Title V Air Operation Permit Revision
Duke Energy Florida, Inc.
Crystal River Power Plant
BART Implementation
Permit No. 0170004-043-AV

APPLICANT

The applicant for this project is Duke Energy Florida, Inc. (DEF). The applicant's responsible official and mailing address are: Mr. Robby Odom, Station Manager - Crystal River Plant and Fuel Operations, Duke Energy Florida, Inc., 299 First Avenue, North, Mail Code CN77, St. Petersburg, Florida 33701.

FACILITY DESCRIPTION

The applicant operates the existing Crystal River Power Plant, which is located in Citrus County at 15760 West Power Line Street, Crystal River, Florida.

This facility consists of: four coal-fired fossil fuel steam generating (FFSG) units with electrostatic precipitators; two natural draft cooling towers for FFSG Units 4 and 5; helper mechanical cooling towers for FFSG Units 1, 2 and nuclear Unit 3; coal, fly ash, and bottom ash handling facilities; and, relocatable diesel fired generators. FFSG Units 4 and 5 are also equipped with low-NO_X burners and selective catalytic reduction systems for the control of nitrogen oxide emissions and with flue gas desulfurization systems for the control of sulfur dioxide emissions. Nuclear Unit 3, which is not a source of air pollution, is not considered part of this permit, although certain emissions units associated with Unit 3 are included in this permit.

This facility is subject to regulation under: Acid Rain, Phase II (40 CFR 75); Clean Air Interstate Rule (Rule 62-296.470, F.A.C.); and, 40 CFR 60 Subparts A, D, Y, IIII and JJJJ, General Provisions, Standards of Performance for Fossil-Fuel-Fired Steam Generators for Which Construction Is Commenced After August 17, 1971, Standards of Performance for Coal Preparation Plants, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, and Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, respectively. The facility is also subject to the regulations of 40 CFR 63 Subparts A and ZZZZ, General Provisions and National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, respectively.

The facility operates two stationary reciprocating internal combustion engines associated with Unit 3 which are subject to regulation under 40 CFR 63, Subpart ZZZZ - National Emissions Standards For Hazardous Air Pollutants For Stationary Reciprocating Internal Combustion Engines.

The facility has three additional reciprocating internal combustion engines that are also subject to regulation under 40 CFR 63, Subpart ZZZZ and 40 CFR 60 Subpart IIII or 40 CFR 60 Subpart JJJJ. New regulated emission units (EU028, EU029 and EU030) were created for these units.

The facility operates flue gas desulfurization (FGD) systems, which include: limestone storage and handling; limestone preparation; limestone slurry injection; and, gypsum dewatering (collectively regulated as EU023, Limestone and Gypsum Material Handling Activities). The limestone preparation activities are subject to the applicable requirements in NSPS Subpart OOO of 40 CFR 60, Standards of Performance for Nonmetallic Mineral Processing Plants.

Also included in this permit are miscellaneous unregulated/insignificant emissions units and/or activities.

PROJECT DESCRIPTION

Specifically, this application serves to incorporate the conditions of air construction permit Nos. 0170004-017-AC, 0170004-036-AC and 0170004-038-AC associated with the Best Available Retrofit Technology (BART) determinations for Crystal River Units 1 and 2 (Crystal River South or CRS) into a revised Title V air operation permit. In addition, this application required the development of a revised particulate matter (PM) compliance assurance monitoring (CAM) Plan for Units 1 and 2 that reflects the revised PM emission limits and associated upgrades to the electrostatic precipitators.

This permit revision also incorporates the changes authorized by permit No. 0170004-042-AV that was recently issued. A few corrections and clarifications to that permit No. 0170004-042-AV were made as suggested by an email from the applicant dated April 3, 2014. These changes are noted in Subsection B of the permit in yellow highlight.

PROCESSING SCHEDULE AND RELATED DOCUMENTS

Application for a Title V air operation permit revision received December 31, 2013.

PRIMARY REGULATORY REQUIREMENTS

Title III: The facility is identified as a major source of hazardous air pollutants (HAP).

Title IV: The facility operates units subject to the acid rain provisions of the Clean Air Act.

Title V: The facility is a Title V major source of air pollution in accordance with Chapter 62-213, Florida Administrative Code (F.A.C.).

PSD: The facility is a Prevention of Significant Deterioration (PSD)-major source of air pollution in accordance with Rule 62-212.400, F.A.C.

NSPS: The facility operates units subject to the New Source Performance Standards (NSPS) of 40 Code of Federal Regulations (CFR) 60.

NESHAP: The facility operates units subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) of 40 CFR 63.

