



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

May 13, 2022

Mr. John Dent, Jr.
Vice President and
Chief Nuclear Officer
Nebraska Public Power District
72676 648A Avenue
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION – PROPOSED INSERVICE TESTING
ALTERNATIVE RS-01, REVISION 0 (EPID L-2021-LLR-0044)

Dear Mr. Dent:

By letter dated June 16, 2021, as supplemented by letters dated October 12, 2021, and December 6, 2021, Nebraska Public Power District (the licensee) requested an alternative to certain specific inservice testing (IST) requirements in the 2004 Edition through 2006 Addenda of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) at Cooper Nuclear Station (Cooper).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(z)(1), "Acceptable level of quality and safety," the licensee proposed Alternative Request RS-01, Revision 0, for snubbers on the basis that the proposed alternative would provide an acceptable level of quality and safety.

As set forth in the enclosed safety evaluation (SE), the NRC staff determines that Alternative Request RS-01, Revision 0, as described in the licensee's letters dated June 16, 2021, October 12, 2021, and December 6, 2021, provides an acceptable level of quality and safety for the proposed one-time extension of the 10-year examination interval specified in ASME Code Case OMN-13 for the mechanical and hydraulic snubbers listed in table 1 of the SE. Accordingly, the U.S. Nuclear Regulatory Commission (NRC) staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes the use of Cooper Alternative Request RS-01, Revision 0, for the fifth 10-year IST program interval, which began on March 1, 2016, and is scheduled to end on February 28, 2026.

All other ASME OM Code requirements for which relief or an alternative was not specifically requested and approved remain applicable.

J. Dent, Jr.

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If you have any questions, please contact the Cooper Nuclear Station Project Manager, Thomas J. Wengert, at 301-415-4037 or by email to Thomas.Wengert@nrc.gov.

Sincerely,

Jennifer L. Dixon-Herrity, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosure:
Safety Evaluation

cc: Listserv



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

ALTERNATIVE REQUEST RS-01, REVISION 0, REGARDING

SNUBBER VISUAL EXAMINATION EXTENSION FOR THE

FIFTH 10-YEAR INSERVICE TESTING INTERVAL

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

By letter dated June 16, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21167A098), as supplemented by letters dated October 12, 2021, and December 6, 2021 (ML21285A286 and ML21340A239, respectively), Nebraska Public Power District (the licensee) requested an alternative to certain specific inservice testing (IST) requirements in the 2004 Edition through 2006 Addenda of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) at Cooper Nuclear Station (Cooper).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(z)(1), "Acceptable level of quality and safety," the licensee proposed Alternative Request RS-01, Revision 0, for snubbers on the basis that the proposed alternative would provide an acceptable level of quality and safety. The alternative request is applicable for the fifth 10-year IST interval, which began on March 1, 2016, and is scheduled to end on February 28, 2026.

2.0 REGULATORY EVALUATION

The regulations in 10 CFR 50.55a(g)(4), "Inservice inspection standards requirement for operating plants," state, in part, that throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components (including supports) that are classified as ASME Code Class 1, Class 2, and Class 3 must meet the inservice inspection (ISI) requirements set forth in section XI of the editions and addenda of the ASME Boiler and Pressure Vessel Code (BPV Code) or ASME OM Code for snubber examination and testing that become effective subsequent to editions and addenda specified in 10 CFR 50.55a(g)(2) and (3) and that are incorporated by reference in 10 CFR 50.55a(a), to the extent practical within the limitations of design, geometry, and materials of construction of the components.

The regulation in 10 CFR 50.55a(b)(3)(v)(B), “Snubbers: Second provision,” states:

Licensees must comply with the provisions for examining and testing snubbers in Subsection ISTD of the ASME OM Code and make appropriate changes to their technical specifications or licensee-controlled documents when using the 2006 Addenda and later editions and addenda of Section XI of the ASME BPV Code.

