James A. FitzPatrick
Nuclear Power Plant
P.O. Box 41
Lycoming, New York 13093
315 342-3840

New York Power Authority

William Fernandez II
Resident Manager

December 7, 1989
JAFP-89-0866

United States Nuclear Regulatory Commission
Document Control Desk
Mail Staticn Pl-137
Washington, D.C. 20555

REFERENCE: DOCKET NO. 50-333
LICENSEE EVENT REPORT: 89-022-00
Hydraulic Shock Suppressor
Pipe Supports - Exceeding
Seal Service Life

Dear Sir:

This Licensee Event Report is submitted in accordance with 10 CFR 50.73.

Questions concerning this report may be addressed to Mr. Hamilton Fish at (315) 349-6013.

Very truly yours,

WILLIAM FERNANDEZ

WF:HCF:lar

Enclosure

cc: USNRC, Region I
USNRC Resident Inspector
INPO Records Center
American Nuclear Insurers



IE22
1/1

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

# LICENSEE EVENT REPORT (LER)

| FACILITY NAME (1) | DOCKET NUMBER (2) | PAGE (3) |
|---|---|---|
| JAMES A. FITZPATRICK NUCLEAR POWER PLANT | 0 5 0 0 0 3 3 3 | 1 OF 0 6 |

TITLE (4) Service Life Exceeded for Elastomeric Seals in 33 Safety-Related Hydraulic Snubbers Due to Failures in Management of Maintenance Records

| EVENT DATE (5) | | | LER NUMBER (6) | | | REPORT DATE (7) | | | OTHER FACILITIES INVOLVED (8) | |
|---|---|---|---|---|---|---|---|---|---|---|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | MONTH | DAY | YEAR | FACILITY NAMES | DOCKET NUMBER(S) |
| 1 1 | 0 7 | 8 9 | 8 9 | 0 2 2 | 0 0 | 1 2 | 0 7 | 8 9 | | 0 5 0 0 0 |
| | | | | | | | | | | 0 5 0 0 0 |

| OPERATING MODE (9) | N | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11) | | | |
|---|---|---|---|---|---|
| POWER LEVEL (10) | 0 0 0 | 20.402(b) | 20.405(c) | 50.73(a)(2)(iv) | 73.71(b) |
| | | 20.405(a)(1)(i) | 50.36(c)(1) | 50.73(a)(2)(v) | 73.71(c) |
| | | 20.405(a)(1)(ii) | 50.36(c)(2) | 50.73(a)(2)(vii) | X OTHER (Specify in Abstract below and in Text, NRC Form 366A) |
| | | 20.405(a)(1)(iii) | 50.73(a)(2)(i) | 50.73(a)(2)(viii)(A) | |
| | | 20.405(a)(1)(iv) | 50.73(a)(2)(ii) | 50.73(a)(2)(viii)(B) | |
| | | 20.405(a)(1)(v) | 50.73(a)(2)(iii) | 50.73(a)(2)(x) | |

LICENSEE CONTACT FOR THIS LER (12)

| NAME | TELEPHONE NUMBER |
|---|---|
| Hamilton C. Fish | AREA CODE 3 1 5 3 4 9 - 6 0 1 3 |

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPRDS | | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPRDS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | B J | S N B | B 2 0 9 | Y | | | | | | | |
| | | | | | | | | | | | |

SUPPLEMENTAL REPORT EXPECTED (14)

| | | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
|---|---|---|---|---|---|
| YES (If yes, complete EXPECTED SUBMISSION DATE) | N NO | | | | |

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)


This is reported voluntarily as an event which may be of generic interest or concern, or contains a lesson to be learned, although we do not believe it explicitly meets the criteria contained in 10 CFR 50.73(a).

A review of the safety-related hydraulic snubber records was being performed for the purpose of identifying those snubbers which would be scheduled for rebuilding during the next refueling outage. On November 7, 1989, it was determined that lack of maintenance records made it necessary to conservatively assume that elastomeric seals in 33 snubbers had not been replaced within the plant's seven-year service life guideline.

