



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

COMANCHE PEAK NUCLEAR POWER PLANT, UNIT NO. 1 – APPROVAL OF PROPOSED ALTERNATIVES 1A4-1 AND 1A4-2 FROM CERTAIN REQUIREMENTS OF 10 CFR 50.55a FOR INSERVICE INSPECTION OF NUCLEAR POWER PLANTS (EPID L-2020-LLR-0093 AND EPID L-2020-LLR-0094)

LICENSEE INFORMATION

Licensee: Vistra Operations Company LLC

Licensee Address: Mr. Ken J. Peters
Senior Vice President and Chief Nuclear Officer
Attention: Regulatory Affairs
Vistra Operations Company LLC
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Plant Name(s) and Unit(s): Comanche Peak Nuclear Power Plant, Unit No. 1

Docket No.: 50-445

APPLICATION INFORMATION

Submittal Date: July 14, 2020

Submittal Agencywide Documents Access and Management System (ADAMS) Accession Nos.: ML20196L827 and ML20196L828

Supplement Date: August 5, 2020

Supplement ADAMS Accession No(s).: ML20218A863

Licensee's Proposed Alternative Nos.: 1A4-1 and 1A4-2

Applicable Regulation: Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a(z)(2)

Applicable Code Requirements: 10 CFR 50.55a(g)(6)(ii)(D) and 10 CFR 50.55a(g)(6)(ii)(E)

Applicable Code Edition and Addenda: The 2007 Edition through 2008 Addenda of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI.

Brief Description of the Proposed Alternatives:

The licensee's proposed Alternatives 1A4-1 and 1A4-2 are related to performing the bare metal visual examinations (VEs) of the reactor pressure vessel (RPV) head control rod drive mechanism (CRDM) and the bottom mounted instrumentation (BMI) nozzles, respectively.

The licensee's Alternative 1A4-1 is a request to delay the required bare metal VE for the RPV head CRDM nozzles from refueling outage 1RF21 (fall 2020) to refueling outage 1RF22 (spring 2022) or 1RF23 (fall 2023). These bare metal VEs are required to be performed for Comanche Peak Nuclear Power Plant, Unit No. 1 (Comanche Peak, Unit 1) every 5 years according to the ASME Code Case N-729-4, "Alternative Examination Requirements for PWR [Pressurized Water Reactor] Reactor Vessel Upper Heads with Nozzles Having Pressure-Retaining Partial-Penetration Welds, Section XI, Division 1."

The licensee's Alternative 1A4-2 is a request to delay performing the required BMI nozzle bare metal VE from refueling outage 1RF21 to refueling outage 1RF22. These bare metal VEs are required to be performed every other outage per ASME Code Case N-722-1, "Additional Examinations for PWR [Pressurized Water Reactor] Pressure-Retaining Welds in Class 1 Components Fabricated with Alloy 600/82/182 Materials, Section XI, Division 1." Additional details on the licensee's alternatives can be found in the referenced documents, which are available by their respective ADAMS accession numbers.

Pursuant to 10 CFR 50.55a(z)(2), the licensee requested to use the above alternatives on the basis that complying with certain ASME Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. This hardship was caused by potential spread of the Coronavirus Disease 2019 (COVID-19) virus to Comanche Peak, Unit 1 personnel and the surrounding community. Additionally, outside contractors used to perform these nondestructive examinations at Comanche Peak, Unit 1 are affected and subject to possible travel restrictions and quarantine requirements.

On August 10, 2020 (ADAMS Accession No. ML20224A055), the U. S. Nuclear Regulatory Commission (NRC) verbally authorized the use of several alternatives at Comanche Peak, Unit 1. The NRC staff determined that the proposed alternatives are justified and provide reasonable assurance of structural integrity of the affected components. This safety evaluation documents the technical basis for NRC's verbal authorizations for Alternatives 1A4-1 and 1A4-2.

