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April 27, 1984

MURRAY R. EDELMAN

VICE PRESIDENT
NUCLEAR

Mr. James G. Keppler
Regional Administrator, Region III
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

RE: Perry Nuclear Power Plant
Docket Nos. 50-440; 50-441
ASME Code Class I Fittings
[RDC 102(84)]

Dear Mr. Keppler:

This letter serves as our final report pursuant to 10CFR50.55(e) concerning certain ASME Class I fittings procured by Pullman Power Products and furnished to the Perry Nuclear Power Project. Mr. F. Jablonski was first notified on March 28, 1984, by Mr. P. Martin of The Cleveland Electrical Illuminating Company that this problem was being evaluated.

This report contains a description of the deficiency, an analysis of safety implication, and corrective action.

Description of Deficiency

The SP44 contractor and SP527 fabricator have, in some instances, provided "block forged" fittings for use in ASME Section III Class 1 piping systems.

Supply of such fittings was not authorized by the Owner as required and the Engineer did not consider the effect of the "block forged" configuration (as it affects thermal fatigue and flexibility) in his ASME Class 1 piping analysis. These fittings typically have extreme section thicknesses and/or abrupt changes in section thickness.

Analysis of Safety Implications

A postulated failure in the area of one or more of the E32 MSIV Leakage Control System fittings with associated single failure of the inboard Main Steam Isolation Valve(s) could result in a radiological release in excess of 10CFR100 guidelines.

A failure in the area of the N22 Main Steam Drain System fittings will result in a small line break in the drywell area, as postulated in the PNPP FSAR, Section 6.2.1.1.3.3.5. This break would not affect safe operation or result in a radioactive release of any consequence.

No failure is postulated for the G33 Reactor Water Clean-Up System fittings due to their acceptability "as-is".

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Corrective Action Taken

Review of documentation and field inspection has identified a total of fourteen (14) block forged fittings in ASME Class 1 piping systems and these have been identified in site Nonconformance Reports.

The four (4) fittings found in the E32 MSIV Leakage Control System will be replaced immediately due to the ready availability of acceptable replacement fittings and the difficulty of qualification analysis.

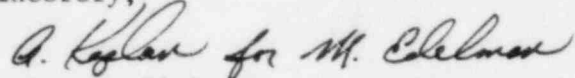
The Engineer has performed an evaluation of the effects of the block forged fittings supplied for use in the G33 Reactor Water Cleanup and N22 Main Steam Drain Systems. This involved the use of two-dimensional heat transfer analyses to provide thermal data which could then be used to perform ASME Class 1 fatigue analyses. Both stress and fatigue evaluations were performed using ASME Section III NB-3600 analytical techniques. The component geometries used in the evaluations were taken from samples of the fittings in question. The results of these evaluations are as follows:

1. While the detailed thermal analysis of the four (4) G33 fittings indicated an increase in thermal stress due to the block forged geometry, the calculated fatigue usage factors were still well below the ASME Code allowable of 1.0. These fittings may be used "as-is".
2. Thermal analysis of the six (6) N22 fittings also showed increases in the thermal stress due to geometry. While revised stress evaluations have shown that the fatigue usage factors are still well below ASME Code limits, they are very close to the NRC break exclusion limits applicable to this piping subsystem. As a result, the Owner has chosen to rework these fittings by grinding to reduce the excess wall thickness in the transverse cross-section, thereby providing additional margin for future reanalysis.

Corrective action is expected to be complete by October 1, 1984.

Please call if there are any additional questions.

Sincerely,



Murray R. Edelman
Vice President
Nuclear Group

MRE:pab

cc: Mr. M. L. Gildner
USNRC, Site Office

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