GPU Nuclear

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March 1, 1985

Dr. Thomas E. Murley, Administrator
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Dear Dr. Murley:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
IE Bulletin No. 81-01

The initial response to the subject bulletin was provided by letter dated March 30, 1981 which indicated our proposed schedule for implementing the safety-related mechanical snubber inspection and testing program. The snubber inspections and tests were performed during our recent (Cycle 10) refueling outage. Results of the inspection and testing program, which was done in accordance with the requirements of the bulletin, are described in the attachment to this letter.

Please note that our previous correspondence identified the mechanical snubbers in use at Oyster Creek as model PSA-10, manufactured by Pacific Scientific Company. These snubbers have been redesignated by the manufacturer as model PSA-11 because of their rated load of 11,000 pounds.

If you should have any questions, please contact the undersigned or Paul Czaya at (609)971-4893.

Very truly yours,

Peter B. Fiedler
Vice President and Director
Oyster Creek

PBF/PFC/dam:0765A
Attachment

cc: Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

NRC Resident Inspector
Oyster Creek Nuclear Generating Station
Forked River, NJ 08731

Sworn and Subscribed to
before me this 1ST day of
March, 1985.

Diana A. Maldet
A Notary Public of NJ
DIANA A. MALDET
A Notary Public of New Jersey
My Commission Expires June 5, 1986

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INSPECTION REPORT FOR OYSTER CREEK MECHANICAL SNUBBERS

IN RESPONSE TO I.E. BULLETIN 81-01,

"SURVEILLANCE OF MECHANICAL SNUBBERS"

I. Description of Visual Examination/Manual Stroke-Test Program

GPUN Plant Procedure No. 775.1.006 Requirements:

a. Visually inspect the snubber and mounting hardware for missing or loose nuts, bent or broken support members, physical damage, deficiencies, or abnormalities.

b. Verify that the snubber has freedom of movement over the range of the stroke in both tension and compression by disconnecting the telescoping end of the snubber from the clevis mounting bracket and manually extending and retracting the snubber through its full stroke. Acceptance criteria shall be that no excessive force (greater that 100 lbs.) is required to start movement and the unit moves smoothly through the full stroke in both directions.

II. Number of Snubbers Examined/Stroke-Tested

A total of 91 snubbers were examined and stroke-tested.

a. Manufacturer: Pacific Scientific Company (PSCo)
Anaheim, Calfornia
b. Model: PSA-11
c. Size: 11,000 lbs. - Design load rating

III. Results of Examination/Stroke-Testing

Two snubbers did not satisfy the inspection requirements of GPUN Procedure No. 775.1.006

a. Snubber Mark No. MS-R2 (Snubber N-1-5, position MS-1-S3)
Part No. 1801107-01 Serial No. 104
Location: Drywell, 44' Elevation, North Main Steam Header

1. Mode of Failure - The snubber was found at a tube extension of 4-1/2 inches, extended 1-3/4 inches past its original cold setting of 2-3/4 inches, and with the adjustment coupling of the rear mounting hardware bent at the threads. The telescoping end was disconnected from the pipe clamp and moved to near full extension to begin the manual stroke test. The snubber locked in the extended position and would not retract when stroked. This constituted a failure under the criteria of freedom of movement over the range of stroke in both compression and tension.

2. Cause of Failure - The bend in the threaded rod inside the adjustment coupling caused the snubber to over extend from its original cold setting of 2-3/4 inches to the "as found" setting of 4-1/2 inches. Analysis could not determine the cause of the bend in the adjustment coupling and any subsequent damage to the snubber itself. The snubber was sent to a laboratory for disassembly and inspection to evaluate the internal condition of the snubber and to try to determine the exact cause of failure. Disassembly revealed slight wearing of the capstan spring and corrosion of the moving parts - the inside surface of the housing, the end of the screw shaft, the inside and outside surfaces of the inertia mass, and the outside of the torque drum all showed signs of corrosion deposits. The failure mode was considered to be corrosion of the moving parts which coupled with the normal stresses put on the snubber caused the bend in the mounting hardware. The cause of the corrosion has been attributed to a leaking pilot valve on the Electromatic Relief Valve (EMRV) installed on the main steam header directly above this snubber assembly

3. Corrective Action - The adjustment coupling on the affected snubber was repaired, and a new replacement snubber was installed in its place (location N-1-5). The final "as left" tube extension was the original cold setting of 2-3/4 inches. The snubber assembly was inspected during the 500 psig "Hot Functional" plant start-up inspection to observe the assembly in hot conditions and was found to be in good condition for plant operation. The snubber in location N-1-5 shall be inspected and manually stroke-tested during the next refueling outage to access its condition after this operating cycle. In addition, the EMRV pilot valve was repaired during the outage.

