Advanced Telecom Power Systems and Energy Efficiency Training Course



23 - 27 Nov 2026

Cape town

4600 € (Per Person)

Ref: #TEL7629_285515

Course Introduction / Overview:

The telecommunications industry is the backbone of the modern digital economy, and its reliability hinges on robust and efficient power systems. As networks evolve to support 5G, IoT, and massive data traffic, the demand for uninterrupted, cost-effective, and sustainable energy has never been greater. This course provides a comprehensive exploration of telecom power systems, from fundamental principles to advanced energy management strategies. It addresses the critical need to reduce operational expenditures (OPEX) and minimize environmental impact through enhanced energy efficiency. Participants will delve into the architecture of AC and DC power systems, battery technologies, and the integration of renewable energy sources. Drawing on concepts discussed by experts like Dr. D.S. Kumar in the field of power systems engineering, the curriculum emphasizes practical application and strategic planning. BIG BEN Training Center has designed this program to equip professionals with the skills to design, manage, and optimize the power infrastructure that underpins modern communication networks, ensuring high availability while championing sustainability. This training is essential for anyone involved in maintaining the resilience and efficiency of telecom infrastructure in a rapidly advancing technological landscape.

Target Audience / This training course is suitable for:

- Telecommunications Engineers.
- Network Operations Managers.
- Field Maintenance Technicians and Supervisors.
- Power System Design Engineers.
- Technical Project Managers.
- Infrastructure and Site Planning Managers.
- Energy and Sustainability Managers.
- Data Center Power Specialists.
- Solutions Architects for Telecom Infrastructure.
- Regulatory and Compliance Officers in the telecom sector.

Target Sectors and Industries:

- Mobile Network Operators (MNOs).
- Telecommunication Tower Companies (Tower Cos).
- Internet Service Providers (ISPs).
- Data Center and Colocation Providers.
- Telecom Equipment Manufacturers and Vendors.
- Satellite Communication Companies.
- Utility and Energy Companies.
- Governmental agencies and ministries of communication and information technology.
- Engineering and Construction firms specializing in telecom infrastructure.

Target Organizations Departments:

- Network Operations and Maintenance.
- Engineering and Technical Design.
- Site Acquisition and Planning.
- Project Management Office (PMO).
- Energy Management and Sustainability.
- Corporate Social Responsibility (CSR).
- Procurement and Supply Chain.
- Technology and Innovation.
- Infrastructure Management.

Course Offerings:

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

- Analyze the complete architecture of modern AC and DC telecom power systems.
- Evaluate various battery technologies, including VRLA and Lithium-ion, for optimal performance.
- Design and implement effective backup power strategies to ensure network uptime.
- Integrate renewable energy sources like solar and wind into telecom site power solutions.
- Conduct comprehensive energy audits to identify and quantify efficiency improvement opportunities.
- Implement advanced cooling technologies and strategies to reduce power consumption.
- Utilize Energy Management Systems (EMS) for remote monitoring and control.
- Develop a strategic framework for reducing operational costs and carbon footprint.
- Troubleshoot common power system faults and performance degradation issues.
- Plan power infrastructure to meet the specific demands of 5G and IoT networks.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to foster a dynamic and immersive learning experience that bridges theory with real-world application. This course moves beyond traditional lectures, employing a blended approach that includes interactive presentations, expert-led discussions, and collaborative group workshops. Participants will engage with detailed case studies drawn from leading global telecom operators, analyzing successful energy efficiency projects and learning from past infrastructure challenges. Practical exercises will simulate key tasks such as calculating power requirements for a new cell site, designing a hybrid power system, and interpreting data from energy monitoring tools. Team-based activities encourage peer-to-peer learning and problem-solving, allowing participants to share diverse experiences and perspectives. Continuous feedback is a cornerstone of our approach, with structured Q&A sessions and expert guidance ensuring that all concepts are thoroughly understood. This hands-on, participant-centered methodology ensures that attendees leave not just with knowledge, but with the confidence and practical skills to implement effective power and energy management solutions within their own organizations.

Course Agenda (Course Units):

Unit One: Fundamentals of Modern Telecom Power Systems

- Introduction to telecom power architecture and its criticality.
- Understanding AC and DC power principles in telecom applications.
- Key components: rectifiers, inverters, converters, and power distribution units.
- International standards and safety protocols for telecom power.
- Power quality issues: surges, sags, noise, and harmonics.
- Grounding and bonding for equipment protection and safety.
- Calculating power loads and dimensioning system capacity.

Unit Two: Battery and Backup Power Technologies

- The role of batteries in ensuring network availability.
- Deep dive into Valve-Regulated Lead-Acid (VRLA) batteries.
- Exploring the advantages of Lithium-ion (Li-ion) battery technology.
- Battery management systems (BMS) for monitoring and optimization.
- Sizing battery banks for specific autonomy requirements.
- Traditional backup solutions: diesel generators and their management.
- Uninterruptible Power Supply (UPS) systems for critical loads.

Unit Three: Renewable and Hybrid Energy Solutions

- Introduction to renewable energy in the telecom sector.
- Solar power systems for telecom sites: design and components.
- Wind energy applications for remote and off-grid towers.
- Designing and implementing hybrid power systems (Solar-Diesel-Grid-Battery).
- Advanced control systems for hybrid energy management.
- Economic and environmental analysis of green power solutions.
- Case studies of successful renewable energy deployments in telecom.

Unit Four: Energy Efficiency and Thermal Management

- The impact of energy consumption on operational expenditure (OPEX).
- Conducting telecom site energy audits and analysis.
- Power Usage Effectiveness (PUE) as a key performance metric.
- Advanced cooling systems: HVAC, free cooling, and liquid cooling.
- Optimizing thermal management in shelters and outdoor cabinets.
- Implementing energy-saving features in power equipment.
- Developing a strategic roadmap for network-wide energy efficiency.

Unit Five: Advanced Management, Monitoring, and Future Trends

- Remote monitoring and management of telecom power assets.
- Leveraging IoT and data analytics for predictive maintenance.
- The unique power demands and challenges of 5G networks.
- Smart grid integration and its implications for telecom power.
- Security considerations for connected power infrastructure.
- The future of energy storage: new battery chemistries and technologies.
- Developing a business case for power system modernization and investment.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

As 5G and IoT deployments accelerate, how might the decentralization of network infrastructure fundamentally reshape traditional telecom power system architectures and energy management paradigms?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by offering a holistic and forward-looking perspective on telecom power, moving beyond basic operational training to cultivate strategic expertise. While other programs may focus narrowly on specific equipment or technologies, this curriculum integrates the technical aspects of power systems with the critical business drivers of energy efficiency, cost reduction, and sustainability. It uniquely prepares participants for the future by dedicating significant focus to the power requirements of emerging technologies like 5G and IoT, as well as the practical integration of renewable energy sources. The content is enriched with real-world case studies and practical problem-solving exercises, ensuring that learning is directly applicable to the challenges professionals face today. Rather than simply presenting theoretical knowledge, the course emphasizes the development of analytical and decision-making skills, empowering participants to conduct energy audits, build a business case for modernization, and design resilient, future-proof power infrastructure. This strategic, comprehensive approach ensures that graduates are equipped not just to manage existing systems, but to lead the energy evolution within their organizations.