



Control Number: 35077



Item Number: 1200

Addendum StartPage: 0

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December 29, 2020

Filing Clerk
Public Utility Commission of Texas
1701 N. Congress Avenue
P.O. Box 13326
Austin, TX 78711-3326

**RE: Project No. 35077, ERCOT Standard Generation Interconnection Agreement
between CenterPoint Energy Houston Electric, LLC and Roughneck Storage, LLC**

To whom it may concern:

Enclosed for filing in Project No. 35077 is the Amendment to Exhibit "C" ERCOT Standard Generation Interconnection Agreement (SGIA) dated October 23, 2020 between CenterPoint Energy Houston Electric, LLC and Roughneck Storage, LLC. This filing is made pursuant to 16 Tex. Admin. Code § 25.195(e).

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Mickey Moon", with a long horizontal flourish extending to the right.

Mickey Moon
Assistant General Counsel
CenterPoint Energy Houston Electric, LLC

Enclosures: (1) Executed SGIA Amendment Provisions

AMENDMENT TO EXHIBIT "C"
ERCOT STANDARD GENERATION INTERCONNECTION
AGREEMENT

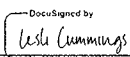
This Amendment ("Amendment") to the Electric Reliability Council of Texas Standard Generation Interconnection Agreement (the "SGIA"), is between **CenterPoint Energy Houston Electric, LLC** ("Transmission Service Provider"), a Texas limited liability company, and **Roughneck Storage LLC** ("Generator"), a Delaware limited liability company, (collectively, "the Parties") and made effective on the 23 day of October 2020. In consideration of the mutual promises and undertakings herein set forth, Generator and CenterPoint Energy agree to amend the SGIA as follows:

Exhibit "C" to the SGIA is replaced with the Exhibit "C" attached to this Amendment.

Except as otherwise expressly provided for herein, the SGIA will continue in full force and effect in accordance with its terms.

CenterPoint Energy Houston Electric, LLC and **Roughneck Storage LLC** have caused this Amendment to be executed in several counterparts, each of which shall be deemed to be an original, but all shall constitute one and the same instrument

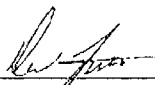
**CENTERPOINT ENERGY HOUSTON
ELECTRIC, LLC**

By:  _____
DocuSigned by
Lesli Cummings
10/23/2020 10:02:02 AM

Name: Lesli Cummings

Title: Manager Transmission Accounts & Support

ROUGHNECK STORAGE, LLC

By:  _____

Name: Daniel Fitzgerald

Title: Authorized Representative

Exhibit “C”
Interconnection Details
Amended and Restated as of October 8, 2020

- 1) Name: Roughneck Storage Project (“Plant”).
- 2) Point of Interconnection Location
 - A) TSP system side of Plant’s terminating structure(s) inside Generator’s GIFSUB, located approximately 1153 N. Columbia Dr., West Columbia, TX 77486 29° 9'31.16"N 95°39'40.67"W
- 3) Delivery Voltage: 138 kV
- 4) Number and Size of Generating Units
 - A) Plant will be comprised of twenty-five (25) generators with a total net rating of 50 MW (“Planned Capacity”), which is projected to be the Plant’s Net Dependable Capability, as defined by ERCOT Requirements.
- 5) Type of Generating Unit
 - A) Sunny Central SMA SCS 2475-US BESS bidirectional energy storage inverters rated at approximately 2.07MW each. Each generating unit will be connected to a 434V/34.5kV transformer, with the 34.5 kV windings connected behind a generator breaker
 - B) Each main power, standby and auxiliary transformer connected at Delivery Voltage will have a 138 kV circuit breaker for isolation from the TIF.
 - C) Electrical characteristics of Plant’s generating units shall be in accordance with the most recent version of data that Generator has provided to TSP and shall be consistent with data provided to ERCOT.
- 6) Metering Equipment
 - A) TSP shall provide and install ERCOT Polled Settlement (EPS) primary and check meters, 138 kV instrument transformers and associated wiring required for measuring the output of the Plant’s generation and auxiliary electrical load at TSP’s WEST COLUMBIA Substation. The 138 kV metering instrument transformers for the EPS metering shall be procured by TSP and owned, maintained, and replaced by TSP. TSP shall install and maintain the metering system’s components in a manner consistent with ERCOT Requirements and the PUCT Substantive Rules.
- 7) Generator Interconnection Facilities (GIF)
 - A) Generator shall furnish, operate, and maintain a complete generation facility capable of generating the Planned Capacity, including, but not limited to, all generators, power system stabilizers, generator step-up transformers, protective devices, and other transformers and associated foundations, the terminating structures, all relays necessary for the protection, synchronization and coordination of the generators, generator auxiliary equipment and the disconnect switches and foundations at the Point of Interconnection.
 - B) The generation unit(s) shall meet all voltage and reactive requirements as outlined in the ERCOT Protocol, ERCOT Operating Guides and other binding documents.

