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

December 13, 1982

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly
Regional Administrator
101 Marietta Street - Suite 3100
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - IMPROPER WELD ATTACHMENT OF SHEAR LUGS - NCR 2451R - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. W. Wright on October 30, 1980 in accordance with 10 CFR 50.55(e). Our first interim report was submitted on December 1, 1980. TVA submitted a final report on NCRs 2451R and 2882R on January 26, 1981. As discussed with Inspector R. V. Crlenjak on October 6, 1981, TVA has determined that further interim reports are necessary to resolve this deficiency. NCRs 3632R and 3674R have been added to the original NCRs due to their similar nature. Further interim reports were submitted on November 4, 1981 and January 25, March 22, August 10, and October 25, 1982. 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

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**ENCLOSURE**
**WATTS BAR NUCLEAR PLANT UNITS 1 AND 2**
**IMPROPER WELD ATTACHMENT OF SHEAR LUGS**
**NCR'S 2451R R3, 2882R, 3632, AND 3674R**
**10 CFR 50.55(e)**
**FINAL REPORT**

## Description of Deficiency

As described in NCRs 2451R R6 and 2882R R2, the original deficiencies, reported on in December 1980, concerned shear lugs installed in 1977 and 1978 which were not installed in accordance with applicable drawings and welding procedures in the HVAC Chilled Water System including the main control room, control building electrical board rooms, and the auxiliary building board rooms. The following conditions deviated from TVA design criteria:

1. Welds were made at the ends of some lugs, making it impossible to determine whether the welds were full penetration as required by TVA design criteria or fillet welds.

2. Lugs were installed where they bridge welded joints in the pipe runs.

3. Lugs were installed with fillet welds, instead of full penetration welds, as required by TVA design criteria.

As a result, the welds may have proved to be inadequate to carry the required design loads.

These deficiencies were identified during programmatic review of seismic supports initiated as part of the corrective actions described in the final report on NCR 2019R submitted in April 1980. The apparent cause of these deficiencies was the lack of training for craft personnel installing the hangers and for the personnel providing engineering and inspection support.

In the course of implementing corrective action for these NCRs, errors in the methods of attaching shear lugs for two of the supports being modified were detected and identified by NCRs described below.

NCR 3632R deals with shear lugs installed on hanger 43A930-7-8ARO and attached by 1/4-inch fillet weld contrary to the disposition for NCR 2451 R3 which required full penetration welds. In correcting this problem construction personnel acted on verbal instructions from design personnel and built up the 1/4-inch fillet welds to 1/2-inch. However, when the written disposition for 3632R was received it specified use of 1/4-inch fillet welds. This subsequent error was documented on NCR 3632R R1.

NCR 3674R deals with the use of welds which appeared to be full penetration type with 0 to 3/16-inch buildup on support 47A920-31-70 R2. The disposition called for was "use-as-is" with 1/4-inch fillet welds.

After investigation TVA has not been able to determine why the lugs for these two supports were welded contrary to the recommended dispositions. A condition that probably contributed to the problem was the splitting of hanger responsibilities between site mechanical and hanger engineering units which could have allowed contradictory or insufficient information to be supplied to personnel involved in the support modification.

Safety Implications

These air-conditioned systems are necessary for the reliability of electrical equipment located in the auxiliary board room and the main control room. This electrical equipment is essential for the safe operation and shutdown of the plant. Failure of these welds could have resulted in the degradation of safety-related equipment essential to the safe operation of the plant.

Corrective Action

Because of the deficiencies identified in the course of implementing corrective actions for NCR 2019R, TVA developed and implemented a new hanger installation and documentation procedure, QCP-4.23, "Installation, Inspection, and Documentation Requirements for Seismic Supports." All hanger engineering and inspection personnel and craft supervisory personnel were trained and/or certified in the requirements of this procedure, and these personnel have been and will continue to be provided with training both to review current procedural requirements and to implement procedure revisions. Also, in July 1981, TVA centralized responsibilities for hangers into one engineering unit.

TVA believes that these steps have demonstrated their effectiveness in preventing recurrence of the type deficiencies identified in NCRs 2451R and 2882R. Isolated problems, as identified in NCRs 3632R and 3674R have occurred and, in response, personnel are directed to implement corrective actions on nonconformed hangers only upon receipt of approved written disposition.

The ongoing review and restructuring of the hanger program arising from NCR 2019R identified deficiencies 2451R and 2882R which are generic to the hanger program at Watts Bar. No other generic deficiencies have been identified as a result of this review. NCR 2019R was closed by NRC Region II Inspector Bill Crowley on June 30, 1982. Corrective action for NCR 3632R R1 has been completed as it has been determined that 1/2-inch fillet welds are acceptable. For deficiencies identified in the other three NCRS (2451R R6, 2882R R2, and 3674R), the disposition has been determined and includes use of 1/4-inch fillet welds or full penetration welds depending on the specific shear lug. All remaining corrective action on these welds will be completed by January 31, 1983.