

## Session 3: Your Career as a Process Technician

### Preparing to Teach

#### Session Overview

Session 3 provides students with detailed information about the work and working conditions of Process Technicians, supported by an interactive shift work role-play. Although Session 3 is designed as a lecture with interactive activities, the instructor may choose to supplement the content with guest speakers, video, and/or other resources. Revisions to instructional content and delivery are acceptable as long as the session meets the required objectives below.



#### Class Preparation Checklist

1. Optional: Invite career Process Technicians from chemicals and refining sectors as guest speakers, if desired.
2. Review Shift Work Role-Play Activity.
3. Copy any handouts to be used in Session 3.
4. Prepare overhead transparencies (if used).
5. Identify relevant new terms or phrases from the Glossary of Terms (on yellow paper located in the back of the instructor manual).
6. Other \_\_\_\_\_



#### Session 3: Objective(s)

1. Describe the roles, responsibilities, and expectations of the Process Technician:
  - Work environment (all weather, drug and alcohol free, team-structured, constantly changing and 24 hours per day operations).
  - Employer expectations.
  - Equipment and process operations, maintenance and control.
  - Physical requirements (lifting, pulling, climbing, etc.).
2. Describe the impact of shift work on:
  - Individual (Health and Safety).
  - Family relationships.
3. Describe changes and future trends in the role of the Process Technician.
4. List the factors responsible for future role changes of the Process Technician.
5. Describe the difference between organized and non-organized (union and non-union) operations.



## Session 3: Agenda

Activity	Minutes	From - To
1. Introduction and Agenda	3	-
2. Student Safety Minute	5	-
3. What a Process Technician Does	10	-
4. Summary of Responsibilities	4	-
5. Monitor and Control Process	4	-
6. Perform Maintenance	4	-
7. Troubleshoot and Problem Solve	4	-
8. Qualifications: Education and Training	4	-
9. Qualifications: Technical Knowledge, Skills and Abilities	4	-
10. Qualifications: Interpersonal Skills	4	-
<b>BREAK</b>	10	-
11. Qualifications: Physical Capabilities	4	-
12. Impact of Shift Work	4	-
13. Shift Work Exercise	14	-
14. Shift Work Exercise Discussion	10	-
15. Potential Impacts of Shift Work	4	-
16. Taking Care of Yourself	4	-
17. Union/Non-Union	4	-
18. Future Trends	10	-
19. Summary and Wrap-Up	10	-



## Note to Instructors

1. Continue to reinforce expectations for successful performance.
2. Encourage interaction through questions.
3. Supplement content with "real world" expectations employers have of employees.

# **Session 3: Your Career as a Process Technician**

## Today's Agenda

- Student Safety Minute
- What a Process Technician does
- Qualifications and Requirements
  - Knowledge and skills
  - Traits and attitudes
  - Physical abilities
- The Work Environment
  - Shift work
  - Physical conditions
  - Organized/Non-organized, Union/Non-union
- Future Trends

