

March 3, 1995

Mr. Robert G. Byram
Senior Vice President-Nuclear
Pennsylvania Power and Light
Company
2 North Ninth Street
Allentown, PA 18101

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING THE PENNSYLVANIA POWER AND LIGHT COMPANY'S REQUEST TO AMEND THE SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 & 2, LICENSES TO REFLECT THE REMOVAL OF THE MAIN STEAMLINE ISOLATION VALVE LEAKAGE CONTROL SYSTEM (TAC NOS. M91013 AND M91014)

Dear Mr. Byram:

The staff has completed its preliminary evaluation of the structural and seismic analysis portions of the November 21, 1994, submittal related to the removal of the main steamline isolation valve leakage control system from Susquehanna Steam Electric Station (SSES), Units 1 and 2. Based on this review certain information is required by the staff to complete its review of the requested license amendments. Specifically, enclosed is a list of questions concerning design details and calculation results.

Please provide your responses to these questions by the first week of April.

This requirement affects 9 or fewer respondents and, therefore, is not subject to Office of Management and Budget review under P.L. 96-511.

If you have any questions concerning this request, please contact me on 301-415-1402.

Sincerely,
/S/

Chester Poslusny, Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-387/388

Enclosure: Request for Additional Information

cc w/encl: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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Mr. Robert G. Byram
Senior Vice President-Nuclear
Pennsylvania Power and Light
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2 North Ninth Street
Allentown, PA 18101

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Sincerely,

A handwritten signature in cursive script that reads "Chester Poslusny".

Chester Poslusny, Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-387/388

Enclosure: Request for Additional Information

cc w/encl: See next page

Mr. Robert G. Byram
Pennsylvania Power & Light Company

Susquehanna Steam Electric Station,
Units 1 & 2

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REQUEST FOR ADDITIONAL INFORMATION

MSIV ALTERNATE LEAKAGE TREATMENT SYSTEM

SUSQUEHANNA STEAM ELECTRIC STATION

- (1) Provide an updated earthquake performance database for piping based on the piping database discussed in GE's Boiling Water Reactor Owner's Group (BWROG) report NEDC-31858P, Rev. 2, and the additional piping database that are required to cover the Susquehanna alternate leakage treatment (ALT) path piping, including data for small-diameter piping in drain/bypass lines. Present the data for each pipe diameter with its associated parameters, such as pipe thickness and pipe diameter-to-thickness ratio.
- (2) The licensee should ensure that all the supports associated with the ALT path piping have been analyzed for their seismic capability, using seismic inputs and methodologies acceptable to the staff. The licensee should also provide examples of analyses and calculations of representative pipe supports for staff review.
- (3) The licensee should provide a detailed comparison between the ALT path piping and the database piping. The comparison should be specific in regard to each of the pipe diameters involved, associated pipe thickness, and pipe diameter-to-thickness ratio. The licensee should ensure that the experience database contains an adequate number of pipe samples.
- (4) The licensee should provide a detailed comparison between pipe spans in the ALT path and those in the database plants, considering both typical pipe runs as well as those with more unique layout configurations. The licensee should ensure that the experience database contains an adequate number of span samples for each of the pipe diameters and layout configurations.
- (5) The licensee should provide the basis for concluding that the earthquake floor motions which excite the ALT piping are bounded (in terms of acceleration and frequency content) by those experienced by the corresponding database piping.
- (6) The licensee should provide examples of evaluations and resolutions performed for the "outliers" which were identified during the plant seismic verification walkdowns.
- (7) The licensee should provide calculations that demonstrate the seismic adequacy of the condenser, by using an acceptable analytical methodology, considering the integrity of pertinent structural members, the seismic demand, and the seismic capability of the condenser support members.
- (8) The licensee should perform a bounding seismic dynamic analysis for a representative portion of the ALT piping which would yield the most critical pipe stresses and support loads. The analysis and the results, including the basis of the selection of the pipe run, the seismic input motion and methodology used, should be submitted for staff review.

