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Lithium Ion Battery Diligence for Energy Storage Systems

Factory Audits to Assess and Mitigate Risk

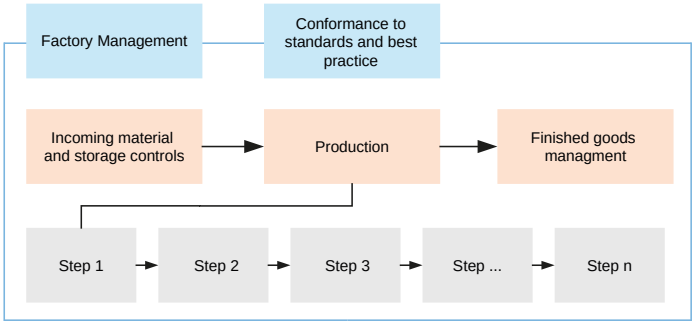
The use of Lithium Ion (Li-Ion) batteries to store energy generated by solar PV systems involves risks that need to be clearly understood and properly managed. One of the biggest risks in any energy storage system is battery safety. Assessing manufacturing processes and quality controls can identify weaknesses that may lead to unsafe operating conditions and under-performance in the field.

Li-Ion batteries are designed in various configurations that require different raw materials, chemical combinations, and manufacturing technologies. Poor material and/or manufacturing quality can lead to failures in the field, such as a reduction in charge cycles, thermal runaway, and even fire. As batteries account for over half of the cost of an energy storage system, it is critical that buyers, owners, and investors assess quality and manage risk prior to delivery.

From Raw Materials to Finished Product

PI Berlin factory audits assess every stage of the production process.

- Cell materials and electrolyte mixing
- Electrode assembly
- Cell production and conditioning
- Battery module, tray, rack and pack assembly
- Performance and safety testing



Assessing All Potential Impacts to Quality

From process controls to production management.

Factory Management

- Incoming and outgoing material quality controls (IQC/OQC)
- Factory, production and quality management
- Health, safety and environmental management
- Conformance to certification and safety standards*

Production

- Manufacturing equipment and calibration
- In process quality controls (IPQC)
- Finished goods management

*including IEC 62619 (UL 1642) for battery packs, trays and cells; IEC 62056 (UL 1973) for battery racks

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Dependable Audits with Actionable Results

PI Berlin factory audits provide independent, benchmarked assessments of battery design, material and assembly quality. They are designed to detect any safety, reliability and performance risks associated with the batteries and enable mitigation of any identified risks before production starts for a specific project.

Factory audits are conducted during active production, using proven techniques to stress-test and analyze factory processes and procedures. Audits include a detailed review of production records and manufacturing documentation. PI Berlin auditors are trained to conduct multi-layer analyses of all aspects of production in order to flush out potential risks that may not be immediately obvious.

Audit reports detail and categorize each audit finding. Categories are assigned by risk severity. Benchmarked quality ratings are provided for comparison across multiple battery vendors. In all cases, an actionable risk management plan is recommended and customized to the customer's specific needs.

PI Berlin Expertise

PI Berlin offers unparalleled technical and auditing expertise in all our PV equipment assessments. We employ battery design and manufacturing experts able to customize our proven auditing process to the requirements of battery technology and manufacturing. Our audit teams are multi-disciplinary and include experts in battery electro-chemistry, manufacturing and auditing. Combined, our experts offer more than 25 years of battery electro-chemistry and manufacturing experience.

Why Choose PI Berlin?

PV Experts

Provided quality management services to over 10 GW of PV projects in 2019

Production Excellence

Conducted 330 PV equipment factory audits since 2011

Trusted Advisors

More than 150 satisfied clients including banks, investors, utilities, developers and residential aggregators

Qualified Risk Management

Evaluated 105 GW of material and manufacturing risks in the lab, factory, and field

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