

**MEMORANDUM OF AGREEMENT  
BETWEEN  
THE SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL  
AND  
THE SOUTH CAROLINA ELECTRIC UTILITIES  
REGARDING THE SOUTH CAROLINA CLEAN AIR MERCURY RULE**

This Memorandum of Agreement (“MOA”) is made and entered into this 1<sup>st</sup> day of December, 2008, by and between SCANA Services Inc. (SCANA), Duke Energy Carolinas LLC (“Duke Energy”), Carolina Power and Light Company d/b/a Progress Energy Carolinas, Inc. (“Progress Energy”), and Santee Cooper (collectively the “South Carolina electric utilities” or “Utilities”) and the South Carolina Department of Health and Environmental Control (“DHEC”) (each a Party and collectively Parties).

**I. PURPOSE.**

This MOA is to define tasks and procedures for participants in response to the vacatur of the Federal Clean Air Mercury Rule (“Federal CAMR”). South Carolina (“S.C.”) promulgated a state version of the Clean Air Mercury Rule (“State CAMR”), S.C. Code. Reg. 61-62.60, Subpart HHHH, June 22, 2007, to implement the Federal CAMR. Vacatur of the Federal CAMR has resulted in a State CAMR that is not possible to implement, as promulgated, due to the numerous linkages to federal programs that will no longer be available. Those programs include the basic development and administration of the allowance budget and trading program and technical development and support for the mercury monitoring program. The United States Environmental Protection Agency (“EPA”) is expected to undertake further rulemaking, in accordance with the Clean Air Act (“CAA”) that will address standards for mercury and other pollutants, and DHEC intends to implement state rules regulating such pollutants.

DHEC has an interest in developing better information on mercury emissions from S.C. facilities. The Utilities and DHEC commit to entering a voluntary agreement to address state CAMR requirements and to provide mercury monitoring or testing to define representative emissions from coal-fired power plants.

DHEC intends to initiate the repeal process for the State CAMR and this action will follow the required process for rulemaking under State statutes. Pursuant to this MOA, DHEC and the Utilities agree to the following actions and principles regarding implementation and compliance with the State CAMR:

- a. Specific State CAMR deadlines.
  - i. Permit application filing deadlines –  
Each Utility holding a Title V Permit with permit conditions currently referencing the State CAMR permit application filing requirements

(due by June 30, 2008), as specified in the vacated federal rule and the current SIP rule, shall submit to the Department separate written requests for minor modifications, for each of its Title V permits, to remove such State CAMR conditions.

- ii. Continuous Emissions Monitoring Systems (“CEMS”) deadlines – Utilities proposing to install CEMS as specified in the Appendices of this MOA shall:
  - a. Complete installation of one half of total proposed CEMS (SCANA: two monitors, Santee Cooper: two monitors, Progress Energy: one monitor) and have signed contracts for installation of remainder by January 1, 2009, except for approved unit-specific alternative dates contained herein.
  - b. Complete certification of CEMS and testing by June 1, 2009, except for approved unit-specific alternative dates contained herein.
- iii. Alternate Monitoring Provisions – This MOA will provide for units, as approved by DHEC, to report mercury emissions using an emission factor and Part 75 heat input methodology derived from the vacated Federal CAMR provisions for low mass emitters. The Utilities shall submit all testing and monitoring protocols for approval in accordance with DHEC regulations. Alternative methods, such as determining estimated emissions for certain units based on representative data from monitoring and/or testing on similar [sister] units, may be implemented upon written approval by DHEC.
- iv. Mercury Emissions Budget – The annual mercury emissions budget for South Carolina’s coal-fired electric utility boilers is not feasible in the absence of a national mercury emissions budget program. As such DHEC believes this requirement is no longer enforceable. With the execution of this MOA the Utilities are no longer required to hold mercury allowances in accordance with the State CAMR. Execution of this MOA does not affect prospective or future federal or state regulations and/or requirements which may be enacted at a later date implementing new mercury limits. Compliance with such limits would be addressed at that time.

b. Compliance Action.

