February 25, 2005

Mr. Christopher M. Crane
President and Chief Nuclear Officer
AmerGen Energy Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT OYSTER CREEK NUCLEAR GENERATING STATION - ISSUANCE OF AMENDMENT RE: CONTROL ROD OPERABILITY REQUIREMENTS (TAC NO. MC3309)

Dear Mr. Crane:

The Commission has issued the enclosed Amendment No. 253 to Facility Operating License No. DPR-16 for the Oyster Creek Nuclear Generating Station, in response to your application dated May 20, 2004, as supplemented by letter dated October 19, 2004.

The amendment revised the Technical Specifications, Section 3.2.B.4, regarding control rod operability requirements for inoperable control rods, clarifying the application of the action requirements for inoperable control rods.

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

Sincerely,

/RA/

Peter S. Tam, Senior Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-219

Enclosures: 1. Amendment No. 253 to DPR-16
2. Safety Evaluation

cc w/encls: See next page

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AMERGEN ENERGY COMPANY, LLC

DOCKET NO. 50-219

OYSTER CREEK NUCLEAR GENERATING STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 253
License No. DPR-16

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by AmerGen Energy Company, LLC, et al. (the licensee), dated May 20, 2004, as supplemented by letter dated October 19, 2004, 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. DPR-16 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 253, are hereby incorporated in the license. AmerGen Energy Company, LLC, shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: February 25, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 253

FACILITY OPERATING LICENSE NO. DPR-16

DOCKET NO. 50-219

Replace the following pages of Appendix A, Technical Specifications, with the attached revised pages as indicated. The revised pages are identified by amendment number and contain marginal lines indicating the area of change.

Remove	Insert
3.1-12	3.1-12
3.2-3	3.2-3
3.2-8	3.2-8

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 253

TO FACILITY OPERATING LICENSE NO. DPR-16

AMERGEN ENERGY COMPANY, LCC

OYSTER CREEK NUCLEAR GENERATING STATION

DOCKET NO. 50-219

1.0 INTRODUCTION

By letter dated May 20, 2004 (Accession No. ML041490092), as supplemented by letter dated October 19, 2004 (Accession No. ML043010274), AmerGen Energy Company, LLC (AmerGen, the licensee) proposed an amendment to change the Technical Specifications (TSs) for Oyster Creek Nuclear Generating Station (OCNGS). The licensee proposed to revise the control rod operability requirements for inoperable control rods in Section 3.2.B.4 and the associated Bases section. The proposed change would clarify the application of the action requirements for inoperable control rods.

The licensee's October 19, 2004, supplement provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on July 6, 2004 (69 FR 40671).

2.0 REGULATORY EVALUATION

The NRC staff and nuclear steam supply owners groups developed the Standard Technical Specifications (STS) that established models of the Commission's policy for TSs, and improved the format and clarity of the specifications. The "Standard Technical Specifications General Electric Plants, BWR/4," NUREG-1433, Revision 3, was approved and issued for use by the NRC. Control rod operability requirements in the STS (Section 3.1.3) apply to "stuck control rods" and "inoperable control rods," i.e., the STS does not define control rods valved out of service as inoperable.

3.0 TECHNICAL EVALUATION

3.1 Current OCNGS TS Requirements

The current Specification 3.2.B.4 specifies, "Control rods which cannot be moved with control rod drive [CRD] pressure shall be considered inoperable." According to AmerGen, a literal interpretation of this specification infers that, in addition to a "stuck" control rod, operable control rods valved out of service to accommodate on-line maintenance of their associated controls, rendering them unresponsive to CRD pressure, are also designated as "inoperable" for the purpose of implementing AmerGen Specification 3.2.B.4 action statements. This interpretation triggers the accelerated control rod exercise requirement of surveillance requirement (SR) 4.2.D, since normal maintenance practice results in more than one operable control rod being fully inserted and valved out of service. SR 4.2.D states:

> Each partially or fully withdrawn control rod shall be exercised at least once each week. This test shall be performed within 24 hours in the event power operation is continuing with two or more inoperable control rods or in the event power operation is continuing with one fully or partially withdrawn rod which cannot be moved and for which control rod drive mechanism (CRDM) damage has not been ruled out. The surveillance need not be completed within 24 hours if the number of inoperable control rods has been reduced to less than two and if it has been demonstrated that control rod drive mechanism collet housing failure is not the cause of an immovable control rod.

AmerGen believes the accelerated control rod exercise may shorten the operable lifespan of the control rod hydraulic controls.

Specification 3.2.B.4 also states:

> In no case shall the number of rods valved out of service be greater than six during the power operation. If this specification is not met, the reactor shall be placed in the shutdown condition.

According to AmerGen, using the literal interpretation as discussed above, operable control rods valved out of service for maintenance are included in this six control rod limit, and could result in an unnecessary plant shutdown. The changes proposed by this license amendment request would clarify the intent of the control rod operability requirements in Specification 3.2.B.4.

