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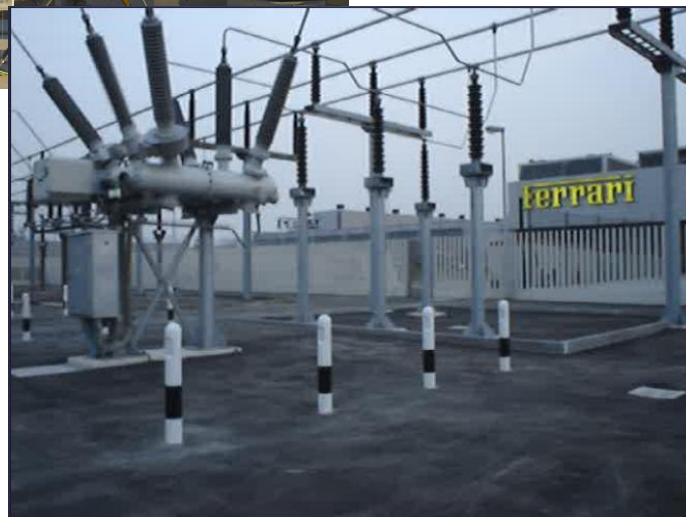
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# Training & Certification HV products



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## **1. TRAINING PROGRAM**

### **1.1 Objectives**

A professional training guarantees a high quality in the installation-, commissioning-, maintenance- and service-processes and safe operation of the equipments. All service engineers who commission, inspect, repair or overhaul ABB ADDA worldwide shall have a certified level of training and experience to assure the highest level of safety and quality paired with competent work and swift progress on site. The product service centre monitors the expiry of the certificates, distributes changed documents, invites for re-certification courses and coordinates the international delegations.

### **1.2 Training Modules**

The course program is modular and designed so that the participants can pass their trainings in steps according to the market needs of the local installed product population.

Each training module can be attended by anybody is interested once ABB ADDA gives its acceptance. At the completion of the module a Diploma of Participation will be issued with the name of Participant.

### **1.3 A - Basic Course**

This course gives an overview of the multifunction apparatus in ABB ADDA portfolio. The basic design and technology are explained. Applications and their advantages compared to traditional solutions are outlined.

### **1.4 B - Operation and Preventive Maintenance**

This course provides all the necessary instructions for a safe operation of specific equipment and the training for qualified preventive maintenance on closed equipment. A safe gas handling of SF6 gas will be instructed.

### **1.5 C – Erection and Commissioning**

This course provides all the classroom training for the commissioning of the specific equipments. Participants who passed the course successfully receive a course confirmation. After the participant has commissioned an equipment successfully under supervision of an accredited Level 3 supervisor, he will receive the commissioning certificate (Level 1) for that particular equipment.

### **1.6 D - Inspection, Corrective Maintenance, Repair**

This course provides the training for inspection, corrective maintenance, and repair of equipment. Participants that passed the training successfully receive a confirmation. After the participant had executed maintenance, from which matter of the training, successfully under the supervision of an accredited Level 3 supervisor, he will receive the maintenance certificate (Level 2) for that particular equipment.

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### 1.7 E – F Re-certification course

Service engineers who have gone through certification training are authorized to perform work up to the specified level for a time until the certificate expires. Those who can provide proof of an adequate amount of service work of that level undertaken during this time interval will - upon expiry of their certificate - not need to re-take the full certification course, but a rather shorter re-certification course. This information has to be delivered to the training centre without further request.

This course gives an up-date on all equipment type on the modifications and experiences that have accumulated since the last training of the participants. In order to renew the Level 1 or 2 certificates of a specific equipment type the participant must prove that he executed a minimum amount of relevant work in a given timeframe stated in the prerequisites of these courses. These certificates will then be extended after taking such a re-certification course. If the prerequisites cannot be met, the complete course C or D has to be repeated after expiry of the Certificate.

