ConnectGen Montgomery County LLC

Mill Point Solar I Project

Matter No. 23-00034

§ 900-2.22 Exhibit 21

Electric System Effects and Interconnection

Revised August 2024

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Glossary Terms

Applicant:	ConnectGen Montgomery County LLC (ConnectGen), a direct subsidiary of ConnectGen LLC, is the entity seeking a siting permit for the Facility from the Office of Renewable Energy Siting (ORES) under Section 94-c of the New York State (NYS) Executive Law.
Facility:	The proposed components to be constructed for the generation, collection and distribution of energy for the Project will include: photovoltaic (PV) solar modules and their rack/support systems; direct current (DC) and communications cables connecting the panels to inverters; the inverters, with their support platforms, control electronics, and step-up transformers; buried alternate current (AC) medium voltage collector circuits; fencing and gates around each array of modules; access roads; temporary laydown/construction support areas; a medium voltage-to-transmission voltage substation with associated equipment and fenced areas; a new 3-breaker ring bus point of interconnection switchyard (POI switchyard); two adjacent approximately 305 foot-long 345 kV transmission line segments to interconnect the new POI switchyard to the existing National Grid Marcy – New Scotland 345-kilovolt transmission line; and an operations and maintenance (O&M) building with parking/storage areas as well as any other improvements subject to ORES jurisdiction.
Facility Site:	The tax parcels proposed to host the Facility, which collectively totals 2,665.59 acres.
Point of Interconnection (POI) or POI Switchyard:	A new 3-breaker ring bus point of interconnection switchyard will be constructed adjacent to the existing National Grid Marcy – New Scotland 345-kilovolt transmission line; the substation will tie into the new POI switchyard via an overhead span and deliver power produced from the Facility onto the electric grid through two overhead spans tapping the National Grid-owned Marcy – New Scotland 345-kV transmission line. The POI switchyard is located off Ingersoll Road in the northeastern portion of the Facility Site.

Limits of Disturbance (LOD):	The proposed limits of clearing and disturbance for construction of all Facility components and ancillary features are mapped as the LOD. The LOD encompasses the outer bounds of where construction may occur for the Facility, including all areas of clearing, grading, and temporary or permanent ground disturbance. This boundary includes the footprint of all major Facility components, defined work corridors, security fencing, and proposed planting modules, and incorporates areas utilized by construction vehicles and/or personnel to construct the Facility.
Project or Mill Point Solar I	Collectively refers to permitting, construction, and operation of the Facility, as well as proposed environmental protection measures and other efforts proposed by the Applicant.
Study Area:	In accordance with the Section 94-c Regulations, the Study Area for the Facility includes a radius of five miles around the Facility Site boundary, unless otherwise noted for a specific resource study or Exhibit. The 5-mile Study Area encompasses 96,784.84 acres, inclusive of the 2,665.59-acre Facility Site.

Acronym List

AC	Alternating current
ACI	American Concrete Institute
ACSR	Aluminum Conductors Steel Reinforced
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
ATBA	Annual Transmission Baseline Assessment
BPS	Bulk Power System
CCT	critical clearing time
CEII	Critical Energy Infrastructure Information
CY19	Class Year 2019
DC	Direct current
FERC	Federal Energy Regulatory Commission
IBA	Individual Breaker Analysis
IBC	International Building Code
IEEE	Institute of Electrical and Electronic Engineers
kV	kilovolt
LOD	Limits of disturbance
MIS	Minimum Interconnection Standard
MOP	Manuals and Reports on Engineering Practice
MV	Medium voltage
MW	Megawatt
NEC	National Electric Code
NEMA	National Electrical Manufacturer’s Association
NERC	North American Electric Reliability Council
NESC	National Electric Safety Code
NFPA	National Fire Protection Association
NPCC	Northeast Power Coordinating Council
NYISO	New York Independent System Operation
NYS	New York State
NYSRC	New York State Reliability Council
NYSTS	New York State Transmission System
O&M	Operations & Maintenance
OATT	Open Access Transmission Tariff
ORES	Office of Renewable Energy Siting
OSHA	Occupational Safety and Health Administration
PD	Partial Discharge
POI	Point of Interconnection
PPE	Personal Protective Equipment
pu	Per unit
PV	photovoltaic
QP	Queue Position
SCADA	System Control and Data Acquisition
SRIS	System Reliability Impact Study
TIA/EIA	Telecommunications Industry Association/Electric Industry Alliance
UL	Underwriters Laboratories
UAV	unmanned aerial vehicles
VLF	Very Low Frequency

