Process Control and Fault Diagnosis

**Duration:** 120 mins  \hspace{1cm} **Level:** Intermediate  \hspace{1cm} **Pass mark:** 80%

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**Course Description:**

**Who is the course for?**

This eLearning course is aimed at individuals who work with process control systems for industrial units, or who are required to have a thorough working knowledge of these systems.

**Is previous experience required?**

It is expected that as a participant in this course you will have received formal training in your role and that you hold suitable qualifications.

**How will the course benefit me?**

Process control systems are responsible for maintaining processes at the desired operating conditions in a safe and efficient manner. This course will identify the essential features of process control systems and describe the features and benefits of different types of control system. It will also explain how to locate and diagnose faults in a system.

The knowledge gained in this course will help you understand how to keep process systems operating in a safe and controlled manner.
How will the course benefit my company?

By properly using process control systems, you contribute to the safe operation of your asset and the prevention of incidents. A reduction in incidents means a safer working environment for everyone.

What standards are referenced in the course?

This course does not refer to specific legislation or laws but is written to current industry best practice and standard operating procedures.

Is there an assessment?

Once you have completed the course, you will be asked a series of questions to check your knowledge and understanding. These are based on the learning objectives for the course and have a pass mark of 80%.

Learning Objectives:

• Identify the basic concepts underlying process control systems
• Describe the basic concepts underlying process control systems
• Explain the importance of process control in the chemical industry
• Identify the main types of automatic control systems
• Explain how the main types of automatic control systems function
• Identify the different types of closed loop control systems
• Describe the different types of closed loop control systems
• Identify the main modes of process control
• Describe the essential features of on/off process control
• Identify the applications of on/off process control
• Describe the applications of on/off process control
• Describe the limitations of on/off control
• Describe the essential features of proportional control
• Differentiate between proportional band and gain
• Identify the applications of proportional control
• Describe the applications of proportional control
• Illustrate how you would calculate the output compared to deviation for proportional settings
• Describe the essential features of an integral control system
• Identify the applications of integral control
• Describe the applications of integral control
• Describe the essential features of a derivative control system
• Identify the applications of derivative control
• Describe the applications of derivative control
• Explain what a three-term control is
• Explain the use of the three-term controller as a means of stability of response
• Identify the main types of control valves
• Explain how the main types of control valves operate
• Identify the main types of valve plug operation
• Explain how the main types of valve plugs operate
• Identify the main functions of valve positioners
• Identify some important factors to consider when selecting a valve positioner
• Identify the factors that affect the location of detecting elements within a control system
• Describe the factors that affect the location of detecting elements within a control system
• Identify the different types of computer control systems used
• Describe the features and operation of the DDC system
• Identify the benefits of a DDC system over conventional panel-based control systems
• Describe the benefits of a DDC system over conventional panel-based control systems
• Identify the disadvantages of a DDC system
• Describe the features and improved reliability of the DCS system
• Identify the components of a DCS
• Describe the components of a DCS
• Identify the benefits of a DCS
• Identify the equipment that is required for an operator to communicate with a DCS
• Describe the equipment that is required for an operator to communicate with a DCS
• Describe the basic principles of the SCADA system
• Identify the features of the SCADA system
• Describe the features and operation of the SCADA system
• Summarise the benefits of the SCADA system
• Define a fault
• Differentiate between a fault and the symptoms produced by a fault
• Illustrate how you would differentiate between a fault and the symptoms produced by the fault
• Identify different methods and techniques of locating faults
• Explain the different methods and techniques of locating faults
• Identify the steps required to diagnose a fault and classify the cause of the failure
• Describe the steps required to diagnose a fault and classify the cause of the failure
• Identify the type of remedial action that should be taken when a fault has been located
• Describe the type of remedial action that should be taken when a fault has been located