



May 4, 2015

Mr. David L. Read, P.E.
Permitting Section Administrator
Division of Air Resource Management
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 5500
Tallahassee, Florida 32399-2400

RE: Request for Permit Determination
Power Block 2 Replacement Steam Turbine Commissioning
Hines Energy Complex
Duke Energy Florida, Inc.
Facility ID No: 1050234

Dear Mr. Read:

Duke Energy Florida, Inc. (DEF) is requesting a permit determination for the commissioning of the replacement steam turbine for Power Block 2 (PB2) located at the Hines Energy Complex.

As you may know, PB2 is configured as two (2) combustion turbines each with its own heat recovery steam generator (HRSG) that provides steam for one (1) steam turbine, commonly referred to a "2-on-1" combined-cycle unit. In addition, the combustion turbines do not have by-pass stacks so they are unable to operate in the simple-cycle mode of operation without bypassing the steam turbine and directing large quantities of steam to the condensers.

PB2 experienced a catastrophic failure and resulting fire on July 7, 2014, which essentially destroyed the steam turbine. As a result, the emission units (i.e., combustion turbines) in PB2 have not operated for nearly one (1) year. Siemens, the manufacturer of the original PB2 steam turbine, has manufactured a replacement steam turbine that is identical to the original steam turbine. That is, there will be no improvement in generation efficiency with the replacement steam turbine.

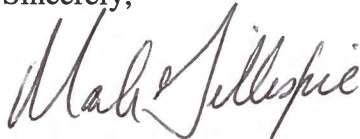
In order to properly shakedown/commission the replacement steam turbine, DEF must operate the combustion turbines in the manner and on the schedule proposed in the attached commissioning narrative. As proposed in the commissioning narrative, DEF expects emissions of carbon monoxide (CO) and nitrogen oxides (NO_x) to be well above the Best Available Control Technology (BACT) limits of 16 and 3.5 ppmvd @15% O₂ as 24-hour block averages, respectively, for extended periods of time. These emission limits were established in Permit No. 1050234-007-AC/PSD-FL-296A and included in the current Title V Air Operation Permit No.

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1050234-020-AV. Conversely, DEF does not expect the NO_x and SO₂ emissions to exceed the New Source Performance Standards (NSPS) Subpart GG as determined by §60.332 and §60.333, respectively.

If you have any questions, regarding this request or the attached proposed steam turbine commissioning narrative, please contact Mr. Chris Bradley by telephone at (727) 820-5962 or via email at Chris.Bradley@duke-energy.com.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Gillespie". The signature is written in a cursive style with a large initial "M".

Mark Gillespie, P.E.
Station Manager
Hines Energy Complex

Attachments:

Proposed Project Stages & Duration of Commissioning the PB2 Steam Turbine
Hines Energy Complex Responsible Official Signature Page
Professional Engineer Signature & Seal Page

cc: Tommy Oneal, Hines Energy Complex
DEF FL-903 Files
FDEP Southwest District Compliance Assurance Program

DUKE ENERGY FLORIDA, INC. - HINES ENERGY COMPLEX

PROJECT STAGES & DURATION OF COMMISSIONING THE PB2 STEAM TURBINE

Projected Stages & Durations:

1. Compressed Air Blows on the Heat Recovery Steam Generator (HRSG) - This effort occurred for approximately 30 hours over the course of two (2) days – March 27 and March 28, 2015. No emissions were generated.
2. Hot Water/"Detergent" Cleaning of the HRSGs - This process began April 14, 2015 and was concluded on April 24, 2015. The hot water was generated using steam scavenged from the remaining power blocks (PBs) via interconnected steam header/piping. This process did not create any emissions.
3. Combustion Turbine (CT) Synchronizing – This stage is currently scheduled to begin around May 15, 2015 and the CTs are expected to operate intermittently for up to seven (7) days. However, the actual duration of operation is dependent upon how quickly the generators will synchronize to the grid. Under this operational mode, the steam generated by the HRSGs will bypass the steam turbine and will be released to the atmosphere. Emissions will be generated during this process. Each CT will run no more than three (3) hours per day.

It is important to note the CTs will be operated at a load that will ensure compliance with the current BACT CO and NOx limits.

4. CT/HRSG Steam Purity Tests and High Load Operations – This stage is currently scheduled to begin around May 25, 2015 and is expected to last approximately four (4) to seven (7) days. However, the actual duration of operation is dependent upon how quickly steam of an acceptable purity can be produced. Under this operational mode the steam generated by the HRSGs will bypass the steam turbine and will be directed ("dumped") to the condenser until the steam purity is acceptable. Once acceptable steam purity is achieved the CTs will then be shut down for at least 24 hours. Emissions will be generated during this process.
5. Rolling and Troubleshooting of the Steam Turbine – After acceptable CT Synchronizing and Steam Purity are reached, the CTs will be shut down for at least 24 hours followed by:
 - a. A single CT will be started and used to "roll up" the steam turbine in the "Full-Speed/No-Load" mode of operation. This effort is expected to take place over the course of approximately 24 to 48 hours.
 - b. Once the steam turbine satisfactorily completes the "Full-Speed/No-Load" portion of the acceptance testing, the steam turbine will be synchronized to the grid at minimum load and then the load slowly increased. It is expected the CTs will be operated at approximately 20% load. This low-load CT operation is necessary to maintain proper CT exhaust temperatures in order to match steam temperatures and pressures and steam turbine metal temperatures to ensure the even heating/expansion of the steam turbine. (Uneven heating/expansion results in unwanted vibration.) When appropriate, the second CT will be started and the associated steam will be blended in as the steam turbine increases in load.

