



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

June 02, 2022

Mr. Terry J. Brown
Site Vice President
Energy Harbor Nuclear Corp.
Mail Stop P-DB-3080
5501 North State Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1 — RELIEF
REQUEST RP-3 REGARDING FUEL OIL TRANSFER PUMP TESTING (EPID
L-2021-LLR-0072)

Dear Mr. Brown:

By letter dated September 20, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21263A193), as supplemented by letter dated March 21, 2022 (ML22080A214), Energy Harbor Nuclear Corp. (the licensee) submitted relief request RP-3 for the fifth inservice testing (IST) interval at Davis-Besse Nuclear Power Station, Unit No. 1 (Davis-Besse). In accordance with paragraph 50.55a(f)(5)(iii) of Title 10 of the *Code of Federal Regulations* (10 CFR), the application requests relief from certain IST requirements for two emergency diesel generator (EDG) fuel oil transfer pumps on the basis that compliance with the requirements is impractical. The September 20, 2021, letter also submitted three other requests; however, this letter only pertains to alternative request RP-3.

The requirements applicable to the fifth IST interval at Davis-Besse are in the 2017 Edition of the American Society of Mechanical Engineers (ASME), *Operation and Maintenance of Nuclear Power Plants*, Division 1, Section IST (OM Code), as incorporated by reference in 10 CFR 50.55a, "Codes and standards. The licensee requests relief from the ASME OM Code requirements for periodic testing to measure or determine the flow rate, differential pressure, and vibration of the EDG fuel oil transfer pumps at Davis-Besse in lieu of these requirements, the licensee will perform alternative testing and trending to ensure the operational readiness of the pumps.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed relief request RP-3 and concludes, as set forth in the enclosed safety evaluation, that granting relief from the specified ASME OM Code requirements for the periodic testing of the EDG fuel oil transfer pumps at Davis-Besse, pursuant to 10 CFR 50.55a(f)(6)(i), is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Furthermore, the NRC staff determined that the licensee's proposed alternative provides reasonable assurance of the operational readiness of EDG fuel oil transfer pumps. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(f)(5)(iii).

Therefore, the NRC staff grants the proposed relief request RP-3 at Davis-Besse for the fifth 10-year IST interval, which is scheduled to begin on September 21, 2022, and end on September 20, 2032.

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

If you have any questions, please contact Blake Purnell at 301-415-1380 or via e-mail at Blake.Purnell@nrc.gov.

Sincerely,

Nancy L. Salgado, Chief
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure:
Safety Evaluation

cc: Listserv



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

PROPOSED ALTERNATIVE REQUEST RP-3

ENERGY HARBOR NUCLEAR CORP.

ENERGY HARBOR NUCLEAR GENERATION LLC

DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1

DOCKET NO. 50-346

1.0 INTRODUCTION

By letter dated September 20, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21263A193), as supplemented by letter dated March 21, 2022 (ML22080A214), Energy Harbor Nuclear Corp. (the licensee) submitted relief request RP-3 for the fifth inservice testing (IST) interval at Davis-Besse Nuclear Power Station, Unit No. 1 (Davis-Besse). In accordance with paragraph 50.55a(f)(5)(iii) of Title 10 of the *Code of Federal Regulations* (10 CFR), the application requests relief from certain IST requirements for two emergency diesel generator (EDG) fuel oil transfer pumps on the basis that compliance with the requirements is impractical. The letter also included three other requests; however, this safety evaluation is only for relief request RP-3.

The requirements applicable to the fifth IST interval at Davis-Besse are in the 2017 Edition of the American Society of Mechanical Engineers (ASME), *Operation and Maintenance of Nuclear Power Plants*, Division 1, Section IST (OM Code), as incorporated by reference in 10 CFR 50.55a, "Codes and standards." The licensee requests relief from the ASME OM Code requirements for periodic testing to measure or determine the flow rate, differential pressure, and vibration of the EDG fuel oil transfer pumps at Davis-Besse. In lieu of these requirements, the licensee will perform alternative testing and trending to ensure the operational readiness of the pumps.

2.0 REGULATORY EVALUATION

The regulations in 10 CFR 50.55a(f)(4) 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.

Enclosure

In accordance with 10 CFR 50.55a(f)(5)(iii), if a licensee has determined that conformance with certain Code requirements is impractical for its facility, the licensee must notify the U.S. Nuclear Regulatory Commission (NRC or Commission) and submit information to support the determination.

The regulations in 10 CFR 50.55a(f)(6)(i) state that the Commission will evaluate determinations under 10 CFR 50.55a(f)(5) that Code requirements are impractical. The Commission may grant such relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

3.0 TECHNICAL EVALUATION

3.1 Licensee's Request

ASME Code Components Affected

The ASME Code Class 3, Group A, EDG fuel oil transfer pump Nos. P195-1 and P195-2.

