

March 26, 2002

Mr. Oliver D. Kingsley, President
and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, Illinois 60555

SUBJECT: CLINTON POWER STATION, UNIT 1 - ISSUANCE OF AMENDMENT
(TAC NO. MB2255)

Dear Mr. Kingsley:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 145 to Facility Operating License No. NPF-62 for the Clinton Power Station, Unit 1. The amendment is in response to the application from AmerGen Energy Company, LLC, dated June 21, 2001.

The amendment replaces individual main steamline leakage limits with an aggregate leakage limit, revising technical specification surveillance requirement 3.6.1.3.9, which provides leakage rate limits applicable to the main steamline isolation valves.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Jon B. Hopkins, Senior Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-461

Enclosures: 1. Amendment No. 145 to NPF-62
2. Safety Evaluation

cc w/encls: See next page

March 26, 2002

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***See previous concurrence**

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OFFICIAL RECORD COPY

Clinton Power Station, Unit 1

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Clinton Power Station, Unit 1

- 2 -

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AMERGEN ENERGY COMPANY, LLC

DOCKET NO. 50-461

CLINTON POWER STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 145
License No. NPF-62

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by AmerGen Energy Company, LLC (the licensee), dated June 21, 2001, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-62 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 145 are hereby incorporated into this license. AmerGen Energy Company, LLC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: March 26, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 145

FACILITY OPERATING LICENSE NO. NPF-62

DOCKET NO. 50-461

Replace the following page of the Appendix "A" Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove Pages

3.6-19

Insert Pages

3.6-19

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 145 TO FACILITY OPERATING LICENSE NO. NPF-62
AMERGEN ENERGY COMPANY, LLC
CLINTON POWER STATION, UNIT 1
DOCKET NO. 50-461

1.0 INTRODUCTION

In a letter dated June 21, 2001, AmerGen Energy Company, LLC (the licensee), proposed a change to the Technical Specifications (TSs) for Clinton Power Station (CPS). The licensee's proposal would revise the current TS Surveillance Requirement (SR) 3.6.1.3.9, which provides leakage rate limits applicable to the main steam line isolation valves. Currently, SR 3.6.1.3.9 specifies an individual leakage rate limit of 28 standard cubic feet per hour (scfh) for each of the four main steam lines. The licensee has proposed to modify SR 3.6.1.3.9 to specify an aggregate limit of 112 scfh for the total leakage through all four main steam lines.

2.0 BACKGROUND

CPS is a boiling-water reactor (BWR) plant with a Mark III containment design. The Mark III design consists of a drywell, a suppression pool, and a containment vessel, which is credited as the outermost leak-tight barrier to prevent fission products from reaching the environment. The four main steam lines carry primary steam from the reactor vessel toward the power conversion systems, thereby penetrating the containment vessel pressure boundary. As the main steam lines are primary containment penetrations, each main steam line isolation valve is subject to 10 CFR Part 50, Appendix J, leakage rate testing.

2.1 Basis for Current Leakage Rate Limit

Compliance with Appendix J to Title 10, Part 50 of the *Code of Federal Regulations* (10 CFR 50) provides assurance that the leakage rate of the primary containment and its penetrations during a postulated accident would not exceed the leakage rate assumed in the plant safety analysis. The allowable leakage rate values for the containment and containment penetrations which are specified in the CPS TS, the associated TS Bases, and the CPS Primary Containment Leakage Rate Testing Program have been selected to ensure compliance with 10 CFR Part 50, Appendix J, and the plant safety analysis.

Each of the four main steamlines at CPS has two 24-inch main steam isolation valves (MSIVs) configured in series, for a total of 8 valves altogether. The safety function of the MSIVs is to isolate the reactor coolant system and the primary containment in the event of a loss-of-coolant accident (LOCA) or other event requiring MSIV closure. Appendix J requires that periodic Type C local leakage rate testing be performed upon the MSIVs to verify that any leakage past them would be less than the allowable limit. In accordance with Appendix J, the CPS TS Bases state that the combined leakage of all penetrations and valves that are subject to periodic Type B and Type C local leakage rate tests is required to be less than 0.6 times the maximum allowable containment leakage rate (L_a). For CPS, L_a is 0.65 percent per day of the weight of the containment and drywell air at the peak containment pressure (P_a) calculated for a design-basis LOCA. P_a is 9 pounds per square inch gage (psig) for CPS.

