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Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Attention: Steven M. Matthews (Mail Stop 9 D4)

Subject: Final Report of Potential Safety Concern on Material Used for Fabrication of Permanent Canal Seal Plate

Reference: Letter from J.H. Taylor FTI to USNRC, "Interim Report of Potential Safety Concern on Material Used for Fabrication of Permanent Canal Seal Plate," April 5, 1996, JHT/96-30

Gentlemen:

The purpose of this letter is to provide the final disposition on the Preliminary Safety Concern relating to the use of material constructed with welded angles that are not allowed by ASME A479 for the permanent canal seal plate, a safety related component. The concern was described in the referenced letter.

The attached evaluation is based on the examination of material test results data. The material properties and structural integrity of the weld have been evaluated and determined to be satisfactory.

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It is concluded that there is no significant safety hazard associated with the continued use of the welded material for the permanent canal seal plate during power or refueling operations at CR-3 or ANO-1. There is no safety concern reportable under 10CFR21 for the two affected plants.

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If you have any questions concerning this matter, please contact the undersigned at 804/832-2817 or Robert Schomaker at 804/832-2917.

Sincerely,

J. H. Taylor, Manager
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JHT/RJS/mcl

c: WF Jones - Framatome Technologies
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EVALUATION OF PSC 1-96

Material Certification of Angle Material for Permanent Canal Seal Plate

Introduction

Upon receipt inspection of material purchased for use as angle material in the fabrication of permanent canal seal plates for ANO-2 (1995), a discontinuity was noted in one leg of the angle material. The material was determined to be fabricated by welding a flat bar material to a standard angle. This process is not allowed for material certified to ASME SA-479. The material was rejected for use in fabrication of the canal seal plate for ANO-2.

However, in 1992/3 a similar angle material from the same supplier was utilized to fabricate the permanent canal seal plates for CR-3 and ANO-1. These seal plates were classified by the customer as safety related. The FTI (then BWNT) subcontractor for fabrication purchased commercial grade materials with CMTR's. FTI (BWNT) then upgraded this material to "safety related" and certified as such. The fabrication of the angle material for CR-3 and ANO -1 has also been determined to be by a welding process, contrary to ASME SA-479 standards.

Use of the welded angles does not adversely affect safety during normal operation. Reliance on the welded angles may be of concern when the permanent canal seal plate fulfills its function of retaining water in the reactor canal during refueling activities. This latter concern was the basis for filing a Preliminary Safety Concern.

Discussion

Correspondence with the fabricator and material supplier documents the TIG automated welding process used to fabricate the angle pieces. The flat bar is of "close chemistry" and weld wire is used in the process.

The highest stresses that the angles see are those imposed during thermal growth of the reactor vessel when the plant is operating. The only loads on the angles when it is performing a safety function is the weight of the water in the flooded canal.

In order to evaluate the structural integrity of the welded angle piece, tests were performed on a sample angle piece at CR-3, for hardness, chemistry, and weld geometry. Results of the testing are documented in reference 1. Hardness and chemical testing of the CR-3 canal seal plate has shown the weld material to be similar to the type 304 stainless steel base material. Rockwell hardness values of the weld are similar to the base metal and chemical analysis of the weld indicate a strong match with type 304. It is the conclusion of FTI Welding Engineering that the seal plate angle weld is structurally and chemically sound.

Material test results data were examined by the Mechanical and Structural Analysis Unit of

FTI. Conclusions of that examination are documented in reference 2.

Evaluation of the Safety Concern

The stresses in the angle pieces are determined to be less when performing its safety function than during normal power operation. The angle pieces have already been cycled through normal operation and a refueling at CR-s and ANO-1. Visual inspections have already taken place and no unacceptable indications were noted. The material properties and structural integrity of the weld have been evaluated and determined to be satisfactory. There are no questions about other materials used in the fabrication of the permanent canal seal plate.

Conclusion

Based on the above discussion it is concluded that there is no significant safety hazard associated with the continued use of the welded material for the permanent canal seal plate during power or refueling operations at CR-3 or ANO-1. There is no safety concern reportable under 10CFR21 for the two affected plants.

References

1. FTI Document 51-1254895-00,01, "CR-3 Seal Plate Test Results", 10/29/96 and 1/9/97.

2. FTI Document 51-1258586-00, "CR-3 Seal Plate Stress Analysis Validation", 1/13/97.