86 - ZES Tagger PT1

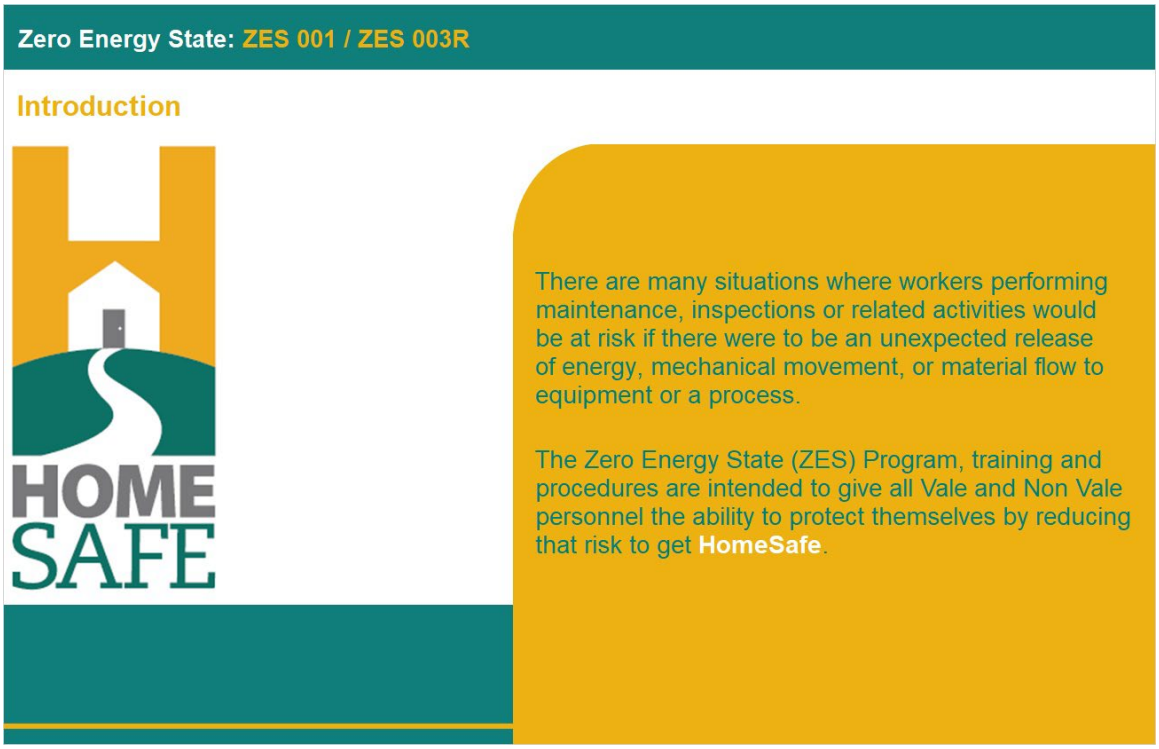
1. Zero Energy State - ZES Tagger PT1 - ZES003A

