



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

January 27, 2020

Mr. Bryan C. Hanson
Senior Vice President
Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO)
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: CLINTON POWER STATION, UNIT 1 – PROPOSED ALTERNATIVE TO THE REQUIREMENTS OF THE ASME CODE FOR WATER LEG PUMP TESTING (EPID L-2019-LLR-0052)

Dear Mr. Hanson:

By letter dated May 23, 2019, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19143A305), Exelon Generation Company, LLC (EGC, the licensee), submitted a request for the use of an alternative to the requirements of certain American Society of Mechanical Engineers Code for Operation and Maintenance of Nuclear Power Plants (OM Code), requirements at Clinton Power Station (CPS), Unit 1.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1), the licensee requested to use an alternative for testing certain waterleg pumps on the basis that the alternative testing provides an acceptable level of quality and safety.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that EGC has adequately addressed the regulatory requirements of 10 CFR 50.55a(z)(1). The NRC staff finds that the proposed alternative relief request (RR)-3201 provides an acceptable level of quality and safety. Therefore, the NRC staff authorizes RR-3201 for the fourth 10-year inservice testing interval at CPS, Unit 1, which is currently scheduled to start on July 1, 2020, and end on June 30, 2030.

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

B. Hanson

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If you have any questions, please contact the Senior Project Manager, Joel S. Wiebe, at (301) 415-6606 or Joel.Wiebe@nrc.gov.

Sincerely,

/RA/

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

Docket No. 50-461

Enclosure: Safety Evaluation

cc: Listserv

SUBJECT: CLINTON POWER STATION, UNIT 1 – PROPOSED ALTERNATIVE TO THE REQUIREMENTS OF THE ASME CODE FOR WATER LEG PUMP TESTING (EPID L-2019-LLR-0052) DATED JANUARY 27, 2020

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST TO USE PROPOSED ALTERNATIVE RR-3201

REGARDING THE TESTING OF CERTAIN WATERLEG PUMPS

EXELON GENERATION COMPANY, LLC

CLINTON POWER STATION, UNIT 1

DOCKET NO. 50-461

1.0 INTRODUCTION

By letter dated May 23, 2019 (Agencywide Documents and Access Management System (ADAMS) Accession No. ML19143A305), Exelon Generation Company, LLC, (EGC, the licensee), submitted an alternative to the requirements of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code), associated with pump inservice testing (IST) at Clinton Power Station (CPS), Unit 1.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1), the licensee requested to use the proposed alternative in relief request (RR)-3201 on the basis that the alternative provides an acceptable level of quality and safety.

2.0 REGULATORY EVALUATION

Regulation 10 CFR 50.55a(f), states, in part, that IST of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with the specified ASME OM Code and applicable addenda incorporated by reference in the regulations.

Regulation 10 CFR 50.55a(z) states that alternatives to the requirements of paragraph (f) of 10 CFR 50.55a may be used, when authorized by the U.S. Nuclear Regulatory Commission (NRC), if the licensee demonstrates: (1) the proposed alternatives would provide an acceptable level of quality and safety or (2) compliance with the specified requirements 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 Alternative RR-3201

The licensee requested an alternative to the pump testing requirements of the ASME OM Code.

Table ISTB-3000-1, "Inservice Test Parameters," specifies the parameters to be measured during inservice tests.

ISTB-3300, "Reference Values," (e)(2) states, "Reference values shall be established at the comprehensive pump test flow rate for the Group A and Group B tests, if practicable. If not practicable, the reference point flow rate shall be established at the highest practical flow rate."

ISTB-3400, "Frequency of Inservice Tests," states, "An inservice test shall be run on each pump as specified in Table ISTB-3400-1."

Table ISTB-3400-1, "Inservice Test Frequency," specifies that a Group A pump test shall be performed on a quarterly frequency.

ISTB-5121, "Group A Test Procedure," states, in part, "Group A tests shall be conducted with the pump operating as close as practical to a specified reference point and within the variances from the reference point as described in this paragraph"

ISTB-5121(b) states, "The resistance of the system shall be varied until the flow rate is as close as practical to the reference point with the variance not to exceed +2% or -1% of the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure is as close as practical to the reference point with the variance not to exceed +1% or -2% of the reference point and the flow rate determined and compared with the reference flow rate."

The licensee has requested to use the proposed alternative described below for the pumps listed in Table 1. The pumps are ASME Code, Section III, Class 2, and are classified as Group A pumps.

