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

December 27, 2000

Mr. Gary Van Middlesworth
Site General Manager
Duane Arnold Energy Center
Nuclear Management Company, LLC
3277 DAEC Road
Palo, IA 52324-0351

SUBJECT: DUANE ARNOLD ENERGY CENTER - ISSUANCE OF AMENDMENT REGARDING CHARCOAL FILTER TESTING (TAC NO. MA7269)

Dear Mr. Van Middlesworth:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 235 to Facility Operating License No. DPR-49 for the Duane Arnold Energy Center. This amendment consists of changes to the Technical Specifications (TS) in response to your application dated November 10, 1999, as supplemented by letter dated October 3, 2000.

The amendment revises TS 5.5.7.c, "Ventilation Filter Testing Program (VFTP)", to include the requirement for laboratory testing of engineered safety feature ventilation system charcoal adsorber samples per American Society for Testing and Materials D3803-1989, as requested in Generic Letter (GL) 99-02, "Laboratory Testing of Nuclear-Grade Activated Charcoal," dated June 3, 1999. Additionally, to be consistent with the GL, the allowable penetration limits are changed to correspond to a safety factor of 2.

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

Sincerely,

Brenda Mozafari

Brenda L. Mozafari, Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-331

Enclosures: 1. Amendment No. 235 to License No. DPR-49
2. Safety Evaluation

cc w/encls: See next page

NRR-058

December 27, 2000

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Site General Manager
Duane Arnold Energy Center
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/RA/

Brenda L. Mozafari, Project Manager, Section 1
Project Directorate III
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NUCLEAR MANAGEMENT COMPANY, LLC

DOCKET NO. 50-331

DUANE ARNOLD ENERGY CENTER

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 235
License No. DPR-49

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

   A. The application for amendment by IES Utilities Inc., et al., dated November 10, 1999, as supplemented on October 3, 2000, complies with the standards and requirements of the Atomic Energy Act of l954, 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 l0 CFR Part 5l 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-49 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 235 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective as of the date of issuance and shall be implemented within 60 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Claudia M. Craig, Chief, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: December 27, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 235

FACILITY OPERATING LICENSE NO. DPR-49

DOCKET NO. 50-331

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

Remove	Insert
5.0-13	5.0-13

5.5 Programs and Manuals

5.5.7 Ventilation Filter Testing Program (VFTP) (continued)

b. Demonstrate for each of the ESF systems that an inplace test of the charcoal adsorber shows a penetration and system bypass at the value specified and at the system flowrate specified below:

ESF Ventilation System	Penetration and System Bypass (%)	Flowrate (cfm)
SBGT System	< 0.1	3600 - 4400
SFU System	< 1.0	900 - 1100

c. Demonstrate for each of the ESF systems that a laboratory test of a sample of the charcoal adsorber, when obtained as described in Regulatory Guide 1.52 Revision 2, shows the methyl iodide penetration less than the value specified below when tested in accordance with ASTM D3803-1989 at a temperature of 30°C and the relative humidity specified below:

ESF Ventilation System	Penetration	Relative Humidity
SBGT System	< 0.5%	≥ 70%
SFU System	< 5.0%	≥ 95%

d. Demonstrate for each of the ESF systems that the pressure drop across the combined HEPA filters, the prefilters (SBGT System only), and the charcoal adsorbers is less than the value specified below and at the system flowrate specified as follows:

(continued)

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 235 TO FACILITY OPERATING LICENSE NO. DPR-49

NUCLEAR MANAGEMENT COMPANY, LLC

DUANE ARNOLD ENERGY CENTER

DOCKET NO. 50-331

1.0 INTRODUCTION

By application dated November 10, 1999, as supplemented by letter dated October 3, 2000, Alliant Energy 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 Duane Arnold Energy Center (DAEC). By the same letter dated November 10, 1999 (NG-99-1338), Alliant Energy requested a change to the Technical Specifications (TS) Section 5.5.7.c, for the Standby Gas Treatment System (SBGT) and the Standby Filter Unit (SFU) System for DAEC. In its letter dated October 3, 2000, the current operating license holder of the DAEC, Nuclear Management Company (NMC or the licensee), submitted additional information relating to charcoal bed depth, residence time, and credited efficiency for both engineered safety features (ESF) systems. 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 October 3, 2000, supplement provided clarifying information that did not change the scope of the original license amendment application or the U.S. Nuclear Regulatory Commission (NRC or the Commission) staff's proposed no significant hazards consideration determination.

As a matter of background information, the NRC received a comment letter from American Society for Testing and Materials (ASTM) in response to a March 8, 2000, *Federal Register Notice* (65 FR 12286). The comment related to revising testing standards in accordance with ASTM D3803-1989 for laboratory testing of activated charcoal as discussed in GL 99-02, "Laboratory Testing of Nuclear-Grade Activated Charcoal," dated June 3,1999. ASTM notified the NRC that the 1989 standard is out of date and should be replaced by Test Standard D3803-1991(1998). The NRC staff acknowledges that the most current version of ASTM D3803 is ASTM D3803-1991 (reaffirmed in 1998). However, the NRC staff decided, for consistency purposes, to have all of the commercial nuclear power reactors test to the same standard (ASTM D3803-1989) because, prior to GL 99-02 being issued, approximately one third of nuclear reactors in the United States had TS that referenced ASTM D3803-1989. The NRC staff has reviewed both versions and finds no substantive changes between the 1989 and 1998 versions.

2.0 EVALUATION

The NRC staff, with technical assistance from Brookhaven National Laboratory (BNL), has reviewed the licensee's license amendment application. In addition, the NRC staff has reviewed the attached BNL Technical Evaluation Report (TER) regarding the proposed TS changes for DAEC. Based on its review, the NRC staff adopts the BNL TER.