4. Effect of Failure on Plant & System - Analysis revealed that thermal forces exerted by the main steam header would have been sufficient to deform the adjustment coupling if the movement capability of the snubber was degraded or lost completely. During the deformation of the adjustment coupling the movement capability of the snubber was lost. However, the effect of this failure on the main steam piping and the plant was deemed to be negligible and at no time was the piping overstressed.

5. Justification for Resuming Operation - The effect of this failure on the Main Steam piping and the plant has been analyzed to be negligible, and at no time was the Main Steam piping overstressed. The inoperable snubber was removed and a new replacement snubber installed in its place using the repaired mounting hardware. The snubber assembly was inspected during the pre-plant start-up "Hot Functional" inspection and found to be in good condition. The attributed source of the moisture for the internal corrosion has also been repaired (leaking EMRV pilot valve). Based on the above, we believe there is sufficient justification for resuming normal plant operation.

B. Snubber Mark No. 461-R4 (snubber N-20-4, Position NZ-3-S4)
Part No. 1801107-01 Serial No. 160
Location: Drywell, 60' elevation, North Core Spray Header

1. Mode of Failure - The snubber was disconnected from the pipe clamp and fully retracted to start the manual stroke test but would not extend from the fully retracted position when stroked. This constituted a failure under the criteria of freedom of movement over the range of stroke in both compression and tension.

2. Cause of Failure - The snubber was found to be in interference with an adjacent horizontal snubber. Snubber N-20-4 was installed at 6° off vertical while the adjacent snubber was installed in front of it horizontally. The two snubbers were found to be in contact, and when N-20-4 was disconnected from the clevis, it sprang away from the clevis, relieving a side load that was caused by the interference. The snubber was sent to a laboratory for disassembly and inspection to determine the cause of failure and the extent of internal damage. Disassembly revealed corrosion on the inside of the housing and the inertia mass and the screw shaft, the capstan spring was slightly worn, and the torque drum was slightly corroded. Further disassembly revealed a bent screw shaft-ball screw assembly. The ball screw assembly would move only 1 to 1 1/2 inches on the screw shaft from full retraction before locking up due to the bend in the shaft. The failure mode was considered to be a combination of corrosion of the moving parts and the bent screw shaft-ballscrew assembly. The cause of the corrosion has been attributed to the leaking EMRV pilot valve; this snubber location is approximately 15 feet above the EMRV.

3. Corrective Action - This snubber location was re-analyzed, and the pipe clamp was relocated to relieve the interference with the adjacent horizontal snubber assembly. A new snubber was then installed in this location. In addition, the EMRV pilot valve was repaired during the outage.

4. Effect of Failure on Plant and System - Stress analysis revealed that when the Core Spray System piping on which this snubber is installed is subjected to design loading, the pipe would move a maximun of 1-1/2 inches due to thermal effects. It was this thermal movement combined with the impaired movement capability due to the corrosion and the interference between the two snubber assemblies which caused the side load and the consequent bent screw shaft. However, inspection of the snubber revealed that partial movement capability (1 to 1-1/2 inches) was retained and the snubber would have allowed the normal Core Spray System piping thermal movement. In the final analysis, the effect of the failure on the Core Spray piping and the plant was negligible and at no time was the Core Spray System piping overstressed

5. Justification for Resuming Operation - The effect of this failure on the Core Spray piping and the plant has been analyzed to be negligible, and at no time was the Core Spray piping overstressed. This snubber location was re-designed and the pipe clamp was relocated to relieve the mechanical binding/interference with the adjacent snubber assembly. The inoperable snubber was removed and a new replacement snubber installed in its place. Based on the above, we believe there is sufficient justification for resuming normal plant operation.