

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Air Permit Review

Permit Issue Date:

Region: Asheville Regional Office
County: Rutherford
NC Facility ID: 8100028
Inspector's Name: Mike Parkin
Date of Last Inspection: 08/21/2007
Compliance Code: C/In Compliance With
 Procedural Reqr

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|---|---|---|---|
| Facility Data | | | Permit Applicability (this application only) |
| Applicant (Facility's Name): Duke Energy Carolinas, LLC - Cliffside Steam Station Facility Address: Duke Energy Carolinas, LLC - Cliffside Steam Station 573 Duke Power Road (SR 1002) Cliffside, NC 28024 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: 8100028.08A Date Received: 01/15/2008 Application Type: Renewal Application Schedule: TV-Renewal Existing Permit Data Existing Permit Number: 04044/T28 Existing Permit Issue Date: 01/29/2008 Existing Permit Expiration Date: 10/31/2008 |
| Steve Hodges Environmental Coordinator (828) 657-2339 573 Duke Power Road Mooresboro NC, 28114 | Rick Roper Manager Cliffside Steam Station 573 Duke Power Road Mooresboro NC, 28114 | William Horton Senior Environmental Specialist (980) 373-3226 526 South Church Street Charlotte NC, 28202 | |
| Review Engineer: Mike Gordon and Ed Martin (Acid Rain Portion) Review Engineer's Signature: _____ Date: _____ | | Comments / Recommendations: Issue 04044/T29 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 22, 2008. This draft revision of the permit constitutes the second public notice period for the Cliffside Title V permit renewal. This second public notice is in response to the time that has elapsed since the first public notice period ended on October 30, 2008 and a result of numerous changes that have occurred to the draft permit as explained below. All comments that are received will be consolidated with all previously received comments and addressed at the conclusion of this public notice.

The facility will be incorporating CAM requirements into the existing coal fired boilers for the electrostatic precipitators (ESP). Also the permit is being modified to incorporate 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, and

opacity limits and testing requirements for 15A NCAC 2D .0536 that are being incorporated into the CAM plan.

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 tangentially fired pulverized coal dry bottom boilers. Units 1-4 have hot side ESP control and low NO_x burners. Unit 5 is over twice the size of the other boilers combined and is equipped with a cold side ESP, an ammonia flue gas conditioning system for opacity control, and the following for NO_x control: low NO_x burners, Selective Catalytic Reduction (SCR), Separated Over Fire Air (SOFA), and Lowered Fire Incremental Re-spacing (LFIR). The facility is installing a new supercritical pulverized coal-fired 800 MW boiler and will simultaneously retire existing Units 1-4 when the new system is brought online. Other ancillary emission sources that will be part of the Unit 6 installation include: an auxiliary boiler, cooling tower, emergency generator, firewater pump, and various coal handling, ash handling and lime handling emission sources. The older less efficient and uncontrolled Units 1-4 (with a combined capacity of about 200 MW) which began operation around 1940 will be retired when the new Unit 6 begins operation, bringing the total capacity of the station (Units 5 and 6) to 1360 MW. Unit 6 is projected to begin operation as early as 2011.

4. Statement of Compliance

Based on the last inspection performed by ARO (Mike Parkin) on 6/4/2009, Duke Energy's Cliffside Plant appeared to be in compliance with all requirements outlined in the air permit 04044T28.

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. Correlated PM and opacity values submitted by the facility were found by the DAQ to not to provide a reasonable assurance of ongoing compliance with the PM emission limits for the anticipated range of operating conditions at each unit and therefore were re-evaluated using the data supplied by Duke Energy. The DAQ then determined a trigger value for CAM that is more representative of the PM and Opacity correlation. It was determined from this data that the excursion values should be set at 12% opacity for Unit 1, 15% for Unit 2, 16% for Unit 3, 15% for Unit 4, and 25% for Unit 5. CAM trigger limits 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. The data submitted by Duke Energy is presented to the

DAQ in lieu of continuous operational data for purposes of correlating opacity and PM emissions.

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

Permit 04044T28 required that the facility monitor opacity using COMS. Although the requirement for COMS have been left in the permit, the additional testing requirements and opacity limits listed under 2.1.A.4.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 previously issued. 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.4. As part of this renewal, the limits have been further refined using data opacity and PM data submitted by the facility for CAM. The requirements that were part of 2.1.A.4 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. A permit section has been created for the incorporation of CAIR related rules under Section 2.6.

