

September 3, 2008

Mr. Charles G. Pardee
Chief Nuclear Officer and Senior Vice President
Exelon Generation Company, LLC
200 Exelon Way
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SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 – REQUESTS
FOR RELIEF ASSOCIATED WITH THE FOURTH INSERVICE TESTING
INTERVAL (TAC NOS. MD7461 AND MD7462)

Dear Mr. Pardee:

By letter dated November 28, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML073330605), as supplemented by letters dated March 19, 2008, and April 30, 2008 (ADAMS Accession Nos. ML080800041 and ML081220715), Exelon Generation Company, LLC (Exelon) submitted Relief Requests 01A-VRR-1, 01A-VRR-2, GVRR-1, and GVRR-2 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. The requests for relief are associated with the fourth inservice testing interval that begins on August 15, 2008, and will conclude on August 14, 2018.

The Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's analysis in support of the request for relief. Request No. 01A-VRR-2 is authorized pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 55a(a)(3)(ii), on the basis that compliance with the Code would result in hardship without a compensating increase in the level of quality and safety. The NRC staff concludes that the proposed alternative provides reasonable assurance that the Safety Relief Valves for which relief is requested are operationally ready. Request Nos. 01A-VRR-1 and GVRR-1 are authorized pursuant to 10 CFR, Part 50, Section 55a(a)(3)(i), on the basis that the proposed alternatives provide an acceptable level of quality and safety. Request No. GVRR-2 was withdrawn by Exelon in the supplemental letter dated April 30, 2008.

The NRC staff's Safety Evaluation regarding Relief Requests 01A-VRR-2, 01A-VRR-1 and GVRR-1 is enclosed. This completes the NRC staff's efforts on TAC Nos. MD7461 and MD7462.

C. Pardee

-2 -

If you have any questions, please contact the PBAPS Project Manager, Mr. John Hughey, at 301-415-3204.

Sincerely,

/ra/

Harold K. Chernoff, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-277 and 50-288

Enclosure: As stated

cc w/encl: See next page

If you have any questions, please contact the PBAPS Project Manager, Mr. John Hughey, at 301-415-3204.

Sincerely,

/ra/

Harold K. Chernoff, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-277 and 50-278

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUESTS 01A-VRR-1, 01A-VRR-2 AND GVRR-1

ASSOCIATED WITH THE FOURTH INSERVICE TESTING INTERVAL

EXELON GENERATION COMPANY, LLC

PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-277 AND 50-278

1.0 INTRODUCTION

By letter dated November 28, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML073330605), Exelon Generation Company, LLC (Exelon) submitted Relief Requests 01A-VRR-1, 01A-VRR-2, GVRR-1, and GVRR-2 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. The submittal requested authorization to use alternatives to certain inservice test (IST) requirements in the 2001 Edition through 2003 Addenda of the American Society of Mechanical Engineers (ASME), *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code). The alternatives are applicable to the fourth 10-year IST interval which is scheduled to begin on August 15, 2008, and will conclude on August 14, 2018. On March 3, 2008, the Nuclear Regulatory Commission (NRC) requested Exelon to submit additional information (ADAMS Accession No. ML080380530). Exelon submitted the requested information in letters dated March 19 and April 30, 2008 (ADAMS Accession Nos. ML080800041 and ML081220715). Exelon withdrew request GVRR-2 in the April 30, 2008, letter.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a(f), "Inservice Testing Requirements," requires, in part, that ASME Class 1, 2, and 3 components must meet the requirements of the ASME OM Code and applicable addenda, except where alternatives have been authorized pursuant to paragraphs (a)(3)(i) and (a)(3)(ii) of 10 CFR 50.55a.

In proposing alternatives, a licensee must demonstrate that the proposed alternative provides an acceptable level of quality and safety or that compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The NRC is authorized under 10 CFR 50 Section 50.55a to approve alternatives to ASME OM Code requirements upon making necessary findings. NRC guidance contained in NUREG-1482 Revision 1, "Guidance for Inservice Testing at Nuclear Power Plants," provides alternatives to ASME Code requirements which are acceptable.

The licensee requested relief in accordance with 10 CFR 50.55a(a)(3)(i), due to hardship or unusual difficulty meeting the requirement without a compensating increase in the level of quality and relief in accordance with 10 CFR 50.55a(a)(3)(ii), due to an alternative that provides an acceptable level of quality and safety.

The NRC's findings with respect to authorizing alternatives to the ASME OM Code are given below.

3.0 TECHNICAL EVALUATION

3.1 Request No. 01A-VRR-1

3.1.1 ASME OM Code Requirement

ASME OM Code Mandatory Appendix I, Section I-1320(a), "Test Frequencies, Class 1 Pressure Relief Valves," 2001 Edition through 2003 Addenda, requires that Class 1 pressure relief valves be tested at least once every 5 years.

