FREE STATE SOLAR PROJECT, LLC

OPERATION & MAINTENANCE PLAN

KANSAS SKY ENERGY CENTER (KSEC)

PROJECT NO. 147658

REVISION 2

JULY 21, 2023

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Introduction

A. Overview

Free State Solar Project, LLC (Free State), is proposing to construct a new utility scale photovoltaic (PV) solar generation facility in Douglas County, Kansas. The Kansas Sky Energy Center (KSEC, Project) would have a nameplate capacity of 159 Megawatts (MW). The project is located approximately 1 mile north of Lawrence, Kansas. The Project location was selected based on the area's strong solar resource, land use, and proximity to existing transmission infrastructure. The Project would include solar array blocks containing PV panels attached to a single-axis tracking system mounted to steel piles. The PV panels will track the sun during the day. Direct current (DC) electricity from the PV panels will be routed underground through collection wiring to Power Conversion Units (PCUs) located throughout the PV array areas. Each PV array area will be fenced and have gated access at the road entrances. Constructed access roads will be gravel and approximately 16 feet wide. Pending regulatory approval, construction of the Project is anticipated to begin in 2024 and be completed in 2025.

B. Operation & Maintenance Plan Purpose and Intent

This Plan addresses the management of the solar and access drives in the Project Area during operation of the Project. This Plan includes the steps that the Project will take to preserve and maintain the facilities throughout the duration of the Project. This Plan may be updated as needed based on changing conditions, new methods, and/or Project needs.

Plan Summary

The Operation & Maintenance plan for this Project includes maintaining the solar and access drive facilities.

A. Solar Maintenance Plan

The plan listed below encapsulates a general summary of the types of activities that will typically be performed by site Operation & Maintenance (O&M) personnel.

Daily

- Monitor operation of the facility and report any fault conditions from the inverter or tracking system.

Monthly

- For the inverters, inspect the air intake filters. Clean or replace them as necessary.
- Monitor for any bird mortalities or injuries and report any findings through company reporting system.

Quarterly

- 25% walkdown to check solar modules for cracks, discoloration, environmental seal deterioration, frame damage, excessive soiling, cord-plate separation/arcing, position movement, animal damage/nesting, and vegetation overgrowth.
- 25% walkdown to check strings & wire management. Look for strained wires, disconnected/separated connectors, crimped wire radii, unsecured wire harness/clips, animal damage/nesting, and grounding.
- 25% walkdown to check DC Combiner Boxes. Look for proper disconnect operation & environmental seals, wire terminations for torque mark alignment, exposed wires, signs of arcing, and pull tests of clamped wire ends.
- For the trackers, inspect for the following:
    - Drive-shaft assemblies and bearing housings for misalignment.
    - Joints, couplings, or bushings for excessive wear. Check column torque markings.
    - Loose joints, couplings, or bushings.
    - Motor lubrication level and condition.
    - Proper position of the tracker relative to the time of day.
    - Cracked or damaged drive components.
    - Proper operation of any sensors and masts.

    - All fasteners on outer rows. Look for signs of loosening such as uncompressed lock washers, misaligned torque marks, or loose nuts.
    - Corrosion on tracker components.
- Inverters. Look for corrosion and environmental seals. Look at wire terminations for torque mark alignment, exposed wires, pull tests, and any other checks recommended by the manufacturer. Infrared thermography should be used to inspect inverters during operation when irradiance is above 400 W/m^2
- Medium Voltage Transformer. Look at the exterior cabinet for heat-sink fins, corrosion, leaking, and ensure the oil gauges are functioning properly.
- Enclosures. Exterior visual inspection of any free-standing enclosures on the site for signs of secure and intact doors and windows, signs of forced entry/vandalism, animal nesting or damage, weather appropriate roof integrity, erosion that may compromise foundation/supports, or obstructions to any ventilation.
- Disconnects and switchgear for connection torque. Additionally, look at disconnects for exposed wires, signs of arcing, and environmental seals. Shall verify proper disconnect operation, perform pull tests of clamped wire ends, and use either infrared thermography or clamp-on test for diagnosis.
- Module Temperature Sensor. Verify that the sensor is mounted firmly. Inspect sensor wiring and wire management including proper wire termination at the data collection point.
- Weather station connections and verify proper operation. Verify calibration logs and that data collected is reasonable and consistent.
- Monitor for any bird mortalities or injuries and report any findings through company reporting system.

<u>Annually</u>

Inspect the following:

- AC feeder. Physical inspection of all wire terminations for torque mark alignments, exposed wires and pill tests of clamped wire ends before and after seasonal temperature swings.
- Solar Modules. There shall be an annual aerial thermographic scan of the modules.
- Medium Voltage Transformers. Perform annual oil analysis testing.
- Monitor for any bird mortalities or injuries and report any findings through company reporting system.

B. Access Drive Maintenance Plan

The plan listed below encapsulates a general summary of the types of activities that will typically be performed by site O&M personnel.

Access Drive Maintenance Plan

- On a quarterly basis, visually inspect driveaway, interior dirt roads, and rights-of-ways for obstructions, degradation of the route, and defects such as potholes that would prevent traffic flow.
- If there are issues with traffic flow due to any of the deficiencies on the site roads, it must be immediately reported and mitigated as soon as possible.

Summary

This Operation & Maintenance Plan addresses the general maintenance activities performed by the O&M site personnel during the construction and operation of the Kansas Sky Energy Center. This plan satisfies the proposed Zoning Regulations for SECS, Section 12-306-49.06(d)(11), where an Operation and Maintenance Plan is required that includes measures for maintaining access drives to provide access for emergency vehicles, as well as general procedures for operation and maintenance of the installation.


BURNS McDONNELL