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# Elevator – General Safety and Maintenance

## Instructor's Guide



### Icons Used In This Guide

-  **REVIEW** slides
-  **INDIVIDUAL ACTIVITY**
-  **ASK**
-  **WRITE**
-  **CLASSROOM ACTIVITY**
-  Multimedia
-  **SMALL GROUP ACTIVITY**
-  **REFER** participants to

### Agenda

Topic #	Topic Title	Duration
1	Overview	20 Minutes
2	Types of Maintenance	30 Minutes
3	Barricades	30 Minutes
4	Fall Protection	10 Minutes
5	Landing the Car	30 Minutes
6	Documentation	20 Minutes
7	Field Trip	80 Minutes
8	Summary	30 Minutes
	<b>Total Time:</b>	240 Minutes

# Elevator – General Safety and Maintenance

## *Instructor's Guide*



## **Overview**

**Purpose** The purpose of this module is to:

Provide the participant with a conceptual understanding of safety practices for elevator inspection and maintenance.

## **Objectives**

At the end of this lesson, the transit elevator/escalator trainee will be able to:

- Identify general safety practices
- Relate safe work practice to elevator maintenance
- Explain safe practices related to the use of scaffolding
- Identify protocol for authority PM documentation

## **Materials**

**Mandatory** Make sure you have the following

- PowerPoint Presentation
- Coursebook
- Quizzes
- Pencils

## **Optional**

You may also want the following for optional activities:

- Chalk board with chalk, large paper with marker, etc.
- Internet connection
- Lab, simulator or out of service elevator
- Specific transit authority related procedures and guidelines
- Transit authority preventative maintenance checklist
- [Elevator Industry Field Employees' Safety Handbook](#)

# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 240 min

This section: 20 min (9 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO



**REVIEW** introduction slides

### Instructor's Notes

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### SAY

#### In your own words:

Welcome to the course on Elevator Safety Procedures for Inspection and Maintenance.  
**Advance**

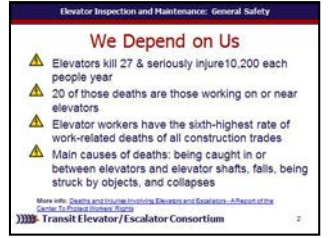
We've seen this earlier, but it doesn't hurt to look again.

- Elevators kill 27 & seriously injure 10,200 each people year
- 20 of those deaths are those working on or near elevators
- Elevator workers have the sixth-highest rate of work-related deaths of all construction trades
- Main causes of deaths: being caught in or between elevators and elevator shafts, falls, being struck by objects, and collapses

**Advance**

### Materials Needed

✓ PPT slides 1, 2



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min      Time remaining: 240 min      This section: 20 min (9 slides )      Section start time: \_\_\_\_\_      Section End Time: \_\_\_\_\_

### DO



**REVIEW** module objectives

### Instructor's Notes

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### SAY

**In your own words:**

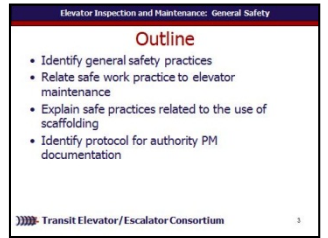
Today we will

- Identify general safety practices
- Relate safe work practice to elevator maintenance
- Explain safe practices related to the use of scaffolding
- Identify protocol for authority PM documentation

**Advance**

### Materials Needed

✓ PPT slide 3



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min      Time remaining: 240 min      This section: 20 min (9 slides)      Section start time: \_\_\_\_\_      Section End Time: \_\_\_\_\_

### DO



**REVIEW** key terms

### Instructor's Notes

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### SAY

**In your own words:**

Lets take a look at some of the key words we will be defining as move through this module:

- Barricade
- Buffers
- Corrective Maintenance
- Fall Protection
- Landing The Car
- Log Books
- Lubrication
- Maintenance Management Software (MMS)

**Advance**

### Materials Needed

✓ PPT slide 4



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min      Time remaining: 240 min      This section: 20 min (9 slides)      Section start time: \_\_\_\_\_      Section End Time: \_\_\_\_\_

### DO



**REVIEW** key terms

### Instructor's Notes

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### SAY

**In your own words:**

As well as:

- Original Equipment Manufacturers' (OEMs)
- Personal Fall Arrest System
- Planned Maintenance
- PM Checklist
- Predictive Maintenance
- Preventive Maintenance (PM)

**Advance**

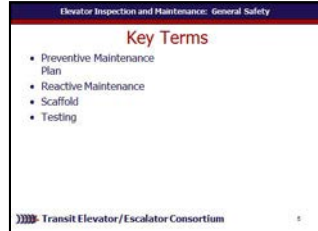
And

- Preventive Maintenance Plan
- Reactive Maintenance
- Scaffold
- Testing

**Advance**

### Materials Needed

✓ PPT slides 4, 5



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 240 min

This section: 20 min (9 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO



ASK



SMALL GROUP ACTIVITY



WRITE

### Instructor's Notes

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### SAY

**In your own words:**

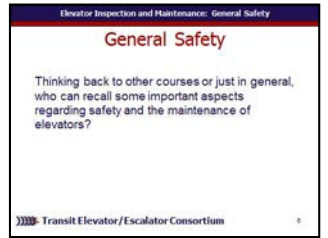
Thinking back to other courses or just in general, who can recall some important aspects regarding safety along with the maintenance and inspection of elevators?