EXHIBIT 21 Electric System Effects and Interconnection

21(a) Electric Interconnection

The proposed Facility will interconnect to the 345 kilovolt (kV) Marcy-New Scotland #18 transmission line owned by National Grid, via a new 3-ring breaker bus Point of Interconnection (POI) switchyard. The Applicant filed an Interconnect Request to the New York Independent System Operation (NYISO) in June 2020 for interconnection of the Mill Point Solar I solar facility utilizing a preferred primary POI switchyard at the existing National Grid transmission line. The POI for the Facility is located approximately 50.5 miles west from the National Grid Marcy substation and 34 miles east from the National Grid New Scotland substation.

The Interconnect Request was assigned Queue Position (QP) 1031. The System Reliability Impact Study (SRIS) is based on the updated NYISO Class Year 2019 (CY19) Annual Transmission Baseline Assessment (ATBA) base cases that have the 2019 Federal Energy Regulatory Commission (FERC)-715 2024 system. The SRIS compares the CY19 ATBA with and without the Project to determine the impact of the Project on the overall system.

The Applicant does not propose the installation of a Battery Energy Storage System.

(1) Voltage

Power generated by the Facility's solar arrays will be transferred to inverters, which will convert the power from direct current (DC) to alternating current (AC). Power from the solar arrays will be approximately 1,500 volts DC and will be converted to approximately 630 volts AC. The power produced by the inverters will be directed to medium voltage (MV) transformers which will increase the voltage to approximately 34.5 kV for transfer to the substation by underground collection lines. A main transformer within the substation will increase the 34.5 kV voltage to the transmission voltage of 345 kV for interconnection to the existing National Grid 345 kV Marcy-New Scotland #18 transmission line. An approximately 1,300-foot overhead generation-tie line ("gen-tie") will connect the substation to the 3-ring breaker in the POI switchyard. Two adjacent overhead transmission lines, approximately 305 feet in length, will connect the POI switchyard to the existing National Grid 345 kV Marcy-New Scotland #18 transmission line.

(2) Conductors

The substation will be located in the east-central portion of the Facility Site off of Ingersoll Road and northeast of the POI switchyard. The 1,300-foot span between the substation and the POI switchyard will use three phases of quad bundled 1351.5 kcmil 45/7 Aluminum Conductors Steel Reinforced (ACSR) Dipper conductors for the loop in and loop out of the POI switchyard with 7 strand steel overhead ground wires.

The POI switchyard will be located in the east-central portion of the Facility Site off of Ingersoll Road and southwest of the substation. Two adjacent overhead transmission lines, approximately 305 feet in length, will connect the POI switchyard to the existing National Grid 345 kV Marcy-New Scotland transmission line. The 305-foot span between the POI switchyard and the Marcy-New Scotland #18 transmission line will use four conductors bundled 1351.5 kcmil 45/7 ACSR Dipper conductors. per circuit, or similar sized conductors selected in coordination with National Grid. National Grid will be the long-term owner and operator of the POI switchyard.

Please see Exhibit 5 and Appendix 5-3 for details regarding the substation and POI switchyard.

(3) Insulator Design

Typical utility-grade ceramic/porcelain or composite/polymer insulators, designed and constructed in accordance with American National Standards Institute (ANSI) C29, will be used. The insulator for the proposed substation and the POI switchyard will be porcelain, however the insulators for the interconnection span may be composite polymer. The load of the insulator will not exceed the insulator strength as detailed in ANSI C29.9 Tables 1 and 2. Refer to Exhibit 5 and Appendix 5-3 for additional information regarding the transmission system insulator design.

