

2. Requirements, Constraints, And Standards

2.1. REQUIREMENTS & CONSTRAINTS

Functional Requirements:

- Design a battery energy storage system (BESS) capable of generating 25 MW of power.
- Design the BESS to last four hours continuously.
- BESS must deliver 100 MWhs of energy.
- The BESS must have a 10% BOL to compensate for battery degradation.

Resource Requirements:

- The site may only use 20 acres of land.
- The land must be flat.
- The location of the site must have ambient temperatures between $-30^{\circ}\text{C} \sim +55^{\circ}\text{C}$.

Constraints:

- The largest cable size available is aluminum 1000 Kcmil.
- The cables must be rated for 40°C .
- Power factor at the inverter must be 0.95.
- For easy and fast construction layout must be designed to have at least a 25 foot turn radius around the BESS.

2.2. ENGINEERING STANDARDS

Engineering Standards:

NFPA 70, National Electric Code Article 310 Conductors for General Wiring

NFPA 855 Standard for the Installation of Stationary Energy Storage Systems

UL 9540A Test Method