Washington Public Power Supply System

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Docket 50-397

April 20, 1983
G02-83-358

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 CONDITIONS #219, IE CIRCULAR 81-05, SWAY STRUT/SNUBBER END BUSHINGS AND #248, ANACONDA FLEXIBLE CONDUIT

References: 1. Telecon L.C. Floyd to J. Elin, dated December 2, 1982, 10CFR50.55(e) Condition #219, IE Circular 81-05, Sway Strut/Snubber End Bushings.

2. Telecon L.C. Floyd to J. Elin, dated March 21, 1983, 10CFR50.55(e) Condition #248, Anaconda Flexible Conduit.

In accordance with the provisions of 10CFR50.55(e), your office was informed by telephone of the above subject reportable conditions on December 2, 1982 and March 21, 1983, respectively. Attachment I and II provide the Project's interim reports on these subjects.

We will continue to provide your office with quarterly updates on these subjects. The next report will be submitted on or before July 20, 1983.

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

C. S. Carlisle
Program Director, WNP-2

LCF/kd

Attachments: (2) As stated

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WNP-2 Files 917B/917Y

IE-27

ATTACHMENT I

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECT NO. 2
DOCKET NO. 50-397
LICENSE NO. CPPR-93
IE CIRCULAR 81-05 SWAY STRUT/SNUBBER END BUSHINGS
10CFR50.55(e) CONDITION #219

Interim Report

Description of Defect or Noncompliance

NRC IE Circular 81-05 addresses potential problems due to loose bushings on strut and snubber paddles. During the Project's evaluation of the Circular it was discovered that inadequate assembly, lack of proper inspection/installation criteria and material substitution may have occurred during installation of struts and snubbers.

Safety Implication

If, due to improper engagement, inadequate assembly or material substitution, a strut or snubber does not function as assumed in piping/support analysis, the piping pressure boundary could fail under overstressed dynamic loads. Although no instances of total disengagement were found, the Project has determined this condition to be reportable under the provisions of 10CFR 50.55(e) due to the extensive evaluation and potential rework required to correct existing installations.

Approach to Resolution

The Architect Engineer (A/E) initially contacted each involved vendor, requesting a recommended response/resolution to the problems identified in IE Circular 81-05. In addition, a field review of snubbers and sway struts with self aligning end bushing was conducted to ascertain the extent of the problem at WNP-2. The results are summarized below for both large bore and small bore pipe.

Snubbers

More than 100 snubbers were reviewed, either as-installed or in the warehouse, and it was determined that no bushing disengagement had occurred. The vendor (Pacific Scientific) confirmed that per their bushing staking procedure, no bushing disengagement should occur and due to the clearance between their paddle and clamp or bracket, it was physically not possible to have total disengagement. Further, WNP-2 has installation instructions from Pacific Scientific which helps ensure proper installation of the snubbers. The A/E performed a review of all clamps and brackets approved for use with Pacific Scientific snubbers and found the maximum disengagement was within the manufacturer's allowables for all cases except Power Piping M300 series clamps modified to accept extended end bushings. The modified clamps are identified by Power Piping figures M302, Rev. 1, M303, Rev. 1, M304 Rev. 3, and M305, Rev. 1.

Approach to Resolution (Continued)

Struts

The A/E reviewed approximately 30 installed struts and found partial disengagement did exist, however, no total disengagement was discovered. The vendors involved have indicated that disengagement should not occur if proper staking and installation procedures are followed. However, the vendors stipulated a partial disengagement of up to 33 percent of the bearing surface is tolerable (some vendors indicated a greater disengagement is tolerable, however 33 percent encompasses all cases).

The A/E performed a drawing review to determine the possibility of total bushing disengagement. This effort was complicated as the Engineer allowed interchanging of selected vendor parts during installation. It was discovered that based on possible clearances between the strut paddle and clamp/bracket, it was physically possible to have total disengagement with a limited number of combinations (9 of 500, see Figure 1 attached) of struts and clamps or brackets, if the staking process as performed by the manufacturers was inadequate.

