Gulf Power Company
Crist Electric Generating Plant

Title V Air Operation Permit Revision
Permit No. 0330045-037-AV

APPLICANT

The applicant for this project is Gulf Power. The applicant's responsible official and mailing address are: Michael Burroughs, Vice President, Power Generation, Gulf Power Company, Crist Electric Generating Plant, One Energy Place, Pensacola, Florida 32520-0100.

FACILITY DESCRIPTION

The Gulf Power Company operates the existing Crist Electric Generating Plant, which is categorized under Standard Industrial Classification Code No. 4911. The facility is located in Escambia County at Governor's Bayou off 10 Mile Road in Pensacola, Florida. The existing facility consists of four predominantly coal-fired fossil fuel fired steam generators (boilers) and two fly ash silos, with the following configurations:

- Units 4 and 5 (EU 004 and EU 005) are tangentially-fired, dry-bottom electric utility boilers manufactured by Combustion Engineering with a nominal generating capacity of 93 megawatt (MW) per unit. Units 4 and 5 control particulate matter with electrostatic precipitators (ESP) and control nitrogen oxides (NO_X) with selective non-catalytic reduction (SNCR). After control by the ESP and SNCR, there is a common bypass stack for Units 4 and 5 that allows operation while bypassing the flue gas desulfurization (FGD) system.
- Unit 6 (EU 006) is a front wall-fired, dry-bottom electric utility boiler manufactured by Foster Wheeler with a nominal generating capacity of 369 MW. Unit 6 controls particulate matter with an ESP and currently controls NO_X with low-NO_X burners and a new selective catalytic reduction (SCR) system. After control by the ESP and SCR, there is a common bypass stack for Units 6 and 7 that allows operation while bypassing the FGD system.
- Unit 7 (EU 007) is a rear wall-fired, dry-bottom electric utility boiler manufactured by Foster Wheeler with a nominal generating capacity of 578 MW. Unit 7 controls particulate matter with an ESP and controls NO_X with low-NO_X burners and a SCR system. After control by the ESP and SCR, there is a common bypass stack for Units 6 and 7 that allows operation while bypassing the FGD system.
- Boiler additives are injected in Units 4 - 7 to reduce slag in the boilers.
- Units 4 - 7 control sulfur dioxide (SO_2) emissions with a common FGD system. Under normal operations, emissions from units 4 - 7 are exhausted through a common stack following the FGD system. In addition, Units 4 - 7 continuously monitor and record opacity, SO_2 and NO_X emissions.
- Sulfuric Acid Mist (SAM) emissions controlled by hydrated lime injection (HLI) on the common duct to all four units just prior to the inlet of the FGD system.

The primary fuel for all four units is pulverized coal. Supplemental fuels include natural gas, fuel oil and on-specification used oil. For Units 6 and 7, fuel oil is only used for startup and as needed for flame stabilization. In addition, Units 4 and 5 may fire carbonaceous fuel (biomass to include wood, switch grass, sawdust and sander-dust). Finally, on-site generated "oil contaminated soil" is periodically combusted for energy recovery purposes. Boilers 4 and 5 were Acid Rain Phase I substitution Units. Boilers 6 and 7 were Acid Rain Phase I Units. All four boilers are subject to the Acid Rain Phase II and CAIR requirements.

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

PROJECT DESCRIPTION

The purpose of this permitting project is to revise the existing Title V air operation permit No. 0330045-025-AV for the above referenced facility. The key differences compared with the previous Title V air operation permit are:

- Incorporation of concurrently issued air construction permit No. 0330045-036-AC that is revising the NO_X and SO_2 emissions limits. See the Technical Evaluation and Preliminary Determination for details of that project;
- Inclusion of several specific conditions from previously issued final air construction permits as described in the Project Review Section below; and
- Inclusion of new and existing reciprocating internal combustion engines (RICE) with applicable requirements.

These documents along with all other associated documents in the issued draft/proposed permit package can be accessed by entering file number in the permit number field at the web link given below.

http://www.dep.state.fl.us/air/emission/apds/default.asp

PROCESSING SCHEDULE AND RELATED DOCUMENTS

11/13/2012 Received the application for a Title V air operation permit revision.

12/10/2012 1st Request for additional information sent.

12/17/2012 Received response to1st request for additional information; application is incomplete.

01/16/2013 2nd Request for additional information sent.

04/01/2013 Received response to 2nd request for additional information.

04/16/2013 Draft/proposed Title V permit revision issued.

04/19/2013 Public Notice published.

05/02/2013 Comments received from the applicant.

PRIMARY REGULATORY REQUIREMENTS

The existing facility is regulated under:

Title III: The facility is identified as a potential 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 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.

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

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

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

CAM: Emissions Units 004, 005, 006 and 007 are subject to the Compliance Assurance Monitoring (CAM) requirements of 40 CFR 64 for emissions of particulate matter controlled by an ESP and emissions of sulfuric acid mist controlled by hydrated lime injection.

