FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
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JONATHAN P. STEVERSON
SECRETARY

March 12, 2015

Sent by Electronic Mail – Received Receipt Requested

brian.powers@duke-energy.com
Mr. Brian V. Powers, Station Manager
Crystal River Units 4 and 5 & Fuel Operations
Duke Energy Florida, Inc.
299 First Avenue, North
St. Petersburg, Florida 33701

Re: Crystal River Units 4 and 5
MATS Compliance Extension Request

Dear Mr. Powers:

On December 15, 2014, and thereafter, we received your request, Title V application, and response to our request for additional information (RAI) [1] for a one-year extension of the Mercury and Air Toxics Standards (MATS)[2] compliance deadline. This requested extension is for the coal-fueled Units 4 and 5 at the Crystal River Energy Complex (CREC) until April 16, 2016. The extension request is limited to the MATS mercury-related requirements, including monitoring, reporting, recordkeeping and work practices. As explained below, the request meets the criteria for obtaining an extension. The extension will be incorporated into the facility's Title V operating permit with appropriate conditions and milestones.

The Clean Air Act and implementing federal regulations provide that an owner or operator of an existing source who is unable to comply with a relevant standard may request that the state Title V permitting authority grant an extension allowing the source up to one additional year to comply with the standard, if such additional period is necessary for the installation of controls.[3] EPA recognized in the preamble to the final MATS rule the need and likelihood of such extensions, stating that the "… *fourth year should be broadly available to enable a facility owner to install controls within 4 years if the 3-year time frame is inadequate for completing the installation."*[4]

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1 Title V permit application received January 13, 2015 and attached original MATS extension request received December 15, 2014 available at the following link Letter Request and Title V Application. Duke Energy Florida response dated 01/30/2015 available at http://arm-permit2k.dep.state.fl.us/psd/0170004/U0002397.pdf.

2 40 Code of Federal Regulations, Part 63, Subpart UUUUU - National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units. Link to 40 CFR 63, Subpart UUUUU

3 Section 112(i)(3) of the Clean Air Act; 40 CFR 63.6(i); 40 CFR 63.6(i)(4)(i)(A).

4 See pp. 9407-9411 of the MATS Preamble.

While the additional mercury control equipment is necessary, key control devices to comply with the MATS are actually in place for CREC Units 4 and 5. The two units were equipped with efficient electrostatic precipitators (ESPs) when constructed. These are used to control particulate matter (PM) as the surrogate for non-mercury metallic hazardous air pollutants (metal HAP). They also remove as much as half of the mercury (Hg) as particulate-Hg. Duke Energy Florida (DEF) completed the installation of continuous emission monitoring systems (PM-CEMS) to demonstrate PM compliance on a 30 operating day basis.

Selective catalytic reduction (SCR) systems and wet scrubbers were installed on CREC Units 4 and 5 in 2009-2010. In addition to nitrogen oxides (NO_X) control, the SCR systems oxidize elemental Hg to readily collectable Hg compounds. In addition to sulfur dioxide (SO_2) control, the wet scrubbers remove hydrogen chloride (HCl) and the Hg compounds. The cost of the project was over $1.0 billion.[5]

After installation of the SCR and wet scrubbers, emissions of NO_X and SO_2 from Units 4 and 5 (combined) were reduced by approximately 90 percent (%) compared with emissions in 2007 and by approximately 95% compared with emissions in 2000. Please refer to **Figure 1**.

