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

85 JAN 22 P1:53

January 17, 1985

WBRD-50-390/85-04
WBRD-50-391/85-03

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - CONTROL ROD DRIVE MECHANISM HEAVY DRIVE ROD GUIDE SCREW - WBRD-50-390/85-04 AND WBRD-50-391/85-03 - FINAL REPORT FOR UNIT 1 AND FIRST INTERIM REPORT FOR UNIT 2

The subject deficiency was initially reported to NRC-OIE Inspector Al Ignatonis on December 20, 1984 in accordance with 10 CFR 50.55(e) as NCR WBN NEB 8420. Enclosed is our final report for unit 1 and our first interim report for unit 2. We expect to submit our next report on unit 2 on or about October 18, 1985. We consider 10 CFR Part 21 applicable to this deficiency.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

David L. Lambert for

J. W. Hufham, Manager
Licensing and Regulations

Enclosure
cc (Enclosure):
Mr. Richard C. DeYoung, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

8502070050 850117
PDR ADOCK 05000390
S PDR

OFFICIAL COPY

IE21 1/1

ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
CONTROL ROD DRIVE MECHANISM HEAVY DRIVE ROD GUIDE SCREW
NCR WBN NEB 8420
WBRD-50-390/85-04 AND WBRD-50-391/85-03
10 CFR 50.55(e)
FINAL REPORT FOR UNIT 1 AND FIRST INTERIM REPORT FOR UNIT 2

Description of Deficiency

Westinghouse Electric Corporation, Pittsburgh, Pennsylvania, notified the NRC of a reportable item associated with control rod drive mechanism (CRDM) heavy drive rod assemblies on Westinghouse-supplied reactors. This item was reported to NRC under 10 CFR 21 by Westinghouse's letter No. NS-NCR-84-2986. Westinghouse subsequently notified TVA in their letter No. WAT-D-6320 dated December 11, 1984, that the condition is applicable to Watts Bar Nuclear Plant (WBN).

The subject condition concerns a potential for the CRDM heavy drive rod assembly guide screws to rotate out of position and fall from the drive rod. A loose guide screw could migrate into the annulus between the drive rod assembly and the rod travel housing as a result of control rod stepping. It could then lodge on top of the CRDM latch assembly. This could potentially result in misstepping, intermittent sticking of the drive line, or a totally stuck drive line.

Westinghouse letter No. WAT-D-6320 to TVA indicated that all of the CRDM heavy drive rod assemblies at WBN (114 total) had been examined. The examination consisted of performing a reverse torque test to 30 inch-pounds on each guide screw to verify whether each screw is positively locked into position. The examination resulted in the identification of 22 screws (13 for unit 1, 9 for unit 2) which could be rotated to some degree. Of the 22 identified as loose, 2 screws (1 per unit) could rotate all the way out of the respective assembly. The results of the examination, including the serial numbers of the loose screws, are documented on Westinghouse field deficiency reports (FDRs) WATM-10269 and WBTM-10145 for WBN units 1 and 2, respectively.

Westinghouse has notified TVA in their letter No. WAT-D-6334 dated January 4, 1985, that the assignable cause of this deficiency was the manufacturing process which allowed the drill to walk during drilling of the pilot hole. The guide screws are normally locked into position by a welded pin that engages the mating threads, thus preventing the guide screw from rotating out of position. In some cases, the drilling deficiency resulted in an oversized pilot hole which prevented the accurate fit of the locking pin.

Safety Implications

Due to the number of loose guide screws identified at WBN, there is a remote possibility that more than one guide screw could fall and cause the simultaneous misstepping or sticking of more than one drive rod. This condition is outside of the design basis of the WBN FSAR. This could adversely affect the safe operation of the plant.

Corrective Action (Unit 1)

Westinghouse Electro-Mechanical Division (WEMD) is presently evaluating the acceptance criteria to be used on the loose guide screws. Based upon their criteria, WEMD will repair or replace all affected heavy drive rod assemblies as necessary. Those assemblies to be repaired will be reworked by WEMD. Repairs will be accomplished by installing a larger diameter locking pin in the guide screw 180 degrees from the existing pin. The new pin will be welded in the guide screw. This modification will be performed using special tooling and procedures which have been designed and approved by WEMD. A reverse torque test will be performed on all modified guide screws to assure that they are positively locked. Those assemblies which are to be replaced will be replaced by unaffected assemblies from unit 2. These will be transferred by serial number and documented. Westinghouse has notified TVA in their letter No. WAT-D-6334 that they have taken steps to prevent recurrence of this deficiency. Future designs will feature a redesigned guide screw with a larger and deeper pilot hole. Additionally, a reverse torque test will be performed on all guide screws to assure that they are positively locked. No further actions to prevent recurrence are required.

All corrective actions for unit 1 will be accomplished by February 28, 1985.

Interim Progress (Unit 2)

Based upon their acceptance criteria, WEMD will repair all affected unit 2 heavy drive rod assemblies and any assemblies transferred from unit 1. These repairs will be accomplished by WEMD as indicated for unit 1 above.