



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

March 31, 2014

Mr. Raymond A. Lieb
Site Vice President
FirstEnergy Nuclear Operating Company
Mail Stop A-DB-3080
5501 North State, Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1- SAFETY
EVALUATION CONCERNING COMPREHENSIVE PUMP TESTING RELIEF
REQUEST (TAC NO. MF0756) (L-13-067)

Dear Mr. Lieb:

By letter dated February 27, 2013, as supplemented by a letter dated October 8, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13059A321 and ML13281A820, respectively), First Energy Nuclear Operating Company, (the licensee), submitted request RP-5, to the U.S. Nuclear Regulatory Commission (NRC). The licensee proposed alternatives to, or requested relief from, certain inservice testing (IST) requirements of the American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code), for the IST program at Davis-Besse Nuclear Power Station (DBNPS), Unit 1, for the fourth 10-year IST program interval. Specifically, pursuant to Section 50.55a(a)(3)(ii) to Title 10 of the *Code of Federal Regulations* (10 CFR), the licensee requested to use the proposed alternative in RP-5 on the basis that the alternatives provide reasonable assurance that the components are operationally ready.

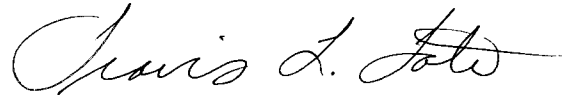
The NRC staff determined that compliance with the ASME OM Code required comprehensive pump test frequency for the identified pumps would result in hardship without compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee's proposed alternative request provides reasonable assurance that the affected components are operationally ready. On this basis, the licensee's proposed alternative in RP-5 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) at DBNPS for the fourth 10-year IST program interval, which began on September 21, 2012, and is scheduled to end on September 20, 2022. All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject request remain applicable.

R. Lieb

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Should you have any questions, please feel free to contact Ms. Eva Brown at (301) 415-2315.

Sincerely,

A handwritten signature in cursive script, reading "Travis L. Tate". The signature is written in black ink and is positioned above the typed name and title.

Travis L. Tate, Chief
Plant Licensing III-2 and
Planning and Analysis Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure: Safety Evaluation

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST NO. RP-5

COMPREHENSIVE TESTING OF HIGH PRESSURE INJECTION PUMPS

FIRSTENERGY NUCLEAR OPERATING COMPANY

DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1

DOCKET NO. 50-346

1.0 INTRODUCTION

By letter dated February 27, 2013, as supplemented by a letter dated October 8, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13059A321 and ML13281A820, respectively), First Energy Nuclear Operating Company, (the licensee), submitted request RP-5, to the U.S. Nuclear Regulatory Commission (NRC). The licensee proposed alternatives to, or requested relief from, certain inservice testing (IST) requirements of the American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code), for the IST program at Davis-Besse Nuclear Power Station, Unit 1 (DBNPS) for the fourth 10-year IST program interval. Specifically, pursuant to Section 50.55a(a)(3)(ii) to Title 10 of the *Code of Federal Regulations* (10 CFR), the licensee requested to perform comprehensive testing of high pressure injection (HPI) pumps each refueling outage in lieu of biennially, and reclassify the pumps from Group B to Group A in order to include vibration test requirements during quarterly pump testing with increased instrument accuracy in accordance with Code Case OMN-18.

The DBNPS, Unit 1, fourth 10-year IST interval began on September 21, 2012, and is scheduled to end on September 20, 2022.

By letter dated March 28, 2003, (ADAMS Accession No. ML030790183), similar requests to RP-5 were approved by NRC for DBNPS third 10-year IST program. The precedent cited by the licensee was considered as part of this review.

2.0 REGULATORY EVALUATION

Section 50.55a(f), "Inservice Testing Requirements," requires, in part, that IST of certain ASME Code Class 1, 2, and 3 components must meet the requirements of the ASME OM Code and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the NRC pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a.

Enclosure

In proposing alternatives or requesting relief, a licensee must demonstrate that: (1) the proposed alternative provides an acceptable level of quality and safety (10 CFR 50.55a(a)(3)(i)); (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety (10 CFR 50.55a(a)(3)(ii)); or (3) conformance is impractical for the facility (10 CFR 50.55a(f)(5)(iii)). Section 50.55a allows the NRC to authorize alternatives to and grant relief from ASME OM Code requirements upon making necessary findings.

3.0 TECHNICAL EVALUATION

3.1 Licensee's Request for Alternative

Components for Which Relief is Being Requested

This request applies to the DBNPS HPI pumps P58-1 and P58-2. The HPI pumps are ASME Code Class 2, Group AB, centrifugal pumps.

Code Requirements

The applicable ASME OM Code edition and addenda for DBNPS is the 2004 Edition through the 2006 Addenda. This request applies to the following Subsection ISTB paragraphs of the ASME OM Code.

Subsection ISTB-3400, "Frequency of Inservice Tests," states that "[a]n inservice test shall be run on each pump as specified in Table ISTB-3400-1."

Table ISTB-3400-1, "Inservice Test Frequency," requires a Group A and Group B test to be performed quarterly and a comprehensive test to be performed biennially.