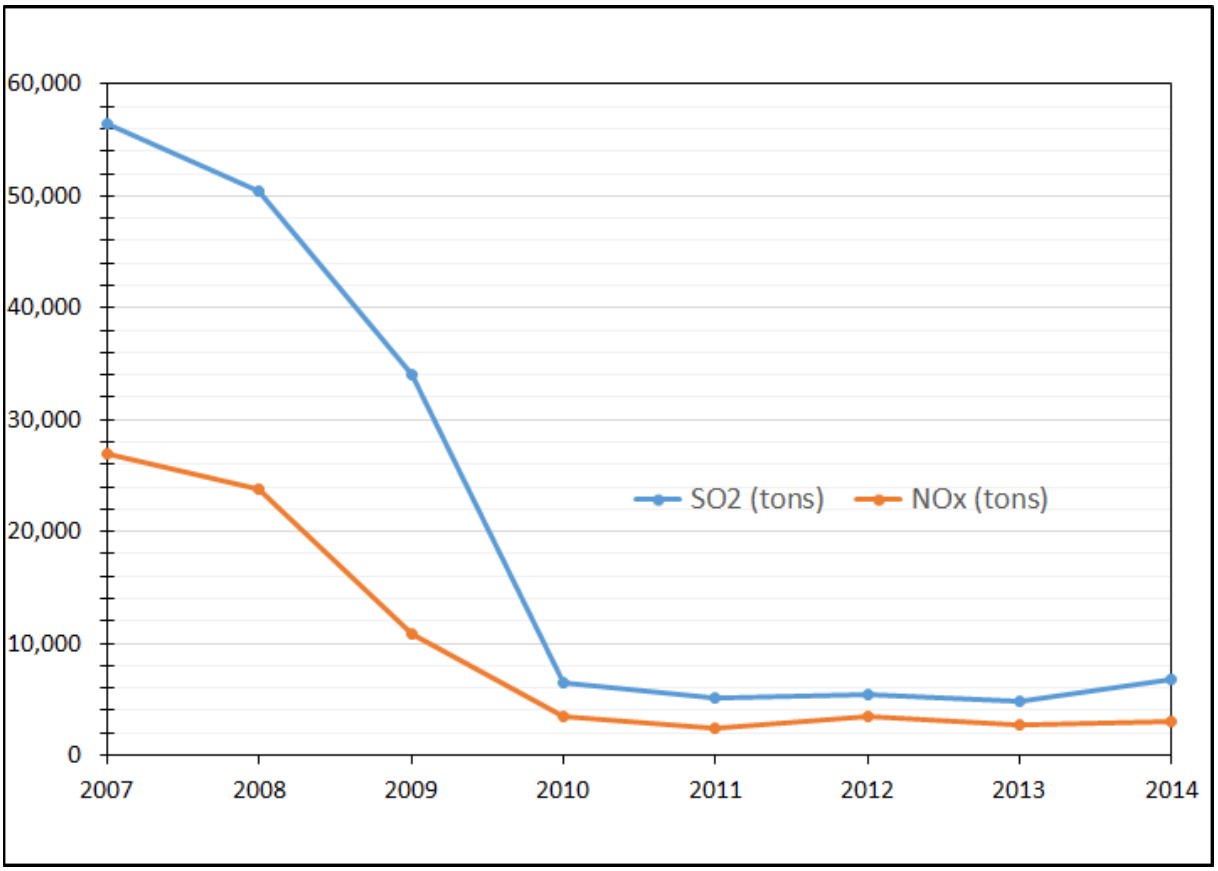

Figure 1. Sulfur Dioxide (SO_2) and Nitrogen Oxides (NO_X) Emissions from Crystal River 4 and 5.

In 2010, a Department contractor conducted Hg emissions stack tests on CREC Unit 5. Hg emissions from Unit 5 were approximately 0.37 pounds of Hg per trillion Btu heat input (lb Hg/TBtu).

[5] Review of Integrated Clean Air Compliance Plan submitted to the Florida PSC. April 1, 2010. Available at: http://www.psc.state.fl.us/library/FILINGS/10/02418-10/02418-10.pdf

Comparisons with similar units without SCR and wet scrubbers suggest that these systems provide 90% control of Hg (beyond the control of particulate Hg by the ESPs).