PROJECT REVIEW

The purpose of this permitting project is to revise the existing Title V air operation permit No. 0330045-025-AV for the above referenced facility to incorporate minor revisions from air construction permit No. 0330045-036-AC, issued concurrently with this permit. The permit revision is made to revise the Crist Unit 7 SCR bypass limit and the plant-wide NO_X emissions limit for Units 4 - 7, established in air construction permit No. 0330045-005-AC and revised in permit No. 0330045-017-AC, and to remove the unnecessary coal blend sulfur specification that was established in permit No. 0330045-029-AC. In addition, this permit revision incorporates several specific conditions of three previously issued final air construction permits that include the Unit 6 SCR permit No. 0330045-028-AC, the Unit 6 ESP permit No. 0330045-032-AC and the Crist fuel blend project permit No. 0330045-029-AC.

To reflect the changes and conditions contained in permit No. 0330045-036-AC, issued concurrently with this permit and the previously issued final air construction permits, the following conditions of the final Title V air operation permit are revised as indicated below.

Within this document, ~~strikethrough~~ formatting is used to denote the deletion of text, while <u>double-underlines</u> are used to denote the addition of text. Where applicable, the permit has been re-numbered to reflect the additions and deletions.

SECTION III. EMISSIONS UNITS AND SPECIFIC CONDITIONS, Subsection A.

1. **The permitting notes following the emissions units description on page 6 of the permit is revised to reflect the addition of the unit 6 SCR for NO_X emissions control devises, Sulfuric Acid Mist emissions control device and the boilers additives for Units 4 - 7.**

   {Permitting Notes: PM emissions from emissions units -004 and -005 are controlled by hot side electrostatic precipitators (ESP) manufactured by Buell, updated with GE ENERGY ESP-3 plates with RDE-1 rigid discharge electrodes, and cold side ESP manufactured by Buell, Model 1.1x48k33-1p. Nitrogen Oxides (NO_X) emissions from units -004 and -005 are controlled by low-NO_X burner tips and selective non-catalytic reduction (SNCR). The SNCR system is designed for a target NO_X reduction of 25% as measured across the SNCR unit inlet and outlet. The designed target ammonia slip level is 5 parts per million per volume (ppmv) corrected to 3% oxygen (O_2) based on a 24-hour average. Unit -004 began commercial operation on July 1, 1959. Unit -005 began commercial operation on June 1, 1961. The generator nameplate rating for unit -004 is 93 MW. The generator nameplate rating for unit -005 is 93 MW. PM emissions from unit -006 are controlled by a cold side electrostatic precipitator (Wheelabrator Model # HaRDE). PM emissions from unit -007 are controlled by cold side electrostatic precipitators designed by Alstom Power Inc.~~ ~~NO_X emissions from units -006 are controlled by Foster Wheeler Low NO_X Burners and by a Selective Non-Catalytic Reduction (SNCR) system designed to achieve no less than a 20% reduction in NO_X emissions as measured across the SNCR unit inlet and outlet. The designed target ammonia slip level is 5 ppmv corrected to 3% O_2 based on a 24-hour average.~~ NO_X emissions from units <u>-006 and</u> -007 are controlled by Foster Wheeler Low NO_X Burners and by a Selective Catalytic Reduction (SCR) system designed to achieve no less than an 85% reduction in NO_X emissions as measured across the SCR unit inlet and outlet. The designed target ammonia slip level is 5 ppmv based on a 24-hour average. Unit -006 began commercial operation on May 1, 1970. Unit -007 began commercial operation on August 1, 1973. The permittee operates a wet FGD system to control SO_2 emissions from Units 4 - 7. Units 4 - 7 share a common stack under normal conditions with the wet FGD system in operation<u>. Sulfuric Acid Mist emissions are controlled by hydrated lime injection on the common duct to all four units just prior to the inlet of the Flue Gas Desulfurization (FGD) system. Boiler additives are injected in Units 4 - 7 to reduce slag in the boilers.</u> Common stack height = 490 feet, exit diameter = 35 feet, exit temperature = 131° F; actual volumetric flow rate = 3,282,000 acfm. The two original stacks for Units 4/5 and Units 6/7 remain as bypass stacks for: periods of startup and shutdown of Units 4 - 7; malfunction of Units 4 - 7 (any or all) or the wet FGD system; or, repair or scheduled maintenance of the wet FGD system. Under normal operating conditions, the existing stack for Units 4/5 will be used to provide makeup air to the system. Units -004 and -005 common bypass stack height = 450 feet, exit diameter = 18.0 feet, exit temperature = 290ºF, actual volumetric flow rate = 596,012 actual cubic feet

per minute (acfm). Units -006 and -007 common bypass stack height = 450 feet, exit diameter = 23.2 feet, exit temperature = 320 ºF, actual volumetric flow rate = 2,975,540 acfm. }

2. **Specific Condition A.3. has been revised to incorporate the use of new boiler additives, as authorized in the Crist higher sulfur coal air construction permit No. 0330045-029-AC. The emissions test report was submitted by the applicant with the application.**

A.3. Methods of Operation.

e. *Boiler Additives.* The permittee is authorized to use boiler additive in Units 4 - 7 to reduce slag in the boilers. The boiler additives are provided by Fuel Tech Inc, and are known as targeted in-furnace injection (TIFI) technology. Two additives are used: magnesium hydroxide (TIFI MG) and aluminum hydroxide (TIFI XP). The maximum injection rates are 12 gallons per hour of TIFI MG and 22 gallons per hour of TIFI XP. The additives may be used separately or in combination.

