

**Exhibit F-6**  
**BESS Annual Performance Test Plan**

**Contents**

|   |          |
|---|----------|
| <b>1.0 General .....</b>                                | <b>1</b> |
| 1.1 Definitions.....                                    | 1        |
| 1.2 Abbreviations .....                                 | 3        |
| 1.3 Referenced Documents .....                          | 3        |
| 1.4 Points of Contact .....                             | 3        |
| <b>2.0 Purpose .....</b>                                | <b>4</b> |
| <b>3.0 Safety .....</b>                                 | <b>4</b> |
| 3.1 Overview .....                                      | 4        |
| 3.2 Lock Out/Tag Out (LOTO).....                        | 5        |
| <b>4.0 BESS Annual Performance Test Procedures.....</b> | <b>5</b> |
| 4.1 Energy Capacity and RTE Test .....                  | 5        |

**1.0 General**

**1.1 Definitions**

- A. **“Battery System”** shall mean a set of battery racks within an enclosure integrated with onboard thermal management, Battery Management System (BMS), Fire Protection System (FPS) connected to a single Power Conversion System (PCS) or inverter.
- B. **“BESS Annual Performance Test Procedures”** shall mean the performance test procedures in Section 4.0 herein.
- C. **“BESS Facility”** shall mean all the equipment and services to produce a fully operational Battery Energy Storage System (BESS) from the medium voltage (MV) AC connection point at the Substation, through the Power Conversion System (PCS) and to the DC/Battery energy storage system.
- D. **“BESS Facility EMS”** shall mean the control system including but not limited to the Energy Management System (EMS) control hardware, software, communication, networking, cybersecurity and PPC utilized to send power commands to, monitor and store data for the Project.
- E. **“Control Mode”** shall mean the programmed control setting of the EMS.
- F. **“Guaranteed Availability”** shall mean the supplied BESS Facility availability guarantee defined in Exhibit E-1 Performance Guarantees.

- G. **“Guaranteed Energy”** shall mean the Contractor supplied useable energy at the POI (net of Station Power usage) at continuous power (CP) used as defined in Exhibit E-1 Performance Guarantees.
- H. **“Guaranteed Power”** shall mean the Contractor supplied Guaranteed Power as defined in Exhibit E-1 Performance Guarantees.
- I. **“Guaranteed RTE”** shall mean the Contractor supplied Guaranteed RTE at the POI defined in Exhibit E-1 Performance Guarantees.
- J. **“HMI” or “Human Machine Interface”** shall mean the EMS Web User Interface that shall be used by Supervisory Control and Data Acquisition (SCADA), Owner or PREPA to interface with EMS.
- K. **“Maximum Charging Capability”** shall mean the maximum charging capability at full power.
- L. **“Measured Availability”** shall mean the measured availability of the BESS Facility at the POI by the BESS Facility.
- M. **“Measured Energy”** shall mean the measured energy output of the BESS Facility at CP at the POI meter by the BESS Facility EMS.
- N. **“Measured Power”** shall mean the measured power output of the BESS Facility at the POI by the BESS Facility EMS.
- O. **“Measured RTE”** shall mean the measured RTE of the BESS Facility at full power at the POI by the BESS Facility EMS.
- P. **“MTR” or “Minimum Technical Requirements”** shall mean the application / functionality requirements of the EMS as defined in Exhibit A-2 - Scope of Work EMS.
- Q. **“POI” or “Point of Interconnection”** shall mean the meter located on the primary side of the 115 kV GSU Transformer inside the PREPA Barceloneta substation as shown in the SLD in Exhibit D-1 Single Line Diagram.
- R. **“Power Unit”** shall mean a single PCS (bi-directional grid-connected power electronic converter) connected to a Battery System and associated control system. A Power Unit is able to charge and discharge independently.
- S. **“Project”** shall mean the BESS Facility and all the equipment and services to produce a fully operational BESS up to the POI including substation equipment.
- T. **“Site Controller”** shall mean the BESS Facility EMS controller that monitors the Unit Controller health and capability and distributes proportional P/Q commands.
- U. **“Station Power”** shall mean energy used for operating the electric equipment on the site of a generation facility located in the [location] or for the heating, lighting, air-conditioning and office equipment needs of buildings on the site of such a generation facility that are used in the operation, maintenance, or repair of the facility.
- V. **“Test Extension”** shall mean any additional time required beyond the test period, to demonstrate BESS Facility operation and performance. The duration of the Test Extension shall be at the sole discretion of the Owner. A Test Extension may be required due to a Test Interruption or weather conditions. All analyses of the test data shall include the data collected during the additional time period due to a Test Extension.

