

Training - Fundamentals of Mechanical Maintenance



GENMAIN-EN-P



Face-to-face only



5 days

This course aims to master the elements of language and understanding of mechanical systems, in terms of design, characterization, maintenance and repair. This will contribute to the maintenance follow-up, but also to the optimized operation of the static and dynamic mechanical systems (rotating machinery)

Level

Knowledge

Public

All technicians from the Oil & Gas industry who work in connection with equipment and mechanical systems (operation, maintenance) and who do not know the fundamentals of design of these systems (or who wish to deepen their knowledge). Jobs mainly concerned: mechanicals, mechanical assistants, mechanical supervisors

Objectives

Attendees will be able to implement the following skills:

- Know the basics of technical drawing, characterize a part, a mechanical assembly
- Identify the different mechanical construction materials
- Know the fundamentals of mechanical system design, the main assemblies (bearing assemblies)
- Know the main power transmission elements (gears, joints...), wisely use the metrology devices used in workshop
- Describe the mechanical strength, chemical resistance and thermal resistance

Pedagogical & technical resources

- Very interactive training given by highly experienced trainers
- Gradual mechanical approach, from the dimensioning of a simple mechanical part to the design basis of a dynamic system such as a rotating machine

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

Responsible

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

TECHNICAL REPRESENTATION OF PARTS & SIMPLE MECHANICAL SYSTEMS

2 days

Technical drawing agreement: 2D and isometric views, projections, section and cut-away views, perspectives, technical vocabulary.

Dimensioning of parts and mechanical systems, ISO tolerances and main adjustments.

Dimensional tolerances and clearance.

Geometric tolerances and surface condition characterization.

Presentation of the tools in a metrology shop, performances and rules of use.

Practical exercises:

- Dimensioning and full geometric control of a pump shaft.
- Understanding of a simple machine cut-away view.
- Representation of a machine element in 2D projection and perspectives.

ELEMENTS OF CONSTRUCTION

1 day

Materials used in the Oil & Gas industry: identification of the metals, alloys, plastics and composites, operating and maintenance rules.

Expansion and effects on the assemblies.

Manufacturing process of metallic parts, molding, forging.

Frequent screwed, bolted, welded and stuck constructions.

Characterization of threads and bores, petroleum thread pitch.

Removable power transmission: keys, gears, hinged connections (joint...), cone interface.

Non-removable power transmission: shrink fitting.

Bearings: characterization, types, identification, assembly rules.

Seals of static systems (between flanges) and dynamic systems (mechanical seals on bearing boxes), analysis and selection of the materials.

Pipe, valves and main line accessories: identification, operation and maintenance rules.

Practical exercises: selection, identification and assembly of the ball bearings in a simple process pump.

ELEMENTS OF MAINTENANCE

1 day

Tightening: importance of torque, order, techniques.

Alignment: understanding the operation, controlling the mating of piping.

Lubrication: properties and characterization of common oil and greases, lubricating systems.

Controlling the condition of parts at disassembly: corrosion, defaults, mating, wear, rupture.

Controlling the clearances at disassembly.

Practical exercise: mechanical completion of a pump on site (control and implementation).

ELEMENTS OF REPAIR

1 day

Surface treatments and coatings.

Overlay welding and reconstitution.

Machining.

Casing repair with staples.

Expertise controlling: dye penetrant testing, metrology, ultrasonic, hardness testing.

Test and requalification: balancing, test, control of performances.

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