Upon the execution of this MOA, DHEC agrees that it deems compliance with this MOA to be sufficient compliance with all aspects of the existing State CAMR by the participating Utilities under the

S.C. Pollution Control Act or any other federal or state provision for alleged violation(s) of the State CAMR.

DHEC has advised EPA, Region 4 of this MOA and EPA has been informed that DHEC will take action to remove the State CAMR language from Utilities' existing Title V permits following receipt of written requests from Utilities.

## II. UTILITY-SPECIFIC TESTING AND MONITORING PLANS.

Utility-specific plans for monitoring and testing at each of the coal-fired generating facilities within South Carolina are outlined in Appendices A-D, within this MOA.

- a. Utilities reserve the right to re-evaluate their respective monitoring plans periodically and following DHEC's written approval may modify such plans. Department approved modifications to such respective monitoring plans shall be incorporated and fully implemented by the utilities as part of this original MOA.
- b. The monitoring deadlines for certification of CEMS and testing are extended from January 1, 2009. Testing and monitoring implementation shall be completed as expeditiously as possible, but no later than June 1, 2009, as noted in Section I.a.ii above and the respective utility-specific Appendices.

## III. MONITORING TEST PLANS AND PROTOCOLS.

Each Utility shall submit test plans and protocols related to the monitoring plans to DHEC for approval on a Utility-specific case-by-case basis. This shall include, but is not limited to, the quality assurance/quality control (QA/QC) protocols, data reporting protocols, stack testing and fuel testing plans, and CEMS installation and certification plans. Applicable references to Parts 75 and 60 and EPA protocols, as they become available, shall be made with exceptions noted within specific plans, including, but not limited to the following exceptions:

- a. Data Substitution. Specifically, substituted and biased data following the Part 75 process will not be required to be submitted to DHEC for the mercury CEMS. The applicable Part 60 New Source Performance Standards ("NSPS") substitution procedures will be followed to determine the representative mercury concentrations in the event of poor mercury CEMS performance. (Utilities may elect to use Part 75 flow monitoring data if the current Part 75 systems are providing data deemed appropriately reliable by DHEC);
- b. National Institute for Standards and Technology ("NIST") traceability conditions;
- c. Unit correlation data with CEMS on a quarterly average basis along with other CEMS reporting; and

- d. Units that propose to use monitoring data from a similar [sister] unit to determine their emissions shall initially test to determine if the use of monitoring data from that similar [sister] unit is in fact representative of that unit's emissions. A correlation factor will be developed for these units by comparing the tested emission rates with the predicted emission rate. If this correlation factor varies by  $< 20\%$  or  $\pm 1.0$  micrograms per Dry Standard Cubic Meter (" $\mu\text{g}/\text{dscm}$ "), then the data will be deemed representative as is and will not require any adjustment. If the correlation factor does not meet the above requirements, then the data will be adjusted by multiplying the data by the correlation factor. The testing and correlation factor development will be repeated on these units annually.

#### IV. MERCURY STUDY.

The Utilities shall participate in and provide material support to a DHEC led mercury study, similar to that previously promulgated in S.C. Regulation 61-62, Subpart HHHH, Section 60.4140 (c) (6) & (7), to develop an assessment of the contribution to mercury deposition related to coal-fired power plants located in South Carolina in relation to the contribution from other sources both within and external to the state. Material support and participation by the Utilities may include, but is not limited to data submission, access to sites, equipment, funding, and participation in workgroups.

#### V. OTHER MATERIAL TERMS.

The Parties agree that this MOA constitutes an enforceable agreement between the Parties only and is not intended and does not create any independent or separate rights for any third parties.

Except as may be provided herein to the contrary, nothing herein shall waive the powers which the Utilities or DHEC have under existing law.

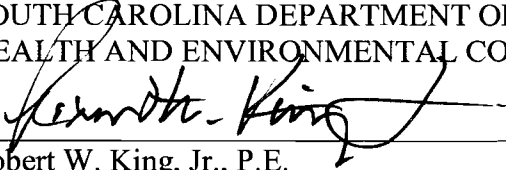
If any provisions of this MOA are found to be unenforceable or beyond the statutory authority of DHEC, upon challenge by a third party, the remainder of the MOA is voidable, unless all parties agree in writing to modification of the MOA. However, if any portion of the MOA is determined to be unenforceable or beyond DHEC's statutory authority, as a result of a challenge by a Party to this Agreement, then the additional portions of the MOA will remain in effect.

