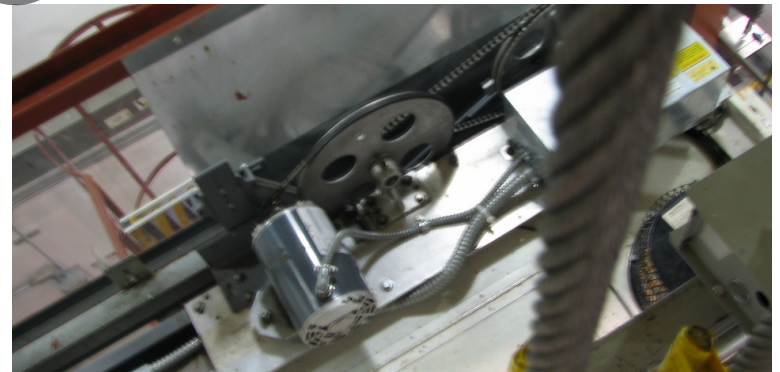
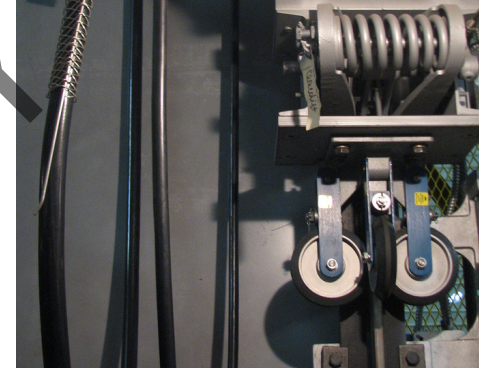


Instructor Guide



214: Elevator: Electrical Systems Module 1: General Electrical Safety Procedures

Elevator – Electrical Systems Safety

Instructor's Guide



Table of Contents

Overview.....	4
Safety Oversight Organizations.....	10
Electrical Safety.....	23
Physiological Effects.....	29
PPE.....	45
Shock Boundary Approaches.....	52
Safe Practices.....	59
Emergency Response.....	82
Summary.....	90

PREVIEW ONLY


Elevator – Electrical Systems Safety


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	Safety Oversight Organizations	10 Minutes
3	Electrical Safety	20 Minutes
4	Physiological Effects	20 Minutes
5	PPE	10 Minutes
6	Shock Boundary Approaches	20 Minutes
7	Safe Practices	30 Minutes
8	Field Trip	20 Minutes
9	Emergency Response	20 Minutes
10	Summary	20 Minutes
	Total Time:	180 Minutes

PREVIEW ONLY

Elevator – Electrical Systems Safety

Instructor's Guide



Overview

Purpose The purpose of this module is to:

Provide the participant with knowledge of safety procedures as related to electrical practices.

Objectives

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

- Identify safety oversight organizations
- Discuss and list the safety rules for avoiding electrical shock
- Determine dangerous levels of electrical current as it relates to the human body.
- Describe several causes of electrical burns.
- Describe the types of Personal Protective Equipment (PPE) which may be required when working on live equipment
- Explain shock protection boundaries of energized electrical equipment
- Demonstrate Lockout/Tagout Procedures
- Explain the reason for grounding of electrical equipment.
- Identify general safety practices
- Identify effective emergency response actions

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
- Transit authority safety procedures and policies
- Examples of PPE
- LOTO example

Elevator – Electrical Systems Safety

Instructor's Guide



Module Length: 180 min Time remaining: 180 min This section: 20 min (6 slides) Section start time: _____ Section End Time: _____

DO



REVIEW introduction slides

Instructor's Notes

SAY

In your own words:

Welcome to the course on Elevator Electrical Safety Procedures.

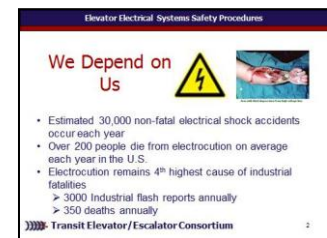
Advance

An estimated 30,000 non-fatal electrical shock accidents occur each year. Over 200 people die from electrocution each year on average in the United States. Electrocution remains the fourth (4th) highest cause of industrial fatalities with approximately 3000 reported flash burn incidents reported annually along with approximately 350 deaths.

