TENNESSEE VALLEY AUTHORITY

CHATTANOOGA. TENNESSEE 37401 5N 105B Lookgut. Place CG JAN 27 P 3: U January 23, 1986

WBRD-50-390/86-10 WBRD-50-391/86-09

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 - INCORRECT ACCIDENT DOSES ON DESIGN DRAWINGS - WBRD-50-390/86-10, WBRD-50-391/86-09 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Art Johnson on December 11, 1985 in accordance with 10 CFR 50.55(e) as SCRs WBN NEB 8528 and WBN NEB 8529. 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 Manager of Licensing

Enclosure

3602040051

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

1983-TVA 50TH ANNIVERSARY An Equal Opportunity Employer

ENCLOSURE

1

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 INCORRECT ACCIDENT DOSES ON DESIGN DRAWINGS WBRD-50-390/86-10, WBRD-50-391/86-09 SCRs SCR WBN NEB 8528 AND SCR WBN NEB 8529 10 CFR 50.55(e) FINAL REPORT

Description of Deficiency

3

TVA design drawing series 47E235 defines the accident radiation environment in the pipe chase and other areas of the plant. The drawings incorrectly list the integrated accident dose for the pipe chase areas as 1E4 rads. The dose listed for pipe chases (el 676-Al6, Al7; el 692-A8, A24; and el 713-A28, A-29) represents only the airborne activity component of the total accident dose. The dose component due to direct shine from piping and equipment containing postaccident sources was not included. Current indications are that the dose for the pipe chase should be in the range of 5E6 to 1E7 rads as a minimum. A recent reanalysis of similar areas in the Sequoyah Nuclear Plant (SQN) indicates doses may be on the order of 5E6 rads. It is anticipated that results of this magnitude will be computed for Watts Bar Nuclear Plant (WBN).

The omission of the direct shine component of the pipe chase dose was caused by a failure of the analyst to recognize that safety-related equipment was located in the pipe chase areas and to include a dose point within those areas when performing the original analysis. The pipe chase was recognized and modeled as a radiation source for determining dose in adjacent areas which were known to contain safety-related components. Accordingly, only airborne radiation dose was designated for this area since direct shine component would not affect dose in adjacent areas. A review of the SQN drawings, using engineering judgment, indicated that the total dose for the pipe chase could not be correct. Examination of the WBN drawings confirmed a similar problem.

Safety Implications

Equipment that would be affected by the error consists of safety-related equipment located inside the pipe chase areas. Two situations may be present:

- 1. The equipment may be qualified to the location-specific dose it will experience, in which case the error is principally a documentation problem.
- 2. The equipment is unqualified to the radiation environment. In this case, the potential exists for the components to fail as a result of the accident and render the corresponding accident mitigation system inoperative or in a degraded performance state which could adversely affect safe plant operation. Replacing the equipment, shielding the equipment, or moving it to a lower radiation environment are options for alleviating the adverse condition.

Corrective Action

TVA will perform a postaccident radiation analysis for the WBN pipe chase area or demonstrate applicability of the SQN results to WBN. The revised radiation dose will then be used for equipment qualification. The revised radiation dose for the pipe chase will be assessed to determine what components may be affected by the revised dose. Location-specific radiation analyses will be performed as required for components which do not appear to be qualified. Components which are not qualified to the radiation environment will be replaced, relocated, or shielded as appropriate. The radiation analyses will be completed and all equipment will be completed and all equipment will be demonstrated to be qualified prior to fuel load of each unit. Other auxiliary building area doses will be reviewed to verify that appropriate values are listed for qualification purposes. Doses which do not appear reasonable will be reanalyzed and corrected as required.

-2-

No action to prevent recurrence is necessary. The engineers involved in the original analyses are no longer in the Radiation Protection Section (RPS). Current KPS personnel have been made aware of the potential for high radiation doses as a result of postaccident fission product shine from components and piping in the pipe chase.