[Rule 62-213.410, F.A.C.; and, Permit Nos. 0330045-011-AC, ~~and~~ 0330045-013-AC and 0330045-029-AC, Specific Conditions C.1. & C2.]

3. **To reflect the installation of the new pollution control equipment for Unit 6, as authorized by the Crist Unit 6 SCR air construction permit No. 0330045-028-AC, Specific Conditions A.5. - A.8. have been revised as follows:**

A.5. Selective Non-Catalytic Reduction (SNCR) System. Fuel Tech, Inc. designed the SNCR systems for Units 4~~,~~ and 5 ~~and 6~~ to be used on an "as needed" basis to meet the plant-wide NO_X limit in Specific Condition ~~**A.15.**~~**A.17.** Urea is delivered by truck (or possibly rail) and stored on site as a 40% aqueous solution in one 45,000 gallon tank. When operated at peak load, this provides approximately 7 days of operating inventory. The solution will be maintained at a temperature of approximately 40° F by circulating through the SNCR system piping loop heating module. Using plant service water or other dilution water source, the metering module dilutes the reagent to a predetermined concentration (approximately 30%) and precisely controls the flow of the diluted reagent to distribution modules located near the boiler injection point. The distribution modules provide the final control of diluted reagent and atomizing/cooling (plant) air being delivered to each injector. The diluted reagent is injected into the boiler via wall-mounted air atomizing lances, which will be installed across the face of the boiler at an elevation of 159'-0" for each unit. At peak load for Unit -004, with 0.36 lb/MMBtu inlet NO_X and 25% reduction, urea injection would be 233 lb/hr on a dry basis. This translates to an ammonia flow of 132 lb/hr. At peak load for Unit -005, with 0.36 lb/MMBtu inlet NO_X and 25% reduction, urea injection would be 238 lb/hr on a dry basis. This translates to an ammonia flow of 135 lb/hr. ~~At peak load for Unit -006, with 0.35 lb/MMBtu inlet NO_X and 20% reduction, urea injection would be 741 lb/hr on a dry basis. This translates to an ammonia flow of 333.8 lb/hr.~~ The SNCR is designed with a maximum ammonia slip concentration of 5 ppmvd corrected to 3% O_2 (24 hour basis) in the duct cross-sectional area for all boiler loads. There are no provisions for continuously monitoring ammonia concentration in the flue gas. When ammonia measurements in the flue gas are required, EPA Method CTM-027 or other methods approved by EPA such as Method 320, which incorporates Fourier transform Infrared Spectroscopy (FTIR) will be used. [~~0330045-012-AC, and~~ Permit No. 0330045-013-AC]

A.6. Selective Catalytic Reduction (SCR) Systems. The SCR systems were designed to achieve no less than an 85% reduction in NO_X emissions as measured across the SCR unit inlet and outlet. The designed target ammonia slip level is 5 ppmv based on a 24-hour average. The storage of ammonia shall comply with all applicable requirements of the Chemical Accident Prevention Provisions in 40 CFR 68. Southern Company Services Inc. designed the SCR systems for Units -006 & -007, which generally consist~~s~~ of the following:

a. *Catalyst Structure/Design Specifications.*

(1) Unit 6. The catalyst consists of titanium dioxide and molybdenum oxide with vanadium pentoxide as the active component. The catalyst is fabricated by applying ceramic catalyst material to a perforated stainless steel mesh grid plate. The catalyst structure is a honey-comb type. The operational temperature range is approximately 600° to 800° F. The initial

configuration is for a catalyst volume of approximately 460 cubic meters (16,260 cubic feet) divided between three catalyst layers. The design inlet NO_X concentration is 0.5 lb/MMBtu and the design output NO_X emissions is 0.07 lb/MMBtu.

(2) Unit 7. Arranged in four layers, the catalyst is a plate-type structure fabricated by applying ceramic catalyst material to a perforated stainless steel mesh grid plate. The active catalyst component is vanadium pentoxide. The system has an operational temperature range between 600° to 800° F (optimum temperature > 680° F). The initial configuration had a catalyst volume of approximately 26,000 cubic feet in 2½ layers. As the catalyst gradually deactivates through use, the remaining layers will be filled and old layers replaced. With all four potential layers in place, the catalyst volume is approximately 41,600 cubic feet.

b. *Ammonia Storage, Mixing and Injection Systems*. Anhydrous ammonia is delivered by truck or rail and stored on site in ~~two~~ three 20,500 gallons tanks.

(1) Unit 6. Ammonia is diluted with air (< 10% by volume) and injected into the SCR inlet duct through the ammonia injection grid (AIG), which is divided into about two dozen zones. Each zone is equipped with a flow indicator and manual control valve for tuning the AIG to match the inlet NO_X profile. Effective ammonia distribution and NO_X conversion are dependent on the velocity profile entering the AIG. A static mixer installed upstream of the AIG creates flow resistance, flattens the velocity profile, and provides uniform gas flow. Downstream of the AIG, a second static mixer is positioned at the AIG injection points to impart a swirl to the diluted ammonia and promote good mixing with the flue gas. For 85% NO_X conversion, the design molar ratio of ammonia-to-NO_X is 0.95 at SCR inlet.