(4) Length of Transmission Line

The proposed substation will be located approximately 1,420 feet northeast of the proposed POI switchyard. A 1,300-foot overhead gen-tie line will connect the substation to the 3-ring breaker in the POI switchyard. The POI switchyard will connect to the existing National Grid 345 kV Marcy-New Scotland #18 transmission line via two adjacent overhead 345 kV lines approximately 305 feet in length. Refer to Exhibit 5 for additional information regarding the overhead gen-tie and transmission lines system design.

(5) Tower Dimensions & Construction Materials

The Facility interconnection will require two steel dead end structures located on the south side of the POI switchyard. The proposed 3-pole dead end structures will support the 345 kV circuits connecting the substation to the POI switchyard. The 3-pole dead ends will be installed on drilled shaft foundations with an aboveground height of approximately 120-145 feet (structure to the east) and 170-200 feet (structure to the west) and are expected to utilize steel poles similar to those used for existing connection to the 345 kV transmission system. The proposed substation and POI switchyard design are depicted in Appendix 5-3. There are two proposed monopoles for the overhead line between the substation and the POI switchyard. Both poles will be installed on caisson foundations with an aboveground height of approximately 135-feet and are expected to utilize steel poles similar to those used for existing connection to the 345 kV transmission system. Please see Appendix 5-3, Sheet MPS-T-102-02 for more details.

(6) Tower Design Standards

The proposed towers and foundations were designed in accordance with the following standards:

- ANSI
- American Society of Civil Engineers (ASCE)
    - Manual 72, "Design of Steel Transmission Pole Structures"
    - Manuals and Reports on Engineering Practice (MOP) 113, "Substation Structure Design Guide"
    - Standard 48, "Design of Steel Transmission Pole Structures"
- American Society for Testing and Materials (ASTM)
- Institute of Electrical and Electronic Engineers (IEEE) C2 – National Electric Safety Code (NESC)
- National Fire Protection Association (NFPA) 70 – National Electric Code (NEC)
- Occupational Safety and Health Administration (OSHA)
- Rural Utilities Service Bulletin 1724E-200 "Design Manual for High Voltage Transmission Lines"

(7) Underground Cable System & Design Standards

No underground lines or cabling are proposed for the 345 kV gen-tie between the substation and the POI switchyard. By running the 345 kV gen-tie lines between the substation and the POI switchyard, the Project avoids additional impacts to wetlands and makes great intention to site the gen-tie poles and access roads to minimize wetland impacts. Running the lines overhead also avoids the need for concrete vaults installed underground to support the installation and operation of a high voltage underground transmission line. The 34.5 kV underground collection system will consist of solely underground cross-linked polyethylene cables. The underground collection line system has been designed in accordance with the following codes and standards:

- ANSI – American National Standards Institute
- ASTM – American Society for Testing and Materials
- OSHA – Occupational Safety and Health Administration
- IEEE – Institute of Electrical and Electronic Engineers
- NEC – National Electric Code
- NFPA – National Fire Protection Association

Refer to Exhibit 5 for more information regarding the MV collection system.

(8) Underground Lines Profile & Oil Pumping Stations/Manhole Locations

No underground lines are expected for the interconnection to the National Grid 345 kV Marcy – New Scotland #18 transmission line. Underground 34.5 kV collection lines will be installed in the MV collection system throughout the Facility. Cross section details of the 34.5 kV collection lines are presented in Appendix 5-1. Collection lines will be buried at a depth of 48 inches in agricultural parcels and 42 inches in non-agricultural parcels. Oil pumping stations or manholes are not proposed for the Facility. Refer to Exhibit 5 for additional information regarding the MV collection system.

(9) Equipment to be Installed

The substation will include one 34.5 to 345 kV main power transformer, a 34.5 kV bus, 34.5 kV underground feeder risers, 34.5 kV overhead feeder bays, and medium and high voltage breakers. The substation will also include a sound wall (i.e., barrier), metering and relaying transformers, disconnect switches, equipment enclosures with power control electronics, lightning masts, light poles, 345 kV dead end structure, capacitor banks, ground grid and steel support structures. The equipment within the substation will be placed on concrete foundations, helical piles, or similar support structures.

