



# Planned Shutdown, Critical Activities, Isolation, Start-up & Commissioning



## Introduction:

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Start Up and Commissioning of new plant and equipment presents both a major technical and management challenge. The overall goal of mechanical completion and commissioning is to verify and document that the system is designed and constructed to fulfill its purpose and specified requirements. Life cycle cost principles and safety should govern all decisions and actions during this critical period.

Early establishment of commissioning packages is essential for an orderly and effective project completion. The commissioning plan shall have maximum priority to enable reversed planning in all project phases. All fabrication and installation planning shall be system oriented. Mechanical completion, commissioning, FAT, Preservation and suppliers assistance requirements shall be identified with this program

The initial start-up of any plant, irrespective of size, type, or industry, is a unique occurrence. The necessity of building a commissioning plan is derived from Cost wise, as this will minimize the budget for commissioning activities that will be allocated for contractor. All Companies operation staff is normally involved from day one in engineering phase. If, however, the same team is also taking part in any phase of the commissioning, it will result in a successful project and a reduction in unexpected startup troubles.

This intensive training course gives the participants a full picture of how to prepare themselves to have influential involvement in the commissioning & start up phases. The training course declares the key roles & responsibilities of the commissioning manager & disciplines team leaders to overcome the combination of technical & management challenges existing in that critical phases.

**In this training course, participants will learn:**

- The key stages of the commissioning process
- How to balance the technical and management challenges of commissioning & Start up
- How to deal with machinery and equipment specific commissioning issues
- How to Manage Risks and solve the types of problems likely to occur during commissioning
- How to enhance the company's turnaround management capabilities, and to ensure a team approach in the planning and execution of plant shutdowns and turnarounds
- To provide a comprehensive understanding of effective Shut down management techniques and implementation

## **Who Should Attend?**

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**This training course addresses the needs of a diverse audience with an interest in Commission, Plant Start-up and Shut down, including:**

- Operation Engineers who have oversight responsibility for Plant Commissioning, Start-up and shut down
- Maintenance Engineers with direct line responsibility as well as staff support responsibility for delivering on effective Plant Start-up & shutdown
- Plant Start-up and Commissioning Managers and Engineers
- Technical personnel & supervisors involved in supporting Plant Start-up & shutdown

## **Course Objectives:**

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An organization's personnel must familiarize themselves with the new equipment, processes and technologies, and develop the relevant operating and safety procedures. Successful commissioning of new facilities involves all the activities of: preparation and planning; mechanical completion and integrity checking; P&ID checking and verification;

pre-commissioning and operational testing; commissioning; start-up; initial operation; performance testing and acceptance and post commissioning. This training course will support to create awareness of planning methods and an integrated organizational approach in the execution of successful turnarounds

**By the end of this training course, participants will be able to:**

- Operate, maintain and troubleshoot boiler, steam turbine and steam system in a professional manner
- Do a successful commissioning & start Up Operations
- Learn the technical strategy for bringing the plant from being a construction site to an operating plant
- Manage the shutdown, outage & turnaround for the plant facilities
- Develop a good plan for any critical isolation activities

## **Training Methods:**

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**This interactive training course will be highly interactive, with opportunities to advance your opinions and ideas, and will include:**

- Lectures
- Workshop & Work Presentation
- Case Studies and Practical Exercise
- Videos and General Discussions

## **Course Outline:**

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### **Day One: Introduction to Start Up & Shutdown Operation and Methodology**

Competency Description: This module will give the participants the complete idea about the project life cycle & ensure the plant readiness for a safe & successful start up

Key behaviors

- Identify project life cycle
- Identify plant readiness
- Declare operation readiness plans & sub plans

- Discuss commissioning & start up methodology
- Identify what is meant by effective start
- Discuss the reasons of delayed start up

### Topics to be covered

- The startup Universal Process definition
- Terminology & Definitions
- Project life cycle
- Contracting Strategy
- Why to Effectively Manage Start-Up
- Avoiding start up delays & problems
- Start Up key dates
- Commissioning & start up flow process
- What Makes Commissioning and Plant Startup Difficult

### Day Two: Pre-commissioning & Mechanical Completion

Competency Description: This module will give participants the knowledge about preparation & planning, how to build a commissioning team, as well as the mechanical completion requirements.

### Key behaviors

- Identify projects planning
- Establish mechanical completion requirements
- Identify commissioning team building
- Identify what is facility inspection
- Declare how to do punch list clearance

### Topics to be covered

- Organization & Roles
- Commissioning & Start up team organization & structure
- Startup task force responsibilities

- Commissioning & start up manager role
- Project planning & work breakdown structure
- The critical path method CPM
- Spare parts management process
- What is startup check list? & how to prepare a check list? Punch list preparation & filtering
- Inspecting pipe lines & plant facilities
- Commissioning tests & recommended practices

### **Day Three: Shutdown / Turnaround Operations**

Competency Description: In this module, the participants will learn how to enhance the company's turnaround management capabilities, and to ensure a team approach in the planning and execution of plant shutdowns and turnarounds.

Key behaviors

- Define what is turnaround, outage & shutdown
- Discuss the shut-down preparation
- Identify shut down planning
- Identify the tools of progress monitoring & control
- Develop the shut-down plan

Topics to be covered

- Introduction to Shut down and Turnaround Management
- The Shutdown Management Process
- Organization and Roles
- Plant Shutdown and Preparation for Maintenance
- Scope of Work Development and Work Breakdown Structures
- Preparation and Execution Issues
- Logistics, infrastructure and materials management
- Developing Shutdown and Turnaround Plans
- The Critical Path Planning Method

- Developing the overall Shutdown Plan
- Shut down Progress Monitoring and Control

#### **Day Four: Isolation & Critical Activities**

Competency Description: In this module, the participants will have the knowledge & skills of how to apply the safe techniques for plant facilities isolation.

Key behaviors

- Discuss the needs of the facilities isolation
- Identify the types of isolation
- Define the isolation requirements
- Study the different Isolation standard
- Declare some critical activities (such as confined space entry, pigging, cleaning & flushing)

Topics to be covered

- Types of Isolation
- Mechanical & Electrical isolation
- Isolation standards & techniques
- Documents necessary prior starting the plant isolation
- Confined space Entry requirements
- Pigging & smart pigging prior plant start up

#### **Day Five: Start-up & Initial Operation**

Competency Description: This module will give the participants the comprehensive idea about the startup operation, startup requirements & essential facilities should be fully ready for safe & successful plant start up.

Key behaviors

- Establish safe start-up of facilities
- List the start-up risks
- Identify the startup essential requirements
- Identify reasons of start-up delay

Topics to be covered

- Utilities start up
- Process units start up
- Sources of problems during the startup operations
- Hazards associated with the startup operation
- Risks or Startup Faults
- Performance & acceptance testing
- Closed-Out Certificates
- Lining up the Plant facilities
- Coordination and Supervision during Start-up