



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

August 26, 2009

Mr Charles G. Pardee  
President and Chief Nuclear Officer  
Exelon Generation Company, LLC  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: CLINTON POWER STATION, UNIT NO. 1 - REQUEST FOR RELIEF FROM  
ASME OM CODE 5-YEAR TEST INTERVAL FOR SAFETY RELIEF VALVES  
(TAC NO. ME0044)

Dear Mr. Pardee:

By letter to the Nuclear Regulatory Commission (NRC) dated November 3, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML083090066), AmerGen Energy Company, LLC (AmerGen), the licensee submitted Relief Request (RR) No. 2210 to extend the 5-year Inservice Test (IST) interval to a 6.5-year IST interval for the 16 Dikkers Valves Model G-471 safety relief valves, for the Clinton Power Station (CPS), Unit No. 1. Specifically, relief was requested from the American Society of Mechanical Engineers/American National Standards Institute (ASME/ANSI), OMa-1988, "Operations and Maintenance of Nuclear Power Plants," 1987 Edition through 1988 Addenda (ASME OM Code), Part 1, "Requirements for Inservice Testing of Nuclear Power Plant Pressure Relief Devices," Section 1.3.3, "Test frequencies, Class 1 Pressure Relief Valves," paragraph (b), "Subsequent 5-Year test Periods."

At the time of the application, AmerGen was the licensee for CPS. AmerGen was a wholly-owned subsidiary of Exelon Generation Company, LLC (EGC). On January 8, 2009, EGC eliminated AmerGen and transferred the operating licenses of the AmerGen reactor plants to EGC. By letter dated January 9, 2009 (ADAMS Accession No. ML090120538), EGC adopted and endorsed docketed submittals that requested specific licensing actions that were made by AmerGen, and requested that the NRC staff continue to process those pending actions on the schedules previously agreed to by AmerGen.

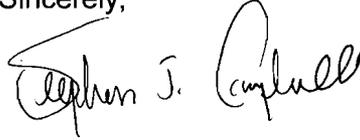
The NRC staff has completed its review of RR No. 2210. The details of the NRC staff's review are included in the enclosed safety evaluation. Accordingly, RR No. 2210, is authorized pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(a)(3)(ii) based on the NRC staff's determination that the imposition of the ASME Code requirements would

C. Pardee

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result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, and that there is a reasonable assurance of operational readiness.

Sincerely,

A handwritten signature in black ink that reads "Stephen J. Campbell". The signature is written in a cursive style with a large, looped initial "S".

Stephen Campbell, Chief  
Plant Licensing Branch III-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-461

Enclosure:  
Safety Evaluation

cc w/encl: Distribution via Listserv



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE INSERVICE TESTING PROGRAM

SECOND 10-YEAR INTERVAL

EXELON GENERATION COMPANY, LLC

CLINTON POWER STATION

DOCKET NO. 50-461

1.0 INTRODUCTION

By letter dated November 3, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML083090066), AmerGen Energy Company, LLC (AmerGen), the licensee, submitted Relief Request No. 2210 for the second 10-year interval inservice testing (IST) program at Clinton Power Station (CPS). The licensee requested relief from certain IST requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI (Section XI). The Clinton Power Station second 10-year IST interval is scheduled to end on December 31, 2009. The relief request involves an extension to the 5-year test interval for Class 1 pressure relief devices in light water reactor power plants.

At the time of the application, AmerGen was the licensee for CPS. AmerGen was a wholly-owned subsidiary of Exelon Generation Company, LLC (EGC). On January 8, 2009, EGC eliminated AmerGen and transferred the operating licenses of the AmerGen reactor plants to EGC. By letter dated January 9, 2009 (ADAMS Accession No. ML090120538), EGC adopted and endorsed docketed submittals that requested specific licensing actions that were made by AmerGen, and requested that the NRC staff continue to process those pending actions on the schedules previously agreed to by AmerGen.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a, requires that IST of certain ASME Code Class 1, 2, and 3 pumps and valves be performed at 120-month (10-year) IST program intervals in accordance with the specified ASME Code and applicable addenda incorporated by reference in the regulations, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Nuclear Regulatory Commission (NRC) pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In accordance with 10 CFR 50.55a(f)(4)(ii), licensees are required to comply with the requirements of the latest edition and addenda of the ASME Code incorporated by reference in the regulations 12 months prior to the start of each 10-year IST program interval. In accordance with 10 CFR 50.55a(f)(4)(iv), IST of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in 10 CFR 50.55a(b), subject to NRC approval. Portions of

Enclosure

editions or addenda may be used provided that all related requirements of the respective editions and addenda are met. In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for the facility. Section 50.55a authorizes the NRC to approve alternatives and to grant relief from ASME Code requirements upon making necessary findings. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provides alternatives to ASME Code requirements which are acceptable. Further guidance is given in GL 89-04, Supplement 1, and NUREG-1482, Revision 1, "Guidelines for Inservice Testing at Nuclear Power Plants."