## 2. CERTIFICATION PROCESS

The certification is reserved to people working in Service/Erection & Commissioning Dept's. The achievement of a certain Certification level gives possibility to proceed with specified activities herein after described (see Table 1) without causing the cancellation of the contractually agreed warranty clause. The warranty clause does not cover anyhow faulty handling/workmanship also if performed by certified person

### 2.1 Commissioning: Level 1 Certificates

To receive this certificate, the commissioning classroom training (C) has to be achieved and one commissioning activity supervised by an accredited Supervisor has to be executed successfully.

The validity of this certificate is limited to 2 years + a grace period of 6 months to attend a re-certification course. To extend the validity via a re-certification course it must be proven that in the last 2 years 2 commissioning of the respective equipment have been executed and the corresponding taking over certificates were sent to the product service centre.

See Table 1 for activities allowed with Level 1 Certificate

### 2.2 Maintenance: Level 2 Certificates

To receive this certificate, the maintenance classroom training (D) has to be achieved one maintenance activity, within that included in the training, supervised by an accredited Supervisor has to be executed successfully.

See Table 1 for activities allowed with Level 2 Certificate

### 2.3 Supervisor: Level 3 Certificate

There is no full course to achieve supervisor level. This level is reached by appointment only. Candidates who are going through a re-certification training for Overhaul (level 2) are screened for evidence of sufficient experience to act as supervisors. The appointed candidates will receive an initiation to their supervisor roles & responsibilities immediately following their re-certification as overhaulers. With this Certification he is allowed to supervise Level 1 or Level 2 Candidates.

See Table 1 for activities allowed with Level 3 Certificate

2.4 Activities allowed for Certification level

Level of Certification	Erection/Commissioning	Service
<b>Level 1</b>	Erection & commissioning on factory tested module not requiring internal live part to be mounted on site	overhauling, small repairing like: change motor, change spring housing, RD replacement, all intervention that should be necessary case by case and being evaluated by ABB ADDA to be part of this level
<b>Level 2</b>	Erection & commissioning on factory tested module also requiring internal live part to be mounted on site	all that foreseen in Level 1 + drives substitution with setting and pole replacement ,all intervention that should be necessary case by case and being evaluated by ABB ADDA to be part of this level
<b>Level 3</b>	Erection & commissioning on factory tested module also requiring internal live part to be mounted on site and HV and IT Test. Supervision to level 1 and 2 Service eng.	all that foreseen in Level 2 + replacement of internal live parts, all intervention that should be necessary case by case and being evaluated by ABB ADDA to be part of this level Supervision to level 1 and 2 Service eng.

Table 1: Activities allowed for Certification level



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### 3. A – BASIC COURSE

#### **One Basic Course for all Type of PASS or for COMPASS**

##### **Objectives**

The participants understand the application and the functions of the substation's equipment.

##### **Contents**

1. Purpose and applications of a multifunctional apparatus
2. Overview of equipments types and technology
3. Range of Products
4. Design
5. Components
6. Functions
8. Comparison with other Solutions
9. Question & Answers

##### **Participants**

Maintenance Engineers, candidates for Field Service Engineers and Front End Sales Personnel.

##### **Prerequisites**

Basic knowledge of electrical and mechanical engineering, technical college qualifications or equivalent education.

##### **Location**

In-house or on customer site

##### **Duration**

1 day

##### **Test**

None

##### **Confirmation of participation**

Yes

##### **Certificate**

None



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#### **4. B – TRAINING COURSE OPERATION & PREVENTIVE MAINTENANCE**

##### **Objectives**

This course will provide all the necessary instructions for a safe operation of a specific equipment, PASS or COMPASS, as well as the training for a qualified maintenance.

##### **Contents**

1. Product Description
2. Product Design, Product Functions and Components
3. Operation Modes, Instruments, Alarms
4. Electrical schema, interlocking
5. Preventive Maintenance on closed breaker
6. Health & Safety
7. SF6-Gas Handling
8. Instruction for Erection
9. Tools
10. Practical Training optional: observing a factory acceptance test
11. Overhaul and maintenance criteria and intervals
12. Documentation
13. Test
14. Questions and Answers

##### **Participants**

Maintenance Engineers, Operation Engineers and Field Service Engineers

##### **Prerequisites**

Knowledge of electrical and mechanical engineering, technical college qualifications or equivalent.