The POI switchyard will include a new 3-breaker ring switchyard construction adjacent to the existing National Grid Marcy-New Scotland #18 345 kV transmission line (Line #18). The new POI switchyard is expected to include three 345 kV breakers, nine 345 kV disconnect switches, one 345 kV metering unit, three 345 kV dead end structures, bus supports, buried control wiring, buried ground wires, control enclosure, and fenced substation gravel yard. The POI switchyard will be owned and operated by National Grid during Facility operation.

Refer to the design drawings in Appendix 5-3 for design information on the substation and the new POI switchyard.

(10) Cathodic Protection Measures

Cathodic protection measures are not expected to be required for installation of the underground systems as no metallic pipelines or conduits are known to be located or anticipated to be used in the Facility Site.

21(b) System Reliability Impact Study

A SRIS was completed for the Facility (QP 1031) in accordance with the NYISO Applicable Reliability Standards set forth in Attachment X of the NYISO Open Access Transmission Tariff (OATT). A copy of the SRIS is included as Appendix 21-1 to this Application, but will be filed separately under confidential cover, as NYISO requires the SRIS to remain confidential due to Critical Energy Infrastructure Information (CEII) Regulations. The SRIS was based on the updated NYISO CY19 ATBA base cases ("Base Cases") that have the 2019 FERC 715 2024 system representation. Results of this study are summarized below:

- <u>Steady-State Analysis (N-0, N-1 & N-1-1), Summer Peak and Light Load:</u> Under N-0 pre-contingency, and the N-1 and the N-1-1 post-contingency, no adverse thermal or voltage impacts caused by the Facility were identified within the Study Area. Under the light load conditions, the Facility caused new voltage violations and worsened existing voltage criteria violations by more than 0.005 per unit (pu) during the N-1 post-contingency analysis. These voltage criteria violations can be alleviated by adjusting the Facility's generator schedule voltage, switching off the nearby capacity banks, or adjusting the transformer taps at the corresponding substation in accordance with NYISO Minimum Interconnection Standard (MIS). The SRIS concluded that the Facility causes no significant thermal or voltage adverse impacts under steady state system conditions.

- Stability Analysis: The transient stability analysis indicated that the New York State Transmission System (NYSTS) and the proposed Facility remain stable and positively damped under the studies contingencies for both the summer peak and light load conditions. The critical clearing time (CCT) assessment indicated that the connection to the Facility does not have a significant impact on the CCT at the adjacent busses or substations. The SRIS concluded that the Facility has no significant impact on the stability of the NYSTS.

- Transfer Assessments: Thermal, voltage, and stability transfer assessment was performed on the summer peak conditions (Levelized Transfer cases) with the Facility on and off. The Facility's impact on Central East and Total East interfaces was evaluated. Degradations higher than 25 megawatts (MW) were observed on the transfer limits. Under MIS, the limits can be restored by generation redispatch, including the Facility.

- Short-Circuit Analysis: Short circuit analysis was performed to determine the impact of the Facility on the fault duty of buses, as well as to identify any circuit breaker and fuse ratings that have been exceeded within the Study Area. This analysis was performed in accordance with the NYISO Guideline for Fault Current Assessment. The Study results indicated that the Facility increased the total bus fault currents at nearby substations. It is observed that the fault current at EDIC 345 kV bus reached about 94% of its lowest breaker ratings in both the pre- and post-Facility cases. An Individual Breaker Analysis (IBA) is recommended for these breakers.

- Northeast Power Coordinating Council (NPCC) A-10 Testing: NPCC A-10 Testing was performed to identify if any existing stations near the Facility POI switchyard could be classified as Bulk Power System (BPS) due to the addition of the Facility. The SRIS results show that based on the stability and the steady state analysis performed at the Facility POI switchyard, no new BPS elements were classified as a result of the connection of the Facility.

21(c) Impact on Transmission System Reliability

The SRIS evaluated several power flow base cases developed by the NYISO including summer peak and light load system conditions. The SRIS concludes that the Facility does not adversely impact the reliability of the NYSTS. Please see Section 21 (b) above.

21(d) Impact on Ancillary Services

The SRIS did not identify any benefits or detriments to the Facility on Ancillary Services.

