

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Air Permit Review

Permit Issue Date:

Region: Mooresville Regional Office
County: Gaston
NC Facility ID: 3600039
Inspector's Name: Tony McManus
Date of Last Inspection: 08/25/2008
Compliance Code: 5 / Meeting Compliance Schedule

Facility Data			Permit Applicability (this application only)	
Applicant (Facility's Name): Duke Power Company, LLC - Allen Steam Station Facility Address: Duke Power Company, LLC - Allen Steam Station 253 Plant Allen Rd. Belmont, NC 28012 SIC: 4911 / Electric Services NAICS: 221112 / Fossil Fuel Electric Power Generation Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V			SIP: NSPS: NESHAP: PSD: PSD Avoidance: NC Toxics: 112(r): Other:	
Contact Data			Application Data	
Facility Contact	Authorized Contact	Technical Contact	Application Number: 3600039.08B Date Received: 01/11/2008 Application Type: Renewal Application Schedule: TV-Renewal Existing Permit Data Existing Permit Number: 03757/T33 Existing Permit Issue Date: 01/05/2009 Existing Permit Expiration Date: 12/31/2013	
Donald Scruggs Environmental Coordinator (704) 829-2350 253 Plant Allen Road Belmont, NC 28012	Stephen Immel Regional Manager (704) 829-2400 Allen Steam Station Belmont, NC 28012	William Horton Senior Environmental Specialist (980) 373-3226 526 South Church Street Charlotte, NC 28202		
Review Engineer: Mike Gordon and Charlie Yirka (RACT Review attachment) Review Engineer's Signature: _____ Date: _____			Comments / Recommendations: Issue 03757/T34 Permit Issue Date: Permit Expiration Date:	

1. Purpose of Application

Duke Energy Carolinas, LLC (Duke) submitted an application for renewal of their Title V permit on January 11, 2008. The facility will be incorporating CAM requirements into the existing coal fired boilers for the electrostatic precipitators (ESP) and arsenic emissions limits to ensure that arsenic impacts from the facility do not exceed the levels listed in 2D .1100. The permit will also include the incorporation of existing State-Only CAIR requirements under 15A NCAC 2D .2400, 15A NCAC 2D .2500 "Mercury Rules for Electric Generators", the removal of 15A NCAC 2D .1400 rules that are replaced by 2D .2400, 15A NCAC 2D .0606 SO₂ requirements for the existing scrubbers, RACT requirements for ES-6 (AuxB) provided by Mr. Charlie Yirka, and the removal of opacity limits and testing requirements for 15A NCAC 2D .0536 that are being incorporated into the CAM plan. This permit includes the following applications that have been consolidated with the renewal:

1. **Application 3600039.08B**
Title V permit renewal application.
2. **Application 3600039.09A** (consolidated with Application 3600039.08B)
Updated acid rain permit
3. **Application 3600039.09B** (consolidated with Application 3600039.08B)
Facility-wide arsenic emissions limits

2. Application Chronology

Refer to "Comprehensive Application Report" for complete details.

3. Facility Description

This facility is an electric power generating utility with primary emissions sources consisting of five pulverized coal boilers. Boiler Units 1-5 have Electrostatic Precipitators (ESP). The following additional NO_x controls are installed all units: low NO_x burners, Selective Non-catalytic Reduction (SNCR), and Separated Over Fire Air (SOFA). Lowered Fire Incremental Re-spacing (LFIR) is incorporated into Units 1,3 and 5 only. Flue Gas Desulfurization scrubbers were incorporated into permit revision 03757T30. The total capacity of the station is approximately 1285 MW. The facility also has one No. 2 Fuel oil fired auxiliary utility boiler subject to NSPS Subpart Dc.

4. Statement of Compliance

Based on the last inspection performed by MRO (Tony McManus) on 8/25/2008, Duke Energy's Allen Plant appeared to be in compliance with all requirements outlined in the air permit 03757T31.

