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COURSE BROCHURE

Grid-Scale Lithium-Ion Energy Storage Operation and Upkeep Training Course

23 – 27 May 2027
Dubai

Grid-Scale Lithium-Ion Energy Storage Operation and Upkeep Training Course

Ref: 1668_61130 **Date:** 23 – 27 May 2027 **Location:** Dubai **Fees:** 4900 GBP

Grid-Scale Lithium-Ion Energy Storage Operation and Upkeep is a 1-week training course for electrical technicians and engineers who run and look after utility-scale containerised storage plants, producing a storage plant operation and upkeep playbook. Grid-scale storage now firms solar and wind output and sells frequency response, so a degraded rack or tripped string costs revenue and grid support. Jupiter Prime Training runs this course to turn storage alarms into confident field action.

Why Grid-Scale Lithium-Ion Energy Storage Operation and Upkeep Matters Now

Three forces shape this subject: rapid growth of grid-connected storage plants, owners who sign availability and capacity contracts with offtakers, and insurers who scrutinise thermal runaway risk in enclosed containers. A site that tracks state of health, keeps cells balanced and acts on early thermal signs protects usable capacity; one that waits for the battery management system to trip loses energy throughput and faces fire exposure. The course draws on electrochemical impedance thinking, state of charge and state of health estimation, and failure mode and effects analysis FMEA applied to storage racks.

Who Gains Most from Grid-Scale Lithium-Ion Energy Storage Operation and Upkeep

- Technicians carrying out routine inspections of racks, modules and enclosures
- Engineers interpreting battery management system logs and alarms
- Staff responsible for power conversion system and inverter upkeep
- Specialists planning capacity tests and module replacements
- Site leads coordinating fire detection, ventilation and cooling checks

An operations crew gains most when its electrical technicians and storage engineers attend together and agree one alarm response routine for the site.

Grid-Scale Lithium-Ion Energy Storage Operation and Upkeep Capabilities

Participants leave able to act on storage plant signals before lost capacity or heat becomes an outage.

- Assess state of health trends from capacity and resistance readings — module replacement timing
- Apply cell balancing and string voltage checks — usable capacity protection
- Test enclosure cooling, ventilation and gas detection performance — fire safety owners
- Calculate round-trip efficiency and auxiliary losses — asset owners and offtakers
- Specify inspection intervals for racks, connections and power conversion units — maintenance planners
- Build fault trees for common alarms and trips — shift technicians

Key Grid-Scale Lithium-Ion Energy Storage Operation and Upkeep Terms

- Battery management system — electronics that measure cell voltages, temperatures and currents and protect the pack by limiting or isolating it.
- State of charge — the share of a battery's present capacity that is still available to discharge.
- State of health — the remaining capacity or performance of a battery compared with its condition when new.
- Cell balancing — equalising charge between cells in series so the weakest cell does not limit the whole string.
- Thermal runaway — a self-heating chain reaction inside a cell that can spread fire and toxic gas to neighbouring cells.
- Round-trip efficiency — energy delivered on discharge divided by energy absorbed on charge, including conversion losses.

Grid-Scale Lithium-Ion Energy Storage Operation and Upkeep Day by Day

Day 1: Storage Systems and Cell Chemistries

- Lithium Iron Phosphate and NMC Cells — Matching Chemistry to Duty
- Rack, Module and String Architecture — Locating Isolation and Fuse Points
- Power Conversion System Layout — Tracing Energy From Grid to Cell
- Container Cooling and Ventilation Design — Holding Cells in Their Window
- Safe Isolation and Arc Flash Precautions — Planning Live and Dead Work

Day 2: Monitoring and Battery Management Data

- Battery Management System Logs — Reading Voltage, Temperature and Current Trends
- State of Charge Estimation — Spotting Drift and Recalibration Needs
- State of Health Indicators — Tracking Capacity Fade and Resistance Rise
- Cell Imbalance Detection — Deciding When Active Balancing Is Needed
- Alarm Thresholds and Event Codes — Separating Nuisance Trips From Real Faults

Day 3: Testing and Preventive Routines

- Capacity Discharge Testing — Confirming Usable Energy Against Rated Values
- Internal Resistance Measurement — Finding Weak Modules Before They Fail
- Thermal Imaging of Busbars and Connections — Catching Loose Terminations
- Torque Checks and Connection Inspection — Preventing Hot Joints
- Round-Trip Efficiency Audits — Exposing Auxiliary and Conversion Losses

Day 4: Fault Diagnosis and Thermal Risk

- FMEA for Storage Racks — Ranking Failure Modes by Consequence
- Fault Tree Building — Tracing Trips to Root Components
- Thermal Runaway Warning Signs — Acting on Off-Gas and Temperature Rise
- Fire Detection and Suppression Checks — Keeping Protection Ready to Act
- Module Replacement and Second-Life Decisions — Weighing Repair Against Renewal

Day 5: Practising the Storage Plant Operation and Upkeep Playbook

- Solar Farm Storage Case — Applying State of Health Trend Review
- Wind Farm Storage Case — Applying Alarm Triage and Fault Trees
- Frequency Response Service Case — Applying Efficiency and Capacity Tests
- Inspection Interval Setting — Agreeing Tasks per Rack, Converter and Enclosure
- Storage Plant Operation and Upkeep Playbook — Sequencing Checks, Tests and Responses

Applying Grid-Scale Lithium-Ion Energy Storage Operation and Upkeep After the Course

- Pull three months of battery management system logs and chart state of health and cell imbalance per string.
- Run a thermal imaging survey of busbars and terminations and log any connection needing re-torque.

Grid-Scale Lithium-Ion Energy Storage Operation and Upkeep Questions FAQ

What is grid-scale lithium-ion energy storage operation and upkeep, and why does it matter now?

It is the day-to-day running, testing and fault diagnosis of utility-scale lithium-ion storage plants. It matters now because storage capacity is growing fast and each lost megawatt-hour hurts revenue.

Which roles gain most from grid-scale lithium-ion energy storage operation and upkeep?

Electrical technicians and engineers who inspect racks, read management system data and maintain converters gain most. Examples come from solar farms and wind farms selling grid services.

How does grid-scale lithium-ion energy storage operation and upkeep differ from a substation DC supply course?

It centres on large lithium-ion storage with power conversion, thermal management and capacity trading duties.

What do you bring back from grid-scale lithium-ion energy storage operation and upkeep?

You bring back a sequenced set of inspections, tests and alarm responses for a grid-scale storage plant.

Grid-Scale Lithium-Ion Energy Storage Operation and Upkeep: The Way Forward

The storage plant operation and upkeep playbook sets out checks, tests and alarm responses for each rack, converter and enclosure. Its first use is deciding which modules need capacity testing at the next outage. Technicians and storage engineers share it, and after a full year of operation the state of health trends deserve a fresh look.