DEFINE
MANAGEMENT CONSULTANTS
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Training Title

Process Plant Equipment Sizing & Selection Training

Training Duration

5 days

Training Venue and Dates

Process Equipment Sizing & Selection		**5**		**14-18 February**		**$3,300**		**Dubai**

In any of the 5 star hotel. The exact venue will be informed soon.

Training Fees

- **3300 US$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch**

Training Certificate

Define Management Consultants Certificate of course completion will be issued to all attendees.

Training Description

Owing to their important role in nearly all industrial processes, sizing and selection of new equipment like thermal equipment (boilers, steam heat exchangers, fired gas heaters…), rotating equipment (pumps, turbines, gas and air compressors ……), are critical to both process efficiency and investment. The course highlights the relation between processes demands and suitable equipment sizing and selection. The piping system design required for each equipment will be studied. The course presents the major types of these equipment and demonstrates their recent technological aspects for installation, operation, maintenance & troubleshooting.

Objectives

1. **To lay out the major types of process plant equipment and process variables**
2. **To illustrate methods of estimating processes plant demand, such as:**
    a. **Thermal energy and steam consumption**
    b. **Air consumption**

c. Boiler feed water treatment

3. Demonstration of advanced information in basic design issues for major equipment
4. To present the main requirements for installation and good operability concerning each type of equipment
5. To study sizing and selecting of equipment properly
6. To clarify the vital role of different types of maintenance regimes in successful and continuous production operation
7. To present examples of troubleshooting through some case studies

Outline

Boilers

- Boiler house
- Various types of boilers
- The ancillary equipment and their integral role in the safety of the boiler
- Correct operation, control procedures for the safe operation.
- Inspection and maintenance program
- Minimize forced outages and prevent serious damage to boiler equipment

Boiler water treatment

- Harmful effects from improper treatment.
- Sizing and selection of water treatment plant
- External and internal water treatment
- Boiler deposits & blowdown control.

Steam consumption

- Steam engineering principles and heat transfer
- Methods of estimating and measuring steam consumption
- steam consumption of plant items: tanks, vats, air heaters and heat exchangers

Steam distribution and condensate return

- Steam traps and steam trapping
- Pipeline ancillaries
- Condensate removal

Heat exchangers

- Main types of heat exchangers and their primary components
- Specifying design requirements and design of primary exchanger components
- Heat exchanger selection
- The heat load, heat exchanger and steam load relationship
- Oversized heat exchangers
- Practical methods of preventing stall
- Typical inspection procedures: locating leaks, tube inspection techniques, eddy current testing, ultrasonic examination

Rotating Equipment:

Pumps

- Pump types, characteristics and operation
- Classification of pumps
- Specific speed and pump type
- Sizing and selection of pumps
- Pump characteristics: head, capacity, power, efficiency, total system head and curves
- Centrifugal pump construction features
- Net positive suction Head (NPSH) and cavitation
- Pipe line design

Turbines

- Turbine types and applications
- Major components of a turbine
- Turbine design and construction
- Governor
- Lubrication, vibration analysis, bearing temperature
- Turbine control
- Erection of a turbine
- Turbine piping

Air Compressors

- Assessment of air consumption of plant
- Sizing and selection of compressor plant
- Selection of compressor ancillary equipment
- Compressor installation
- Main line installation

- **Final service line installation**

Processes control

- **Basic Control Theory**
- **Control Hardware: Electric/Pneumatic Actuation**
- **Control Hardware: Self-acting Actuation**
- **Control Applications**
- **Safety Valves**

Applying predictive maintenance regime

Maintenance and Inspection

Troubleshooting (case study)

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