Training - Maintenance Supervisor

MAINSUP-EN-P | **Face-to-face only** | **35 days**

This program aims to develop the knowledge and skills needed to perform the supervision and maintenance of equipment, systems and networks used in Oil & Gas production facilities. It includes machines mechanical aspects, wears, rupture, lubrication problems, the control and maintenance of instrumented systems, the generation, distribution and use of electrical power and provides a thorough understanding of the associated HSE considerations

IFP Training Certificate

Vocational Certificate

Level

Skilled

Public

All people working for the Oil & Gas production, transport or storage facilities with experience in the maintenance area:

Objectives

Attendees will be able to implement the following skills:

- Know the physical phenomena involved in the Oil & Gas treatments
- Understand the fundamentals of maintenance
- Be familiar with the technology and operation of static equipment and rotating machinery used in the Oil & Gas production facilities and know the different elements concerned by maintenance and inspection policies
- Know field instrumentation technology, understand DCS architecture and safety logics, be familiar with the calibration and synchronization procedures and be aware of the importance of measurement quality
- Be able to analyze and monitor electrical equipment and electrical networks and know how to identify and mitigate associated electrical hazard
- Understand the risks associated to products, equipment and operations and plan adequate resources to carry out activities adopting industry best practices

Pedagogical & technical resources

- Lecturing by industry specialists
- Team work exercises
- Course sessions in relation with practical exercises and case studies
- Mechanical workshops

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

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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

FUNDAMENTALS OF OIL & GAS PRODUCTION — 5 days

Fundamentals of chemistry: atoms, molecules, atomic weight, molecular weight.
Hydrocarbons types and main characteristics.
Applied physics: force, work and energy, temperature, thermal energy and heat transfer, pressure, hydrostatics, hydrodynamics and friction losses.
Well effluent: composition, types and characterization parameters.
Liquid-vapor equilibrium of pure components and mixtures.
Well effluents behavior. Need for effluents field processing. Specifications.

FUNDAMENTALS OF MECHANICAL MAINTENANCE — 5 days

Technical representation of parts and simple mechanical systems: technical drawing and vocabulary (2D views, projections, section and cut-away views, perspectives); dimensioning, tolerances, main adjustments, surface conditions; tools of metrology, performances and rules of use.
Elements of construction: metals, alloys, plastics and composites, operating and maintenance rules; screwed, bolted, welded and stuck constructions; bearings, seals. Pipe, valves and main line accessories.
Elements of repair: surface treatments and coatings; overlay welding and reconstitution; test and requalification.

MAINTENANCE & INSPECTION OF ROTATING MACHINERY (IN MECHANICAL WORKSHOP) — 10 days

General characteristics and technology of rotating machines: reliability, technological descriptions, operating parameters, characteristics; effect of external process parameters: composition of the products, modified suction or discharge conditions; stresses in normal operation and in abnormal conditions, operating limits; influence on the machine lifespan, general operating rules; effect on reliability, associated risks.
Technology and maintenance of the common elements: ball bearings, hydrodynamic bearings, magnetic bearings; sealing systems; balancing: imbalance, eccentricity, balancing class; couplings and alignments; lubrication.
Inspection and failure forecast: diagnosis, functioning point, checking the performance, detection of failure by vibrations and oil analysis; fundamentals of inspection; friction and materials, roughness, surface conditions, fretting corrosion; main rupture modes (stress, fatigue, impact, creep...).

INSTRUMENTATION, PROCESS CONTROL & SAFETY INSTRUMENTED SYSTEMS — 5 days

Sensors and transmitters: measurement of operating parameters, measurement uncertainties; physical principles, technologies, units of measurement, local reading/transmission; transmitter technology; preventive maintenance.
Controls and actuators: control valves (technology, types of valves, characteristic curves, safety position); positioners: principle of operation, types; ON/OFF valves: types, technology. Special ON/OFF valves: SDV, ESDV, BDV.
Controllers and control loop structures: behavior of a P&ID controller: operating point, gain, interactions...; control loops: simple, cascade and split-range.
Distributed Control Systems (DCS): architecture, security/redundancy; alarms, history, newspapers.
Safety Instrumented Systems (SIS): safety loop and safety functions, Safety Integrity Level; high Integrity Protection Systems (HIPS), Emergency Shutdown (ESD), Emergency DePressurization (EDP); Fire & Gas system (F&G).

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ELECTRICAL EQUIPMENT & POWER DISTRIBUTION NETWORK — 5 days

Electricity generation: gas turbine, alternator; monitoring and maintenance of the equipment, troubleshooting.
Electrical distribution and networks: HV and LV networks, architectures and equipment, distribution philosophy, differential protection; switchboards and switchgears, transformers, circuit breakers, protection and isolation elements, batteries; equipotential networks, earthing.
Electric motors: functioning and operation of AC and DC electric motors, windings coupling, adjustment to site conditions; routine monitoring, troubleshooting, starting systems, variable speed systems, maintenance.
Protection against electrical risks (as per the UTE C-18 510): hazards, voltage levels, safe approach distances, related safety devices; effects and consequences of the electrical risks, protections.
Hazardous areas and ATEX standards: definition of a hazardous area, ATEX specifications and standards; impact for the organization (certification, accreditation).

HSE IN MAINTENANCE & CONSTRUCTION ACTIVITIES — 5 days

Operations and HSE.
Risk assessment tools. Job safety analysis.
Permit to work system procedure.
Hazard identification and risk assessment of maintenance and construction works.
Environmental management in maintenance and construction operations.
Organizational framework. Human factors.
Management of contractors.
Audits. Means of improving the HSE performance.

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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