



DANSKAMMER ENERGY CENTER

Case No. 18-F-0325

1001.36 Exhibit 36

Gas Interconnection

Contents

Exhibit 36: Gas Interconnection	1
36(a) Gas Supply Options, Capacity, and System Impact.....	1
(1) Proposed Gas Pipeline Interconnection.....	1
(2) Gas Supply and Gas Transmission Capacity.....	2
(3) Gas Requirement Estimates	3
(4) Natural Gas Capacity and Transportation Service.....	4
(5) Potential Impacts on the Gas Distribution System.....	4
(6) Potential Impact on Gas Wholesale Supplies and Prices in the Region.....	5
36(b) Preliminary Design Details.....	6
(1) Class Criteria.....	6
(2) Location and Design of Valves.....	6
(3) Plan for Pressure Testing.....	6
(4) Cathodic Protection Measures	6

Tables

Table 36-1. Interstate Pipelines that Interconnect to CHGE’s LDS	3
Table 36-2. Danskammer Energy Center Gas Requirements	4

Appendix

Appendix 36-1. CHGE Letter

Appendix 36-2. CHGE System Gates – Pressure History

Exhibit 36: Gas Interconnection

Danskammer, is proposing to repower its existing generating facility (the Danskammer Generating Station) located in the Town of Newburgh, Orange County, New York with a state-of-the-art natural gas fired combined cycle power generation facility (the Project). This Exhibit addresses gas supply options, capacity, and system impact, as well as a description and design concept details for the gas interconnection.

36(a) Gas Supply Options, Capacity, and System Impact

(1) Proposed Gas Pipeline Interconnection

The Project will be connected to an existing Central Hudson Gas & Electric Corporation (CHGE) natural gas metering station located on the Project Site, owned by CHGE, which will be upgraded to accommodate the Project. Upgrades to the existing metering station will be constructed, owned, and operated by CHGE. Gas will continue to be supplied to the Project Site through an existing 12-inch steel service line. The gas yard interconnection will be a 150-foot long 12-inch line. There are two pipelines feeding the metering station through CHGE's gas network which are identified by CHGE as a 12-inch Tuxedo to Poughkeepsie-Danskammer (TPD) spur and a 16-inch Mahopac to Poughkeepsie-Roseton (MPR) spur. These lines will remain in place and continue to serve the Project.

The new gas interconnection will be located within the existing high-pressure piping in CHGE's metering station. CHGE has indicated in its letter provided in Appendix 36-1, that the gas metering yard will need to be upgraded and that the gas yard may need to become as much as four times larger than the existing yard. It is anticipated CHGE will include isolation valves and flow metering as part of the upgrades to the metering station. CHGE will replace the existing equipment to provide more capacity and to include redundancy to allow maintenance during continuous operation of the Project as a baseload power generating facility. During construction and prior to first fire of the combustion turbine or auxiliary boiler, CHGE will develop a design for the metering station that meets the Project's needs. The upgraded metering station may remain at or adjacent to the existing location. New piping will be routed through a new pipe rack to the gas treatment equipment, control and safety valves and gas compressors located in the west Auxiliary Area, as shown on the Preliminary Site Plan as part of Exhibit 11 of this Application.

Operating pressure at the CHGE interconnection is expected to vary from 200 pounds per square inch gauge (psig) to 750 psig. Compression or pressure reduction, as needed to meet the

Project's combustion turbine's allowable pressure inlet range, will be accomplished by equipment downstream of the metering station. Maximum gas flow rate will be 3,630 thousands of standard cubic feet per hour (mscfh) (4.02 billion British thermal units per hour (BBtu/hr), higher heating value (HHV)).

- Gas compression will be required to increase pressure to 700 psig (nominal) when pressure in the supply line is lower than this level. Gas compressors will be located in the Auxiliary Area and are expected to be constructed, owned, and operated by Danskammer. The possibility exists for the compressors to be owned and operated by CHGE if that would be mutually beneficial, with such determination to be made unilaterally by CHGE.
- Gas compressors will be electric motor-driven rotary screw or centrifugal type housed in individual acoustical and weather protected enclosures. These compressors will be packaged systems with operating controls to meet the combustion turbine (CT) pressure and flow requirements. Accessories provided will include gas filtration to protect the compressors from impurities in the incoming gas and closed-circuit air coolers to dissipate heat of compression and lubricating system heat.
- CHGE will continue to own and operate the gas metering yard where the interconnection is to be made.