1.1 L and D Slide

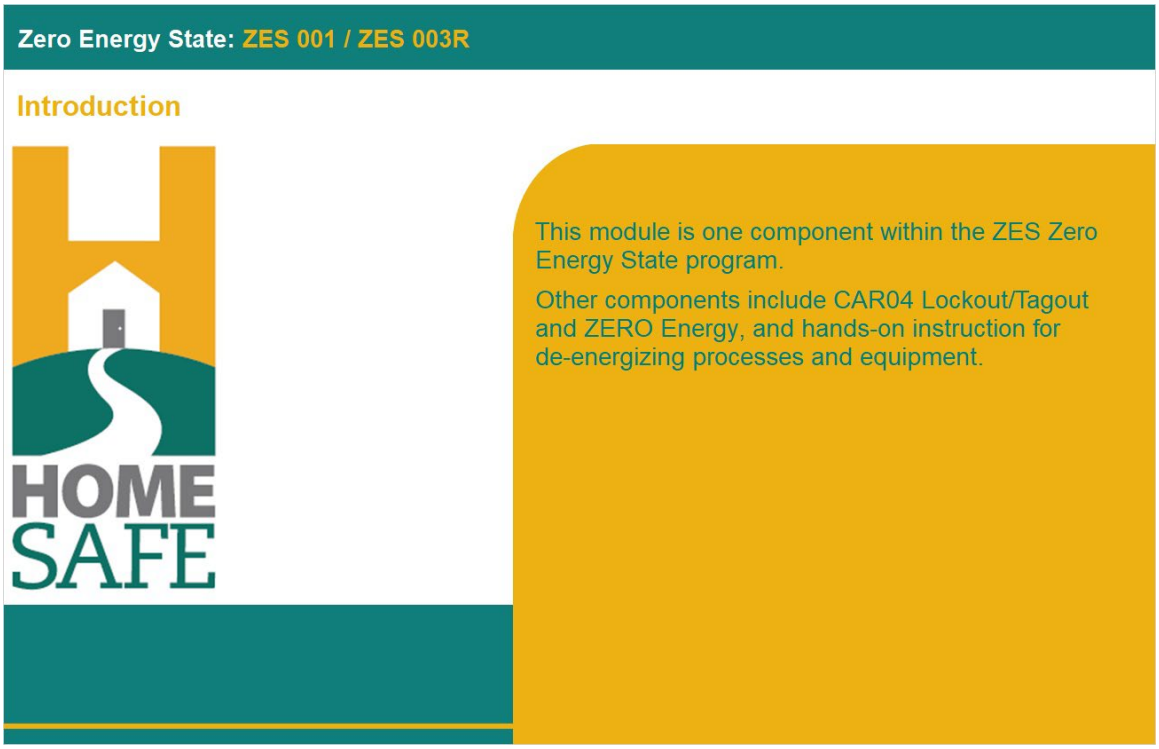
2. Overview

2.1 Overview

2.2 Introduction

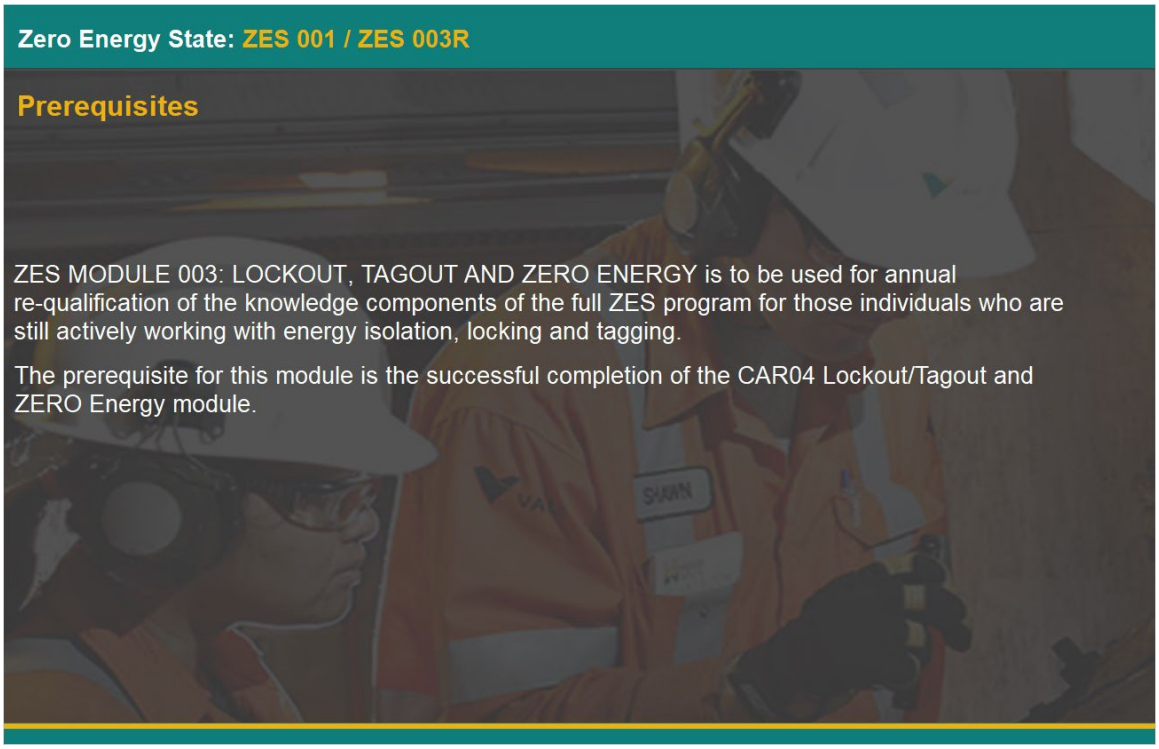


2.3 Introduction

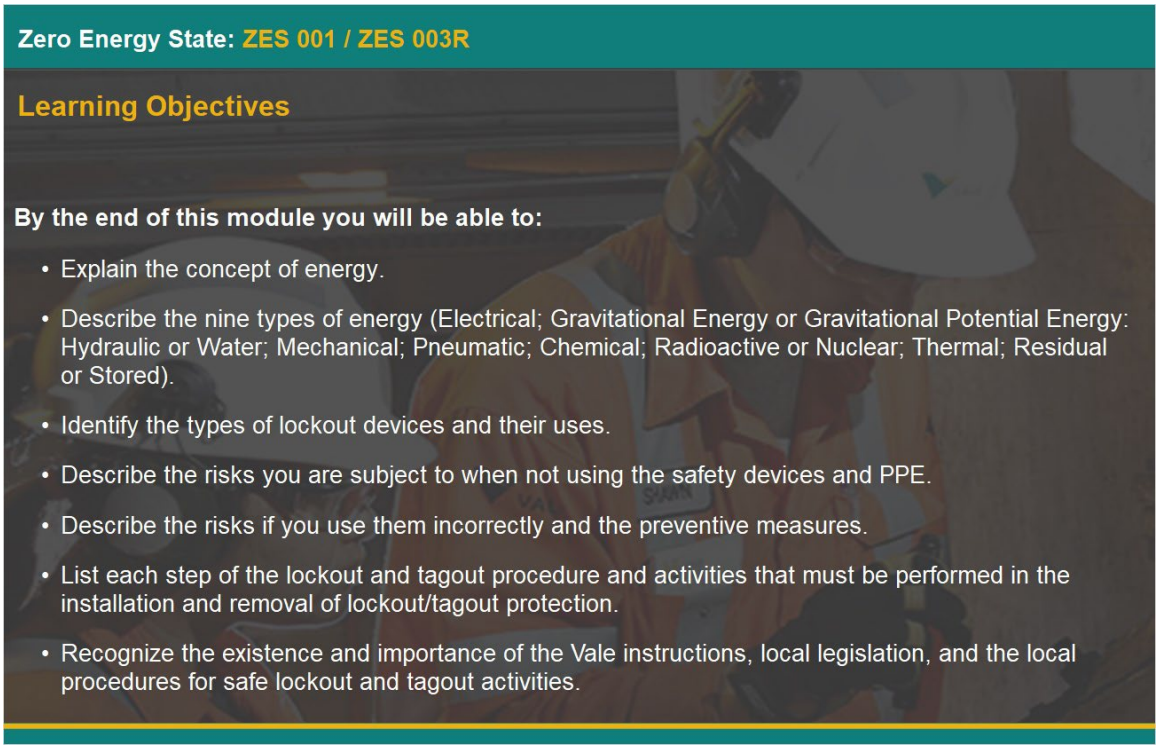


2.4 Introduction

2.5 Prerequisites



2.6 Learning Objectives



3. Definitions

3.1 Overview

3.2 Introduction

Zero Energy State: ZES 001 / ZES 003R

The following are Definitions of terminology used within the Zero Energy State Program.

Zero Energy State;

A state where all hazardous energy has been isolated and de-energized, or otherwise controlled to manage risk.

3.3 Isolation Equipment Operator;

Zero Energy State: ZES 001 / ZES 003R

The following are Definitions dealing with the Zero Energy State Program.

Isolation Equipment Operator;

A qualified person who operates the energy isolation device(s). e.g. controls, valves, etc.

Is there an official rule for left hand switching?

We often hear about the left hand rule.
The left hand rule is the best practice but if you cannot operate the switch in that fashion, escalate to your supervisor, assess the situation through risk management and apply another method.

3.4 Protected Worker; Tagger;

Zero Energy State: ZES 001 / ZES 003R

The following are Definitions dealing with the Zero Energy State Program.

Protected Worker;

A tagger who has installed their personal protection and has verified a zero energy state.

Tagger;

Tagger: a qualified worker who installs and removes their personal protection and manages status tags.

3.5 Designated Tagger;

Zero Energy State: ZES 001 / ZES 003R

The following are Definitions dealing with the Zero Energy State Program.

Designated Tagger;

A qualified worker or another person who installs and removes Project personal protection and manages status tags.

I.M. 3582922: Designated tagger off property and project lock cut off:

A lock box for a water pump was to be disassembled. The designated tagger was on vacation and could not be reached. ZES program was followed and project lock was removed.

3.6 Qualified: Authorized;

Zero Energy State: ZES 001 / ZES 003R

The following are Definitions dealing with the Zero Energy State Program.

Qualified;

A competent person designated by their employer as being qualified because of knowledge, training and experience to safely perform an assigned task.

Authorized;

A person who has been given permission to perform the task.

! ATTENTION

You must be *both Qualified and Authorized before* performing any Lockout/Tagout procedure.

3.7 Local Tagger;

Zero Energy State: ZES 001 / ZES 003R

The following are Definitions dealing with the Zero Energy State Program.

Local Tagger;

A qualified person who uses a Remote Tagger to install the local Tagger's personal protection locks and tags on Energy Isolating Devices.

Remote Tagger;

A qualified person operating, locking and tagging remote energy isolating devices on behalf of the Local Tagger (e.g. Control Room Operators, Sandfill Plant Operators).

3.8 Device; Isolate:

Zero Energy State: ZES 001 / ZES 003R

The following are Definitions dealing with the Zero Energy State Program.

Device;

A piece of equipment or a mechanism designed to serve a special purpose or perform a special function.

Isolate:

To introduce any number of approved physical barriers between the equipment and all sources or forms of energy and/or process material.

3.9 Equipment;

Zero Energy State: ZES 001 / ZES 003R

The following are Definitions dealing with the Zero Energy State Program.

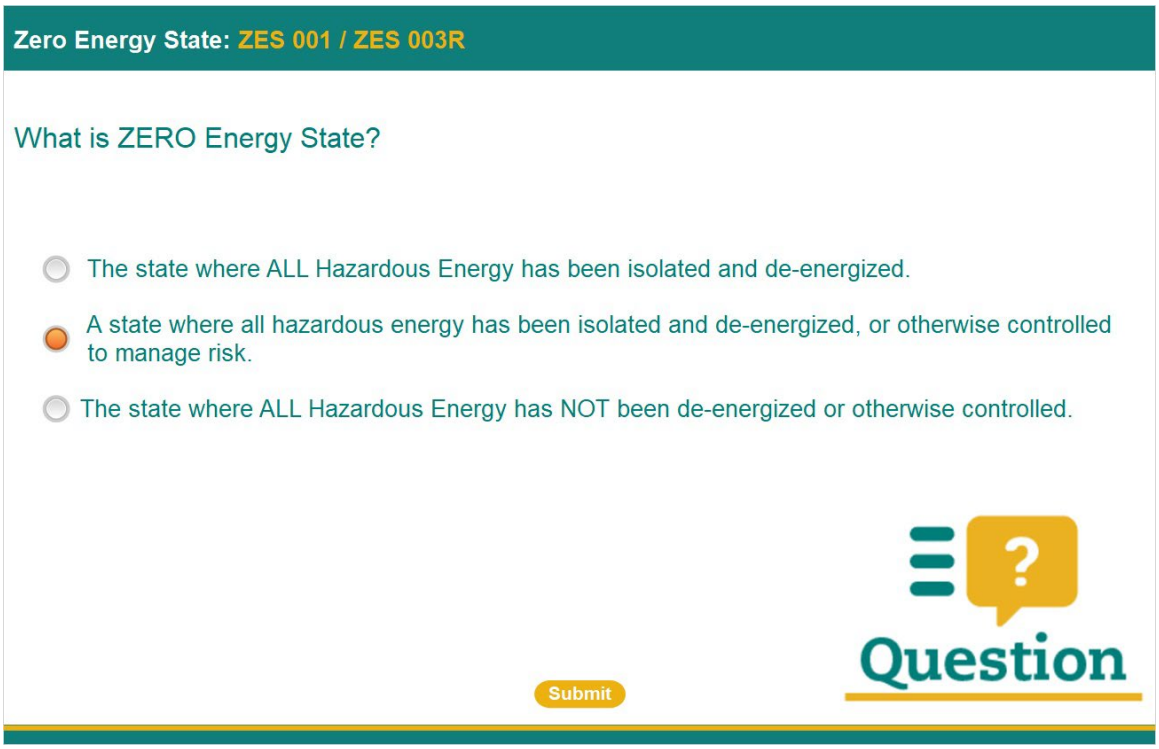
Equipment;

Any machine driven by electricity or any other prime mover and/or combination of machines that operate as a system/process.

Such as pumps, fans, electrical motors, mobile machines, vessels, piping, valves, etc.

3.10 Question 1

(Multiple Choice, 10 points, unlimited attempts permitted)



Correct	Choice
	The state where ALL Hazardous Energy has been isolated and de-energized.
X	A state where all hazardous energy has been isolated and de-energized, or otherwise controlled to manage risk.
	The state where ALL Hazardous Energy has NOT been de-energized or otherwise controlled.

Feedback when correct:

That's right! You selected the correct response.

Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)

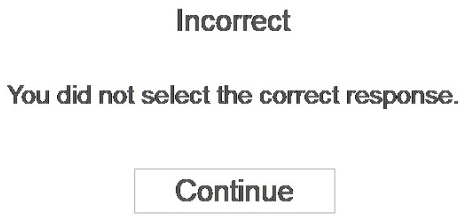
Correct

That's right! You selected the correct response.

Continue

Zero Energy is defined as a state where all hazardous energy has been isolated and de-energized, or otherwise controlled to manage risk.

