COURSE DESCRIPTION

INBOM101
Operations and Maintenance workshop on LV / HV Motors

The goal
The aim of this training is to provide in-depth knowledge of various aspects of HV and LV Motors. It will range from basic principles of operation to selection and performance related issues. It thoroughly introduces the concept of how to maintain a motor effectively and ensure reliability of the motor.

Learning objectives
Upon completion of this course, participants will be able to:

- Understand the details concepts of motor theory, selection and construction
- Appreciate the optimum operation of motors, performance characteristics, stresses on motors and starting methods of motors
- Understand the critical maintenance practices of motors including installation, commissioning, overhauling and condition monitoring

Participant profile
Personnel from industries having at least 1 year of on-site experience, Consultants responsible for engineering, commissioning, operation and maintenance of Motors

Prerequisites
Degree or diploma in engineering, basic knowledge of motors

Topics

Basic theory on motor

- Motor fundamentals
- Types of motor loads
- Load calculation, torque / speed
- Different types of motors: AC (HV, LV) (induction, synchronous

Motor Construction
- Main components
- Mechanical (bearings, shaft, frame)
- Electrical (stator and rotor windings and their materials, slip rings)
- Special motors: Explosion Proof

Motor Selection and Specification
- Sizing and rating
- Nameplate description
- Commercial considerations
- Standardization
- Performance Related Aspects
- Specification Parameters like Torque, Speed and Power Factor

Motor Operation, Motor Starters and Controls:
- Single line diagrams
- Types of motors starters and comparison (pros and cons)
- Variable speed drives
- Restrictions on starting frequency
- Starting, restarting, and re-acceleration
- Voltage dip consideration

Motor Installation, Commissioning and Maintenance
- Installation and its Precautions
- Repair and Overhauls
- Overhaul / repair and motor efficiency
- Preventive Maintenance Programs
- Coupling alignment methods
- Motor storage conditions for long durations
- Mechanical inspections (shaft run out, fittings, shield tolerance according to bearings)

Motor Inspection and Testing Overview
- Fundamentals of Motor Testing
- Factory Testing: Standards used, the structure, the tests
- Overview Electrical Diagnostics Techniques:
- Importance of Off-line Testing
- Various Techniques Employed
- Motor Condition Monitoring Overview
- Importance of On-line Testing
- Various Techniques Employed
- Diagnostics Using Vibration Spectrum Analysis
- Diagnostics Using Current Spectrum Analysis

Motor Protection and Fault Finding Procedures
- Basics of technical safety on motors
- Protective devices and their characteristics / range
- Protection measures / procedures
- Actions in the event of trips

Root Cause Failure Analysis for Motors
- Various Stresses and Failures on motors (TEAM approach
- Salient Failure Modes, Failure Statistics
- The RCFA (Root Cause Failure Analysis) Methodology
- Failure Tree Development
- Storage, Transport, Installation,
- operation – key issues & precautions,
- Do's & Don't, commissioning,

Course type
This is an instructor led seminar with practical demonstrations of product and guided tour to Motor Factory. The language of the course is English.

Laptop or tablet is required to have access to the e-documentation. Please bring your own device.

Duration
The duration of the course is 3 days.

Safety
Participants must wear safety toe shoes or boots while entering the Factory

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The latest version of the course portfolio, and course schedule can be found on our **ABB PowerTEC Webpage :**
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