Process Control for Operators

Introduction

The success of every company depends of each employee's understanding of the business's key components. Employee training and development will unlock the companies' profitability and reliability. When people, processes and technology work together as a team developing practical solutions, companies can maximize profitability and assets in a sustainable manner.

Understanding Chemical Plant Process Control is a key to optimized plant operations. A way to improve an existing plant's operating cost or to reduce a new distillation system's operating cost is to improve the efficiency and operations by correct equipment selection, process optimization and control.

Course Objective

This course will guide the participates to develop key concepts and techniques to operate design and troubleshoot a process control system. These key concepts can be utilized to make design and operating decisions. Training and development is an investment in future success - give yourself and your employees the keys to success.

Product recoveries, purities and energy utilization can be improved in most process systems. This cannot be achieved without first an understanding of principles and design. These principles need to be understood in advance of designing, operating and trouble shooting a process for the operator, designer, or problem solving to be effective.

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Course Syllabus

The goal of the course would be to refresh the knowledge of those who have a basic understanding of process control and to build a foundation to those who are new to the process control. In this course the basic fundamentals will be covered in detail and the advanced topics will be reviewed.

Typical Course Outline

1. Introduction to Petrochemical Key Concepts

    A. Overview of the Petrochemical Industry
    B. Safety in the Petrochemical Industry

2. Introduction to Regulatory Control

    A. Process Control

        1. Parts of the typical control loop
        2. Process & Instrument Diagrams (P&ID's)
        3. Commonly used process control signals

    B Automatic Control
    C Definitions
    D Block Diagram
    E. Open and Closed Loop Systems
    F Feedback and Feed forward Control

2. Typical controlled and manipulated process variables

    A Level
    B Pressure
    C Composition
    D Temperature
    F Flow

3 Process Dynamics:

- A Input Changes
- B Process Representation
- C First Order System
- D Higher Order System
- E Process Identification
- F Sensor and Control Valve Dynamics

4 On-Off Controller

5. PID Controller:

- A Proportional
- B Integral
- C Derivative
- D PID Controller
- E Industrial PID Controller
- F Direct and Reverse Action

6. Cascade Control:

- A. Operations
- B. Initialization

7. Ratio Control

8. Distillation Column Control

- A. Functions of Process Control
- B Characteristics of a Continuous Process
- C Select appropriate composition and column pressure control schemes
- D Process settings during column operation

9. Advanced Process Control

A Introduction to APC
B. Fundamental and terminology
C Overview of current APC technologies
D Typical steps of an APC project.

What You Can Expect To Gain;

- The operation, control and trouble shooting of a process control systems and it's associated equipment,
- An overview of process control, practical solutions as well as theory
- An understating of essential process control concepts,
- Valuable practical insights for trouble free design and field proven techniques for commissioning, start up and shutdown of process operations.
- The fundamental knowledge of process and distillation control.
- To tailor your approach to specific design, analysis and trouble shooting problems.

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Who Should Attend

- People who are making day to day decisions regarding operation, design, maintenance, and economics of process industry plants.

    1. 1st Line Operations personnel,
    2. Operation Supervisors,
    3. 1st Line Maintenance personnel,
    4. Maintenance Supervisors,
    5. Senior Plant Supervisors,
    6. Operations Engineers
    7. Process Support Engineers,
    8. Design Engineers,
    9. Cost Engineers

- This course has been designed for operations personnel who may or may not have a technical degree. The course will review the fundamentals of design, but will focus more on the practical application of these fundamentals. Key Process control inspection, troubleshooting and commissioning guidelines will be reviewed.

- An operator or engineer who must troubleshoot and solve problems in a plant or an engineering office.

- Operations Personnel and Engineering graduates/technologists who will be using process control in their daily work.

- Plant Operation Support Engineers checking plant performance under different operating conditions, and who are involved in design of new facilities or revamps of existing facilities.

- Ideal for veterans and those with only a few years of experience who want to review or broaden their understanding of process control. This course would be a very practical overview for fresh graduate engineers.

- Other professionals who desire a better understanding of the subject matter.