

ABOUT THE INSTRUCTOR

Myke King is a consultant operating independently of any supplier or implementer of control technology

Developer and presenter of Whitehouse Consulting's training courses in process control

Specialties:

- APC (advanced process control) benefits studies, technology selection and project support
- Process control troubleshooting/improvements
- Training in process control from basic techniques, through advanced regulatory control up to multivariable control and real-time optimization

MYKE KING PUBLICATION : PROCESS CONTROL - A PRACTICAL APPROACH

This book was developed from Whitehouse Consulting's well-known training courses. It presents process control design techniques that have an immediate practical application. The theory, originating in the academic world and found daunting by most control engineers, is kept to a minimum.

The book takes a back-to-basics approach. The use of proprietary MPC packages is widespread. Control engineers have invested thousands of man-hours in the necessary plant testing and commissioning. Improving the basic controls is not usually an option once the MPC is in place. Thus poor basic control remains the status quo and becomes the accepted standard to the point where it is not addressed even when the opportunity presents itself. This book raises the standard of what might be expected from the performance of all controllers.

The book is valuable not only to those involved in the implementation of process control but to others, such as process and mechanical engineers, who are involved in the design or support of process plant.

Course Overview

Following on from the introductory course Process Control – A Practical Approach, this course takes the techniques that the delegate has learnt and, using the same practical hands-on approach, shows how they are applied to common processes.

While course delegates will find it helpful to have a basic understanding of the processes, in each case an introduction covers their general principles and key operating variables. Each module addresses the implementation of basic controls on the process and then moves on to the application of more advanced techniques. In the case of the distillation these include both multivariable control and optimization. The methodology covered, when later applied by the delegate to real processes, will ensure that the maximum benefit is captured by each layer of the control hierarchy.

Delegates would include control engineers, process engineers, mechanical engineers and plant supervisors. It is strongly recommended that those attending this course have previously attended the introductory course. The learning is intensive and, while some refresher material is included, delegates without the appropriate basic skills will have difficulty keeping up with others.

Course Content (details in following page)

1. Compressor Control
2. Steam Boiler and Fire Heater Control
3. Distillation Column Control

Pre-requisite Knowledge:

	Process Dynamics	PID Control	Signal Conditioning	Level Control	Feedforward Control
Steam Boiler Control	X	X	X	X	X
Compressor Control	X	X	X		
Distillation Control	X	X	X	X	X

For further information regarding this course please contact:

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DETAILED COURSE SYLLABUS

I. Steam Boiler and Fired Heater Control

- process description
- fuel gas flow compensation
- fuel gas heating value compensation
- total duty control with dual firing of oil and gas
- steam drum swell and inverse response
- 3-element steams drum level control
- flue gas oxygen and CO control
- cross-limiting control
- feed forward on feed rate and feed enthalpy
- heater pass-balancing
- steam header pressure control

II. Compressor Control

- compressor types
- polytropic head
- equal percentage and quick opening valves
- discharge throttling
- inlet guide-vanes
- speed control
- anti-surge and surge recovery control
- multi-compressor balancing

III. Distillation Control

III.1. Process Technology

- mechanism of distillation
- vapour pressure
- relative volatility
- azeotropes
- key components
- feed quality "q"
- cut and separation
- impact of column design
- modeling correlations
- adjusting product composition

III.2. Basic Controls

- control problems
- maintaining the energy balance
- column pressure control
- condenser duty control
- internal reflux control
- flooded condenser
- hot gas bypass
- inverse response problems
- manipulation of vapour rate
- use of split range control
- maintaining mass balance
- energy versus material balance schemes
- Rijskamp scheme
- overcoming reflux drum lag
- tuning the drum level controller

III.3. Composition Controls

- temperature profile
- locating tray temperatures
- choice of manipulated variable
- pressure compensation
- cut and separation models
- inferential properties
- feedforward on feed rate
- feedforward on feed enthalpy
- feedforward on feed composition
- sigma-T/delta-T control
- steady state decouplers
- relative gain analysis
- dynamic decoupling
- on-stream analyzers
- towers with side streams
- multivariable control packages
- technology suppliers

III.4. Optimization

- available variables
- common constraints
- benefits
- available technologies
- flooding protection
- pressure minimization
- energy-yield optimization