



**Florida
Power**
CORPORATION

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USNRC REGION II
ATLANTA, GEORGIA

Mr. James P. O'Reilly
Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
Office of Inspection & Enforcement
101 Marietta Street N.W., Suite 3100
Atlanta, Ga. 30303

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
10 CFR 21 Report on Hydraulic Snubbers

Dear Mr. O'Reilly:

By letter dated January 22, 1982, Florida Power Corporation (FPC) reported the discovery of failed hydraulic snubber adaptor bushings at Crystal River Unit 3 (CR-3) pursuant to the provisions of 10 CFR 21. In our letter dated March 23, 1982, FPC identified a related problem (contaminants in the snubber hydraulic fluid) as being potentially reportable per 10 CFR 21. Further, FPC committed to evaluate the reportability of this issue and make your office aware of the results. Accordingly, FPC hereby submits the following report which identifies the problem of contaminants in CR-3 snubber hydraulic fluid as being reportable per 10 CFR 21.

Normal snubber surveillance during the CR-3 1981 refueling outage revealed a large number of snubbers which were declared inoperable during functional testing. Of the various types of failures, the most significant from a piping standpoint was "zero bleed-rate." This occurs after the snubber has reached lock-up velocity. A snubber which has reached this point and does not exhibit a bleed-rate, acts as a rigid strut and could overstress the attached piping if movement continues due to thermal growth.

The small bore hydraulic snubbers in which this occurred were supplied by Power Piping Company (Pipe Hanger Div; Pittsburgh, PA). The sizes vary from 1.5" x 5" (Bore X Stroke) to 5" x 15". The capacities range from 3000 lb. to 49,000 lbs. These are Model 1900 Series snubbers. They are located throughout CR-3 on various systems. This is the only brand of small bore snubbers (both safety and non-safety related) presently installed at CR-3.

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An onsite evaluation of the snubber failures was performed by Gilbert Associates, Incorporated. After the teardown of two (2) of the failed snubbers, an inspection revealed particulate in the fluid of sufficient size to collect in and block the snubber bleed orifice. The particulate was found in the cylinder as well as the fluid reservoir. It consisted of both magnetic and non-magnetic particles.

Two different analyses were performed on the fluid contaminants: one by the FPC Materials Technology Department and the other by the snubber manufacturer, Power Piping Company.

The Materials Technology report lists particles of up to about 770 microns in size. Their conclusion was that the particles of Fe, Ni, and Cr could be from stainless steel. The others appear to be of extraneous origin (based upon review of materials making up various snubber parts). The report also concludes that some of the elements could be of paint pigment origin.

In the Power Piping Company analysis, (done by Atmospheric Research Organization, Inc.), it was determined that particulate chemistries indicate welding metal and flux, paint chips, and "dirt" as contaminants. The report also shows an elevated phosphorous level found in an unknown particle type. It was stated that "this chemistry is not incompatible with welding rod flux."

The one major difference in the two reports was that the Materials Technology analysis was performed on fluid samples taken from snubbers removed from the reactor building. The Power Piping analysis was performed on fluid from a snubber shipped to the field (Detroit Edison Company) and returned to Power Piping Company after about 3 months without having been installed.

FPC has concluded environmental conditions at CR-3 may have contributed to the contamination problem. However, it is our opinion that there is enough available data to say that sufficient quantities of contaminants were present in the snubbers as supplied by Power Piping Company to render them inoperable. As stated before, an inoperable snubber in this failure mode (zero bleed-rate), could induce excessive amounts of stress in piping that is supported by the snubber. Therefore, FPC has determined this issue to be reportable per 10 CFR 21 because the snubbers contain defects which constitute a substantial safety hazard.

The problem of fluid contamination had not been noted until our most recent refueling outage. No problems (zero bleed-rate) have been documented during the two previous refueling outages. Due to the reservoirs being a non-pressurized type (vented to the atmosphere), there is the possibility that conditions at CR-3 contributed to the contamination problem (during storage, maintenance, and/or operation).

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Since this problem was identified, the CR-3 staff has developed a program in which all fluid reservoirs, both old and new, are completely flushed prior to filling with fresh fluid. This cleaning process has revealed that new reservoirs, obtained from Power Piping Company within the last year, contain varying amounts of what appear to be "Weld Slag," small beads of metal and fine metal filings. FPC will also institute a program to check the fluid of any snubbers removed for testing and/or rebuilding, for evidence of continued contamination.

During the CR-3 1981 refueling outage, when this problem was found, all snubbers inside containment were completely rebuilt, (i.e., reservoirs flushed, new seals, new fluid, and required hardware added). In addition, 27 of the remaining 95 snubbers outside the containment were rebuilt prior to Mode 1. (From a review of piping analyses, these 27 snubbers could affect piping integrity due to zero bleed-rate during thermal movement). The rebuilding of the remaining 68 snubbers should be complete by October 1, 1982.

Should you have questions or comments on the above report, please contact this office.

Very truly yours,



David G. Mardis
Acting Manager
Nuclear Licensing

DGM/myf

Attachments

cc: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555