Commented [SH1]: Update per applicable project

W. **“Test Interruption”** shall mean a time period in which any part of the BESS Facility is partially operational or non-operational due to Owner or Contractor intervention or due to any events outside of Contractor’s control. Data collected during a Test Interruption will not be used to satisfy the requirements of that test and shall be excluded from the analysis of that test.

X. Abbreviations listed below.

## 1.2 Abbreviations

*Table 1 - Abbreviations*

|       |   |
|-------|---|
| BESS  | Battery Energy Storage System                                   |
| BMS   | Battery Management System                                       |
| RBMS  | Rack Level BMS (per Battery Rack)                               |
| CP    | Constant Power  |
| CPR   | Cardiopulmonary Resuscitation                                   |
| EMS   | Energy Management System  |
| FAT   | Factory Acceptance Testing                                      |
| HMI   | Human Machine Interface   |
| JHA   | Job Hazard Analysis   |
| LOTO  | Lock Out / Tag Out  |
| MV    | Medium Voltage  |
| OEM   | Original Equipment Manufacturer                                 |
| PPE   | Personal Protective Equipment                                   |
| RTAC  | Real Time Automation Controller – SEL 3530 device or equivalent |
| RTE   | Roundtrip Efficiency  |
| RTU   | Remote Terminal Unit  |
| SAT   | Site Acceptance Testing   |
| SCADA | Supervisory Control and Data Acquisition                        |
| SOC   | State of Charge   |

## 1.3 Referenced Documents

| # | Document Name   | Version |
|---|---|---------|
| 1 | Exhibit A-2 Scope of Work EMS                           | 1       |
| 2 | Exhibit D-1 Single Line Diagram                         | 1       |
| 3 | Exhibit E-1 Performance Guarantees & Liquidated Damages | 1       |

## 1.4 Points of Contact

### General

| Item | Description      | Company / Mobile / Email |
|------|------------------|--------------------------|
| 1    | Project Engineer |                          |
| 2    |                  |                          |

|   |  |  |
|---|--|--|
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |

#### Site Access

| Item | Description              | Notes |
|------|--------------------------|-------|
| 1    | Site Physical Address.   |       |
| 2    | Site Access Instructions |       |

#### Site Emergencies

| Item | Description                                     | Notes                       |
|------|---|-----------------------------|
| 1    | Emergency Response plan for site.               | Phone No. - TBD             |
| 2    | Site Local Fire Dispatch Number.                | 911 and Owner contact       |
| 3    | Emergency meet site.                            | Substation Front Entrance   |
| 4    | Enclosure fire alarm horn and strobe locations. | Exterior of BESS enclosures |

## 2.0 Purpose

The annual performance testing shall be conducted annually (or as requested by the Owner) to assess compliance with the Performance Guarantees specified in Exhibit E-1 Performance Guarantees and Liquidated Damages. Tests are conducted in a grid-tied configuration. The system is monitored by internal instrument transformers, external instrument transformers, and metering functionalities to monitor and record voltages, currents, power disturbances, etc.

Each test has a section for Notes/Test Conditions. Test conditions such as extreme weather or abnormal grid conditions should be noted.

Because of the amount of time required to run the entire test suite, some of the tests may not be witnessed by the Owner. In such cases, Contractor will run the tests in advance and provide test data. Any testing to be run prior to witness testing shall be confirmed with the Owner in advance.

## 3.0 Safety

### 3.1 Overview

The use of Personal Protective Equipment (PPE) during the performance of procedures outlined in this document is required.

Only authorized personnel will be allowed in the test area, and all authorized personnel and equipment operators will wear PPE in accordance with the arc flash labels relevant to that gear.

Authorized personnel will isolate and Lock-Out/Tag-Out (LOTO) all energy sources feeding a device to verify zero energy.