The regulations in 10 CFR 50.55a(z), “Alternative to codes and standards requirements,” state, in part, that alternatives to the requirements of 10 CFR 50.55a(b) through (h) may be used, when authorized by the NRC, if the licensee demonstrates (1) the proposed alternative 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 the use of an alternative to the provisions of the ASME OM Code as incorporated by reference in 10 CFR 50.55a, and for the NRC to authorize the use of the proposed alternative.

3.0 TECHNICAL EVALUATION

Applicable Code Edition

The applicable Code edition and addenda for the fifth 10-Year IST program interval at Cooper is the 2004 Edition through 2006 Addenda of the ASME OM Code.

ASME Code Components Affected

In its request, the licensee stated that this alternative request applies to all snubbers within the scope of ASME OM Code, subsection ISTA, “General Requirements,” paragraph ISTA-1100, “Scope,” at Cooper as specified below:

Table 1

Type of Snubbers at Cooper	Total Number of Snubbers	Remarks
Anvil/Grinnell Hydraulic Snubbers	53	Details of the Cooper snubbers (i.e., snubber ID, service life, date of replacements, etc.) are listed in Attachment 2 of the licensee’s letter dated October 12, 2021.
PSA-3 Mechanical Snubbers	18	
PSA-10 Mechanical Snubbers	89	
PSA-35 Mechanical Snubbers	48	

Applicable Code Requirements

The IST requirements of the ASME OM Code, as incorporated by reference in 10 CFR 50.55a related to this alternative request, are as follows:

ASME OM Code, subsection ISTD, “Preservice and Inservice Examination and Testing of Dynamic Restraints (Snubbers) in Light-Water Reactor Nuclear Power Plants,”

paragraph ISTD-4200, "Inservice Examination," states, that "Snubbers shall be visually examined on the required schedule and evaluated to determine their operational readiness."

ASME OM Code, subsection ISTD, paragraph ISTD-4250, "Inservice Examination Intervals," specifies the requirements for the initial and subsequent snubber examination intervals.

ASME OM Code, subsection ISTD, subparagraph (d) of ISTD-4252, "Subsequent Examination Intervals," states, in part, that the duration of examination intervals shall be in accordance with table ISTD-4252-1, "Visual Examination Table."

ASME OM Code, subsection ISTD, paragraph ISTD-5300, "The 10% Sampling Test," specifies the 10 percent testing plan, sample size, and composition of snubbers.

ASME OM Code, subsection ISTD, paragraph ISTD-6000, "Service Life Monitoring Requirements," specifies service life monitoring (SLM) requirements.

ASME OM Code, subsection ISTD, subparagraph (a) of ISTD-6200, "Service Life Evaluation," states, that "[t]he snubber shall be replaced with a snubber for which service life will not be exceeded before the next scheduled system or plant outage."

ASME OM Code Case OMN-13, "Requirements for Extending Snubber Inservice Examination Interval at LWR [Light-Water Reactor] Power Plants," Revision 0, allows licensees to extend the visual examination of snubbers, if all of the provisions specified in OMN-13 are met. The NRC accepts the use of ASME OM Code Case OMN-13, Revision 0, in NRC Regulatory Guide (RG) 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," Revision 1, dated August 2014 (ML13340A034), as incorporated by reference in 10 CFR 50.55a.

ASME OM Code Case OMN-13, Revision 0, section 3.7, "Frequency of Examinations," states that all snubbers within the scope of Subsection ISTD shall be examined and evaluated per ASME OM Code subsections 6.1, 6.3, and 6.4 at least once every 10 years.

Licensee's Reason for Request

The Cooper snubber inservice program examinations and testing are currently performed in accordance with the ASME OM Code, 2004 Edition through the 2006 Addenda, as required by 10 CFR 50.55a(b)(3)(v)(B). This requirement requires licensees to comply with the provisions for examining and testing snubbers in subsection ISTD of the ASME OM Code when using the 2006 Addenda and later editions of ASME BPV Code, section XI. In its letter dated October 12, 2021, the licensee stated that the ASME OM Code, subsection ISTD, along with Code Case OMN-13, were initially implemented at Cooper on April 7, 2008. All snubbers referenced in table 1 of this safety evaluation (SE) are currently required to be visually examined and evaluated once every 10 years, in accordance with Code Case OMN-13, section 3.7.

