



Duke Power Company
A Duke Energy Company
EC07H
526 South Church Street
P.O. Box 1006
Charlotte, NC 28201-1006

M. S. Tuckman
Executive Vice President
Nuclear Generation

(704) 382-2200 OFFICE
(704) 382-4360 FAX

November 30, 1999

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington D.C. 20555

Subject: Catawba Nuclear Station Units 1 & 2
Docket Nos. 50 -413, 414
McGuire Nuclear Station Units 1 & 2
Docket Nos. 50 -369, 370
Oconee Nuclear Station Units 1, 2 & 3
Docket Nos. 50 -269, 270, 287
Response to Generic Letter 99-02: Laboratory
Testing of Nuclear-Grade Activated Charcoal

On June 3, 1999, the NRC issued Generic Letter (GL) 99-02 because it was determined 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 the current licensing basis as it relates 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.

The NRC's and the nuclear industry's understandings of the appropriate laboratory tests for nuclear-grade charcoal have evolved over the years. It was initially assumed that high-temperature/high-relative-humidity (RH) conditions were the most severe. Later, with more testing experience, it became clear that the most conservative test is at low temperature/high humidity. The use of outdated test

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protocols or inappropriate test conditions can lead to an overestimation of the capability of the charcoal.

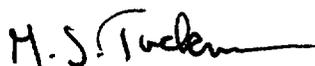
Additionally, the GL requested that within 180 days of its date, licensees submit a written response describing the current Technical Specifications (TS) requirements for the laboratory testing of charcoal samples for each Engineered Safety Feature (ESF) ventilation system. Duke's response to this request is provided in Attachments 1, 2 and 3 for the McGuire, Catawba and Oconee Nuclear Stations, respectively.

The TS for the Catawba and Oconee Nuclear Stations presently require them to test their charcoal samples for each ESF ventilation system to the ASTM D3803-1989 protocol; however, the TS for McGuire require only that the charcoal samples for the Annulus Ventilation and Control Area Ventilation Systems be tested to the ASTM D3803-1989 protocol. On November 23, 1999, a license amendment was submitted for McGuire to adopt the ASTM D3803-1989 protocol for all of their ESF ventilation systems.

Additionally, as requested in the GL, McGuire has been testing their charcoal samples for other ESF ventilation systems in accordance with ASTM D3803-1989 in lieu of the current TS required laboratory testing requirement.

If you have questions or need additional information, please contact Allison Jones-Young at (704) 382-3154.

Very truly yours,



M.S. Tuckman
Executive Vice President
Nuclear Generation

Attachments

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xc: L.A. Reyes
Regional Administrator, Region II

P.S. Tam, ONRR

F. Rinaldi, ONRR

D.E. Lebarge, ONRR

S.M. Shaeffer (MNS)

D.J. Roberts (CNS)

M.C. Shannon (ONS)

ATTACHMENT 1
McGuire Nuclear Station

REQUESTED ACTION: Within 180 days of the date of this GL, submit a written response to the NRC describing your current TS requirements for the laboratory testing of charcoal samples for each ESF ventilation system including the specific test protocol, temperature, RH, charcoal bed thickness, total residence time per bed depth, and penetration at which the TS require the test to be performed. If your current TS specifically require laboratory testing of charcoal samples in accordance with the ASTM D3803-1989 protocol at 30 degrees centigrade [86 F], and you have been testing in accordance with this standard, then you only need to address this requested action (i.e. no TS amendment or additional testing is required).

McGuire's response: ESF ventilation systems at McGuire include the Annulus Ventilation System, Control Area Ventilation System, Aux. Bldg. Filtered Exhaust System, Containment Purge Exhaust (non-ESF) System and Fuel Bldg. Ventilation System.

Annulus Ventilation

Charcoal samples for this system are tested in accordance with ASTM D3803-1989.

Penetration	RH	Temperature
<4%	≥95%	≤30°C

The charcoal bed thickness is 2.0" and the Residence time per 2.0" bed thickness is .37 seconds.

Control Area Ventilation

Charcoal samples for this system are tested in accordance with ASTM D3803-1989.

Penetration	RH	Temperature
<0.95%	≥95%	≤30°C

The charcoal bed thickness is 4.0" and the Residence time per 2.0" bed thickness is .25 seconds.

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Aux. Bldg. Filtered Exhaust

Charcoal samples for this system are tested in accordance with ASTM D3803-1979.

Penetration	RH	Temperature
<10%	≥95%	≤30°C

The charcoal bed thickness of the Unit 1 Aux. Bldg. Filtered Exhaust System is 2.0" and the Residence time per 2.0" bed thickness is .31. The charcoal bed thickness of the Unit 2 Aux. Bldg. Filtered Exhaust System is also 2.0" and the Residence time per 2.0" bed thickness is .35 seconds.

Containment Purge Exhaust (non-ESF)

Charcoal samples for this system are tested in accordance with ASTM D3803-1979.

Penetration	RH	Temperature
<1%	≥95%	≤80°C

The charcoal bed thickness is 2.0" and the Residence time per 2.0" bed thickness is .25 seconds.

Fuel Bldg. Ventilation

Charcoal samples for this system are tested in accordance with ASTM D3803-1979.

Penetration	RH	Temperature
<1%	≥95%	≤80°C

The charcoal bed thickness is 2.0" and the Residence time per 2.0" bed thickness is .28 seconds.

