



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

April 5, 2016

Mr. Joseph W. Shea
Vice President, Nuclear Licensing
Tennessee Valley Authority
1101 Market Street, LP 3D-C
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 2 – ALTERNATIVE TO THE
PRESERVICE EXAMINATION REQUIREMENTS OF AMERICAN SOCIETY OF
MECHANICAL ENGINEERS OPERATION AND MAINTENANCE CODE FOR
SNUBBERS (WBN-2/PSI-4) (CAC NO. MF7447)

Dear Mr. Shea:

By letter dated March 11, 2016, as supplemented by letter dated March 25, 2016 (Agencywide Documents Access and Management System Accession Nos. ML16054A586 and ML16089A163, respectively), Tennessee Valley Authority (TVA) submitted alternative request WBN-2/PSI-4 to the U.S. Nuclear Regulatory Commission (NRC). TVA is proposing an alternative to the requirements of the American Society of Mechanical Engineers (ASME) Operation and Maintenance (OM) Code, 2001 Edition through 2003 Addenda, Subsection ISTD, Section ISTD-4110(d), "Preservice Examination Requirements," for the Class 2 steam generator snubbers at the Watts Bar Nuclear Plant, Unit 2 (WBN2). TVA is requesting that the inservice examination requirements of ASME OM Code, Subsection ISTD-4233 for fluid level be applied in lieu of the preservice examination requirements of OM Code, Section ISTD-4110(d) during the preservice period and up to the start of the first 10-year inservice inspection (ISI) interval for the snubbers at WBN2.

The NRC staff has determined that the proposed alternative request WBN-2/PSI-4 for WBN2, provides an acceptable level of quality and safety. Accordingly, the NRC staff concludes that TVA has adequately addressed all of the regulatory requirements set forth in Title 10, *Code of Federal Regulations* (10 CFR), Part 50, Section 55a(z)(1) for this alternative. Therefore, pursuant to 10 CFR 50.55a(z)(1), the NRC staff authorizes alternative request WBN-2/PSI-4 for WBN2 for the preservice period and up to the start of the first 10-year ISI interval for the snubbers at WBN2.

In its letter dated March 11, 2016, TVA included a regulatory commitment to periodically monitor the fluid level of the four SG snubber reservoirs during the first 10-year ISI interval until the first refueling outage. The frequency of the reservoir fluid level monitoring may be adjusted based on the trend of level change observed in the reservoirs. The NRC staff concludes that reasonable controls for the implementation and subsequent evaluation of proposed changes pertaining to the above regulatory commitment are best provided by the licensee's administrative processes, including its commitment management program. The above regulatory commitment does not warrant the creation of any regulatory requirements (i.e., items requiring prior NRC approval of subsequent changes).

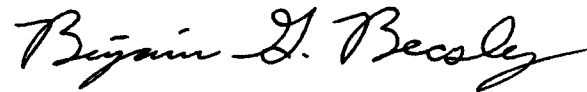
J. Shea

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All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject requests remain applicable.

If you have any questions, please contact the Project Manager, Robert Schaaf at 301-415-6020.

Sincerely,

A handwritten signature in black ink that reads "Benjamin G. Beasley". The signature is written in a cursive style with a prominent initial "B".

Benjamin G. Beasley, Branch Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-391

Enclosure:
Safety Evaluation

cc w/encl: Distribution via ListServ



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

STEAM GENERATOR SNUBBER ALTERNATIVE REQUEST NO. WBN-2/PSI-4

RELATED TO THE STEAM GENERATOR SNUBBER PRESERVICE INSPECTION

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNIT 2

DOCKET NUMBER 50-391

1.0 INTRODUCTION

By letter dated March 11, 2016 (Agencywide Document Access and Management System (ADAMS) Accession No. ML16074A274), as supplemented by letter dated March 25, 2016 (ADAMS Accession No. ML16089A163), Tennessee Valley Authority (TVA, the licensee), submitted alternative relief request WBN-2/PSI-4 for the Watts Bar Nuclear Plant Unit 2 (WBN2), to the U. S. Nuclear Regulatory Commission (NRC). The licensee proposed an alternative to the preservice inspection (PSI) requirements of the 2001 Edition through 2003 Addenda of the American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code), for the PSI of steam generator (SG) snubbers at WBN2.

Specifically, TVA is proposing an alternative to the requirements of ASME OM Code, 2001 Edition through 2003 Addenda, Subsection ISTD, Section ISTD-4110(d), "Preservice Examination Requirements," for the Class 2 SG snubbers at the WBN2. TVA is requesting that the inservice examination requirements of ASME OM Code, Subsection ISTD-4233 for fluid level be applied, in lieu of the preservice examination requirements of OM Code, Section ISTD-4110(d) during the preservice period and up to the start of the first 10-year inservice inspection (ISI) interval for the snubbers at WBN2. The licensee requested to use the proposed alternative in WBN-2/PSI-4, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 55a(z)(1), on the basis that the alternative provides acceptable level of quality and safety.