3.1.2 Exelon's Proposed Alternative Testing

Exelon proposed an alternative test interval to the 5-year test interval requirement in Mandatory Appendix I, Section I-1320(a) of the 2001 Edition through 2003 Addenda of the ASME OM Code for Unit 2 safety relief valves (SRVs) Serial Number (S/N) 178 and S/N 20, and Unit 3 SRV S/N 73. SRVs S/N 178, S/N 20 and S/N 73 were refurbished and set point tested and then placed in storage for 13 to 14 months prior to installation. The 5-year test interval for SRV S/N 178 expires on July 26, 2010. The 5-year test interval for SRV S/N 20 expires on July 7, 2010. The 5-year test interval for SRV S/N 73 expires on August 2, 2009. Exelon is proposing to extend the test interval for each of these valves several months beyond the 5-year interval on a one-time basis. SRVs S/N 178 and S/N 20 would be replaced during the upcoming Unit 2 refueling outage scheduled for the Fall of 2010. SRV S/N 73 would be replaced during the upcoming Unit 3 refueling outage scheduled for the Fall of 2009.

3.1.3 Exelon's Basis for the Alternative

The licensee provided test history data for SRVs S/N 178, S/N 20 and S/N 73 that indicates that the SRVs generally passed the Technical Specification (TS) set point as-found acceptance criteria of $\pm 1\%$ of set pressure. Exelon also stated that an ASME Code-certified off-site vendor is utilized to perform the as-found and as-left testing of the PBAPS SRVs. The licensee asserts that the requested duration for relief is short (i.e. maximum of three months) and extending the test interval several months beyond the ASME OM Code 5-year test interval requirement will not affect the capability of the SRVs to actuate within TS requirements.

3.1.4 NRC Staff's Evaluation of Proposed Alternative

The NRC staff reviewed the set point test history data provided by Exelon. The test data confirms that SRVs S/N 178, S/N 20 and S/N 73 on the whole passed the TS as-found acceptance criteria of $\pm 1\%$ of set pressure. In one instance, an as-found test result was only

slightly below the TS as-found acceptance criteria of $\pm 1\%$ set pressure. In another instance, an as-found test result was only slightly above the TS as-found acceptance criteria of $\pm 1\%$ of set pressure. The NRC staff finds that these test results indicate that the impact of storage in a controlled environment on the opening set point for SRVs S/N 178, S/N 20 and S/N 73 was minimal.

Exelon also stated that an ASME OM Code-certified off-site vendor performs as-found and as-left testing, inspection, and refurbishment of each SRV that is removed from service in accordance with approved procedures. The NRC staff recognizes that although the ASME OM Code does not require that SRVs be routinely refurbished, refurbishment provides reasonable assurance that set point drift during subsequent operation is minimized. The NRC staff finds that this provides added assurance that SRVs S/N 178, S/N 20 and S/N 73 will remain within TS setpoint requirements for the duration of the requested relief.

3.1.5 Conclusion

Based on the NRC staff's review and evaluation of the information provided by Exelon, the NRC staff concludes that extending the test interval for several months beyond the 5-year interval for SRVs that were refurbished, coupled with set point test history results that generally met the TS as-found accept criteria, is an acceptable alternative to the 5-year set point test interval requirement in the ASME OM Code. Therefore, the alternative is authorized, pursuant to 10 CFR 50.55a(a)(3)(i), for Unit 2 SRVs S/N 178 and S/N 20 through the Fall 2010 refueling outage and Unit 3 SRV S/N 73 through the Fall 2009 refueling outage on the basis that the alternative provides an acceptable level of quality and safety.

3.2 Alternative Request No. 01A-VRR-2

3.2.1 ASME OM Code Requirement

ASME OM Code Mandatory Appendix I, Section I-3410(d) of the 2001 Edition through 2003 Addenda addresses Class 1 SRVs with auxiliary actuating devices that have been maintained or refurbished in place, removed for maintenance and testing, or both, and reinstalled. The Code requires these SRVs be remotely actuated at reduced or normal system pressure to verify open and close capability of the valve before resumption of electric power generation.

3.2.2 Exelon's Proposed Alternative Testing

Exelon proposed to verify the open and close capability of Unit 2 Automatic Depressurization System (ADS)/SRVs RV-2-02-071A, B, C, G and K and Unit 3 ADS/SRVs RV-3-02-071A, B, C, G and K by performing a series of overlapping tests. These tests consist of ASME OM Code Appendix I setpoint/leakage testing, ADS logic system functional tests, an ADS leak check, and an SRV cyclic test. These alternative tests would be performed in place of the remote actuation requirement in Mandatory Appendix I, Section I-3410(d) of the 2001 Edition through 2003 Addenda of the ASME OM Code.