ATTACHMENT 2
Catawba Nuclear Station

REQUESTED ACTION: Within 180 days of the date of this GL, submit a written response to the NRC describing your current TS requirements for the laboratory testing of charcoal samples for each ESF ventilation system including the specific test protocol, temperature, RH, charcoal bed thickness, total residence time per bed depth, and penetration at which the TS require the test to be performed. If your current TS specifically require laboratory testing of charcoal samples in accordance with the ASTM D3803-1989 protocol at 30 degrees centigrade [86 F], and you have been testing in accordance with this standard, then you only need to address this requested action (i.e., no TS amendment or additional testing is required).

Catawba's response:

The ESF ventilation systems at Catawba include the Auxiliary Building Ventilation System, Control Room Ventilation System, Annulus Ventilation System and Fuel Building Ventilation System. The Containment Purge Ventilation System is a non-ESF system.

Auxiliary Building Ventilation

Charcoal samples for this system are tested in accordance with ASTM D3803-1989.

Penetration	RH	Temperature
4%	95%	30°C

The charcoal bed thickness is 2.0" and the total residence time per bed depth is .26 seconds.

Control Room Ventilation

Charcoal samples for this system are tested in accordance with ASTM D3803-1989.

Penetration	RH	Temperature
.95%	95%	30°C

The charcoal bed thickness is 4.0" and the total residence time per bed depth is .52 seconds.

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Annulus Ventilation

Charcoal samples for this system are tested in accordance with ASTM D3803-1989.

Penetration	RH	Temperature
4%	95%	30°C

The charcoal bed thickness is 2.0" and the total residence time per bed depth is .26 seconds.

Fuel Building Ventilation

Charcoal samples for this system are tested in accordance with ASTM D3803-1989.

Penetration	RH	Temperature
4%	95%	30°C

The charcoal bed thickness is 2.0" and the total residence time per bed depth is .29 seconds.

Containment Purge Ventilation

Charcoal samples for this system are tested in accordance with ASTM D3803-1989.

Penetration	RH	Temperature
6%	95%	30°C

The charcoal bed thickness is 2.0" and the total residence time per bed depth is .30 seconds.

ATTACHMENT 3
Oconee Nuclear Station

REQUESTED ACTION: Within 180 days of the date of this GL, submit a written response to the NRC describing your current TS requirements for the laboratory testing of charcoal samples for each ESF ventilation system including the specific test protocol, temperature, RH, charcoal bed thickness, total residence time per bed depth, and penetration at which the TS require the test to be performed. If your current TS specifically require laboratory testing of charcoal samples in accordance with the ASTM D3803-1989 protocol at 30 degrees centigrade [86 F], and you have been testing in accordance with this standard, then you only need to address this requested action (i.e., no TS amendment or additional testing is required).

Oconee's Response: ESF ventilation systems at Oconee consist of the Penetration Room Ventilation System (PRVS), Control Room Ventilation System (CRVS) and Spent Fuel Pool Ventilation System (SFPVS). Laboratory testing of charcoal bed samples for the PRVS and SFPVS have been in accordance with ASTM D3803-1989 for several years. Testing of the CRVS booster fan filter train charcoal beds was not required under the old Technical Specifications (TS) but was incorporated into the current TS. Referencing of ASTM D3803-1989 for the PRVS and CRVS was addressed with the issuance of the current TS.

PRVS

Current TS require verification that PRVS filters provide $\geq 90\%$ radioactive methyl iodide removal when tested in accordance with ASTM D3803-1989 (30°C and 95% relative humidity). This must be verified 31 days after removal of the sample. Each filter has three double tray carbon cells with 2-inch thick carbon beds. Each tray is 4.2 square feet in area. The system design flow rate is 1000 cfm. The total residence time is 0.25 seconds.

CRVS

Current TS require verification that CRVS filters provide $\geq 90\%$ radioactive methyl iodide removal when tested in accordance with ASTM D3803-1989 (30°C and 95% relative humidity). This must be verified 31 days after removal of the sample. Each booster fan

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filter train is equipped with 4 double tray carbon cells with 2-inch thick carbon beds. Each tray is approximately 26" x 24". The system design flow rate is 1350 cfm. The total residence time is 0.25 seconds.

SFPVS

Current TS require verification that SFPVS filters (specifically the Units 2 & 3 Reactor Building Purge filters since SFPVS use these filters in the filtered exhaust mode of operation) provide $\geq 90\%$ radioactive methyl iodide removal when tested in accordance with ASTM D3803-1989 (30°C and 95% relative humidity). This must be verified 31 days after removal of the sample. Each filter is equipped with 144 double tray carbon cells with 2-inch thick carbon beds. Each tray is interchangeable with the PRVS trays thus they are 4.2 square feet in area. The filters are designed to operate at a Reactor Building Purge system flow rate of 50,000-cfm Reactor Building Purge system flow rate of 50,000 cfm. However, the SFPVS only use these filters in the filtered exhaust mode and has flow rates of 14,500 cfm for Units 1 & 2 and 12,500 for Unit 3. Total residence time is 0.25 seconds based on a 50,000 cfm Reactor Building Purge flowrate. Therefore, the SFPVS total residence time is much greater than 0.25 seconds.