



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

July 16, 2024

David P. Rhoades  
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President and Chief Nuclear Officer  
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SUBJECT: R. E. GINNA NUCLEAR POWER PLANT – ALTERNATIVE ASSOCIATED WITH  
INSERVICE TESTING OF 'B' AUXILIARY FEEDWATER PUMP - PR-03  
(EPID L-2024-LLR-0006)

Dear David Rhoades:

By letter dated January 26, 2024 (Agencywide Documents Access and Management System Accession No. ML24026A011), as supplemented by a letter dated March 28, 2024 (ML24088A204), Constellation Energy Generation, LLC (the licensee) submitted a proposed alternative to certain Inservice Testing (IST) requirements of the American Society of Mechanical Engineers (ASME) *Operation and Maintenance of Nuclear Power Plants*, Division 1, OM Code: Section IST (OM Code) for a specific pump at R. E. Ginna Nuclear Power Plant (Ginna).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(2), the licensee submitted the proposed alternative in request PR-03 for Ginna on the basis that the ASME OM Code requirements for an identified pump at this time present an undue hardship without a compensating increase in the level of quality or safety.

The Nuclear Regulatory Commission (NRC) staff reviewed the subject request and determined, as set forth in the enclosed safety evaluation, that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2) for request PR-03 at Ginna. Therefore, the NRC staff authorizes the use of request PR-03 (as supplemented) at Ginna until November 30, 2024.

All other ASME OM Code requirements as incorporated by reference in 10 CFR 50.55a for which relief or an alternative was not specifically requested, and granted or authorized (as appropriate), in the subject request remain applicable.

D. Rhoades

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If you have any questions, please contact the Project Manager, V. Sreenivas, at 301-415-2597 or [V.Sreenivas@nrc.gov](mailto:V.Sreenivas@nrc.gov).

Sincerely,

Hipólito González, Branch Chief  
Plant Licensing Branch I  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-244

Enclosure:  
Safety Evaluation

cc: Listserv



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST PR-03

SIXTH 10-YEAR INTERVAL INSERVICE TESTING PROGRAM

CONSTELLATION ENERGY GENERATION, LLC

R. E. GINNA NUCLEAR POWER PLANT

DOCKET NO. 50-244

1.0 INTRODUCTION

By letter dated January 26, 2024 (Agencywide Documents Access and Management System Accession No. ML24026A011), as supplemented by a letter dated March 28, 2024 (ML24088A204), Constellation Energy Generation, LLC (the licensee) submitted a proposed alternative to certain Inservice Testing (IST) requirements of the American Society of Mechanical Engineers (ASME) *Operation and Maintenance of Nuclear Power Plants*, Division 1, OM Code: Section IST (OM Code) for a specific pump at R. E. Ginna Nuclear Power Plant (Ginna).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(2), the licensee submitted the proposed alternative in request PR-03 for Ginna on the basis that the ASME OM Code requirements for an identified pump at this time present an undue hardship without a compensating increase in the level of quality or safety.

2.0 REGULATORY EVALUATION

The Nuclear Regulatory Commission (NRC) regulations in 10 CFR 50.55a(f)(4), "Inservice testing standards requirement for operating units," state, in part, that throughout the service life of a boiling or pressurized water-cooled nuclear power facility, pumps and valves that are within the scope of the ASME OM Code must meet the IST requirements (except design and access provisions) set forth in the ASME OM Code and addenda that become effective subsequent to editions and addenda specified in 10 CFR 50.55a(f)(2) and (3) and that are incorporated by reference in 10 CFR 50.55a(a)(1)(iv), to the extent practical within the limitations of design, geometry, and materials of construction of the components.

The NRC regulations in 10 CFR 50.55a(z) state, in part, that alternatives to the requirements of 10 CFR 50.55a(f) may be used when authorized by the NRC, if the licensee demonstrates that:

(1) *Acceptable level of quality and safety*. The proposed alternative would provide an acceptable level of quality and safety; or

Enclosure

(2) *Hardship without a compensating increase in quality and safety.* Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Licensee's Request PR-03

##### Applicable ASME OM Code Edition

The ASME OM Code of Record for the Sixth 10-Year Interval IST Program at Ginna is the 2012 Edition of the ASME OM Code as incorporated by reference in 10 CFR 50.55a. The Sixth 10-Year Interval IST Program at Ginna began on January 1, 2020.