Status of Resolution

Snubbers

The A/E and Construction Manager are working in conjunction to identify the 55 installations using the modified M300 series clamp. Upon identification of the installations, Burns and Roe will issue engineering direction to provide corrective action.

Struts

To eliminate any possibility of complete disengagement and limit partial disengagement of the sway strut assembly from its paddle end bushing, a Project Engineering Directive (PED 215-H-H197) has been issued directing the Mechanical Contractor to inspect and rework, as necessary, all previously completed rigid sway strut installations. To date, there are 623 strut assemblies to be inspected. In addition, the contract specification (Contract 215) has been revised by the aforementioned PED to include inspection/installation requirements for future installations.

In regards to possible material substitutions, a review by site personnel of installed conditions identified 17 potential cases of material substitution of pins. Further investigation showed that the pins supplied by Power Piping have saw cut ends, no chamfer and no markings. When comparing the Power Piping pins to those supplied by PSA, which has a machine finish, smooth ends with chamfers and a mark number, it would be easy to mistakenly suspect that a field-made pin had been substituted.

Project Completion of Corrective Action

All required rework will be completed prior to system turnover on a system—by-system basis. In those instances where systems have been turned over, required rework will be completed prior to system operational testing.

FIGURE 1

MATRIX OF POSSIBLE STRUT, CLAMP & BRACKET COMBINATIONS AT WNP-2

PP: Power Piping G: Grinnell N: NPSI

	STRUT		BRACKET				CLAMP				
Size	PP Old	N	PP* H5142	PP H5146	N	G*	PP* Old	PP New	PP* 400	N	G
#15	X				X		300	300		X	
	X										X
	X			X				X			
#20/25	X			X				X			
#40		X		X				X			

If strut (X) is combined with clamp/bracket marked (X) total disengagement could occur.

*Bracket and clamp combinations will not result in total disengagement.

ATTACHMENT II

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECT NO. 2
DOCKET NO. 50-397
LICENSE NO. CPPR-93
ANACONDA FLEXIBLE CONDUIT
10CFR50.55(e) CONDITION #248

Description of Deficiency

In response to a NRC Open Item from the Environmental Qualification Audit in February 1983, a pressure temperature test was performed March 15 and 16, 1983, on the Anaconda flexible conduit (UAP sealtight) used inside containment to hook up safety-related electrical equipment. The design requirement of this conduit is to seal the electrical device from moisture intrusion (moisture inside electrical equipment eventually results in equipment failure by shorting).

This test was the first in a series of tests planned to determine the conduits ability to seal the electrical interface from LOCA effects. The test was performed to the pressure/temperature profile as defined in FSAR 3.11 for the first 24 hours (340 F for 3 hours, 320 F for 3 hours, 250 F for 18 hours, all steam conditions, and 45 psig for 6 hours, dropping to 25 psig for remainder of test).

The failure mode was melting, bubbling, and dripping of the Polyethylene copolymer jacket material which exposed the convoluted flexible metal core. This allowed moisture to penetrate the conduit into the device housing (represented in the test by a typical junction box arranged in the test chamber to collect any moisture).

Visual inspection at the end of the test revealed the following.

1. Melting of the polyethylene copolymer jacket.
2. Dripping of the jacket.
3. Blistering of the jacket.
4. Water collection in the bottom of the junction box, verifying moisture intrusion.

Safety Implication

The electrical conduit inside the containment is required to seal the electrical devices from moisture intrusion which eventually results in equipment failure by shorting of the electrical connections. This condition related to safety system equipment is considered to be a reportable deficiency.

Corrective Action

Project has under consideration, various alternative methods for assuring operation of safety-related equipment under post LOCA conditions.

The method is expected to be determined by May 1, 1983 with installation scheduled prior to fuel load.