The CPS second 10-year IST interval commenced January 1, 2000. The program was developed in accordance with the 1989 Edition of the ASME Code, Section XI. The 1989 ASME Code, Section XI, references Operation and Maintenance Standards, Part 1 (OM-1), Part 6 (OM-6), and Part 10 (OM-10) for its IST requirements.

The NRC's findings, with respect to granting or denying the IST program relief request, are given below:

### 3.0 TECHNICAL EVALUATION

#### 3.1 Valve Relief Request 2210

##### 3.1.1 Code Requirements

The licensee requested relief from OM-1, which requires that the test interval for any individual Class 1 relief valve shall not exceed 5 years and a minimum of 20 percent of the valves from each group be tested within any 24-month interval. Relief was requested for the following Safety Relief Valves (SRVs):

1B21-F041A, 1B21-F041B, 1B21-F041C, 1B21-F041D, 1B21-F041F, 1B21-F041G,  
1B21-F041L, 1B21-F047A, 1B21-F047B, 1B21-F047C, 1B21-F047D, 1B21-F047F,  
1B21-F051B, 1B21-F051C, 1B21-F051D, and 1B21-F051G.

##### 3.1.2 Licensee's Basis for Requesting Relief

The installed Dikkers Model G-471 SRVs have shown exemplary test history. However, given the current 24-month operating cycle, 50 percent (i.e., 8 of 16) of the SRVs are required to be removed and tested every refueling outage, so that all valves are removed and tested every two refueling outages. This ensures compliance with the ASME Code requirements for testing of Class 1 pressure relief valves within a 5-year interval. Extending the test interval to 6.5 years would reduce the minimum number of SRVs tested over three refueling outages by eight.

The SRVs are located in the upper elevations of the drywell. The major contributors to radiation exposure are the main steamlines, including the SRVs, along with the high pressure core spray and low pressure core spray lines. Without Code relief, the incremental outage work due to the inclusion of the eight additional SRVs would be contrary to the principle of maintaining exposure to radiation as low as reasonably achievable, in that the removal and replacement of the eight SRVs over three refueling outages will result in approximately 5.6 person-rem of additional cumulative radiation exposure. Historical SRV test results for the Dikkers Model G-471 SRVs indicate that the SRVs continue to perform well. Therefore, the additional cumulative radiation exposure represents a hardship without a compensating increase in the level of quality or safety.

SRV test history from 2001 to present, indicates that all but three of the 40 total tests have successfully passed the ASME Code as-found acceptance criteria of plus or minus 3 percent, a majority of which were installed for two operating cycles. Historical data also indicates that the as-found setpoints for 28 of the 40 tests remained within the as-left tolerance of plus or minus 1 percent.

The as-found test data for the three SRV failures indicates that two of the three test failures did not decrease the level of quality and safety, in that the as-found setpoint for one SRV was within 0.004 percent of the acceptance criteria, and one SRV exceeded the acceptance criteria in a negative, or more conservative direction. The three SRV failures that occurred were SRVs that were as-left setpoint tested using nitrogen by on-site personnel and then as-found setpoint tested by an off-site certified vendor using steam. On-site nitrogen setpoint testing and refurbishment by on-site personnel has been abandoned, and instead, the SRVs are sent to a certified off-site vendor for as-found and as-left setpoint testing using steam. Since changing to as-found and as-left testing using steam as a test medium, there have been no failures. An ASME Code certified off-site vendor is utilized to perform as-found and as-left testing, inspection, and refurbishment of the SRVs. An approved and qualified procedure is used for disassembly and inspection of the SRVs. The procedure requires that each SRV be disassembled and inspected upon removal from service, independent of the as-found test results. The procedure identifies the critical components that are required to be inspected for wear and defects, and the critical dimensions that are required to be measured during the inspection. If components are found worn or outside of the specified tolerance(s), the components are either reworked to within the specified tolerances or replaced. All parts that are defective, out-of-tolerance, and all reworked/replaced components are identified. The SRV is then reassembled, the as-found test is performed, and the SRV is returned to the site.

