



Couplings & Shaft Alignment



Introduction:

This Couplings & Shaft Alignment training course will provide an overview of coupling designs and applications for transferring the torque and rotation from the driver shaft to the rotating machine: pump, compressor or turbine. The training course will indicate the importance of good installation, maintenance and failure analysis of couplings. The topics are specially designed for engineers and technicians that have had limited exposure to couplings and need to upgrade their technical knowledge about coupling characteristics and various operating loads. The focus in the course will be on problem detection, root cause analysis and failure prevention.

Shaft alignment is a technical skill that is categorized as a specialty. It requires measurement instruments and relies on technician's skill and experience if good results are to be expected on pumps, compressors or turbines. This training course will provide an integral training knowledge and experience of shaft alignment to solve misalignment problems in rotating machinery. Emphasis will be on the ways to analyze, identify and correct the root causes of misalignment, unbalancing and vibration in order to achieve smooth operation, and improved machine performance.

This training course will include discussions of various real practical problems and case studies from the existing engineering practice, which will be solved in the form of several workshops.

This training course will highlight:

- Importance of proper selection of couplings
- Guidelines for coupling installation: mounting and dismounting
- Common coupling problems and potential failures
- Effects of shaft alignment
- Best methods and techniques for measurement of shaft alignment
- Effects of misalignment on pump and compressor operation

Who Should Attend?

- Professionals dealing with the operation and maintenance of rotating equipment
- New technicians who wish to improve knowledge and skills
- Those who are involved in condition monitoring and vibration analysis
- Maintenance technicians who are in charge of correcting the machinery problems.
- Engineers and maintenance planners involved in machine's condition monitoring

Course Objectives:

At the end of this training course, you will learn:

- Guidelines for good coupling installation
- Solving common coupling problems and failure prevention
- Vibration monitoring related to coupling health and machinery performance
- Methods and practices for efficient alignment of rotating machine
- Use of classical reverse dial methodology and modern laser optic technique

Training Methods:

This training course will be conducted along workshop principles with formal lectures and interactive examples, which will result in the active participation of all delegates in discussions and teamwork of problem solving. Real life examples will be selected to be solved during several workshop in the form of team work which will enable understanding of the physical insight of the problems and will illustrate the efficient application of evaluation tools. There will be ample

opportunities for active, open discussions and sharing professional experiences on various industrial applications. All course materials will be provided.

Organizational Impact:

On completion of this training course, the delegate will be able to analyse the operation of rotating machine and associated equipment installed within the organization and suggest potential improvements where required.

The knowledge gained in this training course will:

- Enable the delegate to optimize the operation of rotating machine
- Give the delegate confidence to analyse efficiency of machine operation
- Enable measures to improve machine operation for the given application
- Give better handling of machine condition monitoring, maintenance and troubleshooting

Personal Impact:

- Improved confidence when solving problems of rotating machinery
- Better grasp of how good functioning of rotating machine impacts plant efficiency
- Better knowledge of equipment operation and instrumentation on failure prevention
- Improved personal skills for machine operation analysis
- Better ability to troubleshoot complex and difficult problems

Course Outline:

Day One: Couplings - Types, Application & Operation

- Classification & Application of Couplings
- Characteristics of Rigid Couplings
- Characteristics of Flexible Couplings
- Selection of Parameters of Couplings for Pumps & Compressors and Turbines
- Advantages & Disadvantages of Different Types

Day Two: Couplings - Installation, Maintenance & Troubleshooting

- Installation Best Practices & Safety Issues
- Coupling Inspection in Operation
- Vibration Monitoring and Analysis
- Preventive Maintenance & Condition Monitoring
- Failure Prevention & Troubleshooting

Day Three: Shaft Alignment Basics

- Need for shaft alignment
- Effects of shaft misalignment
- Types of misalignment: offset and angularity
- Measuring techniques
- Rim and face alignment method: TIR determination

Day Four: Alignment Measurement Methods

- Reverse dial methodology
- Correcting misalignment: foundation and soft foot
- Thermal growth determination
- Laser optic technique
- Misalignment detected by vibration monitoring

Day Five: Effect of Misalignment on Bearings & Seals

- Effect of misalignment of bearings
- Vibration monitoring results as indication of misalignment
- Effect of misalignment on seals of pumps and compressors
- Leakage control & prevention
- Summary and conclusions