Brian V. Powers
Station Manager, Crystal River Units 4&5
& Fuel Operations

December 15, 2014

Ms. Paula Cobb, Director
Division of Air Resource Management
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

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

Dear Ms. Cobb:

Duke Energy Florida, Inc. (DEF) is a regulated electric utility operating in Florida that serves approximately 1.7 million homes, businesses and industries. DEF has four units at its Crystal River Energy Complex that are subject to EPA's Mercury and Air Toxics Standards (MATS) rule. Based on recent monitoring and testing as described herein, DEF has determined that additional control projects are required for Units 4 and 5.

The final MATS rule was published on February 16, 2012, and it became effective on April 16, 2012. The rule establishes stringent limits for emissions of mercury and other metals and acid gases from coal- and oil-fired electric utility boilers. The MATS rule and Section 112 of the Clean Air Act (CAA) specify a three-year compliance time period or until April 16, 2015. The MATS rule and Section 112(i)(3)(B) of the CAA allow sources to request a one-year extension from the CAA Title V permitting authority for the installation of emission controls.

DEF has developed the attached description of the issue and schedules for installing and implementing additional emission control systems for Units 4 and 5. Because of the recent increases in mercury emissions and the lead time needed for design, installation, and operational tuning, these systems cannot be installed and made operational by April 16, 2015. Therefore, in accordance with the attached schedule and as provided by the final MATS rule, DEF respectfully requests that the Florida Department of Environmental Protection grant an extension of the MATS compliance requirements for Crystal River Units 4 and 5 to April 16, 2016.

Thank you for your consideration of this important request for extension of time. Please contact Mike Kennedy at (727) 820-5567, Jamie Hunter at (727) 820-5764 or me at (352) 337-6904 if you have any questions.

Sincerely,

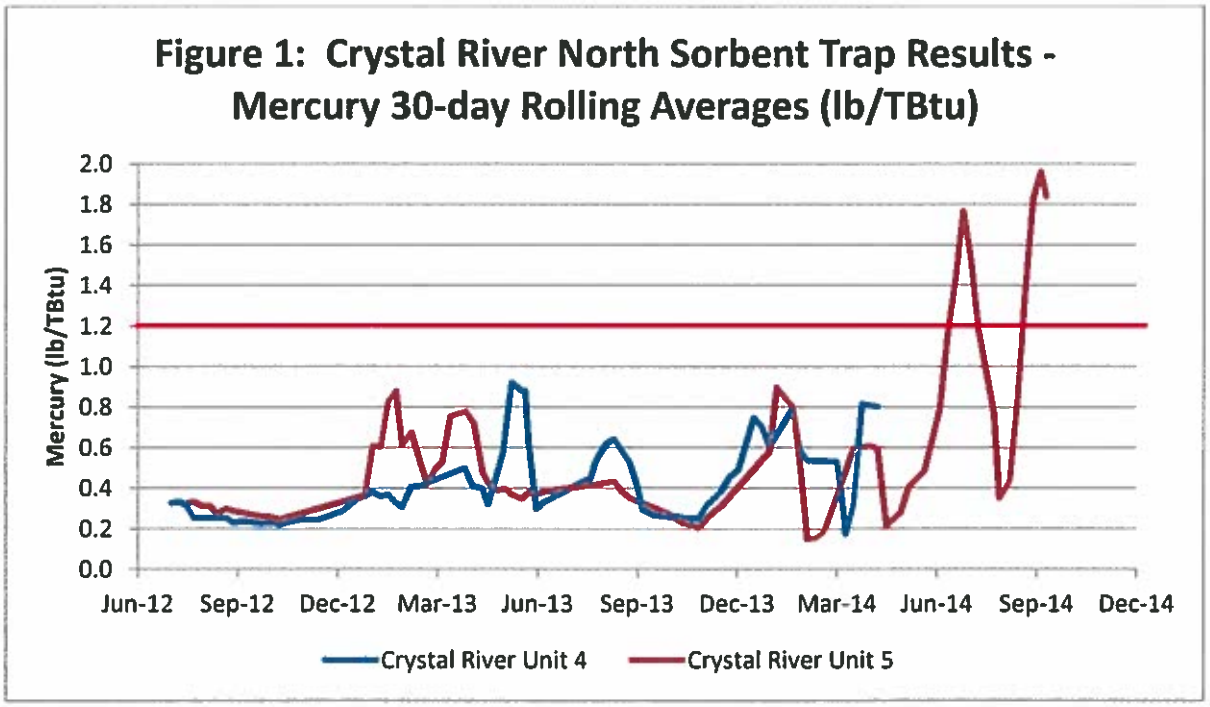
Brian V. Powers
Station Manager, Crystal River Units 4&5
& Fuel Operations