No clarification, modification, change, amendment, termination or waiver of any provision pursuant to this MOA shall be binding upon a party to this MOA except in writing signed by each of the signatories hereto or their authorized representatives.


The terms of this MOA will continue until modified as noted above or by the prospective or future enactment of applicable state or federal regulations.

IN WITNESS WHEREOF the Parties have caused their authorized representatives to execute this Memorandum of Agreement and set their hands as of the date first set forth above.

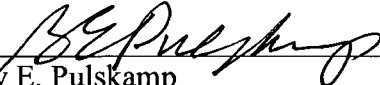
SOUTH CAROLINA DEPARTMENT OF  
HEALTH AND ENVIRONMENTAL CONTROL

  
\_\_\_\_\_  
Robert W. King, Jr., P.E.  
Deputy Commissioner


SCANA SERVICES INC.

  
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Kevin B. Marsh  
Senior Vice President – SCANA Services Inc.

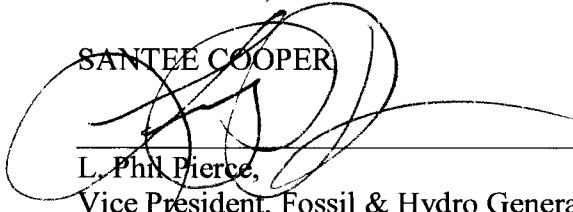
DUKE ENERGY CAROLINAS LLC

  
\_\_\_\_\_  
Barry E. Pulskamp  
Senior Vice President, Regulated Fleet Operations

CAROLINA POWER AND LIGHT COMPANY  
D/B/A PROGRESS ENERGY CAROLINAS, INC.

  
\_\_\_\_\_  
Charles M. Gates  
Vice President, Power Generation

SANTEE COOPER

  
\_\_\_\_\_  
L. Phil Pierce,  
Vice President, Fossil & Hydro Generation

- Appendix A – SCANA Monitoring Plan
- Appendix B – Duke Energy Monitoring Plan
- Appendix C – Progress Energy Monitoring Plan
- Appendix D – Santee Cooper Monitoring Plan

## **Appendix A – SCANA Monitoring Proposal**

### **Mercury Monitoring Plan Proposal:**

SCANA, on behalf of its subsidiaries and affiliates, proposes the following plan to monitor for mercury (“Hg”) at its coal fired plants;

#### **McMeekin Site:**

Units 1 & 2 are Combustion Engineering Control Circulation pulverized coal tangentially fired boilers rated for 125 MW. Units 1 & 2 each have an ASEA Brown Boveri Environmental System. The design is a Flakt Fabric Filter Reverse Gas Baghouse System, with ABB C-E Low NOX Concentric & Overfired Air Burner Systems. These units are essentially identical in their construction and operation.

SCANA proposes to monitor Unit 1 with a Thermo-Electric Hg monitoring system and correlate via Heat Input (HI) or MW from the existing Continuous Emissions Monitoring System (CEMS) to account for the Hg emitted from unit 2.

#### **Canadys Site:**

Units 1 & 2 have Combustion Engineering pulverized coal tangentially fired boilers rated for 136 MW. Units 1 & 2 have Research-Cottrell ESP and Low NOX burners. These units operate similarly with Unit 2 having a slightly larger ESP.

SCANA proposes to monitor Unit 1 with a Thermo-Electric Hg monitoring system and correlate (with simple ratio) via Heat Input (HI) or MW from the existing Continuous Emissions Monitoring System (CEMS) to account for the Hg emitted from unit 2.

Unit 3 is a Foster Wheeler Corporation pulverized coal, opposed fired sub critical, reheat steam generator rated for 220MW. Unit 3 has Research-Cottrell, reverse air fabric filter, bag house with low NOX burners.

SCANA proposes to monitor Canadys Unit 3 annually.