Based on the outcome of the steam turbine roll up, there is a possibility this CT load could be held for extended periods of time or the CT shutdown and steam turbine stopped in order to troubleshoot and correct problems. The CT would then be fired again at low load so as to

DUKE ENERGY FLORIDA, INC. - HINES ENERGY COMPLEX

PROJECT STAGES & DURATION OF COMMISSIONING THE PB2 STEAM TURBINE

slowly “roll up” the steam turbine again. This portion of the acceptance testing is expected to take 72 to 120 hours in total.

It is important to note that PB2 and its associated equipment have been laid-up for nearly twelve (12) months and other Balance of Plant (BOP) issues (including other vibrations) may manifest themselves. If these issues do appear, the steam turbine may have to be shut down and the problems rectified. This could result in additional operating days at low-load to support the possibility of subsequent steam turbine starts and “roll-up”.

Although the steps in the steam turbine shakedown/commissioning process are scripted they are not “cookbook” in nature; that is, the anticipated order in which the steps are followed and their duration may not be foreseeable. As a result, there is a need for flexibility in this process and any resulting emissions. However, emissions will be minimized to the extent possible while still protecting the existing CTs, HRSGs, the rebuilt steam turbine, and any associated systems.

In summary, the steam turbine shakedown/commissioning process is necessary and with the lay-up of the two (2) CT/HRSG units for nearly a year and a rebuilt steam turbine, the process is not a predictable one. DEF does expect that:

1. CO emissions will exceed the BACT limit of 16 ppmvd @ 15% O₂ until the CT loads can be increased to approximately 100 MW.
2. It is not expected that the CTs will exceed the 40 CFR Part 60 Subpart GG (NSPS) NO_x limit of approximately 115 ppm, but as the SCR is not effective at low-load operation, NO_x emissions will exceed the BACT limit of 3.5 ppmvd @ 15% O₂. In order to mitigate the NO_x emissions, ammonia (NH₃) will be injected into the SCR grid as soon as it is effective.

DEF and its associated contractors will strive to minimize emissions of NO_x and CO, both of which will be continuously monitored, measured and reported employing certified CO and NO_x CEMS. In addition, CO and NO_x emissions will be reported in the quarterly excess emissions report required by the current Title V Air Operation Permit (Permit No. 1050234-020-AV).

APPLICATION INFORMATION

Professional Engineer Certification

1. Professional Engineer Name: Mark Bennett Gillespie Registration Number: 64963
2. Professional Engineer Mailing Address: Organization/Firm: Street Address: 15003 Eaglepark Place City: Lithia State: Florida Zip Code: 33547
3. Professional Engineer Telephone Numbers... Telephone: (863) 519 - 6103 ext. Fax: (863) 519 - 6110
4. Professional Engineer E-mail Address: Mark.Gillespie@duke-energ.com
5. Professional Engineer Statement: <i>I, the undersigned, hereby certify, except as particularly noted herein*, that:</i> <i>(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and</i> <i>(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.</i> <i>(3) If the purpose of this application is to obtain a Title V air operation permit (check here <input type="checkbox"/>, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.</i> <i>(4) If the purpose of this application is to obtain an air construction permit (check here <input type="checkbox"/>, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here <input type="checkbox"/>, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.</i> <i>(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here <input type="checkbox"/>, if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.</i> Signature <u>Mark Gillespie</u> Date <u>April 30, 2015</u> (seal)

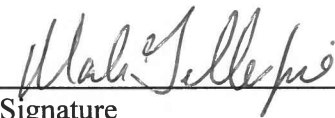
* Attach any exception to certification statement.

WEG 05/05/15

APPLICATION INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name : Mark Gillespie, Station Manager
2. Owner/Authorized Representative Mailing Address... Organization/Firm: Duke Energy Florida, Inc./Hines Energy Complex Street Address: 7700 County Road 555 City: Bartow State: Florida Zip Code: 33830
3. Owner/Authorized Representative Telephone Numbers... Telephone: (863) 519 - 6103 ext. Fax: (863) 519 - 6110
4. Owner/Authorized Representative E-mail Address: Mark.Gillespie@duke-energy.com
5. Owner/Authorized Representative Statement: <i>I, the undersigned, am the owner or authorized representative of the corporation, partnership, or other legal entity submitting this air permit application. To the best of my knowledge, the statements made in this application are true, accurate and complete, and any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department.</i>  Signature <u>April 30, 2015</u> Date

