

**Training Title:**

**MAINTENANCE OF CENTRIFUGAL PUMPS**

**Training Duration:**

5 Days

**Training Venue and Dates**

Ref	Maintenance of Centrifugal Pumps	5	13-17 July 2020	\$6,250	Rome, Italy
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In any of the 5 star hotel. Exact venue will be informed soon.

**Training Fees**

- 6,250 US\$ per participant for Public Training including Course Materials/Handouts, Tea/Coffee, Refreshments & International Buffet Lunch

**Training Certificate**

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

**TRAINING DESCRIPTION**

Centrifugal pumps are among the most used machines in the world as their various designs permit their use in a variety of applications. They are used in everything from washing machines, refrigerators, cars and trucks to construction sites, wastewater treatment facilities and food processing plants. Pump running with least troubles and consequent less downtime improves whole system reliability. Right selection & operation, effective maintenance & inspection programs, and skilled staff are essential factors for prolonged pump life. This course is intended to enable the participants to learn more about pumps maintenance to achieve this required understanding. During the course, participant's discussion, comments and own problems are welcomed and encouraged.

**TRAINING OBJECTIVES**

- Carry out preventive, predictive and corrective maintenance on Pumps (centrifugal single & multi stage, screw & gear types).
- Review the different types of pumps
- Learn how to carry out preventive, predictive and corrective maintenance on centrifugal single & multi stage pumps
- Guide the participants to the right steps of pump selection
- Discuss the effect of cavitations in pumps.
- Be familiar with the right procedure for pinpointing & eliminating pump problems.

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- Have an overview and checklist of pump problems

### WHO SHOULD ATTEND?

Maintenance Engineers, Equipment Supply Engineers, Reliability Engineers and Senior Technicians working with pumping systems should benefit from this course. Also senior staff can update and refresh their knowledge by attending this course.

### TRAINING METHODOLOGY

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions, and motivate everybody find the right answers. The delegates will also be encouraged to raise their own questions and to share in the development of the right answers using their own analysis and experiences.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work & Practical Exercises
- 20% Videos & General Discussions

### TOPICS COVERED

Preventive, predictive and corrective maintenance on centrifugal pumps; new pump models introduced in KOC; type of pumps, pumps components, pumps selection, operating philosophy, trouble shooting, service, maintenance and major repair of pumps, review and update equipment clearance data sheet; hands on training on maintenance (overhaul) of single and multistage pumps, repair procedures for pump parts, pump alignment, reconditioning dry seals, bearing technology (including white metal bearing technology).

### DAILY COURSE OUTLINE

#### DAY 1

##### 1. INTRODUCTION TO PUMPS

- Basic pump theory
- General Requirements of Pump Safety
- Pump Performance Basic Terms
- Pumping Factors
- New pump models introduced in KOC

#### DAY 2

##### 2. CLASSIFICATION OF PUMPS

- Dynamic pumps

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## Centrifugal pumps

- Positive displacement pumps

## Reciprocating pumps-- Rotary pumps

- Slurry Pumps Pump Glossary
- Pump Selection Chart
- Review and update pump data sheet.

## DAY 3

### 3. PUMP AND MOTOR ALIGNMENT

- Introduction
- Types of misalignment
- Causes of Misalignment
- Alignment techniques
- Equipment alignment sequence

### 4. PUMP BEARINGS

- Introduction
- Bearing lubrication
- Bearing failure
- Bearing maintenance
- White metal bearing technology

## DAY 4

### 5. PUMP MECHANICAL SEALS

- Mechanical shaft seals Vs. packing
- Operating principles and fundamentals,
- Seal design, nomenclature.
- Materials of construction.
- Reconditioning dry seals.

### 6. PUMP MAINTENANCE

- Overview of Maintenance Practice (Corrective – Preventive – Predictive – Proactive)
- Lubrication Overview
- Pump Maintenance Procedure (Daily- weekly- semi-annual- Annual)

## DAY 5

### 7. FIELD PROCEDURES OF PUMP TROUBLESHOOTING

- Pre-repair Investigation
- Onsite Inspection ▪ Miscellaneous remedial steps

### 8. PUMP PROBLEMS

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- Cavitation
- Check list for Centrifugal Pump Troubles
- Check list for Screw Pump Troubles
- Check list for Gear Pump Troubles

#### 9. PUMP CASE STUDIES

- Videos on pump maintenance
- Group open discussion

#### NOTE:

Pre & Post Tests will be conducted

Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.



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P.O BOX 45304  
ABU DHABI, U.A.E

T +971 2 6264455  
F +971 2 6275344

[www.definettraining.com](http://www.definettraining.com)