***[Allow participants to think for a minute and perhaps discuss with a partner ideas as well as write down any ideas. Discuss participant responses and if possible list them on a chalk board or similar.]***

**Advance**

### Materials Needed

✓ PPT slide 6



- ✓ paper
- ✓ Chalk board or large paper



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 240 min

This section: 20 min (9 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

### Instructor's Notes

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#### In your own words:

Follow your transit agency's procedures regarding proper Preventive Maintenance (PM) and regular inspections.

**Advance** Each agency will have its own rules regarding the period for preventive maintenance procedures that will be based on **Advance original equipment manufacturers'** (OEMs) recommendations, **Advance** weather conditions, **Advance** number of riders, and **Advance** amount of run time for each unit. **Advance** Preventive maintenance is **Advance** the minor adjustments and minor repairs due to wear and everyday usage. Preventive maintenance includes

✓ PPT slide 7



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 240 min

This section: 20 min (9 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

**In your own words:**

....The lubrication of the components as require.  
This module will cover safety as it pertains specifically to preventive maintenance of transit elevators. For more general safety training please refer to the previous safety modules found within Courses 200 and 213, Overview of Vertical Transportation in the Public Transit Industry and Elevator – Principles of Operation.

**Advance**

✓ PPT slide 7



### Instructor's Notes

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# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 240 min

This section: 20 min (9 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO



**REVIEW** slides

### Instructor's Notes

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### SAY

#### In your own words:

Warning:

The following should always be taken before inspecting and maintaining elevator equipment:

- Notify proper personnel, such as station attendants
- Set up the barricades on all landings (even if hoistway door is closed)

#### Advance

Here is a transit technician notifying the station attendants before performing preventative maintenance. Notice he has already begun to take other precautions as well such as wearing proper PPE.

#### Advance

### Materials Needed

✓ PPT slides 8, 9



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

DO	SAY	Materials Needed
<div> </div> <p><b>REVIEW</b> slides</p> <div> </div> <p><b>ASK</b></p> <p><b>Instructor's Notes</b></p> <hr/> <hr/> <hr/> <hr/> <hr/>	<p><b>In your own words:</b></p> <p><b>Ask</b></p> <p>Who can remember or who knows the three types of maintenance?</p> <p><b>Advance for correct answer</b></p> <p>Reactive Maintenance</p> <p>Predictive Maintenance</p> <p>Preventative Maintenance</p> <p><b>Advance</b></p> <p>Lets talk about <b>reactive maintenance</b> first.</p> <p>Reactive maintenance is “run it till it breaks.”</p> <p><b>Advance</b> No action or effort is taken to maintain the equipment as the OEM intended.</p> <p><b>Advance</b> The advantages of reactive maintenance are minimal incidents of failure of new equipment, limited manpower as the manpower is not used until something breaks, and no one sees any associated maintenance cost. <b>Advance</b></p>	<p>✓ PPT slides 10, 11</p> <div> </div> <div> </div>

# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO



**REVIEW** slides

### Instructor's Notes

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### SAY

#### In your own words:

The disadvantages of reactive maintenance are decreased equipment life expectancy, increased labor costs for repairs because failures will most likely be more extensive, and increased capital cost for premature equipment replacement. Additionally, the lack of maintenance will increase the probability of accidents and lawsuits.

#### **Advance**

Reactive maintenance could, unfortunately, lead to this.

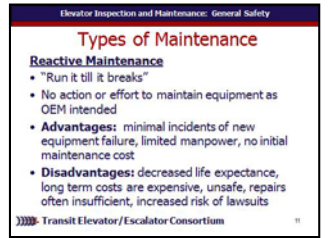
"The elevators just stopped working...we didn't do anything!"

Michigan Central Station in Detroit, Michigan, U.S.A.

#### **Advance**

### Materials Needed

✓ PPT slides 11, 12



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_ Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

### Instructor's Notes

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#### In your own words:

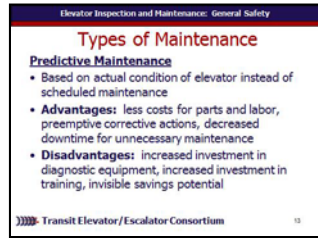
The second type is **predictive maintenance**.  
**Advance** Predictive maintenance is maintenance based on the actual condition of the elevator, rather than on a preset schedule.

**Advance** The advantages of predictive maintenance are decreased costs for parts and labor, allows for preemptive corrective actions, and decreased downtime used for unneeded maintenance.

**Advance** The disadvantages of predictive maintenance are increased investment in diagnostic equipment, increased investment in staff training, and savings potential not easily seen by management.

**Advance**

✓ PPT slide 13



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

### Instructor's Notes

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#### In your own words:

The third type of maintenance is **preventive maintenance (PM)**.

