

Session 4: Normal Startup - Overview and Communication

Prepare to Teach



Session Overview

Session 4 provides an overview of the various startups encountered in the process industry. Risks and hazards associated with startups are covered, as well as the key activities, personnel involved, and the type of information that must be communicated and the ways in which the information should be communicated.



Class Preparation Checklist

1. Bring Instructor's Manual and Timtene Unit Operating Manual to class.
2. Arrange for flipchart easel, flipchart paper, and markers OR whiteboard and markers.
3. Arrange for overhead projector and overheads.



Objectives

Overview:

Performance Objective

1. Identify the basic steps involved when placing equipment into service and bringing a unit online.

Learning Objectives

1. Discuss the different types of startups: normal/routine startup, startup after emergency shutdown, startup after equipment maintenance, and startup after turnaround.
2. Recall that unit startup activities are covered by OSHA's PSM (Process Safety Management of Highly Hazardous Materials) standard, specifically by PSM's Pre-Startup Safety Review element.
3. Describe the risks and hazards associated with unit startup.
4. List the key activities involved when placing equipment into service and bringing a unit online.

Communication:

Performance Objective

1. Given a process scenario, the process technician will identify potential unit personnel to communicate with prior to unit startup.

Learning Objectives

1. List all the departments and personnel who will be involved in or affected by the unit startup.
2. List the types of information that will need to be communicated regarding unit startup.
3. Discuss the communication methods that might be used at different points during the process of starting up the unit.



Agenda

Activity	Estimated Time
1. Agenda	10
2. Performance and Learning Objectives	10
3. Startups: An Overview	30
BREAK	10
4. Risks and Hazards	20
5. Key Activities	30
BREAK	10
6. Personnel Involvement	25
7. Information and Methods of Communication	25
8. Summary and Wrap-Up	10

Begin Lesson

1. Agenda

Time: 10 minutes

DISPLAY

SLIDE #1

OR

**Write on the flipchart
or whiteboard.**

Agenda: Using the transparency, whiteboard, or flipchart, list the topics that you intend to cover in today's class.

2. Performance and Learning Objectives

Time: 10 minutes

DISPLAY

SLIDES #2 - 4

OR

**Write on the flipchart
or whiteboard.**

Discuss the lesson's objectives with the learners in order to provide them with clear-cut guidelines for what is to be learned during the instructional session.

3. Startups: An Overview

Time: 30 minutes

There are various types of startups you may or will be involved with as a process technician.

DISPLAY

SLIDE #5

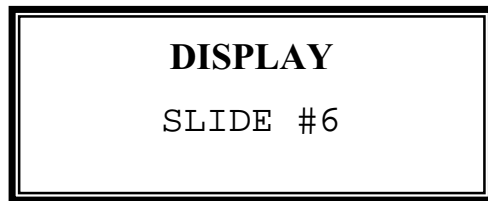
OR

**Write on the flipchart
or whiteboard.**

They include:

- ✓ Normal or routine startup
- ✓ Startup after an emergency shutdown
- ✓ Startup after equipment maintenance
- ✓ Startup after a turnaround

Today, and over the next few sessions, we will be discussing **normal or routine** startups. The point where this stage occurs in the "Life of a Plant" is shown on the overhead:



OR



Although we are going to concentrate on normal startup over the next few sessions, let's first discuss each type of startup we just mentioned briefly in order to differentiate them from each other:

- **Normal or routine startup**
This type of startup is one following a period of unit downtime during which no significant modifications or unit changes occurred. Startup procedure is based on previous successful startups in the past and planning can be done in routine fashion.
- **Startup after an emergency shutdown**
This startup will vary depending on the nature of the emergency (process, instrument, or mechanical failure). The startup must recognize the specific equipment involved, as much of the remaining equipment may be in operation. The pace of this startup may be more intense than normal due to the unusual situation.
- **Startup after equipment maintenance**
Similar to startup after an emergency shutdown.
- **Startup after a turnaround**
Startup after a turnaround will generally include specific provisions for changes or additions to the unit accomplished during the turnaround. The startup procedure must recognize and flag the modifications required by previous procedures.



Break 10 minutes

4. Risks and Hazards

Time: 20 minutes

All startups have risks and hazards associated with them. The risks and hazards associated with a normal startup may be fewer in number than during an initial startup, but they are no less dangerous.

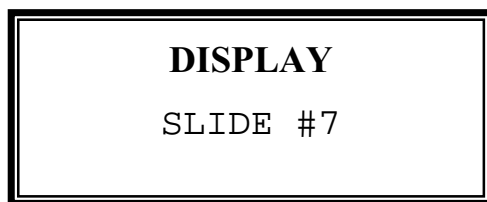
? *What types of risks and hazards do you think are associated with a normal startup?*

- **Failure to remove blinds and install plugs and blind flanges after startup**
- **Failure to completely air (O²) free all equipment which could contain combustibles**
- **Mechanical and thermal shock to equipment, especially piping, leading to leaks, spills, fires, etc.**
- **Failure to completely remove water from dry systems or hot oil systems**
- **Failure to adequately check out chemical and instrument systems**

5. Key Activities

Time: 30 minutes

On the next slide is a list of the key activities, which occur during a Normal Startup, **IN NO PARTICULAR ORDER.**



OR

**Write on the flipchart
or whiteboard.**

- Verify valve alignment
- Check and startup utilities
- Inspect equipment being returned to operations department from maintenance department
- Check for proper operation
- Remove energy isolation devices
- Startup unit
- Check and startup auxiliaries
- Communicate with appropriate personnel involved in Normal Startup

I'd like each of you - **individually** - to place these key activities in their proper order using your Normal Startup Flowchart in your Student Workbook **and a pencil**. Take about 5 minutes to do this.