DEF has measured Hg emissions from CREC Units 4 and 5 since June 2012 using sorbent trap monitoring systems in anticipation of the MATS compliance date of April 16, 2015. Until mid-2014, the results of the sorbent trap monitoring indicated Hg emissions consistently less than the anticipated MATS standard of 1.2 lb/TBtu. Please refer **to Figure 2.**

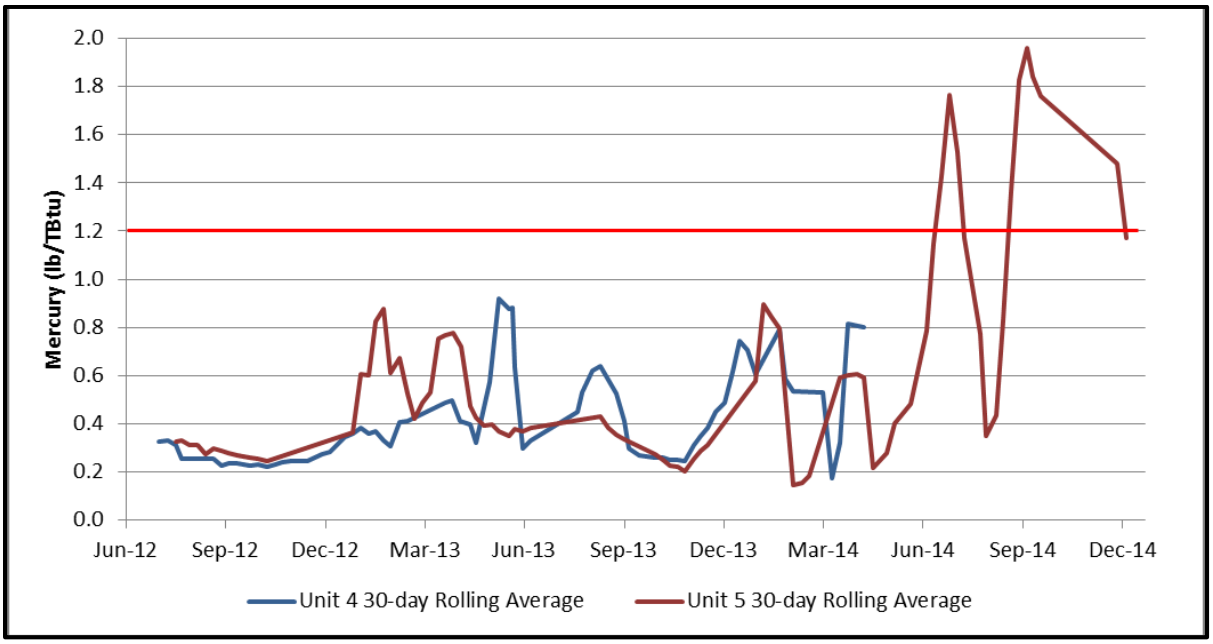

Figure 2. Hg Emissions from CR Units 4 and 5 Measured with Sorbent Traps.

Since mid-2014, there has been an unanticipated increase in Hg emissions that requires additional Hg control measures. Duke Energy Florida believes this increase is caused by the re-emission of Hg after it is converted from elemental Hg to Hg compounds by the SCR catalyst and then captured by the wet scrubbers. To reduce these emissions, DEF installed a temporary chemical additive system to reduce re-emission of Hg from the wet scrubbers. DEF will obtain test data to confirm the efficacy of the technology for application on CREC Units 4 and 5 to design a permanent system.

The permanent system will be integrated with a new continuous emissions monitoring system for Hg (Hg-CEMS) that will provide real-time data for efficient control of the additive injection rate. The Hg-CEMS will be certified for future compliance demonstrations in lieu of the existing sorbent trap technology.

Based on DEF's extension request, the following represents the schedule for completing the envisioned permanent chemical additive system.

Table 1. Listing of Milestones for DEF CREC Hg Re-emission Control Projects.