5. Permit Modifications/Changes

5.1 CAM Application

Coal Fired Boiler Units 1 through 5 are subject to 40 CFR 64 for particulate emissions from the Electrostatic Precipitators (ESP's) and therefore the facility proposed a Compliance Assurance Monitoring (CAM) plan for each unit. Duke Energy submitted a CAM plan that used the opacity data collected during PM emissions stack testing. The data extends over a period of 25 years. Duke energy originally proposed a CAM opacity trigger value of 35% for each unit. A linear regression of the data was plotted on a log-log scale, which Duke stated is most representative of the relationship between PM emissions and opacity for the data set, in order to arrive at a CAM opacity trigger level (excursion point). The point at which the line crosses the PM limit is Duke's proposed trigger level. Correlated PM and opacity values submitted by Duke were found by the DAQ to be deficient (i.e. the data was not accurate enough to develop a reliable correlation between PM and opacity based off of the stack test data alone). As a result it did not provide a reasonable representation of current/normal operating conditions as needed for developing a CAM trigger level. Therefore the data supplied by Duke was re-evaluated by the NCDAQ. The DAQ believed that significant changes to the facility's control devices and methods of operation changes the PM to opacity relationship observed. Analysis of the data broken up according to significant changes that occurred at the facility supports this theory. Evaluation of the last 5 to 10 years of opacity data helped to establish a trigger value for CAM that was more representative of the PM and Opacity correlation for the unit as it is operated today. It was determined from this data that the excursion values should be set at 16% opacity for Unit 1, 20% for Unit 2, 13% for Unit 3, 13% for Unit 4, and 17% for Unit 5. CAM excursion values were set by calculating the average opacity at 90% of the permitted PM limit determined by logarithmic graphing of the data received from the facility for each unit.

Using 3-hour block opacity data

After the opacity excursion points determined above by DAQ from the log-log plots were discussed with Duke. Duke presented the argument that the determined trigger values were too low. In an effort to show that the excursion points were unreasonably low and would cause excessive operator corrective actions to be initiated (see CAM permit condition Section 2.1.A.11, they submitted approximately 4½ years of 3-hour block COM values for each unit to show how many times per quarter operator corrective action would be needed at a the opacities determined by DAQ. Using the 4½ years' worth of 3-hour block data, Duke proposed the excursion points shown in column 3 of Table 1, based on an exceedance of CAM excursion points 2% of the time. Duke claimed a 2% exceedance was a reasonable amount of operator corrective action. DAQ then determined, using the 3-hour block COM data, the average quarterly opacity for the most recent 2-year period that would exceed the 5% CAM trigger that requires them to conduct a stack test (see Monitoring/Recordkeeping below). These

are shown in column 4 of Table 1. The final CAM trigger values (column 5 of Table 1) were selected based on the collective data correlating PM to opacity as well as the 3-hour block data that represented normal operation of the unit. Values that were justifiable and requested by Duke were selected when possible. Values that were determined from the data as being accurate were selected by default. The assumption was made that the 3-hour opacity values represented a level of PM emissions that were generally below 90% of compliance levels and provided a basis for accurate cross check in validating the PM to opacity correlation originally evaluated by the DAQ. Utilizing the last two years of data from Duke is justified by the DAQ because it represents the most recent configuration and operation of each unit.

Table 1. CAM Trigger Values

	% Opacity				
	1	2	3	4	5
	Originally Proposed by Duke	DAQ's analysis using 1999-2007 opacity-PM log-log plots	Duke's proposal using 4½ yrs of 3-hr at 2% of quarterly exceedance of CAM excursion	DAQ's analysis using last 2 yrs of 3-hr data at 5% quarterly exceedance of CAM excursion	Final CAM excursion point
Boiler					
1	35	16	19	24	19
2	35	20	19	17	20
3	35	13	20	14	14
4	35	13	20	19	19
5	35	17	20	14	17

