



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

June 21, 2012

Mr. Michael J. Pacilio  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION - RELIEF FROM THE REQUIREMENTS OF THE ASME CODE, RELIEF REQUEST NO. PR-01 FOR FIFTH INSERVICE TESTING INTERVAL (TAC NO. ME7616)

Dear Mr. Pacilio:

By letter dated November 17, 2011 (Agencywide Documents and Access Management System Accession No. ML113250626), Exelon Nuclear submitted relief request PR-01 for Oyster Creek Nuclear Generating Station (OCNGS) during the fifth Inservice Testing (IST) interval, requesting the use of an alternative to certain requirements of the American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code).

Specifically, pursuant to Title 10 of the *Code Federal Regulations* (10 CFR) Section 50.55a(a)(3)(i), the licensee requested to use the proposed alternative on the basis that the alternative provides an acceptable level of quality and safety.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the subject request and has concluded, as set forth in the enclosed safety evaluation, that the proposed alternative described in Request PR-01 provides an acceptable level of quality and safety for the pumps listed in the enclosed safety evaluation. 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), and is in compliance with the ASME OM Code's requirements. All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject request remain applicable.

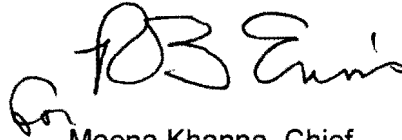
Therefore, the NRC staff authorizes the alternative described in Relief Request PR-01 for the fifth IST interval at OCNGS, which will begin on October 14, 2012, and ends on October 13, 2022.

M. Pacilio

- 2 -

If you have any questions regarding this matter, please contact Senior Project Manager, John G. Lamb at (301) 415-3100 or by e-mail at [John.Lamb@nrc.gov](mailto:John.Lamb@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Meena Khanna". The signature is fluid and cursive, with a large initial "M" and "K".

Meena Khanna, Chief  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-219

Enclosure: Safety Evaluation

cc w/enclosure: Distribution via Listserv



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

REQUEST FOR RELIEF, PR-01

FIFTH INSERVICE TESTING INTERVAL

OYSTER CREEK NUCLEAR GENERATING STATION

EXELON NUCLEAR

DOCKET NO. 50-219

1.0 INTRODUCTION

By letter dated November 17, 2011 (Agencywide Documents and Access Management System Accession No. ML113250626), Exelon Nuclear (Exelon or licensee) submitted relief request PR-01 for Oyster Creek Nuclear Generating Station (OCNGS) during the fifth Inservice Testing (IST) interval, requesting the use of an alternative to certain requirements of the American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code).

The licensee proposed an alternative testing method and acceptance criteria for the following pumps:

- P-3-3A, B, C, and D, Emergency Service Water Pumps (Vertical Line Shaft / Group AB / Class 3)
- P-5-1 and 2, Reactor Building Closed Cooling Water Pumps (Centrifugal/Group A / Class 3)
- P-11-1 and 2, Condensate Transfer Pumps (Centrifugal/Group A / Class 3)
- P-18-1A and B, Spent Fuel Pool Cooling Pumps (Centrifugal/Group A / Class 3)
- P-19-1A and B, Liquid Poison Pumps (Positive Displacement / Group AB / Class 2)
- P-20-1A, B, C, and D, Core Spray Pumps (Centrifugal/Group AB / Class 2)
- P-20-2A, B, C, and D, Core Spray Booster Pumps (Centrifugal/Group AB / Class 2)
- P-21-1A, B, C, and D, Containment Spray Pumps (Centrifugal/Group AB / (Class 2)

The proposed alternative testing method and acceptance criteria will be used in lieu of the current pump testing method and acceptance criteria described in the ASME OM Code for OCNGS. Request PR-01 is applicable to the fifth (IST) program interval for OCNGS.

Enclosure

Specifically, pursuant to Title 10 of the *Code Federal Regulations* (10 CFR) Section 50.55a(a)(3)(i), the licensee requested to use the proposed alternative on the basis that the alternative provides an acceptable level of quality and safety.