CAIR: The facility is subject to the Clean Air Interstate Rule (CAIR) set forth in Rule 62-296.470, F.A.C.

BART: The facility operates units subject to the Best Available Retrofit Technology requirements set forth in Rule 62-296.340, F.A.C.

SITING: Emissions units EU001, EU002, EU003 and EU004 were originally certified pursuant to the Power Plant Siting provisions of Chapter 62-17, F.A.C.

CAM: Compliance Assurance Monitoring (CAM) applies to emissions units EU001, EU002, EU003 and EU004 at the facility. CAM applies because these units have control equipment used to meet federally enforceable limits or standards.

GHG: This facility is identified as a major source of greenhouse gas pollutants.

PROJECT REVIEW

As mentioned in the project description above, the purpose of this revision is to incorporate the terms and conditions of permit Nos. 0170004-017-AC, 0170004-036-AC and 0170004-038-AC associated with the BART determinations for Crystal River Units 1 and 2 (Crystal River South or CRS) into a revised Title V air operation permit. The applicant clarified in the permit application for this project that, in accordance with a letter submitted to the Department dated April 30, 2013, DEF has selected the option contained within the above referenced air construction permits to discontinue the operation of Units 1 and 2 as coal-fired units by December 31, 2020, rather than adding new equipment designed to reduce emissions of NO_X and SO_2. Choosing this option effectively renders Scenario B of permit No. 0170004-036-AC and all of permit No. 0170004-038-AC obsolete. In addition, this application required the development of a revised Compliance Assurance Monitoring (CAM) Plan for particulate matter (PM) from Units 1 and 2 that reflects the revised PM emissions limit and associated upgrades to the electrostatic precipitators.

For ease of identification, all changes that are part of this revision are highlighted in yellow within the draft/proposed permit and this document. Changes are shown in ~~strike through~~ format for deletions and in double underline format for additions. For ease of identification, all changes that were part of the previous revision (No. 0170004-042-AV) are highlighted in blue within the draft/proposed permit and this document. Changes are shown in ~~strike through~~ format for deletions and in double underline format for additions. The affected specific conditions (i.e., new, revised and deleted) are noted below:

A.2. Cessation of Coal Combustion. Units 1 and 2 shall cease to be operated as coal-fired units by December 31, 2020. [Permit Nos. 0170004-036-AC, Specific Condition A.1. and 0170004-038-AC, Specific Condition A.2.]

~~**A.5.** Visible Emissions (VE).~~

~~a. *EU001*. The VE from FFSG Unit 1 shall not exceed 40 percent opacity, six minute average. [Rule 62-296.405(1)(a), F.A.C.; OGC Case No. 86-1576, Order dated December 11, 1986; Permit No. 0170004-003-AC]~~

~~b. *EU002*. The VE from FFSG Unit 2 shall not exceed 20 percent opacity, six minute average, except for one two-minute period per hour during which opacity shall not exceed 40 percent. [Rule 62-296.405(1)(a), F.A.C.; Permit No. 0170004-003-AC]~~

A.6. Opacity Standard – Steady-State Operations. As determined by data collected from the existing COMS or EPA Method 9, visible emissions during steady-state operations from: Unit 1 shall not exceed 30% opacity based on a 6-minute average except for one 6-minute average per hour not to exceed 35% opacity; Unit 2 shall not exceed 15% opacity based on a 6-minute average except for one 6-minute average per hour not to exceed 20% opacity. [Rule 62-296.340 (BART), F.A.C.; 0170004-017-AC, Specific Condition 5.]

~~**A.6.** VE – Soot Blowing and Load Change. Excess emissions resulting from boiler cleaning (soot blowing) and load change shall be permitted provided the duration of such excess emissions shall not exceed 3 hours in any 24 hour period and visible emissions shall not exceed Number 3 of the Ringelmann Chart (60 percent opacity), six minute average, and providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of the excess emissions shall be minimized.~~

~~a. *Load Change*. A load change occurs when the operational capacity of a unit is in the 10 percent to 100 percent capacity range, other than startup or shutdown, which exceeds 10 percent of the unit's rated capacity and which occurs at a rate of 0.5 percent per minute or more.~~

~~b. *VE > 60%*. VE above 60 percent opacity shall be allowed for not more than 4, six (6) minute periods, during the 3 hour period of excess emissions allowed by this condition, for boiler cleaning and load changes, at units which have installed and are operating continuous opacity monitors.~~

