

BEFORE THE POWER SITING BOARD OF THE STATE OF OHIO

**In the Matter of the Letter of Notification Application)
of Long Ridge Energy Generation, LLC for the Long) Case No. 21-0789-EL-BLN
Ridge Energy Amendment Project)**

Members of the Board:

Chair, Public Utilities Commission	Ohio House of Representatives
Director, Development Services Agency	Ohio Senate
Director, Department of Health	
Director, Department of Agriculture	
Director, Environmental Protection Agency	
Director, Department of Natural Resources	
Public Member	

To the Honorable Power Siting Board:

Please review the attached Amended Staff Report of Investigation, which has been filed in accordance with Ohio Power Siting Board (Board) rules. The accelerated certificate application in this case is subject to an automatic approval process as required by Ohio Revised Code (R.C.) 4906.03 and Ohio Administrative Code (Ohio Adm.Code) 4906-6.

Staff recommends the application for automatic approval September 10, 2021, unless suspended by the Board, an administrative law judge, or the chairperson or executive director of the Board for good cause shown. If suspended, the Board must render a decision on the application within 90 days from the date of suspension.

Please present any concerns you or your designee may have with this case to my office at least four business days prior to September 10, 2021, which is the recommended automatic approval date.

Please present any concerns you or your designee may have with this case to my office.

Sincerely,

Merna White

Theresa White
Executive Director
Ohio Power Siting Board

OPSB STAFF REPORT OF INVESTIGATION

Case Number: 21-0789-EL-BLN
(associated with case number 17-1091-EL-BLN)

Project Name: Long Ridge Energy Amendment

Project Location: Monroe County

Applicant: Long Ridge Energy Generation, LLC

Application Filing Date: July 23, 2021

Inspection Date: December 21, 2020

Report Date: September 3, 2021

Recommended Automatic Approval Date: September 10, 2021

Applicant's Waiver Requests: None

Staff Assigned: A. Holderbaum, A. Conway, J. Cross

Summary of Staff Recommendations (see discussion below):

Application: ☐ Approval ☐ Disapproval ☒ Approval with Conditions

Waiver: ☐ Approval ☐ Disapproval ☒ Not Applicable

Application Review

Project Description

Long Ridge Energy Generation, LLC (Applicant) proposes to amend the previously issued certificate in Case No. 17-1091-EL-BLN to allow the generation facility to utilize a hydrogen-natural gas fuel blend of up to 20 percent hydrogen in the combustion turbines for the project. The Applicant plans to implement the conversion to a hydrogen-natural gas fuel blend through two phases. Phase 1 will be to accomplish a five percent hydrogen blend and Phase 2 will be to accomplish a 20 percent hydrogen blend.

GE Gas Power and Long Ridge Energy Generation, LLC issued a joint press release on its collaboration to utilize a hydrogen blend at the facility. According to the Applicant, GE Gas Power has experience with combustion of non-standard fuels in its combustion turbines products and a handful of cases with using refinery gas with up to 70 percent hydrogen concentration. GE Gas Power and Long Ridge Energy Generation, LLC issued a joint press release on its collaboration to utilize a hydrogen blend at the facility. Staff has found that GE Gas Power's 7HA model combustion turbines can utilize up to 50 percent hydrogen blend.¹

1. GE Gas Power, 7HA gas turbine, <https://www.ge.com/gas-power/products/gas-turbines/7ha> (Accessed August 11, 2021).

Long Ridge Energy Generation, LLC initially would receive delivery of the hydrogen fuel to the facility via tube trailers, which is similar to a semi-truck that is used for commercial gas delivery and transportation. The Applicant is an affiliate of Ohio River Partners Shareholder, LLC (ORP). ORP currently has a contract with General Hydrogen Corporation to purchase process byproduct hydrogen to be delivered in tube trailers containing a minimum of 130,000 standard cubic feet of hydrogen gas with a minimum purity of 99.95 percent. The tube trailers would deliver the hydrogen onsite to a hydrogen tube trailer offloading station. The hydrogen would be piped to a hydrogen blending skid and fuel gas tie-in. The Applicant currently estimated that one tube trailer could provide approximately 40 minutes to one hour of operational supply. Long Ridge Energy Generation LLC currently envisions this method of hydrogen blending by tube trailer as an interim step to attract a customer for hydrogen-fueled power. The Applicant would manage hydrogen delivery in a continuous process with approximately four to five trailers on site at any time: two trailers connected to the offloading manifold, two staged in waiting, and the fifth trailer in transit nearby. After satisfactory proof of the hydrogen blending concept and its economics, the Applicant anticipates installation of a more permanent hydrogen production technology to deliver fuel via pipeline.