Applicable Code Edition and Requirements

The applicable ASME OM Code edition for the fifth 10-year IST program interval at Davis-Besse is the 2017 Edition of the ASME OM Code, as incorporated by reference in 10 CFR 50.55a with conditions. The relevant requirements for periodic testing of centrifugal pumps to measure or determine the flow rate, differential pressure, and vibration are in the following ASME OM Code provisions:

- Table ISTB-3400-1 requires Group A pump tests to be performed quarterly and a comprehensive pump test to be performed biennially.
- Paragraphs ISTB-5121 and ISTB-5123 specify the requirements for the conduct of the Group A pump tests and comprehensive pump tests, respectively.
- Table ISTB-5121-1 specifies the acceptance criteria for the Group A and comprehensive pump tests.

Reason for Request

The application states, in part, that:

The EDG fuel oil transfer pumps and motors are submerged inside the EDG fuel oil storage tank and are not accessible for vibration measurements. There are no installed flow instrumentation, pressure instrumentation, valve test connections, or accessible recirculation lines. The pumps transfer diesel fuel oil from the EDG fuel oil storage tanks to the EDG day tanks.

The EDG fuel oil transfer pumps do not have installed instrumentation to measure either flow or discharge pressure. The only possible flow measurement is by measuring EDG day tank volume change over time. Error in measuring this volume is dependent on fuel oil temperature and a limited change in level indication because the EDG day tank has a large upper circular section. Flow rate is dependent upon EDG fuel oil storage tank level and fuel oil viscosity,

which varies with environmental temperature conditions. There are no accessible recirculation pathways nor designed drainage pathways in the pipe line that are used to transfer fuel oil from the EDG fuel oil storage tank to the EDG day tank.

Requested Relief and Proposed Alternative

The licensee requests relief from the following ASME OM Code requirements for periodic testing to measure or determine the flow rate, differential pressure, and vibration of the EDG fuel oil transfer pumps at Davis-Besse:

- The Group A pump test requirements in ISTB-5121, subparagraphs (b) through (e).
- The comprehensive pump test requirements in ISTB-5123, subparagraphs (b) through (e).
- The acceptance criteria in table ISTB-5121-1 for the Group A and comprehensive pump tests.
- The Group A and comprehensive pump test frequency requirements in table ISTB-3400-1.

The licensee requested relief for the duration of the fifth 10-year IST program interval at Davis-Besse, which is scheduled to begin on September 21, 2022, and end on September 20, 2032.

The licensee stated that no vibration monitoring of the EDG fuel oil transfer pumps will be performed. As an alternative to these requirements, the licensee stated that it would perform the following:

Fuel oil transfer system functional testing is performed every 92 days as required by Technical Specification Surveillance Requirement 3.8.1.7. This surveillance requirement verifies that the fuel oil transfer system operates to transfer fuel oil from the fuel oil storage tank to the day tank. Periodic operation of the EDGs for testing purposes requires automatic operation of the EDG fuel oil transfer pumps in order to maintain the required level in the EDG day tanks.

Pump flow rate tests are performed each cycle. Fuel oil is added to the EDG fuel oil storage tank, if necessary, to ensure a specified minimum fuel oil level is established above the EDG fuel oil transfer pump prior to testing. The minimum fuel oil level ensures pump suction pressure is consistent for repeatable system flow characteristics.

The pump flow rate is calculated by measuring the change in EDG day tank level over time. An EDG day tank level change of approximately 150 gallons or more is timed to determine flow rate. As described above, consistent EDG fuel oil transfer pump suction pressure is established prior to the test. Based upon these conditions, pump flow rates are repeatable and capable of predicting pump degradation.

The EDG fuel oil transfer pumps are rated at 10 gallons per minute (gpm). A conservative minimum flow value [i.e., 6 gpm], with respect to design basis, will be used in lieu of ASME OM Code Table ISTB-5121-1. This minimum flow value will ensure the EDG fuel oil transfer pumps do not degrade below required design system flow requirements.

Pump flow rates will be trended for degradation. In lieu of alert levels being specified, required actions will be performed if pump flow rate is determined to be outside the acceptable range.

Periodically, the EDG fuel oil storage tanks are drained, cleaned, and filled with fresh oil. The EDG day tanks are also drained, cleaned and inspected. At these times, a long term pump duration test is possible. The transfer pump will be required to continuously pump 1000 gallons of fuel from the EDG fuel oil storage tank to the EDG day tank. Flow rate will be calculated and evaluated for degradation.

3.2 NRC Staff Evaluation

The 2017 Edition of the ASME OM Code requires that the pump flow rate, differential pressure, and vibration to be evaluated against reference values to monitor pump conditions and to allow detection of hydraulic degradation.

