



Palo Verde Nuclear
Generating Station

Dwight C. Mims
Vice President
Regulatory Affairs and Plant Improvement

Tel. 623-393-5403
Fax 623-393-6077

Mail Station 7605
P. O. Box 52034
Phoenix, Arizona 85072-2034

102-05876-DCM/RJR
August 04, 2008

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

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 2
Docket No. STN 50-529
APS's 60-Day after Plant Restart Letter in Response to First Revised
NRC Order EA-03-009, Item IV.E and Confirmatory Action Letter,
NRR-07-004, Dated March 15, 2007 – U2R14

By letter dated February 20, 2004, the NRC issued to Arizona Public Service Company (APS) the First Revised NRC Order EA-03-009. Item IV.E of EA-03-009 requested that a 60-day report detailing the inspection results of the reactor pressure vessel (RPV) head be submitted to the NRC upon returning each unit to operation.

The enclosure to this letter contains the following requested information for Unit 2's fourteenth refueling outage (U2R14):

- Inspection results for each inspection required by Paragraph C of the Order.
- Inspection results for each inspection required by Paragraph D of the Order.

By letter dated March 15, 2007, the NRC issued to APS a Confirmatory Action Letter (CAL) for PVNGS Units 1, 2, and 3. The CAL confirmed commitments made by APS regarding Alloy 600/82/182 butt welds of the Palo Verde pressurizers.

This letter is to notify the NRC that the commitment made in APS letter 102-05640, dated January 31, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML070430378), regarding the mitigation of the Palo Verde Unit 2 pressurizer Alloy 600/82/182 butt welds was completed during U2R14 and post mitigation inspections were performed. The results of these inspections were initially reported to the NRC Project manager within 14 days of completion of the overlays as required by the stated action in APS letter 102-05641, dated February 08, 2007 (ADAMS Accession No. ML070470525). This information is repeated below as required by our commitment in APS letter 102-05640.

A101
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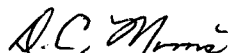
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The ultrasonic examinations of the weld overlay installations in Unit 2 were completed on May 10, 2008. The nine full-structural weld overlays (FSWOL) on the Unit 2 Pressurizer Surge, Hot Leg Surge, Hot Leg Shutdown Cooling (2), Pressurizer Spray and Pressurizer Safety/Relief Nozzles (4) were examined using the liquid penetrant (PT) and phased array ultrasonic examination (UT) methods as required by Relief Request 36. The UT examinations were performed using Structural Integrity Associates, Inc.'s Performance Demonstration Initiative qualified ultrasonic examination procedure and examiners. One laminar indication was identified in the Pressurizer Safety/Relief Nozzle, SRV 202 and was dispositioned as acceptable. Since no unacceptable flaw indications were detected in the overlays, no repairs were needed

As a result of the completion of the mitigation of the Palo Verde Unit 2 pressurizer Alloy 600/82/182 butt welds discussed above, APS has satisfied the commitment to mitigate these welds and is no longer performing enhanced RCS leakage monitoring in Palo Verde Unit 2. This letter also is to notify you that APS has completed the actions and commitments addressed in the Confirmatory Action Letter dated March 15, 2007.

APS completed the Palo Verde Unit 2 14th refueling outage on June 5, 2008. No new commitments are being made to the NRC by this letter. Should you have questions regarding this submittal, please contact Russell A. Stroud at (623) 393-5111.

Sincerely,



DCM/RAS/RJR/gat

Enclosure: Palo Verde Unit 2 60-Day Report Detailing the Inspection Results of the Reactor Pressure Vessel Head during the 14th Refueling Outage

cc: E. E. Collins Jr. NRC Region IV Regional Administrator
M. T. Markley NRC NRR Project Manager
R. I. Treadway NRC Senior Resident Inspector

Assistant General Counsel for Materials Litigation and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Secretary,
Office of Secretary of the Commission
ATTN: Rulemakings and Adjudications staff
Washington, DC 20555-0001

Enclosure

**Palo Verde Unit 2 60-Day after Outage Report
for the 14th Refueling Outage**

First Revised NRC Order EA-03-009

At the start of the Palo Verde Unit 2 14th refueling outage (U2R14) in the spring of 2008, the effective degradation years (EDY) were calculated as 15.01 EDY, which places Palo Verde Unit 2 reactor pressure vessel (RPV) head in the high susceptibility category.

Results of the Inspection Required by Paragraph IV.C

First Revised NRC Order EA-03-009 IV.C.(1) states that:

For those plants in the High Susceptibility category, RPV head and head penetration nozzle inspections shall be performed using the techniques of paragraph IV.C.(5)(a) and paragraph IV.C.(5)(b) every refueling outage.