**Advantage** Preventive maintenance is scheduled maintenance procedures at predetermined time intervals. These procedures are performed by cleaning, inspecting, adjusting, lubricating and replacing worn parts before they fail.

**Advantage** The advantages of preventive maintenance are increased elevator life expectancy, improved elevator reliability, and decreased operating costs over the life of the elevator.

**Advantage** The disadvantages of preventive maintenance are very labor intensive, includes performance of unneeded maintenance, and potential for incidental damage to components in conducting unneeded maintenance. **Advantage**

✓ PPT slide 14



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

#### In your own words:

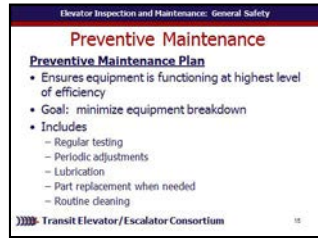
A good **preventive maintenance plan** **Advance** is a structured approach to making sure that any equipment used in a system is functioning with the highest possible degree of efficiency.

**Advance** The goal is to minimize opportunities for the equipment to break down and adversely affect the riding public.

**Advance** While a plan of this type will vary based on the nature of the transit authority's approach, there are a few basics that are likely to be part of any ongoing preventive maintenance strategy. These include regular testing, periodic adjustments, lubrication of parts, replacement of worn parts before they fail, and routine cleaning. Properly performed preventive maintenance increases reliability and reduces breakdowns.

**Advance**

✓ PPT slide 15



### Instructor's Notes

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# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

DO	SAY	Materials Needed
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**REVIEW** slide

### Instructor's Notes

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### In your own words:

A preventive maintenance plan is NOT “IF IT’S NOT BROKEN OR NOISEY, LET IT ALONE”. Preventive maintenance is NOT OPTIONAL. Preventive maintenance is required by code, industry standards, and equipment manufacturers’. The code book states it is mandatory.

### Advance

✓ PPT slide 16



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

**In your own words:**

**Testing** is a basic part of the preventive maintenance plan which involves examination of the equipment to ensure that each device is functioning properly as designed. It is not unusual for testing of this type to be conducted at regular scheduled intervals such as monthly, quarterly or annually. In transit systems that operate around the clock, the testing may occur near the off-peak hours of operation, making it possible to have no more than minimal impact on transportation outcomes. Often, running these periodic tests helps to identify potential issues that could, over time cause the equipment to become inoperable, and provide the chance to address those issues now rather than later.

**Advance**

✓ PPT slide 17



### Instructor's Notes

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# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

### Instructor's Notes

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#### In your own words:

The process of preventive maintenance can be divided into two separate sub-categories: planned maintenance and corrective maintenance. **Planned maintenance** includes scheduled overhauls as well as scheduled equipment replacement (individual component or block systems).

#### Advance

**Corrective maintenance** occurs during the process when a fault, or unsafe condition, is encountered during the PM process. Here, the maintenance personnel performing the PM perform routine service to the equipment, as well as using the opportunity to correct problems that they may encounter. The PM process helps to identify any differences between the actual and the expected behavior of the systems.

#### Advance

✓ PPT slide 18



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min      Time remaining: 220 min      This section: 30 min (16 slides)      Section start time: \_\_\_\_\_      Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**ASK**



**REVIEW** slide

### Instructor's Notes

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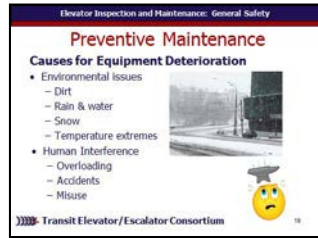
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**In your own words:**

**Ask**  
 Why is elevator preventive maintenance important?  
**Allow participants to discuss possible answers.**  
 From the first day an elevator is put into service, everyday normal operation begins to deteriorate its components. Environmental issues like dirt, snow, rain/water, temperature extremes can accelerate this deterioration. Deterioration can also be accelerated by overloading, accidents and misuse Preventive maintenance is important because elevators not receiving regularly scheduled maintenance will have components that fail prematurely.

**Advance**

✓ PPT slide 19



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_ Section End Time: \_\_\_\_\_

### DO



**REVIEW** slide

### Instructor's Notes

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### SAY

#### In your own words:

The goals of preventive maintenance are:

- Avoid equipment failure
- Perform regularly scheduled procedures to clean, inspect, adjust and lubricate components (which will reduce failures)
- Improve overall safety for the workers, riders, and working environment by properly maintaining elevators
- Increase workforce efficiency
- Reduce the number of elevator failures and shutdowns
- Allow more time to perform scheduled preventive maintenance
- Improve equipment reliability by having an effective preventive maintenance plan

**Do Not Advance**

### Materials Needed

✓ PPT slide 20



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO



**REVIEW** slides



**ASK**

### Instructor's Notes

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### SAY

**In your own words:**

- Fewer elevator repairs and shutdowns result in decreased costs for parts and labor
- Preventive maintenance extends the useful life of an elevator by controlling degradation and minimizing failures.

**Advance**

**Ask**

Why is lubrication important?

