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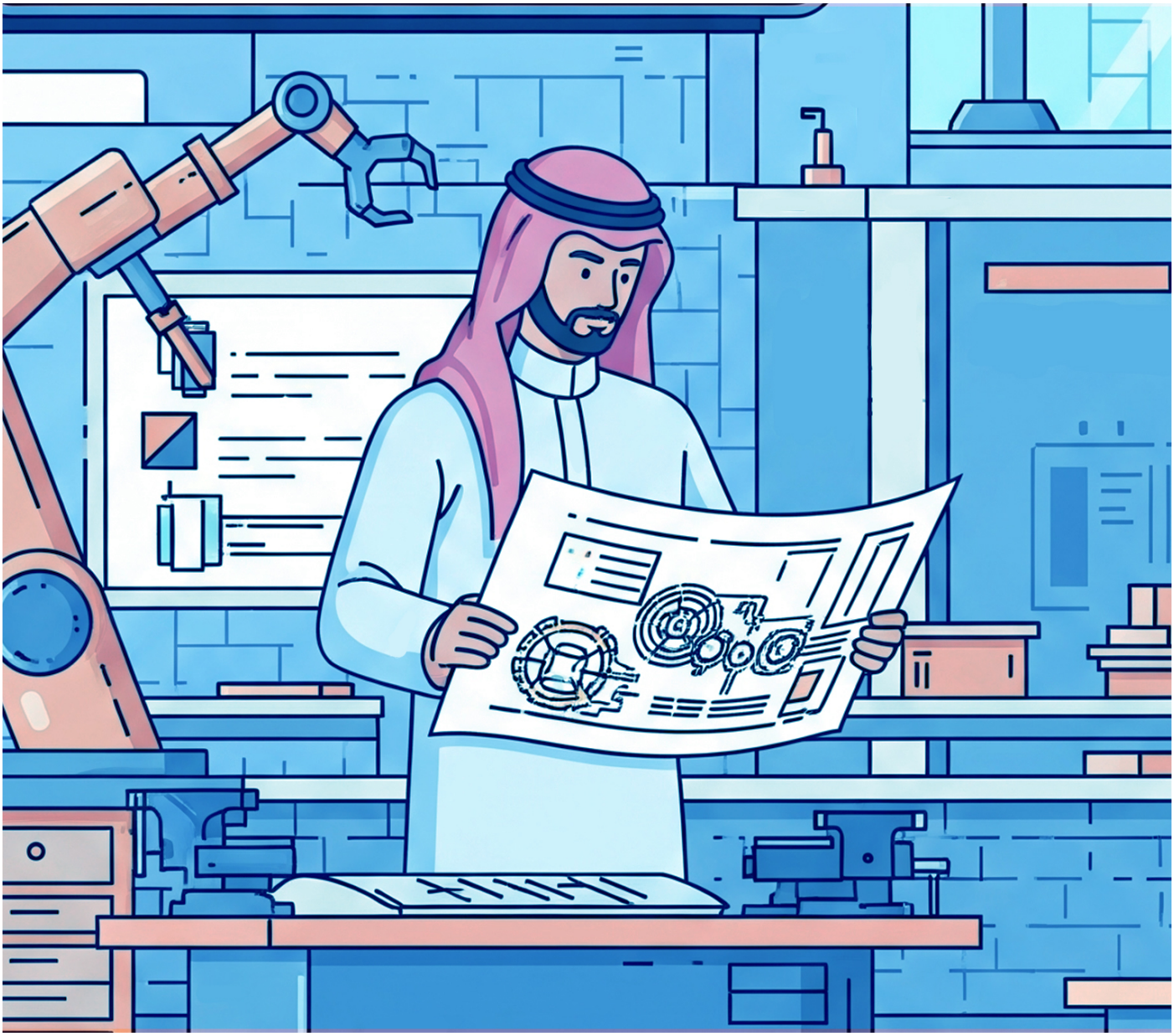

Mechanical Engineering

# Turbine: Major Inspection and Overhaul

## Course Introduction

This course aims to equip participants with comprehensive knowledge and practical skills related to the inspection and overhaul of gas and steam turbines. Covering the latest techniques and technologies, the course emphasizes critical aspects such as design, construction, maintenance practices, and risk-based methodologies for optimizing turbine performance. Participants will engage in hands-on activities, case studies, and discussions to enhance their understanding of turbine maintenance and overhaul processes.

