Mechanical Maintenance Essentials

Technical Proposal
Scope

training course addresses the needs of a diverse audience with an interest in All activities involved
in keeping a system in working, including:

• Operation Engineers who have oversight responsibility for Plant operations

• Maintenance Engineers with direct line responsibility as well as staff support responsibility for
delivering on effective Plant Maintenance

• Plant Start-up and Commissioning Managers and Engineers

• Technical personnel & supervisors involved in supporting Plant Start-up, Maintenance, and shutdown

Terms To Understand

1- Maintenance Engineer Responsibilities

- Understanding the role and responsibilities of a maintenance engineer in an industrial setting.
- Importance of proactive maintenance planning and implementation.
- Communication and coordination skills for effective teamwork.

2- Design Fundamentals:

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Mechanical Maintenance Essentials

- Material classifications
- Material properties
- Material Test
- Fatigue
- Fits & Tolerance

3- Material Selection
- Metals
- Polymers
- Ceramics
- Composites
- Semiconductors

4- Materials Testing
- Techniques for material testing, including tensile, hardness, and impact tests.
- Interpretation of test results and their implications on material performance.
- Quality control measures related to material testing.

5- Shaft & Hub Connections
- Shaft Design
- Shaft and associated components
- Torque Transmission
- Keys
- Pins
- Retaining rings
- Splines
- Set Screws
- Shrink Discs.
- Cone Clamping Elements
- Star Discs
- Clamping systems for torque motors
- Star Spring Washers

6- Couplings
- INTRODUCTION TO TRANSMISSION SYSTEMS
- The function of couplings
- Main Flexible couplings
- Main Elastic Couplings
- Main Rigid Couplings
- Maintenance Of couplings

7- Gears
- Types of Gears
- Spur Gears
- Helical Gears
- Bevel Gears
- Worm Gears
- Elements of the gear structure
- Gears Kinematics

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- Gear accuracy testing and inspection
- Material and heat treatment

8- Belts
- Belts and Belt Drives
- Basic of belt drives
- Advantages and disadvantages of belt drives
- Belt Geometry
- Types of belts
- Belts Materials
- Design of the belt drives
- Belts Selection
- Synchronous belts
- Belts Tension instructions

9- Chains
- Types of Chains
- Chain Identification
- Chain Construction
- Sprocket material
- Ordering Sprocket
- Installation roller chain
- Maintenance “Troubleshooting’s and problem solving”
- Chain Elongation

10-Conveyor Systems

11- Bolts Failures and solutions
- Torque and Tension
- Tightening methods
- Tightening torque
- Tightening Procedures
- Causes of broken bolts
- Causes of losses bolts
- Steps to Prevent Loose Bolts
- Removing broken bolts techniques

12- Maintenance Solutions
- Adhesives
- General purpose degreaser
- Surface Gasket
- Bolt Ease By Penetrating spray
- Leak Detector spray
- Power belt dressing
- Anti-Seize Compounds
- Heavy duty metal repair compound

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Outline

- Introduction to Design
- Gears
- Coupling
- Shaft & Hub Connections
- Chains
- Belts
- Conveyors Systems
- Bolts Failure
- Maintenance Solutions
- Maintenance Engineer responsibilities
- Case Studies

Financial Proposal

- Total number of course days are 16 days --4 Hours / Day
- 12 Theoretical training sessions
- 4 workshops
- Total course hours are 60 hours
- The course includes 30 minutes break each session

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