

## **PRELIMINARY**

## **OPERATION AND MAINTENANCE PLAN**

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Prepared for:



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Project name:

**Alcazar Energy Storage System (ESS) Project**

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## **1.0 Overview**

The purpose of this Preliminary Operation and Maintenance (O&M) Plan (Plan) is to establish a maintenance and management schedule intended to apply safe work practices and minimize potential hazards during operation of the Alcazar Energy Storage System (Project).

The Project is in the Town of Ulster (Town), Ulster County, New York. The Project will consist of a lithium-ion battery energy storage system (BESS) Facility (Facility), to be located on approximately 40 acres of privately-owned land in the Town of Ulster, New York (Project Site), capable of storing and delivering approximately 250 megawatts (MW) of electric energy and associated ancillary services into the New York electric grid. The approximate Project Site coordinates are 41°55'59.80"N, 74° 2'34.75"W (WGS84 coordinate system). The Project Site will contain the proposed BESS Facility and Project substation, including a stormwater retention basin, and a temporary area for construction staging, laydown, and access, sited within a 15-acre privately-owned parcel. In addition, the Alcazar ESS, LLC (Applicant) is proposing to construct an aboveground approximately 0.3-mile gen-tie transmission line, and associated transmission line structures, that will be located entirely within portions of Parcels 48.17-1-13.110 and 48.17-1-22.110 comprising approximately 25 acres. No other structures are proposed to be located within these parcels.

This Plan will present and identify the commitment of the Applicant to instill safe work practices while conducting routine maintenance on the battery energy storage system and associated components. Operation and maintenance practices outlined in this Plan have been identified to prevent and/or minimize, to the maximum extent practicable, any adverse impacts to the surrounding environment and local community within the Project Site.

## **2.0 Purpose**

The purpose of this O&M Plan is to lay out a maintenance and management schedule intended to ensure safe work practices and minimize any potential hazards during the operational life span of the Project. This plan seeks to identify the commitment of the Applicant to ensure industry best practices in conducting routine maintenance on the Project and associated components. The O&M practices outlined in this document have been designed to identify, prevent and/or minimize, to the maximum extent practicable, any adverse impacts to the local community and the surrounding environment.

## **3.0 BESS Technology**

The BESS consists of multiple individual container type enclosures that individually include batteries, racking, DC systems, power converter system (PCS), battery management system (BMS), thermal runaway management, protection and other supporting systems. Overall plant control will be provided using an integrated SCADA and Energy Management System.

The type of batteries used in the BESS enclosures will be state-of-the-art technology. Each battery module has an integrated BMS with cell-bank voltage detection, temperature detection, automatic shutdown (notifying the rack level protection unit), and balancing features.

The BESS Enclosures are a prefabricated pre-engineered system. Each enclosure contains batteries, controls, a UPS, thermal runaway management system equipment and HVAC equipment.

## **4.0 Maintenance Schedule**

### **Scheduled Service Visits: Preventative Maintenance and Inspections**

The type of final technology selected by the Applicant, and level of automation from the supplier, will determine the level of maintenance staffing needed onsite. However, the technology selected is anticipated to include a high level of automation and remote monitoring capabilities. Therefore, it is not anticipated that daily maintenance at the site will be required.

Scheduled maintenance includes the following

- Quarterly site inspections
- Semi-Annual maintenance visits
- Annual full maintenance visit, which can include:
  - o System testing and verification of data acquisition systems;
  - o Module cleaning once a year, or as determined by Project owner;
  - o Field inspection: visual, electrical and mechanical;
  - o Data acquisition system maintenance as needed;
  - o Inverter cleaning and servicing to ensure proper operation.
  - o Fire safety systems testing per fire code and NFPA standards
- Scheduled maintenance and testing required to maintain all manufacturers' warranties.

Substation Monitoring:

- Visual, mechanical, and electrical testing of power transformers and high-voltage breakers;
- Testing of all metering units;
- Testing of all surge breakers, transformers, switches, relays, computer systems, valves, and other instruments;
- Switchgear and switchboard inspections and testing;
- Testing and diagnostics of all cables;
- Testing of the grounding systems; and
- Substation integration into the data collection system.

BESS Monitoring:

- Abiding by employee safety requirements
- Confirming all protective equipment has been properly installed
- Testing of the grounding systems
- Checking that all fuses, connections, safety switches, breakers, and all other systems/components are appropriately installed and securely fastened

- Confirming Battery Management System (BMS) is operating properly
- Fire alarm monitoring 24/7/365 by UL-listed central station service

### **Unscheduled Service Visits: Corrective Maintenance and Repair**

Unscheduled maintenance visits will generally occur during emergencies that would endanger the health and/or safety of the surrounding area or major disruptions to the Project that degrades electricity, such as failure of Facility components, vandalism, or fallen trees.

