



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

January 27, 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 1 - SAFETY EVALUATION
FOR RELIEF REQUESTS RP-1 AND RP-1A (TAC NOS. MF0758 AND MF0760)
(L-13-076)

Dear Mr. Lieb:

By letter dated February 27, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13059A321), FirstEnergy Nuclear Operating Company, the licensee, submitted alternative requests RP-1 and RP-1A pursuant to Section 50.55a(a)(3)(i) to Title 10 to the *Code of Federal Regulations* (10 CFR) for the Davis-Besse Nuclear Power Station (DBNPS), Unit 1. Specifically, the licensee requested to use plant process computer points as digital instrumentation for inservice testing (IST) of certain pumps.

The U.S. Nuclear Regulatory Commission (NRC) staff determined that the proposed alternatives described in RP-1 and RP-1A, provide an acceptable level of quality and safety for pumps listed in the above requests. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(i) for requests RP-1 and RP-1A and is in compliance with the American Society of Mechanical Engineers Code for Operation and Maintenance of Nuclear Power Plant requirements. Therefore, the NRC staff authorizes the proposed alternative in requests RP-1 and RP-1A for the DBNPS, Unit 1, for the fourth 10-year IST program interval which began on September 21, 2012, and is currently scheduled to end on September 20, 2023.

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

Sincerely,

A handwritten signature in cursive script that reads "Travis L. Tate".

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 NOS. RP-1 AND RP-1A

RELATED TO USE OF PLANT PROCESS COMPUTER POINTS

FOR DIGITAL INSTRUMENTATION

FIRSTENERGY NUCLEAR OPERATING COMPANY

DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1

DOCKET NO. 50-346

1.0 INTRODUCTION

By letter dated February 27, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13059A321), FirstEnergy Nuclear Operating Company, the licensee, submitted alternative requests RP-1 and RP-1A pursuant to Section 50.55a(a)(3)(i) to Title 10 to the *Code of Federal Regulations* (10 CFR) for the Davis-Besse Nuclear Power Station (DBNPS), Unit 1. Specifically, the licensee requested to use plant process computer points as digital instrumentation for inservice testing (IST) of certain pumps in lieu of comprehensive pump testing.

This alternative was requested for the fourth 10-year IST interval at DBNPS, which began on September 21, 2012, and ends on September 20, 2022.

2.0 REGULATORY EVALUATION

Section 50.55a(f), *Inservice testing requirements*, to 10 CFR, states that American Society of Mechanical Engineers (ASME), *Code for Operation and Maintenance of Nuclear Power Plants*, (OM Code) Class 1, 2, and 3; and Class MC and CC components (including supports) must meet the requirements set forth in the ASME Code and applicable addenda, except where alternatives have been authorized by the Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 50.55a, paragraphs (a)(3)(i) or (a)(3)(ii).

Section 50.55a(a)(3) to 10 CFR states, in part, that proposed alternatives to the requirements of paragraph (f) may be used when authorized if (i) the proposed alternative would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality or safety.

Enclosure

Table ISTB-3510-1 of ASME OM Code, *Required Instrument Accuracy*, specifies the instrument accuracies for Group A, Group B, Comprehensive, and Preservice tests of pumps.

Code Case OMN-18, *Alternative Testing Requirements for Pumps Tested Quarterly Within $\pm 20\%$ of Design Flow*, states, in part, that the Group A test may be performed quarterly within $\pm 20\%$ of pump design flow rate, with instrumentation meeting the requirements of Table ISTB-3510-1 for the comprehensive and preservice tests, and no comprehensive test is required. The NRC staff approved the alternative proposed in RP-6 for DBNPS, in letters dated August 1 and 28, 2013 (ADAMS Accession Nos. ML13210A467 and ML13228A039, respectively).

By letter dated March 28, 2003 (ADAMS Accession No. ML 030790183), similar requests to RP-1 and RP-1A were approved by NRC for the DBNPS third 10-year IST program. The precedent cited by the licensee was considered as part of this review.

3.0 TECHNICAL EVALUATION

3.1 Licensee's Alternative Request RP-1

3.1.1 Applicable Code Edition and Addenda

The applicable ASME OM Code edition and addenda for DBNPS is the 2004 Edition through the 2006 Addenda.

3.1.2 Components for Which Relief is Being Requested

The licensee proposed alternative to the ASME OM Code requirements of paragraph ISTB-3510(b)(2) for the following pumps:

- P43-1, Component Cooling Water Pump, Class 3, Group A
- P43-2, Component Cooling Water Pump, Class 3, Group A
- P43-3, Component Cooling Water Pump, Class 3, Group A
- P58-1, High Pressure Injection Pump, Class 2, Group AB
- P58-2, High Pressure Injection Pump, Class 2, Group AB
- P3-1, Service Water Pump, Class 3, Group A
- P3-2, Service Water Pump, Class 3, Group A
- P3-3, Service Water Pump, Class 3, Group A

3.1.3 Licensee's Basis and Proposed Alternative

The licensee states:

Plant process computer points may be used as digital instrumentation for Inservice testing of pumps. The computer points may be used in lieu of the associated analog indicators in order to meet the ASME OM Code instrument accuracy requirements. In addition to using computer points, temporary digital instruments are also used as measuring and test equipment for pump testing.

