Advanced Monitoring and Control for Energy Storage Systems

World-leading development of advanced control systems and maximising performance of energy storage system technologies including the vanadium redox flow (VRB) battery. The expertise extends across energy systems to maximise renewable energy power plant performance to improve electricity quality and demand and supply.

More Information

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Competitive advantage

- Novel scalable distributed control approach (using advanced control theory integrated with advanced flow battery designs) to control and coordinate distributed energy storage systems and load management for enhanced reliability and flexibility
- An integrated approach to the design and control of flow batteries based on the dynamic mechanisms of the electrochemical reactions to achieve optimal efficiency and flexibility of battery operation
- Advanced monitoring systems to monitor the state of charge, flow channel blockage, capacity loss monitoring and imbalance of electrolyte, with online fault detection techniques based on dynamic battery models
- Use of flow batteries as a multi-functional energy storage system for voltage stability and power quality improvement without complementary energy stoage devices to reduce system costs and improve reliability

Impact

- Significant improvement of flow battery systems
- Greater flexibility in battery operation to allow optimal charging and discharging with time-varying input/output power for integration with renewable power sources
- Improved voltage stability and power

Successful applications

- Vanadium flow battery develop