REQUEST FOR ADDITIONAL INFORMATION
RELIEF REQUEST 53
ALTERNATE REPAIR OF PRESSURE INSTRUMENTATION NOZZLE
AT REACTOR COOLANT PUMP 2A
PALO VERDE NUCLEAR GENERATING STATION, UNIT 3 (TAC NO. MF6083)
ARIZONA PUBLIC SERVICE COMPANY
DOCKET NUMBER 50-530

By letter dated April 17, 2015, Arizona Public Service Company (APS or the licensee) submitted Relief Request 53 regarding the repair of the differential pressure instrumentation nozzle on the suction side of the 2A reactor coolant pump at Palo Verde Nuclear Generating Station, Unit 3. To complete its review, the NRC staff requests the additional information (RAI) as follows:

Letter dated April 17, 2015, "American Society of Mechanical Engineers (ASME) Code, Section XI, Request for Approval of an Alternative to Flaw Removal - Relief Request 53," Non-Proprietary (Publically available)

1. Section 1, "ASME Code Components Affected," on Page 3 of the relief request identifies the pressure instrument nozzle being classified as Examination Category B-P (Class 1 PWR Components Containing Alloy 600/82/182) and Code Item Number B15.205. However, in the ASME Code, Section XI, Table IWB-2500-1, Code Item number B15.205 does not belong to or match Examination Category B-P. Also, Class 1 pressure retaining dissimilar metal welds in vessel nozzles should be classified as Examination Category B-F, not B-P. Item Number B15.205 does appear in Table 1, "Examination Categories," of Code Case N-722-1, but not in the ASME Code. Clarify the exact Examination Category and Item Number of the pressure instrument nozzle and provide the reference.

2. The design of the half nozzle repair includes a gap of 0.06 inch between the remnant nozzle and the new nozzle. Discuss the calculations that were made to ensure that the 0.06 inch gap is sufficient for the thermal expansion of the remnant nozzle and new nozzle. If no calculations were performed, provide a justification.

3. Provide a piping isometric showing the locations and distances of pipe hangers and restraints along the pressure instrument line from the instrument nozzle attached to the reactor coolant pump to the first anchor.

Attachment 3 – APS Response to NRC Request for Additional Information (RAI), dated April 14, 2015

4. The licensee's response to NRC's RAI Question No. 3(c) did not address the frequency of the boric acid walkdown for the subject repaired instrument nozzle for the future inservice inspections.
    a. Discuss how often the repaired instrument nozzle will be examined in future inservice inspections.

b. After the repair, discuss under which Examination Category and Examination Item will the new J-groove weld be classified in accordance with the ASME Code, Section XI, Table IWB-2500-1.

5. In the PCI Quality Assurance Traveler on Page 12 of 18, Sequence Number 9.1.22 states that APS to perform liquid penetrant examination of all machined surfaces of the replacement nozzle. Sequence Number 9.1.25 instructs APS to perform liquid penetrant examination of weld preparation area on the casing of the reactor coolant pump. After a portion of the original nozzle is removed from the bore of the safe end, clarify whether the inside diameter surface of the bore will be examined by liquid penetrant testing prior to inserting the new Alloy 690 nozzle. If not, discuss how to ensure the bore contains no scratches or flaws.

Letter dated April 17, 2015, "Transmittal of Proprietary Documents for Relief Request 53," Proprietary Attachments (Non-public)

Attachment 1 – Westinghouse Document DAR-MRCDA-15-6-P, Rev. 1*, Palo Verde Unit 3 RCS [Reactor Coolant System] Cold Leg Alloy 600 Small Bore Nozzle Repair*

6. Page 8 states that the fatigue usage factor for the cold leg piping is W. Discuss whether a usage factor of W is calculated for the end of one cycle of operation or for the end of plant's 40 years of operation.

Attachment 2 – Westinghouse Calculation CN-MRCDA-15-13, Rev. 0, *Qualification of Palo Verde Unit 3 Reactor Coolant Pump Replacement Instrumentation Nozzle*

7. The licensee uses the stress analysis that Westinghouse performed for Plant X to apply to Palo Verde, Unit 3. Figure 4-1, "Plant X and Palo Verde Unit 3 Instrumentation Nozzle Layout," on Page 13 presents the location of the new J-groove weld at Palo Verde and the analyzed J-groove weld at Plant X. The J-groove weld at Plant X is located inside surface of the pipe whereas the new J-groove weld at Palo Verde is located at the outside surface of the safe end. The licensee stated that the impact of thermal and pressure transient loads will be less significant than those on the Plant X attachment weld. Discuss the impact of the different weld locations on all analyses and calculations involved in the repaired instrument nozzle at Palo Verde.

8. Clarify which results of Plant X analysis are applicable to the subject instrument nozzle and which results of Plant X analysis are not applicable. Clarify which analysis is performed using the plant-specific parameters from Palo Verde.

9. On Page 18, Table 4-2, "Nozzle Mechanical Loads," shows that Fx and Fz have zero load for the normal condition, whereas for the faulted condition, Fx and Fz have 19 pounds (lbs) each.
    a. Confirm that the 19 lbs for the faulted condition is bounding for all faulted conditions including seismic loading.
    b. Clarify why Fx and Fz have zero load for the normal condition.

   c. Discuss why the nozzle mechanical loads are so low considering that five mechanical loads are applied to the nozzle, as discussed on Page 13 and 14.

10. On Page 24, Table 5-6, “Attachment Weld Input Loads,” presents an axial load of 0.8 pound force on the new weld for the normal condition. Explain why the axial load is so low.

Attachment 3 – Westinghouse Calculation CN-PAFM-15-20, Rev. 2, *Palo Verde Unit 3 RCS Cold Leg Alloy 600 Small Bore Nozzle Repair Transient Stress and Fracture Mechanics Evaluation for One Cycle Operation*

11. Page 10 states that the corrosion allowance for the bore of the subject nozzle should be larger than the corrosion allowance (X inches) for the hot leg nozzles.
    a. Clarify why the cold leg corrosion allowance for the bore is larger than the corrosion allowance for the hot leg nozzles.
    b. It appears that the corrosion allowance is rather large such that the bore may not provide any friction to resist the nozzle ejection load. Discuss whether the new J-groove weld can support the entire nozzle ejection load without the support of the friction from the ID surface of the bore.

12. Page 15 states that the allowable flaw size evaluation performed for a hot leg nozzle repair would be conservatively representative for the Palo Verde Unit 3 RCP suction safe end instrumentation nozzle. Provide the allowable flaw size associated with the RCP suction safe end.