Incorrect (Slide Layer)



Try Again (Slide Layer)

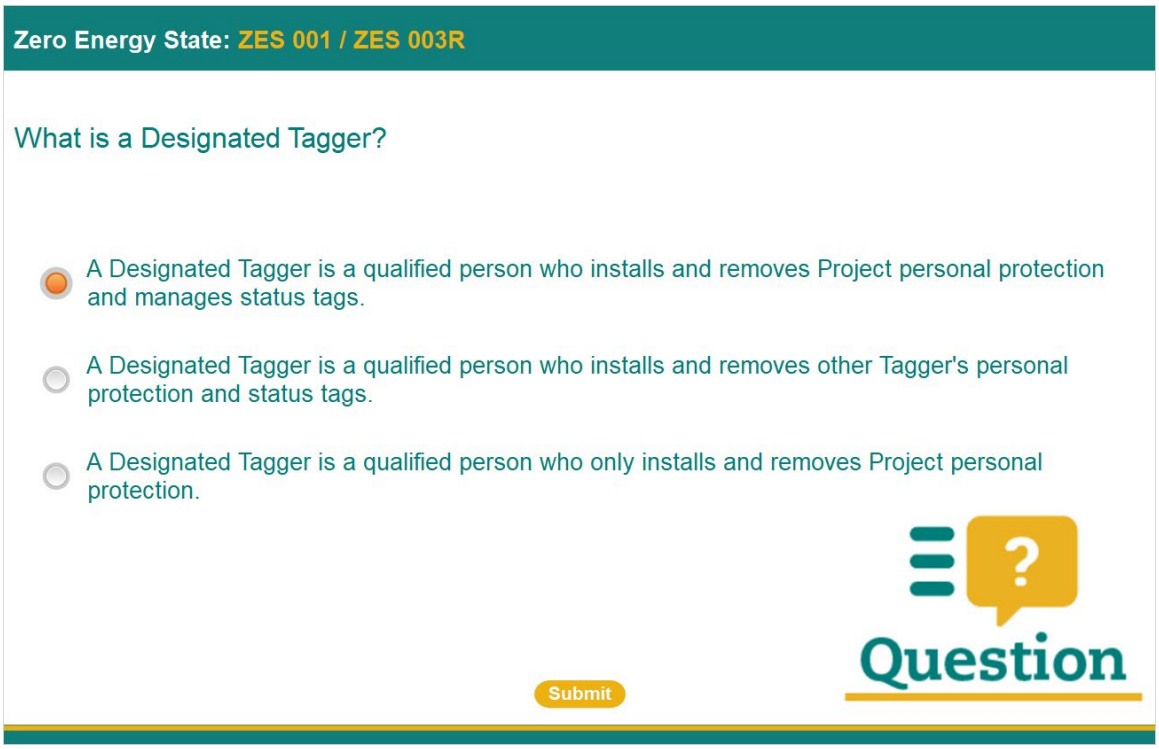
Incorrect

That is incorrect. Please try again.

Try Again

3.11 Question 2

(Multiple Choice, 10 points, unlimited attempts permitted)



Correct	Choice
X	A Designated Tagger is a qualified person who installs and removes Project personal protection and manages status tags.
	A Designated Tagger is a qualified person who installs and removes other Tagger's personal protection and status tags.
	A Designated Tagger is a qualified person who only installs and removes Project personal protection.

Feedback when correct:

That's right! You selected the correct response.

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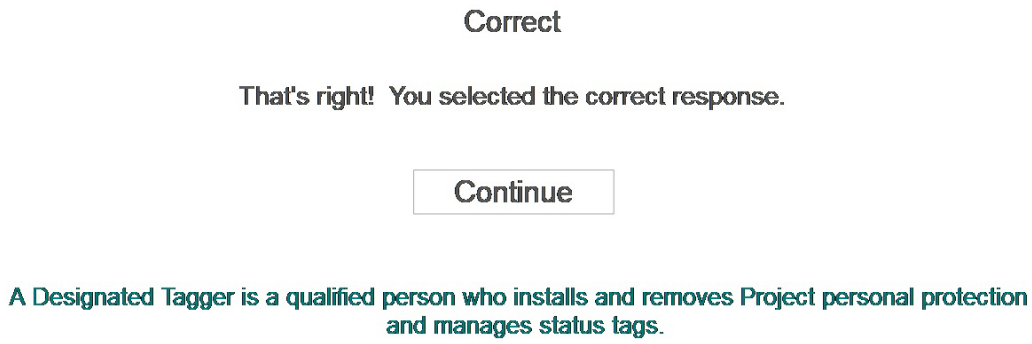
Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)



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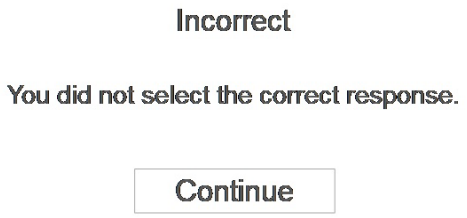

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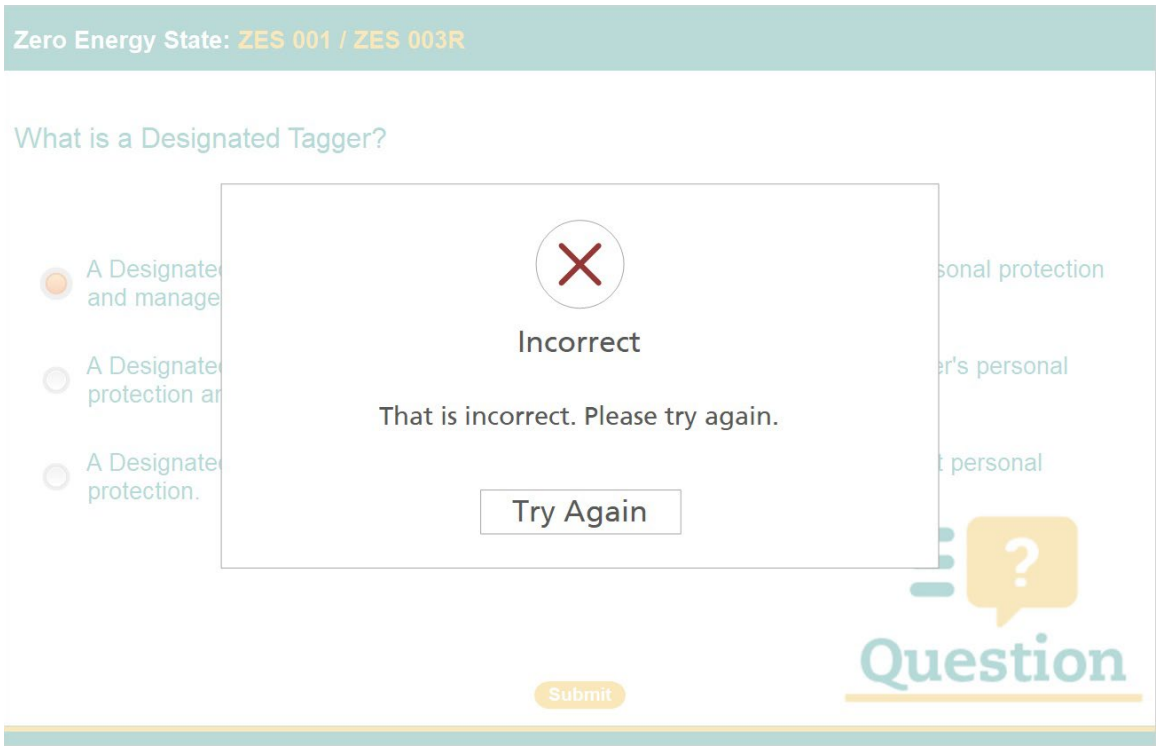
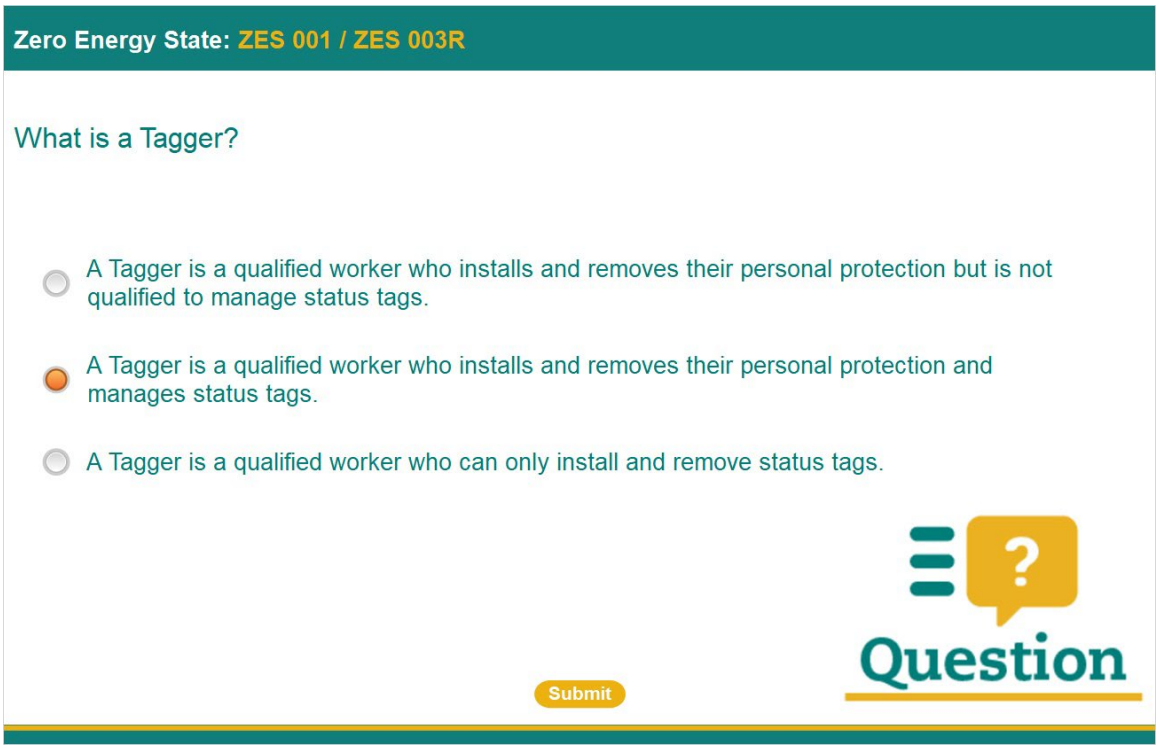