##### ASME OM Code Component Affected

In its submittal, the licensee requested authorization to use the proposed alternative for the pump listed in Table 1 below:

Table 1

Component	Description	ASME Code Class	ASME OM Pump Category
PAF01B	Auxiliary Feedwater Pump B	3	A

##### Applicable ASME OM Code Requirements

The IST requirements in the ASME OM Code, Subsection ISTB, "Inservice Testing of Pumps in Light-Water Reactor Nuclear Power Plants – Pre-2000 Plants," as incorporated by reference in 10 CFR 50.55a, related to request PR-03 are as follows:

ASME OM Code, Subsection ISTB, paragraph ISTB-3400, "Frequency of Inservice Tests," states:

An inservice test shall be run on each pump as specified in Table ISTB-3400-1.

ASME OM Code, Subsection ISTB, Table ISTB-3400-1, "Inservice Test Frequency," requires that a Comprehensive [Pump] Test (CPT) and a Pump Periodic Verification Test (PPVT) be performed biennially for Group A pumps.

ASME OM Code, Mandatory Appendix V, "Pump Periodic Verification Test Program," Section V-2000, "Definitions," specifies the PPVT as a test that verifies a pump can meet the required (differential or discharge) pressure as applicable, at its highest design basis accident flow rate.

ASME OM Code, Mandatory Appendix V, Section V-3000, "General Requirements," paragraph (b), requires that a PPVT be performed at least once every 2 years.

### Proposed Alternative and Basis for Use

The NRC staff summarizes the licensee's proposed request PR-03 and the basis for its use as follows:

As an alternative to the requirements to perform a CPT and PPVT every 2 years on the 'B' auxiliary feedwater (AFW) pump in ASME OM Code, Subsection ISTB, paragraph ISTB-3400 and Mandatory Appendix V, the licensee requests to defer the CPT and PPVT until no later than November 30, 2024. The licensee will continue to perform a quarterly Group A test as scheduled to provide continued monitoring and assurance of the 'B' AFW pump's operational readiness.

The licensee noted that as required in the ASME OM Code, Subsection ISTB, paragraph ISTB-5120, "Inservice Testing," the Group A tests and CPTs are both conducted with the pump operating as close as practical to each test's specified reference point, and testing verifies the same test parameters as outlined in ASME OM Code, Subsection ISTB, Table ISTB-3000-1, "Centrifugal Pump Test Acceptance Criteria." However, Group A tests and CPTs differ in their acceptance criteria ranges, with the CPT ranges being more restrictive. As defined in Mandatory Appendix V, the PPVT verifies a pump can meet the required (differential or discharge) pressure at its highest design basis accident flow.

At Ginna, the licensee states that the CPT and PPVT for the 'B' AFW pump are performed concurrently at the PPVT full flow rate value of 200 gallons per minute (gpm) on a line that terminates at a steam generator, and there is no alternative flow path to achieve the required flow parameters. In the current condition with a disk separation in the Condensate Heater 4B Outlet Check Valve and resulting partial flow blockage, the licensee reported that 200 gpm forward flow to the steam generators initiates a series of secondary system oscillations and responses that cause a secondary flow imbalance which increases plant risk. The licensee notes that the quarterly Group A test is conducted on a recirculation line that does not flow into the steam generator and, therefore, can be performed without causing the secondary transients.

The licensee conducts the Group A test when the pump is operated in the recirculation mode with an installed flow orifice that establishes a 40 gpm flow rate. The licensee indicated that flow is not directly measured during the quarterly Group A test as allowed by the NRC-authorized request PR-02 for Ginna. The Group A test flow rate is considerably lower than the 200 gpm flow used for the CPT and PPVT. Despite the flow differences, the licensee provided tables and figures in request PR-03 to demonstrate that the Group A test produces results that are commensurate with the CPT and PPVT vibration and differential pressure results.

The licensee reports that past data and trends from the quarterly Group A testing, the CPT, and the PPVT for the 'B' AFW pump show no negative trending for any IST parameter, which would indicate pump degradation. Therefore, the licensee considers it unlikely that the upcoming CPT or PPVT would produce a failing value for any test parameter. If there is a change in the pump performance during the period covered by this request, the licensee states that the quarterly Group A pump test that will be performed would detect any failures or declining trends. The licensee also reports that no significant maintenance has been performed or is planned for the 'B' AFW pump that would alter the flow or pressure parameters.

