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December 14, 1990
ND3MNO:3078

Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
Special Report

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

The following Special Report is submitted to notify the commission of the recently discovered potentially overstressed piping supports at Beaver Valley Unit 1.

Very truly yours,

T. P. Noonan
General Manager
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DC/sl

Attachment

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December 14, 1990

ND3MNO:3078

Page two

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December 14, 1990

NB3MNO:3078

Page three

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Unit 1 Special Report

Potentially Overstressed Feedwater Supports due to Postulated Monoball Binding

Description of Postulated Condition

In 1989, Beaver Valley Unit 1 initiated a Steam Generator Feedwater Line Monitoring Program as a result of piping misalignment discovered during 7R. Instrumentation installed on the feedwater piping inside the Reactor Containment Building provided remote indication of piping temperature and displacement. Based on the recorded displacement data and subsequent correlative analysis, Engineering determined that two (2) monoball supports were potentially providing additional restraint to the Loop A feedwater piping. The monoball supports, R-3 and R-4, were designed to provide restraint in only one degree of freedom, the vertical direction. It was postulated that the two (2) monoballs were providing restraint in all three translational degrees of freedom. The effect of this potential condition on the feedwater piping was evaluated by Engineering considering thermal, seismic, deadload and fluid transient loadings.

Engineering determined that considering the monoball acting as three-way restraints would not cause the feedwater piping or supports to exceed their design basis allowable stress limits during a Design Basis Earthquake (DBE). This ensured that the plant could perform a safe shutdown following such a seismic event.

However, the evaluation also concluded that the postulation of binding monoball supports could cause monoball structural frame components to exceed upset allowables during an Operational Basis Earthquake (OBE). The feedwater piping would not exceed its licensing basis stress limits during an OBE.

Cause of Postulated Condition

This condition was the result of postulated binding of two (2) monoball piping supports on the Loop A steam generator feedwater line. These supports are designed to provide free movement in the two (2) horizontal directions for the feedwater piping over a limited range. These supports were determined to be potentially bound in place and could possibly prevent the piping from displacing as designed.

Background (7R)

Monoball support R-5, previously installed in Loop A feedwater piping at Beaver Valley Unit 1, was replaced by a support providing similar restraint function. Field indications, which existed only at R-5, indicated the monoball may not have been providing free movement. However, subsequent inspections of the monoball upon disassembly, revealed no indications of binding. In addition, visual inspection of all feedwater line monoball supports was conducted. No visual anomalies were identified on the other monoball supports. Therefore, other monoballs were not suspect.

Corrective Actions

- 1) Administrative controls will be implemented to require the plant to be shutdown after any seismic event exceeding 25% of OBE. This could result in Loop A feedwater piping supports exceeding their upset allowable limits.
- 2) The monoball piping supports of concern, R-3 and P-4, will be modified as required to address deficiencies. This is an expeditious approach as the inspection and verification of the functionality of the monoballs is a complex process. Testing of the supports cannot be accomplished during plant operation and the removal of the supports would have to be done during an outage.
- 3) An evaluation of all other monoball piping supports has been initiated to determine if similar concerns exist in other piping systems. Further corrective actions will be initiated if additional concerns are identified.
- 4) The organization which provided the monoball design has been notified of the potential binding and has been requested to evaluate the reporting of these concerns under the requirement of 10CFR21.

Safety Evaluation

There were no safety implications due to this postulated condition. As stated above, the Engineering analysis of the potential mechanical malfunction of these supports would not cause piping stresses to exceed their allowable limits during a Design Basis Earthquake, or prevent a safe shutdown following such an event. (Reference: Beaver Valley Unit 1 UFSAR Section 2.5.3, "Seismic Design")