~~[Rule 62-210.700(3), F.A.C. and Permit No. 0170004-003-AC]~~

A.7. Opacity Standard – Soot-Blowing and Load Change Operations. As determined by data collected from the existing COMS or EPA Method 9, visible emissions resulting from soot-blowing and load change operations shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized. In no case shall the duration of ~~such~~ emissions from soot-blowing and/or load change operations exceed the steady-state operations limits for more than 3 hours in any 24-hour period. ~~and~~ In addition, at no time shall the visible emissions from: Unit 1 ~~shall not~~ exceed 40% opacity based on a 6-minute average; Unit 2 ~~shall not~~ exceed 25% opacity based on a 6-minute average. A load change occurs when the operational capacity of a unit is in the 10 percent to 100 percent capacity range, other than startup or shutdown, which exceeds 10 percent of the unit's rated capacity and which occurs at a rate of 0.5 percent per minute or more. [Rule 62-296.340 (BART), F.A.C.; 0170004-017-AC, Specific Condition 6.]

~~**A.7.** Particulate Matter (PM) Emissions. PM emissions shall not exceed 0.1 pound per million Btu heat input. [Rule 62-296.405(1)(b), F.A.C.; Permit No. 0170004-003-AC]~~

A.8. Particulate Matter Emissions Standard – Steady State Operations. As determined by EPA Method 5 or 17, particulate matter emissions from Units 1 and 2 combined shall not exceed 0.04 lb/MMBtu, on a weighted average basis of the total heat input. Compliance shall be demonstrated based on the average of the 3 required 1-hour test runs. [Rule 62-296.340 (BART), F.A.C.; 0170004-017-AC, Specific Condition 3.]

~~**A.8.** PM – Soot Blowing and Load Change. PM emissions shall not exceed an average of 0.3 pounds per million Btu heat input during the 3 hours in any 24 hour period of excess emissions allowed for boiler cleaning (soot blowing) and load change. [Rule 62-210.700(3), F.A.C.; Permit No. 0170004-003-AC]~~

A.9. Particulate Matter Emissions Standard – Soot Blowing and Load Change Operations. As determined by EPA Method 5 or 17, particulate matter emissions from Units 1 and 2 combined shall not exceed 0.12 lb/MMBtu, on a weighted average basis of the total heat input, not to exceed 3 hours in any 24-hour period. Compliance shall be demonstrated based on the average of the 3 required 1-hour test runs. [Rule 62-296.340 (BART), F.A.C.; 0170004-017-AC, Specific Condition 4.]

Note: Where the new specific conditions shown above have been inserted, the specific conditions following have been appropriately renumbered throughout the remainder of the subsection.

In Appendix CAM, Compliance Assurance Monitoring Requirements, the monitoring approach table for emissions units 001 and 002 has been replaced by a new table that utilizes opacity and ESP power readings as monitored parameters for identifying potential excursions using a multiple regression approach. The details of this approach are described in the document: **Attachment to SOB - Revised CAM Plan**.

In addition, Appendix H, Permit History and Table 1 – Summary of Air Pollutant Standards and Terms have been revised to reflect the changes made to the permit through this permitting action.

Changes authorized by permit No. 0170004-042-AV. As noted above, this revision incorporates the changes recently implemented in the last revision as follows:

Subsection B, Description

The specific conditions in this section apply to the following emissions units:

EU No.	Emission Unit Description
003	FFSG, Unit 5
004	FFSG, Unit 4
032	Hydrated Lime Storage and Transfer System

Emissions units 003 and 004 (Unit 5 and Unit 4, respectively) are fossil fuel-fired electric utility steam generators, each consisting of a pulverized coal, dry bottom, wall-fired boiler rated at 760 MW. Air pollution control equipment includes: low-NO_X burners; selective catalytic reduction (SCR) systems; flue gas desulfurization (FGD) systems; ~~alkali injection~~ acid mist mitigation (AMM) systems; and, an electrostatic precipitator (ESP) manufactured by Combustion Engineering. Units 4 and 5 share a common 550 foot tall chimney with separate internal stack liners with continuous emissions monitoring systems (CEMS) on each stack liner. The flue gases exhaust at 130° F with a volumetric flow rate of 2,205,195 acfm through the individual stack liners, which are 30.5 feet in diameter.

Emissions unit 032 is a hydrated lime storage and transfer system for Units 4 and 5 consisting of the following primary components for each unit: a hydrated lime storage silo, which is controlled by a dust collector fabric filter (silo vent filter), rotary valves and blowers for pneumatic delivery of the hydrated lime and hydrated lime injection lances. A delivery truck pneumatically fills the hydrated lime storage silos with hydrated lime for approximately six hours per day. Each hydrated lime silo has dedicated rotary valves and blowers for pneumatic delivery of the hydrated lime to sets of injection lances mounted in flue gas ducts at various locations along the flue gas path. The pneumatic conveyor is also controlled by the dust collectors on the hydrated lime storage silos.

