



Palo Verde Nuclear  
Generating Station

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**10 CFR 50.55a**

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102-04523-CDM/SAB/RKB  
January 25, 2001

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Mail Station P1-37  
Washington, DC 20555-0001

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)  
Units 1, 2 and 3  
Docket Nos. STN 50-528/529/530  
Second 10-Year Interval Inservice Inspection Program – Requests for  
Relief Numbers 15 and 16**

Pursuant to 10 CFR 50.55a(a)(3), Arizona Public Service Company (APS) hereby requests the use of alternatives to the inservice inspection requirements of 10 CFR 50.55a(g). The provisions of 10 CFR 50.55a(g) specify compliance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, and applicable addenda. The alternatives proposed in Requests for Relief Numbers 15 and 16 are related to the removal of insulation on bolted connections when performing VT-2 visual examinations.

Relief Request No. 15, provided in enclosure 1, requests approval to use ASME Code Case N-533-1 as an alternative to the requirements of IWA-5242(a) of ASME, Section XI, which requires insulation to be removed from pressure-retaining bolted connections to perform VT-2 visual examinations on systems which are borted for the purpose of controlling reactivity. The proposed alternative would allow insulation to remain in place when performing the ASME Code required system pressure test VT-2 visual examinations on Class 2 and 3 bolted connections. While depressurized, a separate VT-2 visual examination would be conducted on Class 2 and 3 bolted connections with the insulation removed once per inspection period.

Relief Request No. 16, provided in enclosure 2, requests approval to use ASME Code Case N-616 as an alternative to the requirements of IWA-5242(a) of ASME, Section XI, which requires insulation to be removed from pressure-retaining bolted connections to perform VT-2 visual examinations on systems which are borted for the purpose of controlling reactivity. The proposed alternative would allow insulation to remain in place when performing the system pressure test VT-2 visual examinations on Class 1, 2 and 3 bolted connections that are fabricated of specific corrosion resistant materials.

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APS requests approval by April 1, 2001 to support the ninth refueling outage of PVNGS Unit 1. These relief requests have previously been approved for use by other plants as described in the enclosures.

No commitments are being made to the NRC by this letter.

Should you have any questions, please contact Scott A. Bauer at (623) 393-5978.

Sincerely,

A handwritten signature in black ink, appearing to read "David Spauldin". The signature is written in a cursive style with a prominent loop at the end.

CDM/SAB/RKB/

Enclosures

cc: E. W. Merschoff [Region IV Administrator]  
J. N. Donohew [NRR Project Manager]  
J. H. Moorman [Sr. Resident Inspector]

**ENCLOSURE 1**

**ASME SECTION XI RELIEF REQUEST NO. 15**

**TO THE SECOND 10 - YEAR INTERVAL**

**INSERVICE INSPECTION PROGRAM**

**FOR THE PALO VERDE NUCLEAR GENERATING STATION**

**Relief Request No. 15**

**Visual Examination of Insulated Pressure-Retaining  
Bolted Connections on Class 2 and 3 Systems  
Borated for the Purpose of Controlling Reactivity**

**Code Class:** 2 and 3  
**Code Reference:** IWA-5242(a), 1992 Edition, 1992 Addenda  
**Examination Category:** C-H and D-B  
**Item Numbers:** All  
**Component Description:** Insulated, Pressure-Retaining Bolted Connections on Systems Borated for the Purpose of Controlling Reactivity  
**PVNGS Units:** All

**Requirement** Tables IWC-2500-1 and IWD-2500-1 require that Class 2 and 3 connections be VT-2 examined each inspection period.

ASME Section XI, paragraph IWA-5242(a) requires that "For systems borated for the purpose of controlling reactivity, insulation shall be removed from pressure-retaining bolted connections for visual examination VT-2."

**Alternate Testing** APS will perform a system pressure test and VT-2 examination each period for Class 2 and 3 bolted connections without removal of insulation. APS will remove insulation from the bolted connections, and perform a VT-2 visual examination each period but the connections will not be required to be pressurized for this examination. This alternative is consistent with Code Case N-533-1.

