MARK V, MARK VIE and Gas Turbine

Introduction:

Working with General Electrical "GE" control systems and gas turbine at facilities, attendees   in this "hands-on" course will learn the main differences between control system series "MARK V,VI,VIE" , how to fix and troubleshooting GE control system MARK V& VIE and the basics of Gas turbine main component, theory of operation, start up and shutdown sequence and unit operation protection system.

This course will bring the students up with the latest technologies of general electrical   control systems and the main keys of operation, maintenance and troubleshooting Knowledge, transfer for field maintenance experience of MARK VI/MARK VIE,GTs,

Students' specific needs and concerns are also addressed during the class so that they can go back to their workplace and immediately apply what they've learned. This course can also be adopted as part of a company's regular Qualified I&C Worker program..

Who Should Attend?

This seminar is designed for anyone who needs to sharpen their control system troubleshooting skills in order to increase efficiencies and uptime at their power station or gas station. If you work with gas turbine and GE control system at industrial plants, whether as general maintenance personnel, in cross-training programs, an electrician, or an engineer,

you will find this course extremely useful. As long as you work with control system and troubleshoot problems, this course is for you.

Course Objectives:

Participants attending the program will:

- Interpret the MARK V/VIE architecture and hardware description
- Control and protection System Principles for MARK V/VIE
- Sequencing, Rungs, logic blocks diagram, startup, speed control, temperature control
- Turbine protections (over temperature, exhaust spread, over speed, combustion monitoring)
- TCI software
- Configuring a Trip History Display
- Configuring an I processor and installing an Arcnet card.
- I/O Configurator
- EEPROM Downloader
- Logic forcing
- Software overview and toolbox installation and backup
- Cimplicity software overview and screen editing
- Monitoring Software and Program Block Functions
- Define software variable
- Adding logic alarm, software point
- Replacing I/O Cards
- Modify logic software and add & remove I/O point
- Servo valves and LVDTs overview and theory of operation
- Trouble shooting servo valves and LVDTs
- Hydraulic Valves "SRV, IGV, GCVs" calibration procedures
- Gas Turbine start up and shutdown sequence
- Gas turbine protections and control

Training Methodology

The program will be interactive and practical. There will be work in groups and pairs as well as individual exercises and everyone will get an opportunity to discuss their issues with control system and troubleshoot common faults and failure issues. Each day will end with time to produce an action plan for delegates continuing development.

Course Outline:

Day 1: Introduction FUNDAMENTALS OF INSTRUMENTATS AND BASICS FOR MARK V

- Basics of instruments field measurements (pressure, temperature, level, flow, solenoid valves,.....)
- MARK V system overview and architecture
- Simplex, dual control and Triple modular redundancy principles
- MARK V interface processors "I controller"
- Common data processor "C controller"
- ARCNET principals
- HMI and Cimplicity introduction
- Monitoring I/O Signals
- I/O Configurator
- EEPROM Downloader

Day 2: INTRODUCTION TO MARK VIE AND TOOLBOX INTRODUCTION

- MARK VIE System Overview and Architecture
- Comparison between MARK V and MARK VIE
- Controllers overview and types of processors (USCA,UCSB,UCCC,..)
- Simplex and Redundant controller configuration
- Mark VIE Hardware – I/O Packs and Terminal Boards types
- Mark VIE Hardware – The PDM (Power Distribution Module)

Day 3: HARDWARE CONFIGURATION AND TROUBLESHOOTING

- Controllers flashing procedures
- Controllers build and download
- Controllers Diagnostic alarms troubleshooting
- Configure of I/O pack and terminal boards
- I/O packs diagnostic alarms and trouble shooting
- Replacing I/O Packs and Terminal Boards
- Monitoring Software and Program Block Functions
- The Finder Utility for Toolbox ST.
- Alarm tracing

Day 4: SOFTWARE INSTALLATIION AND HYDRAULIC VALVES CALIBRATION

- Adding I/O point
- Configure alarm point and adding software variable
- Data Collection using Dynamic Data Recorder (DDR)
- Trip log configuration and historian data collection
- Servo valves and LVDT overview
- Hydraulic valves calibration
- ToolBoxST Basics Monitoring "system installation, archive,…"

Day 5: GAS TURBINE INTRODUACTION

- Gas turbine main equipment's
- Startup sequence
- Combustion monitoring
- Turbine supervisory instruments
- Operation mode (speed control, temperature control, …)
- Speed drop principals
- Gas turbine protection (over speed, exhaust spread, exhaust temperature, vibration …)