

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

5N 175B Lookout Place

85 DEC 5 AU 29/9 1985
November 29/9 1985

WBRD-50-390/85-41

WBRD-50-391/85-40

U.S. Nuclear Regulatory Commission
Region II
Attn: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Dr. Grace:

WATTS BAR NUCLEAR PLANT UNIT 2 - AUXILIARY FEEDWATER APPENDIX R ANALYSIS
DEFICIENCY - WBRD-50-390/85-41, WBRD-50-391/85-40 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector
Al Ignatonis on September 18, 1985 in accordance with 10 CFR 50.55(e) as
SCR WBN NEB 8516. Our first report was submitted on October 21, 1985. Delay
in submittal of this report was discussed in a letter dated November 18,
1985. We no longer consider 10 CFR 50.55(e) applicable to this item.
Enclosed is our final report.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. W. Hufham
J. W. Hufham, Manager *by ell*
Licensing and Risk Protection

Enclosure

cc: Mr. James Taylor, 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

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
AUXILIARY FEEDWATER APPENDIX R ANALYSIS DEFICIENCY
WBRD-50-390/85-41 AND WBRD-50-391/85-40
SCR WBN NEB 8516
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

The component list in revision 7 of TVA's Office of Engineering (OE) calculation, "Equipment Required for Safe Shutdown Per 10 CFR 50 Appendix R," for Watts Bar Nuclear Plant (WBN) lists the components required for safe shutdown following a fire. The component list allows for aligning one motor-driven auxiliary feedwater (AFW) pump to two steam generators ten minutes after main feedwater (MFW) is isolated. This condition had not been specifically analyzed. However, discussions with Westinghouse and an examination of the WBN FSAR Chapter 15 analyses for MFW line breaks indicated that delaying the AFW supply for ten minutes and aligning only one motor-driven AFW pump could result in a water solid pressurizer, and subsequent water relief through the pressurizer safety valves. The design criteria of section 2.2.2 of the Appendix R shutdown logic calculation requires that for plant shutdown following a fire, reactor coolant system (RCS) process variables must be within those predicted for a normal loss of ac power event as described in WBN FSAR section 15.2.9. The shutdown scenario described above does not meet this criteria.

This condition was discovered during review of the WBN Vital Equipment List.

TVA has determined the cause of this deficiency to be a design oversight. When originally prepared, the Appendix R safe shutdown component list did not consider a specific timeframe for availability of the AFW system. As a result, the shutdown logic requires alignment of either one of the motor-driven AFW pumps or the turbine-driven AFW pump to supply AFW. This is consistent with the design basis of the system. During the evaluation of cable interactions, it was noted that the motor-driven AFW pump back pressure control valves fail closed and that operator action would be required to reopen the valves. However, when providing for a local means of opening the valves, the timeframe in which the valves need to be opened was not adequately considered. In addition, the timeframe in which steam generator level control valves must be opened was not adequately addressed. The resulting design configuration was not considered to meet the Appendix R design criteria requirements.

Safety Implications

As noted in "Description of Deficiency," the initial conclusion that delaying AFW initiation by ten minutes could result in a water-solid pressurizer (and violation of the design criteria of section 2.2.2 of the WBN Appendix R shutdown logic calculation) was based on discussions with Westinghouse and an inspection of analyses for similar transients which are evaluated in the WBN FSAR. Subsequent to this evaluation, TVA has performed a specific analysis for the sequence of events that delays AFW initiation. The results of this analysis have shown that AFW, at WBN, can be delayed in excess of ten minutes, following a fire that induces closure of the motor-driven AFW pump backpressure control valves without resulting in a water-solid pressurizer. As such, sufficient time is available for the operators to accomplish the necessary valve alignments for mitigation of this condition.

Therefore, TVA considers that since no additions to the required components list, nor physical changes to the plant, nor any new operator actions are necessary to show that the plant response would be within the WBN design criteria for shutdown per 10 CFR 50 Appendix R, further corrective actions are not necessary to resolve significant condition report (SCR) WBN NEB 8516. As such, TVA no longer considers 10 CFR 50.55(e) applicable to this item.