3.2.3 Exelon's Basis for the Alternative

Exelon stated that cycling Unit 2 ADS/SRVs RV-2-02-071A, B, C, G and K and Unit 3 ADS/SRVs RV-3-02-071A, B, C, G and K at reduced or normal system pressure is a hardship because cycling the valves with steam as the medium can cause seat leakage. The licensee notes that while seat leakage is not a concern with respect to the ADS safety function, it can lead to set point drift and other operational problems during subsequent plant operation.

3.2.4 NRC Staff's Evaluation of the Alternative

The NRC staff considered Section 4.3.2.1, "Boiling Water Reactor Safety/Alternative Valve Stroke Testing," of NUREG-1482, Revision 1, in its review of the licensee's proposed alternative. This section of the NUREG identifies that the NRC staff has received numerous requests for approval of alternatives related to stroke testing requirements for dual function main steam SRVs following maintenance activities. NUREG-1482 notes that these requests for relief from in situ testing have been initiated based on undesirable seat leakage of the valves during subsequent plant operation. Thus, the hardship associated with in-situ testing of main steam SRVs is recognized and documented in NUREG-1482. The NRC staff finds that cycling the PBAPS Unit 2 ADS/SRVs RV-2-02-071A, B, C, G and K and Unit 3 ADS/SRVs RV-3-02-071A, B, C, G and K at reduced or normal system pressure constitutes a similar hardship for the licensee.

The NRC staff position contained in NUREG-1482, Section 4.3.2.1, also states that the NRC has approved stroke testing at a laboratory facility when coupled with other tests and verifications as an alternative to the testing required by the ASME OM Code. The licensee will continue to perform ASME OM Code Appendix I setpoint/leakage testing, ADS logic system functional tests, an ADS leak check, and an SRV cyclic test. Therefore, the NRC staff finds that the SRV stroke testing at a test facility coupled with the testing performed following maintenance is an acceptable alternative to the remote testing requirement in the ASME OM Code.

Additionally, the licensee confirmed that station procedures are in place to ensure that proper installation of the electrical and air line connections to each SRV pilot valve is verified following installation of the pilot and main valve assembly in the unit. This information was provided by letter dated March 19, 2008, from the licensee in response to a request for additional information from the NRC staff.

3.2.5 Conclusion

The NRC staff has concluded that compliance with the ASME OM Code requirement to cycle Unit 2 ADS/SRVs RV-2-02-071A, B, C, G and K and Unit 3 ADS/SRVs RV-3-02-071A, B, C, G and K at reduced or normal system pressure following maintenance would be a hardship without a compensating increase in the level of quality and safety because cycling the valves with steam as the medium can cause seat leakage. Stroke testing at a test facility coupled with the testing performed following maintenance is an acceptable alternative to the remote testing requirement in the ASME OM Code, and is consistent with the NRC staff position in Section 4.3.2.1 of NUREG-1482, Revision 1. Therefore, the proposed alternative provides reasonable assurance that the valves are operationally ready and pursuant to 10 CFR 50.55a(a)(3)(ii), the alternative is authorized for the fourth 10-year IST interval.

3.3 Alternative Request No. GVRR-1

3.3.1 Code Requirements – 2001 Edition through 2003 Addenda of the ASME OM Code

ISTA-3130(b) requires that code cases be applicable to the edition and addenda specified in the test plan.

ISTC-3100 requires that any motor operated valve (MOV) that has undergone maintenance that could affect its performance after the preservice test be tested in accordance with ISTC-3310.

ISTC-3310 requires that a new reference value be determined or the previous reference value be reconfirmed by an inservice test after a MOV has been replaced, repaired, or has undergone maintenance that could affect the valve's performance.

ISTC-3510 requires that active Category A and B MOVs be exercised nominally every 3 months.

ISTC-3521 requires that active Category A and B MOVs be exercised during cold shutdowns if it is not practicable to exercise the valves at power, or that active Category A and B MOVs be exercised during refueling outages if it is not practicable to exercise the valves during cold shutdowns.

ISTC-5120 requires that MOVs be stroke-time tested when exercised in accordance with ISTC-3510.

ISTC-3700 requires that valves with remote position indicators be observed locally at least once every 2 years to verify that valve operation is accurately indicated.

