Relief Request Application for BMI Nozzle Penetration Relief Request

1. Title of Project
RELIEF REQUEST - REACTOR VESSEL (RV) BOTTOM MOUNTED INSTRUMENTATION (BMI) NOZZLE PENETRATION EXAMINATION

2. Licensee
Vistra Operations Company LLC (Vistra OpCo)

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6. Plant Identification Number
227551

7. Plant Name
Comanche Peak Nuclear Power Plant (CPNPP)

8. Plant Units
Unit 1

9. Docket Numbers
50-445

10. License Numbers
NPF-87

11. Requested Completion Date
August 14, 2020

12. Applicable Regulation and Inservice Inspection (ISI) or Inservice Testing (IST)
10 CFR 50.55a (z)(2) ISI

13. Proposed Alternative Number or Identifier:
1A4-2

14. Applicable American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code, or ASME Operations and Maintenance (OM) Code, Edition and Addenda:
ASME Section XI, 2007 Edition through the 2008 Addenda, “Rules for Inservice Inspection of Nuclear Power Plant Components.” (Ref. 1)

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

16. ASME Code Class
ASME Class 1

17. Applicable Components and or System Description (if applicable):
58 BMI Nozzles welded to the inside surface of the reactor vessel with partial penetration J-groove welds.

18. Describe the Applicable Code Requirements:
The Code of Federal Regulations, Title 10, Part 50, Section 55a (g)(6)(ii)(E)(1) states:

> 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 this section. The inspection requirements of ASME Code Case N-722-1 do not apply to components with pressure retaining welds fabricated with Alloy 600/82/182 materials that have been mitigated by weld overlay or stress improvement.

ASME Code Case N-722-1, *Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated with Alloy 600/82/182 Materials*. (Ref. 2).

19. Reason for Request:
The U.S. Federal Government made a COVID-19 declaration of emergency pursuant to the Stafford Act on March 13, 2020. The U.S. Center for Disease Control (CDC) determined that COVID-19 poses a serious public health risk. In the state of Texas, where CPNPP is located, a Major Disaster Declaration was declared on March 25, 2020, to take actions necessary to reduce exposure to the virus associated with the COVID-19 outbreak. Although many of the state restrictions have been lifted or reduced, the CDC has indicated that many U.S. States could experience another increased surge in the spread of the virus again this Fall.

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, Vistra Operations LLC (Vistra OpCo) established the following guidelines and restrictions that remain in effect at Comanche Peak Nuclear Power Plant (CPNPP):

1. Employees who do not have a critical need to be at CPNPP facilities must work remotely.
2. Employees who must work from a CPNPP facility are to practice strict social distancing.
3. 1RF21 Outage scope shall be reduced to limit the number of supporting contract personnel.

These guidelines and restrictions were established to eliminate the potential of inadvertently spreading the COVID-19 virus to critical personnel who are necessary to complete 1RF21 refueling outage activities, return the unit safely to service, and to maintain the unit operational to meet its power demands along with the surrounding community.

A large concern with spreading the virus focuses on outside specially trained and qualified resources who perform work to supplement the small CPNPP staff during outages. The concerns associated with outside resources consists of the risk of their availability either due to the potential for travel restrictions and

quarantine requirements imposed by both the U.S. Government and the State of Texas making it extremely difficult to travel from out of state to site, or because of illness. Bringing contract personnel on site with unknown medical history and their potential exposure to COVID-19 virus increases the risks of infecting the CPNPP personnel with COVID-19 virus. It is an extreme hardship for CPNPP to quarantine incoming contractors for sufficient durations to ensure they are free of COVID-19 virus symptoms or to conduct adequate testing of all contractors for COVID-19 virus. However, without these safeguards, the CPNPP staff and surrounding community are at increased risk of contracting COVID-19 virus, which has the potential of affecting the outage and future operation of the station.

Additionally, in general, work during outages tends to be in close spaces and does not allow for social distancing which can be a large contributor towards the spread of the virus as well.

Many of the planned 1RF21 Outage activities are being postponed until future outages based on the above guidelines, restrictions and concerns such that compliance with the applicable code requirements for inspection and testing results in hardship or unusual difficulty without a compensating increase in level of quality or safety during the current and future concerns related to the pandemic. Testing and inspections mandated by the Code of Federal Regulations in Title 10, Part 50, Section 55a, (10CFR50.55a) cannot be postponed without prior NRC approval.

