

**Incoming Form for Request for Alternative under 10 CFR 50.55a(z)(1)  
and 10 CFR 50.55a(z)(2)**

Nov 05, 2020

1. Title of Project:  
Relief Request 66 - Unit 2, Request for Relief from Containment Tendon Inspections
2. Licensee:  
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6. Plant Name:  
Palo Verde
7. Plant Unit(s):  
["2"]
8. Docket Number(s):  
05000529
9. License Number(s):  
NPF-51
10. Requested Completion Date:  
2020-11-20
11. Applicable Regulation and Inservice Inspection (ISI) or Inservice Testing (IST):  
10 CFR 50.55a (z)(2) ISI
12. Proposed Alternative Number or Identifier:  
Relief Request 66
13. Applicable American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code, or ASME Operations and Maintenance (OM) Code, Edition and Addenda:

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code, Section XI, 2007 Edition through the 2008 Addenda, "Rules for Inservice Inspection of Nuclear Power Plant Components"

14. ISI or IST Program Interval Number and start/end dates (as applicable):

Second Interval IWL: August 1, 2011 to July 31, 2021

15. ASME Code Class:

ASME Class CC

16. Applicable Components and/or System Description (if applicable):

Examination Category L-B; Unbonded Post-Tensioning Systems

17. Describe the Applicable Code Requirements:

IWL-2420 Unbonded Post-Tensioning Systems, states:

"(a) Unbonded post-tensioning systems shall be examined in accordance with IWL-2520 at 1, 3, and 5 years following the completion of the containment Structural Integrity Test and every 5 years thereafter.

(c) The 10-year and subsequent examinations shall commence not more than 1 year prior to the specified dates and shall be completed not more than 1 year after such dates. If plant operating conditions are such that examination of portions of the post-tensioning system cannot be completed within this stated time interval, examination of those portions may be deferred until the next regularly scheduled plant outage," Reference 1.

APS is currently in the "subsequent examinations" period, as the specified date (i.e., the anniversary date) for the 35th surveillance year is February 8, 2020. Therefore, the Unit 2 PVNGS deadline for the completion of the inspection is February 8, 2021.

IWL-2421 Sites With Multiple Plants, states, "For sites with multiple plants, the examination requirements, for the concrete containments may be modified if the containments utilize the same prestressing system and are essentially identical in design, if post-tensioning operations for each subsequent containment constructed at the site were completed not more than 2 years apart, and if the containments are similarly exposed to or protected from the outside environment," Reference 1.

PVNGS is a multiple unit site. All three units utilize the same pre-stressing system, are essentially identical in design, and are similarly exposed to the outside environment. The post-tensioning operation for each subsequent containment structure was completed within two years of each other. Because the conditions of IWL-2421(a) are met the PVNGS Unit 2 surveillances are scheduled in compliance with IWL-2421(b)(2). This means all examinations required by IWL-2500 shall be performed at 1, 5, and 15 years and every 10 years thereafter. Only the examination required by IWL-2524 and IWL-2525 need to be performed at 3 and 10 years and every 10 years thereafter.

18. Reason for Request:

Relief is requested pursuant to 10 CFR 50.55a(z)(2) – “Hardship without a compensating increase in quality and safety,” Reference 2.

The U.S. Federal Government has made a COVID-19 declaration of emergency pursuant to the Stafford Act on March 13, 2020. The U.S. Center for Disease Control (CDC) has determined that COVID-19 poses a serious public health risk. The CDC identified the majority of U.S. states reporting community spread of COVID-19. The CDC continues to recommend social distancing and the use of masks as it applies to COVID-19. The CDC defines social distancing as "remaining out of congregate settings, avoiding mass gatherings, and maintaining distance (approximately 6 feet or 2 meters) from others when possible."