#### **Cope Site:**

Cope Unit 1 is an ABB/CE single furnace tangential fired boiler with a turbine rated for 417.3 MW. Unit 1 Utilizes ABB/CE Low NOX Burners which use over fire air to reduce NOX production; Flue Gas Desulfurization accomplished by a dry scrubber containing 2 reactors, each having three atomizers that spray a lime slurry to reduce SO<sub>2</sub>; and a 12 compartment Bag House which removes particulate. A SCR is scheduled to begin operation January 2009.

SCANA proposes to monitor Unit 1 with a Thermo-Electric Hg monitoring system.

Urquhart Site:

Unit 3 is a tangential fired Combustion Engineering boiler with a turbine rated at 110 MW. Unit 3 has Research-Cottrell electrostatic precipitators and Babcox and Wilcox DRB-XCL Low NOX burners.

SCANA proposes to monitor Unit 3 with a Thermo-Electric Hg monitoring system.

Williams Site:

Williams Unit 1 is a Combustion Engineering pulverized coal tangentially fired boiler rated for 665 MW. Unit 1 utilizes a Research-Cottrell ESP which has 24 electrical fields, Alstom low NOX burners, and A SCR utilizing stationary catalytic bed and ammonia reagent is employed to reduce NOX. A wet FGD is scheduled to be in operation in late 2009 early 2010.

SCANA proposes to monitor Unit 1 with a Thermo-Electric Hg monitoring system on the new stack when the scrubber comes online. Prior to the scrubber coming on line SCANA will perform a three run Hg test in 2008 and again in 2009 to determine the pre-scrubber Hg concentrations.

Wateree Site:

Unit 1&2 are opposed fired Riley boilers with a turbines rated at 372 MW. Units 1&2 each have a Baghouse with 12 compartment baghouse (576 bags /compartment) with reverse jet cleaning cycle to control particulate. Units 1&2 each have a SCR utilizing stationary catalytic bed and ammonia reagent. Units 1&2 each have Babcox and Wilcox DRB-XCL Low NOX burners. A shared wet FGD is scheduled to be installed early 2009 and be in operation in late 2009, combined flue gas will exit the scrubber to a new common stack. The existing stacks will be used when the scrubber is in bypass, which will be used infrequently.

SCANA proposes to monitor Units 1&2 with a Thermo-Electric Hg monitoring system on the new combined stack when the scrubber comes online. Prior to the scrubber coming on line SCANA will perform a three run Hg test on each unit in 2008 and again in 2009 to determine the pre-scrubber Hg concentrations.

NOTE:

After monitoring units with Hg monitors for some time SCANA reserves the right to, with DHEC approval, classify units that meet the requirements as Low Emitters, and adjust the type of monitoring on these units.

## **Appendix B – Duke Energy Monitoring Proposal**

### **Mercury Emissions Monitoring Plan for Lee Steam Station Proposed Voluntary Agreement between Duke Energy Carolinas LLC and DHEC**

#### **Purpose and Intent:**

This agreement is proposed in order to provide reliable and accurate mercury emissions data to DHEC for Lee Steam Station Units 1-3 in lieu of Continuous Mercury Monitoring (CMM) on all stacks. Duke Energy intends to provide such data through a testing protocol that will be used together with heat input data from Part 75 CEMS to give an accurate representation of total mercury emissions. The monitoring proposal in Appendix B of this agreement will remain in effect until such time as DHEC determines it has adequate data to represent emissions from Lee Station, or until Duke Energy successfully petitions DHEC to modify or terminate the monitoring proposal portion of this agreement, or until any new federal or state regulations are adopted which require alternate monitoring provisions for mercury.

#### **Description of Units:**

Lee Steam Station:

- Units 1&2 (identical): 100 MW each, pulverized bituminous coal with low NOx combustion controls and hot side electrostatic precipitators.
- Unit 3: 175 MW pulverized bituminous coal with low NOx combustion controls and hot side electrostatic precipitators.

#### **Basis for Test Plan:**

The trace amount of mercury that is naturally present in coal will be released into the combustion gas when coal is burned in a boiler. Some of the mercury released from coal combustion may be captured in the electrostatic precipitators installed on each of the units. At the high temperature in a hot side precipitator, mercury removal is expected to be relatively small, on the order of zero to 20% removal.

