TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

April 27, 1983

WBRD-50-390/81-33
WBRD-50-391/81-32

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:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - IMPROPER CLASSIFICATION OF ERCW SYSTEM PIPING AND COMPONENTS - WBRD-50-390/81-33, WBRD-50-391/81-32 - NINTH INTERIM REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on March 24, 1981 in accordance with 10 CFR 50.55(e) as NCR WBN NEB 8106, concerning the seismic qualification for chillers/coolers and deficient piping of the HVAC system. A similar deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on May 7, 1981 in accordance with 10 CFR 50.55(e) as NCR 3116R R1, concerning improper classification of ERCW system piping. Interim reports were submitted on April 24, June 8, July 14, September 2, and December 9, 1981 and February 17, August 11, and October 19, 1982. Our August 11, 1982 submittal constituted a final report on NCR 3116R R1 (WBRD-50-390/81-50, WBRD-50-391/81-48). Enclosed is our ninth interim report. We expect to submit our next report on NCR WBN NEB 8106 on or about August 29, 1983.

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

IE 27

ENCLOSURE
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
IMPROPER CLASSIFICATION OF ERCW SYSTEM PIPING AND COMPONENTS
NCR WBN NEB 8106
WBRD-50-390/81-33, WBRD-50-391/81-32
10 CFR 50.55(e)
NINTH INTERIM REPORT

Description of Deficiency

During the design review of the Watts Bar Nuclear Plant (WBN) Essential Raw Cooling Water (ERCW) System, it was discovered that portions of the ERCW system (equipment coolers, air cooling units, etc.) may not have proper seismic specification. Watts Bar Design Criteria WB-DC-40-36.1, Revision 0, requires that these components be classified ANS Safety Class 2b and be Seismic Category I or I(L). However, these coolers were shown on TVA design drawings, 47W845 series, as TVA Class G, Seismic Category I(L). Seismic Category I(L) has two levels; one level ensures pressure boundary integrity; the other ensures structural integrity such that component failure will not damage primary safety equipment. Some of these air cooling units serve essential safety-related equipment (SIS, CSS pumps, etc.) required for accident mitigation.

Interim Progress

The primary safety-related HVAC equipment was procured under contracts 77K35-83153-1, 77K35-83119-2, 76K35-83230-1, and 76K35-83190. This equipment was not procured to a specific TVA classification (A, B, C, etc.) as had been indicated on the TVA ERCW System flow diagrams. This equipment was procured to the seismic Category I design requirements specified in WBN-DC-40-36.1 that was in effect at the time of purchase and met the highest commercial quality feasible at the time of procurement. TVA has reviewed the contract files and found sufficient documentation to verify that the equipment meets the requirements of 10CFR50, Appendix B, and is suitable for use in a TVA safety class C system (which is the TVA equivalent to ANS safety Class 2b).

The secondary safety-related HVAC equipment was procured under contracts 77K38-821351 and 76K38-83225. This equipment was not procured to a specific TVA classification (A, B, C, etc.) as had been indicated on the TVA ERCW System flow diagrams. This equipment was procured to the seismic Category I(L) with pressure boundary design requirements specified in WBN-DC-40.36.1 that were in effect at the time of purchase and met the highest commercial quality feasible at the time of procurement. (This equipment is required to maintain its pressure boundary integrity because of its interface with the ERCW system.)

TVA has determined that the Control Rod Drive Mechanism Coolers (CRDM), the Lower Compartment Vent Coolers (LCVC), and the Upper Compartment Vent Coolers (UCVC), located inside containment, bought on contract 77K38-821351, are not seismically qualified to maintain pressure boundary integrity. TVA has determined there was no quality assurance program in effect on the subject contract to certify that the equipment met the requirements of 10 CFR 50, Appendix B. The equipment does meet the structural integrity requirements of seismic Category I(L) components.

The lack of pressure boundary integrity could possibly affect ERCW system operability, but does not affect plant safety as these components are not safety-related (FSAR Section 9.4.7.3). However, existing plant design features, described below ensure that there are no adverse effects on the ERCW system. The equipment is acceptable for use during all operating conditions not involving a seismic event.

The existing equipment met the highest commercial quality available at the time of procurement and has been hydrostatically tested at a pressure of 300 psig which exceeds the ERCW system hydrostatic test pressure of 200 psig. It is therefore acceptable for various plant operating modes.

If a seismic event occurs which results in the loss of equipment pressure boundary integrity, existing level instrumentation in the reactor building sump will detect any increase in the rate of leakage that results from the pressure boundary failure.

Flow measurement instrumentation in the supply and return lines and valves used for containment isolation (FSAR Figure 9.2.3) would facilitate the detection and isolation of components which have incurred a loss of pressure boundary integrity. The redundant trains of the ERCW system would maintain overall plant safety.

In the event that a small break LOCA (Phase A, Containment Isolation) occurs when the HVAC equipment pressure boundary integrity has failed, containment boundary integrity would be maintained since the ERCW system pressure exceeds the maximum containment pressure experienced during a Phase A containment isolation signal. The Phase B containment isolation signal automatically closes the containment boundary isolation valves in the ERCW system supply and return lines (FSAR, Figure 9.2.3). This action automatically isolates the reactor building equipment from the remainder of the ERCW system and ensures the containment boundary integrity and system operability during a LOCA.

Therefore, it is TVA's position that the CRDM, LCVC, and UCVC are acceptable for use in the ERCW system as presently designed and constructed.

The reactor building instrument room water chiller bought on contract 76K38-83225 was seismically qualified in accordance with WB-DC-40-31.13, including pressure boundary integrity of the condenser water system (ERCW water boundary) and water regulating valve (TVA installed in ERCW piping). The pressure boundary integrity of the refrigerant system was waived since these units are not safety-related.

Although these chillers were not specified to be built under a QA program, the detailed specifications required conformance to ASTM, ANSI, ARI, NEMA, AISI, and IEEE (112) industry standards. In addition, the chiller condenser was designed and built for an operating pressure of 150 psig in accordance with ASME, Section VIII and is so stamped and certified. The condenser was hydro tested at 225 lb/in^2 in accordance with ASME, Section VIII requirements.

The chillers were also built at the same time and in the same shop as equipment from contracts 76K35-83190, 76K36-83237, and 77K38-821350, all of which were built under an approved 10 CFR 50, Appendix B, QA program. TVA conducted source inspection at established hold points for this and all of the above contracts. A QA documentation package including pressure test results for the condenser was shipped with the chillers and is on file.

The units were therefore constructed under sufficient quality control procedures and to sufficient detailed technical requirements (ASME VIII and Seismic Category I(L)) to assure the pressure boundary integrity of the chiller condenser.

TVA is continuing with closure of Engineering Change Notice (ECN) 3842 and will provide additional information in our next submittal.