



**10 CFR 50.55a**

Palo Verde Nuclear  
Generating Station

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**102-04998-CDM/SAB/RJR**  
**September 16, 2003**

U.S. Nuclear Regulatory Commission  
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- References
1. APS letter 102-04941-CDM/SAB/RJR, "10 CFR 50.55a Alternative Repair Request for the Second 10-Year Interval of the Inservice Inspection Program: Relief Request 23, Pressurizer Heater Sleeves," dated May 15, 2003.
  2. NRC letter, "Palo Verde Nuclear Generating Station, Units 1, 2, and 3 - Relief Request No. 23 RE: Alternative to Temper Bead Welding Requirements for Inservice Inspection Program (TAC Nos. MB8973, MB8974 and MB8975)," dated July 30, 2003.

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)**  
**Units 1, 2, and 3**  
**Docket Nos. STN 50-528/529/530**  
**10 CFR 50.55a Alternative Repair Request for the Second 10-Year**  
**Interval of the Inservice Inspection Program: Relief Request 23,**  
**Revision 1, Temper Bead Post Weld Examination Methods**

In Reference 1 pursuant to 10 CFR 50.55a(a)(3)(i), Arizona Public Service (APS) Company requested alternatives to the gas-tungsten arc welding (GTAW) machine temper bead welding requirements of IWA-4500 and IWA-4530 of ASME Section XI. Relief from these requirements was granted in Reference 2. However, during planning and implementation sessions for the pressurizer heater sleeve work, it was identified that considerable time and radiological dose could be saved if a magnetic particle (MT) examination of the preheated band could be performed instead of a liquid penetrant (PT) examination. In the enclosure to this letter, APS proposes an alternative to the surface examination requirements of IWA-4533 of ASME Section XI pursuant to 10 CFR 50.55a(a)(3)(i) that would provide an acceptable level of quality and safety. Specifically, APS is requesting to be able to use an alternate surface examination, such as an MT, for the examination of the preheated band area in lieu of the currently required PT.

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PVNGS Units 1, 2, and 3, Docket Nos. STN 50-528/529/530  
Relief Request 23, Revision 1, Temper Bead Post Weld Examination Methods

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This request is for Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2, and 3 during the second 10-Year interval of the Inservice Inspection Program.

APS requests that the Staff's review of the proposed relief request be completed to support the planned modifications of the Unit 1 pressurizer heater sleeves during the spring 2004 refueling outage. This work is currently scheduled to begin in April 2004. If, however, this relief is approved prior to October 10, 2003, this could be used during the U2R11 outage starting on September 27, 2003. A reduction in dose can be obtained by using MT vs PT since the MT process can be performed in less time than the PT process.

No commitments are being made to the NRC in this letter. Should you have any questions, please contact Thomas N. Weber at (623) 393-5764.

Sincerely,



Enclosure: 10 CFR 50.55a Alternative Repair Request: Relief Request 23,  
Revision 1, Temper Bead Post Weld Examination Methods

CDM/SAB/RJR/kg

cc: Regional Administrator, Region IV  
M. B. Fields  
N. L. Salgado

**ENCLOSURE**

**10 CFR 50.55a Alternative Repair Request:  
Relief Request 23, Revision 1, Temper Bead Post Weld Examination  
Methods**

**Alternative Repair Request:  
Relief Request 23, Revision 1, Temper Bead Post Weld Examination Methods**

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**Background Information**

In Reference 1 pursuant to 10 CFR 50.55a(a)(3)(i), Arizona Public Service (APS) Company requested alternatives to the gas-tungsten arc welding (GTAW) machine temper bead welding requirements of IWA-4500 and IWA-4530 of ASME Section XI. Relief from these requirements was granted in Reference 2. In the enclosure to this letter, APS proposes an alternative to the surface examination requirements of IWA-4533 of ASME Section XI pursuant to 10 CFR 50.55a(a)(3)(i). Specifically, APS is requesting to be able to use an alternate surface examination, such as magnetic particle (MT), for the examination of the preheated band area in lieu of the currently required liquid penetrant (PT) examination.

APS proposes the alternative identified in Section IV to the surface examination requirements of IWA-4533 of ASME Section XI pursuant to 10 CFR 50.55a(a)(3)(i). Specifically, APS is requesting that it be able to use an alternate surface examination, such as magnetic particle (MT), for the examination of the preheated band area in lieu of the currently required liquid penetrant (PT) examination. This proposed alternative would provide an acceptable level of quality and safety per the requirements of 10 CFR 50.55a(a)(3). A change to the previously approved alternative (ultrasonic examination of the pad build-up) in lieu of the IWA-4533 required radiographic examination is not being requested.