The licensee states that the proposed alternative in PR-03 is requested pursuant to 10 CFR 50.55a(z)(2) based on its assertion that compliance with the ASME OM Code CPT and PPVT pump test requirements cannot be achieved without considerable plant safety and

reliability risks prior to significant repairs to address the disk separation of the Condensate Heater 4B Outlet Check Valve. The licensee reports that recent inservice testing of the AFW pumps with forward flow to the steam generators has caused secondary plant transients that had the potential to result in a rapid reactor downpower and increased the probability of a loss of Main Feedwater transient, and a subsequent unplanned reactivity management event (reactor trip). The licensee plans to conduct repairs to the valve during the upcoming refueling outage in the fall of 2024 because repairs online present personnel safety and plant reliability risks. In the current conditions, the licensee considers that performance of the CPT and PPVT for the 'B' AFW pump would constitute a hardship without a compensating increase in the level of quality and safety. The licensee asserts that the proposed alternative provides reasonable assurance of pump operational readiness and provides an acceptable level of quality and safety.

#### Reason for Request

The NRC staff summarizes the licensee's reason for request PR-03 as follows:

The licensee states that a disk separation of the Condensate Heater 4B Outlet Check Valve has resulted in a partial flow blockage, which causes secondary plant transients during inservice testing of AFW pumps with forward flow to the steam generators (e.g., September 20, 2023, full flow testing of the Turbine Driven AFW Pump (PAF03) and November 13, 2023, full flow testing of the Standby AFW Pump C (PSF01A)). According to the licensee, these transients resulted in a rapid reduction in heater drain tank (HDT) level below 40 percent, which necessitates manual operation of the HDT level controller. In this condition, if the HDT pump tripped on low level, it would necessitate rapid downpower to 50 percent reactor power to prevent a thermal power transient, which places unnecessary thermal and pressure cycles on plant equipment, thereby reducing overall safety and reliability. In this condition, there is an increased probability of a loss of Main Feedwater transient and an unplanned reactivity management event.

The licensee reports that repairs to address the disk separation of the Condensate Heater 4B Outlet Check Valve are scheduled for the upcoming refueling outage in the fall of 2024. As a contingency, the repair scope is included on the forced outage worklist, and would be performed if a forced outage of sufficient duration and scope occurred prior to the planned refueling outage. Repairs online would require a significant downpower of the reactor, which places unnecessary thermal and pressure cycles on plant equipment; thereby reducing overall safety and reliability. In addition, online repairs would require an "exceptional tagout" due to a single valve isolation of a high energy line, which does not provide complete conventional isolation of hazardous energy for the work.

#### Duration of Proposed Alternative

The licensee proposes that this request, upon authorization, will be applied until November 30, 2024. The licensee considers that this date will provide an adequate window of opportunity to perform the CPT and PPVT of the 'B' AFW pump at full power following Ginna's scheduled fall 2024 refueling outage, when repairs will be made to the Condensate Heater 4B Outlet Check Valve. The licensee states that the biennial test frequency for the 'B' AFW pump will restart from the date of performance of the CPT and PPVT in the fall of 2024.

### 3.2 NRC Staff Evaluation

The ASME OM Code, as incorporated by reference in 10 CFR 50.55a, in Subsection ISTB, paragraph ISTB-3400, requires an inservice test on each pump as indicated in Table ISTB-3400-1, which specifies that a CPT and PPVT be performed biennially for Group A pumps with specific requirements for the PPVT in Mandatory Appendix V. The next performance of the CPT and PPVT for the 'B' AFW Pump (PAF01B) at Ginna is due on August 27, 2024, which is 24 months plus the grace period from the last test performed on March 1, 2022. In request PR-03, the licensee proposes to defer the CPT and PPVT for the 'B' AFW pump at Ginna until no later than November 30, 2024. The licensee will continue to perform a quarterly Group A test as scheduled to provide continued monitoring and assurance of the operational readiness of the 'B' AFW pump. The licensee has submitted the proposed alternative in PR-03 pursuant to 10 CFR 50.55a(z)(2) based on its assertion that compliance with the CPT and PPVT requirements in the ASME OM Code for the 'B' AFW pump at this time would constitute a hardship without a compensating increase in the level of quality and safety. The licensee asserts that the proposed alternative provides reasonable assurance of the operational readiness of the 'B' AFW pump at Ginna and provides an acceptable level of quality and safety.