The Davis-Besse EDG fuel oil transfer pumps are ASME Code Class 3 components, and the plant was issued a construction permit on March 24, 1971. The regulations in 10 CFR 50.55a(f) do not require ASME Code Class 3 components to have been designed or provided with access to enable the performance of IST for plants issued construction permits between January 1, 1971, and July 1, 1974. The EDG fuel oil transfer pumps are inaccessible for vibration measurements. In addition, there are no installed flow instrumentation, pressure instrumentation, or accessible recirculation lines to perform the required test measurements. Therefore, the NRC staff finds that it is impractical to measure or determine the flow rate, differential pressure, and vibration of the EDG fuel oil transfer pumps at Davis-Besse in accordance with the ASME OM Code.

As discussed in section 3.1 of this safety evaluation, the alternative proposed by the licensee includes:

- fuel oil transfer system functional testing performed every 92 days, as required by Surveillance Requirement 3.8.1.7;
- pump flow rate tests each cycle;
- long term pump duration tests performed when the EDG fuel oil storage tanks are drained and cleaned every 48 months and when the EDG fuel oil day tanks are drained and cleaned every 10 years.

The licensee stated that the pump flow rate tests will be performed under preset and repeatable conditions. The license also stated that the pump flow rates will be evaluated and trended for indications of pump degradation. A minimum flow rate of 6 gpm will be established for test acceptance criteria in lieu of the acceptance criteria in table ISTB-5121-1 for corrective action by the licensee. The March 21, 2022, letter states that there have been no EDG fuel oil transfer pump test failures in the past 10 years. The letter also provided a summary of the results for each EDG fuel oil transfer test performed over the past 10 years that shows the flow rates were all well above the proposed minimum flow rate of 6 gpm for test acceptance. Based on this information, the NRC staff determined that the proposed alternative to the ASME OM Code requirements would provide an adequate means of monitoring the EDG fuel oil transfer pumps for degradation and ensuring the operational readiness of the pumps.

The licensee stated that compliance with the ASME OM Code pump testing requirements would require a major modification of the fuel oil transfer system. The licensee also stated that the Davis-Besse EDG fuel oil transfer pumps have a lower safety significance than other fuel oil transfer systems because of the large capacity of the EDG day tanks and the three diverse methods of replenishing the day tanks during EDG operation. The NRC staff determined that modification of the fuel oil transfer systems at Davis-Besse to allow performance of the pump testing required by the ASME OM Code would be an unnecessary burden on the licensee because of the lower safety significance of the pumps and the proposed alternative means of ensuring the operational readiness of the pumps.

In accordance with 10 CFR 50.55a(f)(6)(i), the NRC staff determined that the licensee has met 10 CFR 50.55a(f)(5)(iii) by demonstrating that conformance with the ASME OM Code requirements for periodic testing to measure or determine the flow rate, differential pressure, and vibration of the EDG fuel oil transfer pumps at Davis-Besse is impractical. The NRC staff also determined that the licensee's proposed alternative to test and trend pump performance provides reasonable assurance that the pumps will be operationally ready. Therefore, the NRC staff finds that granting relief from the specified ASME OM Code requirements is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the applicable ASME OM Code requirements were imposed on the facility.

4.0 CONCLUSION

As set forth above, the NRC staff determined that granting relief from the specified ASME OM Code requirements for periodic testing of the EDG fuel oil transfer pumps at Davis-Besse, pursuant to 10 CFR 50.55a(f)(6)(i), is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Furthermore, the NRC staff determined that the licensee's proposed alternative provides reasonable assurance of the operational readiness of EDG fuel oil transfer pumps. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(f)(5)(iii). Therefore, the NRC staff grants the proposed relief request RP-3 at Davis-Besse for the fifth 10-year IST interval, which is scheduled to begin on September 21, 2022, and end on September 20, 2032.

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

Principal Contributors: Gurjendra S. Bedi, NRR
Blake A. Purnell, NRR

Date: June 02, 2022

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1 — RELIEF
REQUEST RP-3 REGARDING FUEL OIL TRANSFER PUMP TESTING (EPID
L-2021-LLR-0072) DATED JUNE 02, 2022

DISTRIBUTION:

PUBLIC

RidsNrrDorlLpl3 Resource
RidsNrrLASRohrer Resource
RidsNrrPMDavisBesse Resource
RidsRgn3MailCenter Resource

RidsNrrDexEmib Resource
CWolf, OCA
ITseng, NRR
GBedi, NRR

ADAMS Accession No.: ML22147A149

OFFICE	NRR/DORL/LPL3/PM	NRR/DORL/LPL3/LA	NRR/DEX/EMIB/BC(A)
NAME	BPurnell	SRohrer	ITseng
DATE	6/1/22	5/31/22	4/22/22
OFFICE	NRR/DORL/LPL3/BC		
NAME	NSalgado (RKuntz for)		
DATE	6/2/22		

OFFICIAL RECORD COPY