- IV.C.(5)(a) Bare metal visual examination of 100 percent of the RPV head surface (including 360° around each RPV head penetration nozzle). For RPV heads with the surface obscured by support structure interferences which are located at RPV head elevations downslope from the outermost RPV head penetration, a bare metal visual inspection of no less than 95 percent of the RPV head surface may be performed provided that the examination shall include those areas of the RPV head upslope and downslope from the support structure interference to identify any evidence of boron or corrosive product. Should any evidence of boron or corrosive product be identified, the licensee shall examine the RPV head surface under the support structure to ensure that the RPV head is not degraded.
- (b) For each penetration, perform a nonvisual NDE in accordance with either (i), (ii) or (iii):
- (i) Ultrasonic testing of the RPV head penetration nozzle volume (i.e., nozzle base material) from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or the bottom of the nozzle if less than 2 inches [see Figure IV-1]); OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0-inch below the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operation stresses) of 20 ksi tension and greater (see Figure IV-2). In addition, an assessment shall be made to determine if leakage has occurred into the annulus between the RPV head penetration nozzle and the RPV head low-alloy steel.

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- (ii) Eddy current testing or dye penetrant testing of the entire wetted surface of the J-groove weld and the wetted surface of the RPV head penetration nozzle base material from at least 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or the bottom of the nozzle if less than 2 inches [see Figure IV-3]); OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0-inch below the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operation stresses) of 20 ksi tension and greater (see Figure IV-4).
- (iii) A combination of (i) and (ii) to cover equivalent volumes, surfaces and leak paths of the RPV head penetration nozzle base material and J-groove weld as described in (i) and (ii). Substitution of a portion of a volumetric exam on a nozzle with a surface examination may be performed with the following requirements:
 1. On nozzle material below the J-groove weld, both the outside diameter and inside diameter surfaces of the nozzle must be examined.
 2. On nozzle material above the J-groove weld, surface examination of the inside diameter surface of the nozzle is permitted provided a surface examination of the J-groove weld is also performed.

IV.C.(5)(a) Bare Metal Visual Examination Results

This examination was conducted in accordance with the requirements of the First Revised Order with no relaxations. A visual examination of the "bare-metal" surface of the reactor head found no evidence of boron or corrosion. No cleaning of the RPV head was necessary during U2R14.

IV.C.(5)(b) Nonvisual Nondestructive Examination (NDE) Results:

Nonvisual NDE was performed in accordance with the requirements of the First Revised NRC Order EA-03-009 Section IV.C.(5)(b) and approved relaxations.

Reactor Head Vent Nozzle:

The U2 head vent nozzle was repaired during the last refueling outage (U2R13). During this outage the inside diameter (ID) of the vent nozzle was examined by eddy current testing (ET) and the j-weld was examined by liquid penetrant testing (PT). The results

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of the examinations were acceptable with no primary water stress corrosion cracking (PWSCC) indications detected.

Control Element Drive Mechanisms (CEDM):

All 97 CEDM nozzles were examined in accordance with Order requirement IV.C (5)(b). All 97 CEDM nozzles examination results were satisfactory. No indications were identified as special interest that required additional examinations to be performed. There were no indications of PWSCC detected.

Results of the Inspection Required by Paragraph IV.D

First Revised NRC Order EA-03-009 Section IV.D. states:

During each refueling outage, visual inspections shall be performed to identify potential boric acid leaks from pressure-retaining components above the RPV head. For any plant with boron deposits on the surface of the RPV head or related insulation, discovered either during the inspections required by this Order or otherwise and regardless of the source of the deposit, before returning the plant to operation the Licensee shall perform inspections of the affected RPV head surface and penetrations appropriate to the conditions found to verify the integrity of the affected area and penetrations.

First Revised NRC Order EA-03-009 Section IV.D. Results:

APS personnel performed a Boric Acid Walkdown (BAW) for the U2R14 refueling outage. BAW inspections completed in Mode 3 just prior to the start of the refueling outage revealed no boric acid leakage sites. Potential boric acid leak sites from pressure retaining components above the RPV Head were examined using PVNGS procedure 70TI-9ZC01, Boric Acid Corrosion Prevention Program. At the end of U2R14, four new leak sites from pressure retaining components above the RPV Head were found.

CEDM Versa Vents 12, 18, 42 and 66 were found to have a dried boric acid indication. However, there were no active leaks and all of the leakage/boric acid residue stayed in the immediate area of the Versa Vent (the leakage/boric acid residue did not make it down to the reactor head or related insulation) and there was no carbon steel affected. The dry residue was cleaned from Versa Vents 42 and 66. The dry residue on Versa Vents 12 and 18 was not cleaned, as this would have required a major disassembly of the CEDM main power and position indication cables to access these vents.

Since no carbon steel is affected and no site was an active leak, Palo Verde Action Requests (PVAR) 3180903, 3181275, 3182516, and 3182517 were initiated to rework these Versa Vents in the next available Palo Verde Unit 2 outage.