(2) Unit 7. Ammonia is distributed into the SCR inlet duct through the ammonia injection grid (AIG), which is divided into about two dozen zones. Each zone is equipped with a flow indicator and manual control valve for tuning the AIG to match the inlet NO_X profile. A static mixer installed upstream of the AIG creates flow resistance, flattens this profile, and makes gas flow uniform. A second static mixer is installed downstream of the AIG. The elements of this mixer are precisely oriented with the AIG injection points to impart a swirl to the diluted ammonia and promote good mixing with the flue gas. A manual gas sampling grid (GSG) is installed downstream of the last catalyst layer, which allows a high-resolution traverse of the flue gas stream. Gas composition data collected from the GSG is used to precisely adjust and tune the AIG. The preliminary design was based on a 0.95 molar ratio of ammonia-to-NO_X.

c. *Ammonia Control Systems*. The ammonia control systems for Units 6 and 7 consist~~s~~ of a control loop with a cascaded, feed-forward control scheme. Process monitors will provide NO_X emission rate data collected at the inlet to and the outlet from each of the SCR systems. The ammonia injection rate is set based on a variety of input data including the measured NO_X rates at the SCR inlet/outlet, the outlet NO_X set point, the heat input to the boiler, the actual NO_X rate measured by the stack monitor, and a scaling factor based on the molecular weights of ammonia and NO_X. The systems ~~is~~are capable of continually adjusting flow control valves to fine-tune the ammonia injection rate based on changing gas stream conditions.

d. *SCR Bypass*. The Unit 6 and Unit 7 SCR designs incorporate~~s~~ dampers and ductwork to provide the capability of bypassing the SCR systems. The bypass is most commonly used to gradually heat or cool the catalyst structure to minimize thermal fatigue during startup and shutdown. During catalyst maintenance and repair, it would also allow access to the SCR reactors without requiring complete shutdown of the Unit ~~00~~6 or Unit 7 boiler.

e. *Unit 6 Ammonia Slip*. There are no provisions for continuously monitoring ammonia concentration in the flue gas. When ammonia measurements in the flue gas are required, a wet chemical method will be utilized. These measurements are taken periodically over the operating life of the SCR catalyst. More frequent tracking of ammonia slip will be monitored by measuring the amount of residual ammonia adsorbed by the fly ash. Fly ash samples will be measured periodically using an ion-specific electrode. Ammonia slip may also be estimated from the ammonia injection monitoring system based on the NO_X rate at the SCR inlet/outlet and the ammonia injection rate.

f. *Unit 6 Gas Sampling Grid (GSG).* During commissioning and periodically over the life of the system, it will be necessary to tune the AIG to optimize the distribution of ammonia in the SCR inlet duct relative to the NO_X distribution to provide optimum NO_X conversion with minimum ammonia slip. To facilitate tuning, a manual gas sampling grid (GSG) is installed downstream of the last catalyst layer. The GSG allows a high-resolution traverse of the flue gas stream for composition across the outlet of the SCR, which can be used to precisely adjust the AIG. The GSG is comprised of individual small-bore (~½") heavy-wall pipes extending from outside the SCR to distributed sampling locations below the last catalyst layer. Portable equipment is used to sample and measure gas concentrations using the GSG.

[Permit Nos. 0330045-005-AC, Specific Condition 3 and 0330045-028-AC, Specific Condition 3]

A.7. Operation of NO_X Control Devices.

a. *SNCR Systems for Units -004 and-005*. The permittee shall maintain and operate SNCR systems for Units -004 and -005 to reduce emissions of nitrogen oxides (NO_X), as needed, in order to comply with the plant-wide nitrogen oxides (NO_X) Limit in Specific Condition ~~**A.15.**~~**A.17.** The SNCR systems for Units -004 and -005 were designed to achieve no less than a 25% reduction in NO_X emissions as measured across the SNCR unit inlet and outlet. Both systems shall be maintained to operate as designed. The designed target ammonia slip level is 5 ppmv corrected to 3% O_2 based on a 24-hour average. The storage of urea shall comply with all applicable requirements of the Chemical Accident Prevention Provisions in 40 CFR 68.

b. ~~*SNCR System for Unit -006.* The permittee shall maintain and operate an SNCR system for Unit -006 to reduce emissions of nitrogen oxides (NO_X), in order to comply with the plant-wide nitrogen oxides (NO_X) Limit in Specific Condition **A.15.** The SNCR system for Unit -006 was designed to achieve no less than a 20% reduction in NO_X emissions as measured across the SNCR unit inlet and outlet. The SNCR system shall be maintained to operate as designed. The designed target ammonia slip level is 5 ppmv corrected to 3% O_2 based on a 24-hour average. The storage of urea shall comply with all applicable requirements of the Chemical Accident Prevention Provisions in 40 CFR 68.~~

c. *SCR System for Units -006 and -007*. The permittee shall operate and maintain an SCR system for Units -006 and -007 to reduce emissions of nitrogen oxides (NO_X). The SCR systems ~~was~~were designed to achieve no less than an 85% reduction in NO_X emissions as measured across the SCR unit inlet and outlet. The SCR systems shall be maintained to operate as designed. The designed target ammonia slip level is 5 ppmv based on a 24-hour average. The storage of ammonia shall comply with all applicable requirements of the Chemical Accident Prevention Provisions in 40 CFR 68.

