Training Services 2019

Power Consulting
# Power Consulting

ABB is a pioneering technology leader that works closely with utility, industry, transportation and infrastructure customers to write the future of industrial digitalization and to capture value.

Within ABB, the Power Consulting unit measures success by what matters to our customers. Our consultants combine global industry expertise with a commitment to helping clients safely and efficiently achieve their electrification objectives.

We help address issues of electrical network strategy, planning, operations, capacity building, efficiency, stability, security, reliability, and resiliency, by assessing these issues and training our clients in these areas.

Power Consulting operates independently from other ABB units allowing us to be product and system agnostic while maintaining a deep knowledge of and familiarity with technologies, standards, and local grid codes from around the world.

We can help identify the challenges of today’s power systems and recommend solutions for your specific needs, helping you address your unique challenges to capitalise on great opportunities.

We have provided solutions for customers across six continents giving us a unique, first-hand perspective on the complex political and regulatory environments that our customers face.

We have helped every type of business — from large, multinational utilities to small and medium-sized municipalities and cooperatives, from manufacturers to hospitals — solve their toughest power challenges.

# Training Services

## Who we are

### About us

Power Grids training experts from ABB Power Consulting units worldwide.

### Our teachers

- PG Consultants and other professionals from throughout ABB
- Well-known specialists from the utility, industrial and academic arenas

### Our facilities

- The Power Technologies Experience Centre in Vadodara (India)
- Training facilities at ABB’s Power Consulting premises in USA, Brazil, UK, Spain, Sweden, Germany, India and China
- Training sessions at clients’ premises

### Our clients

- 69,000 students
- 450 courses
- 250 international clients
- 7,400 university students from leading institutes across India

# ABB Power Consulting has offices in 8 countries supporting customer efforts from renewables integration to energy economics and asset management

- Power Grids training experts from ABB Power Consulting units worldwide.
- 25-plus years of experience at ABB’s Power Technologies Experience Training Centre in India

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01 Power Consulting units across the world
Training Services 2019

What we do

Open courses
We offer a range of technical courses from the fundamentals of electrical engineering to the design of the most critical systems within electrical infrastructures.

Any interested professional can join these open courses which have a fixed programme, price, dates and location for 2019.

On-demand courses and workshops
We combine our open courses with a wider range of technical courses that have a fixed programme but can be organised for your company at any preferred date throughout 2019.

Most of our on-demand courses can take place at our headquarters in Spain, UK, Germany, India or the USA, although we can also organise them at your premises.

Tailored courses
We develop specific training programmes adapted to your staff, activities and needs. Based on your requirements and our experience, we can design customised courses within ABB facilities or at your premises.

The course content can be tailored to provide a specific answer to a one time need, or to include courses in the ABB catalogue, or even to define learning paths that combine several courses presented over a period of time.

On-line training and webinars
Many of our courses can also be developed in an e-learning format depending on your needs, allowing you to work self-paced. We also offer a series of free webinars throughout the year that you can attend to stay updated with the latest hot topics in the energy world.

A wide range of formats and courses to meet our customers’ requirements

Training Services 2019 open courses

**Modern Power Grids**
- An Introduction to electric transportation: EVs and railway systems
  - Days: 3
  - Dates: 2-4 Apr 2019
  - Location: Madrid, ES
  - Price*: 1,620 EUR
- Decentralisation, digitalisation and decarbonisation of the energy sector
  - Days: 3
  - Dates: 9-11 Apr 2019
  - Location: Madrid, ES
  - Price*: 1,620 EUR
- The EU grid codes requirements and their application
  - Days: 1
  - Dates: 9 May 2019
  - Location: Mannheim, DE
  - Price*: 990 EUR

**Software**
- Introduction to NEPLAN: a power system software
  - Days: 3
  - Dates: 24-26 Sep 2019
  - Location: Madrid, ES
  - Price*: 1,160 EUR

**Planning Studies**
- Energy transition: opportunities and challenges with renewable integration
  - Days: 3
  - Dates: 18-20 Jun 2019
  - Location: Madrid, ES
  - Price*: 1,620 EUR
- Power System studies: planning and analysis
  - Days: 4
  - Dates: 12-15 Nov 2019
  - Location: Stone, UK
  - Price*: 2,500 EUR
- Strategic planning of distribution grids
  - Days: 1
  - Dates: 3 Apr 2019
  - Location: Mannheim, DE
  - Price*: 990 EUR