20. Brief Description of the Proposed Alternative (500 characters or less):
Vistra OpCo is requesting this one-time relief associated with delaying the required BMI visual (VE) examinations performed with contract personnel from 1RF21 to 1RF22. This extension is being requested in accordance with 10CFR 50.55a(z)(2) as a hardship without a compensating increase in quality and safety.

In lieu of performing BMI visual (VE) examinations during 1RF21, CPNPP personnel will perform a boric acid inspection of the bottom head from the peripheral of the reactor mirror insulation package by removal of select insulation panels to gain access which will allow inspection for any gross active boric acid leakage.

21. Full Description of the Proposed Alternative:
<u>Proposed Alternative</u>

Delay required BMI visual (VE) examinations performed with contract personnel from 1RF21 to 1RF22. This extension is being requested in accordance with 10CFR 50.55a(z)(2) as a hardship without a compensating increase in quality and safety.

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<u>Basis for Use</u>

Code Case N-722-1 item 15.5 requires that Comanche Peak Unit 1 perform Visual, VE examination of the reactor pressure vessel Bottom Mounted Instrumentation (BMI) Nozzle Penetrations every other outage. The BMI visual inspections are performed in order to detect leakage as a result of Primary Water Stress Corrosion Cracking (PWSCC) operating experience (OE). As identified in MRP-206 (Ref. 3) the inspections

are performed to address safety concerns attributed to nozzle ejection as a result of a large circumferential crack below the bottom of the J-groove weld and the structural loss of the ferritic head material due to boric acid wastage.

In addition, leakage from the Lower Head would be detected in many ways due to CPNPP's extremely low tolerance for Class 1 operational leakage.

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

23. Description of the Basis for Use:
Operations Monitoring

Technical Specifications (TS) 3.4.13, RCS Operational LEAKAGE, for each Unit, limits system operation in the presence of leakage from Reactor Coolant System (RCS) components to leakage amounts that do not compromise safety. Surveillance Requirement (SR) 3.4.13.1 requires the performance of RCS water inventory balance to verify RCS leakage is within limits to ensure that the integrity of the Reactor Coolant Pressure Boundary (RCPB) is maintained.

Per LCO 3.4.13 "RCS operational LEAKAGE shall be limited to No pressure boundary LEAKAGE and 1 gpm unidentified LEAKAGE."

Procedure OPT-303, *Reactor Coolant System Water Inventory*, Attachment 10.2, RCS *Live Leakrate Action Levels and Response Guidelines*, provides the steps that would be taken to satisfy TS SR 3.4.13.1 by performance of an RCS water inventory balance. A summary of the steps is seen below in A through E:

A. Action Levels based on Absolute Value of Unidentified RCS Inventory Balance (From Surveillance Data)

Entrance Criteria	ACTION LEVEL
One seven (7) day rolling average of Unidentified RCS Inventory Balance values > 0.1 gpm	LEVEL 1
Two consecutive Unidentified RCS Inventory values > 0.15 gpm	LEVEL 2
One Unidentified RCS Inventory Balance value > 0.3 gpm	LEVEL 3

B. Action Levels based on Deviation from the Baseline Mean:

Entrance Criteria	ACTION LEVEL
Nine (9) consecutive Unidentified RCS Inventory Balance values > baseline mean [μ]	LEVEL 1
Two (2) of three (3) consecutive Unidentified RCS Inventory Balance Values > [$\mu + 2\sigma$], where σ is the baseline standard deviation	LEVEL 2
One (1) Unidentified RCS Inventory Balance > [$\mu + 3\sigma$]	LEVEL 3

C. Exit Criteria following Action Level Entry:

Exit Criteria
• Location of RCS leak has been identified AND Leak terminated (isolated or stopped) – confirmed by RCS leak rate and VCT level trends OR • A minimum of 2 daily leak rates with indicated leakage less than the applicable Action Level AND Ops Department and Engineering staff recommend exiting the applicable Action Level

D. For any ACTION LEVEL response:
1) Run confirmatory leak rate calculation
2) Confirm indication
3) Evaluate trend of affected parameters
4) Check for abnormal trend of other leakage indicators