## 2.0 REGULATORY EVALUATION

10 CFR 50.55a(f), "Inservice Testing Requirements," requires, in part, that IST of certain ASME Code Class 1, 2, and 3 pumps and valves must meet the requirements of the ASME OM Code and applicable addenda, except where alternatives have been authorized by NRC pursuant to paragraph (a)(3)(i) or (a)(3)(ii).

In proposing alternatives, a licensee must demonstrate that the proposed alternatives provide an acceptable level of quality and safety (10 CFR 50.55a(a)(3)(i)) or 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)). Section 50.55a allows the NRC to authorize alternatives to ASME OM Code requirements upon making necessary findings.

The OCNCS fifth ten-year IST program interval will begin on October 14, 2012, and end on October 13, 2022.

The NRC's findings with respect to authorizing the alternative PR-01 are given below:

## 3.0 TECHNICAL EVALUATION

### 3.1 Licensee's Alternative Request PR-01

ISTB-3300, "Reference Values," states, in part, that "Reference values shall be established within  $\pm 20$  percent of pump design flow rate for the comprehensive test," and "Reference values shall be established within  $\pm 20$  percent of pump design flow for the Group A and Group B tests, if practicable."

ISTB-3400, "Frequency of Inservice Tests," states that "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 Group A and Group B tests be performed quarterly and a comprehensive test be performed biennially for Group A and Group B pumps.

Table ISTB-3510-1, "Required Instrument Accuracy," specifies the instrument accuracies for Group A, Group B, comprehensive, and preservice tests.

Table ISTB-5121-1, "Centrifugal Pump Test Acceptance Criteria," defines the required acceptance criteria for Group A, Group B, and comprehensive tests for centrifugal pumps.

Table ISTB-5221-1, "Vertical Line Shaft and Centrifugal Pumps Test Acceptance Criteria," defines the required acceptance criteria for Group A, Group B, and comprehensive tests for Vertical Line Shaft centrifugal pumps.

Table ISTB-5321-2, "Reciprocating Positive Displacement Pump Test Acceptance Criteria," defines the required acceptance criteria for Group A, Group B, and comprehensive tests for Reciprocating Positive Displacement pumps.

ASME OM 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 applicable ASME OM Code edition and addenda for OCNGS is 2004 Edition with Addenda through OMB-2006.

#### Reason for Request

The licensee stated that:

The ASME Code committees have approved Code Case OMN-18, "Alternative Testing Requirements for Pumps Tested Quarterly within  $\pm 20\%$  of Design Flow." This Code Case has not been approved for use in Regulatory 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," June 2003.

This Code Case OMN-18 allows the Owner to not perform the comprehensive test (CPT) with the associated acceptance criteria, if the quarterly test is performed at  $\pm 20\%$  of design flow and the instrumentation meets the accuracy requirements of Table ISTB-3510-1 for the comprehensive tests.

Further, ISTB allows the Owner to categorize the pumps in their program. As such, an Owner could categorize a pump that otherwise meets the requirements of Group B, as a Group A (or AB) pump, and test according to the provisions of Code Case OMN-18. By doing so they are obtaining additional data (vibration and flow or differential pressure) quarterly, rather than once every two years.

This would allow OCNGS to perform better trending of pump performance data due to the more consistent requirements for each of the quarterly tests. As a result of the increased requirements on the parameters imposed by the proposed alternative during applicable quarterly tests, there is no added value in performing the biennial comprehensive tests on the subject pumps.

## Proposed Alternative and Basis for Use

The licensee stated that:

OCNGS is proposing to utilize the provisions of Code Case OMN-18 and performing a modified Group A test in lieu of performing the Code-required CPT. The enhanced Group A will be run at  $\pm 20\%$  of the pump's design flow rate using  $\pm 1/2\%$  accurate gauges to determine the pump differential pressure. Vibration tests will be performed and the vibration acceptance criteria for the proposed alternative test will remain identical to the standard Group A test. Additionally, OCNGS will utilize a Required Action Range High limit of 106% or lower for quarterly testing, which is also consistent with the planned Code change applicable to CPT.

