HYDRAULIC AND PNEUMATIC SYSTEMS COURSE

Training Dates:	As per schedule	**Training Venue:**	Kuala Lumpur, Malaysia.
Basic Fee:	RM3,450.00 + SST per participant (this includes course materials, meals, refreshment and attendance certificate)		

DURATION

21 hours (Three (3) days)

TARGET GROUP

- Operation and maintenance engineers
- Consulting engineer and hydraulic system designer
- Technical services executives
- Sale and application engineers
- Maintenance and production staff – supervisors, foreman and technician
- Procurement and auditing personnel
- Plant and facilities engineers

TARGETED INDUSTRY/INDUSTRIES

Oil & Gas, Petrochemicals, Power Plant, Renewal Energy Plant, Co-Generation Plant, Palm Oil Mills and Refineries, Plywood Industries, and all industries that using hydraulic and pneumatic systems.

CERTIFICATION

N/A

COURSE OVERVIEW

Hydraulic and pneumatic systems are used in many types of industrial applications, especially for heavy duty machineries pick and place automation system. Comprehensive understanding in basic principle, operation and maintenance of the hydraulic and pneumatic systems and their associate equipment are essential for optimal performance, maintenance and troubleshooting. This course is aimed to enhance the participant's understanding on the principle and operation of hydraulic and pneumatic systems, enhance skill in preventive maintenance and troubleshooting toward cost saving, safety and healthy working environment. Participants are exposed to the latest information on practical aspects of hydraulic and pneumatic systems and extensive discussion on maintenance and troubleshooting.

COURSE OBJECTIVE

- To provide a wide range of information and technical knowledge on hydraulic and pneumatic systems and their associated equipment
- To recognize hydraulic and pneumatic components, their function and symbols
- To construct and read basic hydraulic and pneumatic circuits for troubleshooting
- To enhance skill and competency in servicing, preventive and predictive maintenance
- To develop self-confidence towards the correct decision making for hydraulic and pneumatic troubleshooting

COURSE OUTCOMES

At the end of the course, the delegates will be able to:-

- Understand the principle, function and constructional and practical aspects of various components
- to read and construct several types of the hydraulic and pneumatic circuits
- Expose to some basic design characteristics, calculation and estimation
- Realize the proper and safe operating techniques
- Proper operation and maintenance toward cost and energy saving
- Get familiar with some routine maintenance and repair words
- Enhance skill in system troubleshooting

TRAINING METHODOLOGY

The training methodology will include short lectures, tutorial session, activities, presentations, discussions, case studies, ideas sharing with continuous evaluation and real time feedback.

COURSE CONTENTS

Module 1: Introduction to hydraulic and pneumatic applications: advantages and disadvantages

- Overview of hydraulic and pneumatic technology and applications
- Definition and terminology
- Hydraulic and pneumatic – advantages and disadvantages
- Fundamental and principle of hydraulics and pneumatics
- Hydraulic and pneumatic for industrial machineries
- Technology and development

Module 2: Hydraulic components and symbols

- Operation of basic circuits
- Recognition of hydraulic symbols
- Hydraulic components: pumps, control valves, actuators (linear and rotary)
- Hydraulic filters and tank

- Hydraulic fluids
- Pipe, hoses and fittings
- Seal and packing

Module 3: Hydraulic circuits and control: operation and maintenance

- Integration of components and construction of basic circuits
- Control concepts in hydraulic
- Pressure control valves and force control
- Flow and velocity control
- Load control (counterbalancing, positioning and braking)

Module 4: Preventive and predictive maintenance in hydraulic systems (Part 1)

- Inspection and maintenance of pumps and prime mover
- Maintenance for alignment and balancing
- Maintenance of actuators (cylinders and motors)
- Inspection and maintenance of control valves
- Proper installation and operation for maintenance
- Effective servicing on hydraulic fluid and filters
- The effect on the selection of hoses, piping and fittings
- Maintenance towards safe and healthy environment with hydraulic

Module 5: Preventive and predictive maintenance in hydraulic systems (Part 2)

- Inspection and maintenance of pumps and prime mover
- Maintenance for alignment and balancing
- Maintenance of actuators (cylinders and motors)
- Inspection and maintenance of control valves
- Proper installation and operation for maintenance
- Effective servicing on hydraulic fluid and filters
- The effect on the selection of hoses, piping and fittings
- Maintenance towards safe and healthy environment with hydraulic

Module 6: Compressed Air Systems for Pneumatics – Operation and Maintenance

- Compressor and intake filters
- Main line filter
- Dryer
- Air receiver
- Control valves
- Actuator capacity – velocity and load
- FRL unit
- Hose, piping layout and fittings

Module 7: Pneumatic components, function and symbols - Construction and operation of pneumatic control circuits

- Recognition of pneumatic symbols
- Construction and operation of basic circuits
- Pressure and force controls
- Flow and velocity controls
- Load control

Module 8: Preventive and predictive maintenance of pneumatic systems

- Routine service and inspection
- Maintenance of pneumatic components
- Troubleshooting of pneumatic systems
- Safety in handling of pneumatic systems
- Acts and regulations in relation to pneumatic systems

Module 9: Troubleshooting and repair in Hydraulic and Pneumatic Systems – Case Study

- Review on actual selected problem and malfunctions
- Inspection and evaluation on actual system
- Potential repair work
- Optimization for performance
- Potential and action for cost saving
- Environment friendly working conditions – risk and hazard

Module 10: Plant visit (For in-house workshop only)

- Demonstration and inspection of actual hydraulic and pneumatic systems
- Consultation on the existing hydraulic and pneumatic system in the plant
- Discussion and review on the existing maintenance programme

Question and Answer (Q & A) Session

- Discussion on related issues
- Comments on specific practical troubleshooting

ABOUT THE INSTRUCTOR

Ir. Associate Professor Yahaya bin Ramli, graduated with Masters of Science in Fluid Power Systems from University of Bath, United Kingdom and is both a Registered Professional Engineer (Mechanical) with Board of Engineers Malaysia (BEM) and a Corporate Member of The Institution of Engineers, Malaysia (IEM).

He has extensive field experience with several companies such as Felda Berhad (Plant Superintendent), Petronas Gas Berhad (Project Management Executive and Production Supervisor) and Sobena Offshore Inc (Assistant Plant Manager). Currently, he is a senior lecturer in University of Technology Malaysia at Faculty of Mechanical Engineering and he did a lot of research in thermo fluids technology.

He also active delivering the technical courses such as; pump technology, compressor systems, boiler and steam systems, valve maintenance, compressed air system and etc.