A plant specific reevaluation of seal life was performed. It demonstrated that conservative values of 15 years could be applied to the service life for snubbers in primary containment environments and 20 years to snubbers in reactor building environments. The vendor recommended service life range of 5 to 10 years assumed radiation levels more than seven times the actual levels measured at the plant.

Because the plant was shutdown at the time of discovery, 20 inaccessible snubbers were replaced and functionally tested. Nineteen of the twenty snubbers which were replaced passed the functional test. An engineering evaluation for the one which failed one of its four tests, demonstrated that it was fully capable of performing its safety function. Thirteen accessible snubbers were visually inspected and scheduled for rebuilding or replacement at the refueling outage scheduled for March 1990.

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Description

Section 4.6.I.9 of the plant Technical Specifications requires that at least once per operating cycle, the records for each safety-related hydraulic snubber will be reviewed to verify that the service life will not be exceeded. The determining components for hydraulic snubber service life are the elastomeric seals within the operating mechanism. The vendor recommended service life for these seals is five to ten years with seven years chosen as the guideline for use at this plant. In the course of defining the necessary maintenance activities for snubbers during the next scheduled refueling outage, the responsible engineer identified apparent discrepancies in the computer data base for the scheduled rebuild date for a number of snubbers. It was determined on November 7, 1989 that the interval of time during which certain snubbers had been in service, without documentation of a rebuild or replacement of the elastomeric components, exceeded the plant program guideline for a seven-year service life.

Further detailed checking identified thirty-three safety-related hydraulic snubbers which had been in service for more than seven years and for which documentation of a rebuild during that time interval is not available. Of these, twenty were located in areas of the plant which are not accessible during power operation and thirteen were in normally accessible areas. Of those in the inaccessible areas, fifteen appeared to be overdue for rebuild by at least three years, and the remaining five ranged from 30 to 35 months overdue. Of those in the accessible areas, ten appeared to be overdue by at least three years with the remaining three ranging from 20 to 30 months overdue.

The Technical Specifications provide that if the service life will be exceeded, the service life shall be reevaluated or the snubber shall be replaced or reconditioned. The plant was shutdown for unrelated reasons at the time of discovery of the discrepancies in the snubber documentation. As a conservative measure, the 20 inaccessible snubbers were removed and replaced with snubbers which had been rebuilt with the new elastomeric components.

The Technical Specifications allowed an engineering analysis to be performed to extend seal life. This plant specific evaluation was performed and concluded that the service life for elastomeric components in service at this plant could be conservatively extended to fifteen years for applications inside the primary containment [NH] (inaccessible during power operation), and to twenty years for service outside the primary containment, but inside the reactor building [NG]. Therefore, the thirteen snubbers located in accessible areas were scheduled for rebuilding or replacement during the next refueling outage which is scheduled to begin in March 1990.

Those 20 inaccessible snubbers which were removed were subjected to the standard functional test. Even though the lack of documentation could be interpreted to mean that the service life had expired, 19 of the 20 snubbers passed the functional test.

The one snubber which did not pass failed one of the four tests for locking velocity and bleed rate. Because the plant was shutdown at the time of discovery, there were no applicable Technical Specification operability requirements. As a conservative measure, the requirements of Technical Specification 3.6.I were followed. The snubber was replaced in accordance with Section 3.6.I.2.a. In accordance with Section 3.6.E.3, a visual inspection of the supported components were conducted. No damage was observed. As provided for in this section, an engineering evaluation was performed to ensure that the inoperable snubber had not adversely affected the support components. This engineering evaluation determined that while the compression bleed rate of 0.6 inches/minute was outside the specified range, this value was not considered to be significant to snubber performance. This bleed rate would have allowed a calculated maximum pipe thermal expansion at the snubber of 0.003 inches per minute without imposing any additional loads on the system.

Cause

The inability to provide documentation for the replacement or rebuilding (within a seven-year guideline period for service life) of thirty-three safety-related hydraulic snubbers was caused by multiple failures in the management of records for these snubbers. (Cause Code E) Five factors have been identified as contributors to this problem.

1. Loss of continuity in management of the program caused by frequent transfer of the responsibility for coordinating the snubber program.

2. Lack of a formal program to provide control of data entry into the computer program which is used to track due dates for rebuilding of snubbers to replace seals with service life requirements. This includes a failure to sufficiently cross-check or verify the data base of the computer program against original hard copy records.