REGULATORY EVALUATION

Regulatory Basis:

Pursuant to 10 CFR 50.55a(g)(6)(ii)(D), "Augmented ISI [Inservice Inspection] Requirements: Reactor vessel head inspections": (1) All licensees of pressurized water reactors must augment their inservice inspection program by implementing ASME Code Case N-729-4, subject to the conditions specified in paragraphs (g)(6)(ii)(D)(2) through (4) of [10 CFR 50.55a].

Additionally, pursuant to 10 CFR 50.55a(g)(6)(ii)(E), "Augmented ISI requirements: Reactor coolant pressure boundary visual inspections," "(1) All licensees of pressurized water reactors must augment their inservice inspection program by implementing ASME Code Case N-722-1, subject to the conditions specified in paragraphs (g)(6)(ii)(E)(2) through (4) of [10 CFR 50.55a]."

Section 50.55a(z), "Alternatives to codes and standards requirements," of 10 CFR states, in part, that alternatives to the requirements of 10 CFR 50.55a(b)-(h) may be used, when authorized by the Director, Office of Nuclear Reactor Regulation, if (1) the proposed alternatives would provide an acceptable level of quality and safety or (2) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Based on the above, and subject to the following technical evaluation, the NRC staff finds that regulatory authority exists for the licensee to request, and the NRC to authorize, the proposed alternative requested by the licensee.

TECHNICAL EVALUATION

This safety evaluation covers proposed Alternatives 1A4-1 and 1A4-2, electronically submitted to the NRC by Vistra Operations Company LLC. For clarity, the NRC staff's technical evaluation for each of the submittals are documented separately.

The NRC staff noted that there is an ongoing COVID-19 pandemic, which is of sufficient severity and magnitude to warrant an emergency determination under section 501(b) of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121-5207, and the U.S. Centers for Disease Control and Prevention has determined that COVID-19 poses a serious public health risk. The NRC staff noted that due to the COVID-19 pandemic, the licensee will need to limit the number of personnel entering the Comanche Peak site during the October 2020 refueling outage, as well as implement social distancing between onsite workers to minimize the risk of viral transmission. The NRC staff acknowledges that these precautions are necessary to protect Comanche Peak personnel who are relied on to safely operate the plant. Requiring the licensee to complete these examinations during the October 2020 refueling outage to meet Code requirements is contrary to federal guidelines for protecting workers from viral transmission. Therefore, the NRC staff finds that the licensee's hardship justification for proposed Alternatives 1A4-1 and 1A4-2 is acceptable.

Proposed Alternative 1A4-1

The licensee is requesting to delay the bare metal VE for the RPV head CRDM nozzles from refueling outage 1RF21 to refueling outage 1RF23. The licensee has proposed deferral to 1RF23 because of scheduled volumetric examinations for the CRDM nozzles, currently scheduled to be performed during the 1RF22 outage. With its supplement dated August 5, 2020, the licensee clarified that in the event that the currently scheduled volumetric examinations are not performed in 1RF22, then the licensee will perform the bare metal VEs per the requirements of Code Case N-729-6. The licensee will perform a boric acid examination of the head by observing the flange area and inspecting underneath the CRDM cooling shroud support ring gap, looking for signs of active boric acid leakage during 1RF21 and 1RF22 (if bare metal VEs are deferred to 1RF23).

In addition to the above compensatory VEs, the licensee will continue implementation of the unit's leakage monitoring program in accordance with plant technical specifications, procedures, and administrative controls as described in its submittals dated July 14 and August 5, 2020. The ability to monitor effectively for leakage during the upcoming operating cycle will provide for the prompt identification, investigation, and mitigation of leakage to maintain the structural integrity of the reactor coolant pressure boundary components for which examinations were deferred.

