TENNESSEE VALLEY AUTHORITY

5N 157B Lookout Place

April 21, 1986

WBRD-50-390/86-39
WBRD-50-391/86-37

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 UNITS 1 AND 2 - DEFICIENCIES IN EMBEDDED PLATE - DESIGN AND CONTROL OF FIELD CHANGES - WBRD-50-390/86-39, WBRD-50-391/86-37 - INTERIM REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Gordon Hunegs on March 20, 1986 in accordance with 10 CFR 50.55(e) as SCR WBN CEB 8623. Enclosed is our interim report. We expect to submit our next report on or about September 3, 1986.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. L. Gridley
Manager of Licensing

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
DEFICIENCIES IN EMBEDDED PLATE - DESIGN AND CONTROL OF FIELD CHANGES
EMPLOYEE CONCERN IN-85-031-001 & IN-85-033-001
WBRD-50-390/86-39, WBRD-50-391/86-37
SCR WBN CEB 8623
10 CFR 50.55(e)
INTERIM REPORT

Description of Deficiency

Sampling programs for investigation of the design evaluation of embedded plate field changes and an independent review of cable tray support calculations has identified discrepancies in documentation and deviations from design criteria that may affect the qualification of embedded plates.

The sampling programs for design evaluation of field changes were performed for investigation of employee concerns IN-85-031-001 and IN-85-033-001. The independent review of the cable tray calculations was performed for investigation of problem identification report (PIR) WBN CEB 8543.

The following specific items were identified:

I. The evaluation of field change requests (FCRs) for multiple attachments to embedded plates as specified in Construction Specification N3C-928 assumed that existing major attachments to the embedded plate were qualified. This assumption may be invalid. The calculations for the sampling program and the review of the cable tray calculations indicate that when baseplate flexibility and installed location of the support on the embedded plates are considered, some cable tray supports may overstress portions of the embedded plate. Also, some cable tray support calculations used the wrong allowable anchor stress. Other less significant errors were also identified.

II. Calculations for evaluation of field changes to embedded plates contain errors and do not fully conform to design criteria requirements.

A. The document reviews performed as part of the sampling programs have identified the following:

1. Some embedded plate FCRs reference the wrong unique plate identification number. The erroneous reference numbers were not always identified during the design evaluation.

2. Attachments were identified which are not shown on the latest FCR for an embedded plate. Revised or new FCRs should have been written.

B. Independent review of the calculations performed by design for evaluation of embedded plate FCRs identified the following items:

1. Errors were found in the calculations performed for determination of the reactions for supports attached to the embedded plate.

2. Some embedded plate FCRs were accepted using a standard review form. The calculations providing the basis for the form did not fully envelop the plate and anchorage configurations which could be encountered.

The apparent causes of the deficiencies are: (1) design methods/procedures (prior to Civil Design Standard DS-C1.7.1) that were used/followed for the design of the embedded plates/anchors did not consider plate flexibility, (2) errors in the design calculations, and (3) failure by construction to adequately document all field modifications in accordance with the requirements set forth in Construction Specification N3C-928.

Safety Implications

Consideration of the effects of baseplate flexibility, field installed support locations, or additional loads from unidentified attachments could result in portions of the embedded plates or studs being overstressed and/or the concrete capacity being exceeded under design basis accident conditions. Significantly overstressed embedded plates, studs, and/or concrete could result in loss of support of the cable tray, pipe, or other components supported by the plates. As such, this condition could adversely affect the safe operation of the plant.

Interim Progress

An evaluation plan for resolution of this deficiency is currently being developed. The plan will include detailed evaluations of embedded plates for anchorage of cable tray supports. The evaluation will also consider plate flexibility and accuracy of support locations. Field investigation for determination of support locations will be performed as required.

A review of other types of supports (pipe, conduit, HVAC) will also be performed to assure that plate flexibility and location tolerances are adequately considered. Field investigations will be performed as required.

In order to prevent recurrence, enhancements will be made to procedures and specifications for control of attachments to embedded plates. These changes will include revision to the construction specification for locating attachment on embedded plates and the engineering and construction procedures covering the field change requests.

TVA will provide further information in our next report to be submitted to the NRC on or about September 3, 1986.