

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

December 19, 1983

WBRD-50-390/83-54
WBRD-50-391/83-51

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:

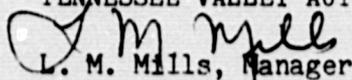
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - BROKEN PIN CARRIER PLATES ON ERCW MOTORS
BY SIEMENS-ALLIS - WBRD-50-390/83-54, WBRD-50-391/83-51 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector
Linda Watson on August 24, 1983 in accordance with 10 CFR 50.55(e) as
NCR W-136-P. Our first interim report was submitted on September 21, 1983.
Enclosed is our final report. 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


L. M. Mills, Manager
Nuclear Licensing

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

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
BROKEN PIN CARRIER PLATES ON ERCW MOTORS BY SIEMENS-ALLIS
NCR W-136-P
WBRD-50-390/83-54 AND WBRD-50-391/83-51
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

Each of the eight essential raw cooling water (ERCW) pumps at Watts Bar Nuclear Plant (WBN) supplied by Siemens-Allis (S-A), Norwood, Ohio, incorporate an anti-reversing mechanism. The mechanism consists of a ramp plate and an opposing pin carrier plate. When the pump impeller is subjected to a driving force such as backpressure which could tend to cause reverse rotation, the pins in the carrier plate engage the ramp plate ratchet and prevent further reverse rotation. The damage noted in the NCR is cracked and broken pin bushings. The vendor has determined that there have been no other pumps of this design supplied for use at any other nuclear plants.

Safety Implications

Should the anti-reverse mechanism fail the ERCW pump shaft could become uncoupled thus rendering the affected ERCW pump inoperable. Since the ERCW pumps are a primary safety-related component, the cited condition could be adverse to the safe operation of the plant.

Corrective Action

S-A has submitted their findings and determination of corrective actions to TVA. S-A determined that the root cause of the problem with the anti-reverse mechanism is loose retaining pins and differences in hardness between the retaining pins and the pin retainer plate. The loose fit between the retaining pins and the pin carrier bushings caused uneven loading on the lower edges of the bushings and subsequent cracking of the bushings. The extremely hard retaining pins impacting the softer steel pin retainer plate caused excessive wear of the latter. S-A will replace the retaining pins with larger diameter pins which will solve the loose fit and eliminate the uneven loading on the bushings. S-A will also provide a harder retainer plate which will withstand the pin impact.

In order to prevent recurrence, S-A has added a step to their design procedure which will include considerations of the effects of fit between the pins and bushings and hardness of the pins and plate impacting surfaces. The only nuclear plant for which the possibility of recurrence exists is Watts Bar since the anti-reversing mechanism used on these motors was not used at any other nuclear plant.

S-A estimates that all reworked parts for all eight ERCW motors will be returned to Watts Bar by January 30, 1984.

Presuming that S-A meets its scheduled delivery date, TVA will install the reworked parts by March 15, 1984.