(2) Gas Supply and Gas Transmission Capacity

A letter from CHGE explaining how it will physically transport gas through its local distribution system (LDS) on a baseload basis to the Project, is attached as Appendix 36-1. Currently there are four interstate pipelines that interconnect to CHGE's LDS, which are listed in Table 36-1 below, along with estimated spare/delivery capacity.

Table 36-1. Interstate Pipelines that Interconnect to CHGE’s LDS

Interstate Pipeline	Metered Capacity (MDth/Day)	Estimated Spare Delivery Capacity (MDth/Day)	CHGE Interconnection Point
Iroquois Gas Transmission (IGT)	365	270	Pleasant Valley Station
Algonquin Gas Transmission (AGT)	110	85	Mahopac Station
Tennessee Gas Pipeline (TGP)	51	28	Cedar Hill Station
Millennium Pipeline (MP)	Not an available option to Project	Not an available option to Project	Tuxedo Station
Source: FERC Form 549B Index of Customers – Q1-2019 for contracted capacity to the delivery point and Company informational postings for Metered Capacity.			

Based on the data reviewed, there is sufficient spare delivery capacity to CHGE’s LDS in excess of the maximum daily usage of the Project. Gas supply is readily available, please see (6) *Potential Impact on Gas Wholesale Supplies and Prices in the Region* below for further discussion. For discussion on types of transportation services, please see (4) *Natural Gas Capacity and Transportation Service* below. Interstate pipelines such as IGT and AGT exhibit seasonal characteristics and have approached or operated at throughput capacity limits during peak heating days during winter months in recent years. As such fuel transport to the Project may be interrupted under extreme circumstances. In order to protect against such potential transport curtailment the Project will have ultra-low sulfur diesel back-up fuel capability.

(3) Gas Requirement Estimates

Table 36-2 below tabulates the Project’s gas requirement estimates. The seasonal and annual gas requirement data is based on the capacities that were calculated in the ProMod production simulation analysis that is included in Exhibit 8 of this Application. The peak hour gas requirement data is based on the Project turbine Original Equipment Manufacturer’s (OEM’s) highest heat input at full load with duct firing. The peak day gas requirement is based on the turbine OEM’s highest heat input for 12 hours at full load with duct firing and 12 hours at full load without duct firing.

Table 36-2. Danskammer Energy Center Gas Requirements

	Danskammer Energy Center (BBtu, HHV)
Peak Hour	4.02
Peak Day	96.58
Seasonal	
Fall (September-November)	6,376
Winter (December- February)	6,037
Spring (March-May)	4,328
Summer (June-August)	8,229
Annual	24,971

(4) Natural Gas Capacity and Transportation Service

For its gas supply, the Project will: 1) make elections for a combination of both firm and interruptible transportation across CHGE's LDS under CHGE's SC11 and SC14 tariffs respectively (the existing Danskammer facility currently holds 19,000 MCF/day under SC11 and 35,000 MCF/day under SC14); and 2) secure transportation on interstate pipelines, through a combination of firm, interruptible and capacity release agreements, based on each of the interstate pipeline's, published tariff rates for each of the respective classes of transportation service. The Project will work with an energy marketing service agent and fuel supplier, who are yet to be appointed, to identify the most economic (lowest cost), options to purchase and transport fuel to the CHGE Interconnection Points for final delivery to the Project.

(5) Potential Impacts on the Gas Distribution System

As provided in its letter in Appendix 36-1, CHGE has conducted an analysis of its gas distribution system to assess its performance under various combinations of simultaneous demand from the Project and from other gas consumers. CHGE reported it anticipates being able to supply the required volume of gas without any major modification to its distribution system. The supply delivery point for the gas delivered to Danskammer is and will continue to be the Central Hudson Pleasant Valley Gate (Iroquois Pipeline) contingent upon delivery of gas to Pleasant Valley Gate Station is at pressures not less than 700 psig. When the Pleasant Valley line or station capacity are not available, Central Hudson's Mahopac Station can provide the volume needed contingent upon delivery pressures not less than 700 psig at the gate. The likelihood that the pressures will

be lower than those indicated above is very low as shown by the historic pressure curves, provided in Appendix 36-2. As evidenced by the rise in pressures shown at Mahopac in late 2019, that source has recently been upgraded and is now at higher pressures than it has historically. During discussions with the Central Hudson Gas Distribution department, there was no concern that the current transmission system would fail to deliver the gas needed by the project, and as long as the required pressures are provided at their gates, there should be no impact on the CHGE distribution system.

