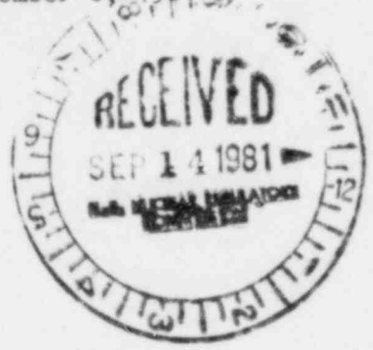
50-438

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

September 8, 1981



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

Dear Mr. O'Reilly:

BELLEFONTE NUCLEAR PLANT UNIT 1 - EXCESSIVE VIBRATIONS OF ERCW PUMP/MOTOR - NCR 1249 - REVISED FINAL REPORT

The subject nonconformance was initially reported to NRC-OIE Inspector F. S. Cantrell on August 19, 1980, in accordance with 10 CFR 50.55(e). This was followed by our interim reports dated September 17 and December 2, 1980 and our final report dated February 4, 1981. As discussed with F. S. Cantrell by telephone on February 13, 1981, enclosed is our revised final report. We consider 10 CFR Part 21 to be applicable to this nonconformance.

If you have any questions concerning this matter, please get in touch with D. L. Lambert at FTS 857-2581.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

for L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure
cc: Mr. Victor Stello, Jr., Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNIT 1
EXCESSIVE VIBRATIONS OF ERCW PUMP/MOTOR
NCR 1249
10 CFR 50.55(e)
REVISED FINAL REPORT

Description of Deficiency

Excessive vibrations have been observed in essential raw cooling water (ERCW) pump/motor assembly while running. TVA and Weir Pumps Limited have agreed that the vibration experienced on the ERCW pumps was because of resonant amplification caused by the operating speed being too close to the natural frequency of the pumps.

The fundamental cause of the problem was that pump design resulted in natural frequencies too near the running speed. A contributing factor also appeared to be the fact that the floor under the pumps was reworked.

Safety Implications

Excessive vibrations could lead to failure of the pump and/or motor resulting in failure of the pump to perform its intended function of providing raw cooling water to the plant. This would result in loss of the cooling to safety-related equipment and would have affected adversely the safety of operations of the plant.

Corrective Action

TVA has evaluated the solution proposed by Weir and determined it to be effective. The solution to the vibration problem consists of shifting the natural frequency away from the running speed by adding mass to the motors.

The permanent addition of weight to the motors has been seismically requalified. The seismic qualification of the ERCW pumps was verified by a Weir Pumps Report (Report No. TECH/LPD/NV/737/81, Revision 0, dated May 1981). This report was based on the original analyses performed by McDonald Engineering and is presently included as an addendum to it.

The report concludes that 2500 pounds of additional weight could be added to the pumps without altering their seismic qualification. TVA has added approximately 1700 pounds to the unit 1 (1A-1A) pump and approximately 2100 pounds to the unit 1 (1A-2A) pump. The vibration levels for each motor are now less than three millimeters (measured from peak displacement). This is within acceptable limits.