Prior to the fifth 10-year IST program interval, the licensee began implementing ASME OM Code, subsection ISTD and the NRC-approved version of ASME OM Code Case OMN-13 in Refueling Outage RE24 (spring 2008) at Cooper. At that time, the operating cycles at Cooper were 18 months in duration. Following the refueling outage in the fall of 2012 (RE27), Cooper began its first 24-month operating cycle. The remaining refueling outages of the fifth 10-year IST program interval are scheduled for the fall of 2022 (RE32) and the fall of 2024 (RE33). Therefore, RE32 represents the first refueling outage in which the full 24-month interval has

occurred for five continuous cycles. Based on this situation, under Code Case OMN-13, snubber examinations that were performed in September/October of 2012 (pre-RE27 or during RE27) would be due exactly 10 years later, on the same dates in September/October of 2022 (pre-RE32 or during RE32) with no grace period allowed.

To maintain these examinations on a five refueling cycle interval and still meet the Code Case OMN-13 frequency with no grace period, the examinations would have to be carefully scheduled and monitored to ensure that the 10-year interval for each snubber was not exceeded prior to the completion of each visual examination. In some cases, the snubber visual examination(s) would be required to be scheduled during times when specific systems are taken out of service, which limits the flexibility in scheduling. Also, delays may occur during the refueling outage, which could potentially move out the initial scheduled date to past the 10-year date required by Code Case OMN-13. The licensee stated that the time and resources to monitor these activities to this degree are not necessary, and that performing a snubber examination at 10 years or slightly over 10 years during the same scheduled snubber refueling outage campaign will not impact program effectiveness. Any actions required prior to plant startup per ASME OM Code, subsection ISTD, and/or Code Case OMN-13, would still be implemented in the same manner.

The licensee further stated that for efficiency purposes, this SLM activity for mechanical snubbers is completed following the as-found Code Case OMN-13 examinations. Generally, the snubber is replaced with a pretested, rebuilt mechanical snubber, and the removed snubber is as-found tested and returned to spares to be rebuilt at a future date. The licensee stated that historically, this service life activity for mechanical snubbers has proven to be very effective in the overall performance of the mechanical snubbers at the 10-year frequency. Therefore, it is not desirable to move this activity to 8 years (four refueling cycles) to ensure that the 10-year Code Case OMN-13 examination frequency with no grace period is met. Also, performing the Code Case OMN-13 examination approximately every 8 years to ensure that Code Case OMN-13 is met, and the SLM activity approximately every 10 years, would not be efficient. The licensee stated that over the life of the plant, performing the examination and SLM activity every four refueling cycles or performing them independently at different intervals would increase resources and radiological dose with no compensating increase in quality or safety. SLM activities will continue to be evaluated by the licensee as required by ASME OM Code, subsection ISTD, paragraph ISTD-6000.

Another basis for pursuing this request is the aggressive SLM approach taken at Cooper for the mechanical snubbers within the program. Although the vendor design life of the mechanical snubbers is 40 years, due to the potential impact from vibration, heat, and radiation, the licensee performs a service life snubber activity after approximately 10 years in service for all mechanical snubbers. The licensee stated that this approach has resulted in an excellent performance history for the mechanical snubbers.

The licensee stated that it has implemented Code Case OMN-13 at Cooper since the spring of 2008, and no snubber examination failures and/or test failures have occurred during this period. The licensee further stated that this success is expected to continue with the proposed alternative.

Licensee's Proposed Alternative

The licensee is proposing a variation to the Code Case OMN-13 frequency requirement of at least once every 10 years. For the reasons stated above, and as discussed in the licensee's letters dated October 12, 2021, and December 6, 2021, the licensee proposed that the Code

Case OMN-13 examination period be 10 years with a grace period not to exceed 90 days for the remainder of the fifth 10-year IST program interval.