(6) Potential Impact on Gas Wholesale Supplies and Prices in the Region

The Project is not anticipated to have any meaningful impact on gas wholesale supplies and prices in the region. Based on the projection modeling conducted by ICF for Exhibit 8, the net incremental increase in annual gas consumption in New York State driven by the Project would be 7,065,711 MMBtu or 6,905,503 thousand cubic feet (MCF). According to the U.S. Energy Information Administration (EIA), in 2018 New York State consumed 1,350,507 million cubic feet (MMCF) of natural gas¹. The estimated incremental consumption from the Project would represent only a 0.53% increase in annual consumption.

Supply for the region is sourced from natural gas basins in Canada and the U.S. (primarily the Marcellus and Utica basins and Central South basins). According to EIA, “the U.S. Energy Information Administration estimates that the United States has about 464 Tcf of proved wet natural gas resources, which includes about 308 Tcf of shale gas resources and about 438 trillion cubic feet of dry natural gas. In the *Assumptions for the Oil and Gas Supply Module* of the National Energy Modeling System used to generate the projections in the Annual Energy Outlook 2019, EIA estimates that the U.S. has about 2,137 Tcf of unproved dry natural gas resources.”² The primary determinants of gas costs will be driven by weather and production/storage levels. Under EIA’s long-term forecast from 2020 through 2050, Henry Hub natural gas fuel prices are projected to remain below \$5.00 per million British thermal units (MMBtu) in its base Reference case³.

¹ https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_SNY_a.htm

² <https://www.eia.gov/energyexplained/natural-gas/where-our-natural-gas-comes-from.php>

³ Annual Energy Outlook 2019 with projections to 2050, p. 73.

36(b) Preliminary Design Details

(1) Class Criteria

The Project's gas interconnection will use ANSI 600 pound (lbs.) flanges and valves. Downstream of the gas treatment equipment, a stream will be taken off to supply low pressure gas (50 psig) to the Project's Auxiliary Boiler and Heat Recovery Steam Generator (HRSG) Duct Burner. A pressure regulator train will include 600 lb class control and isolation valves and downstream pressure protection to 150 psig. The piping pressure class will be 150 lbs. from the regulator train outlet to the Project's Auxiliary Boiler and Duct Burner.

(2) Location and Design of Valves

The Project's gas interconnection will use ANSI 600 lb flanges and valves from the tie-in point located aboveground in CHGE's metering yard and throughout the gas treatment and compression equipment. The compressors then feed the Project's CT with high pressure gas.

(3) Plan for Pressure Testing

This testing will be completed in accordance with 16 NYCRR 255.505. In accordance with this standard, pressure testing will follow pneumatic procedures using nitrogen or other available safe gases. Similarly, pipe cleaning will employ a combination of mechanical means and high velocity air flushing and air flushing will utilize silencers.

(4) Cathodic Protection Measures

The existing gas pipelines that are used to supply gas to the CHGE metering yard will continue to be protected from corrosion by CHGE. Underground lines, and associated cathodic protection measures, to the existing plant will remain in place until the existing plant is decommissioned. The Project's new gas piping will be isolated from CHGE so as not to interfere with cathodic protection. Cathodic protection is not required for new aboveground piping because it is protected from the environment by coating and/or painting.

APPENDIX 36-1

CHGE LETTER

This document contains confidential commercial information, trade secrets, or proprietary information, and/or critical infrastructure information and/or information that is statutorily exempt, as such is entitled to confidential treatment under Section 87(2) of the New York State Public Officers Law and the Commission's Rules and Regulations (16 NYCRR 6-1).

An unredacted version of this document has been submitted under separate cover pursuant to 16 NYCRR section 6-1.4.

APPENDIX 36-2

CHGE SYSTEM GATES – PRESSURE HISTORY

This document contains confidential commercial information, trade secrets, or proprietary information, and/or critical infrastructure information and/or information that is statutorily exempt, as such is entitled to confidential treatment under Section 87(2) of the New York State Public Officers Law and the Commission's Rules and Regulations (16 NYCRR 6-1).

An unredacted version of this document has been submitted under separate cover pursuant to 16 NYCRR section 6-1.4.