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TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
5N 157B Lookout Place

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May 2, 1986

WBRD-50-390/85-52
WBRD-50-391/86-14

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 - IMPROPERLY INSTALLED SOLENOID VALVES - WBRD-50-390/85-52, WBRD-50-391/86-14 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Al Ignatonis on October 9, 1985 in accordance with 10 CFR 50.55(e) as NCR WBN 6298. Subsequently, NCR WBN 6566 was identified for this problem on unit 2. This deficiency is reported for both units together. Interim reports were submitted on November 19, 1985 and January 31, 1986. 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

R. L. Gridley

R. L. Gridley, Director
Nuclear Safety and Licensing

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
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
IMPROPERLY INSTALLED SOLENOID VALVES
WBRD-50-390/85-52, WBRD-50-391/86-14
NCRs 6298 AND 6566
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

ASCO model 8316 solenoid valves were found to not be installed flush on the hanger as shown on typical hanger drawing 47A051-47. The solenoid valves were disassembled and field mounted, as described below, without the use of the vendor-supplied mounting brackets. This disassembly voided the manufacturer's environmental qualification.

The original solenoids (those supplied prior to the environmentally qualified ones) were apparently furnished without manufacturer's mounting brackets. This required TVA personnel to improvise a method of mounting. The method chosen entailed removing the screws from the bonnets and replacing them with all-thread rod. The solenoids were then mounted in a vertical position with a double-nut method of attaching the solenoids to the angle iron portion of the 47A051-47 support. When doing this, however, personnel failed to specify drawing 47A051-47 on the installation inspection documentation. When the solenoids were replaced with NUREG-0588 qualified devices, the same mounting technique was followed and site personnel failed to specify proper mounting drawings or disassembly/assembly criteria on the inspection documentation. This failure to specify acceptance criteria as well as a failure to obtain approval from design personnel for the alternate mounting method are the cause of this condition.

As part of the generic site review of this problem, TVA has identified an additional concern with the mounting of other category I and I(L) locally mounted devices due to the lack of approved mounting details. These devices are also covered in this report.

Safety Implications

The qualified ASCO solenoid valves in question are supplied to TVA as a complete qualified package with supplier-imposed instructions which must be followed to ensure that their application in the plant conforms with qualification tests. Deviating from vendor mounting instructions jeopardizes the environmental and seismic qualification of the valves and removal of the valves' bonnet screws with the use of threaded rods to reestablish the valves' pressure boundary violates the valve's functional qualification.

Because of the mounting procedures used on the ASCO solenoid valves and because of the lack of approved mounting details for other instrumentation devices, there is insufficient assurance that the instrumentation would function during or after a design basis event. As such, this condition could adversely affect plant safety.

Corrective Action

All environmentally qualified solenoids valves will be reworked using the manufacturer's instructions. The mounting details for solenoid valves, other than those environmentally qualified, which were not installed per typical drawing 47A051-47 have been submitted to the Division of Nuclear Engineering (DNE) for seismic qualification as these solenoid valves are already installed on unit 1. Also, unit 1 category I mounted instruments (wall, floor, and duct mounted) installed without DNE approved drawings have been sketched and submitted to DNE for seismic qualification. Nonenvironmentally qualified solenoid valves presently installed on unit 2 will be reworked and remounted per vendor instructions.

A sampling program has been developed by DNE to evaluate and qualify other seismic category I(L) installations. For this program, TVA will select a random sample of 65 instruments from the approximately 2000 category I(L) devices installed. These devices will be reinspected and used to evaluate the adequacy of existing installations. A sample of 65 out of an infinite population will provide a statistical basis for evaluating the entire population as acceptable. If any category I(L) instruments in the initial set of 65 are found to be unacceptable, the population will be expanded to allow for a 95 percent confidence level. This evaluation is expected to bc complete by May 15, 1986. TVA is confident that these installations are acceptable. However, if the installation should not be justified by the sample, TVA will do a 100 percent reinspection.

All necessary modifications to the valves or other instrumentation will be complete by the respective unit's fuel load.

To prevent a recurrence of the instrumentation mounting problems, DNE shall provide instrument mounting details on applicable drawings in the 47A061 series by May 15, 1986, per ECN 6047. Also, the Division of Nuclear Construction (DNC) shall ensure that all instruments are installed/ disassembled/reassembled per approved vendor instructions or TVA drawings as applicable. Where instructions are not clear, DNC shall consult with DNE to obtain clarification or additional information. The procedure WBN-QCI-1.60, "Work Control," issued March 28, 1986, is the basis for assurance that this will be accomplished.