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. As a result, the following new regulations were added:

1. 2D .2500: MERCURY RULES FOR ELECTRIC GENERATORS

In accordance with the applicability requirements in 2D .2501, the rule applies to:

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

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

- (1) Any stationary coal-fired boiler or any stationary coal-fired combustion turbine serving at any time, since the start-up of a unit's combustion chamber, a generator with nameplate capacity of more than 25 MWe producing electricity for sale; or
- (2) Any unit that qualifies as a cogeneration unit during the 12-month period starting on the date that the unit first produces electricity and continues to qualify as a cogeneration unit, or any cogeneration unit serving at any time a generator with nameplate capacity of more than 25 MWe and supplying in any calendar year more than one-third of the unit's potential electric output capacity or 219,000 MWh, whichever is greater, to any utility power distribution system for sale; or
- (3) Any Hg budget unit identified in the table in Rule 2D .2503.

As stationary coal-fired boilers serving a generator with a nameplate capacity greater than 25 MWe and listed in the table in Rule 2D .2503, this rule applies to the five coal fired boilers at Cliffside. As discussed in a memo from Keith Overcash dated September 15, 2009, the DC Court of Appeals vacated CAMR on February 8, 2008, making all but Sections 2D .2509 and .2511 of the 2D .2500 rules deficient and impractical. In accordance with the memo, until new federal rules are promulgated to replace CAMR, the state-only 2D .2500 rules will remain in the permit (if already in the permit), or newly placed into permits, with a footnote stating that Sections 15A NCAC 2D .2509 and .2511 are state-enforceable and that all other sections of 15A NCAC .2500 will not be enforced at this time.

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 Acid Rain Permit

Acid Rain Permit updated by Ed Martin, P.E. (see attached review)

5.7 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 Part II and I since the DAQ no longer separates these sections within the permit. |
| - | - | Throughout | Corrected EPA Test Method rule citations in various sections from 15A NCAC 2D .0501 to the new 15A NCAC 2D .2600 rules. |
| - | - | General Conditions | Updated Permit with the latest General Conditions. Version 2.22.1. |
| - | - | Table of Contents | Revised for additional application attachments (Acid Rain, CAIR). |
| - | - | Throughout | Added specific conditions from Part II to relevant sections of the permit where necessary. |
| 14 | 13 | 2.1.A.4 | Removed 35% opacity limit and testing requirements due to incorporation of requirements and limits in the facility CAM plan located in Section 2.1.A.11. |
| 16 | 14-15 | 2.1.A.7 | Added SO ₂ requirements under 15A NCAC 2D .0606 for the existing scrubbers |
| 17-18 | 16 | 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 2.6 |
| - | 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 CAM plan for Coal fired Boilers (Unit ID No.'s ES-1 to ES-5) |
| 45 | 45 | 2.1.J | Added Method 29 for lead to the list of reference test methods. |
| - | 62 | 2.1.P | Added citation for 15A NCAC 2D .0524 - Subpart OOO in the Regulated Pollutants Table for Particulate Emissions. |
| 76-79 | 77-82 | Section 2.5 | Revised Acid Rain effective dates. |
| | | | Revised NO _x limits in accordance with averaging plan in Section 2.5 B. |
| | | | Revised for new Acid Rain application attachments in Section 2.5 D. |
| - | 83-84 | Section 2.6 | Added CAIR Permit Section |
| - | - | Part II | Removed Part II from the permit due to changes in permitting procedures at the DAQ and incorporation of 501(c)(2) changes that the Permittee has completed and is requesting be covered under the permit shield. General Condition NN now covers the general requirements of Part II and specific requirements are incorporated within the main body of the permit (See Sections related to Unit 6) |

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

NSPS

The Coal Unloading, Conveying, Storage, and Crushing system listed under Section 2.1.E of the permit is subject to NSPS Subpart Y for PM emissions. The Limestone Unloading, Conveying, Storage, and Crushing system listed under Section 2.1.F of the permit is subject to NSPS Subpart OOO for PM emissions. The diesel fuel-fired emergency quench water pump (ID No. QP5), one diesel fuel-fired emergency firewater pump (ID No. FWP5), one No. 2 fuel oil-fired emergency generator (ID No. ES-EG6), and one No. 2 fuel oil-fired emergency firewater pump (ID No. ES-FWP), are subject to NSPS Subpart IIII for sulfur dioxide, VOC and NOx, CO, and PM emissions. The coal/No. 2 fuel oil-fired supercritical electric utility boiler (ID No. ES-6) is subject to NSPS Subpart Da for sulfur dioxides, NOx, PM, visible emissions, and Mercury. The No. 2 fuel oil/propane-fired auxiliary boiler (ID No. ES-Aux 6) is subject to NSPS Subpart Db for sulfur dioxide, NOx, visible emissions, and PM. Coal handling for Unit 6 listed under Section 2.1.N is subject to NSPS Subpart Y. The bagfilter as part of Lime Silo for SDA (ID No. ES-LSSDA) with associated bagfilter (ID No. CD32-3) is subject to NSPS Subpart OOO.

