



**CENTERIOR  
ENERGY**

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Docket Number 50-346

License Number NPF-3

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United States Nuclear Regulatory Commission  
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Washington, D.C. 20555

Subject: Request for Relief from ASME Code Section XI to Permit  
Machine Welding of Steam Generator Tube Plugs at the  
Davis-Besse Nuclear Power Station

Gentlemen:

Pursuant to 10 CFR 50.55a(g)(5)(iii), enclosed is a request for relief from Section XI of the 1986 edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. Relief is requested from the requirements of Section XI, Article IWB-4400, Heat Exchanger Tube or Tubesheet Bore Hole Plugging. Relief is requested to permit machine welding of a welded steam generator tube plug at the Davis-Besse Nuclear Power Station (DBNPS) during the seventh refueling outage (7RFO) which commenced on August 30, 1991.

An explosive welded steam generator tube plug in the hot leg side of the number 2(A) steam generator is to be backed up by a second welded plug. The explosive welded plug being backed up is suspected of being responsible for the small primary to secondary leak which existed during the last cycle of operation. The suspect plug is fabricated from Inconel 600 material. Babcock & Wilcox Nuclear Services Company (BWNS) informed Toledo Edison that similar plugs installed at other plants have been subject to primary water stress corrosion cracking (PWSCC). Other welded plugs of this type installed at the Davis-Besse Nuclear Power Station are being backed up with rolled mechanical steam generator tube plugs during the 7RFO. However, this particular welded plug cannot be backed up with a mechanical plug because there is insufficient tube length remaining and, accordingly, a welded plug will be installed. The welded plug is being fabricated from ER-NI-CR3-SFA-5.14 (INCO 82) material which has proven to be resistant to PWSCC in this application.

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Toledo Edison has contracted ABB/Combustion Engineering (CE) to perform steam generator inspections and steam generator tube plug installations scheduled for the 7RFO. As noted above, in addition to the installation of several mechanical rolled steam generator tube plugs, a single welded plug in the number 2(A) steam generator is to be backed up with a welded plug. CE plans to use machine welding to weld the back up plug in place. Machine welding the plug will minimize radiation dose to workers. Manual welding of the plug would involve a radiation dose of approximately one person-Rem.

During review of the CE welding procedures, which first became available for Toledo Edison review on August 22, 1991, questions were raised regarding the sanctioning of machine welding of steam generator tube plugs by the 1986 and earlier editions of the ASME Code. As required by 10 CFR 50.55a, the DBNPS Inservice Inspection Program, which governs repairs and replacements, references the 1986 edition of the ASME Code. The 1986 edition is the most recent edition of the ASME Code currently approved by the NRC in 10 CFR 50.55a(b).

The 1986 and earlier editions of Section XI of the ASME Code, Article IWB-4410, require that steam generator tube plugging be in accordance with IWB-4420 or IWB-4440. IWB-4420 addresses explosive welding of steam generator tube plugs. IWB-4440 addresses manual welding of steam generator tube plugs. Machine welding of tube plugs is not addressed. After discussions with CE, the Authorized Nuclear Inservice Inspector (ANII) and the Authorized Inspection Agency (AIA), on August 30, 1991, Toledo Edison concluded that there is no avenue available within the NRC endorsed editions of the ASME Code which sanctions machine welding of the replacement steam generator tube plug.

The alternatives of not installing or manual welding the back up plug are undesirable. Manual welding would incur unnecessary radiation exposure and is inconsistent with the principle of maintaining radiation dose as-low-as-reasonably-achievable. Backing up the plug is desirable from the standpoint of maintaining a high degree of steam generator tube integrity. Accordingly, Toledo Edison has opted to request NRC approval of relief from the requirements of Section XI, Article IWB-4410 of the 1986 edition of ASME Code. The relief request is enclosed.