*Allow participants to discuss possible answers.*

Proper lubrication is perhaps the most important part of any preventive maintenance plan. Lubrication of the correct type, at the right location, along with the proper amount extends the life of moving parts.

**Do Not Advance**

### Materials Needed

✓ PPT slides 20, 21



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO



**REVIEW** slide

### Instructor's Notes

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### SAY

#### In your own words:

Proper lubrication reduces friction and wear, forms a film barrier between moving components to prevent or reduce metal-to-metal contact, reducing operating temperature by absorbing and dissipating heat. In addition, proper lubrication will protect against corrosion by setting up a film barrier and neutralizing chemical products. Lubrication keeps components clean by suspending contaminants and keeping them from adhering to parts (i.e., limits damage caused by dust, dirt, and water). Finally, lubrication helps dampen and cushion parts against mechanical shock or vibrations. Lubrication is not an option and is required by code, industry standards, and equipment manufacturers.

**Advance**

### Materials Needed

✓ PPT slide 21



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

### Instructor's Notes

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#### In your own words:

It is recommended that a team approach be used whenever two individuals are performing inspections and/or basic maintenance. This approach varies by transit agencies. The team should review proper communications and safety practices as required by your transit agencies, manufacturer, and governmental agencies. Follow local rules regarding barricades, signs, and informing proper personnel before beginning inspection or maintenance.

#### Advance

✓ PPT slide 22





# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_ Section End Time: \_\_\_\_\_

### DO



**REVIEW** slide

### Instructor's Notes

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### SAY

#### In your own words:

The following are basic recommendations regarding inspections and maintenance. Use your five senses (sight, hearing, feel, smell and limited taste) when inspecting and performing maintenance. Look not only at the part you are working on but at the big picture (i.e., look around when in the pit to see anything that appears to be not right or abnormal). Finally, and most importantly, use your knowledge, past experience and basic physics (i.e., gravity, mechanics, and electricity, etc.). If you have any doubts, always ask. Everyone is learning every day.

**Advance** Think safety first.

**Advance**

### Materials Needed

✓ PPT slide 22



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_ Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**ASK**

**In your own words:**

Lets see what we have learned so far:  
A good preventative maintenance plan includes everything except:

- a. Regular testing
- b. Letting it run until it breaks
- c. Replacing worn parts before failure
- d. Routine cleaning
- e. lubrication

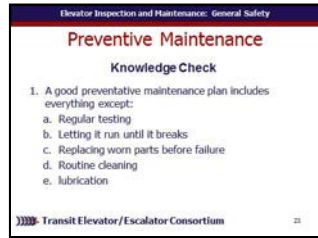
**Call on participants for answer**

**Advance for correct answer**

**Answer: b. letting it run till it breaks**

**Advance**

✓PPT slide 23



### Instructor's Notes

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# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_ Section End Time: \_\_\_\_\_

DO	SAY	Materials Needed
<div></div> <div><p>ASK</p></div> <div><h3>Instructor's Notes</h3></div> <hr/> <hr/> <hr/> <hr/> <hr/>	<p><b>In your own words:</b> Name at least 5 goals of preventative maintenance.</p> <p><b>Call on participants for answer</b> <b>Advance for correct answer</b></p> <p>Possible answers:</p> <ul style="list-style-type: none"> <li>✓ Avoid equipment failure</li> <li>✓ Perform scheduled procedures</li> <li>✓ Improve safety</li> <li>✓ Increase worker efficiency</li> <li>✓ Reduce failures and shutdowns</li> <li>✓ Allow more PM time</li> <li>✓ Preventative Maintenance Plan</li> <li>✓ Decreased labor and parts costs</li> <li>✓ Extends life of elevator</li> </ul> <p><b>Advance</b></p>	<p>✓ PPT slide 24</p> <div></div>

# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 220 min

This section: 30 min (16 slides) Section start time: \_\_\_\_\_ Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**ASK**

**In your own words:**

Basic recommendations for maintenance and inspection include all except

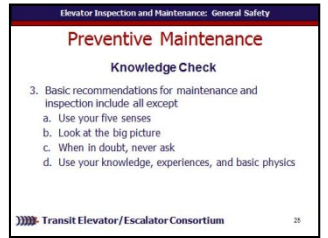
- a. Use your five senses
- b. Look at the big picture
- c. When in doubt, never ask
- d. Use your knowledge, experiences, and basic physics

**Call on participants for answer  
Advance for correct answer**

**Answer: c. When in doubt, never ask  
- ALWAYS ask**

**Advance**

✓ PPT slide 25



### Instructor's Notes

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# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min      Time remaining: 190 min      This section: 10 min (4 slides)      Section start time: \_\_\_\_\_      Section End Time: \_\_\_\_\_

### DO



**REVIEW** slide

### Instructor's Notes

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### SAY

**In your own words:**

When maintenance is being performed on a machine, the area in which you are working may need to be secured. For instance, a portion of a floor plate or side panel may need to be removed to gain access in order to perform maintenance or inspection on the machine. In this case, a hazardous condition has been created. The area needs to be barricaded so that patrons and other employees are aware of the hazard and its location

Securing the area will help prevent people from entering the hazardous area. Securing an area can also prevent curious people from getting too close to you and the equipment. Your undivided attention is required when you are working on a machine or a piece of equipment.

