

ABB UNIVERSITY & ONLINE ACADEMY FOR EXCITATION AND SYNCHRONIZATION

J850D - UNITROL® 6000 X-Power

Operation and Maintenance

5 days, online training

Course goals

UNITROL® 6000 X-Power is a microprocessor-based system which design is based on ABB's high performance controller family AC 800PEC. UNITROL® 6000 X-Power is mainly used for high demanding static excitation system.

The course goal is to learn how to operate, maintain and troubleshoot the UNITROL® 6000 X-Power excitation system.

Main learning objectives

Upon completion of this course, participants will:

- Remember the synchronous machine and its operating conditions
- Know the duties of excitation systems
- Be able to explain the hardware concept and used configuration of the UNITROL® 6000 X-Power excitation system
- Be familiar with the principle mode of operation of the electronic devices with its indication and settings
- Be able to read and interpret the hardware drawing
- Be able to operate the voltage regulator using the excitation control terminal
- Be able to explain the most important software functions
- Be able to localize and replace defective components
- Be able to carry out the maintenance work based on the maintenance schedule

Participant profile(s)

- Operation and maintenance personnel

Prerequisites

- Basic knowledge of electronics and power generation
- Personal computer knowledge is required
- English Level: B1

Delivery and learning methods**Duration**

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| <ul style="list-style-type: none">– Lectures for introduction– Practical exercise using UNITROL® 6000 X-Power excitation demo equipment– Hands-on training using generator simulator | <ul style="list-style-type: none">– 5 days, Max. 8 participants |
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Registration

For registration or enquiries please write: assemgul.mambetova@kz.abb.com

Notes

Tailor-made and on-site training courses on request

Topics

Topics

- Basic of excitation system and operating condition of the synchronous machine
 - Configurations of UNITROL® 6000 X-Power with its redundancy principle
 - Setup and principle of operation of the hardware
 - Main Controller
 - Measuring and I/O interfaces
 - HMI and Communications
 - Excitation Control Terminal ECT
 - Converter Control Panel CCP
 - Power Converter
 - Principle operation of the software
 - Voltage regulator with limiters and power system stabilizer
 - Superimposed $\cos \phi$ / VAR control
 - Channel and follow-up control
 - Monitoring and protection
 - Ethernet addressing and communication to upper control systems
 - How to use the tools for UNITROL® 6000 X-Power utilized for maintenance
 - PECinstaller and configurator tool
 - Excitation Control Terminal
 - How to use the Local Control Terminal ECT
 - Operate the excitation system locally
 - Verify the operating point of the synchronous machine
 - Displaying signals on the panel
 - Use the trending and transient recorder
 - Reading the event/alarm logger
 - Identify and interpret alarm indication
 - How to use the Converter Control Panel
 - Maintenance and troubleshooting procedures
 - How to replace hardware components
 - How to verify proper operation of the excitation system
 - How to perform functional tests
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Virtual Course map

Typical course layout (time or sequence may change)

DAY 1 | 9:00 AM – 3:00 PM

- Course overview
- Basic of excitation systems
- Introduction to UN6000 system topology
- The hardware arrangement and principle operation of the hardware devices
- How to read the hardware drawing

DAY 2 | 9:00 AM – 3:00 PM

- The power converters utilized by UNITROL® 6000 X-Power
- Introduction to the software
- Operation aspects of UNITROL® 6000 X-Power
- The redundancy principle
- Factory visit virtual
- How to use the various tools of UNITROL® 6000 X-Power
- Ethernet Addressing
- Software download/upload
- How to use the Converter Control Panel

DAY 3 | 9:00 AM – 3:00 PM

- How to use the Excitation Control Terminal
 - Operator panel
 - Parameter settings
 - Trending
 - Control Theory

DAY 4 | 9:00 AM – 3:00 PM

- Transient Recorder
- Power chart
- Event recorder
- ECT settings
- Exercises using Simulators
- Commissioning aspects

DAY 5 | 9:00 AM – 3:00 PM

- Maintenance aspects
- How to replace hardware components
- How to run functional tests
- Troubleshooting aspects, alarm handling