21(e) Impact on Total Transfer Capacity

A transfer assessment was completed to determine the incremental impact of the Facility on the Normal and Emergency transfer limits of the Total East and Central East interfaces. Transfer assessments were conducted for the pre- and post-Facility scenarios in accordance with the following North American Electric Reliability Council (NERC), New York State Reliability Council (NYSRC) rules, and NYISO manuals:

- NERC Standard FAC-013-2 Transfer Capability Methodology
- NYSRC Reliability Rules for Planning and Operating the New York Bulk Power System
- NYIS methodology for Assessment of Transfer Capability in the Near-Term Transmission Planning Horizon
- NYISO Transmission Expansion and Interconnection Manual – Attachments F, G, and H
- NYISO Emergency Operating Manual

The results of the transfer assessment show that degradations higher than 25 MW were observed on the Central East and Total East transfer limits. Under the MIS, the limits can be restored by generation redispatch, including the Facility.

21(f) Criteria, Plans, and Protocols

(1) Engineering Codes, Standards, Guidelines and Practices

The Facility will be designed in accordance with the following applicable standards, codes, and guidelines:

- American Concrete Institute (ACI)
- American National Standard Institute (ANSI)
- American Society of Civil Engineers (ASCE)
- American Society for Testing and Materials (ASTM)

- International Building Code (IBC)
- Institute of Electrical and Electronics Engineers (IEEE)
  - IEEE 48 - Standard Test Procedures and Requirements for Alternating-Current Cable Terminations 2.5 kV through 765 kV
  - IEEE 80 - IEEE Guide for Safety in AC Substation Grounding
  - IEEE 400 - Guide for Field Testing and Evaluation of the Insulation of Shielded Power Cable Systems
  - IEEE 400.1 - Guide for Field Testing of Laminated Dielectric, Shielded Power Cable Systems Rated 5 kV and Above with High Direct Current Voltage
  - IEEE 400.3 - Guide for Partial Discharge Testing of Shielded Power Cable Systems in a Field Environment
  - IEEE 485 - IEEE Recommended Practice for Sizing Lead-Acid Batteries for Stationary Applications
  - IEEE 605 - IEEE Guide for Design of Substation Rigid-Bus Structures
  - IEEE 693 - IEEE Recommended Practices for Seismic Design of Substations
  - IEEE 980 - IEEE Guide for Containment and Control of Oil Spills in Substations
  - IEEE 998 - IEEE Guide for Direct Lightning Stroke Shielding of Substations
  - IEEE C37.110 - Guide for the Application of Current Transformers Used for Protective Relaying Purposes
  - IEEE C37.119 - IEEE Guide for Breaker Failure Protection of Power Circuit Breakers
  - IEEE C37.2 - IEEE Standard Electrical Power System Device Function Numbers and Contact Designation
  - IEEE C37.90 - IEEE Standard for Relays and Relay Systems Associated with Electrical Power Apparatus
  - IEEE C57.13 - IEEE Standard Requirements for Instrument Transformers
  - IEEE C57.12.10 - IEEE Standard Requirements for Liquid-Immersed Power Transformers
  - IEEE 998 - IEEE Guide for Direct Lightning Stroke Shielding of Substations
  - IEEE 1313.2 - IEEE Guide for the Application of Insulation Coordination
- National Electric Safety Code (NESC)
- National Electric Code (NEC) 2020
- North American Electric Reliability Council (NERC)
- National Electric Safety Code (NESC)

- National Fire Protection Association (NFPA)
  - NFPA 70 - National Electric Code
  - NFPA 850 - National Fire Protection Association – Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations
- National Electrical Manufacturer's Association (NEMA)
- Telecommunications Industry Association/Electric Industry Alliance (TIA/EIA)

The Facility will comply with NYISO codes and standards regulating the design, construction, and commissioning of electrical and interconnection facilities. For Facility components owned by the Applicant (e.g., collection system), best industry practices, standards, and guidelines will be used. For the POI switchyard, National Grid requirements will be followed.