3.2 OCNGS Control Rod Drive Design and Maintenance

Each CRD has an associated hydraulic control unit (HCU) located in the reactor building that is accessible during reactor power operations. Remote signals to the HCU perform two separate functions: (1) to provide normal rod positioning for reactivity control during startups, shutdowns, flux shaping and load follow, and (2) to actuate a rapid insertion of the rod (scram) when an accelerated plant shutdown is required. The HCU provides rod positioning by directing drive and exhaust water from the CRD hydraulic system for one rod at a time. The scram function is performed on all CRDs for reactor protection and on a single CRD for testing purposes. For a scram the HCU provides a volume of water with stored nitrogen gas pressure, and scram

valves that quickly open to align the water volume and exhaust path to cause rapid insertion of the rod.

Over time the HCU components require both preventative and corrective maintenance to ensure complete HCU functioning capability. Degradation of one or more HCU component(s) can impact the positioning function performance of the CRD. Slow, fast, or improper single notch operation can occur during the operating cycle and be corrected by performing on-line HCU maintenance. The NRC staff requested (publicly available e-mail dated August 31, 2004; Accession No. ML042450672) the licensee to explain what normal HCU preventative maintenance includes. In its October 19, 2004, response the licensee stated that normal HCU preventative maintenance includes:

1. Scram valve operator replacement or rebuild
2. Scram pilot valve replacement or rebuild
3. Accumulator leaks or repairs
4. Various valve seat repairs
5. Directional control valve replacement or rebuild
6. Scram valve limit switch replacement or rebuild
7. Valve packing adjustment or replacements
8. Filter replacements

The licensee further explained that corrective maintenance would include maintenance on any of the above components that indicated degraded performance while in-service. Items 1 through 4 can affect the rod's scram function, while items 5, 7, and 8 can affect the rod's notch function. Item 6 is for indication purposes only.

The scram function is normally unaffected by degradation of components utilized for rod positioning, since HCU components that effect scram performance are designed so that they normally fail to the scram position causing the rod to insert. According to AmerGen, proactive on-line maintenance is performed on scram equipment to assure rods reliably scram only upon a scram signal. Scram speeds are required to be verified after any maintenance on the HCU that could affect scram performance. Scram speeds are also monitored in accordance with TSs to ensure performance meets required speeds.

For control rods that exhibit less than optimum positioning performance, corrective maintenance on their HCUs is scheduled. Additionally, other components will be scheduled for proactive maintenance based on vendor and industry experience. Some examples of vendor and industry experiences include CRDs that double notch due to cooling water check valve seat leakage or directional control valve misoperation. The licensee stated that both of these HCU component issues have occurred at OCNGS and do not affect the ability of the rod to scram, but do affect the rod's ability to notch reliably on a single notch request.

For the past several years, HCU maintenance has been performed with the plant on-line during scheduled power reductions. According to the licensee, down-power operations are scheduled around low power demand periods (i.e., weekends and back shifts) and when multiple surveillances or maintenance is required. Durations typically last from 4 hours to 48 hours. Typically, power is reduced to less than 95 percent and more commonly at approximately 80 percent power when other core maneuvers or plant surveillances are being performed. However, the reduced power level depends on the effect of the rod being fully inserted and the

power reduction required to recover the rod. The licensee stated that due to the increased length of operating cycles (24 months vs. 12 months) and the cost of extended refueling outages, it is desirable to perform more preventative maintenance and proactive corrective maintenance while on-line, to assure that the CRD system operates in a highly reliable manner. Since the duration of the scheduled power reductions are limited, normally more than one control rod is removed from service at the same time to perform HCU maintenance.

Performing such corrective maintenance on HCU components is an effective means of optimizing their performance. Before maintenance is performed, the control rod is fully inserted and disarmed electrically and/or hydraulically by closing the drive water and exhaust water isolation valves. A control rod that has been fully inserted and disarmed for maintenance satisfies the safety function of that control rod since it is in a position of maximum contribution to shutdown reactivity.

According to the licensee, routine maintenance practice involves fully inserting the rod and then valving it out of service. The NRC staff requested the licensee to state whether all rods are fully inserted before undergoing maintenance. In response, the licensee explained that in the past 5 years, only three instances where an inoperable control rod was valved out of service for maintenance, when not fully inserted. The licensee also stated that in each instance, a shutdown margin (SDM) calculation was performed as required by TS Section 3.2.A. The licensee further explained that valving an inoperable control rod out of service for maintenance at other than the fully inserted position is done by exception, and only when inserting the control rod would have an adverse impact on plant operations. No inoperable control rod has been valved out of service for maintenance at a position other than fully inserted in the last 2 years. The licensee confirmed that any partially or fully withdrawn control rod valved out of service for maintenance is still considered inoperable and will count toward the TS limit of six.