3.12 Question 3

(Multiple Choice, 10 points, unlimited attempts permitted)



Correct	Choice
	A Tagger is a qualified worker who installs and removes their personal protection but is not qualified to manage status tags.
X	A Tagger is a qualified worker who installs and removes their personal protection and manages status tags.
	A Tagger is a qualified worker who can only install and remove status tags.

Feedback when correct:

That's right! You selected the correct response.

Feedback when incorrect:

You did not select the correct response.

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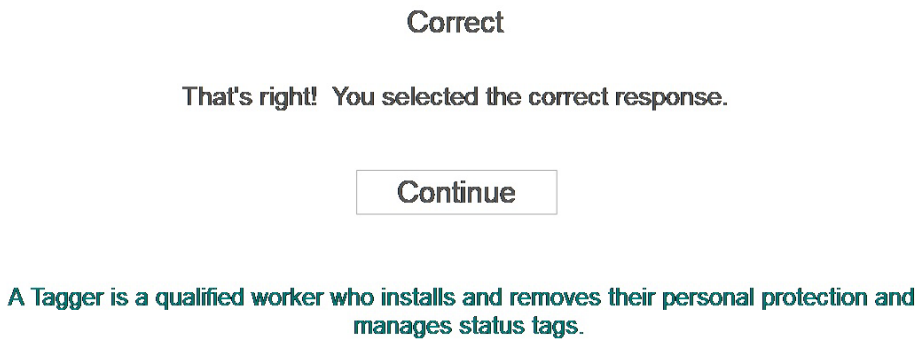
Correct (Slide Layer)



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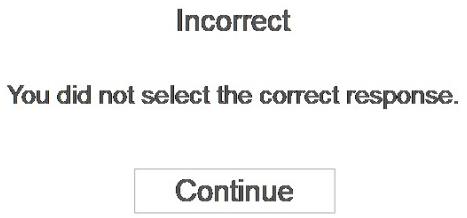
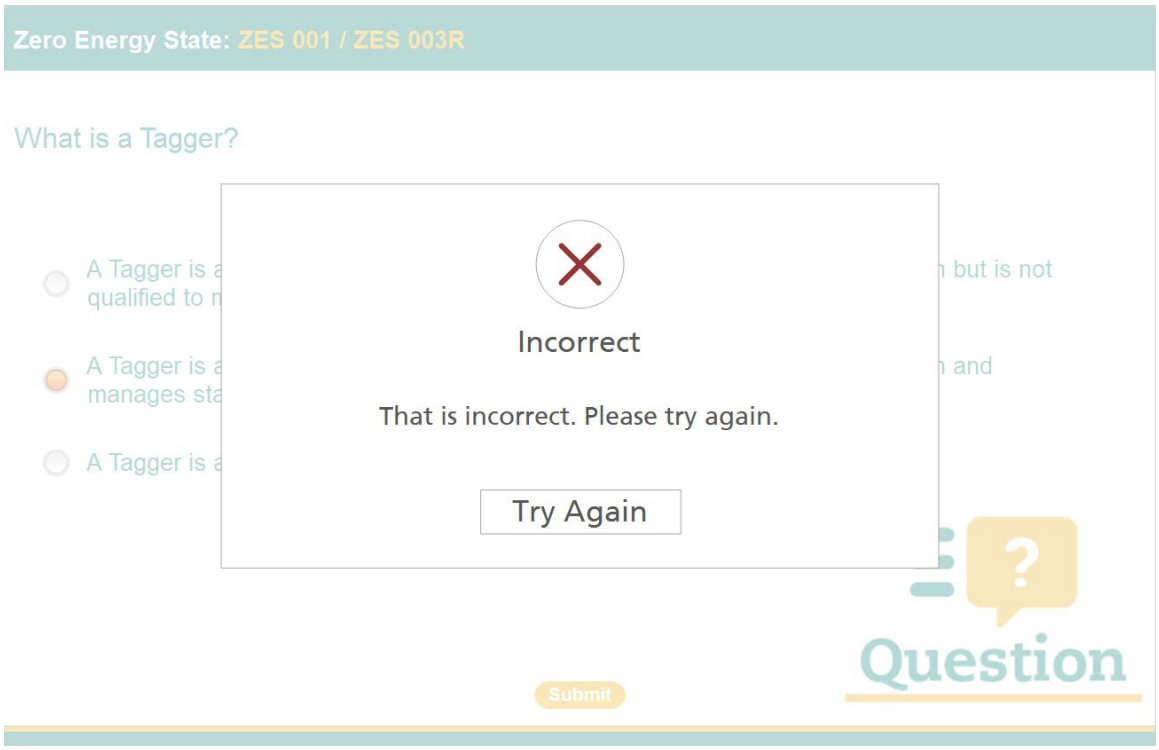
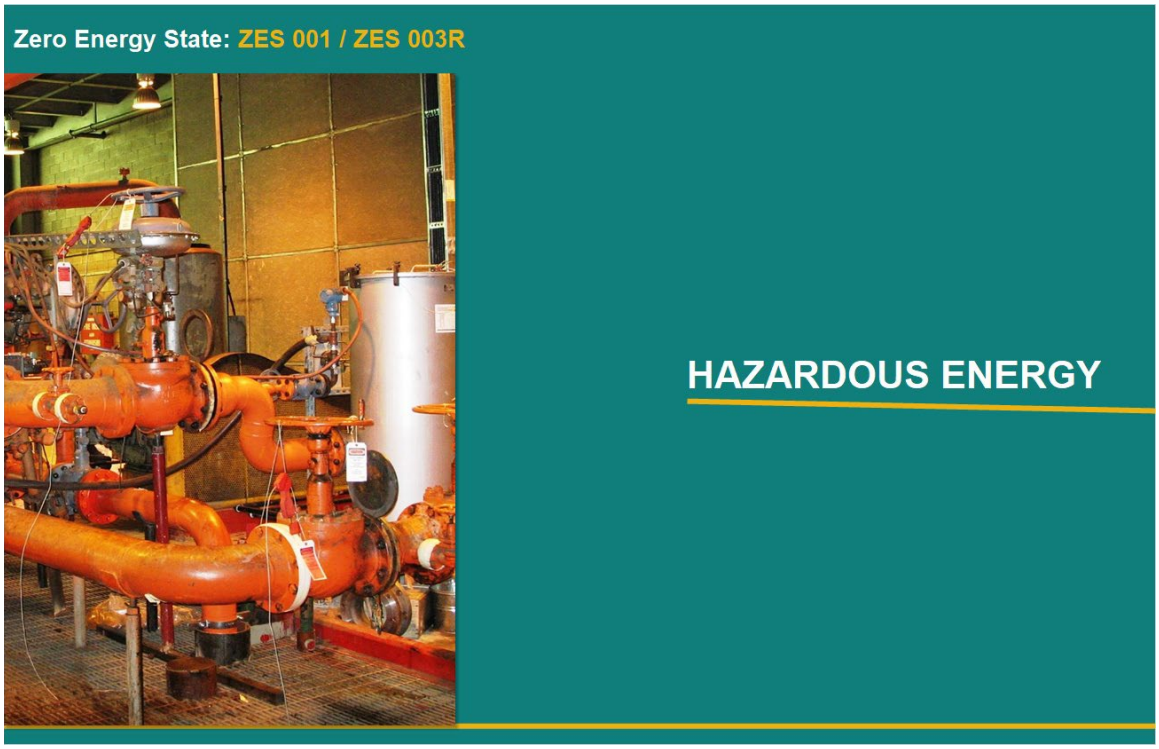


Try Again (Slide Layer)