[Permit Nos. 0330045-005-AC, ~~0330045-012-AC and,~~ 0330045-013-AC and 0330045-028-AC]

A.8. SCR Bypass, Startup/Shutdown. During Units -006 and -007 startup and shutdown, the SCR system may be bypassed in accordance with manufacturer's recommended procedures to allow for controlled catalyst heating and cooling. During startup, the SCR system shall be on line and functioning when the minimum operating temperature of the catalyst is achieved (≥ 600° F). During shutdown, the SCR system may be removed from service when the catalyst temperature drops below 600° F. [Rule 62-210.700, F.A.C. and Permit Nos. 0330045-005-AC and 0330045-028-AC]

4. To incorporate the SCR for Unit 6, to specify that all operational hours are now included in the 30-day rolling NO_X average (including startup, shutdown, malfunctions and SCR bypass) and to remove the 0.35 lb/MMBtu 24-houraverage NO_X limit, Specific Condition A.9. has been revised as follows:

A.9. SCR Bypass, Catalyst Maintenance and Repair. The permittee may bypass the SCR systems to perform maintenance and repair for up to 360 hours per consecutive 12 months during non-ozone events, for each unit. ~~During such allowable bypass periods, the uncontrolled NO_X emissions from Unit 7 shall not exceed 0.35 lb/MMBtu based on a 24-hour average. The daily NO_X emission rates for these periods may be excluded from the plant-wide 30-day NO_X standard specified in Subsection 3B.~~ The daily NO_X emissions rates for these periods shall be included when demonstrating compliance with the plant-wide 30-day NO_X standard. The permittee shall notify the Compliance Authority in advance of the purpose of the SCR bypass, the expected dates of SCR bypass, and the expected duration of SCR bypass. To the

extent practical, the permittee shall schedule regular maintenance of the SCR system for the non-ozone season. [Rules 62-210.700, 62-4.070(3), F.A.C., Permit Nos. 0330045-005-AC, ~~and~~ 0330045-017-AC and 0330045-036-AC]

{Permitting Note: The ozone season is defined as May 1st through September 15th. An Ozone event is defined as any level on the Air Quality Index for Ozone greater than good or moderate (green or yellow).}

5. To reflect the operation of the Hydrated Lime Injection (HLI) process, as established in air construction permit Nos. 0330045-028-AC, 0330029-AC and 0330045-034-AC, Specific Condition A.12. has been added to the permit as follows:

A.12. Hydrated Lime Injection. Sulfuric Acid Mist (SAM) emissions are controlled by hydrated lime injection (HLI) on the common duct to all four units just prior to the inlet of the FGD system. HLI is a process to inject powdered hydrated lime into the flue gas stream at the discharge of the booster fans, upstream of the wet/dry interface at the FGD system to reduce aerosol acid mist emissions from the power plant. The acid aerosol mist is created in the combustion process and is also increased across the SCR catalyst (where the catalyst converts SO_2 to sulfur trioxide (SO_3) in the NO_X reduction process). The Air Preheater (APH), ESP and FGD all help remove the acid aerosol mist, but do not necessarily remove it all. When necessary to further reduce SAM (as indicated by the PEMS), the operation of HLI system will reduce the SAM emissions that are generated by the oxidation of fuel sulfur during combustion. SAM reacts with the hydrated lime and is removed as particulate matter in the downstream FGD system. [Permit Nos. 0330045-028-AC, 0330045-029-AC & 0330045-034-AC

{Permitting Note: Based on applicant estimates, SAM emissions may be reduced by as much as 66.7% using lime injection and another 25% with the wet FGD system, thus the total reduction of acid mist at the facility is estimated at 75%. This combination of controls is expected to remove approximately 50 tons per year of SAM emissions.}

6. To incorporate the new opacity emission limits, as established in the Crist Unit 6 ESP air construction permit No. 0330045-032-AC, Specific Condition A.13. has been revised as follows:

A.13. Visible Emissions.

a. As measured by the individual COMS, visible emissions for units -004 and -005 shall not exceed 40 percent opacity. Because units -004 and -005 share a common stack when the NO_X and/or SO_2 controls are operating in bypass mode, visible emissions violations from the stack will be attributed to both units unless opacity meter results show the specific unit causing the violation.

b. As measured by the individual COMS, visible emissions from units -006 and -007 shall not exceed ~~40 percent opacity, visible emissions from unit -007 shall not exceed~~ 20% based on a 6-minute block average, except for one 6-minute block per hour that shall not exceed 27%. Because units -006 and -007 share a common stack when the NO_X and/or SO_2 controls are operating in bypass mode, visible emissions violations from the stack will be attributed to both units unless opacity meter results show the specific unit causing the violation.

c. Visible emissions from unit -015 limestone storage silo baghouses shall not exceed 5% opacity, as demonstrated by annual EPA Method 9 compliance tests.