Table 1

Component	Description	Rated Flow (gallons per minute)	Rated Differential Pressure (Feet)
1E21-C002	Low Pressure Core Spray (LPCS) and Residual Heat Removal (RHR) A Waterleg Pump	43	199
1E12-C003	RHR Loop B/C Waterleg Pump	43	199
1E51-C003	Reactor Core Isolation Cooling (RCIC) Waterleg Pump	50	130

The CPS, Unit 1, fourth 10-year IST program interval begins on July 1, 2020, and is scheduled to end on June 30, 2030. The applicable ASME OM Code edition for the fourth 10-year IST program interval is the 2012 Edition.

Reason for RR

The waterleg pumps operate continuously to keep their supported system's pump discharge header filled with water. Their hydraulic performance is not critical. In order to perform a quarterly ASME OM Code Group A test on these pumps, they must be isolated from their supported system, which means the main system must be declared inoperable or an abnormal alignment is required to keep the main header pressurized and full of water.

Proposed Alternative

Quarterly monitoring of the pumps' discharge pressure (i.e., main system header pressure) and bearing vibration will be performed during normal operating conditions in lieu of the ASME OM Code quarterly Group A test. Changes in the supported system's main header pressure and vibration levels identified during testing will be evaluated and trended to assess the waterleg pump's performance. A biennial comprehensive pump test will continue to be performed on the waterleg pumps in accordance with the requirements specified in ISTB-5123, "Comprehensive Test Procedure."

In addition to this proposed quarterly testing, each waterleg pump's supported system pump discharge header has instrumentation that continuously monitors the main header pressure and provides an alarm in the main control room when its low pressure setpoint is reached. This will provide indication that the associated waterleg pump is no longer performing its safety function.

The waterleg pumps are also currently being monitored under the CPS, Unit 1, Vibration Monitoring Program.

Each of these waterleg pump's supported system pump discharge header is verified to be sufficiently filled with water in accordance with technical specification (TS) surveillance requirements (SRs) 3.5.1.1 and 3.5.3.1. Any indication that the supported system's pump discharge header piping is not sufficiently filled with water would provide timely indication that the associated waterleg pump's performance has degraded.

NRC Staff Evaluation

The RHR, LPCS, and RCIC waterleg pumps are continuously operating pumps. Their safety function is to keep their respective discharge header piping in a filled condition to prevent water hammer upon the start of the main pump(s) for the supported system(s). The actual output and hydraulic performance of the waterleg pumps are not critical to the safety function, as long as the pumps can maintain their associated discharge header piping full of water.

In lieu of the ASME OM Code-required Group A test, the licensee proposes to monitor the pump discharge header pressures and bearing vibrations on a quarterly basis. In addition to this, there are alarms on the main headers that would alert plant operators of a low-pressure condition indicative of a waterleg pump malfunction or any other condition that allows pressure to degrade (e.g., excessive leakage beyond waterleg pump make-up capabilities). The low-pressure alarm will provide an early detection of a low header pressure. Also, CPS, Unit 1, TS SRs 3.5.1.1 and 3.5.3.1 require periodic verification that the respective RHR/LPCS/RCIC headers are filled with water from the main pump discharge valve to the injection valve. The continuous monitoring of discharge header pressure in the control room and periodic verification that the headers are filled with water will provide reasonable assurance that the waterleg pumps are operable, or that the system leakage has not exceeded the capacity of the waterleg pumps.

In addition, the quarterly vibration measurement of the pump bearings meets the ASME OM Code requirements and will provide the required test results reflecting the mechanical condition of the pumps. Also, the pumps are monitored in the CPS, Unit 1, Vibration Monitoring Program, which exceeds the vibration monitoring requirements in the ASME OM Code. The proposed alternative will therefore provide an acceptable level of quality and safety for waterleg pumps 1E12-C003, 1E21-C002, and 1E51C003.

4.0 CONCLUSION

As set forth above, the NRC staff determined that alternative RR-3201 for CPS, Unit 1, provides an acceptable level of quality and safety for the pumps listed in Table 1. Accordingly, the NRC staff concludes that the licensee has adequately addressed all the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes the use of the alternative RR- 3201 for CPS, Unit 1, for the fourth 10-year IST program interval which begins on July 1, 2020, and is scheduled to end on June 20, 2030.

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

Principal Contributor: R. Wolfgang