NRC Staff Evaluation

As incorporated by reference in 10 CFR 50.55a, ASME OM Code (2004 Edition through 2006 Addenda), subsection ISTD, requires that snubbers shall meet (1) the inservice visual examination requirements in paragraph ISTD-4000, "Specific Examination Requirements"; (2) the inservice operational readiness testing requirements in paragraph ISTD-5000, "Specific Testing Requirements"; and (3) the SLM requirements in paragraph ISTD-6000. Paragraph ISTD-4200 requires that snubbers within the scope of the ASME OM Code are required to be visually examined on the required schedule and evaluated to determine their operational readiness. Further, ASME OM Code Case OMN-13 requires that all snubbers within the scope be visually examined and evaluated at least once every 10 years. As a result, the snubbers listed in table 1 of this SE are required to be visually examined at least once every 10 years. The licensee stated that the Code Case OMN-13 snubber examinations that were performed for the refueling outage in September/October of 2012 (pre-RE27 or during RE27) would be due exactly 10 years later, on the same dates in September/October of 2022 (pre-RE32 or during RE32) with no grace period allowed while using Code Case OMN-13.

To address this scheduling issue, the licensee requested a one-time extension to complete the visual examination intervals for the snubbers listed in table 1 of this SE not to exceed approximate 90 days beyond 10 years. This coincides with the fall 2022 refueling outage (RE32) at Cooper.

Inservice Visual Examination

In its letter dated October 12, 2021, the licensee stated that approximately 74.5 percent of the Cooper snubber program consists of mechanical snubbers (i.e., 155 out of 208 snubbers) and that hydraulic snubbers represent approximately 25.5 percent of the program scope (i.e., 53 out of 208 snubbers). The licensee notes that mechanical snubber visual examinations are performed in conjunction with service life activity, which has resulted in an excellent performance history. The licensee further stated that the current service life of hydraulic snubbers is 25 years, and that the performance history has been excellent for both groups.

In its response to the NRC staff's request for additional information (RAI)-3 in Attachment 1 of its letter dated October 12, 2021, the licensee described the results of its implementation of the 10 percent testing sample plans per paragraph ISTD-5300 for mechanical and hydraulic snubber testing.

Inservice Operational Readiness Testing

The licensee provided details on the satisfactory test results and replacement for SLM of mechanical and hydraulic snubbers in its response to RAI-4, which are summarized below:

The licensee has utilized the 10 percent sample testing plan at Cooper per paragraph ISTD-5300 for mechanical snubber testing. There are three design test plan groups (18 PSA-3, 89 PSA-10, and 48 PSA-35). From RE24 through RE31, 128 mechanical snubbers (16 per refueling outage) were selected for the 10 percent sample plan and all 128 were examined with satisfactory results in the as-found position, then removed and as-found tested with satisfactory results. These snubbers also satisfied the service life monitoring replacement activity as they

were replaced with rebuilt, pretested snubbers that were installed and examined in the as-left condition with satisfactory results.

The licensee has also utilized the 10 percent sample plan per paragraph ISTD-5300 for hydraulic snubber testing, which has one design test plan group of 53 snubbers. From RE24 through RE31, 48 hydraulic snubbers (6 per refueling outage) were selected for the 10 percent sample plan and all 48 were examined with satisfactory results in the as-found position, then removed and as-found tested with satisfactory results. Those selected during refueling outages RE24 through RE30 were also upgraded and replaced, which satisfied the service life replacement for the hydraulic snubbers, as well.

Based on the information provided by the licensee, the NRC staff concludes that Cooper has had an excellent examination and test history for both the mechanical and hydraulic snubbers since initiating ASME OM Code Case OMN-13. No programmatic examination or test failures have occurred, and no significant degradation or anomalies have been identified. As a result, no snubbers have been found to be subject to progressive degradation, and no severe operating environments have been identified that would require the reduction of the existing service life.

