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 GRIER, B.H. Region 1, Philadelphia, Office of the Director (81/03/01)

SUBJECT: Final deficiency rept re discrepancies between hanger loadings on pipe support detail drawing stress isometrics. Verification program has resolved problem for Unit 1. Procedure changes effected for Unit 2.

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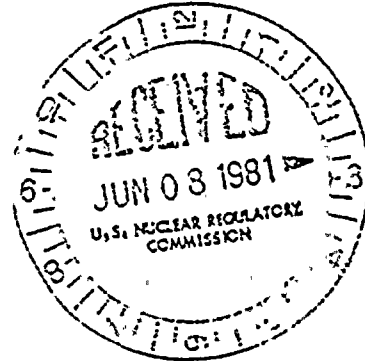
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NORMAN W. CURTIS
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June 4, 1981

Mr. Boyce H. Grier
Director, Region I
U. S. Nuclear Regulatory Commission
631 Park Avenue
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SUSQUEHANNA STEAM ELECTRIC STATION
FINAL REPORT OF A DEFICIENCY RELATING
TO LOAD DISCREPANCIES ON PIPE SUPPORT DETAILS
ERs 100450/100508 FILE 840-4/900-10
PLA-829

References: PLA-391 (9/5/79)
 PLA-462 (3/24/80)
 PLA-514 (7/22/80)

Dear Mr. Grier:

This letter serves to provide the Commission with a final report of a deficiency relating to discrepancies between hanger loadings shown on pipe support detail drawings as compared to those shown on stress isometrics. This deficiency was originally reported in PLA-391 and the information contained herein is submitted as a final report pursuant to the provisions of 10 CFR 50.55(e).

The attachment to this letter contains a description of the deficiency, its cause, safety implications, and the corrective action taken and planned.

We trust the Commission will find the information forwarded by this letter to be satisfactory.

Very truly yours,

N. W. Curtis
Vice President-Engineering & Construction-Nuclear

FLW:sab

Attachment

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Mr. Boyce H. Grier

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June 4, 1981

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1. Description of the Deficiency

During a system walkdown in 1979, Bechtel Engineering discovered discrepancies between hanger loads shown on stress isometric sketches and the corresponding loads shown on pipe support details. A random review of selected pipe support details and stress isometrics indicated that the problem was not generic or widespread, but seemed to be restricted to isometrics issued prior to mid-1976. A verification program was instituted. As a result, some hardware changes were required in several safety-related systems in order to meet FSAR commitments. A QA audit of the pipe support design process revealed that some pipe support details lacked adequate supporting calculations. In some cases, calculations in support of detailed design were not available.

2. Cause

The causes for the deficiencies were:

- i) Inadequate internal design control and interface between Bechtel Plant Design Subgroups. Changes made to the stress analysis by the Stress Groups were not coordinated with the Pipe Support Group. Thus these changes were not incorporated into the pipe support design.
- ii) Inadequate implementation of Bechtel Engineering Procedures Manual (EPM) requirements. Calculations were not properly prepared or were not generated as required.

3. Analysis of Safety Implications

The verification program revealed that some pipe supports were designed for loads below those specified on the stress isometrics. Correcting these discrepancies necessitated changes in the actual hardware for some of the pipe supports. Had this situation gone uncorrected, some supports might have failed, adversely affecting the safe operation of the plant. Therefore, this deficiency is considered to be reportable in accordance with 10 CFR 50.55(e).

4. Corrective Action

For Unit 1, a verification program was established and all Stress isometrics and pipe support details were reviewed:

- i) The loads specified on stress isometrics were reviewed and the pipe support details were revised to reflect correct information.
- ii) A comparison was made between the revised loads and the loads used in hanger design. The revised loads were then compared with actual hardware strength.

iii) If the revised loads were lower than design or, if higher but still within the capacity of existing hardware, no action was needed. If, however, comparisons showed revised loads beyond hardware strength, hardware changes were required. This program for Unit 1 is now complete. The revised pipe support details have been issued for construction.

For Unit 2, an exploratory review showed that the problem was much smaller in scope and could be integrated into the ongoing project design effort. A complete verification for Unit 2 will be completed prior to fuel load as part of the hydrodynamic loads analysis and as-built review programs.

In correcting the problem of inadequate calculations for pipe supports, all Nuclear Class 1, 2, and 3 Seismic Category I piping systems are being analyzed to verify the adequacy of the design for the actual as-built condition. Supporting calculations will be performed and documented for all hangers which lack them.

Appendix B of the Bechtel Engineering Procedures manual (EPM) has been revised to require design coordination among each group in the Plant Design. The stress isometrics are signed by each group prior to issuance to preclude recurrence of the discrepant load problem. Also training sessions have been held with pipe support group supervisors, designers and engineers to ensure that they are aware of the requirements to document calculations as required by the EPM. These training sessions are ongoing.

5. Conclusion

The verification program has resolved this discrepant load problem for Unit 1. The procedure changes effected will ensure the situation does not recur on Unit 2. The problem of hanger calculation deficiencies will be resolved with completion of the as-built design verification program.