



# دورة تدريبية حول أنظمة نقل التيار المستمر عالي الجهد



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المرجع: 36325\_72307 التاريخ: 13 - 17 Apr 2027 الموقع: أمستردام الرسوم: Euro 6000

### Course Overview:

This complete course is designed to provide in-depth knowledge and hands-on experience in HVDC High Voltage Direct Current technology. As the demand for efficient long-distance power transmission increases, HVDC systems have become critical in connecting renewable energy sources and stabilizing grids worldwide. The course covers everything from HVDC transmission fundamentals to advanced HVDC converter station design and HVDC system protection and control. Participants will explore key components such as thyristor valves, converter transformers, harmonic filters, and DC transmission circuits, and how they contribute to the efficiency and reliability of HVDC systems. Additionally, the course delves into topics such as AC vs. DC harmonic filters, earth electrode design, and the advantages of HVDC transmission for offshore wind farms. Through expert-led sessions, case studies, and digital models, participants will be equipped to manage HVDC projects, implement design specifications, and ensure reliable HVDC power transmission efficiency.

### Target Audience:

- Electrical Engineers
- Power Transmission Technicians
- Renewable Energy Project Managers
- HVDC System Designers
- Grid Integration Specialists

### Targeted Organizational Departments:

- Engineering and Design Teams
- Project Management Offices
- Operations and Maintenance Divisions
- Grid Infrastructure and Planning Departments
- Renewable Energy Integration Teams

### Targeted Industries:

- Electrical Power Generation
- Renewable Energy Offshore Wind, Solar
- Energy Transmission Companies
- Industrial Manufacturing
- Government Energy Regulatory Agencies

## Course Offerings:

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

- Design and manage HVDC transmission line components.
- Understand HVDC system protection and control strategies.
- Optimize the use of smoothing reactors and harmonic filters in HVDC systems.
- Implement HVDC converter theory in practical projects.
- Analyze the efficiency of HVDC vs AC transmission systems.
- Utilize digital models for HVDC system studies.

## Training Methodology:

This course will incorporate a combination of theoretical and practical learning methods. Participants will take part in interactive sessions where they will work on real-world HVDC project implementations. Case studies will examine successful HVDC grid integration for renewable energy sources. Group work will be used to discuss complex HVDC design specifications, and feedback sessions will provide insight into the application of HVDC transmission system planning.

## Course Toolbox:

- workbooks on HVDC transmission
- Case studies on HVDC grid integration
- Checklists for HVDC converter station design and maintenance
- Templates for HVDC project management

## Course Agenda:

### Day 1: Introduction to HVDC and Transmission Schemes

- Why High Voltage Direct Current? Topic 1:
- Main Types of HVDC Schemes Topic 2:
- Converter Theory Topic 3:
- Principle Arrangement of an HVDC Transmission Project Topic 4:
- Overview of HVDC System Benefits Topic 5:
- Comparison of HVDC and AC Transmission Systems Topic 6:
- Reflect on the key differences between HVDC and AC systems and the importance of Reflection & Review:  
HVDC in modern power grids.

## Day 2: Components of HVDC Systems

- Thyristor Valves in HVDC Systems Topic 1: •
- Converter Transformer Design and Function Topic 2: •
- Smoothing Reactor: Purpose and Implementation Topic 3: •
- Harmonic Filters: AC Harmonic Filters Topic 4: •
- Harmonic Filters: DC Harmonic Filters Topic 5: •
- Harmonic Filters: Active Harmonic Filters Topic 6: •

Discuss the role of these components in improving HVDC transmission efficiency and **Reflection & Review:** •  
reducing system faults.

## Day 3: HVDC Transmission Circuits and Protection Systems

- DC Transmission Circuit Overview Topic 1: •
- DC Transmission Line Design and Technology Topic 2: •
- DC Cables in HVDC Systems Topic 3: •
- High-Speed DC Switches Topic 4: •
- Earth Electrode: Purpose and Design in HVDC Topic 5: •
- Surge Arresters in HVDC Systems Topic 6: •

Review how these components ensure safe and reliable HVDC transmission. **Reflection & Review:** •

## Day 4: Control, Protection, and Digital Modeling

- Control and Protection in HVDC Systems Topic 1: •
- Digital Modeling for HVDC System Studies Topic 2: •
- Design Specifications for HVDC Projects Topic 3: •
- Fault Management and Recovery in HVDC Systems Topic 4: •
- HVDC Grid Integration and Control Systems Topic 5: •
- Advanced HVDC Protection Strategies Topic 6: •

Reflect on the use of digital models and control systems to enhance HVDC operations. **Reflection & Review:** •

## Day 5: HVDC Project Management and Practical Applications

- HVDC Project Management Best Practices Topic 1: •
- Implementing HVDC Transmission Projects Topic 2: •
- System Maintenance and Reliability in HVDC Topic 3: •
- Benefits of HVDC for Offshore Wind Farms Topic 4: •
- HVDC Transmission Efficiency: Practical Insights Topic 5: •
- HVDC System Planning for Long-Distance Transmission Topic 6: •

Review of project management techniques and how they contribute to the successful **Reflection & Review:** •  
implementation of HVDC systems.