(2) Facility Type Certification

The Facility will use materials and equipment meeting applicable local, state, and federal requirements and will be certified by the Underwriters Laboratories (UL) or other nationally recognized testing laboratory as required by NFPA 70. Equipment will be sourced from Tier 1, investment-grade suppliers to facilitate the long-term, reliable operation of the Facility. Specification sheets for the currently proposed equipment for the Facility are included in Appendix 5-4. The equipment ultimately installed at the Facility will be selected prior to construction and will depend on factors such as market conditions and availability.

(3) Inspection, Testing, and Commissioning Procedures and Controls

The Facility will have a written inspection, testing, and commissioning plan for electrical systems, as detailed below. The inspection, testing, and commissioning plan shall be implemented for all stages of construction and post-construction inspections and testing. When completed, inspection, testing, and commissioning documentation will be provided to the Office of Renewable Energy Siting (ORES) and stored at the Facility Site.

MV Collection System

Equipment and material used on the MV collection system require factory acceptance test reports be provided by the manufacturer showing compliance with the applicable ANSI/IEEE/NETA standards and design standards. Testing and reporting shall be performed under the supervision of a licensed State of New York Professional Engineer. The equipment shall be de-energized prior to performing testing, with the exception of equipment required to be energized for functional testing, including, but not limited to, poles, insulators, hardware, cables, fiber, cable accessories, sectionalizing equipment, fill materials, and grounding material.

Materials, equipment, and installation methods used for the underground and aboveground cables, fiber optic cabling, and the MV system shall be tested and inspected during construction to ensure conformance with the design according to the approved construction drawings (see Appendix 5-1 for typical details). The electrical cables, equipment, and fiber optic communication cables shall be tested in accordance with IEEE/ANSI/NETA recommendations to identify any deficiencies or damage in the system that could result in outages or failure.

The MV electrical cable testing may at a minimum include Very Low Frequency (VLF) or Partial Discharge (PD) testing. Testing of transformers will be performed in accordance with applicable ANSI/IEEE standards. The fiber optic communication cables will be tested for continuity and attenuation after cable placement, splicing, and termination. Post-installation attenuation testing results shall be compared with the pre-installation attenuation results. Changes in attenuation shall not exceed the tolerance of the approved pre-installation specifications. Test results shall be submitted by the construction contractor to the Applicant for review and approval prior to moving to the next stage.

Energization of the MV system may occur only after the following conditions and requirements are met:

- The underground and aboveground MV line commissioning testing has been successfully completed.
- All communications systems have been installed and commissioned.
- The substation switching, tagging, and operating procedures have been placed in effect.
- The substation has been installed, tested, and commissioned, and is ready for safe and reliable energization.
- The substation protection system has been installed, tested, and commissioned.

Substation and POI Switchyard

The substation shall be inspected, tested and commissioned in accordance with applicable ANSI, IEEE, NFPA, NETA, ASTM, etc. requirements. Testing of the substation shall be performed with the equipment de-energized, except where specifically required for it to be energized for functional testing.

All equipment and material received for construction of the substation will be visually inspected for defects and compatibility with the design specifications prior to installation. Manufacturing facilities shall complete industry standard electrical and mechanical tests on equipment before the equipment leaves the manufacturer. Some tests are performed on a "class" of equipment, such that the passing tests results apply to all specific equipment produced. Other tests are required to be performed on each individual piece of equipment. Additional tests will be performed on specific equipment after installation at the Facility Site to ensure that there was no damage during transport or installation. The equipment testing may include, but is not limited to:

- Main power transformer
- High and medium voltage circuit breakers
- Disconnect switches
- Instrument transformers (current transformer, voltage transformer)
- Surge arresters
- Station service transformer
- Medium voltage cables
- Capacitor bank and reactor banks
- DC battery bank and charger

Standard testing shall be performed on equipment to ensure that the components were constructed and installed correctly at the Facility Site. This equipment testing includes, but is not limited to the following:

- Medium voltage bus connections and hardware
- Grounding grid (including electrical resistivity of surface stone)
- Low voltage protection, control and instrumentation wiring
- Protective relaying systems
- System Control and Data Acquisition (SCADA) or similar communication systems

Equipment within the substation will be placed on concrete foundations, helical piles, or similar support structures. Visual and dimensional inspections will be performed on materials and equipment required for the foundations or support structures prior to concrete placement including, but not limited to, reinforcing steel or rebar (for bar size, configuration, tie, welds, etc.), anchor bolts (size, location, elevation, plumbness, etc.), and formwork (size, dimensions, location, height, reveal, etc.).