The tightened Required Action Range, in conjunction with using more accurate pressure instruments during testing, provides more consistent trend results when comparing subsequent tests. Due to the improved accuracy, consistent testing methodology, and the addition of quarterly vibration monitoring on Group AB pumps, deviations in actual pump performance indicative of impending degradation are more easily recognized during quarterly performance trending activities. Additionally, declaring pumps inoperable for reasons other than actual equipment degradation can be avoided.

### 3.2 NRC Staff Evaluation

The licensee is proposing to perform a quarterly IST for all pumps listed in Section 1.0 in accordance with a modified Group A test procedure, in lieu of quarterly Group A tests and a CPT every two years.

The ASME OM Code requires that for Group A pumps, a Group A test be performed every quarter, and a CPT be performed biennially. The Group A test is performed within  $\pm 20\%$  of the pump design flow rate and the pressure instrument accuracy is  $\pm 2\%$ . The upper limit for the "Acceptable Range" for flow rate and differential pressure is 110% of the reference values, and the high value for the "Required Action Range" for flow rate and differential pressure is greater than 110% of the reference values. The CPT is performed within  $\pm 20\%$  of the pump design flow rate, the pressure instrument accuracy is  $\pm 1/2\%$ , and the high value of "Required Action Range" is greater than 103% of the respective reference values. Vibration monitoring is performed during both the Group A tests and the CPTs.

The licensee proposes that for the pumps listed in Section 1.0 above, a modified Group A quarterly test will be performed using ASME OM Code Case OMN-18, with modified "Required Action" ranges, and the biennial comprehensive test will not be performed. The modified Group A quarterly test would be performed within  $\pm 20\%$  of the pump design flow rate, using more accurate pressure instrumentation (i.e. instrument accuracy required for a CPT ( $\pm 1/2\%$  instead of  $\pm 2\%$ )). The licensee will use a more limiting high value of 106% for the "Required Action Range" in lieu of 110% that is normally required by the ASME OM Code for Group A tests. However, the high value 106% is greater than the high value of 103% for the biennial CPT. Using more accurate pressure gauges and a more limiting "Required Action Range" (compared

to the Group A test "Required Action Range") during every modified quarterly Group A test compensates for the elimination of the CPT with its more limiting "Required Action Range" high value of 103%.

OMN-18 was published in the 2009 Edition of the ASME OM Code. This Edition of the ASME OM Code has not been incorporated by reference into 10 CFR 50.55a, and OMN-18 has not been incorporated into Regulatory Guide (RG) 1.192. However, the NRC staff has reviewed OMN-18, and currently has no concerns with its usage, providing that the high values of the Group A test "Required Action Range" for flow (Q) and differential pressure ( $\Delta P$ ) are greater than 106% of the respective reference values. The NRC staff considers the proposed alternative acceptable because all of the tests will be performed with pressure gauges with  $\pm 1/2\%$  accuracy. The elimination of the CPT, with its more limiting "Required Action Range" of upper bound of 103% of the reference value, is compensated for by using more accurate pressure gauges on every quarterly test. Regular testing with more accurate instrumentation and tighter acceptance criteria will provide for better trending of pump performance. Therefore, the NRC staff finds that the proposed alternative provides an acceptable level of quality and safety for testing the pumps listed in Section 1.0 above.

#### 4.0 CONCLUSION

As set forth above, the NRC staff finds that the proposed alternative described in Relief Request PR-01 provides an acceptable level of quality and safety for the pumps P-3-3A,B,C, and D, P-5-1 and 2, P-11-1 and 2, P-18-1A and B, P-19-1A and B, P-20-1A,B,C, and D, P-20-2A,B,C, and D, and P-21-1A,B,C, and D. 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), and is consistent with the ASME OM Code's requirements. All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject request remain applicable.

Therefore, the NRC staff authorizes the alternative described in Relief Request PR-01 for the OCNGS fifth IST program interval, which will begin on October 14, 2012, and is scheduled to end on October 13, 2022.

Principle Contributor: John Huang

Date: June 21, 2012

M. Pacilio

- 2 -

If you have any questions regarding this matter, please contact Senior Project Manager, John G. Lamb at (301) 415-3100 or by e-mail at John.Lamb@nrc.gov.

Sincerely,

/RA by Rick Ennis for/

Meena Khanna, Chief  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-219

Enclosure: Safety Evaluation

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