NRC Staff Conclusion

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 changes satisfy the actions requested in GL 99-02 and are, therefore, acceptable.

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in *Title 10 Code of Federal Regulations* (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 (65 FR 1924, dated January 12, 2000). 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.

5.0 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Attachment: Technical Evaluation Report, Brookhaven National Laboratory

Principal Contributor: Brenda Mozafari, DLPM

Date: December 27, 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-49
ALLIANT ENERGY
DUANE ARNOLD ENERGY CENTER
DOCKET NO. 50 - 331

1.0 INTRODUCTION

By letter dated November 10, 1999 (NG-99-1338), Alliant Energy 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 Duane Arnold Energy Center (DAEC). By the same letter dated November 10, 1999 (NG-99-1338), Alliant Energy requested a change to the Technical Specifications (TS) Section 5.5.7.c, for the Standby Gas Treatment System (SBGT) and the Standby Filter Unit (SFU) System for DAEC. By letter dated October 3, 2000 (NG-00-1596), the current license holder of the DAEC, Nuclear Management Company (NMC), submitted additional information relating to charcoal bed depth, residence time, and credited efficiency for both engineered safety feature (ESF) systems. 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 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 basis 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.

ATTACHMENT

3.0 EVALUATION

3.1 Laboratory Charcoal Sample Testing Surveillance Requirements

The current and proposed laboratory charcoal sample testing TS surveillance requirements for SBGT, and the SFU System 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 for both systems and the proposed relative humidity (RH) of 95 percent for the SFU system are acceptable because they are consistent with ASTM D3803-1989. The proposed RH of 70 percent for the SBGT system is acceptable since, in accordance with the TS Section 5.5.7.e, the system is equipped with safety-related heaters to maintain the 70 percent RH condition. This is consistent with the actions requested in GL 99-02.

By letter dated October 3, 2000, the credited removal efficiencies for radioactive methyl iodine for the SBGT system and the SFU system are 99 percent and 90 percent, respectively. The proposed test penetration for radioactive methyl iodide for the SBGT system is less than 0.5 percent and for the SFU system is less than 5 percent. The proposed test penetration was obtained by applying a safety factor of 2 to the credited efficiency. The proposed safety factor of 2 for all systems 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.

The August 23, 1999, errata to GL 99-02 clarified that if the maximum actual face velocity is greater than 110 percent of 40 fpm, then the test face velocity should be specified in the TS. By letter dated October 3, 2000, the maximum actual "design-basis" face velocity for the SBGT system is 44 fpm and the maximum face velocity for the SFU system is 44 fpm. The proposed testing of the charcoal adsorbers will be performed in accordance with ASTM D3803-1989 which specifies a test face velocity of 40 fpm with appropriate margins. This is acceptable because it ensures that the testing will be consistent with the operation of the ventilation system during accident conditions. Therefore, it is not necessary to specify the face velocity in the proposed TS change. This is consistent with the errata to GL 99-02 dated August 23, 1999.

4.0 CONCLUSION

On the basis of its evaluation, Brookhaven National Laboratory (BNL) recommends that the Nuclear Regulatory Commission (NRC) staff consider the proposed TS changes to be acceptable.

Principal Contributors: Anthony Fresco and Mano Subudhi

Date: November 22, 2000

DUANE ARNOLD ENERGY CENTER (DAEC)

TABLE 1 - CURRENT TS REQUIREMENTS											
System Description						Current TS Requirements					
TS Section	System	Bed Thickness (inches)	Actual Charcoal		Credited Efficiency (% methyl iodine)	Test Penetration (% methyl iodide)	Safety Factor	Test Standard	Test Temp (°C)	Test RH (%)	Test Face Velocity (fpm)
			Res. Time (sec)	Face Velocity (fpm) ***							
5.5.7.c	Standby Gas Treatment (SBGT) System	6	0.75	44	99	<1.0%	1*	ASTM D3803-1979**	≥65.6°C (≥150°F)	≥70%	36 to 44
5.5.7.c	Standby Filter Unit (SFU) System	2	0.25	44	90	<10%	1*	ASTM D3803-1979**	≥51.7°C (≥125°F)	≥95%	36 to 44

* Per letter dated 11/10/99, the licensee indicated that the current penetration does not reflect a safety factor in excess of that assumed in the dose analysis. Therefore, the credited efficiencies are calculated from the specified allowable penetrations using a safety factor of 1.

** Not stated in the TS. Per letter dated 11/10/99, the licensee stated that the current TS requirements for charcoal testing are based on ASTM D3803-1979 and since 1991, the surveillance test procedure calls for testing charcoal samples to both the 1979 and 1989 revisions of ASTM D3803.

*** The actual face velocities are calculated based on maximum gas flow rate through the charcoal beds.

TABLE 2 - PROPOSED TS REQUIREMENTS

System Description						Proposed TS Requirements					
TS Section	System	Bed Thickness (inches)	Actual Charcoal		Credited Efficiency (% methyl iodine)	Test Penetration (% methyl iodide)	Safety Factor	Test Standard	Test Temp (°C)	Test RH (%)	Test Face Velocity (fpm)
			Res. Time (sec)	Face Velocity (fpm) **							
5.5.7.c	Standby Gas Treatment (SBGT) System	6	0.75	44	99	<0.5	2	ASTM D3803-1989	30	70	Not stated (40)*
5.5.7.c	Standby Filter Unit (SFU) System	2	0.25	44	90	<5.0	2	ASTM D3803-1989	30	95	Not stated (40)*

* In accordance with ASTM D3803-1989 requirements.

** The actual face velocities are calculated based on maximum gas flow rate through the charcoal beds.