PSE&G Public Service Electric and Gas Company

80 Park Plaza, Newark, NJ 07101 / 201 430-8217 MAILING ADDRESS / P.O. Box 570, Newark, NJ 07101

Robert L. Mittl General Manager
Nuclear Assurance and Regulation

August 9, 1985

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, MD 20814

Attention: Mr. Walter Butler, Chief
Licensing Branch 2
Division of Licensing

Gentlemen:

ELIMINATION OF ARBITRARY INTERMEDIATE PIPE BREAKS
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

Pursuant to D. Wagner's request for additional information to support Public Service Electric and Gas Company's request for approval to eliminate the postulation of intermediate pipe breaks as specified by SRP 3.6.2, Sections II.1 and II.2, the attached information on steam/water hammer effects is provided for your review.

Should you have any questions in this regard, please contact us.

Very truly yours,

Attachment

C D. H. Wagner
USNRC Licensing Project Manager

A. R. Blough
USNRC Senior Resident Inspector

A001
1/1

QUESTION

1. Expand your discussion on the provisions made for minimizing steam/water hammer effects, by furnishing details of such provisions for individual systems. (See, for example, Clinton submittals dated April 16, 1985, and May 24, 1985, on this same subject.)

RESPONSE

The provisions for minimizing steam/water hammer effects at the Hope Creek Generating Station are as follows:

Residual Heat Removal System (RHR), Low Pressure Coolant Injection System (LPCI), Core Spray System (CS), High Pressure Coolant Injection (HPCI), and Reactor Core Isolation Cooling System (RCIC).

Water hammer in the RHR, LPCI, CS, HPCI, and RCIC Systems discharge lines is prevented by maintaining the lines filled. Jockey pumps keep the discharge lines filled up to the injection isolation valves. Beyond the isolation valves the lines remain filled during standby operations.

Main Steam System

The main steam system is evaluated from steam hammer loads. The dynamic loads are included in the analysis for these lines which was performed using Computer Program ME101 for the piping outside containment. This computer program is described in FSAR Section 3.9.1.2.5. Steam hammer loads are anticipated for this system and are included in the design as discussed in FSAR Section 3.9.1.

Feedwater System

The feedwater system is filled using the condensate transfer system prior to start up of the system. The system is started with flow initially through bypass and recirculation lines to avoid water hammer during startup. During operation the lines will remain filled which minimizes the potential for water hammer.

Reactor Core Isolation Cooling (RCIC) Steam Supply and High Pressure Coolant Injection (HPCI) Steam Supply

The steam supply lines to the turbine are evaluated for steam hammer. The lines are sloped to allow moisture collecting in the lines to drain to a collecting pot. A short section of the RCIC steam supply line could

potentially collect a small volume of water; the effect of this on RCIC operation has been evaluated. The dynamic loads are anticipated for these lines and are included in the design.

Reactor Water Clean Up System (RWCU)

The RWCU system is continuously in operation to purify the reactor water and the lines will be filled minimizing the potential for water hammer.

Main Steam Isolation Valve Drains (MSIV Drains)

The MSIV Drain lines are sloped such that any condensate collecting in the lines will drain to the condenser.

Starting Air System

The starting air system has moisture separators and dryers to prevent moisture from collecting in the lines. This eliminates the potential for steam or water hammer in these lines.

QUESTION

2. In the PSE&G submittal dated June 11, 1985, it is stated that each system will be tested to verify that steady state vibratory levels are within acceptable limits for operating conditions anticipated during service. Confirm that in addition to these tests, preoperational and startup testing for steam and water hammer will be performed on all affected systems.

RESPONSE

A program to monitor the systems for steam/water hammers has been included in which the detection of a water hammer would be documented on a Startup Deviation Report, investigated, and evaluated by engineering for design or personnel error problems.

JES:srd
8/9/85
FN02 3/4