A Finmeccanica Company

Heavy-Duty Gas Turbines

Course Information

GENERAL INFORMATION ABOUT THE TRAINING COURSE HEAVY-DUTY GAS TURBINES

(Reference number: 37514484)

In recent years the utilization of industrial gas turbines has increased considerably. This is especially the case for steam and gas turbine (STAG) power plants and combined cycle plants as applied for district heating and in the process industry.

Modern gas turbine installations are to a greater extent controlled automatically. However, the important task of recording and evaluating data to ensure timely preventive maintenance, still largely depends on the end users operational and maintenance personnel.

In this competitive age it is imperative that end users personnel are fully competent in evaluating machine data and based on this are confident to initiate preventive measures to avoid expensive damage and unnecessary lengthy outages.

To assist your company to ensure your personnel are proficient in their duties and respective responsibilities, Ansaldo Thomassen B.V. offers an open training course "Heavy-Duty Gas Turbines" for operators and mechanical maintenance personnel.

The training course is exclusively meant for employees of end users of gas turbines (companies with one or more operating gas turbines or companies that are going to operate one or more gas turbines).

In this course, the principles, construction, operation and maintenance of General Electric Heavy-Duty type gas turbines, will be explained and discussed. An introduction to the control system is also part of the program. The complete training course lasts 5 days and covers most of the GE Heavy-Duty models, and can be modified depending on the background of the participants.

On the last training day, gas turbine control and protection systems will be introduced, using the Speedtronic Mark V, as an example. This introduction is also applicable to gas turbines with a different control and protection systems.

Enclosed program gives more details about the contents of the training course.
This training course will be organized in:

WEEK 37 (13 – 17 SEPTEMBER 2010)

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COMPLETE TRAINING PROGRAM

FIRST DAY

- Make acquaintance and presentation of the program
- Principle of operation of a gas turbine
  - Basic cycle
  - The efficiency
  - Methods to improve the efficiency
  - Methods to increase the output power
- Various types of gas turbines
  - Single-shaft versus two-shaft machines
  - Heavy-duty versus aero-derived machines
  - Application examples

SECOND DAY

- Major components of gas turbines
  - The axial compressor
  - The combustion system (DLN)
  - The turbine
  - Thee bearings
  - Foundation and support

THIRD DAY

- The auxiliary equipment of the gas turbine
  - Introduction
  - Instruments on the machine
  - Starting means (e-motor, diesel, turbine)
  - Lube oil system (gas turbine, generator)
  - Hydraulic oil system
  - Trip oil system
  - Gas fuel system (DLN)
- The auxiliary equipment of the gas turbine continued
  - Liquid Fuel system
  - Cooling and sealing air system
  - Heating and ventilation system
  - Cooling water system
  - Fire protection system
  - Inlet air system
  - Compressor washing system
  - Other specific systems

FOURTH DAY

- Maintenance requirements
  - Maintenance factors
  - Stand-by and running inspections
  - Special inspection methods
  - Scheduling of disassembly inspections
  - Combustion inspection
  - Hot gas path inspection
  - Major inspection
  - The calculation of the maintenance interval
- Gas turbine operation
  - The gas turbine panel
  - Start-up and stop procedures
  - Simulation start-up and stop
  - Performance evaluation
  - Cleaning of the compressor
  - Trouble-shooting
  - Calculation gas turbine performance

FIFTH DAY

- An introduction to the gas turbine control system
  - Product Overview
  - Introduction Control systems
  - Introduction Protective systems
- Use of the operator interface
  - Introduction
  - Common display targets
  - Unit command targets
  - Main display
  - Main menu
  - Alarm display
  - Use of the backup operator interface
  - Gas turbine operation displays
- Remaining subjects
- Evaluation of the gas turbine course

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Instructors

A qualified instructor of Ansaldo Thomassen B.V. will present the course. He is a full-time professional with vast experience in all aspects of gas turbine operation, maintenance and control technology.

