

June 11, 1984

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T.F. Q2.2.2

United States Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

Attention: Mr. Richard W. Starostecki, Director
Division of Project and Resident Programs

- References:
- (a) Construction Permits CPPR-35 and CPPR-36, Docket Nos. 50-443 and 50-444
 - (b) Telecon of November 10, 1982, A. L. Legendre (YAEC) to Eugene Kelley (NRC Region I)
 - (c) PSNH Letter, dated December 14, 1982, "Interim 10CFR50.55(e) Report; Cold Pulling of Pipe", J. DeVincentis to R. W. Starostecki
 - (d) PSNH Letter, dated July 15, 1983, "Interim 10CFR50.55(e) Report; Cold Pulling of Pipe", J. DeVincentis to R. W. Starostecki
 - (e) PSNH Letter, dated December 15, 1983, "Interim 10CFR50.55(e) Report; Cold Pulling of Pipe", J. DeVincentis to R. W. Starostecki
 - (f) PSNH Letter, dated March 2, 1984, "Interim 10CFR50.55(e) Report; Cold Pulling of Pipe", J. DeVincentis to R. W. Starostecki

Subject: Final 10CFR50.55(e) Report; Cold Pulling of Pipe

Dear Sir:

On November 10, 1982, we reported a potential 10CFR50.55(e) item regarding an isolated incident of violation of UE&C Specification for Assembly and Erection of Piping and Mechanical Equipment, No. 9763-006-248-51, Paragraph 3.5.8.

A. Description of Deficiency

We have found that a misalignment greater than that permitted by the piping erection specification existed prior to the fitup of the Main Steam Piping (Line MS-4007-01-B1-30") field welds F0105 "A" and F0106 "B" of Dravo fabricated spools E2937-1982 and E2937-1981, respectively. This was discovered when the area superintendent requested that the restraints holding the pipe in place for welding be removed to allow a check of the fitup of the pipe.
(Pullman-Higgins Non-Conformance Report No. B0749)

This item is in violation of the specification for Assembly and Erection of Piping and Mechanical Equipment, No. 9763-006-248-51, Paragraph 3.5.8.

A further investigation of a possible generic problem with the use of mechanical clamps that could possibly pull a pipe more than the specified 1/8" was performed.

E. Analysis of Safety Implications

If excessive misalignments existed in the fitup of Code piping, safety-related components (piping, valves, supports, etc.) could possibly be overstressed.

C. Corrective Action

In order to preclude the possibility that safety-related piping is overstressed due to excessive cold pull, the following corrective action was undertaken.

1. The nonconformance report was dispositioned to "rework" the piping following an analysis of the piping and in accordance with installation procedures.
2. In order to assure proper installation in the future, Specification 9763-006-248-51, Revision 10 was issued to add the following:

a. Paragraph 3.5.8.4

Installation procedures shall establish a hold point at the installation of the final spool piece. Adjacent piping shall be verified as to being in the design configuration, as shown on the drawings, spool piece shall be fit into position as verification that the requirements of Paragraph 3.5.8 are not violated.

b. Paragraph 3.5.8.5

When tooling clamps are used, as permitted by Paragraph 3.5.8.1, on the final closure weld of any system, or portion thereof, verification of having met the requirements of Paragraph 3.5.8 shall be performed prior to making the weld.

In conjunction with Items a and b above, Pullman-Higgins has revised their installation procedure and has conducted retraining of pipe fitters, supervisors, Level I QC and Level II QC personnel, accordingly. The implementation date for these activities was January 1, 1983.

D. Additional Studies and Analysis

The evaluation of the piping proceeded on the premise that installation of the supports/restraints after the completion of final closure weld would assure that the effect of any cold pull that may have been introduced would be minimal. It was verified that the supports/restraints were installed after the final closure weld, therefore, also permitting the elimination of a review of the support designs with regard to any unaccounted for loads attributable to cold pull. All ASME piping installed prior to January 1, 1983, where the final closure weld of a system or subsystem was completed, was considered suspect and reviewed with respect to the potential effects of cold pull.

The above review encompassed approximately seventy (70) subsystems, with a subsystem defined as that portion of the piping connecting two points of relative fixity (i.e., anchors, branch connections, equipment nozzles, etc.).

Pumps with flanged connections had the piping disconnected and misalignments were minimized to assure that no operation problems would result from pump/motor coupling misalignments. Since no nonconformances were generated indicating misalignments in excess of those allowed by Specification 9763-006-248-51 (1/8"), it can be concluded that for these systems, no cold pull had been introduced.

Further studies and investigations were initiated in order to further assure that cold pull overstressing was not introduced into the subsystems. The sensitivity study intentionally selected relatively stiff piping configurations so as to yield conservatively high stresses.

From these analyses, a stress per unit of cold pull displacement due to misalignment was developed. Based on the margin left in the Code allowable stresses, an allowable displacement for misalignment was calculated for each subsystem.

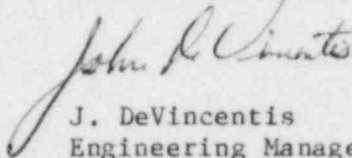
The maximum misalignment due to cold pull was taken as 1 1/4". This misalignment is the maximum misalignment accepted by the clamps which are used to align the pipe for welding. In order to exceed this misalignment, application of an external mechanical force would be necessary which would have resulted in a nonconformance report.

For most of the 70 subsystems, the allowable displacement limit for misalignment was greater than the maximum displacement due to cold pull. Subsystems which had an allowable displacement limit below 1 1/4" were analyzed on a case-by-case basis. Individual analysis of these subsystems produced an allowable displacement for misalignment of greater than 1 1/4".

In conclusion, the results of our evaluations, studies, and investigations indicate that if cold pull had been inadvertently introduced and left undetected, it would not be of sufficient magnitude to cause detrimental effects within the piping. In light of this conclusion, we consider this item not to meet the reportability criteria of 10CFR50.55(e).

Very truly yours,

YANKEE ATOMIC/ELECTRIC COMPANY



J. DeVincentis
Engineering Manager

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