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SUBJECT: Responds to NRC 960611 ltr re violations noted in insp rept
50-528/529/530/96-06. Corrective actions: removed fuel
assembly P2F003, repaired damaged tubes on Upper Guide
Structure & revised Procedure 31MT-9RC33.

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Arizona Public Service

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P.O. BOX 52034 PHOENIX, ARIZONA 85072-2034

102-03728-WLS/AKK/RJH

July 03, 1996

WILLIAM L. STEWART
EXECUTIVE VICE PRESIDENT
NUCLEAR

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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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
Reply to Notice of Violation 50-529/96-06-01

Arizona Public Service Company (APS) has reviewed NRC Inspection Report 50-528/529/530/96-06 and the Notice of Violation (NOV) dated June 11, 1996. Pursuant to the provisions of 10 CFR 2.201, APS' response is enclosed.

In response to the concerns identified in the Inspection Report, APS believes that the combination of weak procedure controls, incorrect assumptions made by personnel in charge of moving the Upper Guide Structure (UGS), and a less than optimum design of the UGS alignment system all contributed to the root cause of failure for damaging the control element assembly guide tubes and UGS.

The subject violation identified that a failure to translate into the procedure adequate measures to assure the design basis of the upper guide structure was maintained resulted in damage to the guide tubes during movement of the UGS. APS' investigation of this issue revealed that the procedure weakness alone did not cause damage to the UGS, rather a combination of design, procedure controls, and work practices all contributed to the root cause. APS believes that past program controls and management expectations for UGS removal and installation during refueling operations, in general, were clearly established. A review of the maintenance history for the previous sixteen refueling outages indicated that inadequate implementation of these controls may have contributed to five events involving potential damage to components of the UGS or lifting rig.

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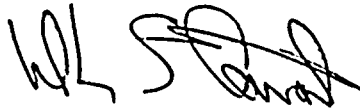
Reply to Notice of Violation 50-529/96-06-01

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In summation, APS believes that the lessons learned and experiences gained from this event have heightened the awareness of plant personnel to potential risks associated with movement of the UGS. In addition, the combination of procedure changes, personnel training, and modifications to the alignment system should ensure that no future damage to the UGS will occur.

Should you have any further questions, please contact Ms. Angela K. Krainik at (602) 393-5421.

Sincerely,

A handwritten signature in black ink, appearing to be 'WLS' followed by a stylized flourish.

WLS/AKK/RJH/pv
Enclosure

cc: L. J. Callan
J. W. Clifford
K. E. Johnston
K. E. Perkins
D. A. Powers



ENCLOSURE

RESTATEMENT OF NOTICE OF VIOLATION 50-529/96-06-01

AND

REPLY TO NOTICE OF VIOLATION 50-529/96-06-01

NRC INSPECTION CONDUCTED MARCH 26, 1996

THROUGH MAY 22 , 1996

INSPECTION REPORT No. 50-528/529/530/96-06



RESTATEMENT OF NOTICE OF VIOLATION 50-529/96-06-01

During an NRC inspection conducted on March 26 through May 22, 1996, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," (60 FR 34381; June 30, 1995), the violation is listed below:

Criterion III of Appendix B to 10 CFR Part 50 states, in part, that measures shall be established to assure that the design basis as specified in the license application for those structures, systems, components to which this appendix applies, are correctly translated into specifications, drawings, procedures and instructions.

The Palo Verde Nuclear Generating Station Updated Final Safety Analysis Report references Combustion Engineering Standard Safety Analysis Report. Section 3.9.5.12 of the Combustion Engineering Standard Safety Analysis Report states that the design basis of the upper guide structure is to align and laterally support the upper end of fuel assemblies within the vessel. This is accomplished by the upper guide structure suspended guide tubes, which were designed to engage the guide posts on the fuel assemblies and, therefore, position the upper end of fuel assemblies within the core.

For landing the upper guide structure on its support storage stand, Procedure 31MT-9RC33, "Reactor Vessel Upper Guide Structure Removal and Installation," Revision 5, Step 4.6.60, states, lower the upper guide structure onto the upper guide structure storage stand at slow speed, aligning upper guide bushing with alignment rods. For lifting the upper guide structure from its storage stand. Step 4.9.17 states, in part, lift the upper guide structure until the lower alignment plate is at approximately 138 feet.

Contrary to the above, measures specified in Procedure 31MT-9RC33, to assure the maintenance of the design basis of the upper guide structure, were inadequate. This resulted in damage to the guide tubes during movement of the structure. The damage occurred on February 10, 1995, when the Unit 2 upper guide structure was lowered onto the storage stand. and/or on March 6, 1995, when it was lifted from its storage stand. This damage, in turn, caused significant structural damage to Fuel Assembly A07 when the upper guide structure was placed into the reactor vessel.

