

## COURSE DESCRIPTION

# J840 UNITROL® 6000 Light/Medium Operation and Maintenance training

### Course goal

UNITROL® 6000 Light/Medium is the newest product of UNITROL series of excitation systems introduced by ABB Switzerland AG. It is a microprocessor-based system using the state-of-the-art technologies currently available. Its design is based on ABB's high performance controller family AC 800PEC.

The course goal is to teach students to operate, maintain and troubleshoot the UNITROL® 6000 Light/Medium excitation system.

### Main learning objectives

Upon completion of this course, the students:

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

### Participant profile

Operation and maintenance personnel

### Prerequisites

Basic knowledge of electronics and power generation

Personal computer knowledge is required

- English Level: B1

### Topics

- Basic of excitation system and operating condition of the synchronous machine
- Configurations of UNITROL® 6000 Light/Medium 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
  - Service Control Panel SCP
  - 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
- Logic control
- Ethernet addressing and communication to upper control systems
- How to use the tools for UNITROL® 6000 Light/Medium utilized for maintenance
  - PECinstaller and configurator tool
  - Excitation C
- How to use the Local Control Terminal ECT or the Service Control Panel SCP
- 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
- Maintenance and troubleshooting procedures
- How to replace hardware components
- How to verify proper operation of the excitation system
- How to perform functional tests

#### **Learning methods and tools**

- Lectures for introduction
- Practical exercise using UNITROL® 6000 Light/Medium excitation demo equipment
- Hands-on training using generator simulator

#### **Enrollment**

Participants are kindly requested to apply online for public courses. Custom-tailored training courses are only available on request.

#### **Duration**

5 days, Max. 8 participants

Tailor made and on-site training courses on request

Registration Link: J840 UNITROL® 6000 Light/Medium

## Course map

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Topics	<ul style="list-style-type: none"> <li>– Course overview</li> <li>– Basic of excitation systems</li> <li>– Introduction to UNITROL® 6000 Light/Medium system topology</li> <li>– The hardware arrangement and principle operation of the hardware devices</li> <li>– How to read the hardware diagram</li> </ul>	<ul style="list-style-type: none"> <li>– The power converters utilized by UNITROL®6000 Light/Medium</li> <li>– Introduction to the software</li> <li>– Operation Aspects of UNITROL® 6000 Light/Medium</li> <li>– The redundancy principle</li> <li>– Factory visit</li> </ul>	<ul style="list-style-type: none"> <li>– How to use the various tools of UNITROL® 6000 Light/Medium</li> <li>– Ethernet Addressing</li> <li>– Software download/upload</li> <li>– How to use the Service-Control Panel SCP</li> </ul>	<ul style="list-style-type: none"> <li>– How to use the Excitation Control Terminal</li> <li>- Operator panel</li> <li>- Parameter settings</li> <li>- Trending</li> <li>- Transient Recorder</li> <li>- Power chart</li> <li>- Event recorder</li> <li>- ECT settings</li> <li>- Exercises using Simulators</li> </ul>	<ul style="list-style-type: none"> <li>– Maintenance aspects</li> <li>– Troubleshooting aspects, Alarm handling</li> <li>– How to replace defective components</li> <li>– How to perform functional tests</li> <li>– The users manual and other documents</li> </ul>
Time	8:30 am – 4:30 pm	8:30 am – 4:30 pm	8:30 am – 4:30 pm	8:30 am – 4:30 pm	8:30 am – 4:30 pm

Typical course layout (time or sequence may change)

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