{Permitting Notes: ~~These~~ ~~e~~Emissions units 003 and 004 are regulated under Acid Rain, Phase I and II and Rule 62-210.300, F.A.C., Permits Required; 40 CFR 60 Subpart D, Standards of Performance for Fossil-Fuel-Fired Steam Generators for Which Construction Is Commenced After August 17, 1971; PSD-FL-007 issued by EPA in February 1978 and, Power Plant Siting Certification PA 77-09 conditions. Fossil fuel fired steam generator Unit 4 began commercial operation in 1982. Fossil fuel fired steam generator Unit 5 began commercial operation in 1984. Emissions unit 032 is regulated under Rule 62-212.300, F.A.C., and by applicable requirements established in Permit No. 0170004-037-AC (PSD-FL-383F).}

B.2. Methods of Operation - Fuels. The fuels that are allowed to be burned in these units are:

a. Bituminous coal,

b. Bituminous coal and bituminous coal briquette mixture with the exception that No. 2 Fuel oil may be used as an igniter fuel and natural gas may be used as a startup and low load flame stabilization fuel.
c. Used oil in accordance with the specific conditions of this permit (See Subsection **J.**).
d. Blend of approximately 80% bituminous coal with 20% Powder River Basin coal (sub-bituminous coal). Coal fuel blends shall not exceed a maximum ~~sulfur content of 3.13% by weight~~ specification of 5.5 lb/MMBtu.

[Rule 62-213.410, F.A.C.; Permit Nos. 0170004-006-AC and 0170004-023-AC (PSD-FL-383C) Specific Condition 3.A.6.; PPSC PA-77-09 and modified conditions; 0170004-037-AC, Specific Condition 6.]

B.5. Emissions Control Equipment and BACT Controls.

a. *Low-NO_X Burners*. The permittee is required to operate and maintain low-NO_X burners manufactured by Babcock & Wilcox (Model No. DRB-42) or equivalent. Based on the preliminary design, each unit contains 54 burners.
b. *Selective Catalytic Reduction (SCR) Systems*. The permittee is required to operate and maintain SCR systems to reduce NO_X emissions. Each system consists of the following basic components: an ammonia injection grid, a mixing grid, SCR reactor with catalyst modules, a urea-to-ammonia processing system, associated bulk storage systems, an automated control system, piping, electrical, and other ancillary equipment. As needed, urea shall be converted into ammonia, which shall be mixed to the proper concentration. Ammonia shall be injected ahead of the SCR reactor, which is installed upstream of the air heater for each unit. The ammonia combines with NO_X in the presence of the catalyst in a reduction reaction to form nitrogen and water. Based on the preliminary design, the SCR systems are capable of a 90% reduction in NO_X emissions with a maximum ammonia slip of 2 to 5 ppmv. The system also incorporates dampers and ductwork to provide the capability of bypassing the SCR system. The bypass is most commonly used to gradually heat or cool the catalyst structure to minimize thermal fatigue during startup and shutdown.
c. *Flue Gas Desulfurization (FGD) Equipment*. The permittee is required to operate wet flue gas desulfurization (FGD) systems after the existing ESPs and induced draft fans to reduce SO_2 and other acid gas emissions. A limestone slurry shall be injected into the FGD absorbers at the design feed rate of approximately 352 gallons per minute (gpm). The slurry consists of approximately 25 to 30% solids and a specific gravity of 1.22. Based on the preliminary design, the FGD systems are capable of a 97% reduction in SO_2 emissions. In addition to the FGD absorbers, the systems consist of: limestone storage and handling; limestone preparation; limestone slurry injection; FGD blowdown; and, gypsum dewatering, transfer and storage.
d. ~~System*Alkali Injection Systems*. The permittee is required to operate and maintain alkali injection systems to reduce SAM emissions. The alkali injection system uses ammonia generated from the urea-to-ammonia processing system, which is part of the SCR system. Ammonia shall be injected into the flue gas through a uniform injection grid located after the boiler air heaters and SCR reactor and before the existing ESP. The additional ammonia reacts with sulfur trioxide (SO_3) to form salts (e.g., bisulfates), which shall be removed by the ESP. Based on the preliminary design, the alkali injection systems are capable of an 85% reduction in SAM emissions.~~
Acid Mist Mitigation (AMM) Systems to Reduce Sulfuric Acid Mist (SAM) Emissions. The permittee is required to control SAM emissions from currently authorized coal fuel blends through either lime injection (primary) or alkali injection (backup). The design for the AMM systems is to use either hydrated lime or ammonia. The hydrated lime or ammonia reacts with sulfur trioxide (SO_3) to form salts (e.g., bisulfates), which shall be removed by the ESP and/or the FGD. The design for both systems is for an 85% reduction.
(1) The hydrated lime shall be injected into the flue gas through a combination of locations after the boiler (i.e., after the air heaters, after the SCR reactor, and before/after the existing ESP). The hydrated lime injection rates will vary based on emission control levels and operational parameters at each of the hydrated lime injection locations. The hydrated lime reacts with the acidic compounds in the flue gas stream to form particulate matter that will be removed in the ESP and/or in the wet scrubber.