**Do Not Advance**

### Materials Needed

✓ PPT slide 26



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 190 min

This section: 10 min (4 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO



**REVIEW** slides



**REFER** participants to Elevator Industry Field Employees' Safety Handbook,

### Instructor's Notes

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### SAY

#### In your own words:

Any distractions could prove to be dangerous and even fatal. Securing the work zone keeps these distractions at a safe distance, allowing you to focus on the task at hand.

#### **Advance**

**Refer participants to the Elevator Industry Field Employees' Safety Handbook Sections 4.3 and 4.4 for additional information on barricades.**

### Materials Needed

✓ PPT slides 26, 27



✓ Elevator Industry Field Employees' Safety Handbook

# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 190 min

This section: 10 min (4 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO



**REVIEW** slide

### Instructor's Notes

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### SAY

**In your own words:**

#### General Safety Reminders and Highlights

Secure workplace when creating a hazardous condition (for example, removing floor plate or side panel).

#### **BARRICADES**

**Advance** Barricades are a crucial element in maintaining a safe inspection and maintenance area.

**Advance** Must be rigid and surround the work area.

**Advance** Minimum of 42 inches tall.

**Advance** All sections must be connected.

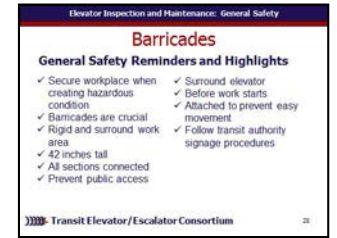
**Advance** Must surround elevator to prevent public access.

**Advance** Must be in place before any work is started on the elevator.

**Advance**

### Materials Needed

✓ PPT slide 28



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 190 min

This section: 10 min (4 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

**In your own words:**

Must be securely connected and attached so that it cannot be moved easily.

**Advance** Methods of attachment vary with location.

**Advance** Follow each transit property's procedure regarding sign procedures for directing riders.

**Advance**

✓ PPT slide 28



### Instructor's Notes

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# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 190 min

This section: 10 min (4 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**ASK**

### Instructor's Notes

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**In your own words:**

Lets see what we have learned so far:  
 Safety reminders for barricades include all except:

- 42 inches tall
- Rigid
- Allows for public access
- Securely connected to prevent easy movement
- In place before work starts

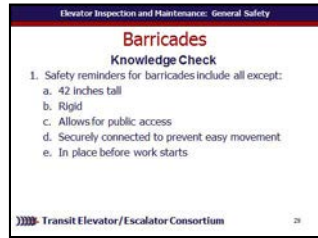
**Call on participants for answer**

**Advance for correct answer**

**Answer: c. Allows for public access**

**Advance**

✓ PPT slide 29



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 180 min

This section: 20 min (7 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO



**REVIEW** slide

### Instructor's Notes

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### SAY

**In your own words:**

When performing maintenance in the hoistway, falls are among the most common causes of serious work-related injuries and deaths. Inspections and maintenance performed along the length of the hoistway are generally performed from the top of the car. The top of the car acts as a moving platform from which the technician works. The car can be moved up or down in the hoistway to facilitate inspections and repairs to any of the various switches, safety devices, or door mechanisms.

**Advance**

### Materials Needed

✓ PPT slide 30



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 180 min

This section: 20 min (7 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

### Instructor's Notes

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#### In your own words:

OSHA requires a **personal fall arrest system** if any risk exists that a worker may fall from an elevated position of six feet or more.

#### **Advance**

A personal fall arrest system consists of three components: anchorage, body harness, and connector/lanyard and may also include a lanyard, deceleration device or lifeline. The full-body harness distributes the forces throughout the body, and the shock-absorbing lanyard decreases the total fall arresting forces. Workers must be trained in the proper wear and use of the body harness. They are not a one size fits all component. Proper sizing is critical to preventing injuries.

#### **Do Not Advance**

✓ PPT slides 31, 32



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 180 min

This section: 20 min (7 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

### Instructor's Notes

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#### In your own words:

The harness must fit snugly across the chest and around the thighs and the D-ring must be positioned in the center of the back between the shoulder blades.

#### Advance

Warning: If you need to tie your harness off to something consult with a competent or qualified person. Make sure to tie off to a secure component like a bracket for the guiderail - not to the scaffolding.

#### Advance

✓ PPT slides 32, 33



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min      Time remaining: 180 min      This section: 20 min (7 slides)      Section start time: \_\_\_\_\_      Section End Time: \_\_\_\_\_

### DO



**REVIEW** slides



**REFER** participants to Elevator Industry Field Employees' Safety Handbook,

### Instructor's Notes

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### SAY

**In your own words:**

Any distractions could prove to be dangerous and even fatal. Securing the work zone keeps these distractions at a safe distance, allowing you to focus on the task at hand.

