LOGIC DRIVES.com

Maintenance Training Courses

On site <u>maintenance training</u> for users of a GE 'Speedtronic' mk VIe gas turbine control panel

We teach operations, maintenance and maintenance management on the mk VI or mk VIe gas turbine control system for general electric aeroderivative and heavy duty frame turbine users.

We organize on-site training courses for maintenance Engineers and assist site managers to increase know-how, confidence and independence of maintenance teams - in daily operations, troubleshooting and start/stop situations.

What to expect

This course is organized using a mk VIe simulator and designed around your site-specific information, such as the turbine type and combustion system. Don't you worry about planning, additional expenses and costs; we come to you instead.

Nothing in this course comes out of a standardized box; You will receive tailor made, on-topic, upper-echelon engineering knowledge about your turbine type, control system, software versions and instrumentation. All specifics are transferred to you and your staff in a training course that is designed specifically for your team.

This course creates a thorough understanding of the big picture and how all software and control functions relate to each other, so that one can use all tools to troubleshoot the system.

Preparation, duration and specifics

Our trainer will prepare the entire training in advance – if desired you can ask for specific topics to go through within a 5-day course; there is always room for questions. We build up a safe, simulated classroom environment on your site location using a hardware based simulator. For maintenance teams, the course is concluded with thorough practicing and examination.

These courses are end-user only since they are based on proprietary and licenced information. The duration of a training course is either 5-day, or 8-day. The course can be given in English, Dutch and German.

For planning and more information contact our customer service team at
Sales@logicdrives.com, visit www.logicdrives.com or call +31 6 301 96 343 for assistance.

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This is the typical layout of our Mk VIe training course:

A. INTRODUCTION; THE BASICS

SYSTEM OVERVIEW AND ARCHITECTURE

1. Learn about the major system components, terminology, communications, control and protection schemes, and redundancy options.
2. The mk VIe panel layout, system architecture, hardware identification and description.
3. Controllers and I/O cards.
4. Power distribution Modules
5. Hands-on; Safety and practising.

SITE SPECIFIC DOCUMENTS AND DRAWINGS

1. Identify the basics of the controls documentation
2. Instructor Led Example based on panel Documentation and Drawings

HMI LOGIN, DEFAULT ACCOUNTS, DEFAULT PASSWORDS

1. Learn   the default user accounts to login into the HMI and user access
2. Practising with HMI Login and user accounts

CONTROLST™ BASICS

1. Learn the terminology used within the ControlST™ software and ToolboxST™ application.
2. Practise with ToolboxST™ terminology

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MONITORING I/O ON A GE MK VIE

1. Monitoring mk VI E inputs and outputs.
2. Learn to locate and identify, monitor and override I/O Points.
3. Local vs. Remote I/O
4. Forcing
5. Uploading
6. Practise to Identify and Monitor I/O Points.

MONITORING MARK VIe SOFTWARE

1. Learn the software structure, terminology, and view live values in the software.
2. Block Structure
3. I/O report
4. Help Files
5. Linked Blocks
6. Hands-On practise; Identify and Monitor Internal Software.

B. REPORTS AND INTERPRETATION

GENERATING REPORTS

1. Learn the various reports that can be generated from the ToolboxST™ software and their uses for troubleshooting.
2. I/O report

3. As a group we will practise on Generating Reports.

FINDER

1. Using the markVIe Finder
2. Learn how to trace signals in ToolboxST™ using the Finder tool and the   'Where Used' Tab
3. Practicing with the Finder tool.

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TRENDER

1. Learn to open the Trender tool,
2. Add traces by using various methods
3. View live control data
4. Using   the Trender tool and watch windows

CONSTANTS AND VARIABLES

1. Learn to tune up:

    1. Identify constants and variables
    2. **Understand the differences**
    3. Make online changes to constants and variables
    4. Changing and saving
    5. Synchronize control constant live values and initial values

2. Practice with Troubleshooting Functions

CREATING AND USING WATCH WINDOWS

1. We teach you how to create and use watch windows
2. Editing application software
3. Making software changes permanent
4. Downloading to the controller
5. Servo Tune-Up

C. Software and analog I/O editing

1. Adding another duplicate unit
2. Review of typical TMR software
3. I/O PAC and Terminal Board replacement
4. Viewing and troubleshooting IO diagnostic alarms

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WORKSTATIONST™ ALARM VIEWER

1. Learn   to use the functions within WorkstationST™ Alarm Viewer to identify and view alarms and events

2. Using   the WorkstationST™ Alarm Viewer

ALARM CLASSES

1. Learn   the various colors and classes for alarm conditions. Identify where in software the alarms classes are defined and generate the alarms report to view the classes

2. Viewing Alarm Classes

ALARM VIEWING, TRACING AND TROUBLESHOOTING

1. View alarms in CIMPLICITY™ screens and/or WorkstationST™ Alarm Viewer
2. Trace the alarm to its' origin using the ToolboxST™ software.
3. We will practice on viewing, tracing, and troubleshooting Alarms

VIEW AND TROUBLESHOOT DIAGNOSTIC ALARMS

1. Generating reports and using the functions within the Hardware tab to identify diagnostic alarms.
2. Learn methods to troubleshoot diagnostic alarms
3. We will practice with Hardware Diagnostics.

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D. I/O PACK INITIALIZATION AND WORKING WITH CIMPLICITY™

CIMPLICITY™ VERSIONS; BASICS, FEATURES AND DIFFERENCES

1. Basics of the CIMPLICITY™ project file.
2. Communication of the I/O pack with CIMPLICITY™.
3. EGD Communication.
4. Learn the and open a screen from within the project file.
5. Navigate through the screens to identify signals from the turbine.
6. Hands-On CIMPLICITY™ (your current version) Basics GT Startup.
7. Learn differences between CIMPLICITY™ versions, their basics and features.
8. Hands-On CIMPLICITY™ Screen Viewing.
9. Locating and starting CimLayout Files .
10. Alarm Viewer files (.avview).
11. Hands-On CIMPLICITY™ Layout.

GAS TURBINE STARTUP AND PROBLEM SOLVING FROM CIMPLICITY™ SCREENS

1. Review the basic procedure to start, synch, and load the Gas Turbine.
2. Learn the major signals from the turbine and acronyms used on the screens.
3. Starting a Gas Turbine.
4. Trouble shooting in several cases as an exercise ' Not ready to start" .
5. First failure analysis for trips (emergency stop).

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