As the basis for its assertion that compliance with the specified ASME OM Code CPT and PPVT requirements would constitute a hardship without a compensating increase in the level of quality and safety, the licensee states that a disk separation of the Condensate Heater 4B Outlet Check Valve has resulted in partial flow blockage, which causes secondary plant transients during inservice testing of the AFW pumps. According to the licensee, these transients result in a rapid reduction in the HDT level which necessitates manual operation of the HDT level controller. In this condition, if the HDT pump tripped on low level, it would necessitate rapid downpower of reactor power to prevent a thermal power transient, which would place thermal and pressure cycles on plant equipment and reduce overall safety and reliability of the plant. In this condition, the licensee indicates that there is an increased probability of a loss of Main Feedwater transient. The licensee has planned repairs of the disk separation of the Condensate Heater 4B Outlet Check Valve for the upcoming refueling outage in the fall of 2024, and also has included these repairs on the forced outage worklist if an outage of sufficient duration and scope occurs prior to that time. The licensee indicates that performing these repairs online would require a significant downpower of the reactor, and cause potential hazardous work conditions by the presence of a single valve isolation of a high energy line. From this information, the NRC staff agrees with the licensee that performance of the ASME OM Code CPT and PPVT requirements for the 'B' AFW pump at this time would constitute a hardship without a compensating increase in the level of quality and safety.

To support the continued operational readiness of the 'B' AFW pump, the licensee provided specific past data from several years of pump testing, including differential pressure, flow, and vibration data. The past data indicate good performance during the historical testing of the 'B' AFW pump, and do not reveal pump degradation in the applicable IST parameters. The licensee reports that no significant maintenance has been performed or is planned for the 'B' AFW pump that would alter the applicable flow or pressure parameters.

In response to an NRC staff request for additional information in its letter dated March 28, 2024, the licensee stated that the Condensate Heater 4B Outlet Check Valve is not in the IST Program at Ginna as it does not meet the scoping criteria of the ASME OM Code. The licensee indicated that this check valve is a 12-inch Crane Swing Check Valve in continuous service (i.e., open). The licensee determined that there are no valves within the IST Program at Ginna of the same size, make, model and service conditions that would warrant changes to IST Program

activities based on the extent of condition review. The licensee plans to conduct further analysis when the internals of this check valve are inspected and repaired during the 2024 refueling outage with those activities being tracked in the Corrective Action Program at Ginna.

Based on its review, the NRC staff finds that the licensee has justified that the performance of the CPT and PPVT for the 'B' AFW pump at Ginna over the short time period beyond the allowed grace period would constitute a hardship without a compensating increase in the level of quality and safety, as a result of the potential for a plant transient if those tests were performed at this time. Further, the staff finds that the licensee has justified that the proposed alternative provides reasonable assurance of the operational readiness of the 'B' AFW pump and provides an acceptable level of quality and safety over this short time period, based on continued performance of the quarterly Group A testing and the good performance history of the 'B' AFW pump. Therefore, the staff finds that request PR-03 satisfies 10 CFR 50.55a(z)(2) for the 'B' AFW pump at Ginna.

#### 4.0 CONCLUSION

As described above, the NRC staff finds that the licensee has justified that the proposed alternative as specified in request PR-03 will provide reasonable assurance of the operational readiness of the 'B' AFW pump at Ginna until November 30, 2024, in light of the hardship that would be caused by compliance of the applicable ASME OM Code requirements without a compensating increase in the level of quality and safety at this time. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2) for request PR-03 at Ginna. Therefore, the NRC staff authorizes the use of request PR-03 (as supplemented) at Ginna until November 30, 2024.

All other ASME OM Code requirements as incorporated by reference in 10 CFR 50.55a for which relief or an alternative was not specifically requested, and granted or authorized (as appropriate), in the subject request remain applicable.

Principal Contributor: Thomas Scarbrough, NRR

Date: July 16, 2024



SUBJECT: R. E. GINNA NUCLEAR POWER PLANT – ALTERNATIVE ASSOCIATED WITH INSERVICE TESTING OF 'B' AUXILIARY FEEDWATER PUMP - PR-03 (EPID L-2024-LLR-0006) DATED: JULY 16, 2024

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