

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

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WBRD-50-390/86-48
WBRD-50-391/86-45

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 - LEAKAGE IN LOWER SEALS OF THE
ESSENTIAL RAW COOLING WATER CLUTCH ASSEMBLY - WBRD-50-390/86-48,
WBRD-50-391/86-45 - FINAL REPORT

The subject deficiency was initially reported to NRC-Region II Inspector
Brian Debs on April 18, 1986 in accordance with 10 CFR 50.55(e) as NCR
W-377-P. Our interim report was submitted on May 16, 1986. Enclosed is our
final report. We consider 10 CFR Part 21 applicable to this deficiency.

Morris Branch was notified of the need to delay this report on July 17, 1986
and provided the schedule of October 17, 1986 for submittal on July 21, 1986.
Delay was caused by lack of vendor information to be able to provide a final
disposition for the condition adverse to quality (CAQ).

If there are any questions, please get in touch with J. A. McDonald at
(615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Homer
J. A. Homer, Director
Nuclear Safety and Licensing

Enclosure

cc (Enclosure):

Mr. James Taylor, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Records Center
Institute of Nuclear Power Operations
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Mr. G. G. Zech
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ENCLOSURE
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
LEAKAGE IN LOWER SEALS OF THE ESSENTIAL RAW COOLING WATER CLUTCH ASSEMBLY
WBRD-50-390/86-48, WBRD-50-391/86-45
NCR W-377-P
10CFR50.55(e)
FINAL REPORT

Description of Deficiency

During a routine maintenance inspection of newly replaced clutch assemblies on all the "B" train Siemens-Allis, 800 HP, 1200 r/min, 6600V type ANV-OD essential raw cooling water (ERCW) pump motors (E-B, F-B, G-B, and H-B), the lower seals of the antireverse Formsprag-Warren clutches were found to be leaking grease. The grease was leaking into the oil of the upper bearing reservoir and splashing the oil on the clutch. Five of the eight clutch assemblies which were installed as corrective action for NCR W-255-P (WBRD-50-390/85-42, 391/85-41) had been replaced for miscellaneous maintenance problems. Eight replacement clutch assemblies had been ordered through Mechanical Drives, Incorporated, Chattanooga, Tennessee, on TVA contract 85PM8-363993. Because the specific part number for the correct antireversing clutch was not known to TVA personnel, these clutch assemblies were ordered by model number of the clutch along with a description indicating that the seals should have been adequate for a nonreverse backstop on a vertical motor. The clutch assemblies were ordered as commercial grade components and dedicated to the ERCW system by TVA. Five of the eight had been installed, three were in storage as spares.

The cause of this deficiency is a failure by the vendor to provide the correct clutch assemblies (adequate for vertical application.)

Safety Implications

Excessive grease leakage into the pump motors upper bearing oil reservoir (greater than two percent) could significantly increase the viscosity of the oil. This condition could result in overheating of the motor bearings due to this increased viscosity and could result in complete loss of the ERCW pump. Because this condition is common to all pumps, more than one ERCW pump could be affected. The ERCW system design basis is for operation under the worst-initial condition of operation. This is assumed to be a safe shutdown earthquake coincident with a loss-of-coolant accident in one unit, extended shutdown in the nonaccident unit, loss of all offsite power, abrupt loss of the downstream dam, and failure of an entire emergency power train. Under these conditions only two ERCW headers would be available. Failure of two pumps on the same header under these design basis conditions would leave only one pump on one header (a diesel generator does not have sufficient capacity to power two pumps on the same header) to apply ERCW which is insufficient. Given the identical nature of the deficiency on all pumps, it is judged that the likelihood of this occurring, while small, is unacceptable. Therefore, this condition could adversely affect the safe operations of the plant.

Corrective Action

Representatives from Siemens-Allis and Formsprag-Warren visited Watts Bar Nuclear Plant (WBN) on April 14 and 15, 1986 to inspect the clutch leakage. The manufacturer's representatives indicated that the purging of excess grease is normal for the clutch. It was also pointed out by the representatives that five of the clutches had the wrong seals. The replacement clutch assemblies which were supplied to TVA contained seals which were not adequate for vertical application.

TVA and the manufacturer's representatives determined that the clutches would maintain adequate lubrication. Since the grease leakage over an extended period of time increases the bearing oil viscosity, a minor modification will be made to prevent the purged grease from leaking into the oil reservoir.

Siemens-Allis has prepared a drawing which specifies the modifications for the addition of an oil baffle. Field Change Request (FCR) WBEP-5 was issued to install oil baffles into each motor. In addition, the Siemens-Allis and Formsprag-Warren vendor representatives supplied TVA with the correct specific part number for the clutch assembly which includes the seals during their visit at WBN. New clutch assemblies with the proper seals have been obtained from Formsprag-Warren and will be installed at the same time the modifications to the oil baffles are made. TVA will fabricate and install the oil baffles and new clutch assemblies before unit 1 fuel loading. The eight clutch assemblies with incorrect seals have been returned to Mechanical Drives for correction.

The installation of the oil baffles and entry of the correct specific part number in the item description on TVA's computer data base for ordering future replacement clutch assemblies should prevent recurrence of this deficiency.

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