### **3.1 Introduction and Agenda**

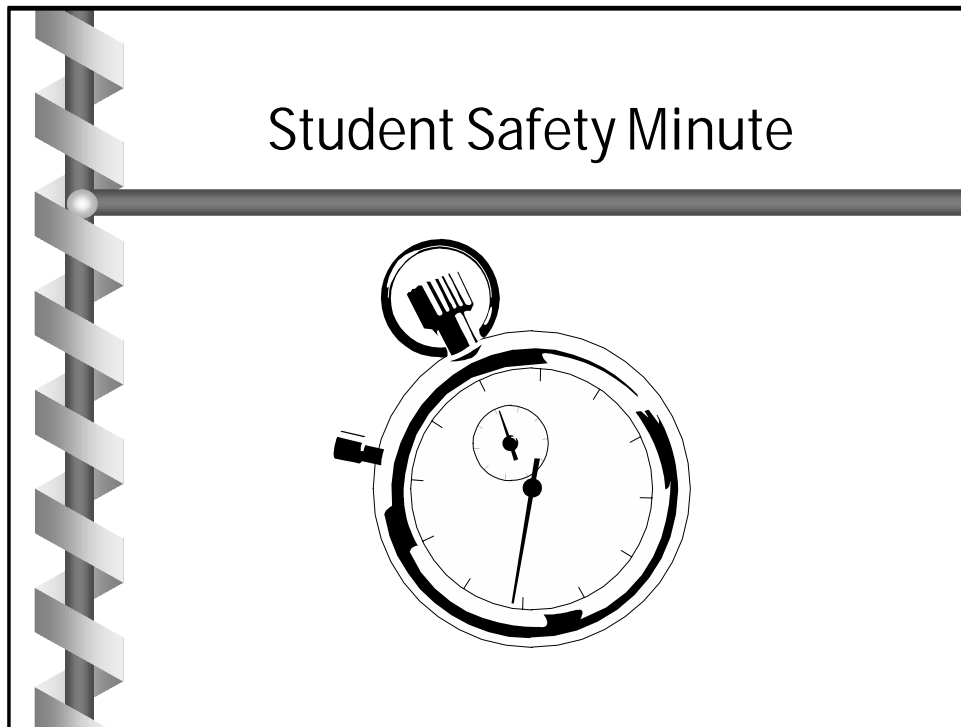
**Time: 3 minutes**

Give students a preview of what is to come by covering the major subject matter topics on the overhead.

*Instructional Strategies*

*This technique is known as an advance organizer, and serves a key role in helping students process cognitive information.*

**Next: Safety Minute**



## 3.2 First Student Safety Minute

**Time: 5 minutes**

1. Designated student presents safety topic following an outline.
2. Designated student interacts with other classmates through discussion, question, and answer.
3. Student submits the outline for the Safety Minute as part of their grade.

### *Instructional Strategy*

*The first student presents a Safety Minute at the beginning of this session. This Safety Minute should follow an outline, just as the instructor's presentations in Sessions 1 and 2 followed an outline. Students will be required to submit these outlines at the end of the presentation as part of their grade. If applicable, copies of handouts for all students should be provided.*

**Next: What a Process Technician Does**



## What they do

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The Process Technician starts, stops, monitors, maintains, controls, troubleshoots, problem-solves, improves, evaluates, analyzes, gas frees, air frees, communicates about, trains others on, and writes procedures.....



## .....for

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Furnaces, turbines, pumps, compressors, exchangers, crystallizers, flakers, dryers, desalters, boilers, reactors, dehydrators, distillation columns, extruders, pelletizers, blowers, evacuators.....

### **3.3 What a Process Technician Does**

**Time: 10 minutes**

1. Review "What a Process Technician Does" handout
  - Tasks and responsibilities
  - Equipment
  - Manner (see next page overhead)
2. Instructor should share own perceptions, experiences, and knowledge to make this concrete and real to the students.

**Next: What a Process Technician Does (Continued)**



.....How

- Safely
- Efficiently
- Environmentally compliant
- While working as a member of a team
- With a focus on the business goals
- In all types of weather.....

### **3.3 What a Process Technician Does (Continued)**

**Time: 10 minutes**

1. Review "What a Process Technician Does" handout
  - Tasks and responsibilities
  - Equipment
  - Manner (see next page overhead)
2. Instructor should share own perceptions, experiences, and knowledge to make this concrete and real to the students.

**Next: Summary of Responsibilities**



## Summary of Responsibilities

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- Monitor and control process
- Troubleshoot and problem solve
- Administrative activities
- Perform with a focus on Safety, Health, Environment and Production

## 3.4 Summary of Responsibilities

**Time: 4 minutes**

1. There are four (4) key areas of responsibilities (review slide).  
Point: All of the duties are performed with a focus on safety, health, environment, and production using proven and tested procedures. This focus includes operating in an alcohol- and drug-free environment.
2. Let's look at each area.
3. Review "Process Technician Job Duties" handout.

**Next: Monitor and Control Process**



## Monitor and Control Process

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- Sample and process streams
- Inspect equipment
- Start, stop, and regulate equipment
- Respond to changes
- Respond to emergencies or abnormal operations
- Document activities, issues, and changes

## **3.5 Monitor and Control Process**

**Time: 4 minutes**

Review key points on overhead and supplement with your own knowledge and experience.

**Next: Perform Maintenance**



## Perform Maintenance

- Change or clean filters and strainers
- Prepare equipment for repair
- Lubricate equipment
- Monitor equipment performance
- Vibration and temperature analysis


## 3.6 Perform Maintenance

**Time: 4 minutes**

Review key points on overhead and supplement with your own knowledge and experience.

- Discuss the trend in the industry to move the Process Technician toward TPM – Total Preventative or Productive Maintenance. TPM is a proactive approach to increasing the life cycle of equipment and reducing maintenance cost by performing repairs prior to catastrophic failure.

