

October 18, 2000

Mr. Mark E. Warner
Vice President - TMI Unit 1
AmerGen Energy Company, LLC
P.O. Box 480
Middletown, PA 17057

SUBJECT: TMI-1 - AMENDMENT RE: LABORATORY TESTING OF NUCLEAR-GRADE
ACTIVATED CHARCOAL - GENERIC LETTER 99-02 (TAC NO. MA7288)

Dear Mr. Warner:

The Commission has issued the enclosed Amendment No. 226 to Facility Operating License No. DPR-50 for the Three Mile Island Nuclear Station, Unit 1 (TMI-1), in response to your application dated November 30, 1999, as supplemented August 11, and September 14, 2000.

The amendment revises the test standard for laboratory testing of activated charcoal to test in accordance with the ASTM (American Society for Testing and Materials) D3803-1989 standard in response to Generic Letter 99-02, "Laboratory Testing of Nuclear-Grade Activated Charcoal."

Your August 11, 2000, supplement withdrew a portion of your proposed technical specifications related to the relative humidity test requirement for the fuel-handling building engineered safeguards feature air treatment system. A Notice of Partial Withdrawal is enclosed. 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/

Timothy G. Colburn, Senior Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosures: 1. Amendment No. 226 to DPR-50
2. Safety Evaluation
3. Notice of Partial Withdrawal

cc w/encls: See next page

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AMERGEN ENERGY COMPANY, LLC

DOCKET NO. 50-289

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 226
License No. DPR-50

1. The Nuclear Regulatory Commission (the Commission or NRC) has found that:
 - A. The application for amendment by GPU Nuclear, Inc., et al. (the then-licensee), dated, November 30, 1999, as supplemented by letters dated August 11, and September 14, 2000, 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-50 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 226, 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 its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Marsha Gamberoni, 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: October 18, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 226

FACILITY OPERATING LICENSE NO. DPR-50

DOCKET NO. 50-289

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

Remove

3-61
3-62
3-62a
3-62b
3-62e
3-62f
4-55a
4-55c
4-55g

Insert

3-61
3-62
3-62a
3-62b
3-62e
3-62f
4-55a
4-55c
4-55g

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 226 TO FACILITY OPERATING LICENSE NO. DPR-50

AMERGEN ENERGY COMPANY, LLC

THREE MILE ISLAND NUCLEAR STATION, UNIT 1

DOCKET NO. 50-289

1.0 INTRODUCTION

By letter dated November 30, 1999 (1920-99-20604), GPU Nuclear, Inc. (GPU Nuclear, the then-licensee), submitted its response to the actions requested in Generic Letter (GL) 99-02, "Laboratory Testing of Nuclear-Grade Activated Charcoal," dated June 3, 1999 (with errata dated August 23, 1999), for the Three Mile Island Nuclear Station, Unit 1 (TMI-1). By the same letter dated November 30, 1999, GPU Nuclear requested changes to Technical Specifications (TSs) Sections 3.15.1, 3.15.2, and 3.15.4, covering the emergency control room air treatment system (ECRATS), the reactor building purge air treatment system (RBPATS), and the fuel-handling building ESF [engineered safety feature] air treatment system (FHBATS), respectively, for TMI-1. AmerGen Energy Company, LLC (AmerGen), successor to GPU Nuclear, has since adopted this license amendment request and supplemented the application by letters dated August 11 (5928-00-20255), and September 14 (5928-00-20297), 2000. AmerGen provided additional information concerning the proposed relative humidity (RH) for the FHBATS charcoal test and inclusion of the test standard, ASTM (American Society for Testing and Materials) D3803-1989, in the TSs. The proposed changes would revise the TS surveillance testing of the safety-related ventilation system charcoal to meet the requested actions of GL 99-02. The August 11, and September 14, 2000, letters provided clarifying information that did not change the initial proposed no significant hazards consideration determination and did not expand the amendment beyond the scope of the original notice (65 FR 12287).

2.0 BACKGROUND

Safety-related air-cleaning units used in the ESF ventilation systems of nuclear power plants reduce the potential onsite and offsite consequences of a radiological accident by filtering radioiodine. Analyses of design-basis accidents assume particular safety-related charcoal adsorption efficiencies when calculating offsite and control room operator doses. To ensure that the charcoal filters used in these systems will perform in a manner that is consistent with the licensing basis of a facility, licensees have requirements in their TSs to periodically perform a laboratory test to determine charcoal adsorption efficiency (in accordance with a test standard) of charcoal samples taken from these ventilation systems.