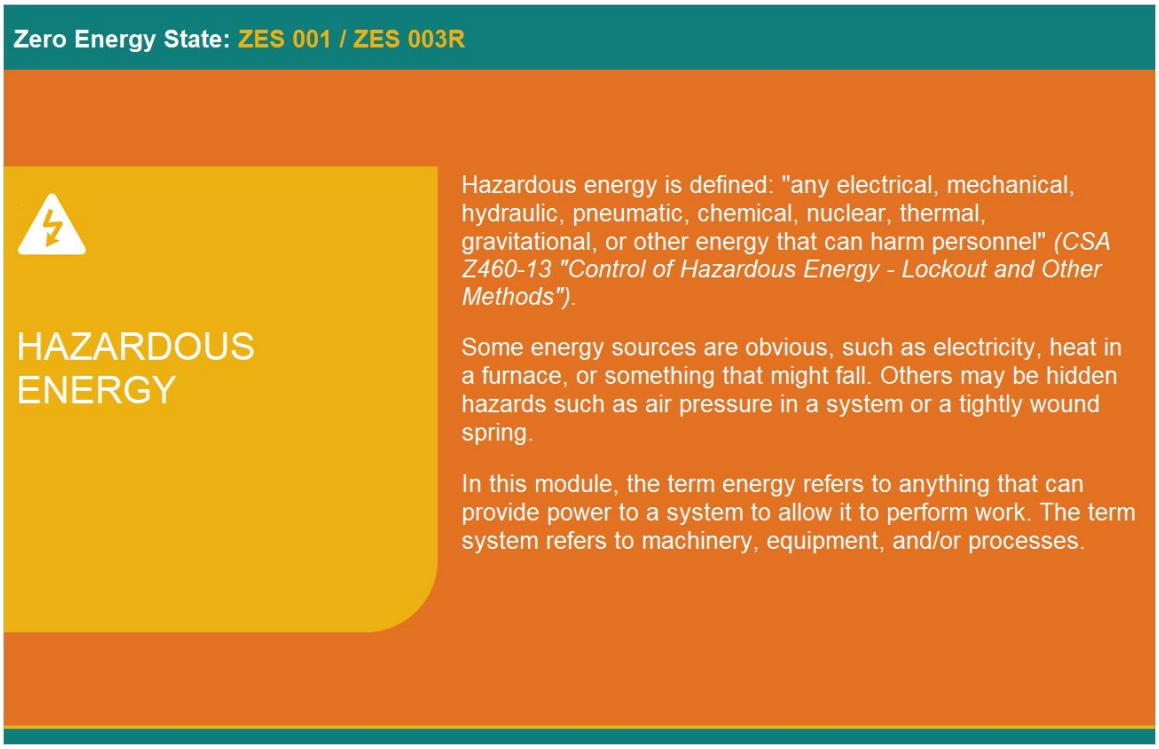


4. Hazardous Energy

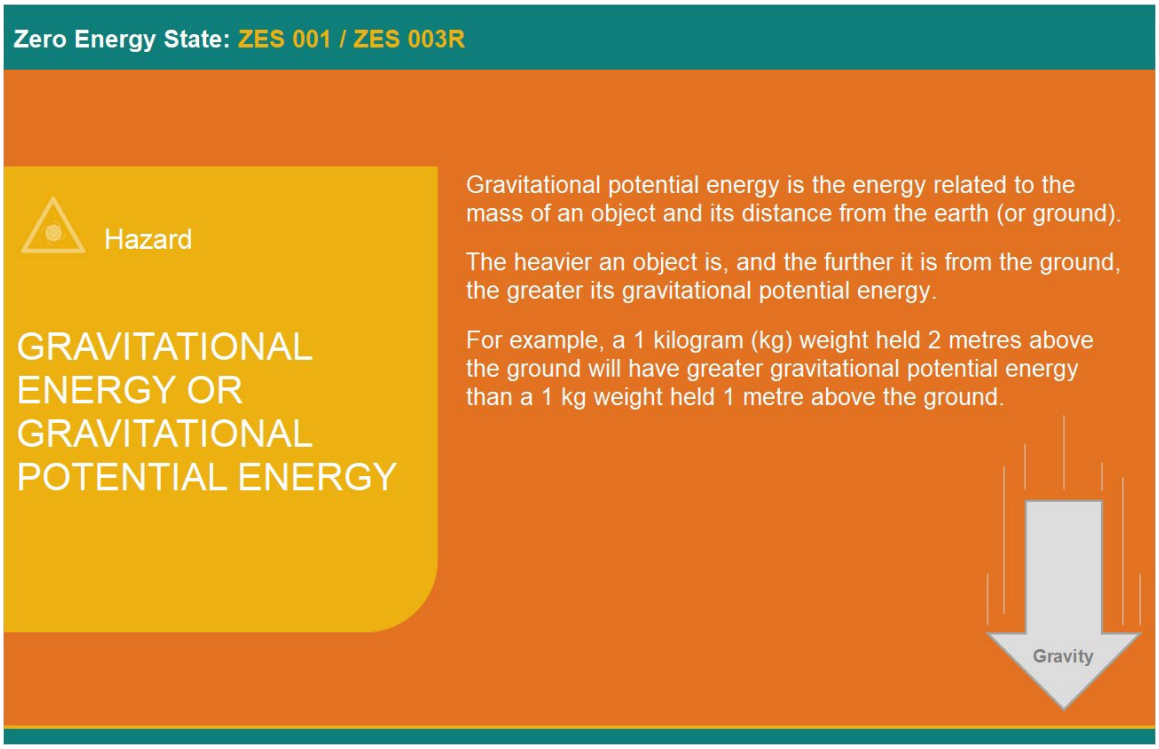
4.1 HAZARDOUS ENERGY



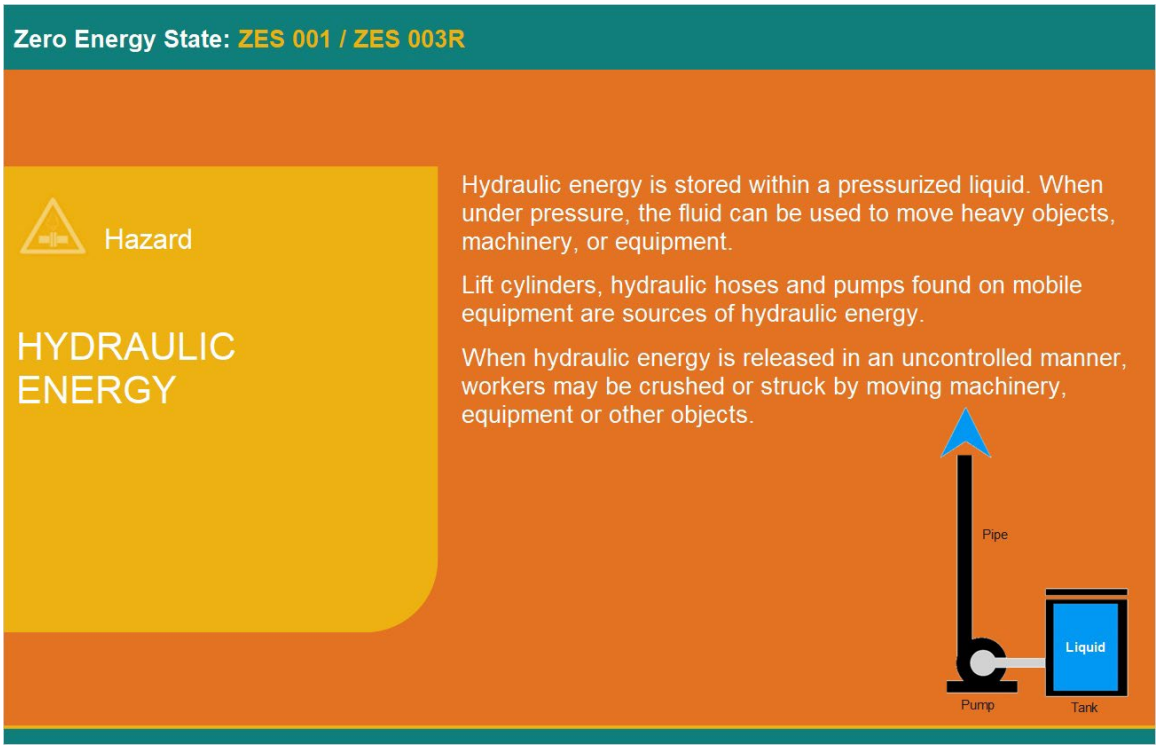
4.2 Introduction



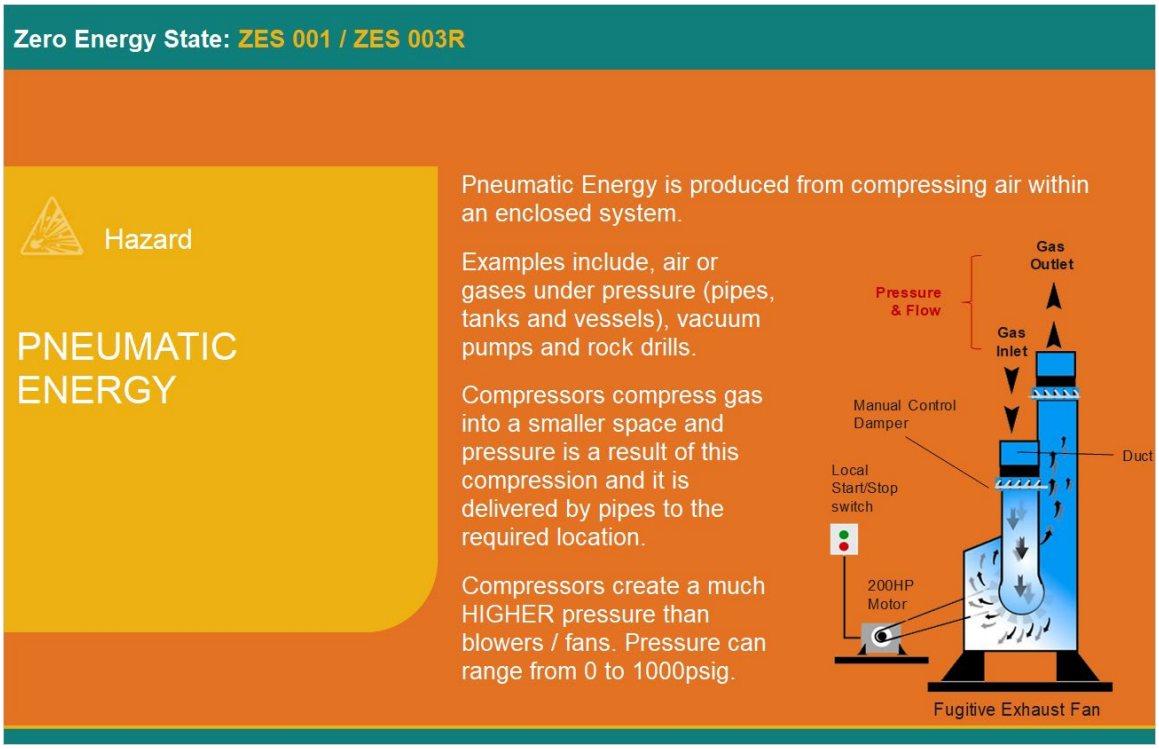
4.3 GRAVITATIONAL ENERGY OR GRAVITATIONAL POTENTIAL ENERGY