**Next: Troubleshoot and Problem Solve**



## Troubleshoot and Problem Solve


- Apply root cause analysis
- Participate in corrective action teams
- Statistical Process Control (SPC)

## **3.7 Troubleshoot and Problem Solve**

**Time: 4 minutes**

Review key points on overhead and supplement with your own knowledge and experience.


**Next: Qualifications: Education and Training**



## Qualifications

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1. Education
2. Technical knowledge and skills
3. Interpersonal skills
4. Physical capabilities



## Education

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- Two-year Associates Degree in Process Technology preferred
- Math, Science, English
- Computer skills: spreadsheets, word processing, database applications

## 3.8 Qualifications: Education and Training

Time: 4 minutes

1. There are four areas of criteria that you need to meet in order to have a successful PTech career. (Review overhead points. Each will be discussed in a separate overhead).
2. **Education and Training**  
Companies now prefer that new hires have a two-year college degree in Process Technology, or equivalent experience that would give you similar math, science, technical, social, and problem-solving skills.

**Next: Technical: Knowledge, Skills and Abilities**



## Technical Knowledge, Skills, and Abilities

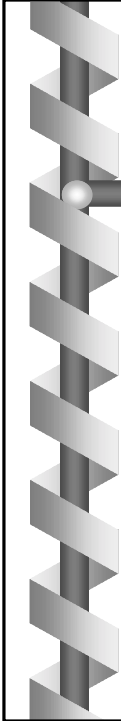
- Operation, maintenance, and troubleshooting of process equipment
- Key regulatory standards and laws
- Communications skills: reading and writing, industry-related materials

### **3.9 Qualifications: Technical Knowledge, Skills and Abilities**

**Time: 4 minutes**

1. Operation, maintenance, and troubleshooting of process equipment.
2. Key regulatory standards and laws.
3. Communication skills: reading and writing, industry-related materials.

**Next: Qualifications: Interpersonal Skills**



## Qualifications: Interpersonal Skills

- Communicate effectively
- Positive attitude towards job, others, self
- Respect for safety of self and others
- Maintain composure in high stress situations
- Responsible
- Reliable
- Appreciation for diversity
- Provide and respond to feedback positively

### **3.10 Qualifications: Interpersonal Skills**

**Time: 4 minutes**

1. Communicate effectively
2. Positive attitude towards job, others, self
3. Respect for safety of self and others
4. Maintain composure in high stress situations
5. Responsible
6. Reliable
7. Appreciation for diversity
8. Provide and respond to feedback positively



**Break 10 minutes**

**Next: Qualifications: Physical Capabilities**



## Physical Capabilities

### Ability to

- Work in high noise level areas [above 85 dB]
- Lift, climb stand for long periods of time
- Work at elevated heights
- Wear personal protective equipment (PPE ]
- Perform in all types of weather - heat, cold, rain
- Handle demands of shift work
- Perform under pressure / high stress situations
- Perform physically demanding tasks

### 3.11 Qualifications: Physical Capabilities

**Time: 4 minutes**

The physical environment that a Process Technician works in can be very demanding. A typical shift can include working in the following conditions:

- Working in high noise areas (above 85 dB)
- Lifting, climbing, or standing for long periods of time
- Working at elevated heights
- Wearing personal protective equipment (PPE)
- Perform in all types of weather – heat, cold, rain etc.
- Handle demands of shift work
- Perform under pressure and in high pressure situations
- Perform physically demanding task

Describe the types of PPE any operator may be required to wear:

- Fully-enclosed corrosive and vapor proof suits with air supply
- Respirators
- Boots, gloves, hardhat, glasses, goggles, etc.

**Next: Impact of Shift Work**



## Impact Shift Workers

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- Fatigue
- Reduced attention span
- Reaction time slowed
- Body clock and work schedule conflict

## 3.12 Impact of Shift Work

**Time: 4 minutes**

1. A really important issue with being a Process Technician has to do with working shifts.
2. *(Explain typical shifts at the facilities.)*
3. Fatigue from shift work has been implicated in many serious incidents:
  - the meltdown at Chernobyl
  - the Challenger disaster
  - the Exxon Valdez oil spill
4. Shift work has been compared to having permanent jetlag. People who work long, irregular hours are:
  - less attentive
  - think and remember less clearly
  - have more accidents
5. Your body operates on a natural time clock that is different from your work hours:
  - You have two mental lowpoints every 24 hours: between 2-6 am and 2-6 pm.
  - "Sunup Effect" – you will start to wake up when the sun rises, even if you really need to sleep.
6. There are certain behaviors and habits that are risky for shift workers (review slide).

