

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

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October 25, 1985

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

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 - CONTROL ROD DRIVE MECHANISM HEAVY
DRIVE ROD GUIDE SCREW - WBRD-50-390/85-04 AND WBRD-50-391/85-03 - SUPPLEMENTAL
FINAL REPORT - UNIT 1/ FINAL REPORT - 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. Our final report for unit 1 and first interim report for unit 2
were submitted on January 17, 1985. Enclosed is our supplemental final report
for unit 1 and final report for unit 2. We conr' 10 CFR Part 21 applicable
to this deficiency.

A one week delay in submittal of this report was discussed with Mr. Ignatonis
on October 22, 1985. This item was closed for both units in NRC-OIE
inspection report Nos. 50-390/85-10 and 50-391/85-10.

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. Hufham
R. W. Hufham, Manager
Licensing and Risk Protection

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
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ENCLOSURE

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
NCR WBN NEB 8420
10 CFR 50.55(e)
SUPPLEMENTAL FINAL REPORT FOR UNIT 1
FINAL 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 under 10 CFR 21 in Westinghouse's letter No. NS-NCR-84-2986 to R. C. DeYoung, NRC. Westinghouse subsequently notified TVA in their letter No. WAT-D-6320 dated December 11, 1984, that the item is applicable to Watts Bar Nuclear Plant (WBN)

The subject deviation is one in which there is 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 identified that Westinghouse had examined all of the CRDM heavy drive rod assemblies at WBN (114 total). The examination consisted of performing a reverse torque test to 30-inch-pounds on each guide screw to verify that each screw is or is not 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 be turned 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. The drilling deficiency resulted in some cases 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

Westinghouse Electro-Mechanical Division (WEMD) defined the acceptance criteria to be used in determining the need to repair the loose guide screws in field change notices (FCNs) WATM-10735A and WBTM-10707A for WBN units 1 and 2, respectively. Guide screws which rotated less than 10° under the reverse torque check specified in the FCNs were declared acceptable. Based upon their criteria, WEMD has repaired or replaced all affected heavy drive rod assemblies as necessary. Some unit 1 assemblies were replaced by acceptable assemblies from unit 2. These were transferred by serial number and documented. All unit 1 and unit 2 assemblies to be repaired have been reworked by WEMD. Repairs were accomplished by installing a larger diameter locking pin in the guide screw 180° from the existing pin. The new pin was welded in the guide screw. This modification was performed using special tooling and procedures designed and approved by WEMD. A reverse torque test was performed on all modified guide screws to assure that they are positively locked.

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 this item are complete. This item was closed in NRC-OIE inspection report Nos. 50-390/85-10 and 50-391/85-10.