Key Milestones	Target Completion
Install temporary Hg Re-emission Control System	December 2014
Submit Hg Characterization Analysis and Report	April 2015
Complete Operational Testing and Analysis from Hg Re-emission Control Trial	June 2015
Certify New Hg-CEMS	October 2015
Complete Commissioning of Hg Re-emission Control System	March 2016
Achieve Final Compliance with the MATS Rule	April 16, 2016

Given the above, DEF's request meets the requirements for obtaining an extension. The Department will incorporate the extension for compliance with the Hg provisions of the MATS into the CREC Title V air operation permit. The permit will include the appropriate permit conditions to ensure compliance with the parts of the MATS that remain in effect, terms of the extension, monthly reports and a requirement to minimize Hg emissions during the extension. See Attachment A for the permit conditions. Specifically, the extension requires DEF to comply with an interim Hg standard of 1.2 lb/TBtu based on a single year block (from April 16, 2015 to April 16, 2016). This ensures that overall Hg emissions for this period will be minimized.

If you have any questions regarding this request, please contact me at 850-717-9083.

Sincerely,

David L. Read, P.E.
2015.03.12 09:18:03
-04'00'

for: Jeffery F. Koerner, Program Administrator
Office of Permitting and Compliance
Division of Air Resource Management

cc: Michael Ballenger, P.E., Trinity Consultants: mballenger@trinityconsultants.com
John (Jamie) Hunter, DEF: john.hunter@duke-energy.com
Diana Csank, Sierra Club: Diana.csank@sierraclub.org
Alisa Coe, Earth Justice: alisa.coe@earthjustice.org

ATTACHMENT A
Conditions for Draft Title V Air Operation Permit

1. Limited MATS Compliance Extension for Mercury: For Units 4 and 5, from April 16, 2015, to April 15, 2016, compliance with the mercury MATS emissions standard of 1.2 lb/TBtu in 40 CFR 63, Subpart UUUUU, Table 2, shall be demonstrated as a one-year block average, rather than as a 30-day, or 90-day, average. For mercury, the MATS compliance date given in 40 CFR 63.9984(b), and referenced in subsequent sections of Subpart UUUUU, is extended to April 16, 2016. For all other MATS-related requirements for Units 4 and 5, the compliance date remains April 16, 2015. [40 CFR 63.6(i); and Rule 62-204.800(11)(d)1, F.A.C.]

2. Compliance Milestones and Reporting: The permittee shall complete the steps necessary for full MATS compliance by the extended MATS mercury compliance date of April 16, 2016. The permittee shall meet the following schedule for completing these steps, unless the permittee notifies the Department in advance:

Key Milestones	Target Completion
Submit Hg Characterization Analysis and Report	April 2015
Complete Operational Testing and Analysis from Hg Re-emission Control Trial	June 2015
Certify New Hg-CEMS	October 2015
Complete Commissioning of Hg Re-emission Control System	March 2016
MATS Compliance Date for Mercury	April 16, 2016

   By the 15th day of each month, the permittee shall provide a written status report for the previous month on the mercury control and measurement upgrades and an updated schedule, if necessary, to the Division and Compliance Authority. The first report is due by April 15, 2015. The permittee shall provide advance notice to the Division and Compliance Authority if it is unable to meet a target in the above schedule and shall identify a new completion date. Each report shall also include a calculation of total cumulative mercury emissions, measured by sorbent trap or CEMS, in units of lb/TBtu, from April 16, 2015, through the end of the time period covered in the report. [40 CFR 63.6(i)(10) and (11), Rule 62-204.800(11)(d)1., F.A.C., and Rule 62-4.070, F.A.C.]

3. Monitoring: The permittee shall properly install all CEMS and CMS and certify that these systems are fully functional prior to April 16, 2015, as specified in the MATS rule and that the data will be available in the manner described in the MATS rule. A sorbent trap CMS for mercury shall be used until the completion of certification of the mercury CEMS. [40 CFR 63.6(i)(10), Subpart UUUUU in 40 CFR 63, and Rule 62-4.070, F.A.C.]

4. MATS Data Reporting: Within 30 days following each quarter of operation during the one-year extension period, the permittee shall report MATS compliance data to the Department. [40 CFR 63.6(i)(10) and (11), Rule 62-204.800(11)(d)1., F.A.C., and Rule 62-4.070, F.A.C.]

5. Full MATS Compliance: By April 16, 2016, all units shall be in full compliance with the MATS rule. [40 CFR 63.6(i)(10) and Subpart UUUUU in 40 CFR 63]