Service Life Evaluation

In its letter dated December 6, 2021, the licensee stated that in accordance with ASME OM Code, Subsection ISTD, paragraph ISTD-6100, "Predicted Service Life," it considered the manufacturer's recommendations and established an initial snubber service life for the mechanical and hydraulic snubbers. Although the recommended design life from Pacific Scientific Company (PSA) was 40 years for the mechanical snubbers, the licensee conservatively elected to implement a service life maintenance activity for mechanical snubbers after approximately 10 years of installation to ensure that the potential service conditions of vibration, heat, and radiation did not adversely impact the performance of the mechanical snubbers. The licensee noted that the hydraulic snubber service life is currently at the vendor-recommended 25 years, and no issues with this service life have been observed.

Further, the licensee stated that the ISTD-6200 evaluation at Cooper is performed at a frequency of once per fuel cycle as required by the ASME OM Code, to ensure that the service life requirements of the ASME OM Code, subsection ISTD, remain met. The licensee further stated that, once per cycle, the results from the most recent refueling outage are reviewed, the existing service life durations are reviewed for potential changes, and the upcoming service life expiration dates are reviewed to ensure that no expiration dates will be exceeded prior to the next scheduled refueling outage. Therefore, the NRC staff concludes that the licensee meets the requirements of ISTD-6200 at Cooper.

Technical Evaluation Summary

Based on the information provided by the licensee in its initial application and supplemental letters, the Cooper snubber examination and testing history during the past 10 years shows that the snubber population is well maintained within the examination, testing, and SLM programs. There have been no deficiencies, adverse trends, or maintenance work orders that would impact or degrade any snubber's performance capability. As described in Attachment 2 of the licensee's letter dated October 21, 2021, each snubber included in the scope of Alternative Request RS-01, Revision 0, will remain within its predicted service life, in accordance with ASME OM Code, paragraph ISTD-6100, through the end of refueling outage RE32 (fall of 2022). The snubber list in Attachment 2 shows that there are 34 mechanical snubbers whose

service life will end during October/November 2022. There are 36 mechanical snubber activities planned for fall 2022 (RE32) in which the OMN-13 examination will be completed in addition to the replacement of the snubbers with pretested, rebuilt snubbers. Therefore, considering the historical performance of the entire snubber population and the current level of acceptable performance, the NRC staff concludes that there is reasonable assurance that each snubber will continue to be operationally ready to perform its safety function during the interval of this proposed alternative.

Based on the information described above, the NRC staff finds that (1) the snubber population visual examinations during the past 10 years indicate acceptable historical performance of the snubbers within the scope of Cooper Alternative Request RS-01, Revision 0; (2) the ongoing inservice testing activities have not identified snubber performance concerns, with specific snubber examination issues resolved by corrective action; (3) the licensee is implementing its SLM program for all snubbers every refueling outage, and (4) service life maintenance activities are not modified by this request.

Therefore, the NRC staff finds that the licensee's proposed alternative for a one-time extension of approximately 90 days for the visual examinations beyond the 10-year requirement of Code Case OMN-13 for all the Cooper snubbers listed in table 1 of this SE and Alternative Request RS-01, Revision 0, and its supplements, will provide an acceptable level of quality and safety until the fall 2022 refueling outage (RE32) in accordance with 10 CFR 50.55a(z)(1).

4.0 CONCLUSION

As set forth above, the NRC staff determines that Alternative Request RS-01, Revision 0, as described in the licensee's letters dated June 16, 2021, October 12, 2021, and December 6, 2021, provides an acceptable level of quality and safety for the proposed one-time extension of approximately 90 days beyond the 10-year examination interval specified in Code Case OMN-13 for the mechanical and hydraulic snubbers at Cooper listed in table 1 of this SE. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes proposed Cooper Alternative Request RS-01, Revision 0, for the fifth 10-year IST program interval, which began on March 1, 2016, and is scheduled to end on February 28, 2026.

All other ASME OM Code requirements for which relief or an alternative was not specifically requested and approved remain applicable.

Principal Contributor: G. Bedi

Date: May 13, 2022

SUBJECT: COOPER NUCLEAR STATION – PROPOSED INSERVICE TESTING
ALTERNATIVE RS-01, REVISION 0 (EPID L-2021-LLR-0044) DATED MAY 13,
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