FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
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PERMITTEE

Tampa Electric Company (TEC)
Post Office Box 111
Tampa, Florida 33600-0111

Authorized Representative:
Karen Sheffield, Director Polk Power Station

Air Permit No. 1050233-040-AC/PSD-FL-194L
Minor Air Construction Permit Revisions
Polk Power Station
Minor Excess Emissions Changes

PROJECT

This is the final air construction permit, which revises Permit No. 1050233-029-AC/PSD-FL-194J, to recognize short term allowable excess emissions due to fuel switches on Combined Cycle Gas Turbine No. 1 (Emissions Unit 001). This permit also establishes allowable periods of NO_X CEMS data exclusions for excess emissions resulting from the tuning of simple cycle combustion turbine Nos. 2 and 3 (EU009 and EU010). The Polk Power Station is an integrated solid fuel gasification combined cycle power generation unit categorized under Standard Industrial Classification No. 4911. The existing facility is located in Polk County at 9995 State Route 37 South, Mulberry, Florida. The UTM coordinates are Zone 17, 402.45 kilometers (km) East and 3067.35 km North; Latitude: 27° 43' 43" North and Longitude: 81° 59' 23" West.

This final permit is organized into the following sections: Section 1 (General Information) and Section 2 (Permit Revisions).

STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of: Chapter 403 of the Florida Statutes (F.S.) and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297 of the Florida Administrative Code (F.A.C.). This project is subject to the general preconstruction review requirements in Rule 62-212.300, F.A.C. and is not subject to the preconstruction review requirements for major stationary sources in Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality. A copy of this permit modification shall be filed with the referenced permit and shall become part of the permit.

Upon issuance of this final permit, any party to this order has the right to seek judicial review of it under Section 120.68 of the Florida Statutes by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel (Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000) and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within 30 days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.

Jonathan Holtom

Digitally signed by Jonathan Holtom
Date: 2014.09.11 08:18:58 -04'00'

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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Final Air Permit package (including the Final Determination and Final Permit Revision) was sent by electronic mail, or a link to these documents made available electronically on a publicly accessible server, with received receipt requested before the close of business on the date indicated below to the following persons.

Ms. Karen Sheffield, TEC - Director Polk Power Station: kasheffield@tecoenergy.com
Mr. Byron T. Burrows, P.E., TEC - Acid Rain Designated Representative: btburrows@tecoenergy.com
Ms. Lyndsey Figler, TEC – Air Programs Engineer: lfigler@tecoenergy.com
Mr. Andrew Bass, P.E., Environmental Consulting and Technology: abass@ectinc.com
Ms. Kelley Boatwright, DEP – SWD: kelley.boatwright@dep.state.fl.us
Mr. Justin Green, DEP - Siting Office: justin.b.green@dep.state.fl.us
Ms. Alisa Coe, Earth Justice: acoe@earthjustice.org
Ms. Heather Ceron, EPA Region 4: ceron.heather@.epa.gov
Ms. Barbara Friday, DEP OPC: barbara.friday@dep.state.fl.us
Ms. Lynn Scearce, DEP OPC: lynn.scearce@dep.state.fl.us

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated agency clerk, receipt of which is hereby acknowledged.

Lynn Scearce

Lynn Scearce
2014.09.11 10:35:44 -04'00'

FACILITY DESCRIPTION

The existing facility is an integrated solid fuel gasification combined cycle power generation unit, which consists of the following emissions units and activities: a 260 megawatt (MW) combined cycle combustion turbine (CCCT, EU 001) which fires syngas or natural gas; an auxiliary boiler (EU 003) which fires natural gas; a sulfuric acid plant (SAP, EU 004); a solid fuel handling system (EU 005); and, a solid fuel gasification system (EU 006). The SAP and solid fuel gasification system have burners that are fired with natural gas. These emission units comprise Unit 1 at the facility. In addition, the facility has: two nominal 165 MW simple cycle gas turbines (EU 009 and 010) firing either natural gas or No. 2 fuel oil which comprise Units 2 and 3; and two nominal 165 MW simple cycle gas turbines (EU 013 and 014) firing only natural gas which comprise Units 4 and 5. The facility also includes emergency generators and fire pumps (EU 007) and miscellaneous unregulated/insignificant emissions units and/or activities.

FACILITY REGULATORY CLASSIFICATION

- The facility is not a major source of hazardous air pollutants (HAP).
- The facility operates units subject to the acid rain provisions of the Clean Air Act (CAA).
- The facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.
- The facility is a major stationary source in accordance with Rule 62-212.400(PSD), F.A.C.

PROPOSED PROJECT

This project makes minor revisions to permit No. 1050233-029-AC/PSD-FL-194J to recognize short periods of excess emissions due to fuel switching events between syngas and natural gas (and vice versa) on the combined cycle combustion (EU 001) in order to accommodate the manufacturer's required operating procedures for fuel switching. According to TEC, the control logic for the control system of EU 001 is set up by the manufacturer (General Electric). When a transfer is initiated, the operator is required to press a button to initiate the transfer and then the control system logic takes over from there. It is an automated process that has been programmed by GE to ensure this process is conducted safely and reliably.

This permit also establishes allowable periods of NO_X CEMS data exclusions for excess emissions resulting from the tuning of simple cycle combustion turbine Nos. 2 and 3 (EU009 and EU010). Emissions Units 009 and 010 were originally authorized under permit No. PSD-FL-263.