Before starting any procedure, authorized personnel must identify and adhere to current policies including but not limited to appropriate training, approach distances, safety equipment, Job Hazard Analysis (JHA), and LOTO.

At no time during the energizing, shall any personnel be within 50 feet of pad mount transformers and Switch Gear being energized, and covered under this procedure.

All personnel shall maintain this distance until specifically released by the Project Engineer.

Contractor will have personnel trained in CPR and proper PPE required for electrical installations including MV electrical equipment during the project installation. In the event of a medical emergency, arc flash and/or fire, site personnel should call 911 or local emergency responders.

### 3.2 Lock Out/Tag Out (LOTO)

LOTO is an acronym for Lock Out/Tag Out. LOTO Procedure should also follow Owner's Health and Safety requirements.

## 4.0 BESS Annual Performance Test Procedures

### 4.1 Energy Capacity and RTE Test

1. Purpose: The "BESS Energy Capacity and RTE Test" is a performance test that demonstrates the Measured RTE, Measured Energy, and Maximum Charging Capability.
  - A. To be valid, the cell temperatures throughout the BESS Facility must be within the OEM required temperature band throughout this test.
2. The Contractor shall perform any required manufacturer's cell balancing procedure prior to this test.
3. Procedure: This test will be performed on all Power Units at the same time.
  - A. System Starting State: The BESS Facility will be in the on-line state and the SOC at each Battery System shall be higher than the SOC at which P-limiting occurs (rollbacks or constant voltage). Next, the BESS Facility shall be discharged. As Power Units start to P-limit, the remaining Power Units must maintain their power. As Battery Systems reach 0% of their share of the power command, they will immediately be commanded to zero power. This step shall end when each individual Power Unit reaches 0% P-limit.
  - B. Record enclosure ambient temperature **[or coolant inlet temperatures]** measurements and cell temperature measurements for all Battery Systems throughout this test.
  - C. Verify that cell temperature measurements at all Battery Systems are within the OEM required temperature band throughout this test.
  - D. Record initial values of each Battery System SOC.
  - E. With an initial active power level of 0 MW and reactive power level of 0 MVAR, next command the BESS Facility to charge from the POI at the Maximum Charging Capability.
  - F. Stop the charge upon the occurrence of any of the following:
    - i. Contractor's discretion
    - ii. The BESS Facility power falls below 95% of the Maximum Charging Capability
  - G. Record and store the cumulative AC energy charged to the system as measured at the POI.
  - H. Within 5 minutes command a real power discharge equal to Guaranteed Power.

- I. Maintain the discharging until the occurrence of any of the following:
  - i. Contractor's discretion
  - ii. When each individual Battery System reaches 0% P-limit
  - iii. The BESS Facility power falls below 95% of the Maximum Charging Capability
- J. Record and store in the BESS Facility's EMS historian the AC energy discharged from the BESS Facility as measured at the POI. The cumulative AC energy recorded at the POI shall be recorded as the Measured Energy capacity.

The Measured RTE The Measured RTE will be calculated as follows:

$$\text{Measured RTE} = \frac{E_{Exp.}}{E_{Imp.}} \times 100\%$$

Where:

- Measured RTE = the actual round-trip efficiency, expressed as a percentage.
- $E_{Exp.}$  = total energy recorded at the POI from Step I in the procedure defined in this section (the "Measure Energy").
- $E_{Imp.}$  = total import energy measured at the POI from Step F in the procedure defined in this section.

*For the avoidance of doubt, it is understood that the Contractor's anticipated Round Trip Efficiency calculations may differ with the above, the Measured RTE is a BESS Facility metric.*

| Pass/Fail Criteria  |        |       |
|---|--------|-------|
| <ul style="list-style-type: none"> <li>• The Measured RTE at the POI as recorded in the EMS is greater than or equal to the Guaranteed RTE.</li> <li>• The Measured Energy capacity at the POI as recorded in the EMS is greater than or equal to the Guaranteed Energy.</li> </ul> |        |       |
| Passed  | Failed | Date: |
|   |        |       |
| Test Performed by:  |        |       |
| Test Witnessed by:  |        |       |