Because of these mechanisms for mercury release and limited capture in the available control systems, mercury emissions from the Lee Station coal-fired boilers can be accurately represented through periodic stack testing. Stack testing will provide a representative emissions factor (mercury concentration, in  $\mu\text{g}/\text{scm}$ ) that will be used with flow data measured by the existing Part 75 CEMS to calculate total emissions for each unit.

Concurrent with the stack test, the as-fired coal to each unit will be sampled and analyzed using ASTM procedures. Duke Energy will also provide DHEC an annual aggregate mercury concentration for coal received to document variations in fuel supply.

Testing protocols and procedures for calculation of emissions will follow the methodology established for determining emissions for Low Mass Emitter units under 40 CFR 75 Subpart I provisions. Exceptions include:

- The method is not restricted to units with emissions less than or equal to 464 ounces per year.
- The actual average tested mercury concentration will be used to determine emissions rather than using the maximum value from any test run or the default minimum concentration of 0.50 µg/scm.
- A single average mercury concentration will be used for each unit rather than an average value for each of the two stacks.

### **Monitoring Plan For Lee Units 1, 2 & 3**

#### **Periodic Stack Sampling:**

Each unit will be tested on an annual basis using Method 30B (sorbent trap method) to determine mercury concentration and total mercury emissions. The test will consist of at least three runs. For each run, an as-burned coal sample will be obtained and analyzed using ASTM procedures to determine mercury concentration and heat content. Test data will be used to provide the following values:

- Boiler Hg Emissions Concentration:      µg/scm (average for two stacks per unit)
- Boiler Hg Emissions Rate:                lb/TBtu (average for two stacks per unit)
- Tested Coal Hg Concentration:           lb/TBtu

#### **Reporting Mercury Mass Emissions:**

The Boiler Hg Emissions Concentration shall be applied to the hourly flow data determined from the installed Part 75 CEMS to calculate mercury mass emissions, following the procedures in 40 CFR 75 Subpart I and Appendix F. Duke Energy will provide to DHEC on an annual basis a summary showing the total mercury emissions on a daily, monthly and annual basis. Reports will be submitted within 90 days of the end of the reporting periods.

In addition, Duke Energy will submit all test protocols and test reports to DHEC for approval in accordance with DHEC regulations.

## **Appendix C – Progress Energy Monitoring Proposal**

### **Mercury Monitoring Plan Proposal:**

Carolina Power & Light d/b/a Progress Energy Carolinas, Inc. (“PEC”) proposes the following plan to monitor for mercury (“Hg”) at its coal-fired Unit 1 at the Robinson Plant.

### **Robinson Unit 1**

Unit 1 is a Combustion Engineering pulverized coal tangentially fired twin-furnace unit with 188 MW gross nominal capacity. Emission controls on Unit 1 include a rotating over fire air (“ROFA”) system and a Buell ESP.

PEC proposes to monitor Unit 1 with a Thermo-Electric Hg monitoring system.

## **Appendix D – Santee Cooper (“SC PSA”) Monitoring Proposal**

### **Mercury Monitoring Plan Proposal:**

Santee Cooper (“SC PSA”) proposes the following plan to monitor for mercury (“Hg”) at its coal fired plants.

#### **Grainger Station:**

Units 1 & 2 are Riley Stoker pulverized coal wall fired boilers each rated for 85 MW. Unit 1 has an American Standard electrostatic precipitator (“ESP”); Unit 2 has a PC Walter ESP. Both units utilize low NO<sub>x</sub> burners. These units are essentially identical in their construction and are dispatched as a single unit.

Santee Cooper proposes to monitor one of the units with a mercury emissions monitoring system and correlate via Heat Input (“HI”) or MW from the existing continuous emissions monitoring system (“CEMS”) to account for the Hg emitted from the other unit.

#### **Jefferies Station:**

Units 3 & 4 are Riley Stoker pulverized coal wall fired boilers each rated for 153 MW. Units 3 & 4 each have dual Buell/CEW ESPs and low NO<sub>x</sub> burners. These units operate similarly.

