



**Fateh**

Trainings & Consultancy

# **TURBO MACHINES CENTRIFUGAL COMPRESSOR CONSTRUCTION & MAINTENANCE**

Training Instructors

**Mr. Khadim Hussain | Mr. Sajjad Hussain**

**BUILDING COMPETENCE, INSPIRING CONFIDENCE**

# Overview

This course provides a comprehensive understanding of centrifugal compressors, their operation, maintenance, and troubleshooting. Participants will learn the basic principles, industrial applications, and various types and configurations such as single-stage, multi-stage, and integrally geared compressors.

By the end of the course, they will be equipped to ensure reliable, efficient, and safe compressor operation.

## Why Us:

We deliver industry-focused training that empowers professionals and organizations to achieve operational excellence. Each program is customized to client needs, ensuring practical relevance and measurable results.

Our expert trainers bring real-world insights, industrial case studies, sharing their experiences and best practices to every session. We create engaging, actionable learning experiences that bridge the gap between theory and practice.

## Target Audience:

Engineers, supervisors, and maintenance personnel in oil & gas, petrochemical, fertilizer, power, and process industries – particularly those in mechanical, reliability, or rotating equipment roles seeking to enhance compressor performance and reliability.

# Course Outline

## Topic 1: Compressor Components and Functions

- Detailed study of impellers, diffusers, casings, diaphragms, shafts, and seals
- Overview of lubrication, seal oil systems, and drive couplings
- Role of instrumentation and control systems in performance stability

## Topic 2: Operating Principles

- Compression process and performance curves
- Understanding surge, choke, and performance monitoring
- Impact of process conditions on compressor efficiency and stability

# Course Outline

## Topic 3: Maintenance Philosophy & Strategies

- Preventive, predictive, and corrective maintenance techniques
- Condition-based monitoring: vibration, temperature, and oil analysis
- Maintenance planning, documentation, and RCM (Reliability-Centered Maintenance)

## Topic 4: Routine Maintenance Procedures

- Daily and periodic inspection routines
- Lubrication, bearing monitoring, seal system checks, and temperature trending
- Early fault detection through data analysis

# Course Outline

## Troubleshooting, Optimization & Safety

### Overhaul and Major Maintenance

- Shutdown preparation and component disassembly
- Rotor inspection, balancing, and bearing/seal replacement
- Reassembly and post-overhaul performance testing

### Troubleshooting & Diagnostics

- Identifying and resolving surge, high vibration, leakage, and oil contamination
- Root cause analysis (RCA) and use of diagnostic tools
- Practical case studies on compressor fault correction

### Performance Testing & Optimization

- On-site efficiency and power testing methods
- Fine-tuning control systems for energy-efficient operation
- Adjusting parameters to improve stability and reliability

### Safety and Best Practices

- Implementation of Lockout/Tagout (LOTO) and confined space protocols
- Safe handling of rotating and high-pressure systems
- Environmental and energy efficiency standards for compressor systems

# Trainers



**Mr. Khadim Hussain**

**Senior Trainer & Consultant**

Mr. Khadim Hussain is a turbo-machinery specialist with over 36 years of hands-on experience in the maintenance, overhauling, and reliability enhancement of critical rotating equipment. A Mechanical Engineering graduate from UET Lahore, he possesses deep expertise in steam turbines, gas compressors, pumps, gearboxes, and SOLAR gas turbines. He has led major machinery revamps and troubleshooting projects across Pakistan and internationally, including Saudi Arabia, Bahrain, and Switzerland. Renowned for solving complex reliability issues and driving equipment upgrades, he has also worked closely with global OEMs on warranty resolutions. As a consultant and trainer, Mr. Khadim combines technical depth with practical insight, earning recognition as a trusted expert in the fertilizer and process industries.



**Mr. Sajjad Hussain**

**Senior Trainer & Consultant**

Mr. Sajjad Hussain is a seasoned mechanical engineer with over 34 years of experience in maintenance, reliability, and plant management within the fertilizer industry. A UET Lahore graduate, he built his career at Fauji Fertilizer Company, rising to Senior Manager Maintenance for twin-train Ammonia and Urea plants. Renowned for his expertise in high-pressure equipment—including turbines, compressors, and pumps—he has led major overhauls, plant commissioning projects, and international technical engagements across the USA, Italy, Saudi Arabia, and more. A committed mentor and trainer, he has developed and delivered specialized courses on machinery maintenance and continues to shape future professionals through hands-on knowledge and leadership.

# Logistics

## Duration

2 days

## Location

At Client's Site or Lahore

## Training Instructors

Mr. Khadim Hussain | Mr. Sajjad Hussain

Get in Touch

☎ **+92 345 3882040 | +92 300 8670542**

✉ **[info@ftc-consultancy.com](mailto:info@ftc-consultancy.com)**



**Fateh**  
Trainings & Consultancy