(2) The alkali injection system uses ammonia generated from the urea-to-ammonia processing system, which is part of the SCR system. When used as a backup to the lime injection, the ammonia shall be injected through a uniform injection grid located after the boiler air heaters and SCR reactor and before or after the existing ESP.

e. *Electrostatic Precipitator (ESP)*. The permittee is required to operate and maintain the existing ESPs to achieve the PM/PM_{10} emissions standards.

f. *Hydrated Lime Injection Systems Dust Collectors.* A dust collector is required on each hydrated lime storage silo to control emissions from the loading of the hydrated lime storage silo and unloading and transfer from the silo to the injection lances. The silo dust collector has a flow rate of approximately 2,000 scfm during the loading operations, which are estimated to occur for 6 hours per day. Each dust collector is designed for a dust outlet specification of 0.015 grains/dry standard cubic feet (dscf).

[Permit Nos. 0170004-023-AC (PSD-FL-383C) Specific Conditions 3.A.2 & 3. and 0170004-037-AC (PSD-FL-383F), Specific Conditions A.3.a., H.2, H.3. & H.5.]

B.8. SO_2 – Sulfur Content.

a. The maximum percent sulfur content of the coal/briquette mixture shall not exceed 0.68%, by weight, averaged on an annual basis. [Rule 62-213.440, F.A.C.; and, Permit No. 0170004-006-AC]

b. Fuel oil shall not contain more than 0.73% sulfur by weight. (See Specific Condition **B.2**.) [Rule 62-213.410, F.A.C.; PPSC PA-77-09 and modified conditions]

c. Coal fuel blends shall not exceed a maximum ~~sulfur content of 3.13% by weight~~ specification of 5.5 lb/MMBtu. (See Specific Condition **B.2**.d.) [Permit No. 0170004-023-AC (PSD-FL-383C) Specific Condition 3.A.6.a.; 0170004-037-AC, Specific Condition 6.]

B.14. Carbon Monoxide (CO) Emissions. As determined by CEMS data, CO emissions shall not exceed 0.10 lb/MMBtu of heat input based on a 30-day rolling average excluding periods of startup, shutdown and malfunction. As determined by CEMS data, CO emissions shall not exceed 680.0 lb/hour based on a 30-day rolling average for all periods of operation including startup, shutdown and malfunction.

~~a. CO Emissions (Interim). As determined by CEMS data, CO emissions shall not exceed 0.17 lb/MMBtu of heat input based on a 30-day rolling average excluding periods of startup, shutdown and malfunction. As determined by CEMS data, CO emissions shall not exceed 1,156 lb/hour based on a 30-day rolling average for all periods of operation including startup, shutdown and malfunction.~~

~~b. *CO Emissions (Final).* Within 24 months of commencing commercial operation of each unit with the new low-NO_x burners, the permittee shall submit an application proposing a revised (lower) final BACT standard. The final standard shall be based on actual CO emissions data collected for initial operation after completing installation of the new low-NO_x burners. There may be separate standards proposed for different fuels.~~

[Permit Nos. 0170004-023-AC (PSD-FL-383C), Specific Conditions 3.A.9.c. & d., 0170004-030-AC (PSD-FL-383E), Specific Condition 9., and 0170004-037-AC (PSD-FL-383F), Specific Condition A.9.c.]

B.15. Hydrated Lime Injection Systems Opacity Work Practice Standard – Dust Collectors. As determined by EPA Method 9 upon request, visible emissions from each dust collector fabric filter exhaust shall not exceed the design emissions rate of 5% opacity, based on a 6-minute average. This visible emissions limit is a work practice standard to prevent circumvention of the control device and ensure proper operation. If visible emissions in excess of this standard occur, the permittee shall investigate the cause and take corrective action to regain operation below the standard (e.g., cause: bag failure / corrective action: replaced bags). For this equipment, visible emissions in excess of the opacity standard are not necessarily a violation of this permit; however, failure to investigate excess emissions and take corrective action to minimize emissions may be considered circumvention of a control device. [Rule 62-297.310(7)(b), F.A.C. and Permit No. 0170004-037-AC (PSD-FL-383F), Specific Condition H.4.]