2.0 REGULATORY EVALUATION

Section 55a(g)(4) of 10 CFR Part 50 requires 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 requirements, except design and access provisions and preservice examination requirements, set forth in Section XI of editions and addenda of the ASME B&PV [Boiler and Pressure Vessel] Code (or ASME

OM Code for snubber examination and testing) that become effective subsequent to editions specified in paragraphs (g)(2) and (g)(3) of this section and that are incorporated by reference in paragraphs (a)(1)(ii) or (iv) for snubber examination and testing of this section [10 CFR 50.55a], to the extent practical within the limitations of design, geometry and materials of construction of the components," except where alternatives have been authorized pursuant to paragraphs 10 CFR 50.55a(z)(1) or 10 CFR 50.55a(z)(2).

In proposing alternatives, a licensee must demonstrate that the proposed alternatives provide an acceptable level of quality and safety (10 CFR 50.55a(z)(1)) or compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety (10 CFR 50.55a(z)(2)). Section 50.55a allows the NRC to authorize alternatives and to grant relief from ASME Code requirements upon making the necessary findings.

Section 50.55a(b)(3)(v) of 10 CFR Part 50 allows the use of ASME OM Code, Subsection ISTD in lieu of ASME Section XI for preservice and inservice examination and testing of snubbers.

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 Commission to authorize the alternative requested by the licensee.

3.0 TECHNICAL EVALUATION

The applicable ASME B&PV Code Section XI for the WBN2 preservice snubber inspection is the 2001 Edition through 2003 Addenda. In lieu of the ASME Section XI for WBN2, TVA is using the ASME OM Code for the snubber preservice examination as allowed by 10 CFR 50.55a(b)(v). The applicable ASME OM Code for the WBN2 preservice snubber examination is the 2001 Edition through 2003 Addenda.

The licensee stated that this alternative request is applicable for the WBN2 preservice test period and up to start of the first 10-year ISI program for snubbers.

3.1 Steam Generator Snubber Relief Request WNB-2/PSI-4

Applicable Code Requirements

ASME OM Code, paragraph ISTD-4110, "Preservice Examination Requirements," states, in part, that a preservice examination shall be performed on all snubbers during initial plant startup.

ASME OM Code, paragraph ISTD-4110(d), "Preservice Examination Requirements," states that if applicable, fluid is at recommended level, and fluid is not leaking from the snubber system.

ASME OM Code, paragraph, ISTD-4140, "Preservice Examination Corrective Action," states that snubbers that are installed incorrectly or otherwise fail to meet the requirements of ISTD-4110 shall be installed correctly, adjusted, repaired, or replaced.

Components for Which Relief is Requested

The licensee proposed an alternative from the ASME OM Code preservice examination requirements of paragraph ISTD-4110(d) for the following SG snubbers:

Table-1, Steam Generator Snubbers in Relief Request WBN-2/PSI-4

Snubber ID	Snubber Description	Type	Manufacturer	Model
2-SNUB-001-2SG1A	Steam Generator # 1 Snubber A	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG1B	Steam Generator # 1 Snubber B	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG1C	Steam Generator # 1 Snubber C	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG1D	Steam Generator # 1 Snubber D	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG1E	Steam Generator # 1 Snubber E	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG2A	Steam Generator # 2 Snubber A	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG2B	Steam Generator # 2 Snubber B	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG2C	Steam Generator # 2 Snubber C	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG2D	Steam Generator # 2 Snubber D	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG2E	Steam Generator # 2 Snubber E	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG3A	Steam Generator # 3 Snubber A	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG3B	Steam Generator # 3 Snubber B	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG3C	Steam Generator # 3 Snubber C	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG3D	Steam Generator # 3 Snubber D	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG3E	Steam Generator # 3 Snubber E	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG4A	Steam Generator # 4 Snubber A	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG4B	Steam Generator # 4 Snubber B	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG4C	Steam Generator # 4 Snubber C	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG4D	Steam Generator # 4 Snubber D	Hydraulic	Curtiss Wright/PHS	PD14860
2-SNUB-001-2SG4E	Steam Generator # 4 Snubber E	Hydraulic	Curtiss Wright/PHS	PD14860

Licensee's Reason for Alternative Request

Twenty, 12-inch bore, Curtiss Wright/Paul Munroe Hydraulics snubbers are utilized at WBN2 for dynamic restraint of the SGs. Five snubbers are installed on each SG and work together to support the SG during a seismic event. The snubbers are located inside the SG enclosures in an area where there are no permanent platforms and radiological conditions limit personnel access during normal power operation. There is one fluid reservoir for the 5 snubbers of each SG. The four fluid reservoirs are located in upper containment on the outside of the SG enclosures and are, thus, accessible during normal power operations.