Attachment

Duke Energy Florida
Crystal River North Plan for MATS Compliance

Description of Issue

DEF has measured the mercury emissions from Crystal River Units 4 and 5 (CR4&5) since June 2012 using sorbent trap monitoring systems. Samples are collected and analyzed on a weekly basis. Between June 2012 and June 2014, the 30-day rolling average results measured between approximately 0.2 and 0.8 lb/TBtu. Since July of this year, Unit 5 has shown elevated 30-day rolling averages approaching 2.0 lb/TBtu (see Figure 1 below). DEF believes that Unit 4 may have a similar problem; however, the sorbent trap monitoring system for Unit 4 suffered damage from a lightning strike and was out of service during this time. The system has since been repaired and is back in operation.



The recent and unanticipated increases in mercury emissions have triggered intensive, ongoing study of the potential cause(s) and solution(s) to the issue. Preliminary results suggest that a significant contribution to the increases is mercury "re-emissions" from the flue gas desulfurization (FGD) systems that have been installed on CR4&5. In combination with selective catalytic reduction (SCR), FGD systems are efficient at removing oxidized mercury. However, the causes of re-emissions are not well understood. In addition, DEF is studying whether the SCRs are not providing sufficient mercury oxidation, which would also contribute to higher mercury emissions. While preliminary results suggest that the SCRs are less likely to be the root cause, it is possible that additional control measures associated with the SCR may be needed. DEF is also investigating other potential causes.

MATS Plan Development

DEF's April 2014 MATS compliance plan update for CR4&5 included installation of continuous particulate monitors (PM CEMS), completion of work practice standards requirements, and evaluation of a potential mercury re-emission control system. The first two activities were completed by December 2014. The mercury re-emission control system was planned for implementation prior to the effective compliance date for Units 1 and 2 (April 2016), as the need for this project was originally driven by facility compliance limits for the Crystal River Energy Complex.

To further investigate and mitigate mercury re-emissions, DEF is expediting the installation of a re-emissions chemical additive system. This system is being used successfully on several other units within the Duke Energy fleet. Operating conditions and FGD chemistry vary from unit to unit. Therefore, testing specifically on CR4&5 is necessary to determine whether this chemical will be effective. Initially, DEF will install a temporary system to conduct this testing and investigate appropriate chemical injection rates. DEF expects to install the system in the February/March 2015 timeframe. In parallel, DEF must design and install a permanent system, followed by testing and tuning of the control logic. The permanent system must utilize a mercury continuous emission monitor (CEM) as an input to the control logic. The signal from this CEM will be used for determining the chemical injection rates. By contrast, the temporary injection system will rely on feedback from the existing sorbent traps, which provide mercury emissions results with a 10-14 day lag time. The mercury CEM and its associated equipment have the longest lead items for implementation.

Compliance Projects

DEF plans to install mercury re-emission control systems and mercury CEMs for CR4&5 to more reliably comply with the MATS mercury emissions requirements. Table 1 contains the projected timelines for implementing the projects. DEF will continue to monitor mercury emissions and study potential causes of the recent increases in order to determine whether there are additional measures necessary to maintain compliance. DEF will continue to refine the project scopes and schedules, and will keep DEP informed of any significant revisions.

Mercury Characterization Study: A study was developed to determine the cause(s) of elevated mercury emissions on CR4&5. Temporary continuous mercury analyzers were installed at the FGD inlet and at the stack, and sorbent traps were used to validate the results. Coal, ash, and FGD slurry samples were taken routinely for analysis. Unit 4 was studied for two weeks – before and after a planned outage – to evaluate shutdown and startup impacts. Unit 5 was studied for one week to develop baseline data and to evaluate impacts of various SCR conditions. The resulting analysis will be completed in January 2015.

Mercury Re-emission Control Systems: The mercury re-emission control systems intended for installation at CR4&5 are manufactured by Nalco for use with the MerControl 8034 Plus chemical. The system will be comprised of a single fiber reinforced plastic (FRP) chemical storage tank to serve both units. Two pump skids – one for each unit – will take suction from the storage tank. Each skid will contain two dosing pumps for normal use and one system charge pump for higher volume additions of chemical. The pumps will be controlled by a controller loaded with a Nalco proprietary control algorithm. The algorithm takes input from several unit parameters to determine the chemical injection rate. In addition to the permanent system, a temporary system will be leased from Nalco and installed in the first quarter of 2015. While this system will utilize more primitive controls, it will allow for early development of control algorithms, as well as for mitigation of re-emissions prior to implementation of the permanent system.