## Target Audience

- Maintenance engineers and technicians.
- Plant operators and supervisors.
- Asset management professionals.
- Engineers involved in turbine operations and maintenance

## Learning Objectives

- Conduct thorough inspections and overhauls of gas and steam turbines.
- Differentiate between maintenance and overhaul practices for various turbine components.
- Apply risk-based methodologies and reliability-centered maintenance principles.
- Identify and troubleshoot common failure mechanisms in turbine systems.
- Optimize repair strategies based on equivalent operating hour (EOH) analysis.
- Implement continuous improvement strategies in turbine maintenance operations.

# Course Outline

- **01 DAY ONE**

#### Turbine Design and Construction Fundamentals

### Session 1: Introduction to Turbines

- Overview of gas and steam turbine technology.
- Basic design principles and construction techniques.

### Session 2: Major Components of Turbines

- Internal components: rotor, stator, and combustion systems.
- External components: generators, bearings, and support structures.

### Session 3: Maintenance and Overhaul Considerations

- Differences between routine maintenance and major overhauls.
- Importance of proper documentation and procedures.

### Session 4: Equipment Monitoring and Performance Evaluation

- Techniques for monitoring turbine health.
- Key performance indicators (KPIs) for turbine efficiency.

### Session 5: Group Activity: Analyzing Turbine Designs

- Participants will work in groups to analyze various turbine designs and their maintenance needs.
- Discussion of findings and best practices.

- **02 DAY TWO**

#### Inspection Techniques and Failure Mechanisms

### Session 1: Inspection Practices for Turbine Components

- Best practices for internal and external inspections.
- Tools and techniques for effective inspection.

### Session 2: Identifying Failure Mechanisms

- Common failure modes in gas and steam turbines.
- Root cause analysis techniques.

### Session 3: Risk-Based and Reliability-Centered Maintenance Approaches

- Introduction to risk-based methodologies.
- Developing reliability-centered maintenance plans.

### Session 4: Case Studies: Turbine Failures and Lessons Learned

- Review of real-world turbine failure cases.
- Discussion on preventive measures and strategies for improvement.

### Session 5: Practical Workshop: Hands-On Inspection Techniques

- Participants will practice inspection techniques on turbine models or simulators.
- Feedback and evaluation of inspection practices.

- **03 DAY THREE**

#### Overhaul Strategies and Continuous Improvement

### Session 1: Major Overhaul Procedures

- Step-by-step approach to conducting a major turbine overhaul.
- Scheduling and planning for maintenance activities.

### Session 2: Optimization of Repair Strategies

- Analyzing equivalent operating hours (EOH) for repair decisions.
- Cost-benefit analysis of maintenance strategies.

### Session 3: Training and Infrastructure for Turbine Operations

- Importance of training for personnel involved in turbine maintenance.
- Developing effective training programs and resources.

### Session 4: Continuous Improvement Practices

- Implementing continuous improvement methodologies in maintenance operations.
- Engaging teams in performance enhancement initiatives.

### Session 5: Course Review and Final Discussion

- Recap of key concepts covered throughout the course.
- Open forum for participants to share experiences and insights.

## Confirmed Sessions

| FROM | TO | DURATION | FEES | LOCATION |
|---|---|---|---|---|
| April 7, 2025 | April 9, 2025 | 3 days | 3250.00 $ | KSA - Riyadh |
| Sept. 8, 2025 | Sept. 10, 2025 | 3 days | 3250.00 $ | UAE - Dubai |
| Dec. 1, 2025 | Dec. 3, 2025 | 3 days | 4950.00 $ | USA - Texas |