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Course Information Letter ---- CT515

(GE) Mk-IV GAS TURBINE CONTROLS CT515

A gas turbine power plant can operate for years with little to no difficulty. Then, on that hot August day, when needed the most, it fails to start. We all know the drill! Or, perhaps, the unit does start, but the number of alarms are significant. How well personnel resolve this problem depends upon how well personnel (1) understand the "big picture" of how all the gas turbine component/systems relate, (2) how familiar personnel are with the print systems, and (3) the ability to interpret alarm information as applied to the available prints. This course targets the need for technicians/engineers to operate, maintain, calibrate and troubleshoot the Mk-IV control system. First, learn the big-picture. Next, learn how to maximize use of the OEM provided information to troubleshoot. Finally, take the information provided by the Mk-IV system and apply it.

Topical Outline includes: Mk-IV Hardware Familiarization, Operator Interface, Available Documentation, Reading Elementaries, FSR_SU/_ACC/_SD, FSRN, FSRT, Fuel Control and valve positioning, Water Injection, Variable Inlet Guide Vane, Protective Circuits

OBJECTIVES: Upon completion of this course the participant should be able to:

1. Demonstrate the ability to use OEM provided documentation that will include the Control Specifications, Elementaries, Application Manual, and P&IDs.
2. Demonstrate the understanding of the Mk-IV hardware components, how they are accessed, and how they communicate.
3. Demonstrate the ability to troubleshoot an equipment alarm, given an Alarm Drop Number.
4. Demonstrate the ability to interpret the more routine diagnostic alarms and recognize appropriate actions.
5. Demonstrate the ability to follow the major "control signal path" through the elementaries.
6. Demonstrate the ability to trace the derivation of a command signal to the servomechanisms.
7. Demonstrate the knowledge necessary to calibrate turbine valve mechanisms.
8. Demonstrate the ability (or knowledge -- based upon equipment availability) to more efficiently use the Mk-IV screens for evaluating/calibrating systems.
9. Demonstrate the ability (or knowledge -- based upon equipment availability) to force logic to facilitate calibration.
10. Describe how to change constants or re-program ladder logic such as to add contact input/outputs, add alarms, and/or alter sequencing.
11. Given plant drawings, trace a signal to/from a field device through appropriate terminal boards, through circuit boards, to a digital "signal name".
12. Demonstrate the ability to follow signal flow to/from the "4" circuits to trip/reset the machine.

COURSE DATES/LOCATION/FEE

For current dates / locations / prices, please see HPC's website, www.hpcnet.com.

COURSE OUTLINE

Monday

Introduction
Mk-IV Hardware Familiarization
Operator Interface
Available Documentation

Tuesday

Reading Elementaries
FSR_SU/_ACC/_SD: Description, Algorithm, Calibration and how this circuit may influence operations.

Wednesday

FSRN: Description, Algorithm, Calibration and how this circuit may influence operations.
FSRT: Description, Algorithm, Calibration and how this circuit may influence operations.

Thursday

Fuel Control: Servo Mechanisms, Gas Control Valve, Liquid Control Valve, and Fuel Splitter
Water Injection: Description, Algorithm, Calibration and how this circuit may influence operations.

Friday

Variable Inlet Guide Vane
Protective Circuits: L4, Overspeed Trip, Emergency Overspeed Trip, Overtemperature Trip, Vibration, 20FG/20FL
Certification Examination (optional)

FREQUENTLY ASKED QUESTIONS

- Will HPC Technical Services bring this course to our location for our personnel only? YES, call or email Stephen Parker, stparker@hpcnet.com for a price quotation.
- Will HPC Technical Services customize the presentation at our site to suit our particular needs? Yes.
- Is HPC Technical Services' textbook available for purchase as a reference document? Yes. \$195 + S&H.
- What is the cost for HPC Technical Service to deliver this course at our location? Well, of course that can vary, but generally speaking, if you're planning on having 6+ attend, when considering your T&L, it is to your advantage to perform the course at your plant (office). You gain from the customization and price.
- Can HPC Technical Services provide "Technical Assistance" in conducting functional checkouts or troubleshooting problems? Yes we can. Call or contact Harold Parker, hparker@hpcnet.com for our rate sheets and any further information required.