Excavations, subgrade, and compacted backfill will be verified to be in accordance with design requirements. The concrete mix will be reviewed and tested to ensure conformance with the design requirements. During pouring of concrete, samples will be taken to test the concrete for proper slump, air content, temperature, and additives amounts are in accordance with design requirements. Numerous test cylinders will be obtained for future strength and compression testing at periodic points after pouring (7 days, 28 days, etc.). The cylinders will be tested to determine if the concrete is curing at the proper rate and will meet design strength prior to being loaded.

Imported stone for the substation yard subbase shall be tested for proper sieve gradation, compaction, etc., as necessary to meet the design standards. Adequate quantities and dimensions of imported material will be verified. A final survey of the station benchmarks and elevations (overall pad and concrete foundations, etc.) will be performed.

Photovoltaic (PV) Module Plant

Plant commissioning will occur once the PV modules, substation, and POI switchyard are fully installed and the NYISO is ready to synchronize the project with the New York electrical grid. Commissioning and operation of the Facility relies on consistent systems monitoring and testing. Systems monitoring will include the following strategies and considerations:

- DC array inspection through manual electrical testing and aerial thermal imaging. Manual electrical testing is used to detect faults or defects in the DC system that the monitoring system was unable to identify. Manual inspection requires that wiring enclosures, combiner boxes and harnesses, and module junction boxes be accessible for more detailed inspection in the event that system testing suggests incorrect operation. Aerial thermal imaging inspection strives to detect string, module, and sub-module faults as well as the racking and balancing of the system (e.g., racking shifts, systemic shading, major erosion) in arrays by monitoring thermal variations between modules.

- Equipment required: Support trucks will be driven to the construction site for manual inspections. Aerial thermal imaging is typically conducted by manned survey aircraft or unmanned aerial vehicles (UAVs).
- Timing: If possible, commissioning will preferentially be completed in late spring or summer when weather is drier and has more stable irradiance. If necessary, this activity can be completed in the spring, fall, or winter depending on weather conditions.

(4) Maintenance and Management

A Facility Maintenance and Management Plan will be prepared for the Facility prior to the commencement of construction detailing the required maintenance, management, and inspection procedures required during operation. The Plan will be implemented once the Facility is operational and submitted in accordance with 19 New York Codes, Rules and Regulations Section 900-10.2(e)(3). The objective of the Facility Maintenance and Management Plan is to improve the operational capacity and availability of the Facility through maintenance guidelines and regular inspections intended to pro-actively detect significant safety or maintenance issues at the Facility.

Solar energy projects are typically comprised of multiple inverters which are electrically connected to produce the desired project nameplate power output. Inverters require recurring, preventative maintenance to ensure proper function as well as corrective maintenance for individual inverters in the event of a malfunction. Maintenance cycles for solar energy facilities typically occur semi-annually and on an as-needed basis and can last from days to weeks. During maintenance activities, solar arrays will remain in-service to the greatest extent practicable.

MV Collection System

The MV collection system is primarily passive and may only require monitoring and failure correction. Ongoing maintenance is generally not required for the MV collection system aside from routine visual monitoring and inspection. The primary equipment for sensing and managing electrical faults in the MV collection system is in the substation, but additional sectionalizing equipment is located throughout the Facility along the MV Collection System routes. Sectionalizing equipment will be located at key points between aboveground and underground portions of the MV collection system and will detect or protect the system from electrical faults. Additional remote indication and control equipment may be necessary for the

MV collection system depending on the final design. Additional equipment may include, but is not limited to:

- Transformers – a transformer is typically provided for each inverter skid and, if desired, can be designed and installed with high and low temperature or oil level alarms.
- Fault Indicators – indicators are placed along the underground cable collection system to aid in identification of faults underground. Fault indicators may have remote signaling capabilities.
- Metal-Enclosed Switchgear – Switchgears for the Facility are anticipated to have remote control capabilities. If manual operation of the collection system is required, such work will be completed by personnel familiar with and trained in the operation and safety hazards of high-voltage electrical equipment.

