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SUBJECT: Request for Approval of Use alternative to Requirements of 10CFR55a, Codes & Standards.

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August 23, 1991

U. S. Nuclear Regulatory Commission
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Washington, DC 20555

**Subject: Oconee Nuclear Station
Unit 1
Docket No. 50-269
Request for Approval of Use Alternative to
Requirements of 10CFR55a, Codes & Standards**

Reference: Letter to H B Tucker from David B Matthews dated 3/1/90

Oconee Nuclear Station has identified a significant number of explosive steam generate tube plugs which require repair due to eddy current indications within the plug pressure boundary. The preferred repair method is to install a welded plug utilizing an automatic welding process developed by Babcock and Wilcox Nuclear Services (BWNS). However, BWNS performed the analysis of the welded plug and its attachment weld to the 1989 edition of Section III. Also, the qualification of the weld procedure specification and the welding operator was performed in accordance with the Section XI 1989 edition. This code edition has not been formally approved by the NRC at this time. BWNS and DPCo have compared the 1989 code edition with the 1980 code edition which is Oconee's code of record. This assessment confirmed that the 1989 code meets the technical requirements and addresses all concerns for automatic welding of tube plugs by providing specific guidance with respect to automatic welding.

The details of the 1980 and 1989 code comparisons are attached. Therefore, as allowed per 10CFR50.55a(a)(3)(i), DPCo requests approval of the 1989 code edition of Section III Division 1 and Section XI for use with the steam generator automatic welded plug and attachment weld to be used on Oconee Unit 1. In order to support the start-up of Unit 1, DPCo request approval by September 20, 1991.

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Approval for use of Alloy 690 material for Steam Generator tube plugs was provided in the referenced letter; therefore, use of Alloy 690 is not part of this request.

Very truly yours,

M.S. Tuckman

M S Tuckman

MST/DRK/sgw

Attachments

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COMPARISON OF 1980 AND 1989 CODE EDITIONS:

Oconee's code of record for ASME Section XI is the 1980 edition Winter addenda. Automatic welding of tube plugs is not addressed in ASME Section III and it was not addressed in Section XI until the 1986 addenda. This addenda has not been approved by the NRC. The Babcock & Wilcox GTAW Automatic welding process was designed and qualified to the 1989 edition of the codes which has not been approved either. For evaluation purposes, the Section XI 1989 Code requirements for Welding Qualification and Operator Qualification were compared to the Section XI 1980 winter addenda for manual welding on tube plugs.

The manual welding procedure for Tube Plugging given in the 1980 winter addenda Section XI includes the following areas of emphasis: Materials; qualification procedures that follow the field procedures for tube preparation; essential variables which include dimensional concerns such as tube size, spacing, extension, proximity and tube thickness as well as those listed in ASME Section IX; restricted access; method for testing the welds; and maintenance records.

In qualifying both the procedure and operators (the use of 5 consecutive welds and the methods of testing the welds are the same). The 1989 Section XI code addresses each of the above areas and in general provides more detailed guidance. An example of this is that the 1989 code gives actual permissible variances for tube size, extension, etc. Both require that the materials used are accepted by the codes. Alloy 690 has been accepted for use as plug material by Duke Power in a letter from the NRC dated March 1, 1990 signed by David B. Matthews.

The 1987 Addenda of Section III revised an overly conservative design rule that had existed in previous Editions of the code. The specific change was in regard to the required adjustment factor on the allowable primary and secondary stress intensities when using fillet welds for structural attachments (See NB-3123.2). The overly conservative factor of 1/2 applied to the allowed stress for a fillet weld was removed. This stress allowable factor was removed to allow the designer to justify the specific configuration being used rather than impose a conservative factor that enveloped all welding techniques and designs. BWNS has reviewed and agrees with this change in the code.

Additionally, NB-3123.2 states that a fillet weld must be evaluated for cyclic considerations. A stress intensification factor of 4.0 was used in that evaluation. Based on the actual weld geometry and repeatability of the welding process, the 4.0 factor is considered to be conservative with respect to the weld quality. This 4.0 factor is multiplied times the calculated normal operating stress ranges to determine the fatigue usage factor for the fillet weld. The fatigue cycles evaluated correspond to those that would be experienced during a 40 year life for the steam generator. The fatigue usage factor calculated has a significant margin to the allowed value. Additionally, the welding Procedure Qualification for the weld plug shows significant margin with respect to the specified minimum weld size.