In response to the COVID-19 Pandemic and to comply with CDC guidance, APS established the Pandemic Plan. Currently APS is in Stage 3, Advanced, of the Pinnacle West/APS Pandemic Plan. The following guidelines and restrictions are currently in place at PVNGS:

1. Employees who do not have a critical need to be at APS facilities must work remotely
2. Employees who must work from an APS facility are to practice strict social distancing

Currently APS does not have the internal capability and equipment to perform the inspection and this must be done by the vendor. Ten contractors needed to perform the containment tendon inspections have recently travelled to states that have confirmed cases of COVID-19 (Arkansas, South Carolina, North Carolina, Illinois, and Indiana). The U.S. CDC identifies higher rates of infection per 100,000 in the last week in each state the contractors are traveling from than the current rate in Arizona. In general, this work activity involves a team of people working in close proximity and does not allow for social distancing which can be a large contributor towards the spread of the virus.

19. Brief Description of the Proposed Alternative (500 characters or less):

APS is proposing a one-time, one-year extension of the Containment Post-Tensioning System Inspection period to allow time to safely and effectively accomplish the inspection.

20. Full Description of the Proposed Alternative:

Pursuant to 10 CFR 50.55a(z)(2), APS hereby requests NRC approval of Relief Request 66 regarding the interval between containment tendon inspections as specified per Paragraph IWL-2420 of the ASME BPV Code, Section XI, Subsection IWL, Reference 1. Relief is requested on the basis that compliance with the Code-specified inspection interval during the COVID-19 pandemic would result in hardship without a compensating increase in the level of quality and safety.

Due to the hardship caused by potential spread of COVID-19 to PVNGS personnel and the surrounding community as well as the travel restrictions and quarantine requirements affecting outside contractors. APS is proposing a one-time, one-year extension of the Containment Post-Tensioning System Inspection period to allow time to safely and effectively accomplish the inspection.

The duration of the proposed alternative would extend from the current February 8, 2021 deadline for performing the Unit 2, 35th year IWL Containment Post-Tensioning System Inspection until February 8, 2022.

21. If needed, include additional information for Question 20:

[21. If needed, include additional information for Question 20:]

22. Description of the Basis for Use:

The purpose of the Containment Post-Tensioning System Inspection is to assess the structural performance of the containment post-tensioning system and the containment building concrete shell on an ongoing basis, up through and including the plant's period of extended operation. All prior Containment Post-Tensioning System Inspection surveillances have been completed successfully with no abnormal degradation of the containment post-tensioning system identified.

A regression analysis of the lift-off was performed for license renewal application. This analysis demonstrated that the average prestress in tendons should remain above the applicable minimum required values (MRVs) for at least 60 years of operation and that all tendons should, therefore, maintain their design basis function for the extended period of operation, Reference 5.

The Concrete Containment Tendon Prestress Program demonstrated that average prestress in both the vertical tendon group and the horizontal cylinder and horizontal dome tendon subgroups should remain above the applicable MRVs for at least 60 years of operation. Therefore, all tendons should maintain their design basis function for the extended period of operation. The material condition of other components (e.g., concrete, bearing surfaces, grease, buttonheads, etc.) showed only minor degradation in a few areas; none indicating a need for significant corrective action, Reference 5.

23. If needed, include additional information for Question 22:

See Attachment 1 to PVNGS Relief Request 66 for Summary of the Unit 2, 25th and 30th Year Tendon Surveillance Results.

24. For 10 CFR 50.55a(z)(2) proposed alternative, describe Hardship or Unusual Difficulty Without Compensating Increase in the Level of Quality and Safety Associated with Compliance with Applicable Code Requirement. For requests under 10 CFR 50.55a(z)(1), leave this section blank.

