

Balancing Rotating Machinery

PRECISION MAINTENANCE
SHORT COURSE



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Unbalance in rotating machinery puts excessive load on bearings and all other components, including the machine structure itself. The unbalance forces also excite resonances, cause looseness and fatigue failure, generate noise, and in certain circumstances, result in poor product quality. It has also been found that machines that are out of balance consume more energy.

The bottom line: you must achieve precision balance.

On this course you will learn how to recognize unbalance and set up the balance job for a successful balance. The course starts with the basics - providing an introduction to vibration, phase and vectors, and fully explaining the balancing process. You will first learn how to perform a single plane balance with vectors. You will learn how to balance a machine using the single-plane and two-plane balance function of an analyzer.

This course will equip you with the knowledge and skills so that you can use a vibration analyzer/balancer, or a simple sheet of graph paper and protractor, and balance a machine - without having to remove it from the plant. We will ensure you understand the entire process and give you the skills to perform precision balancing.

This training will prepare any vibration analyst or balancing practitioner with the knowledge and skills they need to achieve precision balance, which is so important to the reliability of the equipment. Reliability engineers and maintenance supervisors would also benefit from this training.

THE MOBIUS WAY

Mobius makes balancing training unique. We use 3D animations and simulations that completely explain and demonstrate the balancing process - you will see the machine from all angles and be able to fully visualize and understand the effects of balancing and the three dimensional nature of balancing the machine. While our training covers all of the essential procedures, and is filled with valuable tips and tricks, one of the greatest benefits is that our training will help you understand balancing.

COURSE DESCRIPTION

Duration: 2 days

Topics include:

- What unbalance is, why it occurs, and why it is important to precision balance a machine
- Understanding phase: what it is and how to measure it
- Phase conventions, and representing phase with vectors
- Advanced phase - the relationship between the phase angle and the actual heavy spot on the rotor
- Different types of unbalance:
 - Static unbalance
 - Couple unbalance
 - Dynamic unbalance
- How to diagnose unbalance with vibration analysis, phase and other techniques
- Preparing for the balance job: safety first!
- Balancing techniques:
 - Single plane with vectors
 - Single plane with balance program
 - Two plane with balance program
 - The static/couple method
 - Balancing overhung rotors
 - Four-run-no-phase balancing
- Selecting the size and location of trial weights, splitting and combining weights
- Balance quality standards: ISO/ANSI/API/Navy



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