Licensee's Proposed Alternative and Basis

Comprehensive testing of the HPI pumps will be performed each refueling outage instead of biennially. The classification for HPI pumps will be changed from Group B to Group A in order to include, in addition to other provisions, vibration test requirements of ASME OM Code Paragraph ISTB-5121, "Group A Test Procedure," subparagraphs (d) and (e), with vibration acceptance criteria of ASME OM Code Table ISTB-5121-1, "Centrifugal Pump Test Acceptance Criteria," during the quarterly pump test. A Group B pump that is classified as a Group A pump for testing purposes is referred to herein as a Group AB pump.

Using the provisions of this relief request as an alternative to the requirements of ASME OM Code Table ISTB-3400-1, including the performance of comprehensive tests during refueling outages and Group A pump tests quarterly between refueling outages, provides reasonable assurance that the HPI pumps are operationally ready.

The HPI pumps inject water into the reactor coolant system (RCS) to mitigate the consequences of a loss-of-coolant accident (LOCA). These pumps were originally categorized as Group B. Required testing for these HPI pumps is a quarterly Group B pump test and a biennial comprehensive pump test. The ASME OM Code requires that these pumps be tested within ± 20 percent of the pump design flow rate for the comprehensive test. The HPI system is equipped

with a flow test line that is not designed to withstand a flow rate within ± 20 percent of the HPI pump design flow rate, as required to fulfill the comprehensive testing requirements of ASME OM Code subparagraph ISTB-3300(e)(1). In order to achieve the necessary flow rate, without creating low temperature overpressure concerns, the HPI pumps are lined up to discharge into the RCS with the reactor head removed and with water in the refueling canal. These plant conditions are established only during an outage in which a refueling occurs, and are not typically established during a maintenance outage. Removal of the reactor head solely to perform the comprehensive pump test is a hardship since it would substantially increase the scope and duration of a maintenance shutdown and result in associated radiation exposure.

Table ISTB-3400-1 of the ASME OM Code, requires the comprehensive pump test to be performed biennially. Since the plant is on a 24-month fuel cycle, compliance with this requirement is normally achievable. However, if the plant experiences maintenance shutdowns, the added time between refueling outages could jeopardize compliance with this testing requirement.

3.2 NRC Staff Evaluation

The HPI pumps inject water into the RCS to mitigate the consequences of a LOCA. These pumps were originally categorized by the licensee as Group B pumps since they are in a standby system that is not operated routinely except for testing. The Code required testing for these HPI pumps is a quarterly Group B pump test and a biennial comprehensive pump test. The biennial comprehensive pump test requires that these pumps be tested within ± 20 percent of the pump design flow rate biennially.

The licensee proposed to perform the comprehensive test each refueling outage in lieu of biennially. The HPI system is equipped with a flow test line that is not designed to withstand a flow rate within ± 20 percent of the HPI pump design flow rate, as required to fulfill the comprehensive testing requirements of ISTB-3300(e)(1). In order to achieve the necessary flow rate, the HPI pumps are lined up to discharge into the RCS with the reactor head removed and with water in the refueling canal. These plant conditions are established only during an outage in which a refueling occurs, and are not typically established during a maintenance outage. Since the plant is on a 24-month fuel cycle, compliance with this requirement is normally achievable. However, if the plant experiences maintenance shutdowns, the added time between refueling outages could jeopardize compliance with this testing requirement. Removal of the reactor head solely to perform the comprehensive pump test would result in hardship since it would substantially increase the scope and duration of a maintenance shutdown and result in associated radiation exposure.

The licensee proposed to perform the comprehensive test each refueling outage in lieu of biennially. The licensee also proposed to reclassify HPI pumps from Group B to Group A in order to include ISTB-5121(d), ISTB-5121(e), and Table ISTB-5121-1 vibration test requirements during the quarterly pump tests. Therefore, the group A pump tests performed quarterly between refueling outages, combined with a comprehensive test every refueling outage, will provide reasonable assurance that the HPI pumps are operationally ready. There are no vibration test requirements for Group B pumps such as HPI pumps. By changing the HPI pumps from Group B to Group A, vibration testing of HPI pumps, along with measuring the other parameters (e.g. speed, differential pressure, and flow rate), provides a good indication of pump degradation.

4.0 CONCLUSION

Based on the above, the NRC staff determines that compliance with the ASME OM Code required comprehensive pump test frequency of biennially as required in Table ISTB-3400-1 for the HPI pumps P58-1 and P58-2 would result in hardship without compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee proposed alternative provides reasonable assurance that the affected components are operationally ready. On this basis, the licensee's proposed alternative in RP-5 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the fourth 10-year IST interval. This alternative is authorized for the fourth 10-year IST program interval which began on September 21, 2012, and is scheduled to end on September 20, 2022. All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject requests remain applicable.

Principal Contributor: Gurjendra Bedi, NRR

Dated: March 31, 2014

R. Lieb

- 2 -

Should you have any questions, please feel free to contact Ms. Eva Brown at (301) 415-2315.

Sincerely,

/ RA /

Travis L. Tate, Chief
Plant Licensing III-2 and
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Docket No. 50-346

Enclosure: Safety Evaluation

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ADAMS ACCESSION NUMBER: ML14030A574

NRR-028

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