**System Solutions**
- Energy storage in innovative markets and microgrids
  - Days: 2
  - Dates: 5-6 Feb 2019
  - Location: Madrid, ES
  - Price*: 1,380 EUR
- Introduction to voltage control and reactive power: FACTS solutions
  - Days: 3
  - Dates: 26-28 Mar 2019
  - Location: Madrid, ES
  - Price*: 1,380 EUR
- Grid integration of HVDC light, offshore HVDC and FACTS devices
  - Days: 2
  - Dates: 7-8 May 2019
  - Location: Mannheim, DE
  - Price*: 1,980 EUR
- HVDC planning and modelling. Optional economic justification of HVDC
  - Days: 2
  - Dates: 7-9 May 2019
  - Location: Raleigh, NC, USA
  - Price*: 1,850 USD
  - Optional: 400 USD for optional content

**Specialty Issues**
- A Primer for subsynchronous oscillations (SSR, SSTI, SSCI)
  - Days: 1
  - Dates: 24 Apr 2019
  - Location: Raleigh, NC, USA
  - Price*: 950 USD
- Subsynchronous oscillations-the phenomena, studies and mitigation
  - Days: 3
  - Dates: 10-12 Sep 2019
  - Location: Raleigh, NC, USA
  - Price*: 2,100 USD

**Systems Engineering**
- Grounding systems
  - Days: 3
  - Dates: 7-9 May 2019
  - Location: Madrid, ES
  - Price*: 1,480 EUR
- Protection for electric power systems
  - Days: 4
  - Dates: 23-26 Apr 2019
  - Location: Madrid, ES
  - Price*: 1,480 EUR
- Overvoltage and Insulation coordination
  - Days: 3
  - Dates: 15-17 Oct 2019
  - Location: Madrid, ES
  - Price*: 1,480 EUR
- Protection Coordination and arc flash hazard analysis
  - Days: 2
  - Dates: 7-8 Oct 2019
  - Location: Stone, UK
  - Price*: 1,250 EUR
- Substation engineering
  - Days: 1
  - Dates: 9 Apr 2019
  - Location: Vadodara, IN
  - Price*: 700 USD
- Power system earthing
  - Days: 2
  - Dates: 10-11 Apr 2019
  - Location: Vadodara, IN
  - Price*: 1,400 USD
- Power systems studies and relay coordination
  - Days: 4
  - Dates: 15-18 Oct 2019
  - Location: Vadodara, IN
  - Price*: 2,800 USD

**Equipment Management**
- Transformer maintenance and diagnosis
  - Days: 3
  - Dates: 5-7 Mar 2019
  - Location: Bilbao, ES
  - Price*: 1,620 EUR
- Asset Management
  - Days: 1
  - Dates: 6 May 2019
  - Location: Mannheim, DE
  - Price*: 990 EUR

* Prices include a hard and a soft copy of all training material, coffee breaks and lunch during class days. Prices do not include applicable taxes.
Modern Power Grids

An introduction to electric transportation: EVs and railway systems

Objectives
Discover the principles of electric vehicles and the various types of battery technologies. Identify the main traction technologies and storage sizing for electrified transportation.

Audience
Any professional curious about the latest trends in e-mobility and electric transportation.

Course topics
- What are Electric Vehicles? Introduction
  - Types and main characteristics
  - Advantages of electrification over conventional drivetrains
  - Comparison of hybrid architecture technologies
  - Role of electric vehicles in the energy transition
- Plug-In Electric Vehicles (PEV)
  - EV deployment
  - Battery technologies
  - Charging infrastructure
  - Future trends
- Electric public transportation systems
  - Deployment and electrification
  - Storage in electrified public transportation
- Network integration of electrified transportation
  - Main impacts
  - Impacts on distribution networks
  - Corrective measures
  - Grid flexibility
  - Energy storage sizing for electrified public transportation systems
  - Energy management systems
  - Modelling and sizing methods
  - Optimal sizing

Date: 02-04 April 2019
Location: Madrid, Spain.
Price: 1,620 EUR + VAT

Decentralisation, digitalisation and decarbonisation of the energy sector

Objectives
Discover today’s trends in the decentralization of the electricity market. Understand the current context of energy decarbonization and its main challenges. Deepen knowledge of key concepts of cybersecurity, big data or blockchain as applied to the electricity market.

