Advanced UPS Systems and Battery Chargers Training Course

18 – 22 April 2027
Johannesburg

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Ref: 936_169961 **Date:** 18 – 22 April 2027 **Location:** Johannesburg **Fees:** 6000 Euro

Overview

Advanced UPS Systems and Battery Chargers Training Course is a 1-week course for critical-power engineers, maintenance teams, commissioning specialists, facility engineers, and technical managers who need a UPS Commissioning and Lifecycle Decision File. Participants evaluate topologies, rectifier and inverter behavior, static bypass arrangements, battery autonomy, harmonics, redundancy, test evidence, faults, and replacement choices. The course connects measurements and failure symptoms with defensible operating decisions. Agile Leaders Training Center provides this advanced UPS systems course.

Who Should Attend

- Professionals responsible for UPS architecture, capacity, redundancy, and critical-load continuity.
- Teams responsible for electrical maintenance, alarm response, and failure diagnosis.
- Specialists responsible for commissioning, acceptance testing, and load-bank evidence.
- Personnel responsible for battery condition, autonomy, charger settings, and replacement planning.
- Managers responsible for reliability risk, lifecycle cost, and technical approvals.

The course assumes participants already interpret electrical drawings, measurements, alarms, and maintenance records, and leaves out introductory circuit theory.

Departments and Industries

The course supports critical-power decisions across data centers, industrial plants, utilities, healthcare facilities, transport infrastructure, and commercial buildings.

- Electrical engineering and critical-power operations
- Maintenance, reliability, and asset-management departments
- Commissioning and project-delivery teams
- Data-center and telecommunications facilities
- Process industry, healthcare, and transport infrastructure

Learning Objectives

By the end of this course, participants will be able to:

- Compare UPS topologies against critical-load requirements.
- Analyze rectifier, inverter, bypass, and harmonic behavior.
- Build battery autonomy and charger-sizing calculations.
- Evaluate redundancy, selectivity, and parallel-operation risks.
- Apply performance, commissioning, and load-bank test methods.
- Diagnose failures and prioritize lifecycle interventions.

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Course Agenda

Day 1: UPS Architecture and Load Evidence

- Critical-Load Classification and Single-Line Evidence Map
- Online Double-Conversion, Line-Interactive, and Standby Topology Comparison
- IEC 62040 Safety, EMC, and Performance Requirements Map
- Rectifier, DC Link, Inverter, and Output Filter Functional Model
- Load Profile, Crest Factor, and Capacity Margin Worksheet

Day 2: Power Quality and Switching Paths

- Input Power Factor and Current Harmonic Assessment
- Inverter Voltage Regulation and Transient Response Test Method
- Static Bypass Transfer Logic and Synchronization Checklist
- Maintenance Bypass Isolation and Backfeed Risk Review
- Protection Selectivity and Fault-Current Coordination Matrix

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Day 3: Batteries, Chargers, and Autonomy

- Battery Chemistry, String Configuration, and DC Bus Selection Matrix
- Autonomy, Aging Margin, and Temperature Derating Calculation
- Rectifier-Charger Float, Boost, and Current-Limit Setting Sheet
- IEEE 1188 Inspection, Test, and Replacement Evidence Register
- Battery Impedance, Conductance, and Capacity Trend Assessment

Day 4: Redundancy, Commissioning, and Diagnosis

- N+1 and Parallel UPS Redundancy Decision Model
- Commissioning Inspection and Energization Control Plan
- Load-Bank Step Test and Thermal Evidence Sheet
- Alarm Sequence, Event Log, and Waveform Correlation Method
- Failure Mode, Root-Cause, and Lifecycle Priority Matrix

Day 5: UPS Decision Practice

- Suggested Exercise: Topology and Capacity Selection Review
- Suggested Exercise: Battery Autonomy and Charger Setting Calculation
- Suggested Exercise: Static Bypass Transfer Failure Diagnosis
- Suggested Exercise: Commissioning and Load-Bank Evidence Evaluation
- Capstone Exercise: UPS Commissioning and Lifecycle Decision File

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Practical Exercises

The course uses suggested activities to convert system data, measurements, and maintenance evidence into traceable decisions.

- Suggested activity: compare UPS topologies for a mixed critical-load profile.
- Suggested activity: calculate battery autonomy under aging and temperature conditions.
- Suggested activity: diagnose a bypass transfer using alarms and waveforms.
- Suggested activity: present a commissioning and lifecycle recommendation with supporting evidence.

FAQs

Who suits Advanced UPS Systems and Battery Chargers Training and what does it assume?

Critical-power, maintenance, commissioning, facility, reliability, and technical-management personnel suit the course. It assumes experience with electrical drawings, measurements, alarms, and maintenance records while excluding introductory circuit theory.

How does Advanced UPS Systems Training differ from a basic electrical maintenance course?

Advanced UPS Systems Training focuses on topology selection, static switching, harmonics, autonomy, redundancy, performance tests, diagnostic evidence, and lifecycle decisions rather than general electrical inspection and repair.

How is UPS battery autonomy calculated for an aging battery string?

UPS battery autonomy is evaluated from load demand, DC voltage, discharge characteristics, temperature, aging margin, string configuration, charger limits, and the required continuity period.

What evidence supports UPS commissioning acceptance?

UPS commissioning acceptance uses inspection records, protection settings, functional tests, transfer tests, load-bank results, waveform evidence, alarms, thermal observations, and documented exceptions.

When should stationary UPS batteries be replaced?

Stationary UPS battery replacement is prioritized from capacity evidence, condition trends, abnormal cells, temperature history, failure risk, manufacturer criteria, and the continuity consequence of further service.

Conclusion

Participants take back a UPS Commissioning and Lifecycle Decision File linking load requirements, architecture, autonomy, settings, tests, faults, and replacement evidence. The file improves traceability from system measurement to technical approval. It also exposes continuity risks and required interventions before a critical-power decision is implemented.