F-EE-011 Combined Cycle Power Plant (CCPP) Operation Gas Turbine-Part 1

TBA, June/July 2019 @ Dubai, UAE

This five days course is for anyone new into the power industry wishing to gain knowledge of gas turbines and their application. Also personnel advancing to a control room post in a Combined Cycle Gas Turbine (CCGT) Power Plant.

On completion of the course you will be able to demonstrate an understanding of Power Plant efficiency, its importance and what makes a Combined Cycle Plant more efficient.

Why Attend

The gas turbine is a power plant that produces a great amount of energy for its size and weight and thus has found increasing service in the past 20 years in the petrochemical industry and utilities throughout the world. The gas turbine's compactness, weight, and multiple fuel applications make it a natural power plant for offshore platforms. This second edition is not only an updating of technology, which has seen a great leap forward in the 1990s, but also a rewriting of various sections to better answer concerns about emissions, efficiency, mechanical standards and codes, and new materials and coatings. At a time when energy costs are high, this important handbook expertly guides those seeking optimum use of each unit of energy supplied to a gas turbine. In this book, the author has assimilated the subject matter (including diverse views) into a comprehensive, unified treatment of gas turbines. The course discusses the design, fabrication, installation, operation, and maintenance of gas turbines. The intent of this course is to serve as a reference after it has accomplished its primary objective of introducing the participants to the broad subject of gas turbines. Thus course material it is of use to both participants of the course and similarly to professionals as a reference in their daily lives. Covers every aspect of gas turbine design and operation. Presents necessary data and helpful suggestions to assist engineers to obtain optimum performance for any gas turbine, under all conditions.

This five days course is class room based and focusses on the core principles of CCGT plant operation, including:

- ☐ The Gas Laws and Thermodynamics of the Brayton Cycle
- ☐ The Gas Turbine: Compressor design and operation
- ☐ Combustion system design and operation
- ☐ Power Turbine design and operation
- ☐ Auxiliary systems

- ☐ Open cycle operation Auxiliary internal combustion engines: 2 stroke and 4 stroke cycles
- ☐ Engine configurations and applications
- ☐ Combustion theory for Gas Turbines and environmental issues
- ☐ Basic electrical theory, alternators, including static frequency converters
- ☐ Electrical systems, including "Banking" arrangements and protection
- ☐ Safety, plant care and fire systems

Course Objectives

By the end of the course, among various achievements, the participants will learn:

- Gain a thorough understanding of the Combined Cycle Power Plant principles
- Understand the Thermodynamic Principles of the Combined-Cycle Plant and the the Gas Laws and Thermodynamics of the Brayton Cycle
- Get the knowledge of the Combined-Cycle Concepts
- Learn the main Components, Control and Automation of the CCGT
- Introduce the basic electrical theory, alternators, including static frequency converters
- Examine the Operating and Part Load Behaviour of Combined-cycle gas & steam turbine power plants
- Examine the Typical Combined-Cycle Plants
- Introduce to the CCGT Environmental Consideration
- Get the new Developmental Trends of CCGT
- Apply and get the knowledge of Safety, plant care and fire systems

Who should attend

This course is designed for control room operators who wish to improve their skills operating a combined cycle power plant under a variety of normal and abnormal operating conditions, as well as assistant operators who are preparing to assume responsibilities for unit operation.

Course Outline

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

- ***The Electricity Market***
- ***CCGT Economics***
- ***Thermodynamic Principles of the Combined-Cycle Plant***

The Gas Laws and Thermodynamics of the Brayton Cycle

- ***Combined-Cycle Concepts***

Gas Turbine Operating Cycle ● Component Efficiencies ● Compressor ● Burner Section ● Turbine

- ***Applications of Combined Cycles***
- ***CCGT Components***

The Gas Turbine: Compressor design and operation ● Combustion system design and operation ● Power Turbine design and operation ● Auxiliary systems

- ***Control and Automation***
- ***Operating and Part Load Behaviour***

The Gas Turbine: Compressor design and operation ● Combustion system design and operation ● Power Turbine design and operation

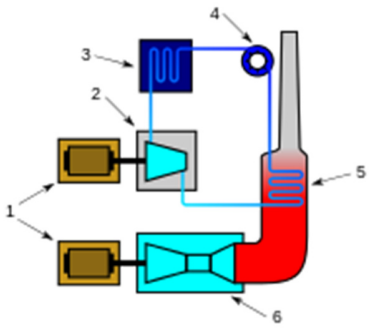
- ***Auxiliary systems***
- ***Open cycle operation Auxiliary internal combustion engines: 2 stroke and 4 stroke cycles***
- ***Engine configurations and applications***
- ***Combustion theory for Gas Turbines and environmental issues***
- ***ACCESSORIES (Lube Oil, Coolers, Power)***

Starting Systems ● Ignition Systems ● Lubrication Systems ● Characteristics of Lube Oils

- ***Detectable problems***

Gas Path Analysis ● Turbine Blade Distress ● Compressor Fouling ● Combustor Distress & Plugged Fuel Nozzles ● Foreign/Domestic Object ● Worn Air/Oil Seals ● Fuel Control Problems

- ***Basic electrical theory, alternators, including static frequency converters***
- ***Electrical systems, including "Banking" arrangements and protection***
- ***Safety, plant care and fire systems***



The workshop

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

30% Lectures

30% Workshops & Work Presentations

20% Case Studies & Practical Exercises

20% Videos, Software & General Discussions

The course instructor may modify the above training methodology before or during the course for technical reasons with no prior notice to participants

Falcon Consulting Professionals LLC

Falcon Consulting Professionals established in Greece for the last 15 years in the areas of technical consulting and professional training for the local industries. ***Falcon*** is expanding in GCC, aiming to provide the best consulting and training solutions to the industries of the region. ***Falcon's instructors are accredited trainers and highly experienced in their fields, as well as adult training.*** We aspire to build our business relationships on mutual trust. The achievement of results with an emphasis on innovation and sustainability, quality, cost analysis and time scheduling are non-negotiable from the conceptual phase of the training sessions to their successful closure.

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Course Fee (2019):

(Including coffee breaks and a buffet lunch daily)

Per participant (Public)[1]: 3.300 *USD*

In house*:……USD upon request*

Fees + VAT as applicable for 2019

[1] * Schedule and prices are subject to change without prior notice. In case of any dispute, Falcon LLC reserves the right on the final decision.
* Delegate can enjoy Early Bird Price (15% off based on the original price) for payment settled 3 weeks prior to the course commencement date.
* * Delegates can enjoy Group Discount Price (20% off based on the original price) for enrolment of group of 3 or above. All the delegates have to be from the same company, attending same training course and schedule).