[Rule 62-296.405(1)(a), F.A.C., Secretarial ORDER(s) signed October 18, 1985, January 3, 1986, May 12, 1988 & June 24, 1988; and, Permit Nos. AO17-211303, Specific Condition 10, AC17-2234016, Specific Condition 14, AO17- 171806, Specific Condition 23, 0330045-005-AC, ~~and~~ 0330045-023-AC and 0330045-032-AC]

7. To reflect the FGD bypass operation, as established in the air construction permit No. 0330045-029-AC., condition e. has been added to Specific Condition A.15. as follows:

e. FGD Bypass Operation. When operating in FGD bypass mode, SO_2 emissions from all four units combined shall not exceed 25,840 lb/hour (equivalent to 2.1 lb SO_2/MMBtu) based on 3-hour block

CEMS averages (or a fuel-based calculation if the CEMS is down). [Permit No. 0330045-029-AC, Specific Condition A.3.]

8. To reflect the new sulfuric acid mist emissions standards, as established in air construction permit No. 0330045-029-AC., Specific Condition A.16. has been added as follows:

A.16. SAM Emissions Cap. As determined by the predictive emissions monitoring system (PEMS) established as part of the hydrated lime injection project, total SAM emissions from Units 4 - 7 (combined) shall not exceed 165.5 tons during any consecutive 12 months, including periods of start up, shutdown, malfunctions and SCR bypass operations. [Rule 62-212.400(12) and Permit No. 0330045-029-AC, Specific Condition A.2.]

9. To clarify that the plant-wide NO_X limit is changing to no longer allow data exclusions for Unit 7 SCR bypass operations (as established in permit No. 0330045-036-AC) and to reflect the installation of the SCR for Unit 6 (as established in permit No. 0330045-017-AC), Specific Condition A.17. has been revised as follows:

A.17. Plant-Wide NO_X Limit. Emissions of nitrogen oxides (NO_X) from the combined operation of Units 4, 5, 6, and 7 shall not exceed 0.2 lb/MMBtu heat input based on a 30-day rolling average~~ except for periods when Unit 7 is shutdown~~. This limit shall apply when either Unit 6 or 7 is on-line. The plant-wide daily NO_X emission rate shall be determined by the following equation:

$$\text{Plant-Wide Daily MMBtu-Weighted } NO_X \text{ Emission Rate} = \frac{\sum_{\text{Units 4, 5, 6, 7}} [(\text{Unit \# daily MMBtu}) \times (\text{Unit \# daily } NO_X \text{ CEMS Rate})]}{\sum_{\text{Units 4, 5, 6, 7}} (\text{Unit \# daily MMBtu})}$$

The "Unit # daily MMBtu" shall be determined by the daily as-burned fuel analysis and the fuel fired for each unit. The "Unit # daily NO_X CEMS Rate" shall be determined by the daily average of NO_X CEMS data for each unit and reported in terms of "lb/MMBtu heat input". The plant-wide daily NO_X emissions rate shall be determined each day regardless of the operating status for Units 6 or 7. The plant-wide 30-day rolling NO_X average shall be determined for each 30 sequential Unit 6 or 7 operating days, which need not be consecutive. A Unit 6 or 7 operating day means any calendar day that either Unit 6 or 7 operates a minimum of 18 hours. The Unit 6 or 7 daily NO_X CEMS rate may consist of less than 18 hours of data if this is due to: CEMS malfunction~~;~~ or invalid CEMS data~~; or exempted data due to start up, shut down or SCR bypass, described below.~~ ~~When the catalyst temperature is below 600° F during a startup or shutdown, NO_x emissions data collected during such periods may be excluded from the daily NO_x CEMS Rate~~. ~~In accordance with Condition No. 9 of Subsection 3A, limited NO_x emissions data collected during SCR bypass during non-ozone events may be excluded from the daily NO_x CEMS Rate~~. The plant-wide NO_X emission standard shall be achieved by utilizing the SCR systems for Units 6 and 7 and ~~implementing the selected NO_x control strategy~~the SNCR systems for Units 4~~,~~ and 5~~, and 6~~. ~~The effective date for the plant-wide NO_x emission standard is:~~

~~a. The startup date of the selected additional NO_x reduction project, (excluding an SCR project for Unit 6), but no later than May 1, 2006; or~~

~~b. The startup date of the SCR project for Unit 6, but no later than December 31, 2007.~~

~~For purposes of this condition, "startup date" shall mean the date that the permittee demonstrates initial compliance with the terms of the required air construction permit (or other Department approval) that authorized implementation of the additional NO_x reduction project.~~ [Paragraphs 2, 3 and Exhibit B of the Agreement; Permit Nos. 0330045-005-AC, 0330045-017-AC & 0330045-036-AC, Specific Condition 3]

10. To assure compliance with the SAM emissions cap through predictive emissions monitoring, as established in air construction permit Nos. 0330045-028-AC and 0330045-029-AC, Specific Condition A.24. has been added to the permit as follows:

A.24. SAM Monitoring. The permittee shall monitor compliance with the SAM emissions cap by conducting the required performance tests and using the SAM emission equation based on research conducted by the Electric Power Research Institute (EPRI), which is used in conjunction with the PEMS established as part of the hydrated lime injection project. The applicant shall refine this equation when new site-specific emissions data is available. To provide input data for the PEMS, the actual coal blend sulfur percentage shall be monitored by either the process CEMS at the inlet to the FGD system or by a fuel-based calculation. In addition, the permittee shall monitor the FGD scrubber and hydrated lime injection rates, the plant load, and any other parameters required for the PEMS protocol that are needed to correlate the acid mist reduction efficiency. [Rule 62-213.440, F.A.C.; and, Permit Nos. 0330045-028, Specific Condition A.12., 0330045-029-AC, Specific Condition A.11. & 0330045-036-AC, Specific Condition 4.]