If evidence of leakage is detected the bolted connection will be evaluated in accordance with the corrective measures of Section XI, Sub-Article IWA-5250, as modified by APS Relief Request No. 12, which was approved by the NRC on April 26, 1999.

**Basis For Relief** Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternative would provide an acceptable level of quality and safety. Specifically, relief is requested from the requirement to remove insulation at Class 2 and 3 bolted connections for visual VT-2 examination coincident with system pressure testing at normal operating pressure.

Relief Request No. 15 (continued)

Basis For Relief  
(continued)

Code Class 2 and 3 systems are extensive, covering many areas and elevations of the Plant. Many of the bolted connections are located in difficult to access areas requiring scaffolding to be erected to provide access. With the high temperatures of these systems in Mode 3, at normal operating temperature and pressure, removing insulation presents personnel safety hazards.

Use of Code Case N-533-1 is an acceptable approach to ensuring leak-tight integrity of systems borated for the purpose of controlling reactivity. The approach includes that a system pressure test and VT-2 examination will be performed each period for Class 2 and 3 systems. The pressure test will utilize the four-hour hold time for insulated bolted connections. The four-hour hold time will allow any leakage to penetrate the insulation, thus providing a means for detecting any significant leakage with the insulation in place. By removing the insulation at least once each inspection period while the system is depressurized, APS will be able to detect minor leakage indicated by the presence of boric acid crystals or residue. This two-step approach will provide an acceptable level of quality and safety for bolted connections of borated systems.

Additional Information

The NRC Staff approved the use of Code Case N-533 for Class 1 systems for APS. This allows APS to perform the VT-2 visual examination with the insulation in place during a system pressure test following a minimum four-hour hold time, and requires the insulation of Class 1 bolted connections to be removed for direct visual examination for any evidence of leakage each outage when the system is depressurized. Under the proposed alternative for Class 2 and 3 systems, the Code Case N-533-1 requirements are the same except that the inspection frequency would be the Code required frequency of every inspection period.

Approval

APS has determined that the use of Code Case N-533-1 will provide an acceptable level of quality and safety. Therefore, relief is requested in accordance with 10 CFR 50.55a(a)(3)(i). This relief request pertains to the Second 10-Year Interval Inservice Inspection Program for PVNGS Units 1, 2, and 3. APS will not implement this alternative without prior authorization from the NRC.

Precedent

1. Relief was granted to APS for application of ASME Code Case N-533 for Class 1 pressure-retaining bolted connections in a letter from S. Dembek, NRC, to J. M. Levine, APS, Palo Verde Nuclear Generating Station - Approval of Inservice Inspection Relief Requests 11 and 12 (TAC NOS MA5248, MA5249 AND MA5250), dated April 26, 1999.

Relief Request No. 15 (continued)

Precedent  
(continued)

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2. The NRC Staff has approved Code Case N-533-1 for Pacific Gas and Electric by letter from S. Dembek, NRC, to G. M. Rueger, PG&E, Inservice Inspection Relief Request – PRS-1D, Revision 1, Use of Code Case N-533-1, Alternative Requirements for VT-2 Visual Examination of Class 1, 2 and 3 Insulated Pressure-Retaining Bolted Connections Section XI, Division 1 – Diablo Canyon Power Plant, Unit Nos. 1 and 2 (TAC Nos. MA7815 AND MA7850), dated March 16, 2000.

