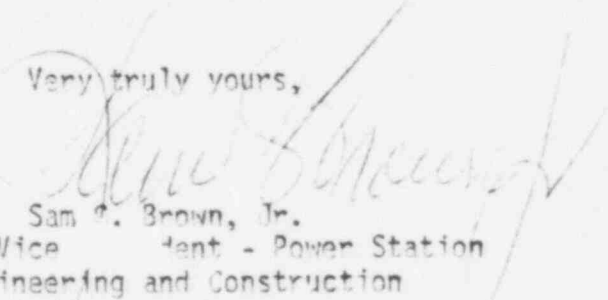
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To eliminate the shaft to end shield problem, the end shield opening was increased to give a greater radial clearance around the shaft where it passes through the end shield. To minimize this increase, the labyrinth sealing slinger on the lower end of the end shield was made larger in diameter, one labyrinth surface was added, plus the labyrinth clearances were made closer and the distance the lab seal sits on the shaft was made longer.

We feel that we have substantiated the capability of the motors by test and that the environmental qualification will be reverified with a Topical Report by General Electric to be submitted no later than July 27, 1979. This report will be more detailed concerning the exact dimensions, materials used, and test results of the modification.

This is our final report on this item. If you have further questions, please contact this office.

Very truly yours,


Sam G. Brown, Jr.
Senior Vice President - Power Station
Engineering and Construction

cc: Mr. Victor Stello, Director
Office of Inspection & Enforcement

✓ Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation

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