The licensee states that during the preservice examination of the 20 SG snubbers, TVA identified evidence of leakage on 5 of the snubbers (i.e., 2-SNUB-001-2SG1B, -2SG1D, -2SG1E, -2SG4A, and -2SG4C). The licensee performed troubleshooting on these five snubbers with the help of an outside vendor and was successful at eliminating the leakage on two of the snubbers (i.e., 2-SNUB-001-2SG1B, and -2SG4A). However, three snubbers (i.e., 2-SNUB-001-2SG1D, -2SG1E, and -2SG4C) continue to exhibit minor leakage. Further troubleshooting of the three snubbers included wiping off the leakage, subsequent re-examination of the snubbers, and monitoring of the associated hydraulic reservoir levels. TVA has stated that any leakage observed at present has been minor. For example, the worst-case snubber exhibits approximately 10 drops per day or less. The vendor has determined the type of leakage exhibited by the remaining three WBN2 SG snubbers is not abnormal under

current plant conditions (cold) and the snubber seal design is such that the seating characteristics should improve as the plant transitions into normal operating conditions.

The licensee proposes an alternative to the requirements of ISTD-4110(d) so that during the PSI period, TVA will not need to replace the SG snubbers that have been identified with minor leaks.

Licensee's Proposed Alternative

The licensee proposes to perform periodic monitoring of fluid levels in the four SG snubber reservoirs and to use inservice examination requirements of the ASME OM Code, ISTD-4233 for fluid level in lieu of the preservice examination requirements of ISTD-4110(d) during the WBN2 preservice test period and up to start of the first 10-year ISI interval program for snubbers at WBN2. In the letter dated March 25, 2016, the licensee states that level monitoring will be performed weekly until WBN2 reaches normal operating pressure and temperature and sufficient level data points have been collected to establish a trend. The level monitoring frequency will be adjusted commensurate with the reservoir level trend.

The licensee also states that if reservoir fluid level cannot be maintained above the required minimum level, then the associated snubbers will be identified as unacceptable and the requirements of ISTD-4270, "Inservice Examination Failure Evaluation," and ISTD-4280, "Inservice Examination Corrective Action," will be applied. In addition, any time the reservoir level is observed to be less than the required minimum level, the condition will be entered into the TVA corrective action program (CAP) for operability determination and corrective action.

3.2 NRC Staff Evaluation

The ASME OM Code, ISTD-4110(d) requires that during the preservice examination of snubbers, if applicable, fluid is at recommended level, and fluid is not leaking from the snubber system. ASME OM Code, ISTD-4140, requires that during preservice examination if snubbers that are installed incorrectly or otherwise fail to meet the requirements of ISTD-4110 shall be installed correctly, adjusted, repaired, or replaced. Therefore, the ASME OM Code requires that leaking snubbers be corrected, repaired or replaced.

As described above, during preservice examination, the licensee discovered that 5 of the 20 SG snubbers have minor fluid leakage, which was documented in the TVA CAP. The licensee was successful at eliminating leakage of 2 of the 5 snubbers, but 3 snubbers continue to exhibit minor leakage. The snubber vendor has determined that the type of leakage exhibited by the WBN2 SG snubbers is not abnormal under cold shutdown conditions and the snubber seal design is such that the sealing characteristics should improve as the plant transition into normal conditions. As such, leaking snubbers will perform their required safety function under design basis conditions as long as they are filled with fluid.

In order to maintain the SG snubbers filled with fluid, the licensee proposes:

1. Periodically monitoring of fluid level of all the four reservoirs during the WBN2 preservice test period up to start of the first 10-year inservice inspection interval at WBN2. The initial level monitoring will be performed weekly until WBN2 reaches normal operating

pressure and temperature and sufficient level data points have been collected to establish a trend. The fluid level monitoring frequency will be adjusted commensurate with the reservoir level trend.

2. Performing the evaluation and corrective action requirements of the ASME OM Code, ISTD-4270 and ISTD-4280, if the reservoir level cannot be maintained at the minimum required fluid level. If at any time the reservoir level is observed to be less than the required minimum level, the condition will be entered into TVA CAP for operability determination and corrective action.

The NRC staff has reviewed the licensee's proposed alternative described above and has determined that periodic monitoring of the fluid level of all the four SG snubber reservoirs (i.e., weekly during the PSI period up to start of the first 10-year ISI interval, and adjusted based on the trend of fluid level observed in the reservoirs) will provide adequate assurance that the SG snubber fluid level will be maintained within the manufacturer's recommendation. By maintaining the snubbers' fluid level, the operability of the snubbers will be maintained. Based on the above, the NRC staff has determined that the snubbers' operability will be maintained during the preservice period and up to the start of the first 10-year ISI program. Therefore, the NRC staff finds that the proposed alternative is acceptable.

4.0 CONCLUSION

Based on the above evaluation, the NRC staff concludes that the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(z)(1) based on the alternative providing an acceptable level of quality and safety. The licensee's proposed alternative is consistent with the objective of inservice testing which is to determine degradation in safety-related components and provides reasonable assurance of operational readiness. Accordingly, the proposed alternative is authorized for the preservice period and up to start of the first 10-year ISI interval for snubbers at WBN2.

All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject requests remain applicable.

Principle Contributor: Gurjendra S. Bedi, NRR

J. Shea

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All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject requests remain applicable.

If you have any questions, please contact the Project Manager, Robert Schaaf at 301-415-6020.

Sincerely,

/RA/

Benjamin G. Beasley, Branch Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-391

Enclosure:
Safety Evaluation

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