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Washington Public Power Supply System

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REGION VISE

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) REPORTABLE CONDITION #307
TARGET ROCK SOLENOID VALVE ADJUSTMENT

Reference: Telecon dated December 19, 1983, R.T. Johnson to R. Dodds,
same subject.

In accordance with the provisions of 10CFR50.55(e), your office was informed by the reference of the above subject condition. The attachment provides the Project's final response on Condition #307.

If there are any questions concerning this matter, please contact Roger Johnson, WNP-2 Project QA Manager, (509) 377-2501, extension 2712.



G. C. Sorensen
Manager, Regulatory Programs

JGT/kd

Attachment: As stated

cc: W.S. Chin, BPA
N.D. Lewis, EFSEC
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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 #307
TARGET ROCK SOLENOID VALVE ADJUSTMENT

FINAL REPORT

Description of Deficiency

The control system for the two reactor recirculation flow control valves contains isolation valves on a total of eight 1" diameter hydraulic lines penetrating containment. Target Rock Model 82M-002 (fail closed) solenoid valves are used in 12 of the 16 isolation valve applications. In preparation for hydraulic system reflushing, four of the six Target Rock valves on the "B" loop would not close when deenergized. These valves are a 1500#, 1" stainless steel, socket welded globe valve with a design pressure of 2200 psi, a normal operating pressure of 1800 psi, and contain FYREQUEL 220 as the line fluid.

Safety Significance

Generic failure of both inboard and outboard valves on any one line, coupled with simultaneous pressure boundary failure both inside and outside containment during an accident condition could result in the release of radioactive materials to the reactor building. This release could exceed Technical Specification limits as well as 10CFR100 exclusion area boundary limits.

Cause for the Deficiency

The valve style in question utilizes a connecting tube between the main disc and the moveable core. During original factory assembly, these three parts were assembled such that the moveable core backseated before the main disc contacted the bonnet. This assembly practice is consistent with the manufacturer's technical manual. In the WNP-2 hydraulic application, the valves serve only as containment isolation but are subject to fluid pressures in both flow directions. Repetitive rapid loading of the above assembly apparently caused the retaining pins to deform the locating holes in the connecting tube and ultimately deform the connecting tube itself. The clearance between the connecting tube and the bonnet is minimal. When the valve energized on the last cycle, the return spring could not overcome the friction between the connecting tube and bonnet resulting in a stuck open valve. Similar valves are utilized throughout WNP-2 and the industry, however, few if any are installed in a similar high pressure hydraulic application. Factory tests with 2750 psi water for 22,000 cycles have been conducted without a failure similar to that reported above.

Corrective Action

Initially, a single valve was disassembled to determine the cause of failure, which was confirmed by the manufacturer. All 12 valves were then disassembled, readjusted and reinstalled under the supervision of Target Rock field personnel; seven of the 12 connecting tubes were replaced; all twelve valves were readjusted such that the main disc backseated against the bonnet rather than transferring the backseat forces through the connecting tube from the moveable core.

A subsequent evaluation of all Target Rock valves resulted in identification of 25 additional similar valves. All 25 valves are of different models, none subject to the high pressure hydraulic service causing the subject generic failure.

Eighteen of the 25 similar valves (Models 79TT-001 and 83TT-001) are installed in the containment inerting system or containment sampling systems and are subject to 50 psi maximum pressure. The seven remaining valves (Model 82M-001) are installed in sampling systems with operating pressures up to reactor vessel pressure, none are subject to the type of hydraulic forces experienced by the 12 readjusted valves.

To confirm the internal adjustment of these seal welded valves, radiographs were taken of deenergized and energized valves before and after adjustments were made. Additionally, radiographs are being taken of selected similar valves to determine the existing disc to bonnet clearance. The extent of radiography and subsequent evaluation has not yet been completed.

Based on the reduced operating pressures, substantially less severe operating conditions, and concurrence from Target Rock, none of the additional valves will be disassembled or readjusted due to the subject failure.

Action to Prevent Recurrence

Under separate cover, Target Rock Corporation has been advised of this 50.55(e) reportable condition and any 10CFR21 report requirements which are a vendor QA program responsibility.