BOOST
THE LEADING TRAINING PROVIDER

Mechanical Engineering

Control Philosophy and Rotating Machinery, Turbine and Compressor Control

Course Introduction

Control philosophy plays a key role in the operation of rotating machinery, turbines, and compressors. A solid control strategy ensures that these systems run efficiently, safely, and with minimal downtime. The interaction between controllers, sensors, and actuators in rotating machinery helps maintain desired performance and stability across a wide range of operating conditions. Turbines and compressors are critical components in many industries, from power generation to oil and gas, and understanding how to optimize their control systems is essential. This training will provide participants with the knowledge to design, operate, and maintain control systems for these complex mechanical systems.

The program will cover control theory, system dynamics, and specific control strategies for turbines and compressors. It will introduce different types of controllers used in rotating machinery, such as PID, cascade, and adaptive control systems. Participants will learn about performance optimization, fault detection, and troubleshooting for turbines and compressors. The course will also explore best practices for control philosophy design and maintenance strategies.

Target Audience

This course is designed for engineers, control system specialists, and technicians involved in the operation and maintenance of rotating machinery, turbines, and compressors.

Learning Objectives

- Understand the principles of control philosophy and how they apply to rotating machinery, turbines, and compressors.
- Learn different control strategies, including PID, cascade, and adaptive control, for optimizing machinery performance.

- Gain expertise in turbine and compressor control systems, including fault detection and performance optimization.
- Develop practical skills in troubleshooting and maintaining control systems for rotating machinery.
- Explore advanced control techniques and how to integrate them with modern automation and monitoring systems.

Course Outline

- **01 DAY ONE**

  Introduction to Control Philosophy and Rotating Machinery

  - What is control philosophy and its role in mechanical systems
  - Key principles of control theory and feedback loops
  - Overview of rotating machinery types and their applications
  - Components of rotating machinery: turbines, compressors, motors
  - The importance of control philosophy in rotating machinery performance
  - Understanding the dynamic behavior of rotating machinery
  - Common issues in rotating machinery and how control philosophy addresses them
- **02 DAY TWO**

  Control Strategies for Rotating Machinery

  - Introduction to PID (Proportional-Integral-Derivative) control
  - Cascade control systems and their applications
  - Model-based control systems for rotating machinery
  - Adaptive control strategies and their advantages
  - Control of vibration and instability in rotating machinery
  - Stability analysis and performance tuning of control systems
- **03 DAY THREE**

  Turbine Control Systems and Optimization

  - Overview of turbine operation and key components
  - Control systems used in turbines (steam, gas, and wind turbines)
  - Startup, shutdown, and load-following control strategies
  - Performance monitoring and optimization for turbines

- Fault detection and diagnostic strategies for turbine systems
- Energy efficiency optimization in turbine control

• **04 DAY FOUR**

Compressor Control Systems and Performance Optimization

- Types of compressors and their role in various industries
- Control systems used in compressor operations (variable speed, pressure, flow)
- Control challenges in compressors: surge, choke, and cavitation
- Monitoring and optimizing compressor performance
- Fault detection, alarms, and safety systems in compressors
- Best practices for energy-efficient compressor control
- Troubleshooting compressor control issues and maintaining reliability

• **05 DAY FIVE**

Advanced Control Techniques and Integration with Automation Systems

- Advanced control methods (Fuzzy Logic, Neural Networks, etc.) for rotating machinery
- Integrating control systems with SCADA (Supervisory Control and Data Acquisition) systems
- Communication protocols and data exchange in rotating machinery control
- The role of predictive maintenance in turbine and compressor systems
- Design and implementation of control system upgrades and retrofits

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
May 12, 2025	May 16, 2025	5 days	4950.00 $	Indonsia - Jakarta
July 14, 2025	July 18, 2025	5 days	4250.00 $	UAE - Dubai
Oct. 5, 2025	Oct. 9, 2025	5 days	4250.00 $	KSA - Al Khobar