GAS TURBINE AND COMPRESSOR OPERATION, MAINTENANCE AND TROUBLESHOOTING

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MAESTRO CONSULTANTS

TRAINING TITLE

GAS TURBINE AND COMPRESSOR OPERATION, MAINTENANCE AND TROUBLESHOOTING

VENUE

Dubai, UAE

DURATION

5 Days

DATES

21 - 25 March 2021

PRICE

US$4,000 per attendee including training material/handouts, morning/afternoon coffee breaks and Lunch buffet.

TRAINING INTRODUCTION

Gas Turbine Training classes provide technical information for those people who maintain the gas turbine engines. The goal of each training program is to build confidence based on knowledge and understanding. Engine System Familiarization and Maintenance Procedures are key focal points of each program. This training is built on a foundation that will enable the student to understand:

- Engine Nomenclature & Functions
- Engine Systems Operation
- Gas Turbine Principles and Theory
- Troubleshooting Techniques Through Class Discussions
- Maintenance and Preventative Maintenance
- Inspection technique

TRAINING OBJECTIVES

The objective of this course is to give participants an understanding of basic gas turbine operations and construction as well as a fundamental knowledge of proper operation, control and protection of the turbine and its accessory systems.
Emphasis is placed on the following areas:

- Basic gas turbine operating cycle
- Overview of gas turbine major components and equipment arrangements and how these relate to overall operation and performance
- Fundamentals of gas turbine control and protection: start-up, speed, load, shutdown and temperature
- Operating parameters and control / protection features of the various turbine support systems such as the lubricating oil, hydraulic, variable inlet guide vanes, starting means and fuels
- Operating factors and considerations that affect maintenance intervals

TRAINING AUDIENCE

Operators, engineers, technicians, and administrative personnel of operating facilities as well those who may work in affiliated industries, who wish to gain an understanding of the day-to-day operation of heavy duty gas turbines.

TRAINING OUTLINE

Design theory and practice

1. An overview of gas turbine

Gas turbine cycle

Performance

Design consideration

Major components

Environmental effect

2. Theoretical and actual cycle analysis

Brayton cycle

Combined cycle

3. Compressor and turbine performance characteristics

Performance characteristic

Aerothermal equations

4. Performance and mechanical standards

Major variables for gas turbine application

5. Rotor dynamics

- Major Components

6. Centrifugal compressors

Components

Performance

Surge

Process

7. Axial flow compressors

Blade and cascade

Airfoil theory

Compressor stall

Performance characteristics

8. Radial- inflow turbines

Description theory

Performance of a radial –inflow turbine

9. Axial- flow turbines

Turbine geometry

Impulse turbine

Reaction turbine

Turbine blade cooling

Cooled turbine Aerodynamic

Turbine looses

10. Combustors

Combustion terms

Combustion chamber design

Fuel atomization and ignition

Typical combustor arrangement

Air pollution problems

- Materials, fuel technology and fuel systems

11. Materials

General metallurgical behaviours in gas turbine

Gas turbine material

Compressor blades

Forging and non-destructive Testing

Coating

12. Fuels

Fuel specifications

Fuel properties

Fuel treatments

Heavy fuel

Cleaning of turbine components

Fuel economic

Heat tracing of piping system

Storage of liquids

- Auxiliary components and Accessories

13. Bearings

Bearing design principles

Tilting pad journal bearing

Bearing materials

Bearing and shaft instabilities

Thrust bearing

Thrust bearing power loss

14. Seals

Noncontact seals

Mechanical face seals

Mechanical seal selection and application

Seal systems

Associated oil system

Dry gas seals

15. Gears

Gear types

Factors affecting gear design

Installation and initial operation

- Installation, operation and maintenance

16. Lubrication

Basic oil system

Lubrication selection

Oil sampling and testing

Contamination and filter selection

Cleaning and flushing

Lubrication management

17. Spectrum analysis

Vibration sensors

Vibration measurements

Vibration analysis

18. Balancing

Rotor imbalance

Balancing procedures

Application of balancing techniques

Balancing machine

19. Coupling and alignment

Gear coupling

Metal diaphragm coupling

Metal disc coupling

Shaft misalignment and correction

20. Control system and instrumentation

Control system

Condition monitoring system

Implementation of condition monitoring

Life cycle cost

Temperature measurements

Pressure measurements

Vibration measurements

Failure diagnostics

Mechanical [problem diagnostics

21. Maintenance techniques

Philosophy of maintenance

Training of personnel

Tools and shop equipments

Machine cleaning

Hot section maintenance

Compressor maintenance

Bearing maintenance

Coupling maintenance

Repair and rehabilitation of turbomachinery

Foundation

Typical problem encountered in gas turbine

TRAINING CERTIFICATE

MAESTRO CONSULTANTS Certificate of Completion for delegates who attend and complete the training course

METHODOLOGY

Our courses are highly interactive, typically taking a case study approach that we have found to be an effective method of fostering discussions and transferring knowledge. Participants will learn by active participation during the program through the use of individual exercises, questionnaires, team exercises, training videos and discussions of "real life" issues in their organizations. The material has been designed to enable delegates to apply all of the material with immediate effect back in the workplace.