Audience
Professionals with experience in the electricity sector interested in understanding the current context of the energy transition.

Course topics
- Decarbonisation
  - What does “decarbonisation of the economy” mean?
  - General goals of decarbonisation
  - EU goals for decarbonisation
  - National transposition of the objectives
  - On-going measures and current status
  - Challenges
- Decentralisation
  - Transition from centralised to distributed generation systems
  - New role of consumers
  - Impact on distribution networks
  - Challenges for retail electric providers
  - New stakeholders in the sector
  - Decentralisation trends
  - New regulations
- Digitalisation
  - Digitalisation in the energy sector
  - Cybersecurity
  - Digitalisation trends
  - Case Studies

Date: 09-11 April 2019
Location: Madrid, Spain.
Price: 1,620 EUR + VAT

The EU grid codes requirements and their application

Objectives
Delve into the technical specifics of European grid codes. Appreciate the role of generating facilities in supporting the stability and flexibility of the grid.

Audience
Engineers with basic knowledge of grid planning and renewables integration who are interested in learning about grid codes and their impact on the electricity systems.

Course topics
- Overview (scope, background and classification)
- Main connections (general principles, connection process and technical requirements)
- Generating facilities (static voltage maintenance, dynamic grid support, adaptation of active power, protective devices, verification of electrical properties, activation conditions and synchronization)

Date: 09 May 2019.
Location: Mannheim, Germany.
Price: 990 EUR + VAT
Software

Introduction to NEPLAN: a power systems software

Objectives
Gain a comprehensive vision of the main functionalities of the software.
Master basic actions in NEPLAN: represent grids, work with diagrams, graphic layers and efficiently use the short-circuit and power flow modules.

Audience
Engineers involved in the study and design of power grids, beginners in this type of software.

Course topics
- Basics of the user graphic interface
- Create and edit NEPLAN libraries
- Symbol editor
- Data export
- Graphic and grid layers
- Load flow analysis
- Theoretical basics for load flow calculations
- Power system element modelling
- Reference value adjustments
- Load balance
- Short-circuit analysis: single-phase, two-phase, three-phase
- Single-line diagrams and tables
- Case studies

Date: 24-26 September 2019.
Location: Madrid, Spain.
Price: 1,160 EUR + VAT
Planning Studies

Energy transition: opportunities and challenges with renewables integration

Objectives
Understand the technical and economic challenges of integrating variable renewable energies in today’s grid.

Audience
Professionals in the energy sector with an engineering background interested in renewables grid integration.

Course topics
- History and problems of renewable energies
- Current energy trends: photovoltaics, solar thermal and wave energy
- Stiffness of the grid and technical concepts
- Grid codes
- Uncertainty and variability of wind and solar
- Technical solutions for fulfilling grid codes
- Distributed generation: status and trends
- Electrification of energy demand status and trends
- Main challenges of the high penetration of renewables in distribution systems
- Studies to determine the compliance with the grid codes
- Power plants measurements and studies
- Current status of renewable technologies
- Main energy policies implemented at national and international level to promote the integration of renewable energies
- Regulatory framework for renewable energies internationally
- Electricity price determination and evolution
- Introduction to electricity market operation
- Impact of renewable energies on the electricity market
- Opportunities for renewable energies in the wholesale electricity market and the operation of the power system

Date: 18-20 June 2019.
Location: Madrid, Spain.
Price: 1,620 EUR + VAT

Power system studies, planning and analysis

Objectives
Understand the modelling of the power system and concepts of power flow studies. Understand short-circuit studies, stability studies and protection principles.

Audience
Personnel from electric utilities, power generation, transmission companies and industries and consultants responsible for the system design, planning and engineering of power system.

Course topics
- Power system studies-Introduction
- Modelling of power system components and networks for various studies
- Load flow studies-voltage profile calculations and influencing factors, modelling and case studies
- Contingency analysis and optimal power flow
- Short-circuit studies-2 bus matrix and symmetrical components, balanced and unbalanced faults
- Transient stability analysis and voltage stability analysis
- Basics of power system protection and devices
- Integration of wind farms in utilities
- IEEE and IEC standards
- Power system study tools
- Case studies

Date: 12-15 November 2019.
Location: Stone, UK.
Price: 2,500 EUR + VAT

Strategic planning of distribution grids

Objectives
Acquire a deep understanding of how distribution grids are planned.