3.3.2 Exelon's Proposed Alternative Testing

Exelon proposed to adopt the requirements of Code Case OMN-1 as revised in the 2006 Addenda to the ASME OM Code in lieu of the performance of stroke time testing and position indication testing as described by ASME OM ITSC 2001/2003a. In response to an NRC staff request for additional information, the license revised relief request GVRR-1. In a letter dated April 30, 2008, from the licensee, the provision to allow for motor control center testing, as contained in section 6.1 of Code Case OMN-1, was excluded.

3.3.3 Exelon's Basis for Alternative

The licensee notes that 10 CFR 50.55a(b) states in part that Regulatory Guide 1.192, "Operating and Maintenance Code Case Acceptability, ASME Code" (June 2003), has been approved for incorporation by reference. Table 2 of Regulatory Guide 1.192 states that the alternative rules of ASME Code Case OMN-1, Rev. 0, when applied in conjunction with the provisions for leakage rate testing in ISTC-3600 may be applied with the following provisions:

1. The adequacy of the diagnostic test interval for each valve must be evaluated and adjusted as necessary but not later than 5 years or three refueling outages (whichever is longer) from initial implementation of ASME Code Case OMN-1.

2. When extending the exercise test intervals for high risk MOVs beyond a quarterly frequency, licensees shall ensure that the potential increase in core damage frequency and risk associated with the extension is small and consistent with the intent of the Commission's Safety Goal Policy Statement.
3. When applying risk insights as part of the implementation of OMN-1, licensees must categorize MOVs according to their safety significance using the methodology described in Code Case OMN-3, "Requirements for Safety Significance Categorization of Components Using Risk Insights for Inservice Testing of LWR Power Plants," with the conditions discussed in this regulatory guide or use other MOV risk-ranking methodologies accepted by the NRC on a plant-specific or industry-wide basis with the conditions in the applicable safety evaluations.

3.3.4 NRC Staff's Evaluation of Alternative

The NRC staff considered Section 4.2.5, "Alternatives to Stroke-Testing," of NUREG-1482, Revision 1, in its review of the licensee's proposed alternative. Section 4.2.5 states in part that as an alternative to MOV stroke-time testing, ASME developed Code Case OMN-1, which provides periodic exercising and diagnostic testing for use in assessing the operational readiness of MOVs, may be used. Section 4.2.5 recommends that licensees implement ASME Code Case OMN-1 as an alternative to the MOV stroke-time testing. The periodic exercising and diagnostic testing requirements in OMN-1 provide an improved method for assessing the operational readiness of MOVs.

Application of code cases is addressed in 10 CFR 50.55a(b)(6) through references to RG 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," which lists acceptable and conditionally acceptable code cases for implementation in IST programs. RG 1.192, Table 2, conditionally approves the use of Code Case OMN-1 and states that the code case is applicable to the 2000 Addenda and earlier editions and addenda of the Code. There is no technical reason for prohibiting the use of Code Case OMN-1 with the 2001 Edition through the 2003 Addenda of the Code. The NRC staff finds that Code Case OMN-1 provides an acceptable level of quality and safety for testing of MOVs and is an acceptable alternative for use in Exelon's IST program. This conclusion is consistent with the NRC staff position in NUREG-1482, Revision 1, and RG 1.192.

Code Case OMN-1 was revised in the 2006 Addenda to the ASME OM Code. Most of the revisions are enhancements such as clarification of valve remote position indication requirements and ball/plug/diaphragm valve test requirements, and the expansion of risk-informed provisions. However, there was one significant revision in Section 6.1, "Acceptance Criteria," that states that MCC testing is acceptable if correlation with testing at the MOV has been established. MCC diagnostic testing was not specifically addressed in the original version of OMN-1. Historically, diagnostic testing of MOVs has been conducted using at-the-valve tests. Although there may be potential benefits of testing conducted at the MCC, the ASME OM Code does not address any method for the correlation of MCC-based measurements to diagnostic test measurements conducted at-the-valve. Exelon excluded the provision for MCC testing in Section 6.1 of request GVRR-1 in supplemental letter dated April

30, 2008. Therefore, the motor control center (MCC) test method will not be used as an acceptance criterion to determine the operational readiness of MOVs.

3.3.5 Conclusion

Based on the above evaluation, the NRC staff concludes that testing MOVs in accordance with Code Case OMN-1 as revised in the 2006 Addenda to the ASME OM Code (with the exception that the MCC test method will not be used as an acceptance criterion to determine the operational readiness of a MOV) is consistent with the NRC staff position in NUREG-1482, Revision 1, Section 4.2.5 and Regulatory Guide 1.192. Therefore, Exelon's alternative to the ASME OM Code MOV stroke-time testing requirements is authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the alternative provides an acceptable level of quality and safety. This alternative is authorized for the Fourth 10-year IST interval.

Principal Contributor: Stephen G. Tingen

Date: September 3, 2008