MAESTRO CONSULTANTS

PREVENTIVE & PREDICTIVE MAINTENANCE OF ROTATING EQUIPMENT

COURSE OUTLINE 2020

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TRAINING TITLE

PREVENTIVE & PREDICTIVE MAINTENANCE OF ROTATING EQUIPMENT

VENUE

Dubai, UAE

DURATION

5 Days

DATES

21 - 25 June 2020

PRICE

US$4,000 per attendee including training material/handouts, morning/afternoon coffee breaks and Lunch buffet daily.

TRAINING INTRODUCTION

This is a five-day course on Rotary Machinery Preventive and Predictive Maintenance. Different maintenance strategies will be discussed; elements of each maintenance strategy, their advantages and disadvantages will be explored. The selection of the appropriate strategy that fit the mode of failure and results in the minimum time between repair and that leads to least down time and maintenance cost is one of the maintenance engineer duty that must be mastered. Tools and measurements involved in each maintenance strategy must also be recognized and deeply understood. To apply the above techniques effectively on the Rotary Machinery, one should be aware of their failure modes, and methods of troubleshooting. The above will applied on different type of Rotary Machinery like pumps, compressors, and Turbines.

TRAINING OBJECTIVES

Upon successful completion of this course, the delegates will be able to:

- ✓ Apply the latest techniques and procedures of excellence in maintenance and reliability management and establish the environment for improvement
- ✓ Recognize the aspects of maintenance today through the various types of maintenance including maintenance strategy development and productive maintenance

- ✓ Apply maintenance business model, maintenance organization, and business elements and identify the different equipment failure patterns and the reasons why equipment fails
- ✓ Determine the process of developing maintenance objectives in accordance to the business plan, R&M policy and maintenance strategy, discuss the significance of equipment plans in maintenance planning and identify several equipment plans development, approaches and plan options
- ✓ Employ the methods of preventive maintenance and condition monitoring such as vibration monitoring, equipment monitoring frequency and infrared thermography
- ✓ Implement the procedure of work selection in accordance with work screening procedure, work request requirements, prioritization systems and cost benefits
- ✓ Carryout various strategies of work planning and scheduling by identifying the planning effectiveness, planners and staffing, routine maintenance planning and use of various planning tools and specify the different proven turnaround practices in accordance with success factors and management practices
- ✓ Recognize the purpose of work execution & job completion and characterize its advantages and disadvantages, implement the methods of maintenance quality assurance and continuous improvement and employ the method of Root Cause Failure Analysis (RCFA)
- ✓ Apply the various stewardship and performance metrics such as performance work management, KPIs, maintenance effectiveness metrics and work force utilization metrics
- ✓ Distinguish the factors of human reliability through classification of human error and human reliability analysis, familiarize the different reliability tools using life cycle cost analysis and life data analysis and discuss the key elements of reliability engineering and how to manage assets in projects

TRAINING AUDIENCE

Engineers, technicians and managers responsible for selection, installation, machinery failure analysis, troubleshooting and maintenance of different rotary machines like pumps, compressors, fans, blowers, steam turbines, gas turbines will benefit from this course.

TRAINING OUTLINE

The following topics will be covered in the course over five working days

Ch 1 Maintenance Strategies

Maintenance Strategies

- Corrective Maintenance
- Breakdown Maintenance
- Preventive Maintenance
- Predictive Maintenance
- Corrective Maintenance

Effective Preventive Maintenance

Planning & Scheduling

Mode of Failures

Coordination with Production

Opportunity Preventive Maintenance Activities

Predictive Maintenance Techniques

Vibration monitoring

Themography

Tribology

Visual inspections

Ultrasonics

Process Parameters

Ch 2 Causes of Machinery Failure

- **Improper Specifications**
  - Improper Sizing
- Material Deterioration
  - Overstressing
  - Material Corrosion
  - Overheating
  - Fatigue Failure
  - Brittlement Failure
- Misalignment
  - Cold versus Hot Alignment
  - Alignment Tolerances
- Imbalance
  - Causes of Imbalance
  - Level of Balancing
  - Vibration due to Imbalance
- Off-design Operation
  - Range of Acceptable Operation
  - Limits of Operation
  - Controlling Systems
- Loop Oil Systems
  - Bearings
  - Seals
  - Control Systems
- Installation Problems

TRAINING CERTIFICATE

MAESTRO CONSULTANTS Certificate of Completion for delegates who attend and complete the training course

METHODOLOGY

Our courses are highly interactive, typically taking a case study approach that we have found to be an effective method of fostering discussions and transferring knowledge. Participants will learn by active participation during the program through the use of individual exercises, questionnaires, team exercises, training videos and discussions of "real life" issues in their organizations. The material has been designed to enable delegates to apply all of the material with immediate effect back in the workplace.