**Next: Shift Work Exercise**

**Handout: Shift Work Exercise**

### 3.13 Shift Work Exercise

**Time: 14 minutes**

#### 1. Objective

The objective of this exercise is to give participants the opportunity to experience some of the dilemmas of working shifts, especially scheduling issues with coworkers.

#### 2. Materials

"Shift Work Role Play" handouts (see Appendix to this session).

#### 3. Introduction

Shift work is essential to the Process Industry. Without 24-hour coverage of the facilities, the Process Industry would not and could not function. There are numerous issues that arise for Process Technicians who are assigned to work shift work.

In this activity, you are going to read a scenario and brainstorm ideas for shift coverage. Also, each team should brainstorm potential problems or hazards associated with the shift coverage coming from someone working a double shift.

#### 4. Instructions

- Have students break out into discussion groups of 4 – 5 people.
- Pass out "Shift Work " exercise and worksheet (three pages).
- Please take 15 minutes to read the scenario in the Shift Work Exercise and discuss possible solutions to the shift work dilemma.
- Meet back here in 15 minutes to discuss it as a group.

**Next: Shift Work Exercise Discussion**


**No Overhead**

### 3.14 Shift Work Exercise Discussion

Time: 10 minutes

1. Have teams share their solutions to the dilemma and their reasons.
2. What effective/ineffective characteristics did the characters display in this scenario?
3. **Key Point:** Had Bob planned ahead, he could have saved himself time and trouble.
4. Ask students to identify potential problems working a double shift. Record their answers on the board as a lead into the next section on Shift Work.

**Next: Potential Impacts of Shift Work**



## Potential Impacts of Shift Work

- Physical Health
- Emotional Health
- Family Problems

## 3.15 Potential Impacts of Shift Work

Time: 4 minutes

### 1. Physical Health Issues

- high rates of use of alcohol, drugs, tobacco
- overeating
- lack of exercise
- long-term sleep disturbances

### 2. Emotional Health Issues

- more irritable, tendency to depression
- lack of social life, healthy leisure activities

### 3. Family Issues

- higher divorce rates
- little time with children and wife; few shared family activities
- missing out on social outings with other families

**Next: Taking Care of Yourself**



## Taking Care of Yourself

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- Establish as regular a schedule as possible
- Create a day-sleeping environment
- Take naps when possible
- Compensate for lower awareness
- Only light snacks in the 2-6 am/pm period
- Avoid stimulants, alcohol, caffeine

## **3.16 Taking Care of Yourself**

**Time: 4 minutes**

Review tips from overhead and share personal experiences.

**Next: Union/Non-Union**



## Union/Non-Union

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- Collective Bargaining


### **3.17 Union/Non-Union**

**Time: 4 minutes**

- **Collective Bargaining**

Process Technicians are represented by a union that negotiates labor contracts through collective bargaining with the company. These contracts (work rules) may govern company practices ranging from wages and benefits to unit staffing levels and job assignments based on seniority.

**Next: Future Trends**



## Future Trends

- Continued emphasis on preventive maintenance of equipment
- More involvement in process control and business decisions
- More computerization and automation
- Continuous upgrading of skills and knowledge

## **3.18 Future Trends**

**Time: 10 minutes**

As the marketplace becomes more competitive, organizations are focused to seek out more efficient ways to operate. One such method is through technology changes which automatically require workforce skill upgrades. The role of a Process Technician has seen much change over the past 10 years with NO indication of slow down for the future.

**Next: Summary and Wrap-Up**



## Summary and Wrap-Up

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- Q&A
- Homework
- New Terms
- Safety Presenter

## 3.19 Summary and Wrap-Up

Time: 10 minutes

### 1. Questions/Discussion Points

- What are some of the critical job functions of the PTech?
- Why does a PTech need to have good listening skills?

### 2. Student Homework

Announce who is scheduled for the Safety Minute presentation in Session 4.

### 3. Terminology

Review terms that were covered in this session and introduce new terms to be covered in Session 4.

### ✓Instructor Follow-Up Checklist

1. Allow yourself extra time to review and become comfortable with the topics and activities for Session 4.
2. Next session: Teamwork and Diversity

**Next: Session 4: Working on Teams**



## **Session 3: Appendix**

### **Contents**

1. The Process Technician Handout
2. Process Technician Job Duties Handout
3. Shift Work Exercise