In some cases, the reference value exceeds 90 percent of the digital instruments calibrated range during comprehensive pump testing.

The licensee proposes:

[a]s an alternative to ISTB-3510(b)(2), digital instruments used to verify the required action levels of ASME OM Code Tables ISTB-5121-1, "Centrifugal Pump Test Acceptance Criteria," and ISTB-5221-1, "Vertical Line Shaft Centrifugal Pump Test Acceptance Criteria," will be selected such that the reference value shall not exceed 97 percent of the calibrated range for comprehensive pump testing.

Plant process computer points or temporary digital instruments may be used for comprehensive pump testing. The computer points use permanent plant instrumentation as input, and by design, the ranges are selected to account for all expected operating and testing conditions. Surveillance tests are written such that the temporary instrumentation is not over-ranged. In addition, digital instrumentation is significantly less susceptible to damage from over-ranging, and the digital instrument is accurate throughout its full calibrated range.

Tables ISTB-5121-1 and ISTB-5221-1 of the ASME OM Code list the acceptance criteria for comprehensive testing and state that the maximum acceptable value of the measured parameter is 103 percent of the reference value (for flow and differential pressure).

The proposed alternative to ISTB-3510(b)(2) requires that the digital instruments used be selected such that the reference value shall not exceed 97 percent of the calibrated range. This ensures that when the digital instrument used during performance of comprehensive pump testing is reading the maximum action level of 103 percent of the reference value, the reading is within the calibrated range of the instrument.

Using the provisions of this relief request as an alternative to the requirements in ISTB-3510(b)(2), during the performance of comprehensive pump testing, provides a reasonable alternative to the [ASME OM] Code requirements. The proposed method of monitoring the affected components for degradation provides an acceptable level of quality and safety, and assurance that the pumps are capable of performing their safety functions.

3.1.4 NRC Staff Evaluation

The licensee proposed an alternative to the requirements of ISTB-3510(b)(2). This alternative request applies to ASME Code Class 2 and Class 3 pumps. ISTB-3510(b)(2) requires that reference values of digital instruments do not exceed 90 percent of the calibrated range of the instrument.

At DBNPS, the licensee indicated that plant process computer points or temporary digital instruments may be used for comprehensive pump testing. The computer points use permanent

plant instrumentation as input, and by design, the ranges are selected to account for all expected operating and testing conditions. Surveillance tests are written such that the temporary digital instrumentation is not over-ranged. In addition, digital instrumentation is significantly less susceptible to damage from over-ranging, and the digital instrument is accurate throughout its full calibrated range.

The proposed alternative to ISTB-3510(b)(2) requires that the digital instruments used be selected such that the reference value shall not exceed 97 percent of the calibrated range. The requirement for not exceeding 97 percent of the calibrated range is based on the maximum required action range of 103 percent in Tables ISTB-5121-1 and ISTB-5221-1. Therefore, the selection of reference value of 97 percent ensures that when the digital instrument is reading the maximum action level of 103 percent of the reference value, the reading is not exceeding the calibrated range of the instrument and is therefore acceptable.

On the basis of the above evaluation, the NRC staff finds the licensee's proposed alternative for testing pumps P43-1, P43-2, P43-3, P58-1, P58-2, P3-1, P3-2, and P3-3 provides an acceptable level of quality and safety.

3.2 Licensee Alternative Request RP-1A

3.2.1 Applicable Code Edition and Addenda

The applicable ASME OM Code edition and addenda for DBNPS is the 2004 Edition through the 2006 Addenda.

3.2.2 Components for Which Relief is Being Requested

The licensee proposed alternative to the ASME OM Code requirements of ISTB-3510(b)(2) for the following pumps when the pumps are tested in accordance with the provisions of ASME OM Code Case OMN-18:

- P14-1, Auxiliary Feedwater Pump, Class 3, Group AB
- P14-2, Auxiliary Feedwater Pump, Class 3, Group AB
- P56-1, Containment Spray Pump, Class 2, Group AB
- P56-2, Containment Spray Pump, Class 2, Group AB
- P42-1, Decay Heat Removal Pump, Class 2, Group A
- P42-2, Decay Heat Removal Pump, Class 2, Group A

3.2.3 Licensee's Basis and Proposed Alternative

The licensee stated:

Plant process computer points may be used as digital instrumentation for Inservice testing of pumps. The computer points may be used in lieu of the associated analog indicators in order to meet the ASME OM Code instrument accuracy requirements. In addition to using computer points, temporary digital instruments are also used as measuring and test equipment for pump testing.

In some cases, the reference value exceeds 90 percent of the digital instruments calibrated range during comprehensive pump testing in accordance with a separate 10 CFR 50.55a Request RP-6 that would utilize the provisions of ASME OM Code Case OMN-18.

