CUSTOMER SUCCESS STORY

XTRALIS PARTNERS WITH GSC FOR REDUCED RISK AT CREMZOW BESS, WITH LI-ION TAMER®

About End User (Gore Street Capital)

Gore Street Capital (GSC) is a renewable energy investment manager operating assets in Great Britain (GB), Ireland, Germany, and the United States of America. Since IPO of the Gore Street Energy Storage Fund in May 2018, GSC's portfolio under management has grown from 10 MW to almost 1.2 GW, with 292 MW operational across four uncorrelated grid systems. GSC's first managed asset outside of GB and Ireland was the 22 MW/29 MWh Cremzow Battery Energy Storage System (BESS) in northern Germany.

The Challenge

Many BESS facilities use lithium-ion (Li-ion) technology to store intermittent generation from renewable sources, like solar and wind, to stop their output from destabilising grid systems by causing deviations in operational frequency. Li-ion cells pose a safety hazard due to the risk of thermal runaway in the event of a battery failure. This condition occurs when an exothermic reaction develops in the cell leading to fires that can spread to adjacent cells. As a result, regulators are developing new safety requirements to provide early warning of failure, and insurers are setting more stringent conditions to cover Li-ion BESS assets. Cremzow was evaluated as one of the higher-risk BESS assets in the GSC portfolio, warranting an intervention to lower the risk.

The Solution

Xtralis' collaboration with GSC was a four-step process including:

- **Understanding** - taking the time to thoroughly explore the needs and requirements of the client and site;
- **Design** - designing a system that offers the optimum protection, including the number and location of sensors;

PROJECT:
Battery Health & Safety

END USER/LOCATION:
Cremzow BESS, Northern Germany

INDUSTRY:
Lithium-ion Batteries

SOLUTION:
Li-ion Tamer Off-Gas Monitor

"The Li-ion Tamer off-gas monitor provides an early warning of Li-ion battery thermal runaway that substantially lowers fire risk whilst satisfying the requirements of our insurer. The retrofit process was straightforward, and we easily integrated the warning system with shutdown procedures—an important advantage of the product"

Daniel Sherlock-Burke
Head of Asset Performance, Gore Street Capital

- **Implementation** - working with local installers to implement the design; and
- **Commissioning** - evaluating the system performance versus the customer expectations.

Following this process, Xtralis specified a Li-ion Tamer battery electrolyte vapor detection system for the 11 containers of Li-ion cells at the Cremzow BESS facility. Each container was fitted with four reference sensors, 16 monitoring sensors, and two GEN 2+ Li-ion Tamer Controllers.

Li-ion Tamer sensors detect electrolyte vapours emitted from battery cells. These off-gases contain volatile organic compounds (VOCs) with a rising concentration indicating a battery fault. By detecting these vapors, Li-ion Tamer can identify a cell failure before thermal runaway occurs, giving time for the cell to be shut down to prevent a fire. Reference sensors positioned near doorways and air- conditioning vents measure the entering atmospheric conditions in the container to prevent false alarms. The Cremzow solution connects to an E-Stop loop to automatically shut down the isolated cell.

Li-ion Tamer Controllers can also be connected to Supervisory Control and Data Acquisition (SCADA) systems using Modbus. This feature allows operators to view system and individual sensor status. If the SCADA system is connected to the cloud, this information will be available off-site too.

The early warning provided by Li-ion Tamer enables BESS operators to take individual battery cells offline before they enter thermal runaway. This means that the cell can be replaced without taking the entire BESS offline.

Additionally, the system alarms before activation of traditional smoke/gas detection and fire suppression systems, thus saving the facility from secondary damage caused by fire suppression.

The Outcome

Li-ion Tamer offers a much earlier detection than other technologies like aspirated smoke detectors (ASD) and aspirated gas detectors (AGD). Xtralis comparative tests showed that Li-ion Tamer provided a warning 25 minutes before thermal runaway. In contrast, both other technologies only detected the failing battery after a thermal runaway had already begun.

An independent study by DNV-GL produced similar results. They found that Li-ion Tamer gave an average of six-minute warning time before thermal runaway across a variety of test conditions.

Li-ion Tamer enables BESS operators to shut down battery cells in the early stages of failure. As a result, smoke detectors and automatic fire suppression should never activate as the failure never progresses to a fire. With the installation of Li-ion Tamer, GSC was able to reduce the risk of their Cremzow BESS facility substantially. This allowed them to secure favorable insurance coverage and ensure compliance with future regulations.

If you need help getting started, contact our lithium-ion battery safety experts for a free battery safety consultation.

Let us help make your technology safer.

GET YOUR FREE CONSULTATION