Personal Protective Equipment (PPE) appropriate for the activities being performed will always be used. Industry standard hazard labels will be installed on accessible electrical equipment specifying PPE required for operational activities.

The underground collection system cannot be freely inspected visually; access points will be provided to allow for limited visual observation of the lines. Access points may include, but are not limited to, riser poles, junction boxes, switchgears, and transformers. In some instances, terminations and cable ends can be inspected at these access points; however, they may also serve to allow for electrical testing equipment connection. Equipment provided by manufacturers that have Manufacturer O&M manuals shall be adhered to for inspection and maintenance procedures. A copy of the O&M manuals shall remain onsite.

Substation

The substation will have a SCADA system that will send status and alarm signals to the overall Facility SCADA system. These signals will notify operators of items such as breaker trips, transformer high and low temperature or oil level, battery charger trouble, etc. Electrically operated equipment may be operated remotely through the SCADA system. The operations team will be able to open and close circuit breakers, motor-operated disconnect switches, the transformer tap changer, etc. Details of the SCADA system will be determined during the design phase after certification by the ORES, but is generally accomplished using a communications line (T1, POTS, etc.) to transfer signals from an operator station to the substation equipment. These items may include, but are not limited to:

- Main power transformer
- High and medium voltage circuit breakers
- Instrument transformers
- Disconnect switches
- Capacitor and reactor banks
- Metal-clad switchgear
- Standby generators
- Station service transformers
- Stationary battery and charger

Equipment within the substation will be supplied by major manufacturers. The equipment shall be inspected and maintained in accordance with the manufacturer's O&M manual. Inspection and maintenance requirements will vary by equipment type and manufacturer. Copies of the manufacturer's O&M manuals shall be stored onsite.

The substation will be regularly inspected, as well as following severe weather events such as extremely high winds, significant snow and ice, etc. During operation, the substation design will be evaluated for adequacy to ensure changes in environmental factors, utility requirements, and equipment changes, do not negatively impact the Facility.

21(g) Transfer of Transmission Ownership

(1) Facilities to be Transferred

National Grid will be the owner of the POI switchyard for the Facility. The Facility will interconnect to National Grid's existing 345 kV Marcy-New Scotland #18 transmission line, however final POI switchyard design and specification will be completed during the ongoing Class Year Facilities Study. Construction of the POI switchyard facility is anticipated to commence and be completed in 2026 prior to Facility operation. Since the National Grid facilities will be located on the Applicant's property, land transfer will be required. The Applicant will be responsible for transferring ownership and management responsibilities of the POI switchyard to National Grid prior to Facility operation.

(2) Transmission Owner Design Requirements

The POI switchyard may be designed and constructed by either National Grid or the Applicant. If completed by the Applicant, National Grid will be consulted for design reviews, construction oversight, and commissioning. Additional detail surrounding the POI switchyard design will not be known until the Facilities Study is complete.

(3) Operational and Maintenance Responsibilities and Standards

National Grid will own and operate the transmission system and therefore will be responsible for performing operation and maintenance activities for the POI switchyard. The Applicant will be responsible for the O&M activities at the substation and may coordinate with National Grid regarding the interconnection location. The final arrangement will be determined during final design in coordination with National Grid.

21(h) Multi-use Options for Utilities

The Applicant does not anticipate sharing facilities with other utilities at this time.

21(i) Equipment Availability and Delivery Schedule

Availability and delivery times for major Facility components vary depending on the selected equipment, manufacturer, and market conditions. The Applicant has not been made aware by manufacturers of any equipment availability restrictions but will monitor equipment availability prior to making the final equipment selections. Facility components are expected to be delivered during the following time ranges, based on current Facility design:

- PV Modules: Spring 2026 to Fall 2026
- Inverters: Spring 2026 to Summer 2026
- Transformers: Summer 2026 to Fall 2026

Procurement strategies will be developed prior to construction during the final engineering and Facility planning stage. Modifications to equipment procurement may be required after the commencement of Facility construction based on product availability.