Training - Electrical Motors: Technology, Operation and Maintenance

EIMEA-EN-P | **Face-to-face only** | **5 days**

This course focuses on the technical development of industrial electrical motors

Level
Skilled

Public
Electrical and mechanical engineers, supervisors, technicians involved in electrical motors maintenance and operation

Objectives
Attendees will be able to implement the following skills:

- Explain how electric motors work
- List the main malfunctions
- Specify the diagnostic tools in use
- Explain repair and inspection techniques

Pedagogical & technical resources

- Visit of a motor repair workshop (when possible)
- Interactive course
- Motor disassembly and assembly in case of an available workshop

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites
No prerequisites are necessary to follow this course

Responsable
IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

OPERATION PRINCIPLE & TECHNOLOGY — 2 days

Working principle of induction and synchronous motors.
Features: power, current, torque and power factors.
Technology and main parameters.

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Protective modes in regards with external environments: temperature classes, protection class index, hazardous area motors, ATEX protection.
Electrical and thermal protection of the motor as well as the use of temperature sensors.
API 541 asynchronous guidelines for refinery and petrochemical motors.
Efficiency motor's standards IEC 60 034-30/IEEE 112.

VARIABLE SPEED FEATURES — 1 day

Power and HV/LV range, fields of use and typical applications.
Speed and motor control as well as network consequences. Synchronous motor: torque control and various technologies.
Induction motor: standard starting methods depending on mechanical load, motor power and network capacity; limiting conditions due to the grid; number of start constraints. Electronic starting method (soft starter).

INSTALLATION — 0.5 day

Main characteristics and constraints for a motor installation.
Skid and shim. Shaft alignment. Comparison to reference datasheets. Vibration footprint.

FAILURE DIAGNOSIS IN OPERATION — 0.5 day

Bearings: temperature, vibration, lubrication monitoring.
Mechanical failures.

CONTROL & REPAIR TECHNIQUES - PRACTICAL WORK — 1 day

Part identification in workshop.
Bearings assembly, housing repair, clearance and run-out checks.
Electrical insulation and phases balancing checks.
Impact of frequency inverters and harmonics on electrical coils insulation and the bearings.
Coil insulation repairs: vacuum coils impregnation, technology and quality. Rewinding and coils positioning according to magnetic circuit's notches. Electrical checks (electrical resistance, insulation, polarization...).
Balancing: quality standards, unload and load tests. Repair specification: specification content as well as work acceptance.
Visit of a motor repair workshop (when possible).

To French entities : IFP Training is referenced to DataDock ; you may contact your OPCO about potential funding.
Please contact our disabled persons referent to check the accessibility of this training program : referent.handicap@ifptraining.com

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