This is a Severity Level IV violation (Supplement 1)(528/9606-01).



REPLY TO NOTICE OF VIOLATION 50-529/96-06-01

Reason For The Violation

PVNGS accepts the violation.

On March 24, 1996 during the core off load conducted for Unit 2, 6th refueling outage (U2R6), the fuel assembly located in core location A07 (assembly number P2F003) could not be removed from the core using the refueling machine. A visual inspection using an underwater camera and video monitor revealed that the hold down plate, upper end fitting, and spacer grids on assembly A07 were about 0.5 inches below adjacent assemblies in A06 and A08. Several fuel pins were also noted to be extending below the lower flow plate on the assembly lower end fitting (LEF). In addition, the height reading from the refueling machine (Z coordinate) was 0.7 inches lower than the as-left reading from the previous core load conducted in March 1995. Further video camera inspections also revealed that the forces applied to the fuel assembly caused the assembly legs to splay (bend outward). This caused binding forces on the core support plate alignment pins which prevented the fuel assembly removal by normal fuel handling machine tools.

In order to remove the fuel assembly, two of the legs on the assembly lower end fitting were cut to relieve the forces holding the assembly in the core and a special rigging was placed on the assembly to ensure the assembly remained intact so that no fuel pin damage occurred while moving the assembly. The assembly was then transferred to the spent fuel pool.



Reason For The Violation (cont.)

A partial video inspection of the UGS in its storage location was conducted. The inspection revealed a deformation of the guide tube that fits over the northeast guide post for core location A07. Further inspections of the UGS identified deformities of varying degrees on several other guide tubes.

The UGS North East guide tube for the A07 assembly location was deformed to the extent that a fuel assembly guide post could not properly engage the tube. Consequently, when the UGS was lowered into the reactor vessel during 2R5, the A07 fuel assembly was damaged.

Based on the design of the alignment system which allowed the guide tubes to come into contact with the laydown pads before positive alignment occurred and the incorrect assumption that no damage to the UGS would occur if the alignment bushing is higher than the alignment rods, the investigation team determined that the root causes of the A07 CEA guide tube damage (and other tubes in the vicinity of the laydown pads) are:

- An inadequate design of the alignment system for placing the UGS into the storage pit. The design does not ensure positive alignment prior to the guide tubes being able to come into contact with the laydown pads.
- An incorrect assumption by personnel in charge of the UGS lift that as long as the upper alignment bushings were higher than the alignment rods in the UGS pit the UGS would not be damaged by the laydown pads.

Corrective Steps That Have Been Taken and Results Achieved

1. The fuel assembly P2F003, which was in the A07 location, has been removed from the core and is currently stored in the spent fuel pool.
2. The damaged tubes on the UGS have been inspected and successfully repaired and the UGS was successfully reinstalled in the reactor vessel.
3. Additional inspections of the refueling pool seal were performed to ensure that the seal ring was not damaged, and the results indicated that no damage to the seal had occurred.
4. Procedure 31MT-9RC33, "Reactor Vessel Upper Guide Structure Removal and Installation" has been revised to require additional verification to ensure that the height of the UGS lift rig lower alignment plate is at or above 138'6" elevation prior to performing any lateral movement. As an additional enhancement, the procedure was revised to also recommend using an underwater camera to assist in verifying UGS clearances prior to movement.

Corrective Steps That Will Be Taken To Avoid Further Violations

1. Additional inspections of the UGS guide tubes are currently scheduled for Units 1 and 3 during their respective refueling outages.
2. Evaluations are currently ongoing to analyze the data from Unit 2 and will continue to also include data obtained from Units 1 and 3 to compare the results to determine differences and similarities regarding the potential mechanism of damage.
3. Alternate methods are currently being considered to modify the UGS alignment system to include a more positive mechanism of alignment. Design changes will be initiated and presented to a management review team for approval by the end of August, 1996. The design change will then be implemented in each Unit during their respective scheduled refueling outages.



4. A review of PVNGS procedures, training, design, process control, and performance experience will continue and be integrated as lessons learned into Industry Events training. In order to maintain sensitivity to this issue, appropriate departments will receive this training prior to the Unit 1 refueling outage.

Date When Full Compliance Will Be Achieved

Fuel Assembly A07 was removed from the stuck position on the core support plate on April 7, 1996, at approximately 5:15 a.m. and placed in a quarantined storage area in the Unit 2 spent fuel pool on April 8, 1996, at approximately 3:40 a.m.

The UGS was inspected and repaired to meet its design function and returned to service by placing the UGS into the reactor vessel with no apparent problems on April 23, 1996.

Long term corrective actions to implement a design change to install a more positive alignment system will be completed during each Unit's respective refueling outage with the final installation scheduled for Unit 2 in November 1997.