References

1. ASME Section XI, Rules for Inspection and Testing of Components of Light Water Cooled Plants 1992 Edition and Addenda, Section IWA-5000.
2. ASME Code Case N-533-1.
3. Letter from S. Dembek, NRC, to J. M. Levine, APS, Palo Verde Nuclear Generating Station - Approval of Inservice Inspection Relief Requests 11 and 12 (TAC Nos. MA5248, MA5249 AND MA5250), dated April 26, 1999.
4. Letter from S. Dembek, NRC, to G. M. Rueger, PG&E, Inservice Inspection Relief Request – PRS-1D, Revision 1, Use of Code Case N-533-1, Alternative Requirements for VT-2 Visual Examination of Class 1, 2 and 3 Insulated Pressure-Retaining Bolted Connections Section XI, Division 1 – Diablo Canyon Power Plant, Unit Nos. 1 and 2 (TAC Nos. MA7815 AND MA7850), dated March 16, 2000.

**ENCLOSURE 2**

**RELIEF REQUEST NO. 16**

**SECOND 10-YEAR INTERVAL**

**INSERVICE INSPECTION PROGRAM**

**PALO VERDE NUCLEAR GENERATING STATION**

**UNITS 1, 2 AND 3**

**Relief Request No. 16**

**Insulation Removal During IWA-5000 Pressure Tests  
on Pressure-Retaining Bolted Connections  
on Systems Borated for the Purpose of Controlling Reactivity**

**Code Class:** 1, 2, and 3  
**Code Reference:** IWA-5242(a), 1992 Edition, 1992 Addenda  
**Examination Category:** B-P, C-H, and D-B  
**Item Numbers:** All  
**Component Description:** Insulated, Pressure-Retaining Bolted Connections on Systems Borated for the Purpose of Controlling Reactivity  
**PVNGS Units:** All

**Requirement** Table IWB-2500-1 requires that Class 1 connections be VT-2 examined each outage. Tables IWC-2500-1 and IWD-2500-1, for Class 2 and 3 connections respectively, require that Class 2 and 3 connections be VT-2 examined each inspection period.

ASME Section XI, paragraph IWA-5242(a) requires that "For systems borated for the purpose of controlling reactivity, insulation shall be removed from pressure-retaining bolted connections for visual examination VT-2."

**Alternate Testing** In insulated systems borated for the purpose of controlling reactivity, a visual VT-2 examination during the system pressure tests of IWB-5000, IWC-5000, and IWD-5000 will be performed in accordance with ASME Code Case N-616 with the insulation installed when the bolting is fabricated with the following materials:

1. SA-564 Gr. 630, H1100
2. SA-193 Gr. B6 tempered at 1100 degrees F min.
3. SA-286 Gr. 660 preloaded below 100 KSI.
4. Nut material – SA-194 Gr. 8 or 8M

Hold times for pressure testing will meet ASME Section XI requirements (e.g., 4 hours for insulated components).

In addition, the use of Code Case N-616 will only apply to bolted connections where the associated valve bodies, pump casings and piping contain a minimum of 10 percent chromium and are in the proper heat treatment condition.



## Relief Request No. 16 (Continued)

Alternate Testing (continued) If evidence of leakage is detected, either by discovery of active leakage or evidence of boric acid crystals, the insulation shall be removed and the bolted connection shall be re-examined and, if necessary, evaluated in accordance with the corrective measures of Section XI, Sub-Article IWA-5250, as modified by APS Relief Request No. 12, which was approved by the NRC on April 26, 1999.

Basis for Relief Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternative will provide an acceptable level of quality and safety. Specifically, relief is requested to use Code Case N-616, which provides an alternative to the ASME, Section XI, IWA-5242(a) requirement to remove insulation for visual VT-2 examination of bolted connections during system pressure testing.

