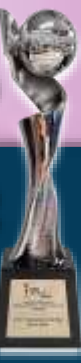




HRD
awards
2022



**TRAINING
PROVIDER**

Date : 12 & 13 Nov 2025 (Wed & Thu)

Venue : Wyndham Grand Bangsar

Kuala Lumpur Hotel

2 DAYS PROGRAM

PIPING, FITTING AND PUMP- PROBLEM IDENTIFICATION AND SOLUTIONS FOR INDUSTRY

**16 CDP
POINTS**

**Awarded by
Suruhanjaya Tenaga**

COURSE OBJECTIVES:

This training program is designed to provide an understanding of engineering related problems related to industry globally and a clear sense of what is required to effectively structure, establish measurements and solve problems. Participants will learn the goals and deliverables behind the solutions. Methodology as well as the most commonly used tools within each phase will be discussed. Participants will also learn how to support a problem solving initiative within their organization.

WHO SHOULD ATTEND:

Facilities engineers, maintenance engineers, design engineers and any one who would like to widen their knowledge on the theory of pumps.

MEASUREMENT TOOLS:

Quiz, exercises and a test at the end of second day.

LEARNING OUTCOME:

On successful completion of this course, the participant should be able to:-

- Understand the benefits and implications of pumps and piping, and relate the concepts to the overall business mission and objectives.
- Think about his/her organization as a collection of processes, with inputs that determine the output.
- Recognize the engineering problem solving model used to improve processes.
- Recognize the organizational factors that are necessary groundwork for a successful engineering problem solving program.
- Integrate the engineering problem solving program effort with other process improvement initiatives.
- Learn the various types of centrifugal pumps and piping types, their functions and terminologies used;
- Understand the design methodologies for centrifugal pumps and piping;
- Understand the various maintenance methods for centrifugal pumps and piping; and
- Understand the application of centrifugal pumps and the various types of piping in various industries.

COURSE INTRODUCTION AND OVERVIEW:

Within industry, piping is a system used to convey fluids (liquids and gases) from one location to another. The engineering discipline of piping design studies the efficient transport of fluid. Industrial process piping (and accompanying in-line components) can be manufactured from wood, glass, steel, aluminium, plastic, copper, and concrete.

Pumps have continued to grow in size, speed and energy level, revealing new problems that are being addressed by innovative materials, mechanical and hydraulic design approaches. Environmental pressures have increased, and these can and are being responded to by the creative attention of pump engineers and users. After all, the engineer is trained to solve problems, employing techniques that reflect knowledge of physical phenomena in the world around us.

Pumps have their fair share of engineering problems in industry.

The said problems could be classified into:-

- Problems which could be identified and solved immediately, with little or no financial implications or loss in production and a drop in quality levels;
- Problems which could be identified and cannot be solved immediately, with little or no knowledge of its implications;
- Problems which recur frequently and cannot be solved permanently etc;

Some of the reasons for these are due to:-

- Incompetent staff;
- A vast variety of equipment;
- Many moving (sliding, reciprocating, rotating) components etc.

This course is industry designed, to provide a broad understanding of the improvement methodology, concepts, and process. The methodology is presented with case studies and examples drawn from service, business process and manufacturing applications. The integration of manufacturing and maintenance is also addressed. With a heavy practice orientation, as much as a third of your time will be spent working through interactive practical exercises and assessments. This course is designed as an introduction to concepts and methodology.

TRAINING METHODOLOGY:

- The latest educational methods and strategies will be utilized.
- The course is designed to maximize delegate participation.
- Questions and answers are encouraged throughout and at the daily wrap-up sessions. This gives participants the opportunity to discuss with others and the presenter their specific problems and appropriate solutions.
- The course shall be conducted through lectures, case studies, group discussions and exercises to reinforce participant's learning.

COURSE CONTENT

DAY 1

Introduction to Piping

- Purpose
- Applicability
- References
- Distribution
- Scope
- Metrics
- Brand names
- Accompanying guidance
- Specification
- Manual organisation

Design Strategy of Piping

- Design analyses
- Specifications
- Drawings
- Basis of design
- Loading conditions
- Piping layout

General Piping Design

- Materials of construction
- Design pressure
- Sizing
- Stress analysis
- Flange, gaskets and bolting (fittings)
- Materials
- Pipe identification
- Piping supports (fittings)
- Testing and flushing

Metallic Piping Systems

- General
- Corrosion
- Design pressure
- Piping supports
- Piping systems
- Joining
- Thermal expansion
- Ductile iron
- Carbon steel
- Nickel and nickel alloys
- Aluminum
- Copper

Plastic Piping Systems

- General
- Polyvinyl chloride (PVC)
- Polytetrafluoroethylene (PTFE)
- Acrylonitrile-Butadiene-Styrene (ABS)
- Chlorinated Polyvinyl Chloride CPVC)
- Polyethylene (PE)
- Polypropylene (PP)
- Polyvinylidene Fluoride (PVDF)

Rubber and Elastomer Piping Systems

- General
- Design factors

- Sizing
- Piping support and burial
- Fluoroelastomer
- Isobutylene Isoprene
- Acrylonitrile Butadiene
- Polychloroprene
- Natural rubber

DAY 2

Fittings

- Flexible couplings (fittings)
- Air and vacuum relief (fittings)
- Drains (fittings)
- Sample ports (fittings)
- Pressure relief devices (fittings)
- Backflow prevention
- Static mixers
- Expansion joints (fittings)
- Piping insulation
- Heat tracing
- Corrosion protection
- Cathodic protection
- Isolation joints
- Protective coatings
- Valve types
- Valve sizing and selection
- Valve schedule

Introduction to Pumps

- Definition of head and related calculations
- Definition of capacity and related calculations, flow velocity
- Piping design:- Parts 1, 2, 3 and 4

Net Positive Suction Head and Specific Speed in Pumps

- Types of pumps
- Calculation of NPSH
- Suggested remedies for NPSH, and cavitation.

Pump and System Characteristic Curves

- Various types of system curves
- Information required to plot system curve
- The various types of pump curves for the various types of pumps.

Power, Efficiency and Electrical Requirements in Pumps

- Power requirements
- Motor selection
- Power consumption and energy savings
- Types of motors
- Torque and power factor

Variable Speed Systems in Pumps

- Reasons for using variable speed systems
- Energy savings under constant and fluctuating flow demand.