



Energy Storage System Helps Aussie Utility Improve Rural Power Reliability

S&C Featured Solution: Energy Storage System

Location: Victoria, Australia

Customer Challenge

Powercor, one of Australia's largest utilities, faced a situation where customers along a rural power line were experiencing poor reliability, resulting in higher-than-average penalties from the Australian Energy Market Operator. These customers, located near Buninyong, a suburb of Ballarat in Victoria, experienced three 90-minute outages on average per year, resulting in lost revenue for local business and inconvenience for residential customers. Moreover, during times of high demand, excessive loading on substation transformers led to a loss of redundancy, resulting in the need for a costly transformer upgrade to meet minimum standards for network reliability.

Wanting to defer the installation of expensive assets, Powercor decided to investigate energy storage as a possible means to improve the line's performance. The utility's engineers believed an energy storage system could power the line from the battery during grid outages and peak-shave during times of high demand to reduce stress on the transformers.

S&C Solution

Because Powercor had limited energy storage experience, it consulted industry expert S&C Electric Company. The utility felt S&C's successful background in developing complete, integrated energy storage systems for other utilities would be helpful in resolving its reliability issues and maximize the opportunity to learn about this new technology.

Wanting to learn more about the benefits of islanding, Powercor identified the Buninyong site as a suitable location because of the issues affecting the line and the potential financial returns gained from improving the line. Powercor examined the problem and found an application for islanding as a solution. S&C then designed, supplied, and commissioned a fully integrated energy storage solution for Powercor. This included a 2-MW S&C PureWave® Storage Management System, a 2-MW/2-MWh Kokam lithium-ion battery system, and the associated electrical infrastructure required to implement a dynamically islanded solution.

The finished product, delivering 2 MWh of stored energy.



"S&C's hardware, reputation for dependability and people enabled our organisation to implement its vision of a network for the future with great confidence"

—Warrick Stapleton, Industrial Solutions Manager, Powercor

S&C's PureWave Storage Management System helped Powercor boost its power reliability and defer a costly transformer upgrade.



S&C chose Kokam because it understood the company's lithium-ion battery technology would best address the utility's needs. S&C also performed all of the associated system studies and protection-system design tasks.

By partnering with S&C early in the design and procurement processes, Powercor was able to draw upon S&C's energy storage experience and work with S&C to address the problem. As a result, Powercor's specialist team of grid design and construction experts, Powercor Network Services, prepared the site and performed the majority of the electrical installation work. S&C provided the detailed electrical design associated with the PureWave power-conversion system, the battery, the high-voltage islanding switchgear, and the necessary sensing and measurement equipment.

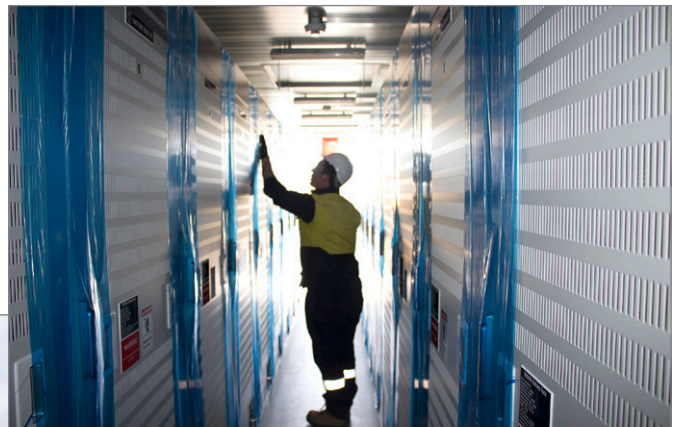
S&C performed detailed factory acceptance testing of the fully integrated energy storage system at its advanced energy storage test facility in Franklin, Wisconsin, using a team comprised of S&C's design engineers and Powercor's most experienced commissioning engineer. S&C also worked closely with Powercor during the onsite commissioning and testing to ensure the installation did not significantly disturb its network. This testing process helped S&C to complete the installation of the storage-management system, battery system, and the third-party equipment in just 2 weeks.

Besides devising a plan to use energy storage to address the reliability issues, S&C collaborated with Powercor to determine how its customers could receive the largest return on investment by eventually using the system for different applications.

Valued Outcome

Powercor commended S&C's equipment quality and technical capability during both factory and site testing. At the time of commissioning, the system was Australia's largest installed grid-connected battery energy storage system and one of the world's few truly dynamically islanding systems of its type.

To ensure Powercor receives a strong return on investment, the utility plans to use the system in a four-prong strategy: reliability improvement, infrastructure upgrade deferment, provision of ancillary services, and renewables integration.



The battery bank being inspected before installation.



Crews install the containerized PureWave® Storage Management System.