**Advance**

**Refer participants to the Elevator Industry Field Employees' Safety Handbook Sections 4 page 29 for additional information on fall protection guidelines.**

### Materials Needed

✓ PPT slide 34



✓ Elevator Industry Field Employees' Safety Handbook

# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 180 min

This section: 20 min (7 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**ASK**

**In your own words:**

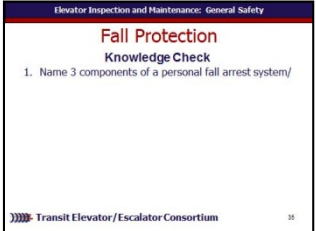
Lets see what we have learned so far:  
Name 3 components of a personal fall arrest system.

**Call on participants for answer**  
**Advance for correct answer**

- Answer:**
- Anchorage
  - Connector/lanyard
  - Body harness

**Advance**

✓ PPT slide 35



### Instructor's Notes

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# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 180 min

This section: 20 min (7 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**ASK**

**In your own words:**

Yes or No. A body harness must fit snugly across chest and around thighs, and the d-ring should be between should blades in center back.

**Call on participants for answer**  
**Advance for correct answer**

**Answer: Yes**  
**Advance**

✓ PPT slide 35



### Instructor's Notes

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# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 160 min

This section: 30 min (15 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

### Instructor's Notes

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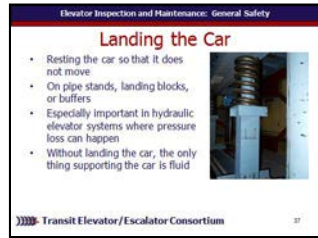
#### In your own words:

**Landing the car** basically means resting the elevator car on pipe stands, landing blocks or buffers to ensure that it does not move.

**Buffers** are the springs mounted in the pit, pipe stands are installed in the pit frequently in place of the buffer, and landing blocks are attached to the rails anywhere they are needed in the hoistway. It is especially needed to land the car when work is being performed on components of the hydraulic system where pressure loss is very possible. The only thing normally supporting a hydraulic elevator is the column of fluid in the cylinder. Should something happen to one of the hydraulic components the pressure will escape and the elevator may drop to the bottom of the hoistway.

**Advance**

✓ PPT slide 37





# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 160 min

This section: 30 min (15 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO



**REVIEW** slides



**ASK**

### Instructor's Notes

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### SAY

#### In your own words:

When landing a car, two maintenance personnel should be present at all time, equipped with the proper PPE.  
 Be sure to use the appropriate pipes when supporting the car. The pipe must be strong enough to support the car.

#### Advance

#### ASK

Who can recall the steps for landing the car?

**Allow participants to discuss possible answers**

### Materials Needed

✓ PPT slides 37, 38



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 160 min

This section: 30 min (15 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO



REVIEW slide

### Instructor's Notes

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### SAY

In your own words:

**Review steps for landing the car using pipes.**

1. Move the car slightly above desired position.
2. Select pipes.
3. Pull buffer spring.
4. Place pipes on buffer stand.
5. Lower car to rest on pipes.
6. Perform LOTO.

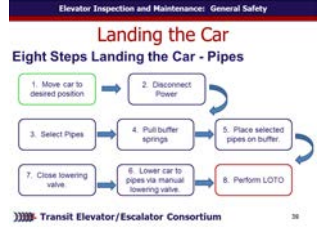
**Advance**

So, after the car is moved slightly above desired position, select piping. Pipes are either provided by the manufacturer for the installation or provided by the Authority for that installation, to the location for use. Here you can see different length pipes.

**Advance**

### Materials Needed

✓ PPT slides 39, 40



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min      Time remaining: 160 min      This section: 30 min (15 slides)      Section start time: \_\_\_\_\_      Section End Time: \_\_\_\_\_

### DO



**REVIEW** slide

### Instructor's Notes

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### SAY

**In your own words:**  
 Pull off the buffer spring  
**Advance**

Next place the pipes on the buffer stand  
**Advance**

Finally lower the car so that it sits on the pipes.  
**Advance**

### Materials Needed

✓ PPT slides 42, 43, 44



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 160 min

This section: 30 min (15 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

### Instructor's Notes

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#### In your own words:

The process for landing a car on landing blocks, also called rail clamps, is very similar to that of installing stand pipes, except that landing blocks can be used at any point in the hoistway. This allows a car to be placed where it is needed and mechanically supported at that point. As with pipes, first raise the car slightly above the desired position. Install the blocks to the rails using all the included hardware and following the directions of the manufacturer and appropriate authority procedures. Lower the car gently to the blocks.

#### **Advance**

If only the pressure on the hydraulic system needs to be relieved, simply rest the car directly on the buffers.

#### **Advance**

✓ PPT slides 44, 45



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 160 min

This section: 30 min (15 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

### Instructor's Notes

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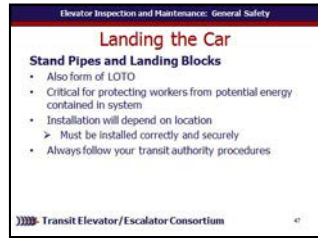
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#### In your own words:

Stand pipes and landing blocks are also a form of Lockout/Tagout and are absolutely critical for protecting workers from the potential energy contained in the elevator car and cylinder. Installation of the stand pipes or landing blocks will vary depending on the stand pipes or landing block used and on the specific conditions of the location. Care must be taken to ensure that the stand pipes or landing blocks are installed properly and securely.