**I. ASME Code Component(s) Affected**

Component number: B4.20  
Description: Pressurizer Heater Sleeve, 36 per Unit.  
Code Class: 1

**II. Applicable Code Addition and Addenda**

The Second 10-year inservice inspection interval code for Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2, and 3 is the American Society of Mechanical Engineers (ASME) Code, Section XI, 1992 Edition, 1992 Addenda.

The construction code for PVNGS Units 1, 2, and 3 is ASME Section III, 1971 Edition, and 1973 Winter Addenda.

The installation code for PVNGS Units 1, 2, and 3 is ASME Section III, 1974 Edition, and 1975 Winter Addenda.

**III. Applicable Code Requirements for Welding Inconel 52 Temper Bead Pad**

Section XI, 1992 Edition, 1992 Addenda, IWA 4533 states that the weld repair as well as the preheated band shall be examined by the liquid penetrant method after the completed weld has been at ambient temperature for at least 48 hr.

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In Reference 1, APS stated that a liquid penetrant examination of the completed repair weld and preheated band would be performed as required by IWA-4533.

In Reference 2, the Safety Evaluation stated that APS will perform the liquid penetrant examination of the completed repair weld and preheated band as required by IWA-4533.

**IV. Proposed Alternative**

Pursuant to 10CFR50.55a(a)(3)(i), APS proposes alternatives to the requirements of IWA-4533 of ASME Section XI. Specifically, APS is requesting to have the option to use an alternate surface examination, such as magnetic particle (MT), for the examination of the preheated band area instead of being required to use the liquid penetrant (PT) examination.

**V. Basis of Alternative for Providing Acceptable Level of Quality and Safety**

IWA-4533 specifically requires a PT examination of the preheated band. An MT examination is preferred by APS for the proposed application due to time and dose considerations. Liquid penetrant requires several steps: cleaning and surface preparation, drying, application of the penetrant, dwell time of the penetrant, cleaning of the penetrant, drying, application of the developer, developing time, reading the results, and post cleaning. Magnetic Particle examination can be performed on the "as-found" surface in a one-step process with immediate results and minimal post examination cleaning. As an example of the alternative requested, Code Case N-638 allows the final weld surface and the band around the weld surface to be examined using surface and ultrasonic methods and does not specify what type of surface exam should be performed.

A change to the previously approved alternative (ultrasonic examination of the pad build-up) in lieu of the IWA-4533 required radiographic examination is not being requested.

Since the pressurizer head is manufactured from low alloy carbon steel, it can be effectively examined using MT methods. Magnetic particle testing is an effective surface examination for low alloy carbon steel. Penetrant testing will locate defects which are open to the surface. However, not only does MT require fewer steps and less surface preparation, it also provides surface and sub surface flaw detection. A reduction in dose could be realized by using MT verses PT in the post weld examination process, since the MT process can be performed in less time than the PT process.

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**VI. Conclusion**

10 CFR 50.55a(a)(3) states:

"Proposed alternatives to the requirements of paragraphs (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that:

- (i) The proposed alternatives would provide an acceptable level of quality and safety, or
- (ii) Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

The proposed alternative discussed in Section V would provide an acceptable level of quality and safety as it would require a code surface examination to be performed without specifically dictating the type of surface examination required. Additionally, because of the reduced preparation and clean up time of MT examinations, an additional radiological dose reduction is expected. Therefore, APS requests that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

APS requests that the Staff's review of the proposed relief request be completed to support the planned modifications of the Unit 1 pressurizer heater sleeves during the spring 2004 refueling outage. This work is currently scheduled to begin in April 2004.

**VII. References**

1. APS letter 102-04941-CDM/SAB/RJR, "10 CFR 50.55a Alternative Repair Request for the Second 10-Year Interval of the Inservice Inspection Program: Relief Request 23, Pressurizer Heater Sleeves," dated May 15, 2003.
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3. ASME Code Case N-638, "Similar and Dissimilar Metal Welding Using Ambient Temperature Machine GTAW Temper Bead Technique, Section XI, Division 1.
4. ASME Section XI, 1992 Edition, 1992 Addenda
5. ASME Section III, 1971 Edition, Winter 1973 Addenda

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6. ASME Section III, Subsection NB, 1971 Edition, Summer 1973 Addenda
7. ASME Section III, Subsection NB, 1974 Edition, Winter 1975 Addenda