WHAT YOU WILL RECEIVE:

1. 1 copy of HPC Technical Services' textbook, (GE) Mk-IV Gas Turbine Controls, a \$195 value, as written by Harold Parker. It is a valuable desktop reference in addition to being able to enhance the learning process. (This valuable text is available for purchase if you cannot attend – US\$195).
2. A "Certificate of Completion" with 2.9 CEUs, authorized for issue by the International Associate of Continuing Education/Training.

GAS TURBINE I&C CERTIFICATION:

There are two levels of certification (Both levels require this course):

1. Engineer
2. I&C Technician

Those who attend this course are automatically qualified to take HPC Technical Services' Certification Examination. This examination is offered at no additional expense to the participant. An 80% passing grade is required. The examination length will not exceed 2-hours. Those who complete this examination will receive a revised "certificate of completion" that recognizes this accomplishment along with two-copies of a "To Whom It May Concern" letter that states their accomplishment. (Two copies are provided, one for the participants' employer and one for the participants' personal file.)

Consult HPC's website, www.hpcnet.com, for detail on this certification program.

(GE) Mk- IV Gas Turbine Controls – CT515

www.hpcnet.com

INSTRUCTOR (S):



Harold Parker is the founder & President of H Parker & Company, Inc. Mr. Parker has worked in the "Power Generation" industry for 36 years, 14-years with GE as a Field Engineer, Start-Up Engineer, Technical Training Specialist and Manager. In 1983 Mr. Parker resigned from GE and started a training company, Schenectady Learning Systems, in Schenectady NY, which evolved into H Parker & Company, Inc. today. During this post-GE period, Mr. Parker was briefly employed as Manager Turbine-Generator Services with General Physics (2-years) and as a Field Engineer with Mechanical Dynamics & Analysis (2-years). Mr. Parker is the primary contributor to the development of the text used in this course presentation. Mr. Parker holds a BSME ('69 from Lawrence Institute of Technology), a MBA ('81 from the State University of New York @ Albany) and is a member of ASME and IEEE.

Bill Lynn. Bill has 35+ years experience, almost all on gas turbine generators and the control systems. Bill "cut his teeth" on the Fuel Regulator Controls and the Mk-I system. Bill continued to develop experience on the Mk-II, -IV, -V, and the -VI systems. Installation, calibration, control checkout, application engineering, troubleshooting, and problem resolution are Bill's expertise. He worked for the GE international department, GE's Detroit District Office, and later the Gas Turbine Department. Bill accepted an early retirement about 4-years ago and has worked as an independent as well as with HPC Technical Services. Bill resides in the Fort Pierce FL area.

RECENTLY SATISFIED CLIENTS:

Calpine Gilroy Cogeneration, Constellation Energy, Edison Mission O&M, Harbor Cogeneration Company, Indeck Energy, Mass Power, MidAmerica Energy, Mirant Corporation, Morris Energy Group, Ocean State Power, Panda Rosemary Cogen, Sacramento (CA) Municipal Utilities Department, TBG Cogen, Texas Utilities, TransCanada, Western Resources, West Plains Energy, Wheelabrator Energy Systems, Willamette Industries*, Wisconsin Public Service, Xcel Energy

HPC TECHNICAL SERVICES
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REGISTRATION FORM

Company: _____

Plant: _____

Address: _____

City/State/Zip: _____

Telephone: _____ FAX: _____

Course Number/Title: _____

Course Dates: ____/____/____ Thru ____/____/____

Course Location: _____ Course Fee: _____

PLEASE ENROLL THE FOLLOWING INDIVIDUAL (S) LISTED BELOW:

Student #1: _____ Email _____

Student #2: _____ Email _____

Taking advantage of HPC's 3-4-2 Policy: Send 3, Pay for 2 when paying in advance.

Student #3: _____ Email _____

Enrolled by: _____ Email _____

Date: _____

METHOD OF PAYMENT

Check to Follow: _____

Check Enclosed #: _____

MC/Visa/AMEX #: _____

Expiration Date: _____ CV Code: _____

Purchase Order #: _____

Please advise how you found out about this course initially.

- Website search
- Fax advertisement
- Magazine advertisement

- Familiar with HPC
- HPC mailing
- Other _____