## How This Course is Different from Other Training Courses:

High Voltage Direct Current HVDC Transmission Training Course offers a complete approach to HVDC transmission. This course focuses on both the theoretical and practical aspects of HVDC system design, installation, and maintenance. It covers in-depth sessions on HVDC system protection and control, converter theory, and advanced HVDC control systems, preparing participants to address modern HVDC grid integration challenges. Additionally, the course includes advanced digital models and case studies to help participants apply their knowledge to real-world HVDC projects. The unique combination of theoretical knowledge and hands-on training sets this course apart in the field.



## فئات الدورات التدريبية



HR TRAINING & DEVELOPMENT

دورات إدارة و تطوير الموارد البشرية



دورات إدارة و تحليل البيانات ودورات علم البيانات



دورات إدارة الجودة وتطوير العمليات



الدورات التدريبية في مجال البيئة والاستدامة



دورات التسويق وإدارة علاقات العملاء وإدارة المبيعات



دورات التدريب القانوني والمشتريات والتعاقدات



دورات الاتصال الجماهيري و السياسات والعلاقات العامة



دورات النظم السيبراني ودورات تقنية المعلومات



دورات الصيانة ودورات المجالات الهندسية المتنوعة



دورات الصحة والسلامة والأمن المهني



دورات السكرتارية و إدارة المكاتب



دورات الحوكمة وإدارة المخاطر والامتثال



**AGILE LEADERS**  
Training Center

## فئات الدورات التدريبية



دورات معتمدة من قبل هيئات دولية



دورات في مجالات القيادة والإدارة



دورات المهارات الشخصية وتطوير الذات



دورات المحاسبة و التمويل و دورات الإدارة  
المالية



دورات مكتب إدارة المشاريع وإدارة المشاريع  
الرشيقية

## مدن التدريب



أمستردام - هولندا



أكرا - غانا



أثينا - اليونان



أبوظبي - الإمارات العربية المتحدة



الدوحة - قطر



الدار البيضاء - المغرب



الجبيل - المملكة العربية السعودية



استنبول - تركيا



المنامة - مملكة البحرين



الكويت - الكويت



القاهرة - مصر



الرياض - المملكة العربية السعودية



بانكوك - تايلند



بالي - جمهورية اندونيسيا



بأكو - أذربيجان



باريس - فرنسا

## مدن التدريب



تبليسي - جورجيا



بوكيت - تايلاند



برشلونة - إسبانيا



براغ - جمهورية التشيك



دبي - الإمارات العربية المتحدة



جوهانسبرغ - جنوب إفريقيا



جنيف - سويسرا



جاكرتا - جمهورية إندونيسيا



سيول - كوريا الجنوبية



سان دييغو - الولايات المتحدة الأمريكية



زنجر - تنزانيا



روما - إيطاليا



طشقند - أوزبكستان



طرابزون - تركيا



شيكاغو - الولايات المتحدة الأمريكية



شرم الشيخ - مصر

## مدن التدريب



فيينا - النمسا



عن بعد - منصة زووم



عمان - المملكة الأردنية الهاشمية



طوكيو - اليابان



لندن - المملكة المتحدة



لانكاوي - ماليزيا



كيب تاون - جنوب إفريقيا



كوالالمبور - ماليزيا



مونترنو - سويسرا



مسقط - سلطنة عمان



مدريد - إسبانيا



ماربيا - إسبانيا



نيس - فرنسا



نيروبي - كينيا



ميونخ - ألمانيا



ميلان - إيطاليا

# WHO WE ARE

Agile Leaders is a renowned training center with a team of experienced experts in vocational training and development. With 20 years of industry experience, we are committed to helping executives and managers replace traditional practices with more effective and agile approaches.

## OUR VISION

We aspire to be the top choice training provider for organizations seeking to embrace agile business practices. As we progress towards our vision, our focus becomes increasingly customer-centric and agile.

## OUR MISSION

We are dedicated to developing value-adding, customer-centric agile training courses that deliver a clear return on investment. Guided by our core agile values, we ensure our training is actionable and impactful.

## WHAT DO WE OFFER

At Agile Leaders, we offer agile, bite-sized training courses that provide a real-life return on investment. Our courses focus on enhancing knowledge, improving skills, and changing attitudes. We achieve this through engaging and interactive training techniques, including Q&As, live discussions, games, and puzzles.



**AGILE LEADERS**  
Training Center

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