

# Mark VI course

The Mark VI Speedtronic has such a high degree of reliability that trouble shooting of your own control system might not be an issue you think of.

But when something happens, you want to solve the problem as quickly as possible and prevent unnecessary long outages. A lack of understanding how the various control functions relate to one another and which tools are needed are the main reasons for not being able to solve the problem.

This course targets the need for technicians and engineers to operate, maintain, calibrate and troubleshoot control systems such that availability and reliability can be maximized. This will be accomplished by thoroughly understanding the concept of the Mark VI gas turbine control system and how to use maintenance screens to quickly determine problems; all with the gas turbine needs kept in mind.

## Course Outline

### Day 1

- Introduction
- Review of Gas Turbine Fundamentals
- Gas Turbine Control Concepts
- MK-VI Fundamentals and Hardware
- Software Installation
- HMI documentation
- MK-VI Architecture

### Day 2

- Blockware Concepts and Architecture
- Blockware Functions
- Introduction to the Toolbox Software
- Browsing Turbine Using Simulator

### Day 3

- Protective Systems
- Speed/Load Control

- Alarm Troubleshooting – Process and Diagnostic
- Temperature Control
- IGV Control
- NOs

### Day 4

- Valve Position Control & LVDT Calibration
- Sequencing Editing
- Validation/Build/Download
- Adding I/O
- Forcing Sigmans
- Changing Control Constant

### Day 5

- Data Historian
- Trending
- Trip History
- Examination

## Objectives

After five days you will master the following objectives:

### Gas Turbine & Mark VI

- understand the basics of a gas turbine operation
- understand the concepts of gas turbine controls
- understand the protective systems' purpose, operation and test functions
- know how to use OEM provided documentation that will include the Control Specifications, Programming, I/O Configuration, Application Manual and P& IDs
- understand the MK-VI hardware components, the component function, how they are accessed and how they communicate;

### Toolbox software

- how to use 'Toolbox' software
- calculate a speed error using the 'Toolbox' software;
- determine the speed/load demand signal, using 'Toolbox' software
- determine the temperature control demand signal, using the 'Toolbox' software
- determine a stop speed ratio valve, gas control valve and primary/secondary valve controlling signals, using the 'Toolbox' software

### Mark VI trouble shooting

- troubleshoot an equipment alarm from the MK-VI panel to the field device
- interpret the more routine diagnostic alarms and recognize appropriate actions
- trace the derivation of a command signal to the servomechanisms
- calibrate turbine valve mechanisms
- use the MK-VI screens for evaluating/calibrating system more efficiently
- force logic to facilitate calibration
- describe how to 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'
- derive and apply a trip signal

## 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

### Instructor

We cooperate with HPC Technologies the American market leader in technical training. The mark VI course will be presented by Guy Zamor, who is specialized in Mark VI. He is a well-known professional with GE field and training experience. He speaks English, French and Spanish. This course will be executed in English; all training material is in English as well. When Guy is not available, he will be replaced by a professional with the same experience level.

### 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: NL30ABNA0530028778

BIC (Swift code): ABNANL2A

### What's included?

- Training books & manuals
- A training by a certified trainer who uses a mark VI simulator and sheets for presentation
- 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 person. 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 +31.263.684.868.

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: +31.26.368.48.39

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