Toledo Edison notes that beginning with the 1986 addenda, Section XI, Article IWB-4430, Tube or Tubesheet Hole Plugging by Fusion Welding, was added. IWB-4430 addresses requirements for machine welding of tube plugs. The relief request would adopt these requirements as an alternative to IWB-4410 of the 1986 edition of the ASME Code. Toledo Edison believes that there are no technical issues related to approval of this alternative since the NRC has proposed a revision to 10 CFR 50.55a to endorse ASME Code editions and addenda through the 1989 edition (56FR3796 dated January 31, 1991). No restrictions on the use

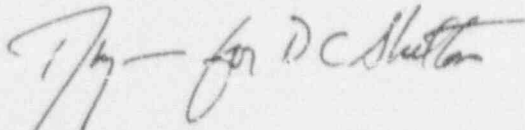
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of IWB-4430 were indicated in the proposed rule. Therefore, Toledo Edison concludes that adoption of the requirements IWB-4430 of a later Code edition (1986 edition with addenda through 1988 and the 1989 edition), provides an acceptable level of quality and safety.

Toledo Edison requests NRC approval of the enclosed relief request by September 20, 1991, the scheduled date for installation of the back up welded plug.

If you have any questions regarding the relief request, please contact Mr. R. W. Schrauder, Manager - Nuclear Licensing, at (419) 249-2366.

Very truly yours,

A handwritten signature in dark ink, appearing to read "J. B. Hopkins" with a stylized flourish at the end.

PWS/dlm

Attachment

cc: P. M. Byron, NRC Region III, DB-1 Senior Resident Inspector  
A. B. Davis, Regional Administrator, NRC Region III  
J. B. Hopkins, NRC/NRR DB-1 Senior Project Manager  
Utility Radiological Safety Board

RELIEF REQUEST

Request for Relief from ASME Code Section XI, Article IWB-4410, to Permit Machine Welding of Steam Generator Tube Plugs.

Component Description

Once Through Steam Generator Tubes

ASME Code Class

ASME Section III, Class A - 1968 Edition through summer 1968 Addenda

Applicable Code Requirement

Section XI of the 1986 edition, Article IWB-4410 states:

"Heat exchanger tube or tubesheet bore hole plugging shall be in accordance with the rules of IWB-4420 or IWB-4440."

IWB-4420 addresses explosive welding of steam generator tube plugs.  
IWB-4440 addresses manual welding of steam generator tube plugs.  
Machine welding of steam generator tube plugs is not sanctioned by the 1986 or earlier editions of Section XI.

Statement of Requested Relief

Relief is requested from the IWB-4410 requirement to explosively weld or manually weld steam generator tube plugs in accordance with the rules of IWB-4420 or IWB-4440, respectively.

Basis for Requested Relief

During the seventh refueling outage (7RFO), an explosive welded steam generator tube plug in the hot leg side of the number 2(A) steam generator is to be backed up by a second welded plug. The explosive welded plug being backed up is suspected of being responsible for the small primary to secondary leak which existed during the last cycle of operation. The suspect plug is fabricated from Inconel 600 material. Babcock & Wilcox Nuclear Services Company (BWNS) informed Toledo Edison that similar plugs installed at other plants had been subject to primary water stress corrosion cracking (PWSCC). Other welded plugs of this type installed at the Davis-Besse Nuclear Power Station are being backed up with rolled mechanical steam generator tube plugs. However, this particular welded plug cannot be backed up with a mechanical plug because there is insufficient tube length remaining and a welded plug will be installed. The welded plug is being fabricated from ER-NI-CR3-SFA-5.14 (INCO 82) material. Machine welding is to be used to weld the back up plug in order

to maintain radiation exposure to workers as-low-as-reasonably-achievable. Manual welding of the plug would involve a radiation dose of approximately one person-Rem. The alternatives of not installing or manual welding the back up plug are undesirable. Manual welding would incur unnecessary radiation exposure and is inconsistent with the principle of maintaining radiation dose as-low-as-reasonably-achievable. Backing up the plug is desirable from the standpoint of maintaining a high degree of steam generator tube integrity.

#### Proposed Alternative Requirements

Machine welding of tube plugs will be performed in accordance with the requirements of Section XI Article IWB-4430, Tube or Tubesheet Hole Plugging by Fusion Welding, incorporated in the 1986 addenda and subsequent editions of the ASME Code. The NRC has proposed a revision to 10 CFR 50.55a to endorse ASME Code editions and addenda through the 1989 edition (56FR3796 dated January 31, 1991). No restrictions on the use of IWB-4430 were indicated in the proposed rule. Therefore, Toledo Edison concludes that adoption of the requirements of IWB-4430 of a later Code edition (1986 edition with addenda through 1988 and the 1989 edition), provides an acceptable level of quality and safety.