COURSE DESCRIPTION

J640 Power Electronics
UNITROL® 5000 Service and Commissioning

Course goal

UNITROL® 5000 is a microprocessor-based system using the state-of-the-art technologies. Its design is based on ABB's over 35 years of experience in solidstate AVR's as well as 10 years in microprocessorbased technology in this field. The course goal is to teach students to start-up, adjust, operate, maintain and troubleshoot the UNITROL® 5000 excitation system.

Main learning objectives

Upon completion of this course, the students:
— Remember the synchronous machine and its operating conditions
— Know the duties of excitation systems
— Know the design aspects of UNITROL® 5000 and its possible configuration
— Know the principle mode of operation of the electronic devices
— Can operate the voltage regulator using the local panel
— Can read and interpret the hardware and software drawings
— Can use the commissioning and maintenance tool
— Are able to change parameters and display signals
— Can explain the most important software functions
— Are able to implement new standard function blocks to the software
— Can identify and interpret alarm indication
— Can read the fault logger
— Are able to localize and replace defective components
— Are allowed to start the certification program for commissioning UNITROL® 5000

Participant profile

Project design and commissioning engineers

Prerequisites

Basic knowledge of electronics and power generation Personal computer knowledge is required

Topics

Basic operating condition of the synchronous machine Configurations of UNITROL® 5000 for various applications
Single channel and double channel configuration
Principle operation of the hardware

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- Measuring units, I/O interfaces_
- Controller board
- Fast I/O
- ARCnet field bus
- Converter types
- Local service and control panel

Principle operation of the software
- Voltage regulator with limiters and power system stabilizer
- Channel and follow-up control
- Monitoring and protection
- Superimposed cos phi / VAr control
- Data exchange on dual-channel systems
- Setting of configuration and parameters using local panel and CMT tool
- Logic control
- Communication to superior data buses (MODBUS / Profibus)
- Most important parameters
- Using commissioning and maintenance tool
- How to change parameters, how to record signals using the data logger and trending window
- How to add application function blocks
- How to read the fault logger

Service and Commissioning aspects
- Commissioning procedures and settings
- Alarm indication
- Troubleshooting using the help of the users manual
- Preventive Maintenance

Learning methods and tools
Lectures for introduction
Practical exercise using UNITROL® 5000 excitation demo equipment
Hands-on training using generator simulator

Duration
5 days
Max. 8 participants

Course map

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Topics	– Course overview – Basics of excitation systems –Overview of the hardware configuration	Overview of the hardware devices – How to use the local operating panel – Factory visit – Software – documentation – param. / signals – interface HWSW	– Most important software functions – How to use the local service panel – How to use the commissioning and maintenace tool CMT	– How to use the commissioning and maintenace tool CMT - Trending - Data Logger - Application FB (Function Block)	– Software additional functions – ARCnet control Panel – Most important parameters – Maintenance, fault handling
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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