E. IF confirmed:
1) Increase monitoring of leakage indicators
2) Initiate a Condition Report to document investigation and results in an EVAL
3) Commence a leak investigation
   - IF ACTION LEVEL 1, search for sources as resources allow
   - IF ACTION LEVEL 2, search for sources, continue 24 hour/day, 7 days/week until cause determined
   - IF ACTION LEVEL 3, search for sources, continue 24 hour/day, 7 days/week until cause determined. At 0.50 gpm sustained leakage, the Shift Manager should consult with the Duty Manager to consider an orderly shutdown to Mode 3.
   - Initiate logbook detailing all systems and rooms inspected for leakage with findings. All rooms should be inspected with a thermographic camera (Fire Brigade or Engineering camera).
   - Track all inspections on copies of system drawings, denoting piping and valves inspected.
   - Review recent plant evolutions to determine any “suspect” source(s).
   - Check any components or flow paths recently changed or placed in service, shutdown, vented, drained, filled, etc.
   - Check any maintenance activity that may have resulted in increasing leakage.
   - Check RCS and seal injection filter seals, vents, and drains for leakage (most common source of leakage).
   - Check any filters recently alternated or changed for leakage from their vents or drains, inspect filter housings for gasket leaks, check seal injection filters and reactor coolant filters for signs of leakage.
   - Scrutinize sump pump run times, sample trends, and rad monitor readings.
   - Divide the primary plant into several large groups for investigation. (e.g. Leakage

to atmosphere inside containment, S/G primary to secondary leakage, leakage to atmosphere outside containment, inter system leakage)

- Scrutinize tank levels and trends (eg., RHUT, RCDT, PRT and SRST), utilizing temporary indication if necessary.
- Check SI and RHR check valves for small leaks.
- Initiate outside Containment walk-downs of various portions of potentially affected systems.
- Notify System Engineer to obtain input/assistance.

4) IF increased leak rate is indicated inside Containment, THEN:
   - Begin planning for Containment entry while carrying out other actions; obtain proper approval for Containment entry.
   - Obtain a Containment Sump sample (during pump out) and analyze for activity, a larger than expected boric acid concentration and other unexpected chemicals.
   - Evaluate other systems for indications of leakage.
   - Obtain a Containment atmosphere sample for indications of RCS leakage.
   - Perform a Containment entry to search for signs of leakage.
   - If necessary, utilize robot to perform loop room inspections.
5) Identify the source of the increase in leakage.
6) Quantify the leakage.
7) Initiate plan to correct the leak.
8) Monitor Containment airborne radiation levels as well as area radiation monitors and sample Containment atmosphere for indications of RCS leakage.
9) Monitor other Containment parameters (temperature, pressure, humidity, etc.).
10) If the leak source is found and isolated or stopped, re-perform RCS leak rate calculation.

In addition to surveillance required monitoring, Operations continually monitors the RCS leak rate through control board metering and trend graphing capability. Instrumentation such as pressurizer level, sump levels, containment pressure and humidity instruments, and many others are monitored on a continuous basis and are logged and reviewed each shift.

Administrative controls

Administrative procedures require monitoring of RCS leakage under the Boric Acid Corrosion Control Program (BACCP) on a per cycle basis. The program also addresses abnormal trends in RCS primary system leakage indicators, which may provide indication of leaks much smaller than TS and RCS leakage levels. CPNPP monitors the following containment building/system parameters during the operating cycle to determine any potential leakage from borated or radioactive systems containing boric acid:

Unidentified Reactor Coolant System Leakage:

This parameter monitors unidentified reactor coolant system leakage both inside and outside of containment. The purpose is to review the data graph for trends in leakage and assess if any increases are indication of borated system leakage in Unit 1 containment.

Containment Air Particulate and Gaseous Concentration:

Radiochemistry analysis are performed of the containment atmosphere for each vent process. The vent

process is performed approximately every three days and can identify changes in containment activity. The isotope for detecting increase leakage is noble gas Argon-41. Argon-41 is a short-lived isotope that can be readily monitored to detect small increases or upward trends in leakage. From this parameter, an increase in borated system leakage in the Unit 1 containment can be detected.

Containment Air Cooler Condensate Flow and Containment Sump Level/Pump Rates:

The containment air cooler condensate flow is not separately measured, but flows to the containment sumps. Therefore, the reported sump flow rates include the containment air cooler condensate flows. Review of monthly Unit 1 sump pump volumes for this operating cycle are performed to determine if any upward trend in daily pump volume rates are observed. An increased pump rate could indicate leakage from borated systems in Unit 1 containment.

