Industrial Battery Integration with an Energy Management System

Overview

Bechtel presented us with the issue of researching and designing a 60 MW battery system coupled with an EMS system. This system would be used in an islanded microgrid running a 300 MW load off five, 60 MW generators. Once a generator fails, it takes 3 to 4 hours for the standby to come up to full power, therefore this battery would kick on when the generator fails and support the system until the standby comes to full power.

Objectives

For this project, our group needed to do intensive research on existing battery technology on the market, as well as available energy management systems available on the market. We then developed a representative simulation of this battery system utilizing Simulink.

Approach

- With the help of our sponsor we developed an understanding of the customer needs
- Heavy research was then conducted into both battery and management systems available
- Research was then formatted into final research spreadsheet to be presented to Bechtel
- Frequency response was than selected as the system trigger to coordinate system response
- Simulation design began in Simulink to model the system based upon frequency response
- Behavior graphs were than modeled for the system to describe how it will function

Outcomes

- The research conducted under this project will help them moving forward with battery storage systems and management systems.
- This simulation has proven that it is a feasible system and it will mitigate downtime on their systems once a generator is tripped.