



**Fateh**

Trainings & Consultancy

# RECIPROCATING COMPRESSOR CONSTRUCTION AND MAINTENANCE

Training Instructors

Mr. Sajjad Hussain | Mr. Khadim Hussain

BUILDING COMPETENCE, INSPIRING CONFIDENCE

# Overview

This comprehensive three-day course is designed to provide participants with a solid understanding of reciprocating compressors, their operation, and maintenance requirements.

By the end of the program, participants will be able to understand the working principles of reciprocating compressors, identify key components and their functions, perform routine inspections and maintenance, and effectively troubleshoot common operational and mechanical issues. The course also emphasizes the application of best practices for achieving efficient, reliable, 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:

Maintenance Engineers, Plant Operators, Mechanical Supervisors, Reliability Teams, and Technical Trainers involved in compressor operation and maintenance.

# Course Outline

## Topic 1: Introduction to Reciprocating Compressors

- Fundamentals of gas compression systems and types of compressors
- Applications across process industries
- Comparison between reciprocating and centrifugal compressors

## Topic 2: Principles of Operation

- Compression cycle and thermodynamic basics
- Single-acting vs. double-acting compressors
- Effects of clearance, pressure ratio, and speed on efficiency
- Capacity control methods

# Course Outline

## Topic 3: Major Components and Functions

- Cylinder, piston, piston rings, crankshaft, valves, and bearings
- Cooling and lubrication systems: intercoolers, aftercoolers, and lubrication methods
- Understanding system reliability and design integrity

## Topic 4: Support Systems and Accessories

- Compressor foundations, alignment, and drive systems (motors, turbines, engines)
- Pulsation dampeners, unloaders, control systems, and safety devices

# Course Outline

## Maintenance, Troubleshooting & Best Practices

### Operation & Performance Monitoring

- Start-up and shutdown procedures
- Use of P-V diagrams for performance analysis
- Vibration, temperature, and efficiency monitoring

### Maintenance Practices

- Preventive and predictive maintenance programs
- Overhaul procedures and inspection checklists
- Valve and ring maintenance, alignment, and balancing.
- Record keeping and trend analysis for reliability improvement

### Troubleshooting & Problem Diagnosis

- Common issues: valve failures, leaks, blow-by, vibration, and pressure fluctuations
- Root cause identification and corrective action planning
- Practical troubleshooting case studies

### Safety & Best Practices

- Safe handling of pressurized gas systems
- Permit-to-work and isolation procedures
- Root cause analysis and failure prevention methods

# Trainers



**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.



**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.

# Logistics

## Duration

2 days

## Location

At Client's Site or Lahore

## Training Instructors

Mr. Sajjad Hussain | Mr. Khadim Hussain

Get in Touch

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