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50-387  
388

NORMAN W. CURTIS  
Vice President-Engineering & Construction-Nuclear  
770-5381

July 16, 1981

Mr. Boyce H. Grier  
Director, Region I  
U. S. Nuclear Regulatory Commission  
631 Park Avenue  
King of Prussia, PA 19406



SUSQUEHANNA STEAM ELECTRIC STATION  
FINAL REPORT OF A DEFICIENCY INVOLVING  
DISSIMILAR METAL WELD JOINTS ON SMALL PIPE  
ERs 100450/100508 FILES 840-4/900-10  
PLA-875

Reference: PLA-709 (4/21/81)

Dear Mr. Grier:

This letter serves to provide the Commission with a final report of a deficiency involving dissimilar metals joined in socket welds on small pipe. The deficiency was the subject of PLA-709. This report is submitted under 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 this information to be satisfactory.

Very truly yours,

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

FLW:sab

Attachment

PENNSYLVANIA POWER & LIGHT COMPANY

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PDR ADOCK 05000387  
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Mr. Boyce H. Grier

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July 16, 1981

cc: Mr. Victor Stello (15)  
Director-Office of Inspection & Enforcement  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Mr. G. McDonald, Director (1)  
Office of Management Information & Program Control  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

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P.O. Box 52  
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1. DESCRIPTION OF PROBLEM

Bechtel NCR 6479, dated 9/18/80, documented the following conditions:

- a) There are 111 Q-listed, small pipe spools containing 187 socket welds which involved the joining of dissimilar metals (carbon to stainless steel). The welds were made using a carbon to stainless weld procedure which was not included in the list of approved welding procedures shown on Bechtel drawing M-198. The use of the unapproved welding procedure is in noncompliance with Bechtel specification M-204 paragraph 6.2.1.b and with Note 1 on drawing M-198.
- b) Also noted is the fact that 43 of the spools, which had 90 socket welds involving dissimilar metals, were identified as being in systems with design temperatures greater than 212°F. This is contrary to the requirements of drawing M-198, Note 24, which limits the dissimilar metal weld joints to the systems which have design temperatures of 212°F or less.

The field has stated in Construction Memo to Engineering CME 5397 that all applicable drawing and weld documentation has been reviewed and that the extent of the deficiencies above are completely identified in NCR # 6479.

2. CAUSE OF DEFICIENCY

- a) All welding procedures not listed on drawing M-198 require approval from Bechtel Project Engineering as noted on the drawing. Welding was performed without this approval as noted in 1(a) above. The failure to recognize that the weld procedures were not listed on drawing M-198 was an oversight of Bechtel field personnel.
- b) Bechtel Field Engineering failed to comply with system design temperature restrictions on dissimilar metal welding applications as noted in 1(b) above. Bechtel field piping personnel, who prepare design details for the field welding personnel, failed to identify the system design temperature restriction for dissimilar metal welds. It is noted that Bechtel field piping personnel do not normally refer to M-198. The Field Welding Group incorrectly presumed that the piping detailers reviewed the system operating conditions (i.e. temperature) prior to detailing the dissimilar socket welds.

3. ANALYSIS OF SAFETY IMPLICATION

The Bechtel drawing M-198 requires the field to refer all nonlisted dissimilar metal welds to Project Engineering for selection of proper welding procedures. This was not done for the subject 187 welds. However, Project Engineering has subsequently determined that the weld procedures used (P8, P1-T-Ag or P8, P1-A) are acceptable.

Regarding violation of design temperature limits, Bechtel Project Engineering has determined that 31 of the welds are acceptable because either the process temperature at the weld will be less than 212°F or the fatigue stresses at the weld are within allowables. The remaining 59 welds will be replaced. This disposition will be implemented via Bechtel NCR 6479.

Failures in any of the 59 welds, which are to be replaced, could have affected the safe shutdown of the plant. Therefore, the design temperature deficiency is reportable under 10 CFR 50.55(e).

4. CORRECTIVE ACTION

Replacement of the 59 deficient welds has commenced, 15 welds have been completed as of June 29, 1981.

Drawing M-198 was revised (Rev. 15) to include the appropriate carbon to stainless steel weld procedures.

General Note #24 on Drawing M-198 (limits dissimilar welds to systems with design temperatures of 212° or less) will be added to the Bechtel "Piping Class Sheets, Summary Sheets and Standards" (M-199). This drawing is used by Bechtel Field Engineering - Piping in their preparation of welding design details.

The affected field personnel have been reinstructed in a training session regarding the requirements of the Bechtel Construction Specification for Welding.