The ASME OM-1 Sub-Group on Safety and Relief Valves developed Code Case OMN-17, "Alternative Rules for Testing ASME Class 1 Pressure Relief/Safety Valves." Code Case OMN-17 allows owners to extend the test interval for safety and relief valves from 60 months to 72 months plus a 6-month grace period. The Code Case imposes a special maintenance requirement to disassemble and inspect each safety and relief valve to verify that parts are free from defects resulting from time related degradation or service induced wear prior to the start of the extended test interval. The purpose of this maintenance is to reduce the potential for setpoint drift. The approved and qualified procedure that is used by the off-site vendor for disassembly, inspection, repair, and testing of the SRVs satisfies the special maintenance requirement specified in Code Case OMN-17. All currently installed SRVs were disassembled, inspected, repaired, and tested in accordance with the qualified procedure, prior to installation,

to verify that parts were free from defects resulting from time related degradation or maintenance induced wear. Therefore, the currently installed SRVs comply with Code Case OMN-17.

Furthermore, each SRV removed from service will continue to be disassembled, inspected, repaired, and tested in accordance with the qualified procedure prior to reinstallation.

### 3.1.3 Licensee's Proposed Alternative Testing

The ASME Class 1 pressure relief valves (i.e., Dikkers Model G-471 SRVs) shall be tested at least once every 6.5 years. A minimum of approximately 20 percent of the pressure relief valves will be tested within any 24-month interval, and this 20 percent shall consist of valves that have not been tested during the current 6.5 year interval, if they exist. The test interval for any individual valve shall not exceed 6.5 years.

### 3.1.4 Evaluation of Relief Request RV-07

The ASME Code requires that all Class 1 relief valves of each type and manufacture be tested within each subsequent 5-year period, with a minimum of 20 percent of the valves being tested within any 24 months. The NRC staff reviewed the set pressure test summary results provided to determine if it is acceptable to extend the test frequency beyond the 5-year test frequency specified in the ASME Code. The set pressure test summary results show that the SRVs passed the current technical specification (TS) acceptance criterion of plus or minus 3 percent of set pressure when utilizing a certified off-site vendor for as-found, and as-left setpoint testing using steam. The NRC staff finds that this test history demonstrates good performance.

The ASME developed Code Case OMN-17, "Alternative Rules for Testing ASME Class 1 Pressure Relief/Safety Valves." The ASME plans to publish OMN-17 in the upcoming edition/addenda of the ASME OM Code. Code Case OMN-17 allows licensees to extend the test frequency for safety valves from 60 months to 72 months plus a 6-month grace period. The code case imposes a special maintenance requirement to disassemble and inspect each safety and relief valve to verify that parts are free from defects resulting from time-related degradation or maintenance-induced wear prior to the start of the extended test frequency. The purpose of this maintenance requirement is to reduce the potential for set pressure drift. The licensee stated that each SRV removed will be refurbished prior to the start of each test interval consistent with the special maintenance requirement in Code Case OMN-17. Critical components will be inspected for wear and defects, and the critical dimensions will be measured during the inspection. Components will be reworked to within the specified tolerance or replaced if found to be worn or outside of specified tolerances.

The ASME Code 5-year test frequency requires that a minimum of 8 of the 16 SRVs be tested every refueling outage (24 months). Extending the test frequency to 6.5 years would reduce the minimum number of SRVs that are required to be tested over a period of 3 refueling outages by 8 SRVs. The licensee estimates that extending the test frequency to 6.5 years would result in a reduction of the expected cumulative radiation exposure by 5.6 person-rem over a period of 3 refueling outages.

The NRC staff finds that the extension of the ASME OM Code 5-year test frequency to 6.5 years is acceptable. Refurbishment to a like-new condition prior to the start of each 6.5-year test

interval provides reasonable assurance that set pressure drift will be minimized. Past performance demonstrates good performance because the SRV as-found set pressure test results passed the current TS acceptance criterion of plus or minus 3 percent of set pressure when utilizing a certified off-site vendor for as-found, and as-left setpoint testing using steam. Therefore, the additional time beyond that required by the ASME OM Code should not impair operational readiness. Compliance with the ASME Code requirements would result in hardship or unusual difficulty without a compensating increase in quality and safety due to increased personnel radiation exposure. Relief is not granted from the Code requirement to test a minimum of 20 percent of the valves from each group within any 24-month interval.

#### 4.0 CONCLUSION

Based on the above evaluation, the proposed alternative to extend the 5-year test interval for the identified SRVs is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) on the basis that compliance with the Code requirements would result in hardship or unusual difficulty without a compensating increase in quality and safety. The additional time beyond that required by the ASME Code should not impair valve operational readiness. The proposed alternative is authorized for the remainder of the second 10-year IST interval.

Principal Contributor: W. Poertner, NRR

Date: August 26, 2009

C. Pardee

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result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, and that there is a reasonable assurance of operational readiness.

Sincerely,

*/RA/*

Stephen Campbell, Chief  
Plant Licensing Branch III-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-461

Enclosure:  
Safety Evaluation

cc w/encl: Distribution via Listserv

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