A large-break LOCA (i.e., a double-ended guillotine break of a recirculation system pipe or a main steamline break) has the most severe dose consequences of any design-basis accident for CPS. The analysis for a large-break LOCA is based upon the assumption that the aggregate leakage through all four main steamlines is less than or equal to 112 scfh. In recognition of the fact that the MSIVs at BWR plants are large valves and have shown an historical tendency to leak excessively, the additional stipulation was placed into the CPS TS that each main steamline shall not contribute more than one-quarter of the aggregate leakage limit, or 28 scfh.

2.2 Proposed TS Change

The licensee has proposed to modify SR 3.6.1.3.9, which currently allows a maximum leakage rate of 28 scfh per main steamline. The proposed SR 3.6.1.3.9 reads as follows:

“Verify total leakage rate through all four main steamlines is \leq 112 scfh when tested at $\geq P_a$.”

The licensee’s proposed TS change is similar to changes approved by the Nuclear Regulatory Commission (NRC) staff for a number of BWR plants, including TS changes approved for Monticello Nuclear Generating Plant on April 3, 1996, and Dresden Nuclear Power Station, Units 2 and 3, on October 1, 1999.

2.3 Licensee Rationale for Proposed TS Change

The licensee stated in its submittal of June 21, 2001, that the proposed aggregate leakage limit for all four main steamlines would significantly reduce maintenance costs, worker radiation exposure, and outage resources. Based upon historical data, the licensee has stated that MSIV repair has typically cost about \$80,000 and that maintenance workers may be exposed to approximately 3.2 rem of radiation dose equivalent. Additionally, the licensee has stated that the proposed aggregate leakage limit would avoid unnecessary maintenance-induced failures associated with MSIV refurbishment and premature valve replacement or major repair due to relatively small amounts of aggregate main steamline leakage.

3.0 EVALUATION

The effect of the proposed amendment would be to allow any single main steamline to have a maximum leakage rate of up to 112 scfh (i.e., four times greater than the current individual

main steamline leakage limit), provided that the sum of the leakage for all four main steamlines is also less than or equal to 112 scfh. The aggregate main steamline leakage limit in the proposed SR 3.6.1.3.9 is thus, in accordance with the leakage rate assumption made in the plant safety analysis, which forms the basis for this TS limit.

As discussed in Section 2.1 of this evaluation, the measured leakage rates of the main steamlines are included in the total leakage rate calculated for all penetrations whose leakage is measured by Type B and Type C local leakage rate tests. The CPS TS Bases state that the total leakage rate for all Type B and Type C tested penetrations is required to be less than the 0.6 L_a leakage limit. Therefore, the proposed revision to SR 3.6.1.3.9 would not affect the total leakage rate through containment valves and penetrations which are subject to periodic Type B and Type C testing in accordance with 10 CFR Part 50, Appendix J.

The removal of main steamline individual leakage limits may slightly increase the expectation value of the actual aggregate main steamline leakage, due to the current improbability that all four main steamlines would simultaneously be leaking at or near their limiting individual rate. However, since the time that individual main steamline leakage limits were introduced into the CPS TS, the NRC staff has re-examined its position on the suitability of these individual limits. As documented in Section 2.2 of this evaluation, the NRC staff has granted TS changes for a number of BWR plants to permit the replacement of individual main steamline leakage limits with aggregate limits.

The staff's safety evaluations for these TS changes, in addition to citing the fact that individual main steamline leakage limits are not needed in order to comply with plant safety analyses or 10 CFR Part 50, Appendix J, requirements for Type B and Type C testing, have also found that the disadvantages associated with maintaining relatively low individual main steamline leakages are not justified by any additional conservatism the individual limits might provide. For instance, the frequent MSIV maintenance necessary to meet low individual main steamline leakage limits has been correlated with repeated valve failures from maintenance-induced defects, such as seat cracks, excessive pilot valve seat machining, and mechanical defects introduced by assembly and disassembly. In addition, the re-working of a single MSIV has been estimated to result in an occupational radiation exposure on the order of one person-rem. Recognizing these disadvantages, the NRC staff has consistently concluded in its safety evaluations that individual leakage rate limits for main steamlines need not be specified, considering that an aggregate main steamline leakage limit would satisfy the basis for the TS requirement.

4.0 FINDING

Based upon the foregoing evaluation, the NRC staff has concluded that the aggregate limit for main steamline leakage proposed by the licensee in SR 3.6.1.3.9: (1) would not exceed the leakage rate assumed for the main steamlines in the plant safety analysis, and (2) would be in accordance with the leakage testing requirements of Appendix J to 10 CFR Part 50. Accordingly, the staff has found the proposed change to the CPS TS and its bases to be acceptable.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois State official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes a surveillance requirement. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (66 FR 50464). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: J. Lehning

Date: March 26, 2002