5.2 Removal of Particulate testing requirements [15A NCAC 2D .0536]

Permit 03757T33 required that the facility monitor opacity using COMS as a surrogate PM compliance method. Although the requirement for COMS have been left in the permit, the additional testing requirements and opacity limits previously listed under 2.1.A.5.f have been removed from the permit due to overlapping requirements that have been included as part of the facility CAM Plan and in order to establish consistency with existing utility permits already processed this year. Permit conditions previous to this renewal required the facility to perform stack testing if opacity data shows greater than 5% of the trigger limit listed in 2.1.A.5. As part of this renewal, the limits have been further refined using opacity and PM data submitted by the facility for CAM. The requirements previously listed as part of 2.1.A.5 have been appropriately moved to 2.1.A.11.

5.3 Clean Air Interstate Rules

On December 23, 2008 The U.S. Court of Appeals for the D.C. Circuit ruled to remand the Clean Air Interstate Rules (CAIR) to the EPA and therefore leave CAIR and the CAIR Federal Implementation Plans, including the CAIR trading programs, in place until EPA issues a new rule to replace CAIR in accordance with the July 11, 2008 decision. EPA informed the Court that development and finalization of a replacement rule could take about two years.¹ On July 1, 2006 (Amended May 1, 2008) North Carolina issued rules listed under 15A NCAC 2D .2400 for implementation of the CAIR Program under delegated authority. North Carolina's rules have been approved by the Environmental Management Commission (EMC) but have not as yet been approved by the EPA therefore the .2400 rules remain State-Only Enforceable requirements.

¹ See "State of North Carolina vs. EPA" Case No. 05-1244 U.S. Court of Appeals for the District of Columbia. December 23, 2008

5.4 Mercury Rules for Electric Generators

On February 8, 2008, the D.C. Circuit vacated EPA's rule removing power plants from the Clean Air Act list of sources of hazardous air pollutants. At the same time, the Court vacated the Clean Air Mercury Rule.² The NC EMC adopted rules under 15A NCAC 2D .2500 on January 1, 2007 specifically for the reduction of mercury emissions within the State. While these rules were, in part, a result of the federal CAMR rulemaking, they remain in effect despite the vacatur of the Federal CAMR Rule. Because the rules are currently in effect they remain State-Only requirements.

5.5 15A NCAC 2D .0606 - Part 51 Appendix P for SO₂

Duke energy has two existing Flue Gas Desulfurization spray tower scrubbers (SO₂ scrubbers) in service at the facility. Pursuant to 15A NCAC 2D .0606(a) fossil fuel fired generators “shall be monitored as described in Paragraph 2 of Appendix P of 40 CFR Part 51.” Paragraph 2.1.2 provides,

A continuous monitoring system for the measurement of sulfur dioxide which meets the performance specifications of paragraph 3.1.3 of this appendix shall be installed, calibrated, maintained, and operated on any fossil fuel-fired steam generator of greater than 250 million BTU per hour heat input which has installed sulfur dioxide pollutant control equipment.

2D .0606 further provides

The excess emissions recorded by the monitoring systems required to be installed under this Rule shall be reported no later than 30 days after the end of the quarter to the Division in the manner described in Paragraphs 4 and 5.1 through 5.3.3 of Appendix P of 40 CFR Part 51 except that a six-minute time period is deemed as an appropriate alternative opacity averaging period as described in Paragraph 4.2 of Appendix P of 40 CFR Part 51.

The permit contains Appendix P provisions as a result of the operation of ESP's to control particulate. The SO₂ Appendix P provision that will be added to this revised permit was patterned after the existing Appendix P provision with the exception of the averaging time. Compliance with sulfur dioxide emission standards are determined by averaging hourly continuous emission monitoring system values over a 24-hour block period beginning at midnight. Excess emissions and monitor downtime are calculated using the same equations listed in the permit for continuous opacity monitoring.