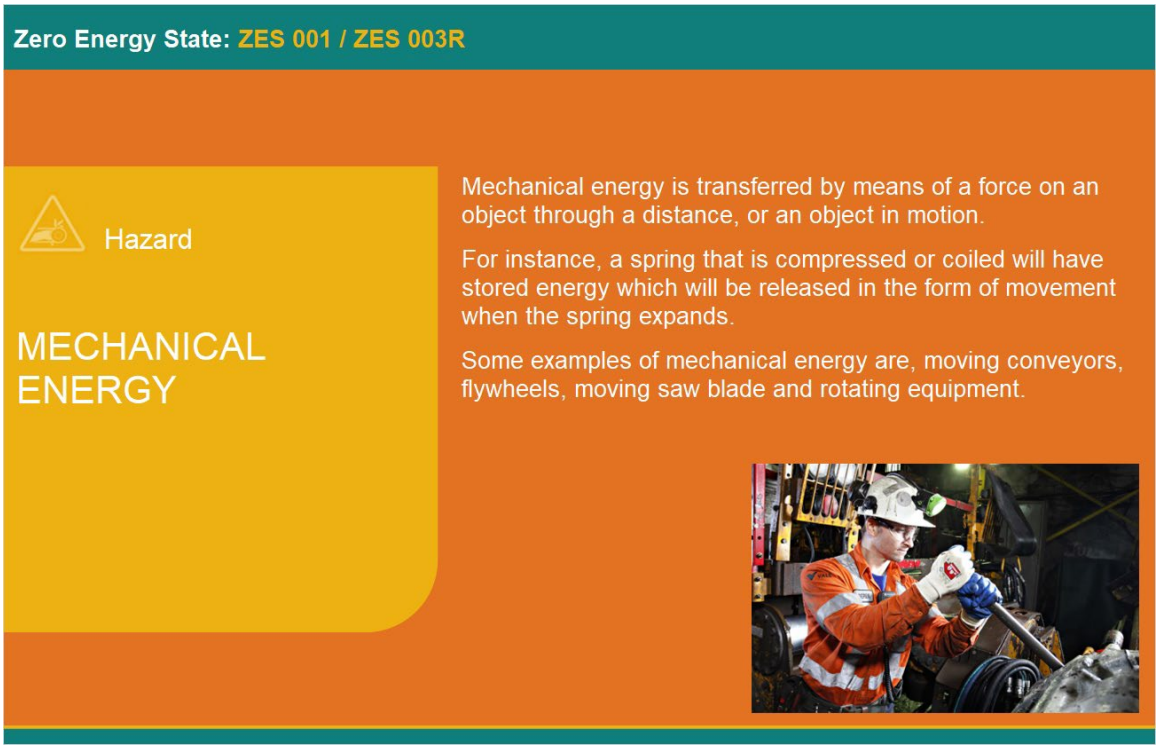
4.4 HYDRAULIC



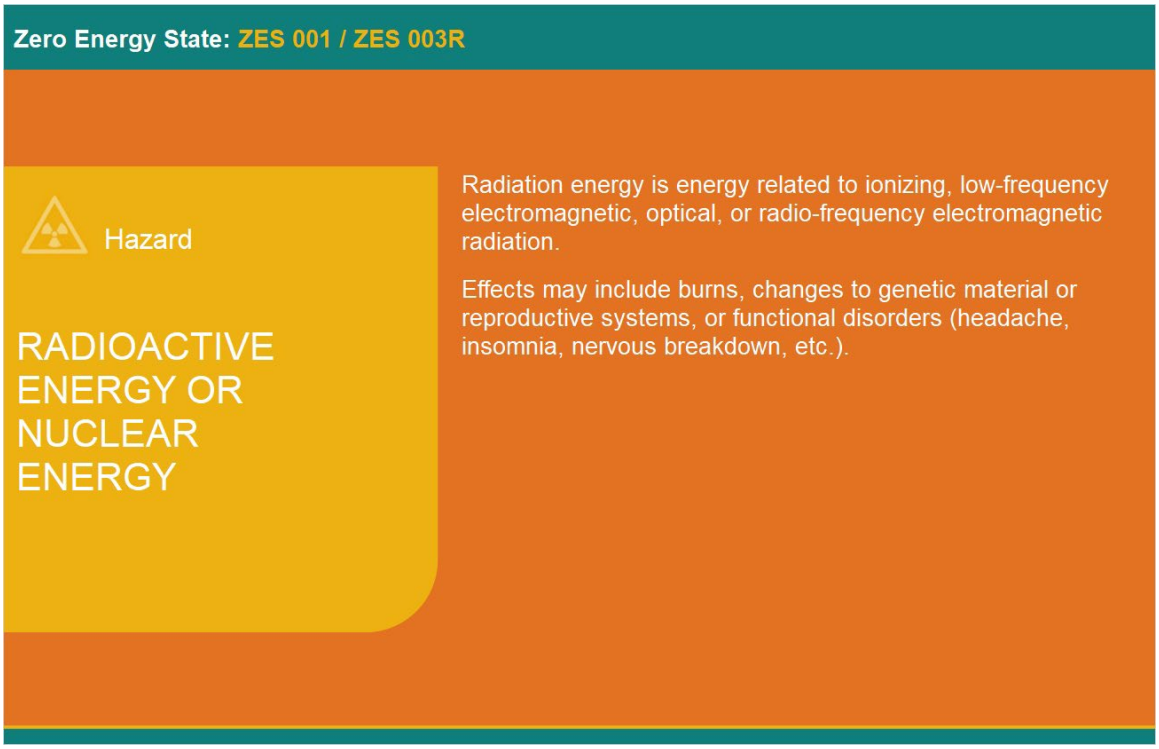
4.5 Pnuematic



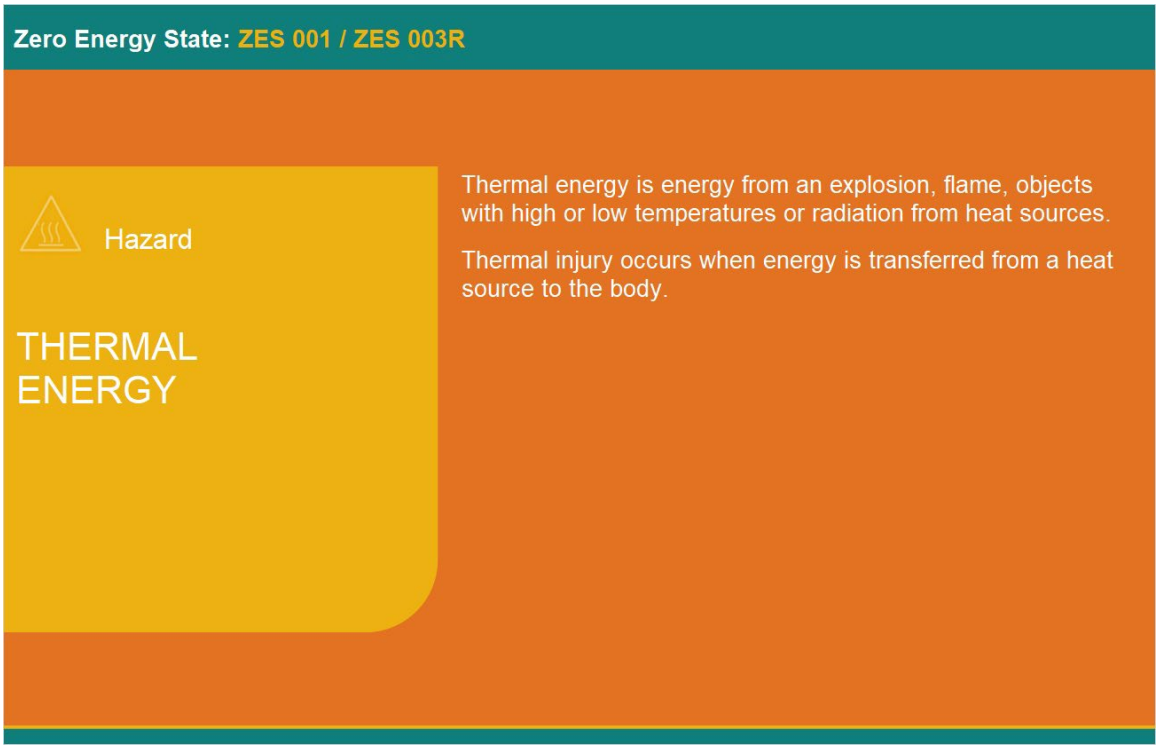
4.6 Mechanical



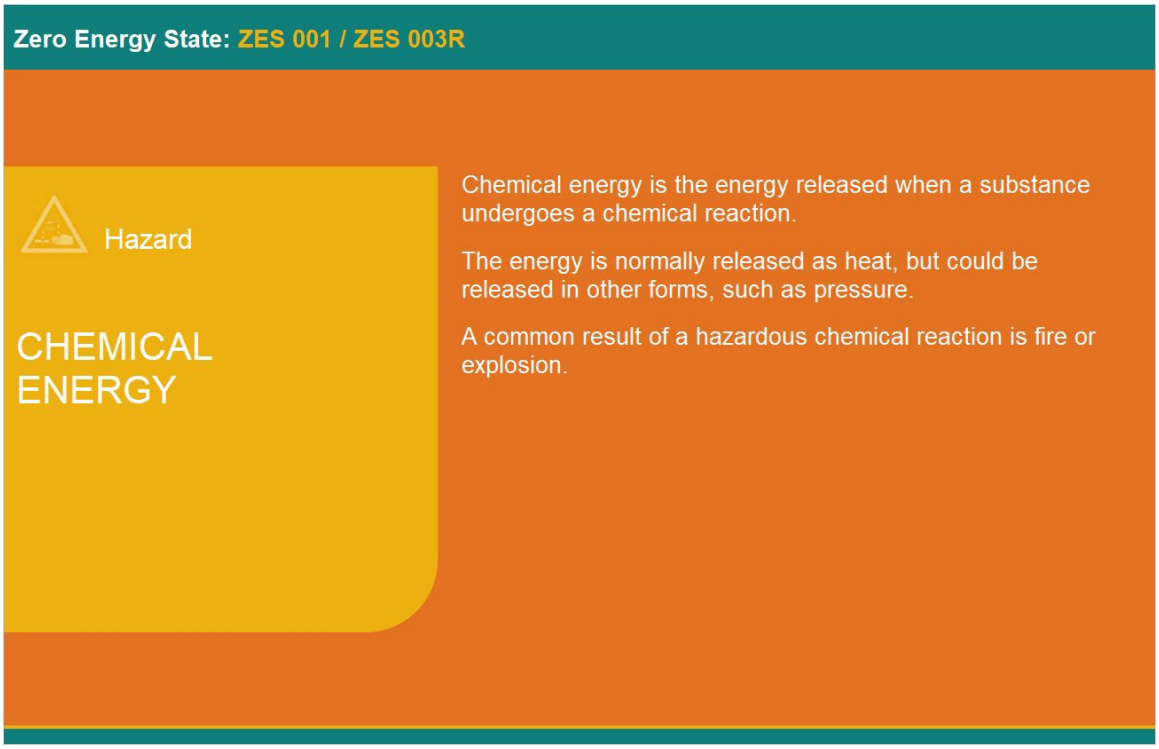
4.7 Radioactive or Nuclear



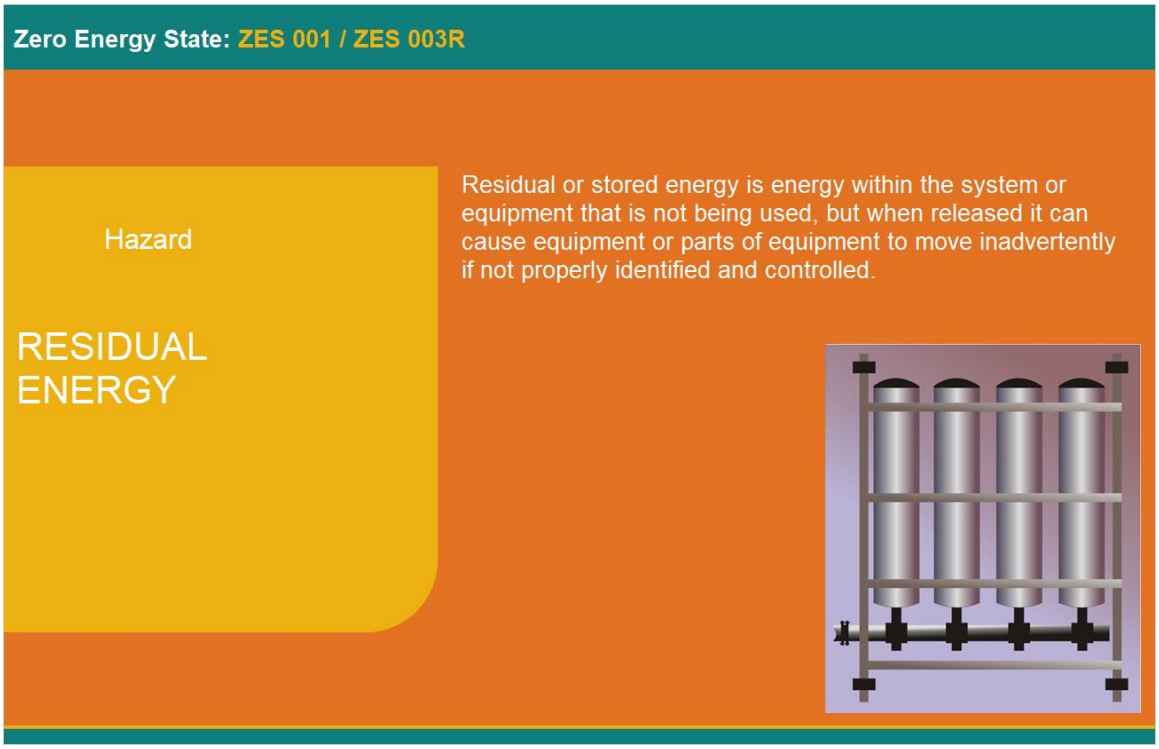
4.8 Thermal


Zero Energy State: ZES 001 / ZES 003R
Hazard
THERMAL ENERGY
Thermal energy is energy from an explosion, flame, objects with high or low temperatures or radiation from heat sources.
Thermal injury occurs when energy is transferred from a heat source to the body.