##### **Location**

In-house or on Customer Site

##### **Duration**

1 days

##### **Test**

Yes

##### **Confirmation**

Yes

##### **Certificate**

None

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**5. C – TRAINING COURSE ERECTION & COMMISSIONING****Objectives**

This course will provide all the necessary training needed for the Commissioning of specific equipment

**Contents**

1. Packing, Storage, Transport
2. Erection
3. Breaker Function
4. Operation Modes
5. Mechanical and Electrical Checks
6. Electrical Measurements
7. Drives
8. Health & Safety
9. SF6 Handling (Pressures, Density Monitor, Service Equipment, Leakage Detector, Filling and Evacuating Device, Recycling)
10. Tools
11. Preparations for Commissioning
12. Obtaining the plant specific documents Electrical Diagram, Dimension Drawing, Commissioning Report, Factory acceptance test report
13. Practical Training “Commissioning Step by Step” using the Operation Manual
14. Obligations and regulations for certificate holders
15. Questions and Answers
16. Test

**Participants**

Field Service Engineers

**Prerequisites**

Operation and Maintenance ,Course B and solid knowledge of electrical and mechanical engineering is required. Technical college qualifications or equivalent.

We reserve the right to further screen participants with an admission test.

**Location**

In-house

**Duration**

3 days

**Test**

Final Test

**Confirmation**

Yes

**Certificate**

After one successful and supervised commissioning in the field



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## 6. D – TRAINING COURSE INSPECTION, MAINTENANCE AND REPAIR

### Objectives

This course will provide the necessary training for Inspection and Corrective maintenance: BLK drive, Disconnector drive, SF6 gas leakage, SF6 gas control system,

### Contents

- Failure Analysis
- CB's drive maintenance
- Disconnector's drive maintenance
- Change of Density monitor, Bursting Disk, Valve,
- Maintenance of a gas leakage
- Spare parts
- Mechanical and Electrical Checks
- Functional Checks
- Drying agent
- SF6 handling of used gas
- Re-Commissioning after maintenance
- Health & Safety
- Questions and Answers
- Test

### Participants

Field Service Engineers

### Prerequisites

Certification Level 1 (commissioning) and meeting requirements for re-certification.

### Location

In-house

### Duration

PASSM00	1 day
PASSM0	1 - 2 days
COMPASS	1 day

### Test

Final Test

### Confirmation

Yes

### Certificate

After three successful and supervised maintenance in the field, but only for the items object of the training.



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## 7. E – RE-CERTIFICATION

### **One Re-certification training for all Type**

#### **Objectives**

These courses will provide an up-date on modifications and experiences from the last 2 years. These courses are required every 2 years to re-validate the Level 1 and Level 2 Certificates.

#### **Contents**

1. Information about design changes
2. Information about failure potential
3. Information about replacement kits and up-grades
4. Distribution of newest manuals and checklists
5. Experience exchange
6. Networking
7. Questions and answers

#### **Participants**

Certified Field Service Engineers Level 1 and Level 2

#### **Prerequisites**

Commissioning Certificate (Level 1) or Maintenance Certificate (Level 2) and eligible for re-certification.

#### **Location**

In-house

#### **Duration**

2..3 days

#### **Test**

None

#### **Confirmation**

Yes

#### **Certificate**

Extension of Certificate for 2 years (+ grace period of 6 month to attend up-date course)

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To enable FES to explain Products, Service Products and Applications professionally

**Contents**

1. Organization of product service centre, local service centers
2. Applications of ABB ADDA's products
3. Product Portfolio
4. Equipment's Options
5. Required technical Data's for tender elaboration
6. Products of Competitors
7. Advantages of ABB multifunctional apparatus and customer benefits
8. Commercial comparison with alternative solutions
9. Service Products - upgrades (content/costs) - reasons for carry out the overhaul timely - service ordering process and partners
10. Frequently asked customer questions and answers
11. Test

**Participants**

Front End Sales People in charge of the ABB u.o. ADDA Portfolio. Experienced Sales Engineers with Technical Understanding

**Prerequisites**

Basic Course A

**Location**

In-house

**Duration**

1 day

**Test**

Final Test

**Confirmation**

Yes

**Certificate**

None