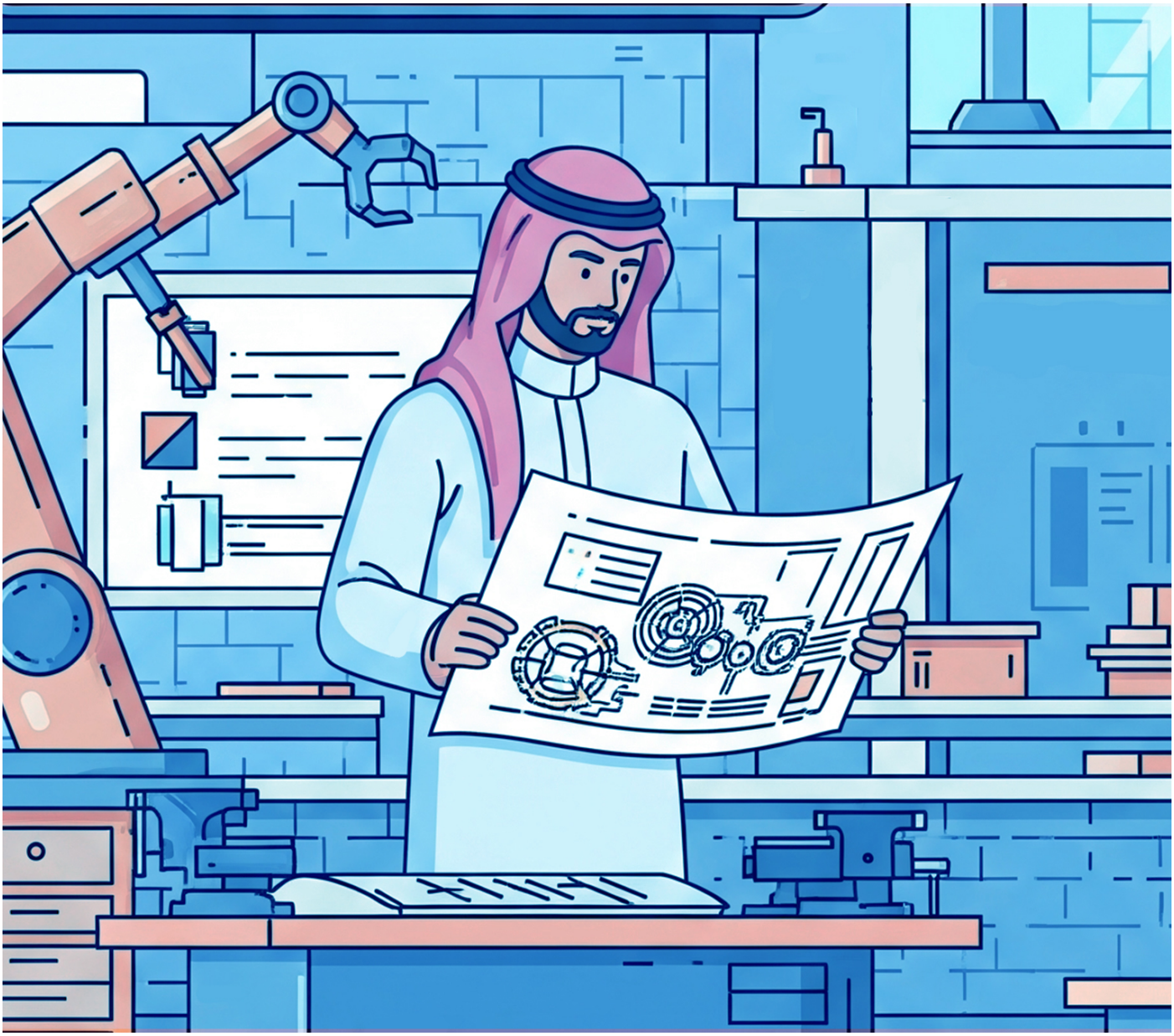
BOOST
THE LEADING TRAINING PROVIDER



Mechanical Engineering

Operational Flexibility & Efficiency Enhancements of Gas Turbine

Course Introduction

Ensuring Gas turbines run at Maximum Efficiency is a primary Goal for Operators. In the current Economic Climate, anything that increases Productivity, and hence profit, is clearly welcome. From an Environmental point of view, it is also important that Turbines run as Efficiently – and produce as Few Emissions – as possible. Fortunately, there are several ways to improve Gas Turbine Output. Controlling the Humidity and Temperature of Air entering the Combustion Inlet is one of the most important, as it has a direct effect on the turbine's Efficiency, Emissions, and Operational Reliability. The Simple Gas Turbine Configuration has Higher Power Output with effect the compression ratio, while the Regenerative Gas Turbine Configuration has Higher Efficiency with effect Lower Compression Ratio, therefore the variation of Total Power Output is insignificance at Lower Compression Ratio. The extensive modelling performed in this study reveals that, the ambient temperature and compression ratios are strongly influence on the performance of Combined Cycle, a Higher Overall Efficiency can be achieved for combined cycle with add regenerative to topping cycle.