On March 13, 2020, President Donald Trump declared the Coronavirus (COVID-19) pandemic a national emergency. In addition, Arizona Governor Doug Ducey declared a state of disaster due to the COVID-19 pandemic on March 11, 2020. The U.S. Center for Disease Control (CDC) has determined that COVID-19 poses a serious public health risk. The CDC identified the majority of U.S. states reporting community spread of COVID-19. Currently APS is operating in accordance with the Pinnacle West/APS Pandemic Response Guideline. Due to the COVID-19 pandemic, there is a desire to minimize the potential of inadvertently spreading the COVID-19 virus to PVNGS personnel from outside contractors who perform examinations and testing for containment tendon. Due to the potential spread of COVID-19 to PVNGS personnel, APS has identified performance of these examinations and testing as a hardship without a compensating increase in the level of quality and safety in accordance with 10 CFR 50.55a(z)(2). As an alternative, APS is proposing a one-time, one-year, extension of the Containment Post-Tensioning System Inspection period to allow time to safely and effectively accomplish the inspection. These examinations in Unit 2 are delineated by ASME, Section XI, Subsection IWL.

25. Proposed duration of the alternative:

The duration of the proposed alternative would extend from the current February 8, 2021 deadline for performing the Unit 2, 35th year IWL Containment Post-Tensioning System Inspection until February 8, 2022.

26. If needed, include any additional information

Technical Specification Section 5.5.6, Pre-Stressed Concrete Containment Tendon Surveillance Program states: "The Tendon Surveillance Program, inspection frequencies, and acceptance criteria shall be in accordance with ASME Code Section XI, Subsection IWL of the ASME Boiler and Pressure Vessel Code and applicable addenda as required by 10 CFR 50.55a, except where an exemption or relief has been authorized by the NRC."

27. Precedents:

Callaway Plant, Unit 1 - Relief Request CC-01 "10 CFR 50.55a Request: Proposed Alternative to ASME Section XI Requirements for Containment Tendon Inspection," References 3 and 4.

28. References (optional):

1. American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section XI, 2007 Edition through 2008 Addenda
2. 10 CFR 50.55a, Code and standards, June 3, 2020
3. Callaway Plant, Unit No. 1 - COVID-19 Relief Request CC-01 Containment Tendon Inspection [Agencywide Documents Access and Management System (ADAMS) Accession No. (ML20097F643)]
4. Callaway Plant Unit 1, 10 CFR 50.55a Request: Proposed Alternative to ASME Section XI Requirements for Containment Tendon Inspection, ADAMS Accession No. ML20097F643
5. Safety Evaluation Report – Related to the License Renewal of Palo Verde Nuclear Generating Station, Unit 1, 2, and 3, ADAMS Accession No. ML11095A011

29. Do you have attachments?

Yes

**Attachment 1  
to  
PVNGS Relief Request 66**

**Summary of the Unit 2, 25<sup>th</sup> and 30<sup>th</sup> Year Tendon  
Surveillance Results**

**4 pages**

## Summary of the Unit 2, 25<sup>th</sup> and 30<sup>th</sup> Year Tendon Surveillance Results

Summary results of the 25<sup>th</sup> and 30<sup>th</sup> Year Tendon Surveillances, performed on Palo Verde's Unit 2, confirmed the functional integrity of the selected post-tensioning system met the applicable code requirements. The minor exception concerning the in-service filler material reserve alkalinity value, was documented in PVNGS corrective action program which addressed the requirements of IWL-3300. Therefore, based on these results, it is reasonable to conclude there is sufficient technical basis to allow for an extension given the post-tensioning system has met the applicable code requirements with no abnormal degradation of the system.

During the 30<sup>th</sup> Year surveillance only examinations required by IWL-2524 and IWL-2525 were performed.

Results for the 25<sup>th</sup> and 30<sup>th</sup> Year are presented for each tendon end examined (12 end caps per surveillance) as follows:

### 1) Grease Cap Removal

#### o 25<sup>th</sup> Year Visual and Physical Tendon Surveillance

Acceptable grease coatings were found on all tendon ends, and no unusual conditions were reported at any tendon end with the exception of H32-026 Shop End, H13-014 Field End, and V-15 Shop End, which reported darker colored grease than normal. Although the color of the grease was darker than expected, the chemical tests of the in-service grease were all within required specifications for moisture content and soluble ions.