Advance

Materials Needed

✓ PPT slides 1, 2



Elevator – Electrical Systems Safety

Instructor's Guide



Module Length: 180 min

Time remaining: 180 min

This section: 20 min (6 slides)

Section start time: _____

Section End Time: _____

DO



REVIEW module objectives

Instructor's Notes

SAY

In your own words:

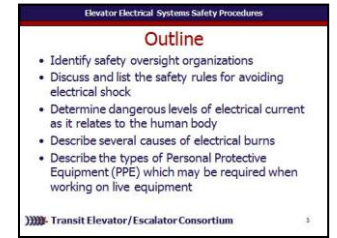
The purpose of this module is to provide the participants with a basic knowledge of safety procedures and demonstrate “best practice” safety behaviors including proper selection of personal protective equipment (PPE) during the testing and maintenance of vertical transportation electrical systems. In doing so we will,

- Identify safety oversight organizations
- Discuss and list the safety rules for avoiding electrical shock
- Determine dangerous levels of electrical current as it relates to the human body
- Describe several causes of electrical burns
- Describe the types of Personal Protective Equipment (PPE) which may be required when working on live equipment

Advance

Materials Needed

✓ PPT slide 3



Elevator – Electrical Systems Safety

Instructor's Guide



Module Length: 180 min Time remaining: 140 min This section: 20 min (15 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



ASK

In your own words:

Lets see what we have learned so far:
Ventricular fibrillation occurs with _____
milliAmps (mA) or 2 Amps.

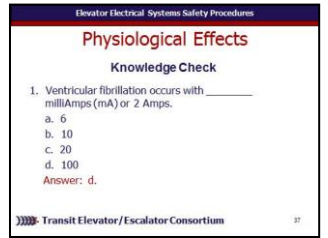
- a. 6
- b. 10
- c. 20
- d. 100

Call on participants for answer
Advance once given the correct answer

Answer: 100.

Advance

✓PPT slide 37



Instructor's Notes

Elevator – Electrical Systems Safety

Instructor's Guide



Module Length: 180 min

Time remaining: 140 min

This section: 20 min (15 slides) Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



ASK

In your own words:

Four causes for electrical burns include all except

- a. Direct contact
- b. Electrical Arcs
- c. Flash Burns
- d. Moisture
- e. Flame Burns

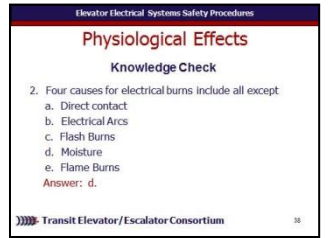
Call on participants for answer

Advance once given the correct answer

Answer: d.

Advance

✓ PPT slide 38



Instructor's Notes

Elevator – Electrical Systems Safety

Instructor's Guide



Module Length: 180 min Time remaining: 120 min This section: 10 min (7 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



REVIEW slide

In your own words:

Our next section looks at personal protective equipment, or you may recall this is also referred to as PPE. In this section, we want to take a look at the particular PPE that is required for working on live equipment.

Advance

✓ PPT slide 40



Instructor's Notes

PREVIEW ONLY

Elevator – Electrical Systems Safety

Instructor's Guide



Module Length: 180 min

Time remaining: 120 min

This section: 10 min (7 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



REVIEW slide

In your own words:

General PPE includes

Advance disposable clothing

Advance hand protection including electrical gloves when needed

Advance safety vests and hats

Advance face and eye protection

Advance ear protection

Advance breathing protection

Advance and foot protection including hard toed safety shoes and insulated boots.

Advance

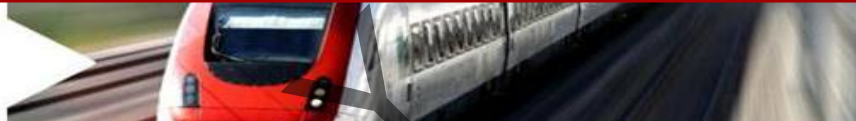
✓ PPT slide 42



Instructor's Notes

Elevator – Electrical Systems Safety

Instructor's Guide



Module Length: 180 min Time remaining: 120 min This section: 10 min (7 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



REVIEW slide

In your own words:

Wear nonconductive protective equipment for the face, neck, and chin whenever there is a danger of injury from exposure to electric arcs or flashes or from flying objects resulting from electrical explosion.

Advance

Wear protective equipment for the eyes whenever there is danger of injury from electric arcs, flashes, or from flying objects resulting from electrical explosion.

Advance

And wear flame-resistant clothing wherever there is possible exposure to an electric arc flash above the threshold incident-energy level for a second-degree burn.