Santee Cooper proposes to monitor one of the Units with a mercury emissions monitoring system and correlate via HI or MW from the existing CEMS to account for the Hg emitted from other unit.

#### **Cross Station:**

Unit 1 is a Foster Wheeler pulverized coal opposed wall fired boiler rated for 620 MW. Unit 2 is a Combustion Engineering/Alstom pulverized coal tangentially fired boiler rated for 540 MW. Unit 3 is an Alstom pulverized coal tangentially fired boiler rated for 580 MW. Unit 4 is currently being constructed; it is also an Alstom pulverized coal tangentially fired boiler that should be rated for 580 MW.

Unit 1 utilizes low NO<sub>x</sub> burners, over fire air, and a Babcock Power SCR system to reduce NO<sub>x</sub> production; a GE wet limestone scrubber utilizing forced oxidation to produce calcium sulfate (gypsum) from SO<sub>2</sub>; and an ABB electrostatic precipitator to remove particulate.

Unit 2 utilizes low NO<sub>x</sub> burners, over fire air, and a Babcock Power SCR system to reduce NO<sub>x</sub> production; a Peabody wet limestone scrubber utilizing forced oxidation to produce calcium sulfate (gypsum) from SO<sub>2</sub>; and a Research Cottrell electrostatic precipitator to remove particulate.

Unit 3 and 4 utilize low NO<sub>x</sub> burners, over fire air, and an Alstom SCR system to reduce NO<sub>x</sub> production; a Babcock Power wet limestone scrubber utilizing forced oxidation to produce calcium sulfate (gypsum) from SO<sub>2</sub>; and a Wheelabrator electrostatic precipitator to remove particulate.

Santee Cooper proposes to maintain continuous mercury emissions monitors on Units 1 and 2. Units 3 and 4 are required via a PSD/MACT permit to annually test for mercury. Santee Cooper proposes to maintain the current monitoring on these units.

Winyah Station:

Unit 1 is a Riley Stoker pulverized coal wall fired boiler rated for 295 MW. Units 2, 3 & 4 are Riley Stoker pulverized coal wall fired turbo boilers rated for 295, 295 and 270 MW, respectively.

Unit 1 utilizes low NO<sub>x</sub> burners, over fire air, and a Babcock Power SCR system to reduce NO<sub>x</sub> production; a Babcock Power wet limestone scrubber utilizing forced oxidation to produce calcium sulfate (gypsum) from SO<sub>2</sub>; and a Research Cottrell electrostatic precipitator to remove particulate.

Unit 2 utilizes low NO<sub>x</sub> burners, over fire air, and a Babcock Power SCR system to reduce NO<sub>x</sub> production; a Babcock Power wet limestone scrubber utilizing forced oxidation to produce calcium sulfate (gypsum) from SO<sub>2</sub>; and a Research Cottrell electrostatic precipitator to remove particulate.

Unit 3 utilizes low NO<sub>x</sub> burners, over fire air, and a Babcock Power SCR system to reduce NO<sub>x</sub> production; a Babcock & Wilcox wet limestone scrubber utilizing forced oxidation to produce calcium sulfate (gypsum) from SO<sub>2</sub>; and a Research Cottrell electrostatic precipitator to remove particulate.

Unit 4 utilizes low NO<sub>x</sub> burners, over fire air, and a Babcock Power SCR system to reduce NO<sub>x</sub> production; an American Air Filter wet limestone scrubber utilizing forced oxidation to produce calcium sulfate (gypsum) from SO<sub>2</sub>; and a Research Cottrell electrostatic precipitator to remove particulate.

Santee Cooper proposes to monitor one of the turbo units with a mercury emissions monitoring system and correlate via HI or MW from the existing CEMS to account for the Hg emitted from the other units. Santee Cooper proposes to annually test Unit 1 since the boiler design is different from the other three units.

NOTE:

For units other than the Cross units subject to a PSD/MACT permit requiring Hg testing, after monitoring units with Hg monitors for two years, Santee Cooper will reserve the right to classify units that meet the requirements as low emitters, and with DHEC approval adjust the type of monitoring on these units.