#### Advance

✓ PPT slide 47



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 160 min

This section: 30 min (15 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

#### In your own words:

Given the relatively small space of a hoistway, construction of an adequate platform can be a tricky undertaking. Specific training on constructing a scaffold and putting in the proper safety features is outside the scope of this course and the work generally done by transit elevator maintainers.

#### Advance

OSHA regulations include specific requirements for planking, fall protection, ladders, and other important safety considerations. Personnel constructing must be fully trained and those working on scaffolding should be trained in scaffold procedures and hazards. Planking must be of the correct grade (if wood) or strength. Fall protection is required based on height, railing height, and other considerations.

#### Do Not Advance

✓ PPT slide 48



### Instructor's Notes

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# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 160 min

This section: 30 min (15 slides) Section start time: \_\_\_\_\_ Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slide

#### In your own words:

Ladders have specific limitations and methods of attachment. The requirements are in some cases very detailed and covered in OSHA and other regulatory materials. If any safety concerns are noted then they should be referred to qualified personnel for review and if needed reconciliation.

The regulations further require that the scaffolds be designed by a qualified person and constructed and loaded in accordance with that design. When constructing and using a scaffold for work on an elevator make sure the scaffolding was constructed as designed and that all the components fit properly and all fasteners are in place.

**Advance**

✓ PPT slide 48



### Instructor's Notes

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# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 160 min

This section: 30 min (15 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO



**REVIEW** slides



**REFER** participants to Elevator Industry Field Employees' Safety Handbook,

### Instructor's Notes

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### SAY

#### In your own words:

Any distractions could prove to be dangerous and even fatal. Securing the work zone keeps these distractions at a safe distance, allowing you to focus on the task at hand.

#### **Advance**

**Refer participants to the Elevator Industry Field Employees' Safety Handbook Sections 10 & 11 page 29 for additional information and guidelines on portable ladders, scaffold, and working platforms.**

### Materials Needed

✓ PPT slide 49



✓ Elevator Industry Field Employees' Safety Handbook



# Elevator – General Safety and Maintenance


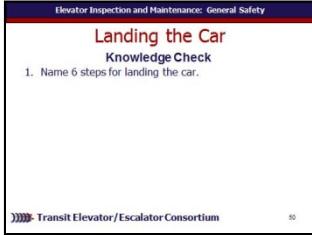
## Instructor's Guide



Module Length: 240 min

Time remaining: 160 min

This section: 30 min (15 slides) Section start time: \_\_\_\_\_ Section End Time: \_\_\_\_\_

DO	SAY	Materials Needed
 <p><b>ASK</b></p>          <p><b>Instructor's Notes</b></p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<p><b>In your own words:</b> Lets see what we have learned so far: Name 6 steps for landing the car.</p> <p><b>Call on participants for answer</b> <b>Advance for correct answer</b></p> <p><b>Answer:</b></p> <ol style="list-style-type: none"><li>1. Move the car slightly above desired position.</li><li>2. Select pipes.</li><li>3. Pull buffer spring.</li><li>4. Place pipes on buffer stand.</li><li>5. Lower car to rest on pipes.</li><li>6. Perform LOTO.</li></ol> <p><b>Advance</b></p>	<p>✓PPT slide 50</p> 

# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 160 min

This section: 30 min (15 slides) Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**ASK**

**In your own words:**

Yes or No. Personnel constructing must be fully trained and those working on scaffolding should be trained in scaffold procedures and hazards.

**Call on participants for answer**

**Advance for correct answer**

**Answer: Yes**

**Advance**

### Instructor's Notes

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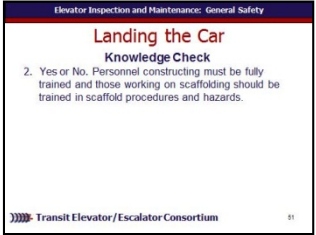
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✓ PPT slide 51



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 130 min

This section: 20 min (6 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**ASK**



**REVIEW** slide

### Instructor's Notes

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**In your own words:**

**Ask**

How does your transit agency complete documentation?

**Allow participants to discuss possible answers.**

**Advance**

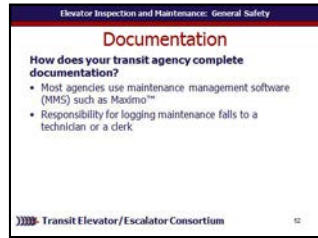
While documentation of all maintenance and replacement is required by code, how this is done varies by location. Most properties use some sort of **maintenance management software (MMS)** such as Maximo.

**Advance**

Responsibility for logging this maintenance could fall on either the technicians or a clerk. Some systems still use **log books**. In some instances both maintenance software and logbooks are used. Make sure to follow your local transit procedures.

**Advance**

✓ PPT slide 52



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min      Time remaining: 130 min      This section: 20 min (6 slides)      Section start time: \_\_\_\_\_      Section End Time: \_\_\_\_\_

### DO



**REVIEW** slide

### Instructor's Notes

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### SAY

**In your own words:**

Here are two examples of documentation:  
Here is example of a computer software documentation system.

