

TENNESSEE VALLEY AUTHORITY

CHAATANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

RECEIVED FEB 23 8:18 February 21, 1984

WBRD-50-390/81-88
WBRD-50-391/81-82
WBRD-50-390/82-105
WBRD-50-391/82-99

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 - INSPECTION REQUIREMENTS AND QUALITY ASSURANCE PROGRAM FOR PIPE INSULATION - WBRD-50-390/81-88, WBRD-50-391/81-82, WBRD-50-390/82-105, WBRD-50-391/82-99 - REVISED FINAL REPORT

Because of their similarity and for reporting purposes, nonconformances NCR WBN SWP 8158 (WBRD-50-390/81-88, WBRD-50-391/81-82) and Audit WB-M-82-05, Deficiency No. 2 (WBRD-50-390/82-105, WBRD-50-391/82-99) were previously combined. The subject deficiencies were initially reported to NRC-OIE Inspector R. V. Crlenjak on October 9, 1981 and October 8, 1982 in accordance with 10 CFR 50.55(e) as NCR WBN SWP 8158 and Audit WB-M-82-05, Deficiency No. 2, respectively. Interim reports for NCR WBN SWP 8158 were submitted on November 9, 1981 and February 17, April 25, and October 18, 1982. Our first interim report for Audit WB-M-82-05, Deficiency No. 2 was submitted on November 3, 1982. Our first combined report (fifth interim) was submitted on April 7, 1983. A final report was submitted on September 26, 1983. Enclosed is our revised 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
L. M. Mills, Manager
Nuclear Licensing

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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

ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
INSPECTION REQUIREMENTS AND QUALITY ASSURANCE PROGRAM
FOR PIPE INSULATION
NCR WBN SWP 8158 AND AUDIT WB-M-82-05, DEFICIENCY NO. 2
WBRD-50-390/81-88, WBRD-50-391/81-82
WBRD-50-390/82-105, WBRD-50-391/82-99
10 CFR 50.55(e)
REVISED FINAL REPORT

Description of Deficiency

TVA has failed to establish and implement a quality assurance (QA) program for the storage, installation, inspection, and documentation of insulation used on and around safety-related equipment.

The root cause of this deficiency stems from the fact that TVA originally felt the documentation of insulation requirements could be adequately controlled by the use of color-coded drawings which were generated by TVA's Division of Engineering Design (EN DES) and maintained by the design, procurement and construction groups involved with insulation. Therefore, it was originally determined unnecessary to implement a QA program for the control of insulation at Watts Bar Nuclear Plant (WBN).

Safety Implications

Failure to establish and implement such a program could result in the installation of defective or inadequate insulation. This could result in damage to safety-related piping which could come into contact with excess chloride or fluoride contamination through contact with insulation that had been exposed to the elements. This contamination might promote stress corrosion cracking which could lead to damage to safety-related piping and thereby degrade the safety of plant operations. Also, incorrect documentation, could result in an incorrect seismic analysis of the safety-related systems and their potential failure during a seismic event.

Corrective Action

Procedure SWP-EP 43.18, "Insulation/Heat Tracing Drawings for Safety-Related Systems," has been issued for the control of design drawings detailing insulation requirements at WBN. New drawings have been issued to show mass type insulation on mechanical piping systems. The mechanical piping systems which use reflective metal insulation cross reference approved vendor drawings which detail the insulation requirements. The instrument and control diagrams are being revised to reference the vendor contract which specifies the insulation requirements for instrumentation systems. These diagrams will be issued by March 30, 1984 under engineering change notice (ECN).

A revision to Mechanical Design Guide DG-M18.0.1, "Insulation for Piping and Equipment in Nuclear Power Plants," has been issued to describe general documentation and inspection requirements of insulation on safety-related piping systems.

The receipt and storage of insulation shall be documented in accordance with WBNP-QCT 1.06, "Receiving," and WBNP-QCT 1.36, "Storage and Housekeeping," respectively.

Revisions to construction specifications N3G-881, "Identification of Structures, Systems, and Components Covered by the Watts Bar Quality Assurance Program," and N3C-912, "Support and Installations of Piping Systems in Category I Structures," have been issued to provide the scope of inspection requirements and acceptance criteria for insulation installed at WBN. Construction specification N3C-912 specifies the engineering documentation requirements for mass type and reflective metal insulation. In addition, it stipulates that all design and construction work performed before the issuance (revision 1; December 3, 1982) of the documentation requirements detailed in N3C-912 will be verified by a design engineering evaluation of the insulation requirements on the safety-related systems (which has been completed) and the issue of design drawings (as discussed above) for insulation. These drawings will be used in the construction insulation inspection program.

TVA's Division of Construction (CONST) established an insulation quality control program with the issue of site procedure WBNP-QCP 4.49, "Insulation Inspection," on September 9, 1982. All safety-related (primary and secondary) insulation, including insulation installed before the issue of WBNP-QCP 4.49, will be inspected as prescribed by WBNP-QCP 4.49. All deviations from the insulation drawing requirements shall be approved by EN DES and documented in accordance with WBNP-QCT 1.13, "Preparation and Documentation of Field Change Requests."

Insulation inspections are included in the scope of site procedure WBNP-QCT 1.40, "Inspection and Test Documentation Status Accountability," which provides the methods and computerized programs utilized to indicate inspection and test documentation status. The accountability program identifies insulation segments that require inspection and indicates inspection status. At the time of the transfer of equipment to TVA's Division of Nuclear Power (NUC PR), the accountability program is sorted to produce a list of inspections outstanding against that equipment. The outstanding inspections (which include insulation) are added to the Outstanding Work Item List that is provided to NUC PR to identify remaining work.

The insulation inspection program at WBN is currently in progress with the inspection at various stages of completion for different systems. The inspection effort has been delayed because insulation is one of the last items to be inspected. This is done in order to verify that the installed insulation has not been damaged by other ongoing CONST activities.

The design and construction programs described above to qualify all safety-related insulation installed at WBN are fully established at this time.