Audience
Engineers with experience as grid planners interested in learning about distribution grids.

Course topics
- The difference between expansion planning and target network planning
- Objectives of planning (economy and loss minimisation)
- Legal basis (Incentive regulation)
- Technical conditions (voltage band, current carrying capacity of equipment and reliability indicators such as ASIDI)
- Mapping of future load feed situations (including electromobility)
- Walkthrough depending on the time horizon (Introduction, network slimming and separation point optimisation)

Date: 03 April 2019.
Location: Mannheim, Germany.
Price: 990 EUR + VAT

Visit to the world’s first Renewable Integration Centre (CECRE) in Madrid
System Solutions

Energy storage in innovative markets and microgrids

Objectives
Explore today’s innovative markets for energy storage and the trends in business models for microgrids.

Audience
Any professional interested in understanding the problems of energy storage in macro and microgrids.

Course topics
- Introduction to storage technologies
  • Description of present grid related challenges
  • Rationale for designing storage systems within the grid and regulatory framework
  • Main energy storage technologies
- Main storage technologies
  • Battery storage: Description of the technology with examples
  • Flywheel energy storage: Description of the Technology with examples
  • Power electronics and automation in storage systems
- Innovative applications for energy storage systems
  • Microgrids
  • Interconnected networks
- Case studies
  • Case studies: feasibility study, storage technology selection and dimensioning

Date: 05-06 February 2019.
Location: Madrid, Spain.
Price: 1,380 EUR + VAT

Introduction to voltage control and reactive power - FACTS solutions

Objectives
Understand the fundamentals of voltage and reactive power network problems. Discover the alternatives, technical and economical advantages that FACTS systems can provide.

Audience
Professionals dealing with reactive power problems who are interested in the technological solutions and their applications.

Course topics
- Voltage and reactive power control
  • Analysis of grid problems
  • Consumption and generation of reactive power
  • Solutions for reactive power and voltage control
  • FACTS systems
    • Dynamic short compensation
    • Applications of FACTS devices: T&D grids, renewables, Industry, railway
    • Configuration and components of a FACTS installation
    • Control and protection
    • Comparison of STATCOM and SVC
  • Economics of FACTS
  • A FACTS project: from the feasibility study to commissioning

Date: 26-28 March 2019.
Location: Madrid, Spain.
Price: 1,380 EUR + VAT
System Solutions

Grid integration of HVDC light, offshore HVDC and FACTS devices

Objectives
Understand the role of HVDC in today’s grids. Discover the functionalities of Voltage Source Converters (VSC) in FACTS and HVDC systems.

Audience
Engineers with experience as grid planners and interest in better understanding the role of HVDC and FACTS devices.

Course topics
• HVDC introduction (history and background)
• FACTS devices and characteristics
• VSC theory
• VSC harmonics
• VSC controls
• Network integration (steady-state analysis)
• Control modelling for studies
• Case studies for dynamic and harmonic analysis

Date: 07-08 May 2019.
Location: Mannheim, Germany.
Price: 1,580 EUR + VAT

HVDC planning, modelling and economic justification

Objectives
Obtain a high-level understanding of HVDC technology, existing applications, market drivers and operational considerations. Acquire an understanding of HVDC interactions with AC systems, modelling considerations, and controls. Appreciate issues addressed by new or existing HVDC applications. Understand economic aspects of project justification (optional).

Audience
Individuals who work for developers, electric utilities and transmission system operators who are involved in the planning, engineering, specification and operation of power transmission systems.

Course topics
• HVDC transmission market drivers and benefits
• HVDC technologies and equipment
• HVDC applications
• HVDC controls
• HVDC—AC system Integration
• Planning and specification studies
• HVDC modelling
• HVDC in weak systems
• Future trends and challenges
Optional ½ day
• HVDC economic studies
• Transmission constraints and HVDC operational nomograms
• HVDC grid model for economic studies

Date: 07-09 May 2019.
Location: Raleigh, North Carolina, USA.
Price: 1,850 USD for 2 full days (7-8 May).
400 USD for optional ½ day (9 May)
A primer for subsynchronous oscillations (SSR, SSTI, SSCI)

Objectives
Gain a general understanding of the various types of subsynchronous oscillation (SSO) phenomena and their causes.
Gain an overview of the studies required to identify the potential risks of SSO.
Review possible mitigation and protection measures for SSO.

