WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O. Box 1223 • Elma, Washington 98541 • (206) 482-4428

April 21, 1989

Docket No. 50-508
G03-89-065

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Subject: NUCLEAR PROJECT NO. 3
POTENTIAL 10CFR50.55(e) DEFICIENCY
DEGRADATION OF NON-METALLIC COMPONENTS AND
SLUDGE FORMATION IN LUBRICATING OIL

On March 27, 1989, the Supply System notified your office of a potential 10CFR50.55(e) deficiency concerning the subject condition. Attached is a Supply System approved Interim Report. The report provides a description of the deficiency, corrective actions taken/planned, and current status.

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To-date, the Supply System does not have sufficient information to fully determine reportability under 10CFR50.55(e). This written report is being submitted pursuant to earlier oral notification. If our evaluations determine that the subject condition is reportable, the Supply System will submit the appropriate report to describe the corrective plans. As our investigation continues, if significant new information is developed, Interim Reports may be filed before final reportability is determined.

Should you have any questions or desire further information, please contact Mr. C. M. Butros, WNP-3/5 Site Manager at (206) 482-4428, Ext. 5010.

G. C. Sorensen, Manager
Regulatory Programs

WAD/cae

Attachment

cc: Mr. R. G. Bailey, Puget Sound Power & Light Co.
Mr. W. L. Bryan, Washington Water Power Co.
Mr. C. Goodwin, Portland General Electric Co.
Mr. J. R. Lewis, Bonneville Power Administration
Mr. T. A. Lockhart, Pacific Power & Light Co.
Mr. J. B. Martin, Administrator, Region V
Mr. N. S. Reynolds, Bishop, Cook, Purcell & Reynolds
Ms. R. M. Taylor, Ebasco - Elma
Ebasco - New York

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

NUCLEAR PROJECT NO. 3
(Docket No. 50.508)
POTENTIAL DEFICIENCY 10CFR50.55(e)
INTERIM REPORT
Degradation of Non-Metallic Components and Sludge Formation
Deviation/Noncompliance No. 66

Introduction

This Interim Report is submitted pursuant to 10CFR50.55(e) and 10CFR21 because of its potentially generic nature. It concerns the discovery of degraded non-metallic components and sludge formation in lubricating oil which had Mobil Vaprotec Concentrate added. Vaprotec is an oil based vapor phased inhibitor that has been added to virtually all WNP-3 equipment with oil lubricated bearings or gears to prevent corrosion on the wetted and non-wetted surfaces. This deficiency has been designated potentially reportable since the determination of reportability could not be completed within 14 days of QA notification as required by our project procedure. Reportability will be decided when the cause and extent of safety-related equipment degradation, if any, has been confirmed and an engineering assessment of its safety significance has been completed. On March 27, 1989, James Melfi of the Region V Office, was notified of this problem by telecon.

Description of the Problem

In September 1988, WNP-3 staff became aware that some oil lubricated rotating equipment being preserved at the Site, was becoming difficult to rotate. We were aware that the WNP-1 site had noticed similar difficulties and their internal inspections revealed the presence of a heavier phase with a syrup-like consistency in the lubricating oil. There was also an apparent oil film hardening and buildup on the bearing surfaces in the air space that prevented normal rotation of the equipment. WNP-3, like WNP-1, was using Mobil Oil products with Vaprotec additive for corrosion protection.

The following actions were initiated to obtain detailed information on WNP-1 problems and to determine the extent of rotation and oil contamination problems at WNP-3:

1) WNP-3 staff attended meetings at WNP-1 with Mobil Oil Representatives to learn about the WNP-1 problem and possible corrective actions.

2) A WNP-3 investigation was initiated to determine, if in general, the effort required to rotate shafts was normal or indicative that a problem existed.

3) Selected equipment, which seemed to exhibit difficulty in rotation, was disassembled and inspected.

4) The history of Vaprotec usage at WNP-3 was reviewed, including problems identified with lubricating oil which might have been related to Vaprotec usage.

In early March 1989, WNP-3 completed the initial investigation of this concern. We determined the following problems existed in selected equipment having Mobil lubricating oil with Vaprotec additive.

a) A non-metallic pump bearing housing internal component had deteriorated. WNP-1 found a similar problem during an internal inspection in November 1988. This problem has not yet been discovered on any safety related equipment.

b) A tacky coating was found on bearing surfaces and sludge was found within the bearing cavities. The bearings did not rotate when turned by hand and evidence was found that preventive maintenance hand rotation may be causing bearing wear.

c) The Vaprotec concentration within the lubricating oil is generally several times greater than recommended by Mobil. These higher concentrations are a result of Mobil's instructions to WNP-3 to add Vaprotec Concentrate periodically to lubricating oil to compensate for its dissipation over time. Vaprotec apparently does not dissipate as rapidly as Mobil implied and the periodic additions have significantly increased Vaprotec concentration in the oil. This high Vaprotec concentration may be contributing to or causing the other problems noted above.

Corrective Action

The degradation of non-metallic parts and fouled bearings were evaluated and the Project determined that a 90-day moratorium on Vaprotec usage and rotation of equipment shafts that have lubricating oil spiked with Vaprotec was prudent and warranted.

Further, WNP-3 staff determined that these problems might be significant and therefore potentially reportable under 10CFR50.55(e) and 10CFR21.

During the moratorium, the Preservation Program in this area will be reviewed, corrosion protection measures adjusted and a corrective action plan developed. The plan will address the following:

1) The inspections, tests and engineering reviews necessary to determine the cause and extent of equipment degradation.

2) The development of rework procedure to restore the degraded equipment to its original design condition including inspection requirements.

3) The issuance of non-conformance reports, where applicable, to document problems and to track corrective action.

4) The determination of safety significance and reportability of this problem under 10CFR50.55(e) and 10CFR21.

Current Status

The Project is in the second month of the above mentioned 90-day Moratorium Period. Currently, we are trying to duplicate, under controlled conditions, the problems we discovered in our investigation. Tests are being performed with various mixtures of lubricating oil, Vaprotec and moisture to determine which mixtures will cause a precipitation of sludge out of the oil. In addition, duplicate non-metallic pump parts have been ordered and upon receipt will be exposed to these various mixtures and checked for deterioration. We are also working to develop methods for removing the sludge from the oil cavities and the tacky coatings from the bearing surfaces.

Final Report

A Final Report will be submitted when the cause and extent of the effect on safety-related equipment is known and determination of reportability under the requirements of 10CFR50.55(e) has been made. Interim reports may be issued as significant new information is disclosed.