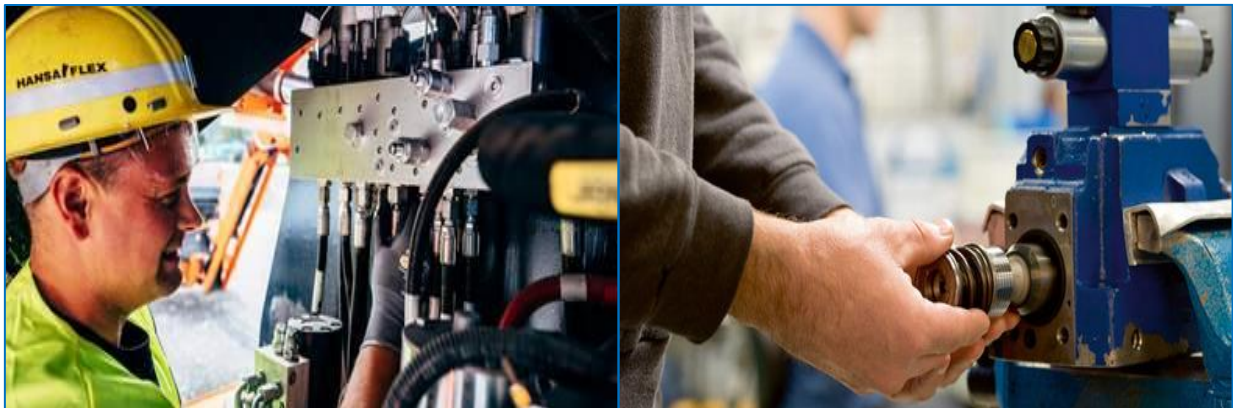




MU267: Operation and Maintenance of Hydraulic Equipment

Training Description:

This intensive training course provides participants with a greater working expertise and understanding of hydraulic operated equipment: operation, maintenance and troubleshooting. The course delivers an interactive training experience designed to help participants understand the various components found in a typical hydraulic system and how these components function and interact with each other.

Further, each participant will learn about the major groups of hydraulic components, including the function and principles of operation of direct-and pilot-operated relief valves, pressure-reducing valves, directional-control valves, fixed- and variable-displacement pumps, and accumulators. Understanding of the basic hydraulic circuits most often used in industrial hydraulic systems is covered. Hydraulic principles of mechanical maintenance, types of hydraulic fluids and their characteristics will be also covered.

This practical training course will discuss more on how to recognize faults and damage to major components in hydraulic systems during inspection and to adjust control valves and test hydraulic circuits for correct and safe operation.

This training course will highlight:

- Principles of Hydraulic Power Systems
- Problems Related to Hydraulic Fluids
- Variable and Fixed Displacement Hydraulic Pumps
- Principles of Operation of Control Valves
- Operation and Maintenance of Hydraulic Operated Equipment
- Maintenance, Inspection and testing of Hydraulic System

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Identify hydraulic systems components
- ✓ Describe essential hydraulic terms and understand their key applications
- ✓ Recognize the impact hydraulic fluids have on components
- ✓ Describe the correct operation, control sequences and procedures for the safe operation of various simple hydraulic systems
- ✓ Initiate an effective inspection and maintenance program
- ✓ Minimize forced outages and prevent series damage to hydraulic equipment
- ✓ Explain the latest technologies available for electro hydraulic systems

Training Designed for:

This course is intended for plant engineers, mechanical engineers, design engineers, consulting engineers, operation maintenance, inspection and repair managers, supervisors, plant operations and maintenance personnel, process and mechanical technicians.

Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request.”

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

❖ Principles of Hydraulics and Hydraulic Fluids

- Pascal's Law
- Main Components of a hydraulic System
- Filters, Reservoirs and Accumulators
- Closed and Open Loop
- Properties of Hydraulic Fluid
- Types of Hydraulic Fluids
- Fluid Selection
- Problems Related to Hydraulic Fluid

DAY TWO:

❖ Hydraulic Pumps

- Principles of Pump Operation
- Classification (Positive & Non-Positive Displacement) Gear Pump
- Vane Pump (Variable Volume & Pressure Compensated Variable Volume Pumps)
- Position Pump (Axial/Inline, Bent Axis, Radial, Variable Volume, Pressure Compensated & Over Center Axial Pumps)
- Gerotor Pump
- Rating of Pumps
- Pressure, Flow & Efficiencies of Pumps

❖ Hydraulic Motors

- Principle of Motor Operation
- Classification (Rotating & Piston Type)
- Gear Motors
- Vane Motors
- Piston Motors
- Difference between Hydraulic Motors & Hydraulic Pumps
- Specification of Hydraulic Motors
- Efficiency of Hydraulic Motors
- Motor Slippage

❖ Hydraulic Cylinders

- Classification (Single & Double Acting)
- Construction of Cylinders
- Cylinder Mounting
- Seals
- Cylinder Design Checklist
- Common Cylinder Problems

DAY THREE:

❖ Hydraulic Pumps & Actuators

- Classification and performance of Hydraulic Pumps
- Variable and Fixed Displacements Hydraulic Pumps
- Gear Pumps
- Vane Pumps
- Piston Pumps
- Pressure Compensator, and Load Sense Control
- Hydraulic Cylinders
- Hydraulic Motors

❖ Direction Control Valves

- Poppet Valve
- Check Valve
- Spool Valve (Rotary & Sliding Valves)
 - Direct & Indirect Operated Valves
- Valve Actuation Methods (Manual, Electrical, Pilot, Pneumatic, Electro-Hydraulic, Electro-Pneumatic)
- 2, 3 & 4 Way Direction Control Valves
- Positive & Negative Overlapping
- Center Conditions (Open Center, Closed Center, Tandem Center & Float Center Valves)

❖ Pressure Control Valves

- Relief Valves (Pressure Regulating & Emergency Relief)
- Meaning of Surge Pressure
- Meaning of Surge Pressure
- Sequence Valves
- Counterbalance Valves
- Pressure Reducing valves
- Unloading Valves

❖ Flow Control Valves

- Classification (Non-Pressure Compensated & Pressure Compensated)
- Location of Flow Control Valve (Meter-in, Meter-out & Bleed-off Circuits)

DAY FOUR:

❖ Operation and Hydraulic Circuits

- Operator Responsibilities
- Symbol of Hydraulic Components
- Operation of Regenerative Circuits
- Counterbalance Circuits
- Decompression Circuits
- Hydraulic Circuits of Various Machines
- Case Studies

DAY FIVE:

❖ Maintenance and Troubleshooting of Hydraulic Systems

- Flow Chart of Hydraulic Circuits

- Troubleshooting of Different Components of Hydraulic Systems
- Assembling and Disassembling Hydraulic Units
- Inspection and Testing of Hydraulic Systems
- Maintenance of Hydraulic Systems
- Case Studies
- ❖ Course Conclusion
- ❖ Final Examination and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

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