Audience
Individuals who work for developers, electric utilities and transmission system operators who need a high-level understanding of the risks associated with subsynchronous oscillations including the potential impacts to equipment, plant design and points-of-interconnection.

Course topics
• History of SSO
• Overview of SSO phenomena and their causes
  - Induction Generator Effect and Subsynchronous Control Interaction (SSCI)
  - Torsional interaction due to series capacitors and active devices such as HVDC stations, SVCs or STATCOMs
  - Torque amplifications
  - Impacts of POI selection
  - SSO studies
  - Potential mitigation and protection options

Date: 24 April 2019.
Location: Raleigh, North Carolina, USA.
Price: 950 USD

Subsynchronous oscillations: phenomena, studies and mitigation

Objectives
Understand of the various types of subsynchronous oscillation (SSO) phenomena.
Understand the role of electrical machines and the power grid in SSO.
Understand the studies required to identify the potential risks of SSO and how to interpret the results. Review potential mitigation and protection measures for SSO.

Audience
Individuals who work for developers, electric utilities and transmission system operators who need a more complete understanding of the risks of subsynchronous oscillations and the potential impacts to equipment, plant design and points-of-interconnection.

Course topics
• An Overview of SSO and its history
• The underlying concepts of SSO phenomena
• Electrical machines and characteristics associated with SSO
• Mechanical aspects of machines associated with SSO
• The electrical grid’s contribution to SSO
• In depth discussion of SSO phenomena
• Mitigation and protection for SSO
• SSO studies and modelling aspects

Date: 10-12 September 2019.
Location: Raleigh, North Carolina, USA.
Price: 2,100 USD
Systems Engineering

Grounding systems

Objectives
Learn the basic criteria for the safe design of earthing systems in any high voltage facility. Analysis using case studies following the international standards IEC and IEEE.

Audience
Professionals involved in the study, operation or maintenance of electrical installations.

Course topics
- Soil characteristics and systems geometry
- Electrical current flow analysis
- Step and touch potentials determination
- Design and installation aspects
- Measurements of soil resistivity, resistance grounding and voltages
- Case studies: substations and smaller stations based on current standards and applicable legislation

Date: 07-09 May 2019.
Location: Madrid, Spain.
Price: 1,480 EUR + VAT

Protection for electric power systems

Objectives
Identify the main protection devices and systems used in generation, transmission and distribution.

Audience
Engineers without experience in the field of electrical protection, as well as those who are interested in the theoretical aspects of their operation.

Course topics
- Fault calculation
- Devices associated with protection systems
- Basic concepts regarding protection relays
- Protection for lines
- Protection for generators
- Protection for static machines
- Common protection for systems

Date: 23-26 April 2019.
Location: Madrid, Spain.
Price: 1,480 EUR + VAT
Systems Engineering

**Overvoltage and insulation coordination**

**Objectives**
Understand how to ensure the insulation coordination of electrical systems. Learn how to select surge arresters, line insulation levels, shield wires, earthing and related items.

**Audience**
Engineers and technicians with an electrical background.

**Course topics**
- Insulation coordination
- Temporary overvoltages (TOV)
- Fast front lightning overvoltages
- Slow front overvoltages
- Insulation levels selection and coordination
- Protection equipment. Surge arresters
- Shielding
- Substation case study

**Date:** 15–17 October 2019.
**Location:** Madrid, Spain.
**Price:** 1,480 EUR + VAT

**Protection coordination and arc flash hazard analysis**

**Objectives**
Understand the concept of Power System protections and grading studies. Understand arc flash hazard concept and analysis.

**Audience**
Personnel from electric utilities, power generation, transmission companies and industries and consultants responsible for system design, planning and engineering of power system.

**Course topics**
- Power system protection principles
- Relay co-ordination and grading between overcurrent and protection devices
- Directional overcurrent relays
- Unit protection
- Primary and backup relays and their grading
- Arc flash hazard concepts
- Arc flash hazard analysis
- Power system study tools
- IEEE 242, NFPA standards
- Case studies

**Date:** 07–08 October 2019.
**Location:** Stone, UK.
**Price:** 1,250 EUR + VAT
Systems Engineering

Substation engineering

Objectives
Understand various substation basics and switching configurations.
Understand different types of busbar configurations and layout engineering issues.
Understand the various substation equipment and accessories.