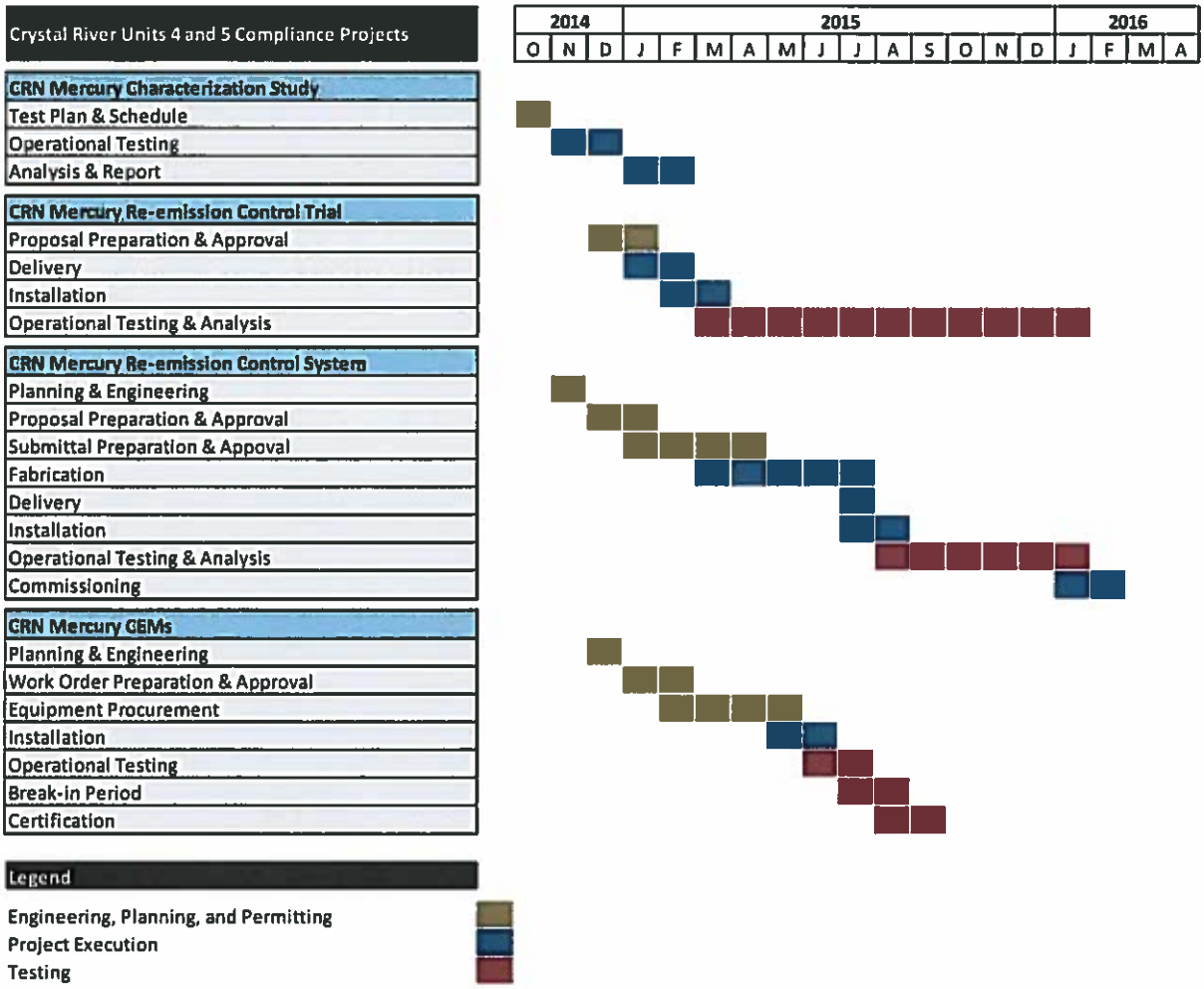
Mercury CEMs: Continuous mercury analyzers will be installed on the stacks of CR4&5 for mercury monitoring, feedback to the mercury re-emission control systems, and MATS compliance demonstration.

Project Timelines: Implementation timelines for the required projects are shown in Table 1. The engineering, project management, environmental and operations teams are now moving forward with the design, planning and permitting phases of the projects. The first four months are needed for detailed project design, planning and procurement. The majority of the project installation work will begin in May 2015. Operational testing and analysis will be performed after the projects are completed to ensure consistent and reasonably efficient mitigation of mercury re-emissions. Based on this schedule, DEF's project work and final adjustments should be completed in the first quarter of 2016.

Table 1: CRN MATS Compliance Plan – Current Projected Timelines
(Note: Current planning information – subject to change.)

Crystal River North MATS Compliance Project Schedule Overview

Initial Project Scope and Schedule (Under Review & Subject to Change) Rev 12/08/14



Please note that the schedule above does not include installation of PM CEMS and completion of work practice standards requirements, both of which were completed by December 2014.