COURSE DESCRIPTION

CHJ220 – High Power Rectifier Systems
Operation and Maintenance

Course goal
ABB high power rectifier systems are employed in electrochemical electrolysis processes, graphite electrolysis plants, and DC-arc furnaces. Typically, such plants consist of at least a rectifier-transformer, rectifier power part, rectifier cooling unit and control system. The course goal is to operate and make appropriate maintenance on high power rectifier (HPR) systems.

Main learning objectives
Upon completion of this course the participants will know:
- Basic theory of power electronics and rectifier technology
- Basics of rectifier system design
- The typical design and configuration of rectifier systems
- The major components and main sections of rectifier systems
- Operation, operation levels and control principles
- Maintenance schemes

Participant profile
This training is targeted to operation and maintenance personnel.

Prerequisites
Basic understanding of electrical systems and power electronics is required.

Topics
- Basics of rectifier theory
- Rectifier connections
- 3-phase rectifier bridge
- Star-star surge reactor configuration
- Regulator function
- Phase control for thyristor applications
- Tap changer and transducer control for diode rectifier systems
- System design
- Design and system arrangement
- On-load tab changer transformer
- Parallel operation of rectifier groups
- Typical arrangement
- Rectifier transformer
- Rectifier part
- Cooling unit
- System control
- Control, regulator and protection features of the rectifier system
- Local control system
- Master control concept
- Man machine communication
- The AC800PEC control system
- Reading of drawings and manuals
- Operation and operation levels
- Safety & health
- Applicable maintenance

Course type and methods
- Lectures for introduction
- Practical exercise using demo equipment

Duration
The duration is 4 days.

Remarks
This course takes place in our offices in Turgi, Switzerland.

Custom-tailored and on-site courses are offered on request.
### Course map

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**Topics**

- Transformer
- Rectifier
- Losses
- Cooling
- Auxiliaries
- DC isolator
- Process
- Concept of control (CoC)
- Operation
- Control loop
- Control hardware

**Time**

- DAY 1: 9:00 am – 5:00 pm
- DAY 2: 9:00 am – 5:00 pm
- DAY 3: 9:00 am – 5:00 pm
- DAY 4: 9:00 am – 5:00 pm

*Typical course layout (time or sequence may change)*