B.16. Excess Emissions Allowed.

a. Excess emissions resulting from startup, shutdown or malfunction shall be permitted provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions shall be

minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration.

b. In accordance with Rule 62-210.700(6), F.A.C., excess emissions due to startup, shutdown or malfunction have been considered in establishing the sets of CEMS-based emissions standards of this permit. With regard to SAM emissions, the AMM ~~alkali injection~~ systems ~~is currently shared by Units 4 and 5 and the system~~ must be shutdown to conduct some maintenance and repairs. The following additional conditions apply to the ~~shared alkali injection~~ AMM systems:

~~(1) *Additional SAM Testing.* Prior to January 14, 2014 (before March 18, 2012 in Permit 0170004-035-AV), the permittee shall conduct additional SAM emissions tests (at least three, 1-hour test runs) on at least one unit without the alkali injection system in operation while firing lower sulfur "substitute coal". The SAM emissions standard shall not apply during these information-gathering tests. The purpose of the tests are to determine the SAM emissions rate (lb/MMBtu) while firing "substitute coal" with the alkali injection system offline. The permittee shall submit a test report in accordance with the requirements of this permit and specifically identify whether the units are capable of complying with the SAM emissions limit while firing the tested "substitute coal". Each test report shall also include the results from all previous tests conducted for such purposes. If the sulfur content of the "substitute coal" increases, subsequent SAM tests may be conducted as necessary in accordance with this condition.~~

~~*{Permitting Note: Currently, "substitute coal" is available at the plant and used for Units 1 and 2. Although the permitted maximum sulfur content of this coal is approximately 1.3% by weight (2.1 lb SO_2/MMBtu), the actual sulfur content is less than 1% by weight. When firing "substitute coal", reductions in SAM emissions by the wet FGD system may be sufficient to demonstrate compliance with the SAM emissions standard.}*~~

(~~2~~1) *Preventive Maintenance*. To minimize malfunctions of the ~~alkali injection~~ AMM systems and resulting excess SAM emissions, the permittee shall conduct annual preventive maintenance.

(a) Whenever possible, ~~T~~ the preventive maintenance shall be scheduled for a period when ~~at least one~~ the unit (Unit 4 or Unit 5) is down for a scheduled outage, which occurs approximately every 18 months per unit. ~~Whenever possible, the scheduled outages shall be staggered such that only one unit will be in an outage each year to accommodate the required annual preventive maintenance.~~

(b) When conducting the required preventative maintenance of the ~~alkali injection~~ AMM systems, the permittee may operate ~~no more than one~~ the unit while firing "substitute coal" without the ~~alkali injection~~ AMM systems in operation for no more than 240 hours per calendar year. If stack testing demonstrates compliance with the SAM emissions standard while firing "substitute coal" for a given sulfur content without the ~~alkali injection~~ AMM systems in operation, the hours of operation while firing that coal shall not count towards this operational restriction.

(~~3~~2) *Repair*. The following conditions apply to malfunctions of the ~~alkali injection~~ AMM systems. A malfunction is defined as, "Any unavoidable mechanical and/or electrical failure of air pollution control equipment or process equipment or of a process resulting in operation in an abnormal or unusual manner."

(a) The permittee shall maintain a list and inventory of spare parts associated with the shared ~~alkali injection~~ AMM system equipment to facilitate quick repairs.

(b) When a malfunction occurs, the permittee shall immediately investigate to determine the corrective action required. For malfunctions that will require an extended period of time to repair, the permittee shall begin preparations to fire "substitute coal" or to begin operation of the alternative AMM system (either the ammonia based, or hydrated lime based system, whichever is not currently in operation). When initially evaluating a given malfunction and performing the repair, Units 4 and/or 5 may be operated without the ~~alkali injection~~ AMM system for no more than 72 hours; thereafter, Units 4 and/or 5 shall begin firing "substitute coal" or begin operation of the alternative AMM system in order to continue operating while the plant makes the repair.

(c) The ~~alkali injection~~ AMM systems shall not be offline (including the malfunctions) for more than a total of 480 hours per calendar year to evaluate malfunctions and conduct repairs. This

operational restriction shall include: authorized hours of firing normal coal for initial evaluation and repair (up to 72 hours per event); and authorized hours of operation firing "substitute coal" that has not yet demonstrated compliance with the SAM emissions standard. If stack testing demonstrates compliance with the SAM emissions standard while firing "substitute coal" for a given sulfur content without the ~~alkali injection~~ AMM systems in operation, the hours of operation while firing that coal shall not count towards this operational restriction.

