

**TRAINING TITLE**

**TURBINE: MAJOR INSPECTION AND OVERHAUL**

**Training Duration**

**5 day**

**Training Venue and Dates**

<b>Ref. No.</b> ME139	<b>Turbine: Major Inspection and Overhaul</b>	<b>5</b>	<b>05-09 May 2025</b>	<b>\$5,500</b>	<b>Abu Dhabi, UAE</b>
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In any of the 4 or 5-star hotels. The exact venue will be informed later.

**Training Fees**

- \$5,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Lunch

**Training Certificate**

**Define** Management Consultants Certificate of course completion will be issued to all attendees.

**TRAINING DESCRIPTION**

This 5-day training course provides participants with essential knowledge and practical skills necessary for performing major inspections and overhauls of turbines used in power generation and industrial applications. It covers the entire process of turbine inspection, from preparatory steps to post-overhaul performance testing, with a focus on both steam and gas turbines. The course emphasizes best practices for ensuring turbines operate at peak efficiency, safety, and reliability over their operational lifespan.

**TRAINING OBJECTIVES**

**By end of course participants will be able to understand**

- **Understand the various types of turbines** (steam, gas, and combined cycle) and their operational principles.
- **Identify the critical components** of turbines and their functions in the overall system.
- **Plan and prepare for a major turbine inspection** and overhaul.
- **Conduct a thorough inspection** of turbine components, including rotors, stators, bearings, and seals.
- **Diagnose common turbine faults** (mechanical, thermal, electrical) and understand troubleshooting techniques.
- **Follow safety protocols** and best practices during turbine maintenance and overhaul.
- **Perform detailed measurements and testing** to assess turbine health and performance.
- **Understand the overhaul procedures**, including disassembly, part replacement, reassembly, and post-overhaul testing.

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- **Optimize turbine performance** post-overhaul through adjustments and recalibrations.

### **WHO SHOULD ATTEND?**

- **Turbine Technicians and Engineers**
- **Maintenance Supervisors**
- **Power Plant Operators and Field Engineers**
- **Reliability Engineers**
- **Project Managers**
- **Mechanical and Electrical Engineers**
- **Safety Officers**

### **COURSE PROGRAM**

#### **Day 1: Introduction to Turbines and Inspection Fundamentals**

- Overview of turbine types (steam, gas, and combined-cycle turbines).
- Key turbine components and their functions: rotors, stators, blades, bearings, seals, and more.
- Basic principles of turbine operation: thermodynamics, fluid dynamics, and mechanical systems.
- Common causes of turbine failures and the need for regular inspection.
- Overview of turbine inspection processes.
- Types of inspections: routine, major, and emergency inspections.
- Documentation and reporting for turbine inspections.
- Safety considerations during turbine inspection and maintenance.

#### **Day 2: Major Inspection and Diagnostic Techniques**

- Preparing for a major turbine inspection: pre-inspection procedures and planning.
- Inspection of mechanical components: blades, rotors, casings, and nozzles.
- Inspection of thermal components: temperature monitoring, expansion, and heat distribution.
- Visual inspections, ultrasonic testing, and non-destructive testing (NDT) methods.
- Diagnostic tools and techniques: vibration analysis, oil analysis, and thermography.
- Inspection of seals, bearings, and lubrication systems.
- Troubleshooting common mechanical and thermal issues.

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### Day 3: Turbine Overhaul Procedures

- Steps in the turbine overhaul process: disassembly, cleaning, inspection, and part replacement.
- Guidelines for dismantling turbine components safely and efficiently.
- Cleaning and restoring turbine parts: rotor blade maintenance, seal replacement, and bearing inspection.
- Common problems encountered during turbine disassembly.
- Reassembly of turbines: ensuring correct alignment, proper torque, and sealing.
- Quality checks during reassembly: tolerances, surface finishes, and component inspection.
- Post-overhaul testing: performance testing and load testing.

### Day 4: Performance Testing and Post-Overhaul Adjustments

- Performance tests to assess turbine efficiency: vibration monitoring, temperature, and pressure checks.
- Balancing and alignment of rotating components.
- Post-overhaul adjustments: fine-tuning for optimal performance.
- Troubleshooting turbine malfunctions after overhaul.
- Commissioning procedures for newly overhauled turbines.
- Startup procedures: key considerations during turbine start-up and shutdown.
- Data logging and monitoring during performance tests.

### Day 5: Safety, Best Practices, and Industry Standards

- Safety procedures and standards during turbine overhaul (e.g., lockout/tagout, personal protective equipment).
- Industry standards for turbine inspections and overhauls (API, ASME, ISO standards).
- Environmental factors affecting turbine performance: temperature, humidity, and vibration.
- Developing a turbine maintenance strategy: preventive vs. corrective maintenance.
- Review of the course content and key takeaways.
- Q&A and course wrap-up.

**NOTE:**

**Pre-& Post Tests will be conducted.**

**Case Studies, Group Exercises, Group Discussions, Last Day reviews, and assessments will be carried out.**

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