In GL 99-02, the staff alerted licensees that testing nuclear-grade activated charcoal to standards other than ASTM D3803-1989, "Standard Test Method for Nuclear-Grade Activated Carbon," does not provide assurance for complying with their current licensing basis with

respect to the dose limits of General Design Criterion 19 of Appendix A to Part 50 of *Title 10 of the Code of Federal Regulations* (10 CFR Part 50) and Subpart A of 10 CFR Part 100.

GL 99-02 requested that all licensees determine whether their TSs reference ASTM D3803-1989 for charcoal filter laboratory testing. Licensees whose TSs do not reference ASTM D3803-1989 were requested to either amend their TSs to reference ASTM D3803-1989 or propose an alternative test protocol.

3.0 EVALUATION

The NRC staff, with technical assistance from Brookhaven National Laboratory (BNL), has reviewed the licensee's submittals. The current and proposed TS surveillance requirements for laboratory charcoal sample testing for the ECRATS, the RBPATS, and the FHBATS are shown in Tables 1 and 2, respectively, of the attached BNL Technical Evaluation Report (TER). The proposed test temperature of 30 °C and test RH of 95 percent for all three systems is consistent with ASTM D3803-1989. The licensee had originally proposed testing the FHBATS at 30 °C and 70 percent RH in its November 30, 1999, application, taking credit for installed heater humidity control, but withdrew the proposed request to test at 70 percent RH in its August 11, 2000, supplement, following discussions with the staff and BNL. The licensee's proposed test penetrations for radioactive methyl iodide result in a safety factor of 2 for all three systems. The proposed safety factor of 2 is acceptable because it ensures that the efficiency credited in the accident analysis is still valid at the end of the surveillance interval and is consistent with the minimum safety factor of 2 specified in GL 99-02. Further, the licensee has stated that the three system face velocities (for air moving through the systems) will be consistent with the face velocities specified in GL 99-02 and are less than 110 percent of 40 ft/min (44 ft/min), and in accordance with GL 99-02, the proposed TSs need not specify the face velocities for testing. The proposed use of ASTM D3803-1989 is acceptable because it provides accurate and reproducible test results. The licensee's proposed TSs and related Bases changes are consistent with the actions requested in GL 99-02. On this basis, the TER concludes that the licensee's proposed TS changes are acceptable.

The staff has reviewed the BNL TER regarding the proposed TS changes for TMI-1. Based on its review, the staff adopts the TER. In view of the above, and because the NRC staff considers ASTM D3803-1989 to be the most accurate and most realistic protocol for testing charcoal in safety-related ventilation systems, the NRC staff finds that the proposed TS and related Bases changes satisfy the actions requested in GL 99-02, and are acceptable.

4.0 COMMENTS RECEIVED

The NRC received a letter from ASTM in response to a March 8, 2000, Federal Register Notice (65 FR 12286) related to revising testing standards in accordance with ASTM D3803-1989 for laboratory testing of activated charcoal in response to GL 99-02. ASTM notified the NRC that the 1989 standard is out of date and should be replaced by D3803-1991(1998). The staff acknowledges that the most current version of ASTM D3803 is ASTM D3803-1991 (reaffirmed in 1998). However, it was decided, for consistency purposes, to have all of the nuclear reactors test to the same standard (ASTM D3803-1989) because, prior

to GL 99-02 being issued, approximately one-third of the nuclear reactors had TSs that referenced ASTM D3803-1989 and there are no substantive changes between the 1989 and 1998 versions.

5.0 STATE CONSULTATION

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

6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to surveillance requirements. 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 (65 FR 12287). 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 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.

Attachment: Brookhaven National Laboratory's Technical Evaluation Report dated
August 18, 2000

Principal Contributor: T. Colburn

Date: October 18, 2000

TECHNICAL EVALUATION REPORT
BROOKHAVEN NATIONAL LABORATORY
FOR THE OFFICE OF NUCLEAR REACTOR REGULATION
DIVISION OF SYSTEMS SAFETY AND ANALYSIS
PLANT SYSTEMS BRANCH
RELATED TO AMENDMENT TO FACILITY OPERATING LICENSE NO. DPR-50
GPU NUCLEAR, INC.
THREE MILE ISLAND NUCLEAR STATION, UNIT 1
DOCKET NO. 50 - 289

