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**Washington Public Power Supply System**

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REGION V

Mr. J. B. Martin  
Regional Administrator  
U.S. Nuclear Regulatory Commission  
Region V  
1450 Maria Lane, Suite 210  
Walnut Creek, California 94596

Subject: NUCLEAR PROJECT NO. 2  
10CFR50.55(e) CONDITION #296  
LOOSE INTERNAL ASSEMBLY SCREWS ON HFA RELAYS

Reference: Telecon dated November 17, 1983, R.T. Johnson to Tolbert  
Young, same subject.

In accordance with the provisions of 10CFR50.55(e), your office was  
informed by the reference of the subject condition. The attachment  
provides the Project's final report on Condition #296.

If there are any questions concerning this matter, please contact  
Roger Johnson, WNP-2 Project QA Manager, at 377-2501, extension 2712.

*Alan Foster for*

G. C. Sorensen  
Manager, Regulatory Programs

JGT/kd

Attachment: As stated

cc: W.S. Chin, BPA  
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WASHINGTON PUBLIC POWER SUPPLY SYSTEM  
NUCLEAR PROJECT NO. 2  
DOCKET NO. 50-397  
LICENSE NO. CPPR-93  
10CFR50.55(e) CONDITION #296  
LOOSE INTERNAL ASSEMBLY SCREWS ON HFA RELAYS

FINAL REPORT

Description of Deficiency

All the GE Co. Type HFA auxiliary relays used in safety-related systems at WNP-2 were replaced with new Class 1E qualified "Century" series HFA relays because of the HFA coil bobbin failures reported in GE Service Advice Numbers 721-PSM-152.1, 152.2, and 152.2A. When the relays were energized following replacement, test personnel noticed that some of these relays exhibited excessive hum and vibration. Further inspection of these relays revealed that the two inner assembly screws which connect the mounting plate to the magnetic core and coil assembly were loose. Of a group of 58 HFA's inspected, approximately 60% were found with these assembly screws not torqued to the recommended 19-21 inch-pounds. Some of the relays had screws loose enough so that the normally-open contact wipe was lost.

Safety Implication

On the HFA relay, the magnetic core pole face acts as a stop for the armature stop screw and is the reference point for the normally-open contact wipe adjustments. Even a small amount of looseness can result in less than minimum normally-open contact wipe as specified in the relay setting instructions. Since the seismic qualification was performed with properly adjusted contacts, a relay with less than minimum contact wipe does not fall within the component qualification limits. Further loosening could result in loss of contact for the normally-open contacts, and eventually to total loss of relay function if the core and coil assembly came loose from the mounting plate. Such failures of the HFA relays could cause a large variety of safety system failures in various safety systems in which they are used at WNP-2.

There are a total of 261 of the HFA relays used in the safety systems at WNP-2. These safety systems are as follows:

- ADS - Automatic Depressurization System
- RHR - Residual Heat Removal System
- LPCS - Low Pressure Core Spray System
- RCIC - Reactor Core Isolation Cooling System
- HPCS - High Pressure Core Spray System
- RPS - Reactor Protection System

The condition is considered to be a reportable deficiency under 10CFR50.55(e) and Part 21 criteria.

Cause of Deficiency

The screws which were found loose were the two inner assembly screws which connect the mounting plate to the magnetic core and coil assembly. This entire assembly is fastened to the relay case with four screws which are accessible.

GE Co. Service Advice 721-PSM-152.1 recommends checking the four external screws for tightness during routine relay maintenance inspections but does not address the two inner assembly screws. The inner assembly screws are not accessible without disassembling the relay and hence would not normally be checked for tightness when installing the relay or during routine relay maintenance. Hence, we conclude that these screws were intended by the relay manufacturer not to require retightening for the life of the relay if properly assembled at the factory. Therefore, the cause of this deficiency is either a design deficiency or a quality control deficiency by the relay manufacturer.

#### Corrective Action

All "Century" series Type HFA relays procured on Purchase Order No. 52637 will be disassembled, plate to core assembly screws properly torqued, reassembled, and contact and pickup calibration checked in accordance with Procedure SLT-S108.0-3 and FDI No. TCJN. This deficiency will be referred to the relay manufacturer for his evaluation as a potential 10CFR50 Part 21 reportable defect and to confirm his recommendations on torque values and periodic checks on the subject core to mounting plate inner assembly screws. The work will be completed to meet safety system operating requirements for fuel load.

#### Actions to Prevent Recurrence

There are no generic considerations for this deficiency at WNP-2 because all HFA relays used in safety systems at WNP-2 are covered by this report. Any possible generic effects to other nuclear plants using HFA relays will be evaluated by the relay vendor.