The preliminary locations of the offloading station, pipeline, and fuel gas tie-in are included in Exhibit B of the Application. This Application includes an approximately 900 feet of three-inch diameter schedule 10S stainless steel pipe to deliver the hydrogen from the offloading station to the fuel gas tie-in location. The design pressure has not yet been finalized but would be approximately 650 to 750 pounds per square inch gauge. The Applicant has confirmed that the entire hydrogen blending project including these hydrogen blending/handling facilities will be incorporated and reflected in Long Ridge Energy Generation, LLC's operations and maintenance plans, site wide safety program, and procedures.²

Staff notes and the Applicant is aware of the challenges of burning hydrogen such as its lower energy density, faster flame speed, impacts to piping material, and safety. The Applicant further indicates that it has engaged multiple technical consultants (notably GE Gas Power, Black & Veatch, Tetra Tech, and Kiewit) to provide the engineering, hardware and software, air emissions analysis, and implementation package to blend up to five percent hydrogen by volume into the fuel stream as the initial phase. Staff also notes that GE Gas Power has found that the Dry Low NOx (DLN) model 2.6+ burners used by the GE Gas Power 7HA.02 combustion turbine are currently only capable of operating on a hydrogen level of approximately 15 percent. The Applicant also expects that the fuel supply manifolds on the combustion turbine and some sections of fuel piping would be replaced to handle the increased volumes and exposure to hydrogen.³ The Applicant also intends to review the controls and safety systems to determine if other upgrades are necessary. The Applicant stated that its upgrade plan would mainly use equipment from GE, the manufacturer of the combustion turbine. Staff agrees with this analysis and approach. Staff recommends that at least 30 days prior to use of any fuel blend greater than 15 percent hydrogen by volume, that the Applicant shall provide OPSB Staff an engineering technical memorandum, with input or review from its engineering consultants or GE Gas Power, that the DLN burners installed at Long Ridge Energy Generation, LLC are able to operate at a fuel blend of 15 percent hydrogen by volume or

2. Long Ridge Energy Generation, LLC's August 12, 2021 Responses to Staff's August 10, 2021 Data Requests, DR #11.

3. Long Ridge Energy Generation, LLC's August 12, 2021 Responses to Staff's August 10, 2021 Data Requests, DR #10.

more. The engineering technical memorandum shall also describe or note any retrofit/replacement of the DLN burners or study results of the DLN burners to accommodate a hydrogen percent higher than 15 percent.

Electric Grid

The Applicant submitted a generation interconnection request for the Hannibal Port Power Project to PJM Interconnection, LLC (PJM) in April 2016.⁴ The request was for a total injection of 485-megawatt (MW) injection into the bulk power system. PJM assigned the request queue position number AB2-093.⁵ The Interconnection Service Agreement (ISA) and Interconnection Construction Service Agreement (ICSA) were filed at the Federal Energy Regulatory Commission.⁶ The Applicant asserts that no changes would be required with PJM via the New Services Queue to allow the units to use a hydrogen-natural gas fuel blend.

*Air Pollution*⁷

According to the Applicant, its air pollution Permit-to-Install (PTI), Permit No. P0122829, must be modified to accommodate blending of up to five percent hydrogen into the fuel stream. The Applicant, its consultant Tetra Tech, and GE developed an air emissions forecast and marked up version of the current PTI that reflects the five percent hydrogen blend. On July 19, 2021, the Ohio Environmental Protection Agency (Ohio EPA) received the air emission dispersion modeling and request for an administrative modification to the PTI. Ohio EPA's preliminary review indicates no emissions increases and Ohio EPA expects to issue the administrative modification to accommodate blending up to five percent hydrogen by the end of August 2021.

Staff consulted Ohio EPA Division of Air Pollution Control personnel about the proposed request for a hydrogen fuel blend of up to 20 percent. Ohio EPA advised that the current proposal was only for five percent and that alterations would require submittal of an emissions evaluation or an

4. PJM Interconnection, LLC is the regional transmission organization charged with planning for upgrades and administering the generation queue for the regional transmission system in Ohio. Generators wanting to interconnect to the bulk electric transmission system located in the PJM control area are required to submit an interconnection application for review of system impacts. The interconnection process provides for the construction of expansions and upgrades of the PJM transmission system, as needed to maintain compliance with reliability criteria with the addition of generation in its footprint.

5. PJM Interconnection, "New Services Queue," Queue ID: AB2-093, accessed August 11, 2021, <https://pjm.com/planning/services-requests/interconnection-queues>.

6. Letter orders accepting the ISA and ICSA were issued on May 9, 2019 and October 24, 2019, respectively. Interconnection Service Agreement by and Among PJM Interconnection, LLC and Long Ridge Energy Generation LLC and AEP Ohio Transmission Company, Inc., Docket No. ER19-1302-000 (Mar. 14, 2019) (ISA 5300). Interconnection Construction Service Agreement by and Among PJM Interconnection, LLC and Long Ridge Energy Generation LLC and AEP Ohio Transmission Company, Inc., Docket No. ER19-2682-000 (Aug. 26, 2019) (ICSA 5454).