5.6 RACT

Please see the attached review summary provided by Mr. Charlie Yirka

5.7 15A NCAC 2D .1100 - Arsenic Emissions

The Air Quality Committee (AQC) of the Environmental Management Commission (EMC) asked the Division of Air Quality (DAQ) to proceed with developing options for addressing toxic air emissions from combustion sources in North Carolina following vacatur of the Industrial, Commercial, and Institutional Boiler and Process Heater (40 CFR 63 Subpart DDDDD) Maximum Achievable Control Technology (MACT) rule.

At the March 2008 AQC meeting it was decided to use current provisions in 15A NCAC 02Q .0712, Calls by the Director, to address existing sources that might present an unacceptable risk to human health based on the

² See “State of New Jersey et al. vs. EPA” Case No. 05-1097 U.S. Court of Appeals for the District of Columbia. February 8, 2008

acceptable ambient levels (AAL) in 15A NCAC 02D .1104 or epidemiology studies. As a screening step, Human Exposure Modeling (HEM) was conducted to identify risks associated with combustion sources. The HEM modeling identified combustion sources at 42 existing facilities presenting a cancer risk greater than one in one million.

Each of the 42 Facilities identified in this screening step were contacted and a request was made to provide additional information specific to their ambient impacts relative to the acceptable levels in 15A NCAC 02D .1100. If, based on that information, a facility had the potential to exceed one or more AALs, a Director's Call of that facility would be made.

In order to avoid a Director's Call, Duke Energy Carolinas, LLC – Allen Steam Station requested an emissions limit that is equal to approximately 96% of the AAL for arsenic and conducted AEROMOD emissions modeling (revised modeling for arsenic received on May 30, 2009) to demonstrate compliance with the AALs for the emissions sources. Arsenic emissions from each unit shall not exceed 0.8672 tons per year and the facility-wide arsenic emissions are limited to 1.741 tons per year. Actual facility emissions of arsenic are expected to be approximately 0.05212 tons per year from each unit, or approximately 0.1038 tons per year facility-wide. This emissions rate is approximately 1/10th the permitted rate and therefore monitoring of arsenic will not be required at this time.

5.8 Table of Changes

Old Page No.	New Page No.	Part, Section, or Condition No.	Change
-	-	Cover	Amended to reflect current permit number, issue date, effective date, and associated application information
-	-	Throughout	Removed references to 501(C)(2) modifications due to publication of public notice as a result of this permit
14	12-13	2.1.A.5.f	Removed opacity limits and testing requirements as a specific condition for to 2D .0536 due to incorporation of requirements and limits in the facility CAM plan located in Section 2.1.A.11.
16	13-14	2.1.A.7	Added SO ₂ requirements under 15A NCAC 2D .0606 for the existing scrubbers
17-18	42-44	2.1.A.9	Removed specific conditions that referenced 15A NCAC 2D .1400 rules and replaced with 15A NCAC 2D .2400 based specific conditions in the CAIR Permit Section 2.5
-	16	2.1.A.9	Incorporated applicable requirements of 15A NCAC 2D .2500 for Mercury emissions from Coal fired Boilers (Unit ID No.'s ES-1 to ES-5)
-	17-19	2.1.A.11	Added facility CAM plan for Coal fired Boilers (Unit ID No.'s ES-1 to ES-5)
-	20	Section 2.1.A.13	Added arsenic emissions limits voluntarily agreed upon by Duke Energy in order to avoid a Director's call (2Q .0705) requirement for air toxics
-	22-23	2.1.B.4	Added RACT requirements for ES-6 (AuxB) boiler
-	34	Section 2.2.B.2	Added facility-wide arsenic emissions limit in connection with above change
-	42-44	2.5	Added CAIR Permit Section and attached associated application as part of this permit

6. NSPS, NESHAPS, Attainment Status, NSR, 112(r), PSD, and CAM

NSPS

There are no changes to the already existing NSPS affecting sources consisting of the Limestone Receiving, Storage, Transfer, and Grinding system listed under Section 2.1.D and 2.1.E of the permit that is subject to NSPS Subpart OOO for PM emissions and the No. 2 fuel oil/propane-fired auxiliary boiler (ID No. ES-6 (AuxB)) that is subject to NSPS Subpart Dc for sulfur dioxide.