Advance

✓ PPT slide 43



Instructor's Notes

Elevator – Electrical Systems Safety

Instructor's Guide



Module Length: 180 min

Time remaining: 120 min

This section: 10 min (7 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



ASK

Instructor's Notes

In your own words:

Lets see what we have learned so far:
In addition to using appropriate PPE, one should also use the following when working with electrical equipment: (check all that apply)

- a. Nonconductive head protection
- b. Flame resistant clothing
- c. Eye protection
- d. Dust protection

Call on participants for answer

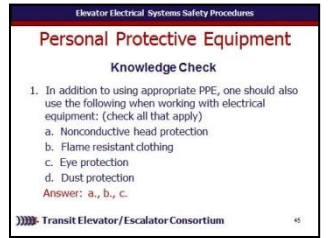
Advance once given the correct answer

Answer: a., b., c.

Advance

Review previous slide for retention purposes.

✓PPT slides 45, 46



Elevator – Electrical Systems Safety

Instructor's Guide



Module Length: 180 min Time remaining: 110 min This section: 20 min (13 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="34 464 144 564" data-label="Image"> </div> <p data-bbox="170 492 434 535">REVIEW slides</p> <p data-bbox="28 792 444 835">Instructor's Notes</p> <hr/> <hr/> <hr/> <hr/> <hr/>	<p data-bbox="676 428 1023 464">In your own words:</p> <p data-bbox="676 492 1400 614">Shock protection boundaries and energized electrical equipment is what we will take a look at next.</p> <p data-bbox="676 678 840 714">Advance</p> <p data-bbox="676 735 1168 778">A qualified person is one who</p> <p data-bbox="676 792 840 828">Advance</p> <p data-bbox="676 849 1381 978">has the skills and knowledge related to the construction and operation of the electrical equipment and installations and</p> <p data-bbox="676 992 850 1035">Advance</p> <p data-bbox="676 1056 1420 1135">has received safety training to recognize and avoid hazards involved.</p> <p data-bbox="676 1156 840 1192">Advance</p>	<p data-bbox="1497 471 1825 506">✓ PPT slides 47, 48</p> <div data-bbox="1535 528 1854 763" data-label="Image"> </div> <div data-bbox="1535 778 1854 1006" data-label="Image"> </div>

Elevator – Electrical Systems Safety

Instructor's Guide



Module Length: 180 min Time remaining: 110 min This section: 20 min (13 slides) Section start time: _____ Section End Time: _____

DO



REVIEW slides

Instructor's Notes

SAY

In your own words:

The closest distance an “unqualified” person can approach, unless escorted by a “qualified” person.

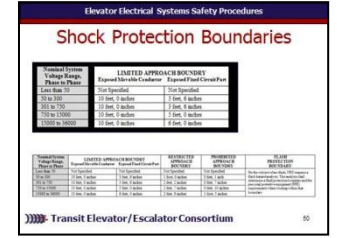
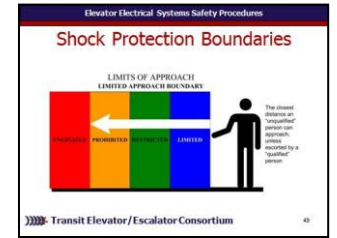
Advance

[Discuss the pull out from the chart below.]

Advance

Materials Needed

✓ PPT slides 49, 50



Elevator – Electrical Systems Safety

Instructor's Guide



Module Length: 180 min Time remaining: 90 min This section: 30 min (23 slides) Section start time: _____ Section End Time: _____

DO



REVIEW slides



Multimedia

Instructor's Notes

SAY

In your own words:
[If time and at instructor's discretion, click on the photo and briefly share video about electrical LOTO safety basics.]
Advance

Materials Needed

✓ PPT slides 79



✓ Internet connection

Elevator – Electrical Systems Safety

Instructor's Guide



Module Length: 180 min Time remaining: 20 min This section: 20 min (4 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="34 464 144 571" data-label="Image"> </div> <p data-bbox="173 492 425 571">CLASSROOM ACTIVITY</p> <p data-bbox="28 792 444 835">Instructor's Notes</p> <hr/> <hr/> <hr/> <hr/> <hr/>	<p data-bbox="676 428 1023 464">In your own words:</p> <p data-bbox="676 471 1429 735"><i>[Use objectives on slide to review what was learned. 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.]</i></p> <p data-bbox="676 742 840 778">Advance</p>	<p data-bbox="1497 471 1825 506">✓ PPT slides 93, 94</p> <div data-bbox="1535 528 1854 756" data-label="Image"> </div> <div data-bbox="1535 778 1854 1006" data-label="Image"> </div>

Elevator – Electrical Systems Safety

Instructor's Guide



Module Length: 180 min Time remaining: 20 min This section: 20 min (4 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



CLASSROOM ACTIVITY

In your own words:
 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

Read slide. Discuss definitions as a group.
Advance

✓ PPT slide 95



Instructor's Notes
