



Building a **Secure Data Foundation** for a Utility-Scale BESS Site

How Phaseshift delivered a unified industrial data layer for real-time operations, historical analysis, third-party analytics, and API-driven data science at a battery energy storage facility.

— THE CHALLENGE

A leading independent power producer and developer needed more than basic plant visibility for one of its utility-scale battery energy storage sites. The company required a secure, scalable way to collect operational data from across the site, bring it into a private cloud environment, and make that data useful to multiple stakeholders simultaneously.

Requirements included live streaming dashboards for real-time operational awareness, a historian for long-term time-series retention and troubleshooting, a structured data feed for a specialized third-party battery analytics provider focused on performance, safety, and warranty workflows, and authenticated API access for internal data scientists. Critical site data was fragmented across multiple plant systems, trapped inside site-level systems or one-off integrations, making it impossible to create a single operational view or support external analytics without adding infrastructure, maintenance, and cybersecurity risk.

— THE APPROACH

Phaseshift acted as the site's secure data backbone. We gathered site data from the plant, normalized it, and brought it into our private cloud so it could be governed and reused across multiple applications. Instead of forcing the customer to build and maintain separate pipelines for each dashboard, vendor, or stakeholder, Phaseshift created one controlled data layer that served all consumers from a single source of truth.

EDGE-TO-CLOUD INGESTION

Secure data collection from site-level systems to private cloud infrastructure

DATA NORMALIZATION

Standardized data governance layer across all plant data sources

HOSTED DASHBOARDS AND HISTORIAN

Real-time operational visibility and durable time-series retention

API AND MULTI-STAKEHOLDER ACCESS

Flexible interfaces for internal teams and external analytics partners

— THE TRUST LAYER

Battery energy storage sites are classified as critical infrastructure. The operational data they produce, including real-time state of charge, cell-level telemetry, thermal management behavior, and grid dispatch signals, carries heightened sensitivity for asset owners, lenders, insurers, and grid operators. These stakeholders expect rigorous data governance, clear chain of custody, and confidence that site data is collected and stored within trusted infrastructure.

For operators and developers managing BESS portfolios, integrating third-party analytics or enabling remote monitoring requires a data partner that satisfies cybersecurity requirements without introducing additional vendor risk. Phaseshift is an American company purpose-built for critical infrastructure data. It gives BESS owners and developers a secure, domestically managed data layer that meets the governance standards institutional stakeholders require, without displacing the operator's own analytics, service teams, or vendor relationships.

— THE OUTCOMES



Live Dashboards

Real-time streaming visibility into site behavior for operators and stakeholders



Durable Historian

Long-term time-series retention for troubleshooting and trend analysis



Analytics Pipeline

Structured downstream feed to third-party battery analytics provider



API Access

Direct authenticated access for internal data science teams and models



Single Secure Path

One controlled data corridor from site to private cloud



Zero Fragmentation

Eliminated point-to-point integrations and disconnected data sources

Phaseshift allowed the customer to treat operational data as a strategic asset rather than a collection of disconnected signals. The architecture delivers operational visibility through live dashboards, preserves site history through a historian, enables third-party analytics, and gives internal data science teams API-level access to the full dataset.

"For battery storage owners and developers, this is the real value of a modern industrial data layer: site data that is usable, governed, and accessible across the people and systems that need it."

— THE COMMERCIAL VALUE

A unified data platform is not just an operational requirement for BESS sites. It is a commercial asset. Owners and developers that invest in a governed data foundation unlock measurable returns across the full lifecycle of the asset, from commissioning through repowering.

HIGHER-MARGIN O&M CONTRACTS

Reliable data access and automated monitoring reduce the cost to deliver on existing service agreements while enabling more ambitious performance guarantees on new deals.

PREMIUM MONITORING SERVICES

Fleet dashboards, automated reporting, and advanced analytics become monetizable offerings built on a trusted, normalized data layer the operator already controls.

REDUCED WARRANTY EXPOSURE

Continuous cell-level monitoring and historical retention enable evidence-based warranty claims, faster dispute resolution, and proactive degradation management.

LIFECYCLE ASSET INTELLIGENCE

Owners with real operational data can optimize dispatch strategies, plan augmentation timing, and make evidence-based repowering decisions that maximize asset value.

USE CASES

REAL-TIME MONITORING AND ALARMING

Live site monitoring with configurable alarm thresholds, event-driven notifications, and real-time visibility into battery state of charge, thermal behavior, and dispatch status.

BATTERY HEALTH AND DEGRADATION ANALYSIS

Continuous tracking of cell-level performance, capacity fade, and thermal anomalies to support degradation modeling, augmentation planning, and warranty substantiation.

PERFORMANCE AND SLA REPORTING

Automated or on-demand performance reporting at the site or portfolio level, supporting customer SLA reviews, lender reporting, and regulatory compliance submissions.

ANALYTICS AND AI ENABLEMENT

Clean, normalized operational data piped directly into the operator's degradation algorithms, dispatch optimization models, data science notebooks, and emerging AI workflows.

CROSS-SITE FLEET INTELLIGENCE

Comparative analysis across sites, battery chemistries, system integrators, and operating conditions to identify systematic patterns, optimize maintenance, and inform procurement.

STAKEHOLDER AND LENDER ACCESS

Governed data sharing and reporting interfaces for asset owners, lenders, independent engineers, insurers, and offtakers without exposing proprietary operational analytics.

THE INTELLIGENCE LAYER

Phaseshift goes beyond passive data collection. The platform's agentic capabilities autonomously govern, correlate, and act on site data as it flows through the system, turning raw telemetry into operational intelligence without manual pipeline management.

AUTONOMOUS FLEET CORRELATION

Cross-references battery behavior across sites, chemistries, system integrators, and firmware versions to surface systematic patterns invisible at individual site level.

PROACTIVE DEGRADATION DETECTION

Continuous state-of-health baseline monitoring identifies early capacity fade, thermal anomalies, and cycling pattern shifts before they become warranty events.

SELF-GOVERNING DATA PIPELINES

Ingestion flows adapt automatically as new sites commission, BMS firmware updates roll out, or monitoring configurations change across the portfolio.

PREDICTIVE WARRANTY INTELLIGENCE

Correlates cycling depth, environmental exposure, and capacity trajectories to flag emerging warranty risk at the fleet level before claims materialize.

THE VALUE

Every BESS owner and developer managing a growing portfolio will eventually need a unified data platform. The question is whether to build it piecemeal across projects, integrators, and markets, or to deploy a proven, hardware-agnostic solution that is already purpose-built for the challenge. Phaseshift eliminates the integration tax, accelerates service readiness, and provides the trusted data governance posture that institutional stakeholders demand.

Phaseshift is not a replacement for the operator's analytics or service organization. It is the operational data backbone that makes them effective at portfolio scale.

Ready to build your secure data foundation?

www.phaseshiftdata.com