TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

85 NOV 7 A10:05

October 31, 1985

WBRD-50-391/83-05

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

Dear Dr. Grace:

WATTS BAR NUCLEAR PLANT UNIT 2 - INCORRECT USE OF CATEGORY I(L) SUPPORTS ON PIPES NEAR WATER CHILLERS - WBRD-50-391/83-05 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector A. K. Hardin on January 17, 1983 in accordance with 10 CFR 50.55(e) as NCR SWP 8265. Enclosed is our final report.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Domer

for J. W. Hufham, Manager
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

8511220205 851031
PDR ADOCK 05000391
S PDR

ENCLOSURE

WATTS BAR NUCLEAR PLANT UNIT 2
INCORRECT USE OF CATEGORY I(L) SUPPORTS ON PIPES NEAR WATER CHILLERS
WBRD-50-391/83-05
NCR WBN SWP 8265
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

Piping for the primary water make-up, high-pressure fire protection, and demineralized water systems, shown on TVA drawing 47W491-6, in the vicinity of main control room water chillers A-A and B-B and shutdown board room water chillers A-A and B-B have been supported by category I(L) supports for position retention. The piping in the vicinity of this equipment should have been supported by category I(L) supports for pressure boundary integrity and position retention. These water chillers are safety-related equipment. TVA Electrical Design Standard DS-E1.3.1, "Protection of Electrical Equipment that is Susceptible to Failure from Fluid Spray and Condensation," requires that water lines not be routed over safety-related electrical equipment; or, that measures be taken to prevent damage to safety-related electrical equipment when water lines are routed above it.

TVA has determined that the cause of this deficiency involved three areas:

1. Lack of Guidance - No procedures or guidelines were established to aid the piping system designer in properly identifying the noncritical systems' piping which must be supported for pressure boundary integrity to protect safety-related electrical equipment from water spray in the event of an earthquake.

2. Incorrect or Out-of-Date Drawings - The fire suppression study drawings (SK1200 series), and the 47W491 and 47W492 series physical piping drawings did not identify the noncritical piping around the chillers as requiring seismic support nor the equipment as requiring shielding from water spray. Also, the fire suppression study drawings were not updated for several years to reflect additional class 1E equipment.

3. Lack of Knowledge of Existing Design Criteria - Design project personnel were either unfamiliar with or not aware ignorant of the existence of the following design criteria: WB-DC-40-31.3, "Assignment of Responsibility for Analyses, Support, and Fabrication of Piping Systems," and WB-DC-40-31.7, "Design Criteria for Analysis of Category I and I(L) Piping Systems." Supplemental procedures do not exist for implementing the requirements of these criteria.

Safety Implications

Category I(L) supports are not qualified as pressure boundary supports. During a seismic event, the affected piping could break or rupture and the resulting water spray could damage safety-related equipment near the pipes and, thereby, jeopardize safe operation of the plant.

Corrective Action

TVA's Pipe Rupture Evaluation Final Report, which documents the results of an organized task force inspection, contains a listing of all IEEE class 1E electrical equipment which is located in areas where piping has been supported for position retention only. All affected class 1E equipment which is identified in this report will be sealed or shielded against water spray from postulated failures in non-safety-related piping. For equipment which cannot be shielded or sealed, the non-safety-related piping has been analyzed and qualified supports have been designed to ensure the pressure boundary integrity of the piping.

Additional sheets to the TVA 47W200 series equipment drawings have been issued, beginning with sheet No. 100, to identify all areas of the category I structures containing non-safety-related piping which is not supported for pressure boundary integrity. All class 1E equipment and components located in these areas is indicated on the drawings, and drawing notes have been added to indicate what action is required to protect the equipment and components against water spray.

Also, Watts Bar Engineering Project (WBEP) Engineering Procedure (EP) 43.24, "Piping Analysis Techniques--Selection," was issued on March 15, 1984, to (1) provide guidance to design personnel for the proper use of the equipment drawings, (2) provide a method of continuously updating the equipment drawings, (3) list all of the design criteria associated with identifying which non-safety-related systems are required to be analyzed and supported for pressure boundary retention, and (4) identify which design organizations are responsible for performing the piping analysis and support design. These corrective actions will prevent recurrence of this deficiency.

All necessary design work associated with this deficiency was completed on September 24, 1985, per engineering change notice (ECN) 5092. All necessary construction work will be completed by fuel load for unit 2 (commitment completion date: February 1, 1987).