- C) Generator shall furnish, own and maintain the connection from Plant's equipment to Plant's terminating structure at the Point of Interconnection, including phase conductors, static conductors, structure(s), tower fittings, suspension insulators, terminating clamps and line conductor terminal fittings.
- D) TSP shall provide to Generator the TSP's alpha/numeric identifiers for incoming 138 kV transmission lines and shall provide TSP's alpha/numeric identifiers for high voltage circuit breakers, switches, power transformers, generators and certain low side equipment and the TSP's assigned 6-character substation identification for the GIF. The GIF high voltage circuit breakers, switches, transformers, generators and certain low side equipment, including 34.5kV feeder breakers, shall be identified with TSP's identifiers. TSP will develop a substation basic one-line diagram that includes these identifiers. The Generator shall mark these identifiers on the substation equipment. TSP may stencil identification numbers on substation equipment and mount signs, labels, drawings, telephone numbers, and instructions on the GIF. The Generator shall use TSP's assigned substation name, or Substation ID, and equipment identifiers in discussions with TSP and in RARF submittals.
- E) Generator shall provide the foundations for Plant's terminating structures and disconnecting devices. Generator shall design and install the Plant's terminating structure(s), and disconnecting devices in accordance with TSP's conductor loading requirements.
- F) Generator shall connect its generating plant ground mat, directly or indirectly to TSP's WEST COLUMBIA Substation ground mat. The grounding method shall be designated by the TSP and descriptions for each method are as follows:
 - 1) Direct method - direct method should be utilized when Generator's plant's proximity makes directly bonding feasible. To obtain reasonable separation, direct bonding method shall consist of a minimum of two subgrade grounding connections originating from (and ending to) different corners of the two grids, in order to eliminate common mode failure. In this scenario, the two grounding systems are directly bonded via dedicated grounding conductors of adequate ampacity to establish electrical bond(s).
 - G) 2) Indirect method - electrical bonding(s) between the generating plant ground mat and the TSP's ground mat established via overhead shield or static wires. The overhead grounding connections shall consist of static wire(s), of adequate ampacity, and be continuous throughout all transmission towers, if any, between the TIFSUB and GIFSUB Substations. The static wires shall be terminated or bonded at both ground mats via grounding leads (of adequate ampacity), which connect the ground grid to the static wire(s). Electrical characteristics of Plant's Generator Interconnection Facilities shall be in accordance with the most recent version of TSP's "Specification for Customer 138 kV Substation Design" attached as Exhibit "I" and in particular, the section pertaining to "Generation".
- H) Generator shall provide a disconnect switch located on Generator's terminating structure(s) for connection to TSP's System.
- I) Generator shall provide NEMA four-hole pads on Plant's disconnect switch for connection to NEMA four-hole pads on TSP's connecting conductors.
- J) Generator shall facilitate to TSP the grant of all necessary land rights, including but not limited to, fee ownership, easements, and access agreements, in a written form acceptable to and drafted by TSP. The aforementioned grant of rights to TSP shall be provided in a

manner so as to prohibit the delay of TSP's access to the property to perform its work. Failure of Generator to provide the aforementioned grant of rights that results in a delay for TSP to perform its work as required under this Agreement, shall not be charged against the TSP.