DEPARTMENT REVIEW

The emissions of nitrogen oxides (NO_X) from the combined cycle combustion turbine (EU001) are controlled through the injection of nitrogen when firing syngas and the injection of steam when firing natural gas. The steam and nitrogen are injected through a common port into the combustion turbine. Due to design constraints, the header where the steam and nitrogen feed lines join together is at a sufficient distance from the injection port to create a concern for condensation if both steam and nitrogen are mixed in the common line, due to the relative temperature difference between nitrogen and steam. To avoid excessive water droplets from entering the combustion turbine and causing damage to the turbine blades, GE requires that the injection system for the fuel being fired be shut down prior to a fuel switch so that the common injection line can be purged prior to turning on the injection system for the alternate fuel type. During the period when the common duct is being purged, NO_X concentrations in the stack gases may rise briefly due to a lack of steam or nitrogen injection, but the operating capacity of the unit is also ramped down as one fuel is turned off and the alternate fuel is turned on. So, while actual NO_X concentrations may rise briefly, the actual mass emissions will likely be less than those recorded at full load operation and total annual emissions are not expected to increase as a result of this change. With these considerations, the Department approves TEC's request for excess emissions of NO_X from the combustion turbine (EU 001) for up to one hour due to a fuel switching event.

For the simple cycle combustion turbines (EU009 & EU010) the Department feels that excess emissions related to manufacturer-required tuning activities are small in comparison to higher actual daily emissions from improperly tuned equipment. Allowing short periods of slightly higher emissions during the tuning events results in lower total actual annual emissions. As such, the Department has been routinely encouraging operators to keep their combustion turbines properly tuned by allowing periods of excess emissions resulting from tuning to be excluded from the NO_X CEMS compliance averages in more recently issued permits. However, these emissions units were permitted prior to the current permitting practice under permit No. PSD-FL-263, which was issued on October 8, 1999. To encourage proper tuning in order to keep total annual emissions as low as possible, the Department approves TEC's request to exclude periods of excess emissions from the NO_X CEMS data for compliance demonstration periods for EU009 and EU010. This permit establishes a new, stand-alone, condition for excludable emissions, which is in addition to the provisions/requirements established in permit No. PSD-FL-263 (and subsequent revisions).

This permit does not authorize any increases in the allowable permitted capacities or pollutant emissions limits for any of the permitted emissions units at this facility. Except for the revised conditions listed below, the plant must continue to comply with all other existing permit restrictions.

SECTION 2. PERMIT REVISIONS

The following permit conditions are revised as indicated. ~~Strikethrough~~ is used to denote the deletion of text. Double-underlines are used to denote the addition of text. All changes are emphasized with yellow highlight.

Permit Being Modified: Permit No. 1050233-029-AC/PSD-FL-194J

Affected Emissions Unit: Combined Cycle Combustion Turbine, EU001.

1. Section 2, Specific Condition 13, is revised as follows:

   13. Excess Emissions: The following excess emissions provisions cannot be used to vary any NSPS or NESHAP requirements from any subpart of 40 CFR 60 or 40 CFR 63. Unless otherwise specified in this permit, the following conditions apply.

      a. *Excess Emissions Allowed - Startup, Shutdown or Malfunction*. Excess emissions resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) 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. Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during start-up, shutdown, or malfunction shall be prohibited.

      b. *Best Operational Practices to Minimize Excess Emissions*. The permittee shall follow the best operational practices to minimize excess emissions during startup and shutdown.

      c. *Excess Emissions Prohibited*. Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown or malfunction shall be prohibited.

      d. *Excess Emissions Allowed – Fuel Switching*. Excess emissions of NO_X from the combined cycle combustion turbine (EU 001) resulting from fuel switching (either syngas-to-natural gas or natural gas-to-syngas) shall be permitted providing (1) the manufacturer's operational instructions for performing a fuel switch are followed and (2) the duration of excess emissions from each fuel switch shall be minimized but in no case exceed one hour in duration.

   [Rule 62-210.700 and 62-213.440(1), Operational Requirements that Assure Compliance, F.A.C. and Applicant's Request]

2. Section 3, Specific Condition 18, is revised as follows:

   18. Records of Startup, Shutdown, Fuel Switching and Malfunction: The owner or operator shall make and maintain records of periods of startup, shutdown, fuel switching and malfunction. These records shall show the dates, times and duration of these episodes and shall document suspected cause of each episode, corrective actions taken by the owner or operator and actions taken to reduce excess emissions. [Rule 62-4.070(3), F.A.C.]

The following is a new condition, which is created in addition to all previously established conditions in permit No. PSD-FL-263 (and subsequent revisions) for Simple Cycle Combustion Turbine Nos. 2 and 3.

Permits Being Enhanced: Permit Nos. PSD-FL-263 and 1050233-032-AC/PSD-FL-263B

Affected Emissions Units: Simple Cycle Combustion Turbines, EU009 and EU010.

3. Allowable NO_X Data Exclusions - Tuning. Provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions are minimized, NO_X CEMS data collected during initial or other tuning sessions shall be excluded from the compliance demonstrations provided the tuning session is performed in accordance with the manufacturer's specifications. The permittee shall report any excess emissions in the quarterly NO_X report. [Rule 62-210.700(5), F.A.C.]