The NRC staff also noted that the Comanche Peak, Unit 1 RPV head and CRDM penetration nozzles are fabricated from Alloy 690 with Alloy 52 and 152 welds. A number of nuclear plants have installed replacement RPV head and CRDM penetration nozzles from Alloy 690 with Alloy 52 and 152 welds due to their increased resistance to primary water stress-corrosion cracking (PWSCC). To date, there have been no instances of leakage attributed to PWSCC from these Alloy 690 with Alloy 52 and 152 welds. Therefore, based on the above, the NRC staff finds that licensee's proposed Alternative 1A4-1 is justified and also provides reasonable assurance of adequate protection.

Proposed Alternative 1A4-2

The licensee is requesting to delay the bare metal VE for the BMI nozzles from refueling outage 1RF21 to refueling outage 1RF22. The licensee will perform a boric acid inspection of the bottom head from the peripheral of the reactor mirror insulation package, by removal of insulation panels. The licensee stated that they will remove select insulation panels to gain access that will allow for inspection for any gross active boric acid leakage. The periodicity of the required bare metal examinations (i.e., once every other refueling outage) is meant to detect reactor coolant leakage as a result of PWSCC of the penetration nozzles. The safety concern of such leakage is that it creates an environment that could lead to: (1) initiation and growth of large circumferential cracks, which could potentially result in a nozzle ejection or (2) boric acid corrosion of the low alloy steel lower head assembly. Both of which could lead to a loss-of-coolant accident.

The NRC staff noted that the required BMI bare metal VEs were last performed at Comanche Peak, Unit 1 in the fall of 2017, during the 1RF19 refueling outage. During the 1RF20 refueling outage (spring of 2019) the licensee was not required to perform bare metal VEs of the BMI nozzles, but the licensee did perform boric acid examinations of the bottom head area. The licensee has not observed BMI leaks at Comanche Peak, Unit 1, as a result of those examinations. During the outage in 1RF21 (fall 2020), the licensee proposed to remove select insulation panels to gain access, which allows for inspection for any apparent active boric acid leakage. The NRC staff notes that while this examination will not be of the bare metal head to nozzle annulus surface as required, it would be useful in identifying any larger accumulations of boric acid deposits from potentially leaking nozzles or associated welds. The NRC staff finds that the compensatory VEs, proposed to be performed in fall of 2020 instead of the required bare metal VEs, provide an opportunity for the licensee to identify relatively small leaks provided they were present for a relatively long time (e.g., if they began to leak subsequent the fall 2017 VEs or the boric acid walk downs of spring 2019). This is because even a relatively small leakage of reactor coolant in a PWR, over a long period will become apparent by a relatively large amount of boric acid residue. This leaves the possibility that the licensee may miss the opportunity to identify a relatively small leak at the BMI's that is also so recent that only the required bare metal VEs would have discovered. Given the above and industry operating experience, there is a remote risk that Comanche Peak, Unit 1 may have minor leakage as described above. However, the NRC staff finds that the unit's leakage monitoring program in accordance with plant technical specifications, procedures, and administrative controls, as described in its submittal, can identify significant leakage during the current operating cycle, and take corrective action so that the structural integrity of the BMI nozzles and the bottom head will be maintained. Therefore, based on the above, the NRC staff finds that licensee's proposed Alternative 1A4-2 is justified and also provides reasonable assurance of adequate protection.

CONCLUSION

The NRC staff has determined that complying with the specified requirements described in the licensee's requests referenced above would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The proposed alternatives provide reasonable assurance of the structural integrity of the subject components. The NRC staff concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(2). The NRC authorizes the use of proposed Alternative 1A4-1 at Comanche Peak, Unit 1, until completion of refueling outage 1RF23, currently scheduled for fall 2023. The NRC authorizes the use of proposed Alternative 1A4-2 at Comanche Peak, Unit 1, until completion of refueling outage 1RF22, currently scheduled for spring 2022.

All other ASME BPV Code, Section XI, requirements for which an alternative was not specifically requested and approved remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: Roger Kalikian

Date: January 28, 2021

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