Now, I want you to pair up with ONE other student, compare your flowcharts, and decide - through discussion - how the order of the activities should be modified. Take 10 minutes.

At the end of this 10 minutes, ask for teams to volunteer to share their flowcharts with the class. Give them the next slide (a blank flowchart) and a transparency marker. Have them write the order they established in the appropriate boxes. Give each volunteer team 2 - 3 minutes to share.

Once each team has shared, ask the class which team identified the correct order. If a team DID identify the **CORRECT ORDER** (see below) then congratulate them. If no one did, but some got close, recognize them and then share the correct order with the class.

- Communicate with appropriate plant personnel involved in Normal Startup.
- Inspect equipment being returned to operations department from maintenance department.
- Remove energy isolation devices.
- Check and start up utilities.
- Check and start up auxiliaries.
- Verify valve alignment.
- Start up unit.
- Check for proper operation.



Break 10 minutes

6. Personnel Involvement

Time: 25 minutes

Here's a list of all the various departments you will find present in a plant - not all of these will be in each unit. Use the Normal Start Up– Key Players Scenarios to take notes during the discussion.

DISPLAY

SLIDE #8

OR

**Write on the flipchart
or whiteboard.**

- Administration
- Feed/Product Movements and Shipping
- Environmental/Safety Manager
- Maintenance
- Process
- Operations
- Utilities

? *Can you think of any other departments or organizations that might be involved with a normal startup?*

- **Engineering (Technical Services, Process, Mechanical, Electrical)**
- **Laboratory**
- **Information Systems**

? ***Which personnel (by job title) from the administration department do you think would be involved and why?***

Title: Plant Manager

Why: Oversee coordination

Title: SH&E

Why: Safety oversight

Title: IT

Why: Debug any IT problems

? ***Which personnel (by job title) from the maintenance department do you think would be involved and why?***

Title: Maintenance Manager Superintendent for plant

Why: Coordinate unit with other plant maintenance

Title: Maintenance Supervisor for unit

Why: Direct unit maintenance efforts

Title: Maintenance Foreman and Technicians

Why: Plan and accomplish maintenance required

? ***Which personnel (by job title) from the operations department (other than the process technicians and their shift foremen) do you think would be involved and why?***

Title: Operation Manager Superintendent for plant

Why: Coordinate unit with other plant unit

Title: OPNS, Supervisor for upstream/downstream unit

Why: Coordinate specific feed/product requirements

Title: Supervisor, Oil Movements/Shipping and Receiving

Why: Supply feed, handle product movement

? ***Which personnel (by job title) from the utilities department do you think would be involved and why?***

Title: Utilities Supervisor

Why: Coordinate unit with other plant units

Title: Utilities Foreman
Why: Shift coverage/coordination for startup

Title: Utilities Technicians
Why: Furnish utilities when required

? *Which personnel (by job title) from other organizations do you think would be involved and why?*

Title: Superintendent of Engineer
Why: Technical support

Title: Laboratory Superintendent
Why: Analytical support

7. Information and Methods of Communication

Time: 25 minutes

Different types of information will be shared between the process technicians and the personnel discussed earlier. Using your Normal Startup Key Players Scorecard, found within your Student Workbooks, let's do the following:

1. Create a list of the personnel mentioned (by job title)
2. Discuss the type of information needed to be shared with each of them regarding normal startup, and then
3. List the method used to share this information. Methods would consist of memos, procedures, phone calls, radio calls, emails, etc.

Administration:

Title: Plant Manager
Information to be Shared: Startup timing, rates, impact on plant, budget, SH&E
Method: Memos – written or electronic

Title: SH&E Manager
Information to be Shared: Startup timing, rates, impact on plant, budget, SH&E
Method: Memos, procedures

Title: Operations Manager
Information to be Shared: Startup timing, rates, impact on plant, budget, SH&E
Method: Memos

Auxiliaries:

Title: Oil Movements/Shipping Superintendent
Information to be Shared: Startup timing, rates, impact on plant, budget, SH&E
Method: Memo

Title: Oil Movements/Shipping Foreman, Technicians
Information to be Shared: Startup timing, rates, impact on plant, budget, SH&E
Method: Phone, radio, email

Maintenance:

Title: Maintenance Manager
Information to be Shared: Startup timing, rates, impact on plant, budget, SHE
Method: Memo

Title: Unit Maintenance Superintendent
Information to be Shared: Timing, manpower required days/on shift
Method: Memo

Title: Maintenance Foreman
Information to be Shared: Timing, manpower required days/on shift
Method: Memo

Operations:

Title: Unit Superintendent
Information to be Shared: Timing, startup procedure, SH&E requirements
Method: Memo, Procedure

Title: Unit Superintendent, Upstream/Downstream of Unit
Information to be Shared: Timing, startup procedure, SH&E requirements
Method: Memo, phone, radio, email

Utilities:

Title: Utilities Superintendent
Information to be Shared: Timing requirements
Method: Memo

Title: Utilities Superintendent, Foreman, Technicians
Information to be Shared: Timing requirements
Method: Memo, phone, radio, email

Other Organizations:

Title: Engineering Manager

Information to be Shared: Timing, requirements for staff coverage

Method: Memo

Title: Laboratory Superintendent & Supervisor

Information to be Shared: Timing, requirements for staff coverage

Method: Memo, phone, email

8. Summary and Wrap-Up

Time: 10 minutes

1. Encourage additional questions over course content and exercises.
2. Review homework assignment:
 - Review the information captured on today's worksheets:
 - ✓ Normal Startup Flowchart
 - ✓ Normal Startup Key Players Scenarios
 - Continue to review the following section on the Timtene Unit Operating Manual:
 - ✓ Process Description and Design Basis
 - ✓ Auxiliaries and Utilities