#### o 30<sup>th</sup> Year Visual Tendon Surveillance

Acceptable grease coatings were found on all tendon ends and no unusual conditions were reported at any tendon end with the exception of H13-043 Field End and H32-043 Field End, which reported dark colored grease above the shim stack and normal colored grease throughout, and V-29 Shop End, which reported darker colored grease. Although the color of the grease was darker than expected, the chemical tests of the in-service grease were all within specifications for moisture content and soluble ions.

### 2) Free Water Inspection

#### o 25<sup>th</sup> Year Visual and Physical Tendon Surveillance

All inspected tendon ends were found with no evidence of free water and were acceptable per IWL-3221.3(e).

#### o 30<sup>th</sup> Year Visual Tendon Surveillance

All inspected tendon ends were found with no evidence of free water and were acceptable per IWL-3221.3(e).

### 3) Sheathing Filler Analysis

#### o 25<sup>th</sup> Year Visual and Physical Tendon Surveillance

Soluble ion concentrations and moisture contents were within acceptable limits for all inspected tendons, per IWL-3221.4. The reserve alkalinity (base) numbers for the filler material met the acceptance criteria per site procedure. The procedure did not meet Table IWL-2525-1. The procedure

## Attachment 1 to PVNGS Relief Request 66

was corrected as required by a condition report evaluation and an engineering evaluation was performed when this was identified. All reserve alkalinity numbers were greater than zero; therefore, they were acceptable.

- *30<sup>th</sup> Year Visual Tendon Surveillance*

Soluble ion concentrations and moisture contents were within acceptable limits for all inspected tendons, per IWL-3221.4. The original reserve alkalinity (base) numbers for the tendons were unknown, therefore it was not possible to confirm the current reserve alkalinity values met the acceptance criteria of greater than 50 percent of the as installed value. A condition report was written to document this condition and an engineering evaluation was completed to satisfy the requirements of IWL-3300.

#### **4) Anchorage Inspection (Buttonhead Count)**

- *25<sup>th</sup> Year Visual and Physical Tendon Surveillance*

Horizontal Tendons H32-030 Field End, H32-026 Shop End, H32-026 Field End, H13-014 Shop End, H13-014 Field End and Vertical Tendons V-75 Field End, V-08 Shop End were identified as having cracked buttonheads. The cracks did not penetrate into the wire or bisect the button head and did not meet the rejection criteria; therefore, they were acceptable.

Horizontal Tendon H32-026 Field End had one malformed (undersized) button. This buttonhead did not meet the rejection criteria; therefore, it was acceptable.

Horizontal Tendon H32-026 Shop End had one protruding wire after retensioning which was rejected.

- *30<sup>th</sup> Year Visual Tendon Surveillance*

Horizontal Tendons H21-001 Field End, H13-043 Field End, and Vertical Tendons V-29 Shop End, V-75 Field End were identified as having cracked buttonheads. The cracks did not penetrate into the wire or bisect the button head and did not meet the rejection criteria; therefore, they were acceptable.

#### **5) Anchorage Inspection (Corrosion Levels/Cracks)**

- *25<sup>th</sup> Year Visual and Physical Tendon Surveillance*

All inspected tendon anchorage components were found with an acceptable corrosion level of 'A' with the exception of H32-026 Shop End, which had a corrosion level of 'B' which was still acceptable, per IWL-3221.3. No cracks were identified in the anchorheads.

- *30<sup>th</sup> Year Visual Tendon Surveillance*

All inspected tendon anchorage components were found with an acceptable corrosion level of 'A' with the exception of H21-001 Field End, H32-030 Field End, V-29 Field End, and V-75 Field End, which had a corrosion level of 'B' which was still acceptable, per IWL-3221.3. No cracks were identified in the anchorheads.

