

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401  
400 Chestnut Street Tower II

May 21, 1984

BLRD-50-438/84-23  
BLRD-50-439/84-22

U.S. Nuclear Regulatory Commission  
Region II  
Attn: Mr. James P. O'Reilly, Regional Administrator  
101 Marietta Street, NW, Suite 2900  
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

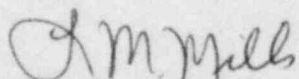
BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - OVERPRESSURIZATION OF EMERGENCY  
RAW COOLING WATER PIPING BECAUSE OF TWO MECHANICAL FAILURES -  
BLRD-50-438/84-23, BLRD-50-439/84-22 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector  
R. Carroll on March 1, 1984 in accordance with 10 CFR 50.55(e) as NCR 2879.  
This was followed by our interim report dated March 29, 1984. Enclosed is  
our final report.

If you have any questions, please get in touch with R. H. Shell at  
FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

  
L. M. Mills, Manager  
Nuclear Licensing

Enclosure

cc: Mr. Richard C. DeYoung, Director (Enclosure)  
Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Records Center (Enclosure)  
Institute of Nuclear Power Operations  
1100 Circle 75 Parkway, Suite 1500  
Atlanta, Georgia 30339

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ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2  
OVERPRESSURIZATION OF EMERGENCY RAW COOLING WATER PIPING  
BECAUSE OF TWO MECHANICAL MALFUNCTIONS  
BLRD-50-438/84-23, BLRD-50-439/84-22  
NCR 2879  
10 CFR 50.55(e)  
FINAL REPORT

Description of Deficiency

During a hydrostatic test on February 16, 1984, a temporary pressure gauge snubber and relief valve failed and resulted in an overpressurization of a portion of the essential raw cooling water (ERCW) system. The pressure gauge had been calibrated on February 14, 1984, and was used to set the relief valve at 235 lb/in<sup>2</sup>g on the same date.

During the hydrostatic test, a small double-acting, air-driven pump was used to pressurize the system to 90 lb/in<sup>2</sup>g. The pressure was then raised to 100 lb/in<sup>2</sup>g by several strokes of the pump and at this time the overpressurized portion of the system was checked for leaks, with none occurring. The valve was opened, and the pump was started. When the pressure was near 180 lb/in<sup>2</sup>g, it was noted that the pressure was increasing at an excessive rate. At that point, the pump was shut off, and the valve between the pump and test items was closed before the indicated pressure reached 230 lb/in<sup>2</sup>g.

Due to a significant lag in the response of the pressure gauge the pressure indication continued to increase (above 235 lb/in<sup>2</sup>g) and efforts were initiated to relieve the pressure (since the relief valve had apparently failed). The coupling on the relief valve was loosened and valve 1KE-VJDC-242-B was opened in the discharge side of the air handling unit (AHU). By the time the pressure was relieved, the gauge had begun to level off at approximately 480 lb/in<sup>2</sup>g. Although the coils on AHU 1VA-MAHU-198-B and associated KE (ERCW) system piping between valves 1KE-VHAC-280 and 1KE-VJDC-242-B were subjected to a pressure estimated at 480 to 500 lb/in<sup>2</sup>g, they are only hydrostatically qualified to a pressure of 300 lb/in<sup>2</sup>g.

The valve and pressure gauge were purchased by TVA's Division of Construction as shelf items and are non-quality assurance items.

Safety Implications

The AHU affected by this overpressurization provides cooling of the 590 elevation area in the Auxiliary Building where several safety-related pumps and associated electrical equipment are located. Severe overpressurization

could have damaged the coils to the point of failure although in this instance, such damage did not occur. A failure of the coils of this unit and a resultant loss of the safety-related AHU could have occurred, resulting in a rise in temperature in the area and the leakage of cooling water from the coils. This could have adversely affected the safe operation of the plant.

#### Corrective Action

Nonconformance report 2879 has been returned from TVA's Division of Engineering Design with the recommended corrective action to "use-as-is." The relief valve involved in the deficiency has been destroyed and the pressure gauge snubber has been reworked. Hydrostatic test 1KE-H-53 (per Bellefonte Construction Test Procedure 7.6) was successfully completed on April 26, 1984, and no visible damage was evident to the AHU coils as a result of the overpressurization. The simultaneous malfunction of the pressure gauge and the relief valve appear to be an isolated occurrence. It should be noted that both the relief valves and pressure gauges are checked for calibration both before and after hydrostatic tests are performed. Therefore, no further action to prevent recurrence is necessary.