1.0 INTRODUCTION

By letter dated November 30, 1999 (1920-99-20604), GPU Nuclear, Inc. (GPU Nuclear) submitted its response to the actions requested in Generic Letter (GL) 99-02, "Laboratory Testing of Nuclear-Grade Activated Charcoal," dated June 3, 1999, for the Three Mile Island Nuclear Station Unit No.1 (TMI-1). By the same letter dated November 30, 1999, GPU Nuclear requested changes to the Technical Specifications (TS) Sections 3.15.1, 3.15.2, and 3.15.4, covering the Emergency Control Room Air Treatment System (ECRATS), the Reactor Building Purge Air Treatment System (RBPATS), and the Fuel Handling Building ESF Air Treatment System (FHBATS), respectively, for the Three Mile Island Nuclear Station Unit No.1. By letter dated August 11, 2000 (5828-00-20255), AmerGen Energy Company, LLC, successor to GPU Nuclear, Inc., provided additional information concerning proposed test relative humidity for the FHBATS and inclusion of the test standard, ASTM D3803-1989, in the TS sections. The proposed changes would revise the TS surveillance testing of the safety related ventilation system charcoal to meet the requested actions of GL 99-02.

2.0 BACKGROUND

Safety-related air-cleaning units used in the engineered safety features (ESF) ventilation systems of nuclear power plants reduce the potential onsite and offsite consequences of a radiological accident by filtering radioiodine. Analyses of design basis accidents assume particular safety related charcoal adsorption efficiencies when calculating offsite and control room operator doses. To ensure that the charcoal filters used in these systems will perform in a manner that is consistent with the licensing basis of a facility, licensees have requirements in their TS to periodically perform a laboratory test (in accordance with a test standard) of charcoal samples taken from these ventilation systems.

In GL 99-02, the staff alerted licensees that testing nuclear-grade activated charcoal to standards other than American Society for Testing and Materials (ASTM) D3803-1989, "Standard Test Method for Nuclear-Grade Activated Carbon," does not provide assurance for complying with their current licensing bases with respect to the dose limits of General Design Criterion (GDC) 19 of Appendix A to Part 50 of Title 10 of the Code of Federal Regulations (10 CFR) and Subpart A of 10 CFR Part 100.

GL 99-02 requested that all licensees determine whether their TS reference ASTM D3803-1989 for charcoal filter laboratory testing. Licensees whose TS do not reference ASTM D3803-1989 were requested to either amend their TS to reference ASTM D3803-1989 or propose an alternative test protocol.

3.0 EVALUATION

3.1 Laboratory Charcoal Sample Testing Surveillance Requirements

The current and proposed TS surveillance requirements for laboratory charcoal sample testing for the Emergency Control Room Air Treatment System (ECRATS), the Reactor Building Purge Air Treatment System (RBPATS), and the Fuel Handling Building ESF Air Treatment System (FHBATS) are shown in Table 1 and Table 2, respectively.

The proposed use of ASTM D3803-1989 is acceptable because it provides accurate and reproducible test results. The proposed test temperature of 30 °C and test relative humidity (RH) of 95% for all three systems are acceptable because it is consistent with ASTM D3803-1989. This is consistent with the actions requested in GL 99-02.

The credited removal efficiency for radioactive organic iodine for both ECRATS and FHBATS is 90 %, and for RBPATS is 70%. The proposed test penetration for radioactive methyl iodide for ECRATS and FHBATS is less than 5 %, and for RBPATS is less than 15%. The proposed test penetrations result in a safety factor of 2 for all three systems. The proposed safety factor of 2 is acceptable because it ensures that the efficiency credited in the accident analysis is still valid at the end of the surveillance interval. This is consistent with the minimum safety factor of 2 specified in GL 99-02.

GPU Nuclear stated in the November 30, 1999 letter that all three systems, the ECRATS, RBPATS, and FHBATS, have a face velocity of 40±10% fpm, and are therefore not specified in the proposed TS amendments. This is acceptable because it ensures that the testing will be consistent with the operation of the ventilation system during accident conditions and is consistent with the August 23, 1999 errata to GL 99-02.

4.0 CONCLUSION

On the basis of its evaluation, BNL recommends that the NRC staff consider the proposed TS changes to be acceptable.