- K) Generator shall own all protective relays, instrument transformers, instrumentation, and control equipment physically located on Plant side of the Points of Interconnection.
- 8) TSP Interconnection Facilities (TIF)
- A) TSP shall complete its entire scope of work on the WEST COLUMBIA Substation (except for Punch List Items) including, but not limited to, bus works, supports, structures, circuit breakers, disconnect switches, relays, and other equipment necessary for protection and coordination, controls, and wiring all as necessary to provide an interconnection between Plant's generation facilities and TSP's System; energize the same, and interconnect with Plant, all as provided herein.
- 1) Punch List Items are defined as those non-material items of work that remain to be performed in order to ensure full compliance with this Agreement. Punch List Items do not include any items of work, alone or in the aggregate, non-completion of which (i) prevents the WEST COLUMBIA Substation from being used for its intended purposes as described in this Agreement or in accordance with applicable laws; (ii) prevents the WEST COLUMBIA Substation from being legally, safely, and reliably placed in commercial operation; or (iii) in the exercise of reasonable engineering judgment could have an adverse effect on the operation, efficiency, or reliability of the WEST COLUMBIA Substation, or its ability to transmit the Plant's power to the ERCOT grid.
- B) TSP shall furnish, own, and maintain the connection from TSP's equipment to Plant's terminating structure(s) at the Point of Interconnection, including phase conductors, static conductors, structures, tower fittings, suspension insulators, terminating clamps and line conductor terminal fittings with NEMA standard four-hole flat pads for attachment to the NEMA four-hole pads on Plant's disconnecting device.
- C) TSP shall furnish, own, and maintain the connection from WEST COLUMBIA Substation to TSP's transmission system.
- D) TSP shall develop and install transmission improvements that it determines, in its sole discretion, are foreseeable and reasonably necessary to safely, reliably, and economically integrate the Plant into the TSP System. TSP MAKES NO PROMISE, REPRESENTATION, OR WARRANTY AS TO WHETHER THE TSP SYSTEM WILL BE FREE OF CONSTRAINTS AT ANY TIME, INCLUDING BUT NOT LIMITED TO TIMES WHEN THE TRANSMISSION IMPROVEMENTS UNDER THIS AGREEMENT ARE BEING MADE OR AFTER THEIR COMPLETION.
- E) TSP shall expand its existing WEST COLUMBIA Substation as shown on the drawing entitled "CenterPoint Energy 138 kV WEST COLUMBIA Substation, Substation Development Plan for Roughneck Storage Project Interconnection Agreement – Final Proposed Offer," dated 02-11-2020 ("WEST COLUMBIA Substation Development Plan") and any subsequent modifications to such drawing(s) made by TSP and delivered to Generator ("Attached Drawings - Exhibit "H").
- F) Generator shall facilitate to TSP all necessary land rights, in a form acceptable to and drafted by TSP.

9) Communications Facilities

- A) TSP shall provide and maintain, at TSP's expense, a communication circuit for real-time data transmittal via SCADA equipment from the WEST COLUMBIA Substation to TSP's Energy Management System.
- B) Generator shall provide a fiber optic communication interface device on its end of the fiber and TSP will provide a fiber optic communication interface device on its end of the fiber associated with the RTU inputs between Plant and the WEST COLUMBIA Substation.
- C) Generator shall furnish RTU inputs identified in Exhibit "C", Paragraph 11)B) from the Plant to the WEST COLUMBIA Substation's communication interface point.
- D) Generator shall provide a voice telephone extension outlet in close proximity to Plant's relay panel that is located within the Plant. Such telephone extension outlet shall be connected to the local exchange carrier's telephone system; however, the telephone extension outlet may be connected to Plant's internal telephone system, provided Plant's internal telephone system is equipped with an uninterruptible power supply system.
- E) TSP shall furnish RTU inputs identified in Exhibit "C", Paragraph 11) A) from WEST COLUMBIA Substation to Plant's communication interface termination point.
- F) TSP shall provide fiber optic communication cables of sufficient length to connect between WEST COLUMBIA Substation to Plant relay panel. TSP will stop at Generator's terminating structure(s) located at the Point of Interconnection and provide enough cable slack between Generator's terminating structure(s) and Generator's GIFSUB Substation fiber termination panel. Generator shall own the fiber optic communication cables from the Generator's fiber optic splice box(es) located at the terminating structure(s), at the Point of Interconnection, to inside the GIFSUB Substation control house. Generator shall take the fiber optic cables into the GIFSUB Substation and terminate at the fiber termination panel.

10) System Protection Equipment

- A) Generator shall provide two sets of protective relaying accuracy (C800) current transformers on Generator's 138 kV circuit breakers associated with the protective relaying between Plant and the WEST COLUMBIA Substation. Each set of current transformers will provide signals to independent sets of primary and backup protective relays for the interconnecting lead between the GIF and the WEST COLUMBIA Substation. The current transformer ratio will be approved by the TSP relay protection engineer and reflected on the Generator's drawings.
- B) The fiber optic communication cables will have strands of single mode fiber optic cable to be utilized at 1300 nm wavelength for communication of protection data and telemetry.