Audience
Electrical engineers, design, EPC, testing and commissioning personnel, consultants and engineers from generation companies, industries having IPPs and CPPs, utilities, industries and process plants, academia, students of electrical/power system.

Course topics
- Switchyard basics, various switching configurations
- Basics of protection philosophy for different bus configurations
- Layout engineering (basic considerations)
- Overview of substation design calculations
- Statutory obligations and safety aspects in substations
- Equipment and accessories

Date: 09 April 2019.
Location: Vadodara, India.
Price: 700 USD + VAT

Power system earthing

Objectives
Gain knowledge necessary to design and manage the earthing systems for utilities and industries.
Appreciate the complex problems of conductive and inductive interrelationships between substation and powerline earthing.
Appreciate the techniques for solving problems found in earthing system design using computer based techniques.

Audience
Asset managers, project managers, maintenance managers, electrical engineers and other technical staff responsible for power system or other assets that rely on earthing systems for their safe and correct operation. Understand the risk associated with earthing and possible mitigation options.

Course topics
- Basic concepts of earthing, electrical properties of soil and measurement
- Earth potential rise, step and touch potential concepts
- Fundamentals of overhead line earthing, cable earthing and equipment earthing
- Basics of lightning and surge protection
- Overview of earthing system design and case studies

Date: 10-11 April 2019.
Location: Vadodara, India.
Price: 1,400 USD + VAT

Power system studies and relay coordination

Objectives
Build knowledge on the modelling of power system components. Appreciate the different types power system analysis and their relevance to power systems. Gain insight into related IEEE/IEC standards. Understand the analysis functions in the NEPLAN power system software.

Audience
Electrical engineers, design, EPC, testing and commissioning personnel, consultants and engineers from generation companies, industries having IPPs and CPPs, utilities, industries and process plants, academia, students of electrical/power system.

Course topics
- Load flow, voltage profile calculations and influencing factors, modelling and case studies, contingency analysis
- Transient stability and voltage stability analysis
- Harmonic analysis
- Fault calculation, short-circuit current calculations and studies. Z bus matrix and symmetrical components, balanced and unbalanced faults
- Relay co-ordination and grading between overcurrent and short circuit devices
- Power system study tools – NEPLAN® and case studies

Date: 15-18 October 2019.
Location: Vadodara, India.
Price: 2,800 USD + VAT
Equipment Management

Transformer maintenance and diagnosis

**Objectives**
Become familiar with the transformers’ life management based on condition analysis, risk assessment and overall planning. Discover the key diagnostic method and techniques of preventive and corrective maintenance.

**Audience**
Engineers and technicians interested in advanced management of transformer life.

**Course topics**
- Types of transformers and configurations
- Main components and configurations
- Accessories and protection components
- Maintenance techniques
- Preventive
- Predictive
- Corrective
- Advanced diagnostic testing
- Visit to the transformer repair facilities

**Date:** 05-07 March 2019.
**Location:** Bilbao, Spain.
**Price:** 1,620 EUR + VAT

Asset management

**Objectives**
Explore the fundamentals of asset management and how it has evolved. Gain knowledge and master the importance of accounting for all management functions and understanding their role. Learn how to perform asset simulations with a software like NEPLAN.

**Audience**
Professionals with experience in asset management related to the energy sector.

**Course topics**
- Basis of asset management (development in recent years, motivation, challenges)
- Structure of asset management (maintenance strategies, FMEA, aging behaviour resources, aging model, remaining lifespan, renewal strategy, short and long-term consideration)
- Business management functions (budget planning, economic considerations, Life Cycle Cost)
- State, importance and risk assessment
- Asset simulation
- Integration into the company organization
- System landscape in asset management
- Short introduction of the software NEPLAN AM

**Date:** 06 May 2019.
**Location:** Mannheim, Germany.
**Price:** 990 EUR + VAT
State of the art training facility in Asia
ABB PowerTEC

Infrastructure

- Experience center
- Auditorium with 100+ capacity
- 2 Classrooms with 30+ capacity each
- Customer Lounge

Practical demonstrations

- Life size equipment
- Cut sections
- Models
- Switchyard

Futuristic technology

- Virtual reality experience of HVDC
- Factory cockpit
- Live Industrial Microgrid

The state of the art infrastructure blended with experienced trainers
General information

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