Principal Contributors: Mano Subudhi
Date: August 18, 2000

THREE MILE ISLAND NUCLEAR STATION UNIT 1

TABLE 1 - CURRENT TS REQUIREMENTS											
System Description						Current TS Requirements					
TS Section	System	Bed Thickness (inches)	Actual Charcoal		Credited Efficiency (% organic iodine)	Test Penetration (% methyl iodide)	Safety Factor	Test Standard	Test Temp	Test RH	Test Face Velocity (fpm)
			Res. Time (sec)	Face Velocity (fpm)							
3.15.1	Emergency Control Room Air Treatment System (ECRATS)	**	0.241	41.5	90	<10***	Not Stated (1)****	Reg. Guide 1.52, Rev.2; RDT M16-1T*****	125 °F	95%	Not Stated
3.15.2	Reactor Building Purge Air Treatment System (RBPATS)*	**	0.247	40.5	70	<10***	Not Stated (3)****	Reg. Guide 1.52, Rev.2; RDT M16-1T*****	250 °F	95%	Not Stated
3.15.4	Fuel Handling Building ESF Air Treatment System (FHBATS)	**	0.278	36.0	90	<10***	Not Stated (1)****	ANSI N510-1980, Method A	30 °C	95%	Not Stated

* Based on NRC review in December 1979, RBPATS is not a safety grade system. However, the system charcoal filters are subject to TS requirements.

** All trays are Type II charcoal filter trays, consisting of two 2-inch-deep beds of charcoal mounted in a horizontal casing.

*** TMI-1 Tech Spec specifies a radioactive methyl iodide decontamination efficiency rather than penetration.

A ≥90% decontamination efficiency is specified for all three systems.

**** Safety Factor calculated from credited efficiencies and test penetration.

***** Currently carbon samples are tested in accordance with ANSI N510-1980. ANSI N510-1980 is not indicated in the current TS.

THREE MILE ISLAND NUCLEAR STATION UNIT 1

TABLE 2 - PROPOSED TS REQUIREMENTS											
System Description						Proposed TS Requirements					
TS Section	System	Bed Thickness (inches)	Actual Charcoal		Credited Efficiency (% methyl iodide)	Test Penetration (% methyl iodide)	Safety Factor	Test Standard	Test Temp (° C)	Test RH (%)	Test Face Velocity (fpm)
			Res. Time (sec)	Face Velocity (fpm)							
3.15.1	Emergency Control Room Air Treatment System (ECRATS)	**	0.241	41.5	90	<5	2	ASTM D3803-1989	30	95	Not stated (40)***
3.15.2	Reactor Building Purge Air Treatment System (RBPATS)*	**	0.247	40.5	70	<15	2	ASTM D3803-1989	30	95	Not stated (40)***
3.15.4	Fuel Handling Building ESF Air Treatment System (FHBATS)	**	0.278	36.0	90	<5	2	ASTM D3803-1989	30	95	Not stated (40)***

* Based on NRC review in December 1979, RBPATS is not a safety grade system. However, the system charcoal filters are subject to TS requirements.

** All trays are Type II charcoal filter trays, consisting of two 2-inch-deep beds of charcoal mounted in a horizontal casing.

*** Test face velocity as specified by ASTM D3803-1989.

Three Mile Island Nuclear Station, Unit No. 1

cc:

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UNITED STATES NUCLEAR REGULATORY COMMISSION

AMERGEN ENERGY COMPANY, LLC

DOCKET NO. 50-289

NOTICE OF PARTIAL WITHDRAWAL OF APPLICATION FOR

AMENDMENT TO FACILITY OPERATING LICENSE

The U.S. Nuclear Regulatory Commission (the Commission) has granted the request of AmerGen Energy Company, LLC (the licensee), to withdraw a portion of its November 30, 1999, application for proposed amendment to Facility Operating License No. DPR-50 for the Three Mile Island Nuclear Station, Unit 1, located in Dauphin County, Pennsylvania.

The portion of the proposed amendment would have revised the test requirement for the relative humidity (RH) related to activated charcoal testing for the fuel-handling building engineered safeguards features air treatment system from 95 percent RH to 70 percent RH.

The Commission had previously issued a Notice of Consideration of Issuance of Amendment published in the FEDERAL REGISTER on March 8, 2000 (65 FR 12287). However, by letter dated August 11, 2000, the licensee withdrew a portion of the proposed change.

For further details with respect to this action, see the application for amendment dated November 30, 1999, and the licensee's letter dated August 11, 2000, which withdrew the portion of the application for license amendment. The above documents are available for public inspection at the NRC's Public Document Room, located at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland, and accessible electronically through the

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ADAMS Public Electronic Reading Room link at the NRC Web site (<http://www.nrc.gov>).

Dated at Rockville, Maryland, this 18th day of October, 2000.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Timothy G. Colburn, Senior Project Manager, Section 1
Project Directorate 1
Division of Licensing Project Management
Office of Nuclear Reactor Regulation