ENCLOSURE

- (9) For each of the earthquake-facility pairs in the experience database which are being relied upon to demonstrate the seismic adequacy of the ALT system for Susquehanna provide the following information:
- a. The name, location (latitude and longitude), and foundation geology (i.e., rock, deep soil, shallow soil) of the facility.
 - b. The name, date, time, epicenter, magnitude of the earthquake and the distance from the facility to the earthquake rupture.
 - c. The five percent of critical damping response spectra of the ground motion estimated at the facility from the earthquake.
 - d. The method used to estimate the ground motion at the facility. If the ground motion is based on actual ground motion recordings, provide the location (latitude and longitude) and foundation geology of the recording station and its distance from the facility and its distance to the closest part of the fault rupture. If the estimation is based on a method other than an actual recording of the earthquake ground motion or if the recording station is not collocated with the facility, describe the method used to estimate the ground motion in detail and provide any ground motion attenuation equations which may have been used to obtain the estimate.
- (10) Provide the following information related to the seismic analysis of the turbine building referred to in Section 2.3 (on page 7) of Enclosure 2 of the Nov. 21, 1994 submittal:
- a. The details of seismic analysis performed, and the seismic building model that was used, including the structural and soil properties.
 - b. A discussion of the procedure used to account for the variabilities associated with the structure frequency, structure damping, and the soil (rock) moduli.
 - c. Justification for the use of the NUREG/CR-0098 median ground response spectra as the ground motion input for this analysis.
 - d. The location at which the ground motion was input to the seismic building model.
 - e. The results of the seismic analysis including the floor response spectra at critical locations of the turbine building.
- (11) In Section 2.0 (on page 5) of Enclosure 2 to the November 21, 1994, submittal it is stated that the turbine building was designed to prevent collapse for the DBE condition. On page 7 of Enclosure 2 it is stated that "A seismic analysis of the turbine building was performed for the DBE loading in the north-south, east-west, and vertical directions in



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order to assure that the building will not collapse. The resulting deflections were also utilized to confirm that there is no interaction with the reactor building." Except for the horizontal shears in both the north-south and east-west directions subjected to the DBE reported in figures 2A and 2B of Enclosure 2, no other analysis results were reported.

- a. State whether the reported horizontal shears were obtained from the three directional DBE motion input.
 - b. The horizontal shears reported in figures 2A and 2B can be considered as seismic demand. Provide the corresponding shear capacity of the turbine building in both horizontal directions.
 - c. State whether the analysis results conclude that the turbine building would not collapse during the DBE, and provide technical bases to justify such a conclusion.
 - d. Provide the calculated maximum deflection of the turbine building during the DBE.
 - e. State whether a time history analysis or a response spectrum analysis was used to calculate the maximum deflection and the stability of the turbine building.
 - f. State whether the analysis results indicate that the turbine building would respond inelastically during the DBE.
 - g. Provide the name of the computer code which was used for the analysis of the turbine building, under the DBE loading condition, and state whether the code has the capability of handling inelastic structural behavior.
- (12) With respect to piping anchorage, the submittal only states that "Concrete anchor bolts are evaluated using data from the A46/SQUG criteria, Appendix C." No evaluation results were provided.
- a. The submittal did not address how the seismic demand for the pipe anchors was obtained, however, during the January 24, 1995, meeting, the licensee stated that the seismic demand was obtained from piping dynamic analyses. Provide information on the type of analysis performed, the basis of acceptance for the analysis procedure, and the results of the analysis.
 - b. Provide the evaluation results for piping anchors by comparing the seismic demand to the anchor capacity.

(13) The submittal states that "The block walls which are of concern for the MSIV LCS Elimination Project are evaluated with seismic loads using the DBE floor spectra." However, no evaluation results were reported and there was no mention of the adequacy of these blockwalls.

- a. Provide the evaluation results for the blockwalls.
- b. Explain the criteria which were used for the evaluation of the capacity of the blockwalls (e.g., the strength method in the Uniform Building Code).