ANALOG CONTROLS

Condensed Course Outline

PROCESS CONTROL FUNDAMENTALS

- ☐ Importance of process control
- ☐ Measurement purpose & requirements
- ☐ Process signals
- ☐ Analog data representation
- ☐ Signal operating ranges
- ☐ Measurement error & response time
- ☐ Transmitters & controller output

CONTROL LOOPS & SIGNAL TRANSMISSION

- ☐ Typical control loops
- ☐ Pneumatic & electrical signal transmission
- ☐ Current-to-pneumatic systems
- ☐ Loop components & deterioration

PID CONTROL

- ☐ Control loop terminology
- ☐ Sensors & transmitters
- ☐ Controllers & recorders
- ☐ Final control elements
- ☐ Proportional, integral & derivative control
- ☐ Loop tuning & stability
- ☐ Cascade & ratio control

TEMPERATURE MEASUREMENT

- ☐ RTDs
- ☐ Thermistors
- ☐ Thermocouples
- ☐ Calibration & compensation
- ☐ Temperature standards

LEVEL MEASUREMENT

- ☐ Capacitance level systems
- ☐ Ultrasonic level detection
- ☐ Hydrostatic pressure
- ☐ Differential pressure transmitters
- ☐ Purge systems
- ☐ Level safety considerations

PRESSURE MEASUREMENT

- ☐ Pressure transducers
- ☐ P/I & P/P devices
- ☐ Strain gauge & piezoelectric sensors
- ☐ Instrument installation
- ☐ Maintenance & troubleshooting

FLOW MEASUREMENT

- ☐ Turbine & paddlewheel meters
- ☐ Magnetic flowmeters
- ☐ Vortex meters
- ☐ Mass & thermal flowmeters
- ☐ Ultrasonic flowmeters
- ☐ Meter installation

WORKING WITH CONTROLLERS

- ☐ Controller types
- ☐ Direct & reverse action
- ☐ Manual vs. automatic control
- ☐ Proportional output methods
- ☐ Control strategies
- ☐ Alarms & indicators

MOTOR DRIVES & FINAL CONTROL ELEMENTS

- ☐ AC motor drives
- ☐ PWM fundamentals
- ☐ Drive parameter setup
- ☐ Drive troubleshooting
- ☐ Valves & actuators
- ☐ Positioners & proportional relays