Containment Humidity/Dew Point Temperatures:

The Unit 1 containment has five area dew point temperature sensors at containment elevations 832, 860, and 905, as well as the Control Rod Drive Mechanism shroud and the reactor coolant pipe penetrations. Weekly dew point temperature measurements during plant operation are performed to monitor changes in temperature that could be indicative of leakage from borated systems in containment. Minor changes in temperature, both up and down, are gradual and are considered to be normal due to seasonal variations.

Continued monitoring of these parameters will provide early indication of any abnormal unidentified leakage during the upcoming cycles following 1RF21.

Previous CPNPP Unit 1 Internal Operating Experience (OE)

The last BMI inspection for Unit 1 with vendor assistance was performed in the Fall of 2017 during refueling outage 1RF19 with no relevant indications. During every other outage when the BMI visual VE examinations are not performed, (i.e., 1RF20) CPNPP personnel perform a boric acid inspection of the bottom head area. To date there have been no observed BMI leaks in Unit 1.

Other Considerations

Visual examination of the exterior surface of the BMI Penetration will be performed by the Boric Acid Corrosion Control Program (BACCP) during 1RF21.

The ISI Pressure Testing Program will implement the Class 1 System Leakage Test required by ASME Section XI Examination Category B-P, Item Number B15.10 at normal operating pressure and temperature during heat up from 1RF21 which includes the BMI area; VT-2 Visual Examination will be performed during the test.

Any gross leakage (i.e. water, boric acid, insulation deformation) or structural deformities would be identified during the above examinations/activities and captured in the Corrective Action Program.

In summary, extending the inspection frequency for direct visual examination of reactor bottom head and associated penetrations to the next refueling outage scheduled for the Spring of 2022 (1RF22) would not adversely impact the function of the reactor bottom head or penetrations pressure boundary integrity or

result in a reduction in plant safety. In the current pandemic environment, performing the required tests would result in an increased risk of virus exposure to plant personnel and a reduction in occupational health and safety without a compensating benefit. Therefore, this one-time request for relief meets the criteria in 10 CFR 50.55a(z)(2) for proposing inspection alternatives on the basis that compliance results in hardship or unusual difficulty without a compensating increase in level of quality or safety during the current COVID-19 pandemic.

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

25. If requesting an alternative based on 10 CFR 50.55a(z)(2), 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, Texas Governor Greg Abbott declared a state of disaster due to the COVID-19 pandemic on March 25, 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 CPNPP is operating in accordance with the CPNPP 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 CPNPP personnel from outside contractors who perform specialty work at CPNPP. Due to the potential spread of COVID-19 to CPNPP personnel, Vistra OpCo has identified performance of these examinations 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, Vistra OpCo is proposing to delay the examinations from fall 2020 (1RF21) to spring 2022 (1RF22).

26. Proposed duration of the alternative:
The proposed alternative, upon approval, will be implemented at CPNPP, Unit 1, starting from 1RF21, which is scheduled to begin on October 18, 2020, through the end of refueling outage 1RF22, which is scheduled to begin in the spring of 2022.

27. Include any additional information, as necessary:

28. Precedents (optional):
ML20088A533 supplemented by ML20090L944 – Relief Request 65 Unit 2, COVID-19, Request for Relief from Bottom Mounted Instrumentation Nozzles and a Pressurizer Nozzle to Surge Line Weld Overlay Examination – Palo Verde Nuclear Generating Station (PVNGS).

Similar relief to defer Reactor Vessel (RV) Bottom Mounted Instrumentation (BMI) Nozzle Penetration Visual Examinations due to pandemic-related issue was verbally authorized by the NRC Office of Nuclear Reactor Regulation on April 15, 2020 to Vistra Operations Company LLC for Comanche Peak Nuclear Power Plant Unit 2 for 10 CFR 50.55a Relief Request 2A3-4, BMI Visual Examinations, Revision A dated April 9, 2020.

29. References:
1. American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section Xl, 2007 Edition through 2008 Addenda

2. ASME Code Case N-722-1, Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated with Alloy 600/82/182 Materials Section XI, Division 1.

3. MRP-206, Inspection and Evaluation Guidelines for Reactor Vessel Bottom-Mounted Nozzles in U.S. PWR Plants.

4. 10CFR50.55a, Code and standards, June 3, 2020.

30. Do you have attachments?

Yes

Full text of the CPNPP BMI Relief Request