**Advance**

And here is a log book that a technician would have to write information regarding inspection and maintenance performed.

**Advance**

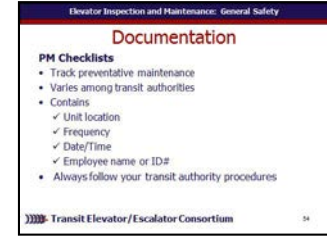
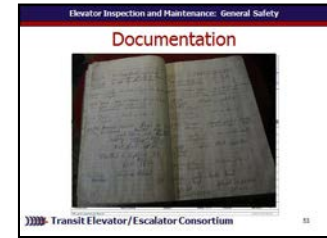
In most instances **PM checklists** are used to track preventive maintenance done to a transit elevator. These checklists vary from agency to agency but frequently contain the following information:

- Location of the Unit
- Frequency
- Date/Time
- Employee name or ID#

**Advance**

### Materials Needed

✓ PPT slides 53, 54



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min      Time remaining: 130 min      This section: 20 min (6 slides)      Section start time: \_\_\_\_\_      Section End Time: \_\_\_\_\_

### DO



**REVIEW** slide

### Instructor's Notes

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### SAY

**In your own words:**

Remember to always follow your authorities procedures on documentation of Preventive maintenance.

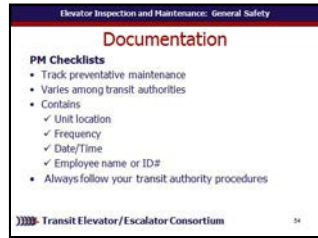
**Advance**

Here is an example of a PM checklist from BART.

**Advance**

### Materials Needed

✓ PPT slides 54, 55



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 130 min

This section: 20 min (6 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**ASK**

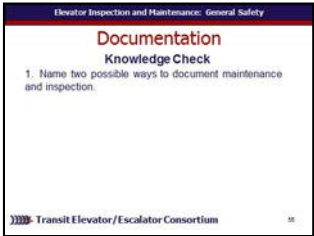
**In your own words:**

Lets see what we have learned so far:  
Name two possible ways to document maintenance and inspection.

**Call on participants for answer**  
**Advance for correct answer**

**Answer: log book and computer software**  
**Advance**

✓ PPT slide 56



### Instructor's Notes

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# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min

Time remaining: 130 min

This section: 20 min (6 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**ASK**

### Instructor's Notes

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#### In your own words:

Describe what type of information may be found on a preventive maintenance checklist,

**Call on participants for answer**

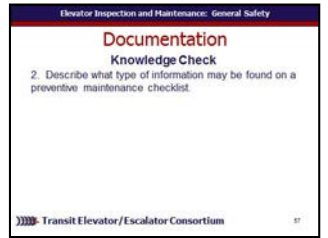
**Advance for correct answer**

Answer:

- ✓ Unit location
- ✓ Frequency
- ✓ Date/Time
- ✓ Employee name or ID#

**Advance**

✓ PPT slide 57



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min      Time remaining: 110 min      This section: 80 min      Section start time: \_\_\_\_\_      Section End Time: \_\_\_\_\_

DO	SAY	Materials Needed
<div> </div> <p><b>ASK</b></p> <div> </div> <p><b>CLASSROOM ACTIVITY</b></p> <p><b>Instructor's Notes</b></p> <hr/> <hr/> <hr/> <hr/> <hr/>	<p><b>In your own words:</b></p> <p><i>[At instructor's discretion, take time to visit the field and look for examples safety related to inspection and maintenance.] Advance.</i></p>	<p>✓ PPT slide 58</p> <div> </div>



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min      Time remaining: 30 min      This section: 30 min (3 slides)      Section start time: \_\_\_\_\_      Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



#### CLASSROOM ACTIVITY

#### Instructor's Notes

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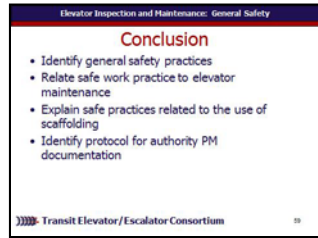
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**In your own words:**  
*[Read slide.*  
*For each objective, briefly review what was learned in this module or ask participants to share what they have learned for each learning objective and briefly discuss as a class.]*  
**Advance**

Lets take a look at some of the key words we have defined as moved through this module.  
**Read slide. Discuss definitions as a group.**  
**Advance**

**Read slide. Discuss definitions as a group.**  
**Advance**

✓ PPT slides 59, 60



# Elevator – General Safety and Maintenance

## Instructor's Guide



Module Length: 240 min      Time remaining: 30 min      This section: 30 min (3 slides)      Section start time: \_\_\_\_\_      Section End Time: \_\_\_\_\_

### DO



**CLASSROOM  
ACTIVITY**



**INDIVIDUAL ACTIVITY**

### Instructor's Notes

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### SAY

**In your own words:**  
  
*Administer quizzes.*

### Materials Needed

- ✓ PPT slides 60
- ✓ Quizzes
- ✓ Pencils