Training manual / computer simulation program

Each trainee will receive a training manual (approximately 500 pages), covering the relevant subjects of the training course. The manual consists of equipment descriptions, schematics and operating and maintenance instructions. The text is supplemented by a large number of illustrations, drawings and photo's of the equipment. The manual also contains an abundance of reference information, for further private studies. To support the discussed subjects, a calculation and simulation program will be used. The participants will receive a copy of this program.

Language

The training will be executed in English. The manuals are in the English language as well.

Training location

The training course will be held close to the Ansaldo Thomassen buildings, which are part of the Business-Park in Rheden, The Netherlands. A visit to the work and repair shops is part of the training program.

Training duration

Monday	09.30 - 16.00
Friday	09.00 - 15.00
Other days	09.00 - 16.00
Lunch	12.00 - 13.00

A lunch in the company dining room will be provided free of charge, by Ansaldo Thomassen B.V.

Pricing / Payment conditions

For the Heavy-Duty gas turbine training course, the cost will be: EUR 1.600,- per person.

Payment in advance after receipt of our invoice:
EUR bank account: IBAN: NL37 COBA 0637 0361 23 (preferably) or account 063 70 36 123.
BIC (Swift code): COBANL2X
at Commerzbank AG - Amsterdam, The Netherlands.

Registration

If you wish to participate in the course register online at www.ansaldothomassen.com or complete the registration form on the next page and fax or mail it, at least 14 days prior to the start of class, to:

Ansaldo Thomassen B.V.
Customer Training
Attn.: Mrs. M. van Breemen
PO Box 95
6990 AB Rheden
The Netherlands
Tel: +31 26 49 75 894
Fax: +31 26 49 75 857
E-mail: mirjam.vanbreemen@ansaldothomassen.nl

Receipt of the registration forms will be formally confirmed.
The maximum amount of participants will be 20.

Cancellation

If you have received a registry confirmation but are forced to cancel due to circumstances beyond your control, you can cancel the registration up to one week before the course commencement date. The paid amount will then be refunded. After this date, or in the event of a no-show, no amount will be refunded.
In the event of too few participants, the training course may be cancelled or deferred to a later date. A cancellation notification will be sent one week prior to the course start date. Ansaldo Thomassen is not responsible for any expenses related to non-refundable airline tickets or hotel accommodations.

Hotel accommodation

As an attachment to the registry confirmation, you will receive a list of hotels in the vicinity of Rheden, and a map showing the route to the training location.

Further information

If more information concerning the training course is required, or if you need information about other training possibilities, please do not hesitate to contact our Customer Training department at the above-mentioned address.

Specific questions

For specific technical questions about this training course please contact:
Mr. R. van Alphen de Veer
Tel: +31 26 49 75 952
E-mail: rutger.vanalphendeveer@ansaldothomassen.nl

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Heavy-Duty Gas Turbines

Registration Form (Please return at least 14 days prior to commencement of the training course)

Full Name and Job Title .....

Organization .....

Street / PO Box ..... no. .....

City .....

Postal code .....

Country .....

Telephone number .....

E-mail address .....

VAT number .....

Your order number for this registration .....

Wishes to participate in the training course "Heavy-Duty Gas Turbines" in:

WEEK 37 (13 – 17 SEPTEMBER 2010)

Under the conditions as mentioned our course information file with reference number: 37514484. Cost EUR 1.600,- per person.

In what way are you involved in Heavy-Duty gas turbines?
And which type of Heavy-Duty gas turbine and gas turbine controls are you particularly interested in?

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Place .....

Date .....

Name .....

Signature .....

COMPANY STAMP

Please send to:

Ansaldo Thomassen B.V.
Customer Training
Attn.: Mrs. M. van Breemen
PO Box 95
6990 AB Rheden
The Netherlands
Tel: +31 (0)26 49 75 894
Fax: +31 (0)26 49 75 857
E-mail: mirjam.vanbreemen@ansaldothomassen.nl
Internet: www.ansaldothomassen.com