11. To ensure that bypass dampers are effectively sealed after bypass operations, as established in air construction permit No. 0330045-029-AC, Specific Condition A.25. has been added to the permit as follows:

A.25. Bypass Monitoring. The permittee shall continuous monitor the exhaust flow after the bypass dampers to ensure that bypass dampers are effectively sealed. [Permit No. 0330045-029-AC, Specific Condition A.12.]

12. To reflect the required monitoring of the boiler additive injection rates during SAM performance testing, as established in air construction permit No. 0330045-029-AC, Specific Condition A.32. has been added to the permit as follows:

A.32. Boiler Additive Injection Rates. The permittee shall continuously monitor and document the injection rates of boiler additives during all SAM performance tests required by this permit if the boiler additives are in use. [Permit No. 0330045-029-AC, Specific Condition C.8.]

13. To reflect the additional allowable test method for Sulfuric Acid Mist and Sulfur Dioxide Emissions, Method 8 has been added to the Test Methods table in Specific Condition A.34. as follows:

A.34. Test Methods. Required tests shall be performed in accordance with the following reference methods:

Method	Description of Method and Comments
8*	Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions from Stationary Sources

* To demonstrate compliance with the SAM limit specified in this permit, Gulf Power may utilize EPA Method 8; conditional test methods: CTM-013, CTM-013A or CTM-013B, as appropriate; or, other test methods as approved through the Department's alternate sampling procedure (ASP) protocol.

14. To update the annual compliance test requirements for emission units 004, 005, 006 and 007, Specific Condition A.36. has been revised as follows:

A.36. Annual Compliance Tests Required. Except as provided in Appendix ASP B-97-01 (attached), ~~D~~during each federal fiscal year (October 1st to September 30th), in accordance with the requirements listed below and to demonstrate compliance with the emission limits in Specific Conditions ~~**A.12. – A.17.**~~**A13. –A.19.**: Units -004~~,~~ and -005 ~~and -006~~ shall be tested for VE, SO_2 and PM; Units -006 and -007 shall be tested for VE, NO_X, SO_2, PM; Unit -007 shall be tested for ~~and~~ ammonia slip; and, Unit -015 shall be tested for VE. [Rule 62-297.310(7)(a)4., F.A.C., Permit Nos. 0330045-005-AC, ~~and~~ 0330045-023-AC and 0330045-028-AC]

15. To incorporate the SAM compliance requirements from permit No. 0330045-029-AC, Specific Conditions A.47. and A.48. have been added.

A.47. SAM. The permittee shall demonstrate compliance with the SAM emissions cap by conducting the required performance tests and using the SAM emission equation based on research conducted by the Electric Power Research Institute (EPRI), which is used in conjunction with the PEMS established as part of the hydrated lime injection project. The applicant shall refine this equation when new site-specific emissions data is available. [Rule 62-213.440, F.A.C.; and, Permit Nos. 0330045-028, Specific Condition A.12. & 0330045-029-AC, Specific Condition A.11.]

A.48. Additional SAM Compliance Tests. If the actual coal blend sulfur specification increases by 0.30 lb SO_2/MMBtu or more based on a 10-day average above the current maximum tested coal blend sulfur specification, the permittee shall conduct new "SAM Performance Stack Tests" at the stack (or in ductwork after the FGD system) to determine SAM emissions within the following load ranges: 40% to 50%; 50% to 60; 70% to 80%; 80% - 90%; and greater than 90%. Within each range, the permittee shall conduct at least two test runs to determine SAM emissions. One test run shall be with the HLI system "on" and one test run shall be conducted with the HLI system "off". For each load range, multiple tests may be conducted at varying HLI rates. The tests shall be conducted within 45 days of determining that the actual coal blend sulfur specification increased by 0.30 lb SO_2/MMBtu or more based on a 10-day average.

(a) *SAM Test Reports*. Within 45 days after completing the performance tests, the permittee shall submit a test report summarizing the results. For each test run, the report shall also indicate: the fuel firing rate of each unit; heat input rate of each unit; hydrated lime injection rate; controlled SO_2 emission rate based on CEMS; uncontrolled SO_2 emission rate in lb/MMBtu based on the process CEMS at the inlet to the FGD system (or a fuel-based calculation if the CEMS is down); opacity based on COMS; ammonia injection rates for SCR (Units 6 and 7); and ammonia injection rates for SNCR (Units 4 and 5). Within 90 days after completing the performance tests, the permittee shall submit a second report summarizing the following:

(1) Identify each set of operating conditions and parameters evaluated;
(2) Identify the relative influence of each operating condition or parameter;
(3) Describe how the control system will adjust the HLI rate based on the given operating condition or parameter; and Show how the information will be used to adjust the equation in order to estimate SAM emissions based on different operating conditions, parameters and HLI rates.