NESHAPS

One Emergency No. 2 fuel oil fired Generator, ID No. ES-7 (EmGen), is subject to 40 C.F.R. 63 Subpart ZZZZ. The generator is subject to initial notification only therefore no specific conditions were added as a result of this permit.

Attainment Status and NSR

Gaston County is in attainment.

112(r)

This facility is not subject to Section 112(r) of the Clean Air Act requirements.

PSD

The Allen Plant is a major stationary source.

CAM

Coal Fired Units 1, 2, 3, 4, and 5 are subject to CAM for PM emissions from the Electrostatic Precipitators (ESP's). See discussion above in 5.1 for details.

7. Permit History

Permit No.	Issuance Date	Description of Revision
03757T23	July 22, 2003	Initial TV Permit
03757T24	November 12, 2003	Reissued Initial Title V Permit due to Duke Energy Adjudication
03757T25	December 3, 2003	Listed as a 502(b)(10) change to incorporate separate SOFA, LOFIR and low NOx equipment on mainly unit 5 to the permit
03757T26	August 24, 2004	Listed as a 502(b)(10) change to the permit to add urea injection to Unit 3
03757T27	December 10, 2004	Revised NOx requirements, added backup generator and several insignificant sources
03757T28	June 10, 2005	Reopened for cause to make some administrative changes
03757T29	January 19, 2006	Minor modification that incorporated the newly approved SIP and added an SNCR system to Unit 4.
03757T30	June 30, 2006	Significant Modification that added SNCR systems, scrubbers, and a limestone handling system to several units as well as removing Insignificant and other sources from the permit that are no longer in service.
03757T31	May 15, 2007	State only modification authorizing the burning of EDTA and associated toxics limitations
03757T32	September 17, 2008	Significant modification that added the dry flyash handling system and incorporated other administrative changes to the permit
03757T33	January 5, 2009	Significant modification that incorporated Acid Rain permit requirements

8. Facility Emissions Review

The following is an emission summary for this facility. Actual emissions are for year 2007, as reported by the company to DAQ through submittal of annual emission inventory.

Pollutant	Actual Emissions (Tons/Yr)
PM	4456.68
PM10	3654.22
PM2.5	2730.82
CO	3042.76
NOx	6453.88
SO ₂	50587.16
VOC	90.14
Single HAP (HCl)	2953
Total HAP	3227.96

9. Public Notice / EPA and Affected States Review

Public notice for this permit is required. The EPA Review period applies. This permit will affect no additional states.

10. Conclusions, Comments, and Recommendations

This is a permit renewal for the Duke Energy – Allen Steam Electric Generation Plant. CAM should be closely monitored in the next few years to ensure it has been implemented effectively in this permit. Several facility requirements are triggered at any time the three-hour average opacity is exceeded for a given unit. Furthermore, the permit states:

“If five (5) percent or greater of COMS data (averaged over a three hour block period and excluding startup, shutdown, and malfunction periods) recorded in a calendar quarter show opacity values higher than those listed above, a stack test shall be performed in the following calendar quarter to demonstrate compliance with the particulate standard. If the stack test exceeds 80 percent of the PM limit then retesting shall be conducted in accordance with 2.1.A.5.e.”

As discussed above, significant overlap was found in between Section 2.1.A.5 and 2.1.A.12. Since the Compliance Assurance Monitoring requirements were more stringent than those required as part of 15A NCAC 2D .0536 the additional testing requirements of Section 2.1.A.5 were removed.

Major changes have occurred in this permit renewal to include RACT, CAIR, Mercury control, 2D .0606, etc. and are discussed in detail above in section 5. Actual arsenic emissions from the facility are approximately 1/10th of the requested permit limit and are significantly below the AAL.

MRO has requested a draft copy of this permit.