The Black & Veatch Solution

**Typical BESS Project Plan View**

Black & Veatch Integrated BESS Solution

**BESS Overview: Battery-to-Transmission Grid**

- **Power**: Two (2) 2.25 MW power conversion, 5.5 MW installed.
- **Energy**: Six (6) 3.7 MWh enclosures, 22 MWh installed, 15 MWh guaranteed, 2.5 hours of operation.
- **Interconnect Voltage**: 12.5 kV

**BESS Layout w/Constraints**

- Power Conversion
- Electrical Equipment
- Control Center
- Property Line
- Setback
- Interconnect
- Fence w/ Gate
- Wetlands

Cross Section of Black & Veatch Integrated BESS Solution

Rendering for visualization purposes
BESS Basics

BESS for Energy or Power
An analogy for how a battery energy storage system works is to compare it with a water system. A battery is like a tank, and both hold a certain amount of capacity. This capacity is the energy stored in the system. The flow of the water from the tank is like the flow of electricity from the battery and represents the power distribution of the system.

Battery Chemistry: LFP versus NMC
Lithium, Iron (Ferrum), and Phosphate (LFP) is the Black & Veatch-preferred method for safety, power, and long life. Nickel, Manganese and Cobalt (NMC) is sometimes client specified for energy and cost savings.

Thermal Runaway
LFP is safest by far.
The Black & Veatch–engineered BESS solution is derived from its 100-year experience serving the electric utilities, which focuses on critical battery parameters while addressing client-specific needs (applications and use cases). Common considerations include:

- Rated Power and Energy (duration of power)
- Equipment Life, as affected by
  - Cycling and throughput
  - Time spent at a state of charge
- Round-trip-efficiency at the interconnection
- Use cases highly dependent on client
  - Utility or Developer
  - Generation or Wires
  - Rate-based or Merchant

The Black & Veatch Difference:
- Safe
- Secure
- Reliable
- Flexible
- Dynamic
- Quality
- Responsive
- Schedule Certainty
- Cost effective

A true, new utility asset