3. Insufficient training or supervision of temporary personnel who loaded data into the computer program. This sometimes resulted in the erroneous entry of the dates on which snubbers passed functional tests instead of the dates at which these snubbers were rebuilt to replace seals.

4. A few instances involving assignment of duplicate plant identification numbers to snubbers. (Each number is supposed to be unique.)

5. Organization of snubber records by snubber location number instead of by snubber identification number. This facilitated determination of the operability status and history of each pipe support location. However, this made it difficult to track the maintenance history for individual snubbers.

Cause of Snubber Failure

This snubber has not yet been dissassembled. The most probable cause for failure of the compression bleed rate test is a weakness in the spring which holds open the poppet valve in the bleed line between opposite sides of the snubber piston. It is noted that this type of failure is not related to the service life of elastomeric seals.

Analysis

This event is being reported in the "Other" category under NUREG 1022 guidelines for reporting of events which the licensee believes might be of generic interest or concern, or contain a lesson to be learned although they do not meet the criteria contained in 10 CFR 50.73(a).

The surveillance tests required by Technical Specification Section 4.6.I.9 for service life monitoring were performed once per operating cycle as required. However, the data base upon which these reviews were based was flawed. It is not possible to determine whether the records to prove that some snubbers were rebuilt are missing, or whether the rebuilds were not performed. Thus, a worst case analysis must assume that the seven-year guideline for service life of elastomeric components was exceeded for the snubbers discussed in this LER.

The plant specific evaluation of elastomeric service life concluded that a conservative service life for the specific elastomers in the primary containment [NH] (drywell) is 15 years, and for service in the reactor building [NG] 20 years. The assumptions used for the vendor recommended seven-year service life included a radiation field exposure which was over seven times the dose which would have been received in this plant had it been operated continuously at full power for 15 years. The acceptability of the 15- and 20-year service lives is based on documented evidence of the performance of elastomers in both laboratory and environmental qualification testing. Accordingly, it is reasonable to conclude, that even though the rebuild records for these snubbers were not located, there were no safety consequences and there would have been none due to snubber concerns even if a design basis seismic event had been experienced.

There is no question that the required functional tests were performed in accordance with the schedule required in the Technical Specifications. The functional tests were up to date. Further, the functional tests of the removed snubbers indicated that all but one were functional. The engineering analysis demonstrated conclusively that this snubber, which passed three of the four tests, would still have performed its safety function. Further, the nature of the failure was unrelated to the service life of elastomeric components. Therefore, all the systems to which these snubbers were connected were never inoperable due to problems with the snubbers.

Corrective Actions

Immediate:

1. Twenty safety-related snubbers located in inaccessible areas for which current rebuild records could not be located were replaced with qualified snubbers prior to restarting the plant.

2. The removed snubbers were functionally tested and the results recorded.

3. An engineering evaluation (JAF Calculation JAF-89-043), "Evaluation of Bergen Patterson Snubber Elastomer Service Life" was performed. The evaluation, based on actual plant conditions, that service lives of 15 years for drywell applications and 20 years for reactor building applications were acceptable and conservative.

4. The Technical Specification required visual inspection of supported components and engineering analysis for the application of the one snubber, which failed one of four functional tests, were performed. It concluded that this snubber would have performed its safety function and that there were no safety consequences.

Near-Term:

Hard copy records for each snubber arranged by the plant snubber number will be maintained. (Previous records were arranged by snubber location number which made it difficult to track the history of individual snubbers.)

A snubber history page will be established and maintained for each snubber number. This page will contain dates and references for each snubber functional test, rebuild, visual inspection, installation location, and storage period back to its last documented rebuild.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Additional Information:

Failed Component Data: Hydraulic Shock Suppressor

Plant Location: 23-19A-S-2
High Pressure Coolant Injection System

Plant Snubber Identification Number: 157

Manufacturer: Bergen Patterson

Part Number: 252

Size: 3 Kip, 6" Stroke, 3-3/8" Tunnel

Failure: Compression Bleed Rate Test Results, 0.6 Inches/Minute

Date Seals Last Replaced: More than ten years ago, date not known