Introduction

In the highly competitive field of process plant operation, the strategic importance of the **Technical/Operations function** is often overlooked despite its potential to significantly improve productivity, enhance product quality, and secure market share gains.

This **Process Plant Startup, Commissioning, and Troubleshooting** training course is designed to provide participants with essential principles of problem-solving and problem prevention within an operational or process environment. Troubleshooting is a core competency for top-tier industrial corporations, and organizations looking to minimize system downtimes will find this course indispensable.

Commissioning and Startup

The **Commissioning and Startup phase** of a plant is a critical period, ensuring that newly constructed or revamped facilities and units are technically sound, functioning optimally, and ready for operation. This stage involves everything from testing individual equipment to ensuring the plant operates efficiently as an integrated system.

This course delves into the nuances of **Startup Commissioning**, offering detailed guidance on steering through startup and commissioning processes and troubleshooting to ensure smooth operations.

Targeted Groups

This course is designed for professionals engaged in plant startup, commissioning, and troubleshooting, including:

- **General Managers** overseeing plant startup and commissioning.
- **Operations and Maintenance Managers** with direct responsibility or staff support roles in startup and commissioning.
- **Commissioning Managers, Engineers**, and **Technical Personnel** supporting commissioning activities.
- **Supervisors and Engineers** from both **Operations** and **Maintenance** involved in commissioning.
- **Production, Maintenance Engineering**, and **Process Engineering Staff**.

Course Objectives

By the end of the **Process Plant Startup, Commissioning, and Troubleshooting** course, participants will be able to:

- Acquire advanced **troubleshooting skills** to become highly effective problem-solvers.
- Learn a **structured approach to troubleshooting** with common terminology and a shared understanding.
- Discover ways to foster **continuous improvement** in operational processes for incremental efficiency gains.

- Understand the difference between possessing a **techniques manual** and actively implementing the methodologies.
- Identify key personnel who should **champion troubleshooting** and problem-solving.
- Understand **work practices** that promote success by minimizing process variability.

Targeted Competencies

Upon completing the course, participants will be proficient in:

- Understanding the **critical stages of the commissioning process**.
- Balancing **technical** and **managerial challenges** in commissioning.
- Handling **machine and equipment-specific commissioning issues**.
- Managing **risks** and addressing problems that arise during the commissioning process.
- Redefining the **operations process** for improved efficiency.
- Utilizing **maturity indexing** to assess and guide improvement.
- Analyzing and solving **problems** with structured approaches.

Course Content

Unit 1: Introduction and Preparation

- Overview of **process plant startup and commissioning** processes.
- Understanding **organizational roles and responsibilities**.
- Techniques for **cost estimation** and preparing for **spare parts** logistics.
- Preparing for successful plant startup.

Unit 2: Commissioning Strategy

- Developing a **commissioning strategy**.
- Understanding **mechanical completion** and **integrity checks**.
- Pre-commissioning tasks and **operational testing** methodologies.
- Key steps for **startup/initial operation** and establishing **detailed testing and acceptance criteria**.

Unit 3: Process Plant and Machinery-Specific Issues

- Special focus on **commissioning process plants** and **machinery**.
- Commissioning **instrumentation and control systems**.
- Procedures for **preparing and isolating process plants** before commissioning.

Unit 4: Management, Planning, and Control

- Strategic **planning and control** for startup and commissioning.
- Accelerating **planning techniques** for efficiency.
- Monitoring and controlling commissioning progress, including **earned value analysis**.

Unit 5: Managing Risks during Commissioning

- Best practices for **troubleshooting** and **problem-solving** during commissioning.
- Rigorous **risk management** strategies.
- Maintaining **safety** and **quality** throughout the commissioning process.

Unit 6: Concepts

- Explore the **nature of process issues** affecting performance.
- Define **performance** using variables like speed, quality, and cost.
- Contextualize **effort inputs** and differentiate between **asset-based** and **business process-based** methods.
- Structured approaches to **process challenges**.
- Understand **maturity indexing**, **6 significant losses**, and the **7 wastes** concepts.

Unit 7: Tools and Techniques

- Analysis of **interactive and dynamic variable relationships**.
- Introduction to various **tools and techniques** for troubleshooting.
- In-depth **problem analysis** and the practical application of tools and techniques.
- Selecting the appropriate **tools** and methods for specific challenges.

Unit 8: People Issues

- The impact of **working practices** on empowerment and efficiency.
- Understanding **group dynamics** and their relevance to commissioning.
- Identifying **individual motivators** and developing troubleshooting skills.
- Managing **organizational change** during the commissioning phase.

Unit 9: Operator, Maintainer, Designer Interface

- Promoting **cross-functional teamwork**.
- Introduction to **TRIZ** (Theory of Inventive Problem Solving) for innovative problem-solving.
- Auditing processes against **dynamic standards**.
- Analyzing the effects of **maintenance/operations strategies**.
- Developing **standards** and **performance indicators**.
- Reviewing concepts, tools, and techniques to enhance **life-cycle costing** and design for **maintenance**.

By completing this course, participants will be equipped with the essential skills to handle **startup**, **commissioning**, and **troubleshooting** effectively, ensuring smoother operations, enhanced efficiency, and minimal downtime.