In the event of an emergency, the O&M Contractor and/or the Project owner will contact the appropriate Town personnel (fire department, police department) to inform them of the emergency. Appropriate personnel will then be dispatched to the Project site as soon as possible.

In the event of a major disruption to the Project, the O&M Contractor and/or the Project owner will schedule a corrective maintenance visit as soon as possible with all reasonable effort to schedule any such maintenance activities between 8:00 A.M and 5:00 P.M.

### **Vegetation Maintenance Overview**

This section establishes an integrated vegetation maintenance plan designed to prevent disruptions in production or safety associated with vegetation located on or near Project components. Vegetation maintenance will target only those plants that are incompatible with the Applicant's use of the land and will address the following objectives:

- Maintaining transmission reliability
- Minimizing fire hazards
- Improving/Maintaining accessibility by controlling vegetation on and around components and access roads.

The Applicant has prepared a Landscaping Plan for the Facility that illustrates the proposed plantings and planting locations for the Project. Most of the Facility will be comprised of impervious surfaces. Other proposed surfaces include rock mulch and shrub bed mulch. A small portion in the northeast portion of the Project will include tree plantings. In addition, the Applicant is proposing to plan non-irrigated native seed mix in several locations along the north, west, and southeast boundaries of the Facility.

### **Practices and Prescriptions**

During the operational lifespan of the Project, vegetation will be mowed as needed, typically at least twice a year, within the fenced-in area of the BESS. Approximately every two to three years, vegetation immediately surrounding the fence lines will be mowed or brush-hogged to facilitate maintenance along the fence line.

### **Inspection Schedule**

Vegetation inspections will occur semi-annually and will be confined to the Project Site.

## **Inspection Elements**

The following elements will be implemented during scheduled inspections in order to maintain unimpeded operation of the Project and meet vegetation maintenance objectives.

Regular planned inspections will evaluate and identify:

- Excessive growth of ground cover grass or weeds;
- Bare spots and/or excessive weed growth;
- Vegetation that impedes on Facility equipment;
- Signs of damage to the perimeter fence due to vegetation growth; and

Periodic mowing and repairs to grassed areas:

- Maintain vegetation height based on actual observed growth (typically maintained below 18-24 inches);
- Mow at least two times annually, depending on conditions
- Mow less often just outside (about 5 to 15 feet) from the fence;
- Trim around equipment pad
- Check for and remove loose debris

Periodic management of perimeter landscaping:

- Trim around fence as needed

## **Reporting of Inspection Results**

The Applicant will maintain a detailed log of inspections that will be available upon request.

## **5.0 Snow Removal**

Snow removal of Facility entrances and access roads will be performed as needed. Snow will be cleared of access roads and entrances and stored on site. The Applicant will consult a third party to dispose of snow off site, if necessary.

## **6.0 Inspection Records**

Any observed conditions requiring maintenance during operation of the Project will be recorded and stored electronically. The inspection records will identify and prioritize maintenance based on the risk of reliability for each component. Each inspection shall be documented electronically with the date completed.

## 7.0 Maintenance Implementation

**Tracking:** Monthly, the Applicant will review the progress of inspections and work scheduled to establish a work plan. Resource movements and schedule adjustments will be made as necessary to ensure work plan objectives are met.

**Quality Assurance and Auditing** – Upon completion the contractor will certify the work as completed to the specification. In addition, the work is inspected & documented in a database maintained by the owner.

**Documentation** – The work plan is maintained in the database. Reports are monitored to ensure the work plan is complete and exceptions are noted. Archiving the documentation in the database occurs and ends the process.

## 8.0 Safety

The Applicant is committed to ensuring site safety and security at the Project site by implementing the following:

**Access Controls:** The Project will be enclosed by a fence with locking gates to prevent unauthorized access to the Project's components and facilities.

Each battery contained within an ESS unit are kept locked and only accessible for maintenance purposes via cabinet doors and cannot be physically entered by personnel at any time.

The Fire Department should not attempt to open the enclosure doors at any time.

**Project Monitoring:** The Project will be remotely monitored by an experienced 3<sup>rd</sup> party contractor chosen before start of operations.

**Component Setbacks:** All permanent Project components will be setback a minimum of 100 feet from all property lines. Any high-voltage equipment will be designated as such and will not be charged until the Facility is fenced and secure.

**Fire Safety:** Prior to the commencement of construction, a meeting will be held with the local fire department where a site plan and an overview of fire safety protocols will be provided. Upon completion of construction, a walk-through of the Facility will be scheduled to review fire safety protocols and ensure any remaining questions are answered. All Facility personnel and emergency responders will be made aware of the Facility's Emergency Response Plan. The Emergency Response Plan identifies the correct emergency contact information, and outlines the response tactics necessary to ensure safety and mitigate risks during emergency operations.

The access roads for the Facility will be designed to a sufficient width to ensure safe access to the Facility by fire department vehicles and emergency response personnel.