Grid-Scale Battery Storage Training Course: Revenue, Siting, Procurement and Operation

1 – 12 February 2027
Geneva

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Programme Summary

Grid-scale battery storage is the subject of this two-week training course for power utility directors, project development heads, grid operators and energy regulators, taught at strategic level and ending in a deployment decision file for one storage project. Storage plants now carry large capital and safety exposure, yet choices on use case, site, connection and contract are often made separately. The programme links them, moving from system need to technology, revenue, sizing, siting, connection, fire safety, procurement and operation. Mars Training Centre UK delivers this programme on grid-scale battery storage to mixed-organisation cohorts.

The Business Case

Utilities, independent developers and public energy bodies are asked to approve storage plants whose value depends on several linked decisions. A leader who can test a revenue case, read a safety test report and compare bids on equal terms reduces the chance of a stranded asset, an unsafe site or a contract that fails in year three. The programme works on the measures below.

- Project Return: Is protected when revenue stacking, degradation and augmentation are modelled together before approval.
- Safety Exposure: Falls when fire test data and installation requirements are read before a site is chosen.
- Delivery Risk: Is contained when connection, procurement and acceptance terms are agreed in one sequence.

Principles and Evidence Base

- IEC 62933: The international series on electrical energy storage systems, applied in Sessions 1 and 9 to define system performance and to review acceptance testing.
- UL 9540A: The test method for thermal runaway fire propagation in battery systems, applied in Session 7 to read test data before design decisions are taken.
- NFPA 855: The standard for the installation of stationary energy storage systems, applied in Sessions 5 and 7 to check separation, layout and protection.

Intended Participants

- Executives who approve storage investment and carry responsibility for its return and risk.
- Project development leads who move a storage project from concept to a financial close decision.
- Grid operators who must accept, dispatch and protect storage connected to their network.
- Regulators and policy leads who set market rules, connection terms and safety expectations for storage.

Typical settings include electricity utilities, independent power developers, transmission operators and industrial energy users.

Learning Outcomes

1. Participants will be able to evaluate the system need that a storage project is meant to meet.
2. Participants will be able to compare battery technologies and revenue streams for a stated duty.
3. Participants will be able to construct a sizing and dispatch case that allows for degradation.
4. Participants will be able to diagnose connection, siting and fire safety gaps before a design is fixed.
5. Participants will be able to prioritise contract terms and acceptance tests that protect long-term performance.
6. Participants will be able to justify a deployment decision to a board or regulator.

Programme Structure

Day 1: Grid-Scale Battery Storage Use Cases and System Need

What problems can grid-scale battery storage solve for a power system?

- System Need Mapping
- Storage Use Case Catalogue
- Power and Duration Requirement Matrix
- Network Planning Role Review
- Value Stream Taxonomy

Day 2: Technology Options and Chemistry Choice

Which battery technology suits each duty cycle?

- Cell Chemistry Comparison
- Round-Trip Efficiency Table
- Degradation and Cycle Life Curves
- Thermal Behaviour Profiles
- Technology Selection Scorecard

Day 3: Battery Storage Revenue Stacking and Market Position

How do income streams combine, and which of them conflict?

- Revenue Stacking Model
- Capacity and Ancillary Service Mapping
- Energy Arbitrage Spread Analysis
- Contracted and Merchant Income Split
- Revenue Risk Register

Day 4: Sizing, Dispatch and Degradation Allowance

How are power and energy ratings set for a stated duty?

- Load and Price Profile Analysis
- Power and Energy Rating Sizing
- Dispatch Rule Design
- Augmentation Schedule
- Availability Guarantee Calculation

Day 5: Siting, Land and Permitting

Where should a storage project be built, and what does the site allow?

- Site Screening Matrix
- Network Node Value Review
- Land and Permitting Checklist
- Environmental and Community Impact Screen
- Separation Distance Layout

Day 6: Battery Storage Grid Connection

How does a storage plant connect to the network and behave on it?

- Connection Application Pathway
- Grid Code Compliance Matrix
- Protection and Control Scheme Review
- Power Conversion System Requirements
- Grid Forming Capability Screen

Day 7: Battery Storage Fire Risk and Safety Design

How is battery storage fire risk found, tested and reduced?

- Thermal Runaway Propagation Review
- UL 9540A Test Data Reading
- NFPA 855 Installation Gap Check
- Detection and Suppression Options
- Emergency Response Plan Outline

Day 8: Procurement and Contracting

How are supply, integration and warranties contracted and compared?

- Battery Storage Procurement Strategy
- Single and Multi-Contract Comparison
- Performance Guarantee Terms
- Warranty and Degradation Clauses
- Bid Evaluation Matrix

Day 9: Commissioning, Operation and Asset Life

What keeps a plant performing and safe until the end of its life?

- Factory and Site Acceptance Test Plan
- IEC 62933 Performance Test Review
- State of Health Monitoring Dashboard
- Maintenance Strategy Schedule
- End-of-Life and Recycling Route

Day 10: Deployment Decision File for One Storage Project

Do the findings join into a file that a board can approve?

- Applying the Session 3 Revenue Model
- Testing the Session 4 Sizing Case
- Checking the Session 7 Safety Gap Check
- Reviewing the Session 8 Bid Matrix
- Completing the Deployment Decision File

Methodology

The programme is a case analysis supported by prepared data. Participants work from a fictional network with a stated system need, price profiles, a site shortlist, test reports and two competing bids. Each session adds one decision to a single project, and peers acting as a board challenge the result in the final session.

- Suggested activity: Stacking three revenue streams and testing which two conflict in dispatch.
- Suggested activity: Reading a prepared fire propagation test report and listing the design changes it requires.
- Suggested activity: Scoring two bids against one performance guarantee schedule.

Capstone Output

Each participant completes a deployment decision file for one storage project. It holds the system need statement, a technology choice, a revenue and sizing case, a site and connection review, a safety gap check and a bid comparison. At work it goes to an investment committee or a regulator, and it sets the checklist applied to later storage proposals.

Frequently Asked Questions

Is grid-scale battery storage training suitable for leaders who are not electrical engineers?

Yes. Grid-scale battery storage is taught through prepared cases and decision templates. You need responsibility for investment, planning, operation or regulation of power assets, but no design or modelling background.

Which standards does grid-scale battery storage rest on in this training?

Grid-scale battery storage here rests on IEC 62933, UL 9540A and NFPA 855, each applied to a performance, fire test or installation decision.

How is the decision file from grid-scale battery storage training used at work?

You take the deployment decision file to your investment committee or regulator, use its safety gap check before site selection, and keep its bid comparison as the template for later projects.

How does grid-scale battery storage differ from a programme on solar and wind portfolio management?

Grid-scale battery storage concentrates on deciding, connecting, contracting and operating storage plants, while a programme on solar and wind portfolio management concentrates on generation assets and their route to market.