

January 17, 2003

MEMORANDUM TO: Ledyard B. Marsh, Deputy Director
Division of Licensing and Project Management
Office of Nuclear Reactor Regulation
/RA by Roy Caniano Acting For/

FROM: Cynthia D. Pederson, Director
Division of Reactor Safety

SUBJECT: REQUEST FOR TECHNICAL ASSISTANCE - APPLICATION OF
ASME CODE SECTION XI, IWB-2430 REQUIREMENTS
ASSOCIATED WITH SCOPE OF VOLUMETRIC WELD
EXPANSION AT THE PRAIRIE ISLAND NUCLEAR
GENERATING PLANT (TIA 2003-01)

In accordance with the NRC Inspection Manual, Part 9900, "Technical Guidance," if inspectors identify Code issues that result in disagreement with the licensee, the identified issue should be sent via Task Interface Agreement to NRR for resolution. A Region III inspector has identified a disagreement with the licensee's interpretation of the American Society of Mechanical Engineers (ASME) Code Section XI requirements. The Region requests that NRR review this issue related to potentially nonconservative application of the ASME Code Section XI, IWB-2430 requirements associated with expanding the scope of weld examinations after identification of weld flaws which exceed Code allowable limits. The specific issue involves the Prairie Island Nuclear Generating Plant licensee's interpretation of the wording in IWB-2430, which was used as a basis to not expand the scope of volumetric weld examinations for the steam generator (SG) head-to-tubesheet welds in both Units.

Background

On November 25, 2002, a Region III inspector identified an unresolved item associated with the licensee's failure to perform a volumetric examination of the Unit 1, SG 12 and Unit 2, SG 21 head-to-tubesheet W-A welds during the 1999 and 2002 refueling outages respectively.

For Unit 1, the licensee identified a flaw during the 1999 ultrasonic (UT) examination of the SG 11 head-to-tubesheet weld W-A that exceeded Code acceptance standards of Table IWB-3410-1. The licensee accepted the flaw in the SG 11 weld W-A that exceeded the Code allowable size for continued service based on an analysis derived in WCAP 14166, "Handbook on Flaw Evaluation for Prairie Island Units 1 and 2 Steam Generators and Pressurizer." However, the licensee did not expand the volumetric inspection scope to the SG 12 W-A weld during this outage as required by paragraph IWB-2430 of Section XI of the 1989 Edition no Addenda of the ASME Code. For the SG 12 W-A weld, the licensee had not completed an UT examination since 1998.

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During the extent of condition review, the licensee identified that a similar condition also existed for the Unit 2 SG W-A welds. When the licensee examined the SG 22 weld W-A in February of 2002, 14 flaws were identified which exceeded Code acceptance standards of Table IWB-3410-1. The licensee applied a weld flaw analysis derived in WCAP 14166 to accept these flaws for continued service. However, the licensee did not expand the scope of the inspection to include UT examination of the SG 21 weld W-A during the 2002 outage. The licensee last performed a UT examination of 1/3 of the SG 21 weld W-A length in 2000 and another 1/3 of this weld length in 1997. The licensee had performed a full length UT examination of this weld in 1993.

Applicable Code Requirements

The licensee is in the third Code interval and was committed to requirements of Section XI, 1989 Edition, no Addenda of the ASME Code for these inservice examinations. Specifically, the SG head-to-tubesheet W-A welds were required to be volumetrically examined once per interval in accordance with The Table IWB-2500 Category B.2.40.

Section XI, IWB-2430 requires "Examinations performed in accordance with Table IWB-2500-1 that reveal indications exceeding the acceptance standards of Table IWB-3410-1 shall be extended to include additional examinations at this outage. The additional examinations shall include the remaining welds, areas, or parts included in the inspection item listing..." This Code requirement implements prompt actions to determine the extent of potential degradation when inservice flaws are identified which exceed Code limits. Therefore, the inspector was concerned that the licensee's decision to not examine weld W-A on SG 12 during the 1999 refueling outage and SG 21 during the 2002 refueling outage could have potentially allowed weld flaws of unacceptable size to remain in service.

Section XI, IWB-2420(b) requires "If flaw indications or relevant conditions are evaluated in accordance with IWB-3132.4 or IWB-3142.4, respectively, and the component qualifies as acceptable for continued service, the areas containing such flaw indications or relevant conditions shall be reexamined during the next three inspection periods listed in the schedules of inspection programs of IWB 2410." For SG 11 and SG 22, the licensee was performing these successive examinations beginning in 1994 for SG 11 and 1989 for SG 22 after identification of subsurface flaws which exceeded acceptable sizes as identified in Table IWB-3410-1. The licensee staff believed that these subsurface flaw indications which exceeded Code acceptance criteria, were likely fabrication related weld defects (e.g., slag, inclusions or weld porosity), vice service induced. However, the licensee's manual UT examination methods were not sufficient to confirm the flaw locations or to determine changes in flaw size (e.g., flaws indications sometimes got smaller in subsequent examinations). Therefore, the licensee staff had considered each flaw identified in the SG W-A welds that exceeded Code acceptance criteria during these examinations a "new" flaw.

Licensee Decision to Not Expand Weld Examinations

The licensee staff verbally discussed with the Region III inspector their decision to not apply the Section XI, IWB-2430 requirements to expand the scope of weld examinations for these SG W-A welds. The licensee staff had applied a successive examination schedule discussed in Section XI, IWB-2420 to the SG 11 and SG 22 W-A welds because flaws were identified that required an analysis to leave in service. The licensee staff then excluded application of IWB-2430 requirements to expand the extent of weld examinations to SG 12 and SG 21 W-A welds, because SG 11 and SG 22 W-A welds were in a successive examination schedule which began in 1994 and 1989 respectively. The licensee staff had interpreted the Section XI, IWB-2430 statement "examinations performed in accordance with Table IWB-2500-1," to allow excluding expansion of weld examinations for "new" weld flaws identified during successive examinations performed under IWB-2420.

The inspector requested the licensee to provide a technical basis to support their application of Code requirements. At the conclusion of the inspection, the licensee staff did not have a documented technical basis, nor an NRC endorsed Code Case, which supported their potentially nonconservative application of Code requirements.

Requested Action

Recognizing that the licensee has not followed an NRC endorsed Code Case, nor provided a technical basis for their interpretation of Section XI, IWB-2430 requirements, is the licensee's interpretation and application of Code requirements correct in this case? If the licensee application of Code requirements is determined to be correct, what is the technical basis for not expanding the scope of weld examinations when "new" flaws are identified which exceed Code acceptance limits?

Risk Significance

A risk significance evaluation of the licensee's interpretation of Code requirements, for this Prairie Island specific case would likely result in a finding of low safety significance, because of lack of industry observed service induced flaws for these types of welds. However, this licensee intends to take this issue to the ASME Code Committee for Code interpretation. If the licensee receives a favorable Code interpretation, it will likely be applied to other welds and at other sites within the Nuclear Management Company fleet (includes six sites in Region III). In addition, this issue presents a barrier to the closeout of this technical concern for the Prairie Island site.

L. Marsh

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This request was discussed between Roy Caniano (Region III) and Stuart Richards (NRR) on a conference call held on January 7, 2003. It was agreed that NRR would accept this issue as a Task Interface Agreement and respond to this request by July 31, 2003.

cc: J. Lamb, NRR
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