The steam turbine

High Operational Flexibility - the Ability of a Power plant for fast startup and to adjust load output fast and predictable to changing market requirements is an essential prerequisite to ensure economic success. Most factors limiting the load output of an existing combined cycle power plant are the allowed pressure and temperature transients of the steam turbine The FIVE days course discusses the computation of the Performance of the Gas Turbine Power Plant. The Attendees will be explained the computations of entire Plants and the proper correction factors applicable in all the sections of the plant, will be developed and discussed.

Target Audience

- Automotive Engineer
- Boiler Engineer
- Ceramics Engineer

- Equipment Engineer
- High-Pressure Engineer
- Marine Engineer
- Mechanical Design Engineer
- Mechanical Engineer
- Naval Architect
- Pipeline Engineer
- Power Engineer
- Rotating Equipment Engineer
- Senior Mechanical Engineer
- Turbine Engineer
- Validation Engineer

Learning Objectives

- Understanding Fundamentals of Gas Turbine Technology to Operational Aspects of Power Plants.
- Understanding all Operations Aspects and troubleshooting of all System and Equipment in the Field and control Room.
- Provide Operation Engineers and Operators with a broad Review and Systems of the key Factors driving the Operation of Gas Turbine.
- Appreciate of the Operational Problems associated with Gas Turbine used for Power Generation and their Auxiliaries.
- Understanding how the behavior of Operators will be during all the Operations Modes such as during Normal Operation Condition, Startup, Shutdown, and Emergency Condition to learn what is the right action should be taken during each case?
- Investigation, Diagnose system versus component Problems, Causes and Root Reasons.

Course Outline

- **01 DAY ONE**

Module (01) Optimizing Gas Turbine Unit

- 1.1 Thermodynamics Parameters
- 1.2 Modern Design Issues
- 1.3 Utilization & Optimization
- 1.4 Efficiency Parameters
- 1.5 Simple and Combined Cycle
- 1.6 Factors Affecting Performance
- 1.7 Loss Prevention and Minimization
- 1.8 Detection of Performance Deterioration
- 1.9 Diagnostics and Trend Analysis

Module (02) Upgraded Gas Turbine Components

- 2.1 Inlet Guide Vans
- 2.2 Improved Seals, Tighter Clearances
- 2.3 Combustion Liners
- 2.4 Transition Pieces
- 2.5 Turbine Blades & Vanes
- 2.6 Hot Section Coatings
- 2.7 Compressor Coatings
- 2.8 Instrumentation & Condition Monitoring

• **02 DAY TWO**

Module (03) GT Availability & Reliability

- 3.1 Operation Modes
- 3.2 Availability Issues
- 3.3 Utilization Factor
- 3.4 Factors affecting GT Availability
- 3.5 Starting Reliability
- 3.6 Operation Reliability
- 3.7 Tuning for Optimum Performance
- 3.8 Update Operating Philosophies

Module (04) Major Factors Influencing GT Performance

- 4.1 Operation and Services Factor
- 4.2 Effects of Type of Fuel Used
- 4.3 Firing Temperature
- 4.4 Duty Cycle and Effects
- 4.5 Air Quality and Environment
- 4.6 Exhaust Temperature
- 4.7 Starting Frequency
- 4.8 Selecting Maintenance Approaches

• **03 DAY THREE**

Module (05) Gas Turbine Protection Devises

- 5.1 Overview about GT Protection
- 5.2 Over-Speed Protection Trip
- 5.3 Trip Devises Testing
- 5.4 Electronic Trip Systems
- 5.5 Other Protection Trip

Module (06) Continue Safe Operating Units

- 6.1 Take the Reading during Duty
- 6.2 Analyzing of the Operation Reading
- 6.3 Report any diffraction in the Reading
- 6.4 Dealing with Every incident during the Operation

• **04 DAY FOUR**

Module (07) Optimized Operational Flexibility

- 7.1 Lifetime Extension
- 7.1.1 Repair Components
- 7.1.2 Replace Components
- 7.1.3 Modify (If Need it)
- 7.2 Future Operational Scenario

- 7.2.1 Total Starts 9.2.2 Further Operating Time
- 7.2.3 Base / Intermediate / Peak Load

Module (08) Lifetime Assessment

- 8.1 Analysis of Operational Data
- 8.2 Lifetime Analysis
- 8.3 Remaining Lifetime
- 8.4 Component Safety
- 8.5 Integrity & Reliability
- 8.6 Examination & Investigation

• **05 DAY FIVE**

Module (09) Gas Turbine Efficiency's Updated

- 9.1 GT Efficiency to Present Energy Industry Solutions
- 9.2 GT Efficiency's Automated Tuning System
- 9.3 GT Efficiency Corporate Updated for Future
- 9.4 Innovative Technology for Reducing Emission
- 9.5 Optimizing GT Efficiency Parameters
- 9.6 Effecting of Fuel Type System

Module (10) Configuration for Improving Efficiency

- 10.1 Integration Gas Turbine Components
- 10.2 Study Effective Parameter of GT Model

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
May 12, 2025	May 16, 2025	5 days	4950.00 $	England - London
July 21, 2025	July 25, 2025	5 days	4250.00 $	UAE - Dubai
Oct. 27, 2025	Oct. 31, 2025	5 days	4250.00 $	UAE - Dubai