In lieu of removing insulation at bolted connections for the sole purpose of performing visual VT-2 examination, when the bolting is fabricated from the corrosion resistant materials shown above, the use of Code Case N-616 provides an acceptable level of quality and safety. Corrosion resistant bolted connections on borated systems consist of materials with chromium content greater than or equal to 10%, which are resistant to boric acid corrosion. The basis for a minimum chromium content being used as a measure of susceptibility to degradation is established in ASME Section XI Code Case N-616, "Alternative Requirements for VT-2 Visual Examination of Class 1, 2, and 3 Insulated Pressure-Retaining Bolted Connections, Section XI, Division 1." Code Case N-616 has been approved by ASME and is published in Supplement 6 to the 1998 Edition of ASME Section XI, 1998 Code Cases. During previous refueling outages at PVNGS, Class 1 bolted connections have been inspected with insulation removed in accordance with IWA-5242(a) and APS Relief Request No. 11 (Code Case N-533). The bolted connections did not exhibit any evidence of degradation due to boric acid corrosion. Where boric acid residues were discovered and corrosion resistant bolting removed, no corrosion was evident on the bolting material. These results were consistent with expectations that no boric acid corrosion degradation mechanism exists on the corrosion resistant materials.

Additionally, Code Class systems borated for the purpose of controlling reactivity are extensive and consist of large systems covering many areas inside the containment bioshield on multiple elevations. Scaffolding is required to access many of the bolted connections. In addition, many of the bolted connections are located in medium to high radiation areas. Insulation removal combined with scaffolding requirements is burdensome due to increased outage resource requirements, increased costs associated with implementation and

## Relief Request No. 16 (Continued)

Basis for Relief (continued)	outage duration, and increased radiation exposure. Many of these same costs are incurred utilizing the relief provided by Code Cases N-533 and N-533-1. Therefore, utilizing the relief provided by Code Case N-616, where the appropriate corrosion resistant bolting material is used, will reduce these effects significantly.
Approval	APS has determined that the use of Code Case N-616 will provide an acceptable level of quality and safety. Therefore, relief is requested in accordance with 10 CFR 50.55a(a)(3)(i). This relief request pertains to the Second 10-Year Interval Inservice Inspection Program for PVNGS Units 1, 2, and 3. APS will not implement this alternative without prior authorization from the NRC.
Precedent	<ol style="list-style-type: none"><li>1. The NRC Staff has approved a similar alternative for the use of Code Case N-616 by letter dated October 31, 2000 from R. A. Gramm, NRC to C. M. Dugger, Entergy Operations, Waterford Steam Electric Station, Unit 3 – Relief Request Related to Pressure-Retaining Bolted Connections in Class 1, 2 and 3 Borated Systems (TAC. No. MB0010).</li><li>2. The NRC Staff has also approved the use of Code Case N-616 by letter dated October 19, 2000 from S. Dembek, NRC to G. M. Rueger, Pacific Gas and Electric Company, Diablo Canyon Nuclear Power Plant – Relief Request PRS-6 – Use of the American Society of Mechanical Engineers Code Case N-616 (TAC Nos. MA9292 and MA9203).</li></ol>
References	<ol style="list-style-type: none"><li>1. ASME Section XI, Rules for Inspection and Testing of Components of Light Water Cooled Plants 1992 Edition and Addenda, Articles IWA-5000, IWB-5000, IWC-5000, and IWD-5000</li><li>2. ASME Code Case N-616, Alternative Requirements for VT-2 Visual Examination of Classes 1, 2, and 3 Insulated Pressure Retaining Bolted Connections</li><li>3. ASME Code Case N-533, Alternative Requirements for VT-2 Examination of Class 1 Insulated Pressure-Retaining Bolted Connections</li><li>4. NRC Generic Letter 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants</li></ol>

Relief Request No. 16 (Continued)

References  
(continued)

5. Letter dated October 31, 2000 from R. A. Gramm, NRC to C. M. Dugger, Entergy Operations, Waterford Steam Electric Station, Unit 3 – Relief Request Related to Pressure-Retaining Bolted Connections in Class 1, 2 and 3 Borated Systems (TAC. No. MB0010).
  
6. Letter dated October 19, 2000 from S. Dembek, NRC to G. M. Rueger, Pacific Gas and Electric Company, Diablo Canyon Nuclear Power Plant – Relief Request PRS-6 – Use of the American Society of Mechanical Engineers Code Case N-616 (TAC Nos. MA9292 and MA9203).