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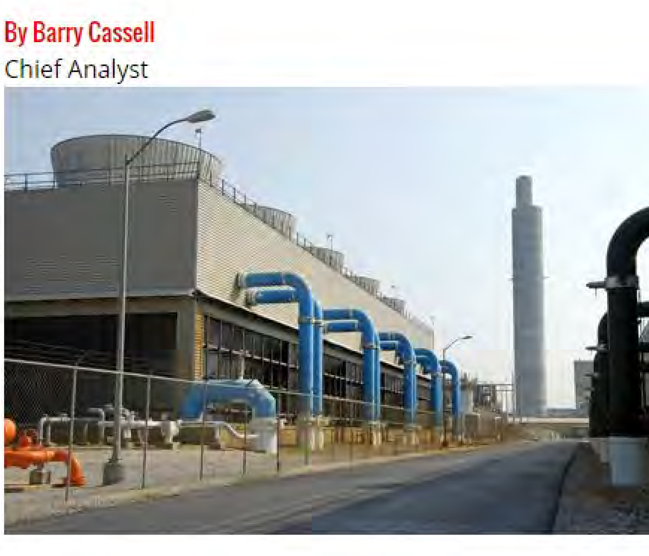
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ESC Harrison Kicks Off Permitting for 640-MW, Gas-Fired Project in West Virginia

Dec 21, 2016

By Barry Cassell
Chief Analyst



ESC Harrison County Power LLC applied Nov. 22 at the West Virginia Department of Environmental Protection for an air permit allowing it to construct, install, and operate a new natural gas fired combined-cycle combustion turbine (CT) plant, to be located near the City of Clarksburg, Harrison County, West Virginia.

The application was recently posted to the department's website. ESC said it would like DEP air permit approval by October 2017 to provide sufficient time for financing, equipment ordering, fabrication, construction, and installation, and achieving commercial operation by June 2020. This project would have a nominal gross electrical generating capacity of 640 MW.

The project site is zoned for industrial use, and provides multiple strategic advantages that will allow the plant to produce low-cost baseload electricity, the application said. The proposed primary point of interconnection is a direct 138-kV interconnection to the FirstEnergy/Allegheny Power existing Glen Falls 138-kV substation, situated about two miles north of the project site. Plant output will be sold into the PJM Interconnection regional electric grid.

This new plant requires pre-construction approval of an air permit under the federal Prevention of Significant Deterioration (PSD) program and under the DEP's regulations. The emission sources associated with the project are:

- One General Electric (GE) Frame 7HA.02 advanced combined-cycle CT, with a Heat Recovery Steam Generator (HRSG) equipped with Duct Burners (DB), both firing pipeline quality natural gas;
- One Auxiliary Boiler with a maximum heat input of 77.8 million British Thermal Units per hour (MMBtu/hr) which will burn pipeline quality natural gas;
- One Fuel Gas Heater with a maximum heat input of 5.5 MMBtu/hr which will burn pipeline quality natural gas;
- One 2,000-kW Emergency Generator fueled by ultra-low-sulfur diesel (ULSD) fuel;
- One 315 horsepower (hp) emergency Fire Water Pump fueled by ULSD; and
- Diesel fuel, lubricating oil, and aqueous ammonia storage tanks.
- Cooling of the plant's steam driven electric generator will be achieved using a Dry Air Cooled Condenser (DACC).

This is a 1x1 project with one CT and one steam turbine.

Electricity will be generated using the one combined-cycle CT, with a design maximum heat input of approximately 3,496.2 million British Thermal Units per hour (MMBtu/hr), on a Higher Heating Value (HHV) basis. The CT will drive a generator to produce electricity. The electricity generated by the CT will be routed through a local electrical substation and sold on the grid. The highly efficient combined-cycle CT (HCCT-1) will be equipped with an inlet evaporative cooling system used at higher ambient temperatures to increase the density of the combustion air, thereby increasing fuel and mass flow and, in turn, power output. The air density increase will be accomplished by evaporating water into the inlet air, which will decrease air temperature and correspondingly increase air density.

The project includes the installation of DB to produce additional steam in the HRSG for additional power output from the steam turbine generator. The maximum duct firing level is expected to be 1,001.3 MMBtu/hr on a HHV basis. The fuel for the DBs will be the same as for the CT: pipeline-quality natural gas. Steam generated in the HRSG is routed to a steam driven turbine with a dedicated electric generator.

The CT will be equipped with dry low-NOx (DLN) combustors. These combustion controls, along with Selective Catalytic Reduction (SCR) systems, will control emissions of nitrogen oxides (NOx) from the CT. An Oxidation Catalyst will be used to control carbon monoxide (CO) and volatile organic compounds (VOC) emissions from the CT. The SCR and Oxidation Catalyst will be incorporated into the HRSG, at locations where the emission control reactions optimally occur.

SCR involves the injection of aqueous ammonia (NH_3) with a concentration of less than 20% by weight into the CT/DBs exhaust gas stream. Ammonia reacts with NOx in the CT exhaust gas stream, reducing it to elemental nitrogen (N_2) and water vapor (H_2O). The aqueous ammonia will be stored on-site in one storage tank with a capacity of approximately 35,000 gallons.

The CT/DB will have its own exhaust stack, which is expected to have a height of 205 feet above grade. For permitting and emissions estimating purposes, this application assumes that the CT/DBs will operate 8,760 hours per year (hr/yr).

ESC Harrison is controlled by Energy Solutions Consortium Holdings LLC. Contact information shown in the application is: ESC Harrison County Power LLC, Andrew Dorn IV, Manager, 360 Delaware Avenue, Suite 406, Buffalo, NY 14202.

Notable is that the attorneys for ESC Harrison County Power filed a Nov. 14 notice with the West Virginia Public Service Commission that ESC Harrison intends to file no sooner than 30 days from the date of this notice an application for a siting certificate for this project. That application had not been filed as of Dec. 20.

This project was also the subject of a May 2016 study from PJM. For this project, which has PJM queue #AA2-119, the connection to ESC Harrison's facilities will be provided through a direct connection to the 138-kV bus in the Glen Falls substation. The intent of this System Impact Study is to determine a plan, with approximate cost and construction time estimates, to connect the subject generation interconnection project to the PJM network at a location specified by the power project developer. It is a mid-point in a queue process that eventually leads to an Interconnection Service Agreement. The project entered the queue in April 2015.

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