3.3 Proposed TS Changes

The licensee proposed to revise Section 3.2.B.4 by adding words (in **bold**) as follows:

> **In service** [c]ontrol rods which cannot be moved with control rod drive pressure shall be considered inoperable. If a partially or fully withdrawn control rod drive cannot be moved with drive or scram pressure, the reactor shall be brought to a shutdown condition within 48 hours unless investigation demonstrates that the cause of the failure is not due to a failed control rod drive mechanism collet housing. Inoperable control rods shall be valved out of service, in such positions that Specification 3.2.A is met. In no case shall the number of **inoperable control** rods valved out of service be greater than six during power operation. If this specification is not met, the reactor shall be placed in the shutdown condition.

3.3.1 Addition of "**In service**"

Specification 3.2.B.4 defines an inoperable control rod as one that cannot be moved with CRD pressure. However, there is a situation where operable control rods are valved out of service, and as a consequence, "cannot be moved with control rod drive pressure." This involves operable control rods that have been fully inserted and valved out of service to perform maintenance on the control rod's HCU or other control features external to the CRD. The

proposed addition of "**In service**" would clarify that the control rod system operability requirements of TS 3.2.B.4 is directed only at inoperable or stuck control rods and not at fully inserted rods valved out of service for maintenance.

Changing the first sentence this way does not eliminate any operability requirements for an inoperable control rod. The remaining portions of the current TS 3.2.B.4 specify the required actions for all inoperable control rods, and additional requirements for stuck control rods not in the fully inserted position. Stuck control rods in the fully inserted position are still considered inoperable, and accordingly, the requirements for inoperable control rods apply. The second sentence of the current TS 3.2.B.4 specifies the required action if a partially or fully withdrawn control rod cannot be moved with drive or scram pressure (i.e., a stuck control rod). The third sentence requires all inoperable control rods to be valved out of service, and verification that the shutdown margin requirements of TS 3.2.A are met. The fourth sentence of the current TS 3.2.B.4 prohibits power operation if the number of inoperable control rods exceeds six. The last sentence requires the reactor to be shutdown if the specified control rod operability requirements are not met. These sentences will remain in the TSs unchanged, except for proposed change discussed in Section 3.3.2 below. The requirements needed to assure the operability of control rods will remain the same by this proposed change.

A literal interpretation of the current TS would require designating an operable control rod that has been fully inserted and valved out of service to perform on-line maintenance as an inoperable control rod. Since on-line maintenance is normally performed on more than one control rod at the same time, the accelerated control rod exercise requirement of TS 4.2.D would be triggered. TS 4.2.D requires that each partially or fully withdrawn control rod be exercised at least once a week. However, TS 4.2.D also states that in the event power operation is continuing with two or more inoperable control rods or one fully or partially withdrawn rod that cannot be moved and for which CRD mechanism damage has not been ruled out, this test must be performed within 24 hours. It is possible that the excessive accelerated control rod testing may shorten the operable lifes pan of the HCU components.

The NRC staff evaluated the technical justification set forth by the licensee, and compared the proposed change against NUREG-1433, Revision 3. The NRC staff found the proposed wording meets the intent of NUREG-1433, Revision 3. Accordingly, the NRC staff concluded that the proposed change is acceptable.

3.3.2 Addition of "**inoperable control**"

The third sentence of the current TS 3.2.B.4 identifies as a "required action" for inoperable control rods, the requirement to valve the control rod out of service. The fourth sentence uses the "valved out of service" phrase not as a required action, but as a condition requiring a plant shutdown if the limit of six is exceeded. The proposed change would limit the application of "valved out of service" to inoperable control rods only, but not to fully inserted control rods valved out of service while undergoing routine maintenance.

Currently, maintenance and operations procedures and OCNGS TS only allow six inoperable control rods to be valved out of service at a time. The purpose of added words is to allow the valving out of operable control rods for maintenance, at their fully inserted position, without declaring them inoperable. Therefore, the total number of control rods valved out of service,

both inoperable and those valved out of service at the fully inserted position for maintenance, could exceed six. However, the number of control rods valved out of service due to being inoperable will continue to be limited to six at a time.

The NRC staff evaluated the technical justification set forth by the licensee, and compared the proposed change against NUREG-1433, Revision 3. The NRC staff found the proposed wording meets the intent of NUREG-1433, Revision 3. Accordingly, the NRC staff concluded that the proposed change is acceptable.

3.3.3 Proposed Revision to the TS Bases

The licensee proposed to revise the TS Bases (on page 3.2-8) associated with TS Section 3.2.B.4 to reflect the changes evaluated above. The NRC staff reviewed the proposed revision and agreed that it is consistent with the proposed changes to Section 3.2.B.4.

3.3.4 Correction of Typographical Error

Table 3.1.1, page 3.1-12, last revised by Amendment No. 208 on June 2, 1999, contains a typographical error: “See note i” was inadvertently typed as “See note I.” The licensee proposed to correct this typographical error. The NRC staff agrees that this correction is purely editorial in nature and has no impact on the technical content of the TS.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to use of a facility component located within the restricted area as defined in 10 CFR Part 20. 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 (69 FR 40671). 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.

6.0 CONCLUSION

The Commission 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: T. Ford

Date: February 25, 2005

Oyster Creek Nuclear Generating Station

cc:

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