(~~4~~3) *Purpose*. The purpose of this condition is to provide operational flexibility to conduct timely maintenance and repair on the ~~alkali injection~~ AMM system ~~shared~~ used by Units 4 and 5 while minimizing excess SAM emissions. Once compliance is demonstrated for firing "substitute coal" with a given sulfur content, periodic testing is not required except as allowed by Rule 62-297.310(7)(b), F.A.C. (Special Compliance Tests). In addition, the compliant sulfur content for "substitute coal" shall be established based on the following equation:

$\% S_{Comp.} = (\%S_{Tested})\ (SAM_{Limit}) / (SAM_{Tested})$

Where:

$\%S_{Comp.}$ = Maximum percent sulfur content by weight that would demonstrate compliance
$\%S_{Tested}$ = Actual percent sulfur content by weight fired during stack test
SAM_{Limit} = Permitted SAM emissions limit, 0.009 lb/MMBtu
SAM_{Tested} = Actual SAM emissions rate in lb/MMBtu based on stack test

Example: Stack testing shows an actual SAM emissions rate of 0.0085 lb/MMBtu when firing substitute coal with a sulfur content of 0.98% by weight and the ~~alkali injection~~ AMM systems offline. Therefore, the maximum sulfur content of "substitute coal" considered demonstrated would be:

$\% S_{Comp.}$ (SC) = (0.98% S) (0.009 lb/MMBtu) / (0.0085 lb/MMBtu) = 1.04% sulfur by weight

Therefore, if "substitute coal" is fired with an actual sulfur content equal to or less than the maximum sulfur content as calculated above ($\%S_{Comp.}$), then the hours while firing that coal do not count towards the operational restrictions specified for maintenance and repair. If "substitute coal" is fired with an actual sulfur content higher than the calculated value ($\%S_{Comp.}$), then the hours while firing that coal do count towards the operational restrictions specified for maintenance and repair.

[Rules 62-210.700(1) & (6), F.A.C. ~~and~~; Permit Nos. 0170004-023-AC (PSD-FL-383C), Specific Condition 3.A.12., and 0170004-037-AC (PSD-FL-383F), Specific Condition A.12.]

B.21. Fuel Monitoring – Units 4 and 5. The permittee shall continuously monitor each fuel to determine the heat input rates to Units 4 and 5. (See Specific Condition **B.41.**). [Permit No. 0170004-037-AC (PSD-FL-383F) Specific Condition A.23.]

B.22. Control Device Parametric Monitoring. The following parameters related to the operation of the control devices shall be continuously monitored (see also Specific Condition **B.42.**).

a. *SCR System*. The permittee shall continuously monitor the ammonia injection rate of the SCR control system.
b. *FGD System*. The permittee shall continuously monitor the limestone slurry injection rate of the FGD control system.
c. *AMM Systems*. The permittee shall continuously monitor the hydrated lime or ammonia injection rate of the AMM systems. Operation of the AMM systems shall be determined by the automated control system, which shall be set in accordance with the preliminary performance and compliance tests for SAM emissions.
d. *ESP*. The permittee shall continuously monitor the opacity in the ductwork just after the ESP for use as part of the Compliance Assurance Monitoring Plan (see Appendix CAM). Operation of the ESP shall be based upon COMS data collected during satisfactory PM emissions compliance tests.

[Permit No. 0170004-037-AC (PSD-FL-383F), Specific Condition A.25.]

B.23. Operating Protocols for the AMM Systems. The permittee shall operate the AMM systems in accordance with the operating protocol determined by the performance tests. Using the following procedures, the

permittee may conduct additional SAM performance tests to establish a new operating protocol for the AMM system due to changes with the fuel blends, control equipment, operating methods or other circumstances. When collecting data during the SAM performance tests, the permittee is exempt from the SAM emissions standards of this permit.

c. For each set of operating conditions being evaluated, the permittee shall conduct at least a 1-hour test run to determine SAM emissions. At least nine test runs shall be conducted to evaluate the effect of SAM emissions on parameters such as: the SO_2 emissions rate prior to the SCR catalyst, the unit load, the flue gas flow rate, the ammonia and/or hydrated lime injection rate, the current catalyst oxidation rate, and the operating level of the FGD system.

d. Tests shall be conducted with the fuel blends and load rates that are representative of the actual operating ranges intended for Units 4 and 5. Sufficient tests shall be conducted to establish the SAM emissions rates under varying operating conditions and levels of ammonia and/or hydrated lime injection (e.g., bypass of the SCR reactor, SCR reactor in service without ammonia and/or hydrated lime injection, SCR reactor in service, etc.).