#### **6) Bearing Plate Concrete Inspection**

- *25<sup>th</sup> Year Visual and Physical Tendon Surveillance*

All cracks observed within the 24" perimeter of the concrete surrounding each inspected bearing plate were less than 0.01" in width, per IWL-

3221.3(d). Only the horizontal tendons had visible concrete surrounding the bearing plate; therefore, data was not collected for the vertical tendons.

o *30<sup>th</sup> Year Visual Tendon Surveillance*

All cracks observed within the 24" perimeter of the concrete surrounding each inspected bearing plate were less than 0.01" in width, per IWL-3221.3(d). Only the horizontal tendons had visible concrete surrounding the bearing plate; therefore, data was not collected for the vertical tendons.

Horizontal tendon H32-043 Field End had surface abrasions on the surrounding concrete due to the forms and it met acceptance criteria.

**7) Anchorhead Measurements**

o *25<sup>th</sup> Year Visual and Physical Tendon Surveillance*

Measurements taken at the anchorheads of all the inspected tendon ends were within the acceptable ranges with respect to the stressing ram adaptor that was used for performing lift-offs at that tendon end.

o *30<sup>th</sup> Year Visual Tendon Surveillance*

Measurements of the anchorhead diameter were recorded; however, because the stressing jack was not used, these measurements were not compared to the stressing jack interior diameter to confirm compatibility.

**8) Hydraulic Jack (Stressing Ram) Calibrations**

o *25<sup>th</sup> Year Visual and Physical Tendon Surveillance*

The hydraulic jacks used for tendon lift-offs were calibrated before and after the surveillance period and were found to be within an acceptable variation of +/- 1.5 percent.

o *30<sup>th</sup> Year Visual Tendon Surveillance*

The hydraulic jack was not used in this surveillance.

**9) Tendon Lift-Off Forces**

o *25<sup>th</sup> Year Visual and Physical Tendon Surveillance*

All as-found tendon lift-off forces exceeded the Prescribed Lower Limit (PLL) value, and thus the 95 percent of the PLL, for the 25<sup>th</sup> Year Surveillance period.

o *30<sup>th</sup> Year Visual Tendon Surveillance*

Lift-offs were not performed during this surveillance.

**10) Wire Visual Inspection and Tensile Testing**

o *25<sup>th</sup> Year Visual and Physical Tendon Surveillance*

All test wires removed and tested were found to have acceptable corrosion levels of 'A', diameter values within the acceptable range, and acceptably high ultimate stress, yield stress, and elongation percent values, per IWL-3221.2.

o *30<sup>th</sup> Year Visual Tendon Surveillance*

Wire visual inspection and tensile testing were not completed during this surveillance.

**11) Tendon Restressing**

- *25<sup>th</sup> Year Visual and Physical Tendon Surveillance*

All detensioned tendons were retensioned to acceptable forces and had acceptable elongations, per IWL-2523.3.

- *30<sup>th</sup> Year Visual Tendon Surveillance*

The tendons were not detensioned during this surveillance; therefore, they were not restressed.

**12) Grease Cap and Grease Replacement**

- *25<sup>th</sup> Year Visual and Physical Tendon Surveillance*

All tendon grease caps were properly installed to their respective tendon ends, and all tendon grease caps were refilled with grease to acceptable levels, per IWL-3221.4.

- *30<sup>th</sup> Year Visual Tendon Surveillance*

All tendon grease caps were properly installed to their respective tendon ends, and all tendon grease caps were refilled with grease to acceptable levels, per IWL-3221.4.

**13) Concrete Examination**

A visual examination of the Unit 2 Concrete Containment's exterior surfaces was completed in August of 2017. No conditions were identified which would require structural repair or more frequent examinations. The condition of the exterior concrete surface was deemed acceptable, per IWL-3211.