(b) *Data Collected for SAM Performance Tests*. The operator shall use best efforts to maintain the designated heat input rate throughout each SAM performance test run. During each test run, the following information shall be recorded: fuel firing rate of each unit; heat input rate of each unit; hydrated lime injection rate; controlled SO_2 emission rate based on CEMS; opacity based on COMS; uncontrolled SO_2 emission rate in lb/MMBtu based on either the process CEMS at the inlet to the FGD system or a fuel-based calculation; ammonia injection rates for SCR on Units 6 and 7; and ammonia injection rates for SNCR on Units 4 and 5.

(c) *SAM Summary Report*. A summary report shall be submitted to the Office of Permitting and Compliance and the Compliance Authority for each set of SAM performance tests (Stack Tests). Each report shall: summarize the emissions, monitoring and operational data collected; evaluate the SAM emissions for the given conditions; identify the impacts of the control equipment; and provide a discussion for refining the SAM equation.

[Permit Nos. 0330045-029-AC, Specific Conditions A.6., A.8., A.10., A.13. & A.14. and 0330045-036-AC, Specific Condition 4]

16. To incorporate the language regarding the operation of the Crist Mercury Research Center from air construction permit No. 0330045-028-AC, Specific Condition A.69. (previously A.62.) has been revised as follows:

A.69. Final Notification and Removal. Notification shall occur within 45 days, in writing, upon completion of the final test. Prior to ~~December 31, 2009~~removal of the mercury research center, the permittee shall

have provided the DEP Northwest District Office and the Office of Permitting and Compliance with its plans to disassemble and remove all slipstream components, returning the unit back to its original condition. ~~Such plans shall be completely executed by April 1, 2010.~~ [Permit Nos. 0330045-011-AC and 0330045-028-AC, Specific Condition A.2.]

17. The Appendices section is revised to incorporate the Units 4 - 7 Sulfuric Acid Mist (SAM) Compliance Assurance Monitoring (CAM) plan, as submitted by the applicant.

18. The Appendices section is revised to incorporate the new Crist Unit 6 ESP CAM Plan, as submitted by the applicant.

19. Because the new Unit 6 SCR has been installed, as outlined in air construction permit No. 0330045-028-AC, all Specific Condition references to permit No. 0330045-012-AC are obsolete and have been deleted from the Title V air operation permit through this revision.

20. Due to the insertion of new Specific Conditions A.12., A.16., A.24., A.25., A.32., A.47. & A.48., and the above listed revisions to other conditions, Specific Conditions and cross reference numbers have been revised as appropriate throughout Subsection A.

21. A new Subsection D. for emission unit 017 has been added. This subsection is comprised of six compression ignition reciprocating internal combustion engines (CI RICE) that are subject to the requirements of 40 CFR 60, Subpart IIII, NSPS. These engines were part of the group of engines in EU 011 in the previous permit. A new EU designation is given (017) to separate these engines from the group of engines that are subject to the requirements of 40 CFR 63, Subpart ZZZZ. The new section header has been emphasized with yellow highlight within the permit document for ease of location.

22. A new Subsection E. for emission unit 018 has been added. This subsection is comprised of five compression ignition reciprocating internal combustion engines (CI RICE) that are subject to the requirements of 40 CFR 63, Subpart ZZZZ, NESHAP. These engines were part of the group of engines in EU 011 in the previous permit. A new EU designation is given (018) to separate these engines from the group of engines that are subject to the requirements of 40 CFR 60, NSPS, Subpart IIII. The new section header has been emphasized with yellow highlight within the permit document for ease of location and read.

23. The insignificant list of emissions units and activities in Appendix I has been revised to include: the 20,500 gallons ammonia (NH_3) tank, which was added to the facility as part of the Crist Unit 6 SCR project; the rented Portable Diesel Non-Road Engine Driven Pump for Landfill storm water collection pond; the 415 HP Kohler - Detroit Portable Emergency Generator for office Annex (Coal Handling Shed); and, the five portable diesel welding machines. These engines were part of the group of engines in EU 011 in the previous permit and were separated from applicable 40 CFR 63, Subpart ZZZZ, NESHAP and 40 CFR 60, NSPS, Subpart IIII requirements of the other engines.

{Note: Emissions unit **EU 011** (General Purpose Internal Combustion Engines) will be shown as an **Inactive** emission unit in ARMS.}

24. Because the applicable RICE requirements have been specifically included in the body of the permit, the following appendices have been deleted from the appendix section:

~~Appendix ICE, Requirements For Internal Combustion Engines.~~

~~Appendix NESHAP A, 40 CFR 63, Subpart A - Standardized General Provisions.~~

~~Appendix NESHAP ZZZZ, 40 CFR 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.~~

~~Appendix NSPS A, 40 CFR 60, Subpart A - General Provisions.~~

~~Appendix NSPS IIII, 40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.~~

25. Also, Table H, Permit History, was updated to reflect the latest projects.

CONCLUSION

This project is the third revision to Title V air operation permit No. 0330045-025-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.