

# Mark IV course

A system will always fail when you least expect it and when you need the gas turbine the most. How fast you resolve this problem depends upon your knowledge; how well do you understand the turbine control systems and how quickly can you determine problems by using the maintenance screens.

As the Mark IV control system is getting older and the engineering staff is getting younger. A good Mark IV training course has become a necessity.

This course gives you the opportunity to maximize availability and reliability of the Mark IV by increasing your knowledge how to operate, maintain, calibrate and troubleshoot. By means of case studies, all aspects of Mark IV hardware, documentation and the development of control signals will be presented.

This course is also available as an on-site course.

## Course Outline

### Day 1

- Introduction
- MK-IV Hardware familiarization
- Operator Interface
- Available Documentation

### Day 2

- Reading Elementaries
- FSR\_SU/ACC/\_SD: Description, Algorithm, Calibration

### Day 3

- FSRN: Description, Algorithm, Calibration
- FSRT: Description, Algorithm, Calibration

### Day 4

- Fuel Control: Servo Mechanisms, Gas Control Valve
- Liquid Control Valve, Fuel Spitter, DLN
- Water Injection: Description, Algorithm, Calibration

### Day 5

- Variable Inlet Guide Vane
- Protective Circuits: L4, Overspeed, Trip, Emergency Overspeed Trip, Overtemperature Trip, Vibration,
- 20FG/20FL
- Examination

## Objectives

After five days you will master the following objectives:

### Gas Turbine & Mark IV

- use OEM provided documentation that will include the Control Specifications, Elementaries, Application Manual and P&IDs
- understand the MK-IV hardware components, how they are accessed and how they communicate

### Mark IV trouble shooting

- troubleshoot an equipment alarm, given an Alarm Drop Number
- interpret the more routine diagnostic alarms and recognize appropriate actions
- follow the major 'control signal path' through the elementaries
- trace the derivation of a command signal to the servomechanisms
- calibrate turbine valve mechanisms
- use the MK-IV screens more efficiently for evaluating/calibrating systems
- force logic to facilitate calibration
- change constants or re-program ladder logic such as to add contact input/outputs, add alarms, and/or alter sequencing
- Given plant drawings, trace a signal to/from a field device through appropriate terminal boards, through circuit boards, to a digital 'signal-name'
- follow signal flow to/from the '4' circuits to trip/reset machine

## Examination & Diploma

Those who attend this course are automatically qualified to take the Certification Examination.

There are no additional expenses to participate in the exam. An 80% pass mark is required and the examination length will not exceed 2 hours.

Those who obtain a positive result will receive a diploma which is internationally accepted and accredited by IACET (International Association for Continuous Education and Training).

## Specifications

### Entrance requirement

Both levels are required to participate:

- Engineer
- I&C Technician

It is recommended that participants have the equivalent knowledge/background of our Combustion Turbine Familiarization course. A combination of these courses can be offered.

### Instructor

The Mark V course will be presented by a highly Respected professional with GE field and training experience. This course will be executed in English; all training material is in English as well.

### Price

The price for this course is 3.500,00 Euros per person (vat excluded).

Payment in advance after receipt of our invoice.

ABN-Amro Bank, Arnhem, the Netherlands

Bank account: 530028778

IBAN: NL30ABNANL0530028778

BIC (Swift code): ABNANL2A

### What's included?

- Printed training books & manuals
- A training by a certified trainer who uses a sheets for presentation
- The use of a computer during the course
- Lunch
- Examination

**What's not included?**

- Hotel & accommodation

Upon request accommodation can be booked for you, but for your own expense. The cost for an overnight stay is around 120,- euro's per night. Please mention your request for a hotel accommodation in your email.

**Location and duration**

The location of this course is in Arnhem, the Netherlands and has a duration of five days.

Monday 10.00 – 17.00

Tuesday – Thursday 09.00 – 17.00

Friday 09.00 – 16.00

A free lunch, coffee & tea and soft drinks are included.

**Registration**

Wish to participate? Please register online at [www.speedtronic.com](http://www.speedtronic.com) or fill in the registration form in this brochure and fax it to +31.481.42.00.76

Don't forget to subscribe at least 4 weeks prior to the first course day. When registered, you will receive an order confirmation.

**Cancellation**

If you have subscribed and you are forced to cancel due circumstances beyond your control, you can cancel the registration according our cancellation policy below:

- Cancellation up to 6 weeks before course date: full refund
- Cancellation < 6 weeks: no refund, but the opportunity to attend next course.

We reserve the right to cancel or to defer the course to a later date in the event of too few participants. In such case a full refund will be in order.

We are not responsible for any expenses related to non-refundable airline tickets or hotel accommodations.

**Further information**

If you need more information about this course or other course possibilities, please don't hesitate to contact us phone: +31.481.42.00.73

e-mail: [sales@speedtronic.com](mailto:sales@speedtronic.com)