LEBALELO WATER USER ASSOCIATION

Purpose of Storage Solution:

Battery backup for critical pump infrastructure

Lebalelo is a water user association, comprising of both the commercial mining sector and the South African Department of Water and Sanitation. Established in 2002, Lebalelo supplies bulk raw water to the mining sector as well as communities in the Eastern Limb of the Bushveld Igneous complex in Limpopo South Africa.

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CLIENT REQUIREMENTS & CHALLENGE:

Lebalelo's power supply is essential to the water supply of the region. Given the constraints in the South African grid and power generation units, Lebalelo endures power cuts from 4-8h per day leaving their residents without water.

The main loads are **primary motors (355kW)** and **secondary motors (500kW)** with soft start units, along with an additional 50kW load per train, resulting in a **total demand of 1760 kW per train.**

During black start conditions, this equates to approximately **4000A at 550V**.

Meeting these requirements demands meticulous planning and system understanding to ensure optimal performance and safety.

In partnership with NEC XON **EPC of the project**

Project Fact Sheet:

The **AEG Storage Converter** is a four-quadrant converter, designed to manage a bidirectional energy transfer between an energy storage device and an AC power supply. In addition, the Storage Converter is able to stabilize Microgrids by voltage- or frequency regulation to allow seamless transition between on-grid and off-grid operation.

The **Solar MD Battery Energy Storage System (BESS)** is a high voltage system with advanced BMU and BMS technology, designed for use in containerized solutions, suitable for commercial and utility-scale operations. The LFP Prismatic Cells are incredibly durable, safe and powerful. Solar MD uses the renowned CATL cells thereby offering a performance guarantee of 12 years on the battery modules.

The **Plant Controller from Solar MD** takes over the whole management of the energy system and is visible for the user on the mypower24 platform. The remote control allows programmable logic expressions as well as a full visibility of the consumption data.

Project Details:

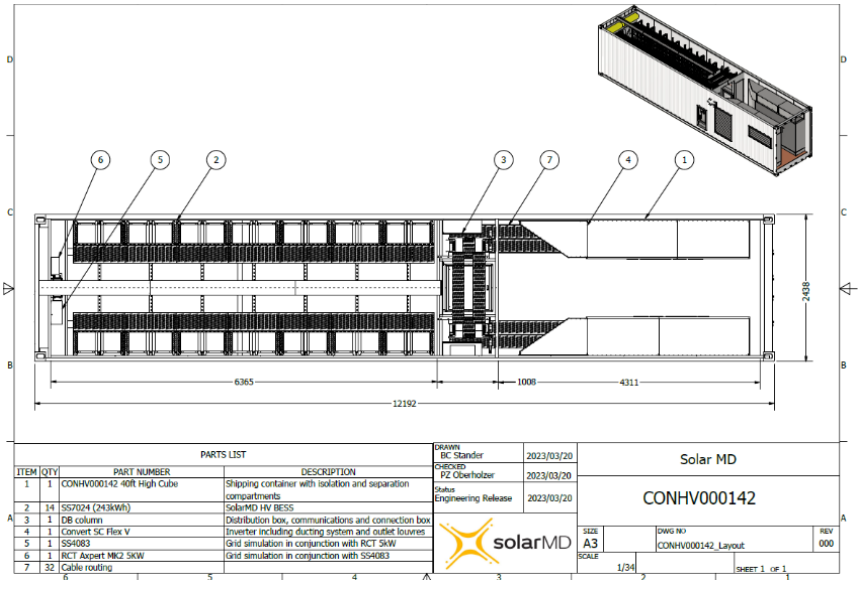
- **40ft High Cube Container**
- **AEG Convert SC Flex V**
  - Max. AC real power PAC @ 25°C: During charge & discharge: 987 kW
  - Max. permissible DC current: During charge & discharge: 1600 A
- **Solar MD SS7024**
  - 14x batteries with 243.1 kWh = 3,403.4 kWh Total capacity
- **Solar MD Plant Controller and EMS**

Solar MD Engineering Aspects:

Electrical, Mechanical & Software Engineering:

- Container Procurement and Fabrication
- Hoist Rail Design
- Separation Wall Design
- CABW Outer Frame Design
- Front Wall + Door Assembly & Design
- Louvre & Ducting Design
- Cable Trays & Ladder Design
- Electrical Detailed Design
- Ensuring compliance with safety standards IEC 62933-5-2:2020
- DB Construction & Design
- AC Breaker Design
- DC Disconnector Box Design
- Busbars Design
- Fire Suppression Design
- Connection Box Design 525V HV to 400V LV
- Cooling and temperature management
- Switchgear for On- & Off-Grid function
- Project specific software adjustments
- Integration into mypower24
- Programming and testing

1. **Initial Design:**
   a. Drafting of the preliminary layout, understanding of software requirements.
2. **Client Presentation of First Design:**
   a. Introducing design for review and feedback.
3. **Modification and Manufacturing of Container:**
   a. Cutting & Welding Container
   b. Container Painting
   c. Component Fitting
   d. Electrical and Mechanical installation
   e. Software Integration and Testing



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