NESHAPS

One Emergency Diesel Generator (ID No. ES-12 (EmGen) and one diesel fuel-fired emergency quench water pump (ID No. QP5) are subject to 40 C.F.R. 63 Subpart ZZZZ initial notification requirements. The No. 2 fuel oil-fired emergency generator (ID No. ES-EG6), and the No. 2 fuel oil-fired emergency firewater pump (ID No. ES-FWP) are subject to 40 C.F.R. 63 Subpart ZZZZ. The facility also is required to request an applicability determination as part of Permit condition 2.1.D.3 for the diesel generator.

Attainment Status and NSR

Rutherford County is in attainment. There is no NSR for this renewal.

112(r)

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

PSD

The Cliffside Plant is a major stationary source. Units 1-5 are not subject to NSR requirements. Unit 6 is subject to NSR (PSD) and those requirements were incorporated in previous permit revisions.

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 |
|------------|--------------------|---|
| 04044T20 | September 23, 2003 | Initial TV Permit |
| 04044T21 | November 12, 2003 | Reissued Initial Title V Permit due to Duke Energy Adjudication |
| 04044T22 | December 3, 2004 | Minor Modification to revise reporting requirements for NOx related language |
| 04044T23 | June 10, 2005 | Reopened for cause to revise federal opacity monitoring and reporting requirements in accordance with letter to Mr. Albert J. Smith III from Donald R. van der Vaart dated February 15, 2005. |
| 04044T24 | July 12, 2006 | Minor Modification reopened for cause. Replaced proposed SIP 2D .0521 language with approved SIP 2D .0521 language and other changes to rule related language. |
| 04044T25 | December 15, 2006 | 501(c)(2) modification. Incorporation of new emissions sources, revised SO2 requirements for FGD system, and various other administrative corrections. |
| 04044T26 | January 18, 2007 | Administrative Amendment. |
| 04044T27 | July 13, 2007 | Administrative Amendment |
| 04044T28 | January 29, 2008 | 15 NCAC 2Q .0501(c)(2) permit. Added Coal Fired Boiler Unit 6 to the facility as well as additional handling and processing equipment to support operation of this unit. |
| 04044T29 | March 13, 2009 | Added requirements for emissions of HAP's from unit 6. (Major status avoidance) |

8. Facility Emissions Review

The following is an emission summary for this facility. Actual emissions are for year 2008, as reported by the company to DAQ through submittal of annual emission inventory.

| Pollutant | Actual Emissions Tons/Yr |
|------------------|-----------------------------|
| PM | 1634.16 |
| PM10 | 1530.87 |
| PM2.5 | 1404.41 |
| CO | 1141.22 |
| NOx | 2308.01 |
| SO ₂ | 29424.63 |
| VOC | 64.70 |
| Single HAP (HCl) | 1838 |
| Total HAP | 1996 |

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 – Cliffside Steam Electric Generation Plant. CAM is a major change in this permit and should be closely monitored in the next few years to ensure it has been implemented effectively in this permit. The facility is required to inspect and take corrective action (if required) at any time it experiences an opacity excursion. An excursion is defined in the CAM plan as a three-hour average opacity level greater than the levels specified in the permit. 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.4.e.”

Similar language could be found in Section 2.1.A.4 for these emissions sources and it was determined that they overlapped significantly. Since the requirements as part of CAM implementation were more stringent than those required as part of 15A NCAC 2D .0536 the additional testing requirements of Section 2.1.A.4 were removed.

This draft constitutes the second public notice of the permit. Several significant changes and some minor changes have occurred since the initial public notice. These changes include incorporation of CAIR permit requirements into a separate section, updated Acid Rain provisions, additional SO₂ requirements, state mercury rules, etc. The amount of time that has lapsed since the initial public notice along with the changes to the draft permit are justification for a second public comment period. All comments previously received for the initial permit draft will be consolidated with any new comments and addressed at the conclusion of this public comment period.

ARO has requested a draft copy of this permit.