

# PRACTICAL CONTROL VALVE SIZING, SELECTION AND MAINTENANCE



## YOU WILL LEARN:

- What happens inside a control valve
- The difference between cavitation and flashing
- Choked flow
- Simple calculations to determine CV values
- How to recognise severe service applications
- The types of control valves and relative advantages
- Different characteristics and specifying seat leakage rates
- Size actuators for linear and rotary applications
- Advantages of pneumatic, hydraulic and electric types
- How to select materials for bodies, trims, packing boxes, and gaskets
- Computer sizing programs
- Failure modes for control valves
- New approaches to troubleshooting

## WHO SHOULD ATTEND:

- Control valve specialists
- Plant safety specialists
- Instrumentation and control engineers and technicians
- Electrical engineers
- Project engineers
- Process control engineers
- Consulting engineers
- Maintenance engineers, technicians and planners
- Systems engineers



## The Workshop

It is claimed that the majority of control valves throughout the world have not been correctly sized and that large numbers operate on manual mode. Whether this is true or not is difficult to establish but we do know that the method of sizing and selecting a control valve for a specific application is generally not well understood. Although there are many factors that need to be taken into account the subject is not difficult to understand if dealt with in a logical manner.

Many maintenance problems result from people treating the symptoms of a problem rather than tackling the true cause - a basic understanding of the principles is all that is usually needed to solve the problem for good. This practical, hands-on workshop is designed to maximise knowledge retention and understanding. It provides an opportunity for participants to discuss with the presenter and others, specific problems and appropriate solutions. All delegates take away a detailed and comprehensive copy of the material presented; therefore minimal note taking is encouraged to ensure maximum delegate participation and attention.

### Pre-requisites

No specialist knowledge or skills are required – only a technical background so that there is an understanding for such factors as the difference between pressure and force. In fact this course is a good introduction to someone who has had no dealings with control valves in the past as well as an important refresher course for control valve specialists who benefit from the back-to-basics approach.

## Practical Sessions

This is a practical, hands on workshop enabling you to work through practical exercises which reinforce the concepts discussed.

## The Program

### INTRODUCTION TO CONTROL VALVE THEORY

- Introduction and definitions
- Energy types
- What happens inside a control valve
- Cavitations and flashing
- Choked flow
- Valve co-efficient CV

### DIFFERENT TYPES OF CONTROL VALVES

- Globe valves
- Butterfly
- Eccentric disk
- Ball
- Rotary plug
- Diaphragm and pinch

### CHARACTERISTICS

- Equal percent
- Linear
- Quick opening
- Selection method

### HIGH PRESSURE DROP APPLICATIONS

- Cavitations control and elimination
- Low noise
- Diffuser plates
- Chokes
- Disk stack technology
- Pressure balanced trim

### VALVE SIZING EXAMPLES OF HIGH PRESSURE DROP APPLICATIONS USING COMPUTER PROGRAMS

- Water – pump bypass
- Steam – turbine bypass
- Gas – pressure reducing
- Oil – choke valve

### ACTUATORS

- Pneumatic
- Hydraulic
- Electric
- Sizing on rotary valves and linear valves
- Mounting considerations
- Manual over-rides
- Accessories

### POSITIONERS

- Basic principles
- Conventional pneumatic
- Conventional electro-pneumatic
- Smart positioners
- Feedback options

### PNEUMATIC CIRCUITS

- Volume tank fail system
- Fail fix
- Volume boosters

### MATERIALS

- Body materials and pressure ratings
- Trim and packaging
- Guides and gaskets

### QUALITY STANDARDS

- ASME
- NACE
- ISO 9000/2000
- PED
- NAMUR

### INSTALLATION AND MAINTENANCE

- Installation, commissioning and routine maintenance
- Fault finding
- Modes of failure

### SUMMARY, OPEN FORUM AND CLOSING