7. The Revised Code provides for the Ohio EPA to administer and enforce the provisions of R.C. Ch. 3704 with regards to air pollution control. See e.g., RC 3704.03, 3704.161. The Ohio EPA Division of Air Pollution Control ensures compliance with the federal Clean Air Act and the Emergency Planning and Community Right-to-Know Act as part of its mission to attain and maintain air quality at a level that protects the environment and public health. (Ohio EPA, Division of Air Pollution Control, <https://www.epa.ohio.gov/dapc/#188913097-featured-topics>). The Division of Air Pollution Control develops and enforces rules in the Ohio Administrative Code, which assist the state of Ohio to: attain and maintain the National Ambient Air Quality Standards (NAAQS) contained in the Clean Air Act; fulfill the requirements set forth by the Ohio General Assembly in R.C. 3704; and protect and maintain healthy air quality for the citizens of the state of Ohio. (See, Ohio EPA, Division of Air Pollution Control Rules and Laws, <<https://www.epa.ohio.gov/dapc/DAPCrules>>).

administrative modification application prior to proceeding with another fuel change. In order to accommodate the blending above five percent hydrogen into the fuel stream, Staff recommends that prior to any blending of hydrogen greater than five percent, that within seven days of submission to Ohio EPA, the Applicant shall provide to OPSB Staff and docket a copy of emissions evaluation or the administrative modification application for any fuel blends that are greater than five percent hydrogen by volume.

Staff finds that with the commitments from the Applicant, adherence to the Ohio EPA PTI Permit No. P012289, and the conditions below, the facility would comply with requirements of R.C. Chapter 3704.

Cultural Resources

The proposed modifications would not result in increased impacts to cultural resources. Adherence to the conditions of the original certificate would minimize impacts to these resources.

Surface Waters

The proposed modifications would not result in increased impacts to surface waters. Adherence to the conditions of the original certificate would minimize impacts to these resources.

Listed Species

The proposed modifications would not result in increased impacts to listed wildlife species. Adherence to the conditions of the original certificate would minimize impacts to listed species.

Recommended Findings

Staff's review of the application included consideration of the requirements listed in R.C. 4906.10. Based on Staff's review, the application meets the necessary criteria for granting a certificate. Staff recommends approval of this application on September 10, 2021 subject to the following conditions. Staff notes that its recommendation for approval of this application should not be construed as a recommendation for approval of cost recovery in any ratemaking proceeding.

Recommended Conditions

- (1) The Applicant shall continue to adhere to all conditions as certificated in Case No. 17-1091-EL-BLN.
- (2) Subject to the application of R.C. 4906.13(B), the certificate authority provided in this case shall not exempt the facility from any other applicable and lawful local, state, or federal rules or regulations nor be used to affect the exercise of discretion of any other local, state, or federal permitting or licensing authority with regard to areas subject to their supervision or control.
- (3) Prior to the commencement of construction activities related to the hydrogen fuel facilities in areas that require permits or authorizations by federal or state laws and regulations, the Applicant shall obtain and comply with such permits or authorizations. The Applicant shall provide copies of permits and authorizations, including all supporting documentation, on the case docket prior to commencement of construction.

- (4) Within 30 days prior to the use of any fuel blend greater than 15 percent hydrogen by volume, the Applicant shall provide OPSB Staff and docket a copy of an engineering technical memorandum, which can include input or review from its engineering consultants or GE Gas Power, that the DLN burners installed at the Long Ridge Energy Generation Project are able to operate at a fuel blend of 15 percent hydrogen by volume or more. The engineering technical memorandum shall also describe or note any retrofit/replacement of the DLN burners or study results of the DLN burners to accommodate a hydrogen percent higher than 15 percent.
- (5) Within seven days of submission to Ohio EPA, the Applicant shall provide OPSB Staff and docket a copy of the emissions evaluation or the administrative modification application for any fuel blends that are greater than five percent hydrogen by volume.
- (6) Within 60 days after the commencement of commercial operation, the Applicant shall submit to Staff a copy of the as-built specifications for the entire facility. If the Applicant demonstrates that good cause prevents it from submitting a copy of the as-built specifications for the entire facility within 60 days after commencement of commercial operation, it may request an extension of time for the filing of such as-built specifications.
- (7) The Applicant shall use reasonable efforts to provide as-built drawings in both hard copy and as geographically-referenced electronic data.
- (8) The Applicant shall file within 30 days prior to commencement of construction to allow for the use of hydrogen as a fuel, the final engineering drawings for the offloading station, hydrogen pipeline, and fuel gas tie-in. Separate submittals may be done for the hydrogen pipeline and fuel gas tie-in if constructed separately from the offloading station.

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Case No(s). 21-0789-EL-BLN

Summary: Staff Report of Investigation electronically filed by Mr. Matt Butler on behalf of Staff of OPSB