The NRC staff approved the alternative proposed in RP-6 in letters dated August 1 and 28, 2013.

The licensee proposed:

[a]s an alternative to ISTB-3510(b)(2), digital instruments used to verify the required action levels of ASME OM Code Case OMN-18 will be selected such that the reference value shall not exceed 94 percent of the calibrated range.

Plant process computer points or temporary digital instruments may be used for [ASME OM] Code Case OMN-18 pump testing. The computer points use permanent plant instrumentation as input, and by design, the ranges are selected to account for all expected operating and testing conditions. Surveillance tests are written such that the temporary instrumentation is not over-ranged. In addition, digital instrumentation is significantly less susceptible to damage from over-ranging, and the digital instrument is accurate throughout its full calibrated range.

The alternative proposed in 10 CFR 50.55a Request RP-6 to apply Code Case OMN-18 would require the maximum acceptable value of the measured parameter be 106 percent of the reference value.

The proposed alternative to ISTB-3510(b)(2) requires that the digital instruments used be selected such that the reference value shall not exceed 94 percent of the calibrated range. This ensures that when pump testing is performed pursuant to Code Case OMN-18 and the digital instrument is reading the maximum action level of 106 percent of the reference value, the reading is within the calibrated range of the instrument.

Using the provisions of this relief request as an alternative to the requirements in ISTB-3510(b)(2), during the performance of Code Case OMN-18 pump testing, provides a reasonable alternative to the Code requirements. The proposed method of monitoring the affected components for degradation provides an acceptable level of quality and safety, and assurance that the pumps are capable of performing their safety functions.

3.2.4 NRC Staff Evaluation

The licensee proposed an alternative to the requirements of ISTB-3510(b)(2) for pump tests in accordance with the provisions of ASME OM Code Case OMN-18 (OMN-18). This alternative request applies to ASME Code Class 2 and Class 3 pumps. ISTB-3510(b)(2) requires that reference values of digital instruments do not exceed 90 percent of the calibrated range of the instrument.

At DBNPS, the licensee indicated that plant process computer points or temporary digital instruments may be used for pump testing. The computer points use permanent plant instrumentation as input, and by design, the ranges are selected to account for all expected operating and testing conditions. Surveillance tests are written such that the temporary digital instrumentation is not over-ranged. In addition, digital instrumentation is significantly less susceptible to damage from over-ranging, and the digital instrument is accurate throughout its full calibrated range.

The proposed alternative to ISTB-3510(b)(2) requires that the digital instruments used be selected such that the reference value shall not exceed 94 percent of the calibrated range. The requirement for not exceeding 94 percent of the calibrated range is based on the maximum required action range of 106 percent as required in the approved Alternative Request RP-6 for modified Group A tests using the provisions of ASME OM Code Case OMN-18. In lieu of Group A and compressive tests, ASME OM Code Case OMN-18 allows modified Group A tests be performed within $\pm 20\%$ of pump design flow rate, and with instrumentation meeting the requirements of Table ISTB-3510-1 for the comprehensive and preservice tests.

For the OMN-18 modified Group A test, a maximum of 106 percent of reference flow or differential pressure will be applied as the high end of the acceptable range, and values above 1.06 would be considered to be in the required action range. Therefore, the selection of reference value of 94 percent ensures that when the digital instrument used during performance of Code Case OMN-18 pump testing is reading the maximum required action level of 106 percent of the reference value, the reading is not exceeding the calibrated range of the instrument, and is therefore acceptable.

On the basis of the above evaluation, the NRC staff finds the licensee's proposed alternative for testing pumps P14-1, P14-2, P56-1, P56-2, P42-1 and P42-2, provides an acceptable level of quality and safety.

4.0 CONCLUSION

As set forth above, the NRC staff determined that the proposed alternatives described in RP-1 and RP-1A provide an acceptable level of quality and safety for pumps listed in the above requests. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(i) for requests RP-1 and RP-1A and is in compliance with the ASME OM Code requirements. Therefore, the NRC staff authorizes the proposed alternative in requests RP-1 and RP-1A for the DBNPS, Unit 1, fourth 10-year IST program interval, which began on September 21, 2012, and is currently scheduled to end on September 20, 2023.

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

Principle Contributor: J. Huang

Date of issuance: January 27, 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

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The U.S. Nuclear Regulatory Commission (NRC) staff determined that the proposed alternatives described in RP-1 and RP-1A, provide an acceptable level of quality and safety for pumps listed in the above requests. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(i) for requests RP-1 and RP-1A and is in compliance with the American Society of Mechanical Engineers Code for Operation and Maintenance of Nuclear Power Plant requirements. Therefore, the NRC staff authorizes the proposed alternative in requests RP-1 and RP-1A for the DBNPS, Unit 1, for the fourth 10-year IST program interval which began on September 21, 2012, and is currently scheduled to end on September 20, 2023.

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

Sincerely,
 / RA /
 Travis L. Tate, Chief
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Docket No. 50-346
 Enclosure: Safety Evaluation

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