e. At least 15 days prior to initiating the performance tests, the permittee shall submit a test notification, preliminary test schedule and test protocol to the Office of Permitting and Compliance and to the Compliance Authority.

f. Within 45 days following the last test run conducted, the permittee shall provide a report summarizing the emissions tests and results. All SAM emissions test data shall be provided with this report.

g. Within 45 days following the submittal of the performance test report and no later than 90 days following the last test run conducted, the permittee shall submit an operating protocol summarizing the following: identify each set of operating conditions evaluated; identify each operating parameter evaluated; identify the relative influence of each operating parameter; describe how the automated control system will adjust the ammonia injection rate based on the selected parameters; identify the frequency with which operational parameters will be reevaluated and adjusted within the automated control system; provide a description of the algorithm used for the automated control system or a series of related performance curves; and provide details for calculating and estimating the SAM emissions rate based on the level of ammonia injection and operating conditions. The performance tests shall be used to set the AMM control systems and estimate SAM emissions.

[Rule 62-212.400(BACT), F.A.C.; and, Permit No. 0170004-037-AC (PSD-FL-383F), Specific Condition A.16.]

B.36. When PM Tests Not Required. Annual and permit renewal compliance testing for particulate matter emissions is not required for ~~these~~ emissions units 003 and 004 while burning:

a. only gaseous fuel(s); or
b. gaseous fuel(s) in combination with any amount of liquid fuel(s) for less than 400 hours per year; or
c. only liquid fuel(s) for less than 400 hours per year.

[Rules 62-297.310(7)(a)3. & 5., F.A.C.; and, ASP Number 97-B-01.]

B.37. Additional Compliance Test requirements.

a. *Test Fuel*. Initial compliance tests were to have been conducted with the highest sulfur content representative of the actual coal blends being fired. Within 60 days of determining that the fuel sulfur content of the actual coal blends fired have increased by 0.5% by weight or more from the highest tested sulfur content that demonstrated compliance, the permittee shall conduct new tests to determine emissions of opacity, PM and SAM. For purposes of this condition, the fuel sulfur content shall be based on an average of the as-fired fuel samples for 30 successive operating days. Once compliance has been demonstrated at the higher fuel sulfur levels (2.63% to 3.13% sulfur by weight), subsequent tests shall be conducted using a fuel with a sulfur content that is representative of the actual coal blends being fired.

b. *Operational Data for Tests*. When compliance tests are conducted, for each test run, the permittee shall monitor and record the following information: fuel feed rate; heat input rate; sulfur content of fuel; the ammonia injection rate of the SCR control system; the limestone slurry injection rate of the FGD control system; lime or ~~alkali~~ammonia injection rate of the AMM systems; flue gas oxygen content (%); CO,

NO_X, and SO_2 CEMS emissions data; and opacity data.

[Permit No 0170004-023-AC (PSD-FL-383C) Specific Conditions 3.A.19.c. & d. and 3.A.20. and 0170004-037-AC (PSD-FL-383F), Specific Condition A.20.]

B.42. Control Device – Record Keeping for Parametric Monitoring.

a. *SCR System*. The permittee shall continuously monitor and record the ammonia injection rate of the SCR control system. Data shall be reduced to 1-hour block averages.

b. *FGD System*. The permittee shall continuously monitor and record the limestone slurry injection rate of the FGD control system. Data shall be reduced to 1-hour block averages.

c. ~~*Alkali Injection*~~ *AMM Systems*. The permittee shall continuously monitor and record the hydrated lime or ~~alkali~~ammonia injection rate of the ~~alkali injection~~ AMM systems. Data shall be reduced to 1-hour block averages. Operation of the ~~alkali injection~~ AMM systems shall be determined by the automated control system, which shall be set in accordance with the preliminary performance and compliance tests for SAM emissions.

d. *ESP*. The permittee shall continuously monitor and record the opacity in the ductwork just after the ESP for use as part of the Compliance Assurance Monitoring Plan under Title V. Operation of the ESP shall be based upon COMS data collected during satisfactory PM emissions compliance tests.

[Rule 62-212.400 (BACT), F.A.C.; Permit Nos. 0170004-023-AC (PSD-FL-383C), Specific Conditions 3.A.25.a, b., c. & d., and 0170004-037-AC (PSD-FL-383F), Specific Condition A.25.c.]

CONCLUSION

This project revises for the fourth time Title V air operation permit No. 0170004-024-AV, which was effective on January 1, 2010. This Title V air operation permit revision is issued under the provisions of Chapter 403, Florida Statues (F.S.), and Chapters 62-4, 62-210, 62-213 and 62-214, F.A.C.