11) Telemetry Requirements

- A) Selected real-time data of the WEST COLUMBIA Substation will be available at TSP's existing RTU for Generator's use. TSP's RTU will be equipped with a DNP-3 "Slave" serial communication port for this purpose. TSP shall furnish the fiber optic cable(s) between the WEST COLUMBIA Substation and the Plant RTU or DCS "Master" serial communication port for this purpose.

- B) Generator shall furnish Plant data to TSP's RTU communication port at the WEST COLUMBIA Substation as referenced below. The Generator's RTU/DCS shall be equipped with a DNP-3 "Slave" serial communication port for this purpose. TSP shall furnish the fiber optic cable between the Plant and the WEST COLUMBIA Substation RTU "Master" serial communication port for this purpose.
 - C) Generator shall provide Plant data to ERCOT according to ERCOT requirements. TSP is not responsible for providing Plant data to ERCOT.
 - D) Generator shall provide to TSP at TSP's WEST COLUMBIA Substation the following signals originating at Generator's Plant:
 - 1) Analog Data from Plant
 - (i) Kilovolts for each collector bus (A phase scaled as line-to-line value).
 - (ii) Net megawatts for each generator feeder (three phase).
 - (iii) Net megavars for each generator feeder (three phase).
 - (iv) Net megavars for the reactive support equipment. (three phase)
 - (v) Kilovolts for 138 kV transmission voltage (A phase scaled as line to line).
 - (vi) Net megawatts and megavars for the 138 kV transmission line (three phase).
 - (vii) Frequency at the collector bus
 - (viii) Megawatts and megavars for each 138/34.5 kV transformer (three phase).
 - (ix) Megawatts and megavars for each 34.5 transformer (three phase)
 - (x) Data at the plant electrical load points via digital panel meters (watts, vars, watt-hour from each meter)
 - 2) Status Data from Plant
 - (i) Status of the 138 kV transmission voltage circuit breakers.
 - (ii) Status of all 34.5 kV circuit breakers for feeders and reactive support equipment.
 - (iii) Status of generator automatic voltage regulator (automatic and manual).
 - E) TSP will provide to Generator at Generator's GIFSUB_ Substation the following signals originating at TSP's WEST COLUMBIA_ Substation:
 - 1) Analog Data from TSP Substation Devices
 - (i) Kilovolts for the Point of Interconnection (A phase scaled as line to line).
 - (ii) Megawatts, megavars, and megawatt-hour data (three phase)
 - 2) Data from TSP Substation Devices
 - (i) Status of transmission voltage circuit breakers associated with the generator lead(s).
 - (ii) Alarm for failure of Pilot Wire/fiber optic relaying communication channels, if applicable.
- 12) Supplemental Terms and Conditions
- A) The following drawings are attached and made a part of this agreement as Exhibit "H" – Attached Drawings. (*Note: The drawings contain a line of demarcation between TSP provided facilities and Generator provided facilities*).
 - 1) CenterPoint Energy 138 kV Roughneck Storage Project / WEST COLUMBIA Substation for Roughneck Storage Project Interconnection Agreement – Final Substation Development Plan Basic Offer, dated 02-11-2020. ("Attached Drawings – Exhibit "H").
 - 2) Basic Offer – CenterPoint Energy 138kV one line relaying & metering Diagram for Roughneck/W Columbia Battery Storage Project Facility Study
 - B) Cost Responsibility:

- 1) Notwithstanding the provisions of Exhibit "A", Section 8.1, the amount of the contribution in aid of construction, if any, that Generator may be required to make, shall be specified in Exhibit "E". Security Arrangement Details.
 - 2) {The Generator does not desire any enhancements to TSP's basic offer interconnection facilities and therefore no contribution in aid of construction ("CIAC") of the Transmission Interconnection Facilities is required.
 - 3) The TIF described herein is designed based on the generating capacity provided by the Generator. It is assumed that the generating facility will be capable of generating the Planned Capacity by the Scheduled Commercial Operation Date specified in Exhibit "B". Within the first 12 months following Commercial Operation, if the highest level of Actual Capacity is less than the Planned Capacity, the Generator shall be responsible for TIF costs, if any, that are determined, solely by the TSP, to have been incurred to accommodate Generator's Planned Capacity, but are then determined to not be necessary to accommodate Generator's Actual Capacity. As used here, "Actual Capacity" shall mean the Plant's total Net Dependable Capability, as determined or accepted by ERCOT, in accordance with ERCOT Requirements. Generator shall pay such costs determined herein within thirty (30) days following the receipt of TSP's invoice.
- C) Clarifications to Exhibit "A"
- 1) The Parties agree that at the time of executing this Agreement the references to the PUCT Rules contained within certain definitions set forth in Exhibit "A", "Article 1. Definitions" have the meanings ascribed to such terms as established in the current PUCT Rules. The Parties recognize that the PUCT Rules are amended from time to time by the PUCT. The parties also acknowledge that ERCOT issues ERCOT Requirements in which terms are redefined from time to time. When the PUCT Rules or ERCOT Requirements are amended and terms defined in Exhibit "A", "Article 1. Definitions" are affected by such amendments, the Parties agree that such terms shall have the meanings as amended by the PUCT or ERCOT. The term "System Security Study" shall have the same definition as "Security Screening Study" in the ERCOT Requirements.
- D) Miscellaneous
- 1) Each Party shall be solely responsible for keeping itself informed of, and understanding its respective responsibilities under, all applicable North American Electric Reliability Corporation ("NERC") Standards and ERCOT Requirements and all valid, applicable laws, rules, regulations and orders of, and tariffs approved by, duly constituted Governmental Authorities.
 - 2) CenterPoint Energy has documented data specifications that define the operational data CenterPoint Energy requires to perform real-time monitoring. These specifications are incorporated in Section 11 above, Exhibit 'F' Outage and Clearance Coordination Procedure, and Exhibit 'G' Telemetry Specification.
 - 3) Generator shall provide on its property access roads to the TIF, and the access roads will be maintained by Generator in such a manner and condition to allow passage of heavy utility vehicles. Otherwise, Generator shall provide, or cause to be provided, such perpetual easements as reasonably needed by TSP, in a form acceptable to TSP and at no cost to TSP, to use and construct access roads from the fence line of TSP's

West Columbia Substation to the TIF in such a manner and condition to allow passage of heavy utility vehicles.

- 4) Each Party's personnel, contractors, subcontractors, and agents shall abide by and comply with the other Party's reasonable safety requirements and procedures while in areas designated as under that other Party's control.
 - 5) In the event that Generator's personnel, contractors, subcontractors, or agents cause delays in the work schedule of TSP, Generator shall reimburse to TSP the additional costs associated with such delays within 30 days of receipt of an invoice for such costs.
 - 6) Generator understands and agrees that identification of any, including but not limited to stability, oscillation, harmonic, short circuit, over frequency, under frequency, over voltage, under voltage, phase imbalance, or geomagnetic disturbance conditions that may affect Generator's Plant and implementation of any associated protective measures, are the sole responsibility of Generator.
 - 7) ERCOT Requirements.
 - (i) Unless expressly stated herein, where the ERCOT Requirements are in conflict with TSP's specifications or procedures, the ERCOT Requirements shall prevail.
 - (ii) ERCOT requirements currently require installation of power system stabilizers on synchronous generators.
 - (iii) Prior to commercial operation, ERCOT may verify that the Generator is meeting ERCOT Requirements, including complying with Guide and Protocol requirements on RARF modeling, telemetry and testing, as well as complying with reactive standards, the provision of accurate stability models, and the installation of power system stabilizers, if required. It should be noted that the Generator will not be able to energize the GIF until authorized by ERCOT (typically 30 days after the TIF is modeled and energized). Failure to meet these ERCOT Requirements may result in delays to commercial operation.
 - 8) All generator data, including data for stability studies (transient and voltage) and subsynchronous resonance data, as required by the ERCOT Requirements, shall be provided to ERCOT and the TSP before commercial operation. This data shall be updated when the Plant begins commercial operation. Any updates to this information will be provided within 60 days to ERCOT and the TSP as changes or upgrades are made during the life of the Plant. This requirement applies to all future owners of the Plant. The Generator and any future owners of the Plant shall comply with these data requirements along with all applicable NERC Standards. Such Standards are subject to change from time to time, and such changes shall automatically become applicable based upon the effective date of the approved change.
- 13) Special Operating Conditions, if any, attached: None.
- 14) Cost Estimate Differences, if applicable: Not applicable