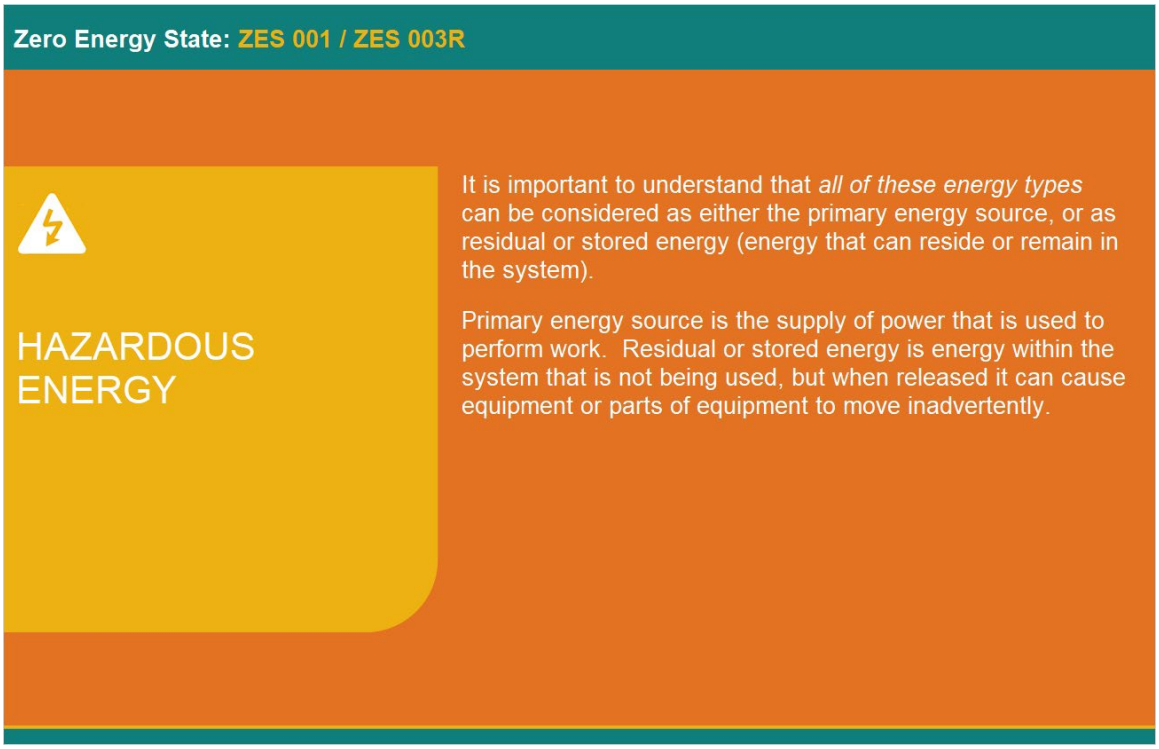
4.9 Chemical


Zero Energy State: ZES 001 / ZES 003R
Hazard
CHEMICAL ENERGY
Chemical energy is the energy released when a substance undergoes a chemical reaction.
The energy is normally released as heat, but could be released in other forms, such as pressure.
A common result of a hazardous chemical reaction is fire or explosion.

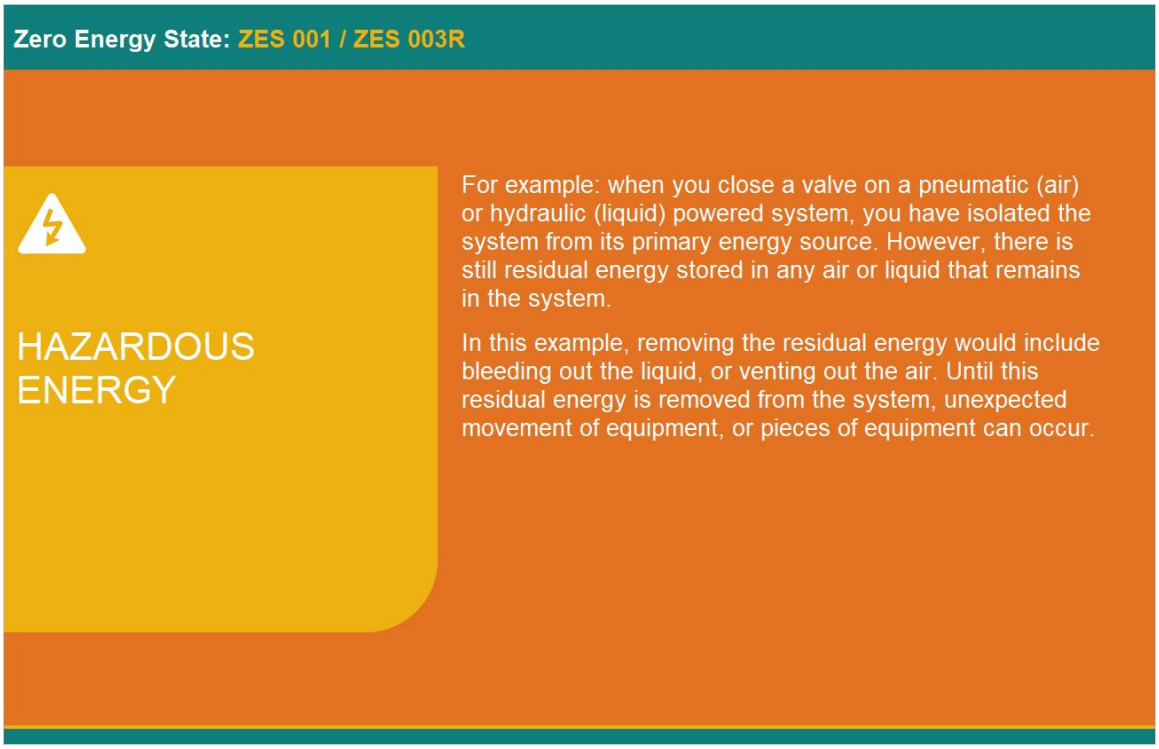
4.10 Residual



4.11 Control

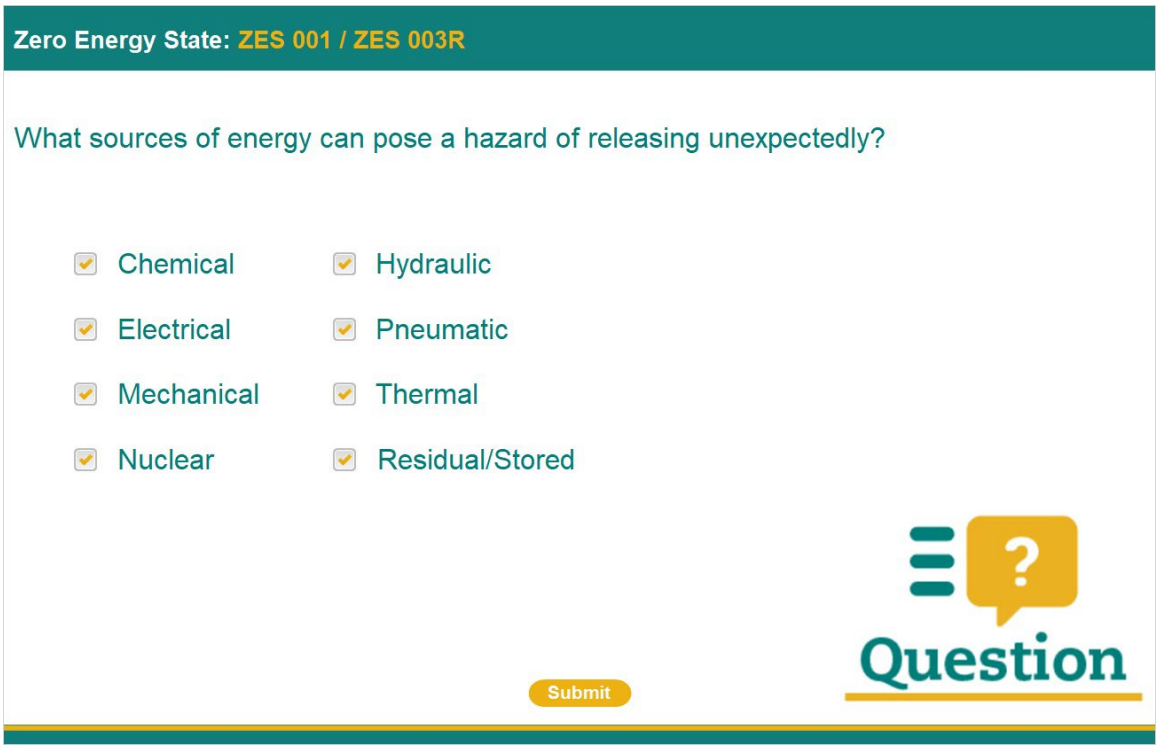

Zero Energy State: ZES 001 / ZES 003R
HAZARDOUS ENERGY
It is important to understand that all of these energy types can be considered as either the primary energy source, or as residual or stored energy (energy that can reside or remain in the system).
Primary energy source is the supply of power that is used to perform work. Residual or stored energy is energy within the system that is not being used, but when released it can cause equipment or parts of equipment to move inadvertently.

4.12 Control



4.13 Question 1

(Multiple Response, 10 points, unlimited attempts permitted)



Correct	Choice
X	Chemical
X	Hydraulic
X	Electrical
X	Pneumatic
X	Thermal
X	Mechanical
X	Nuclear
X	Residual/Stored

Feedback when correct:

That's right! You selected the correct response.

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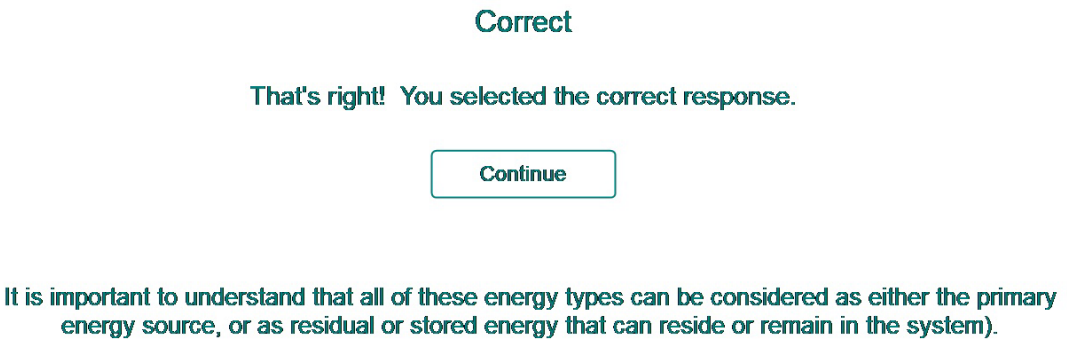
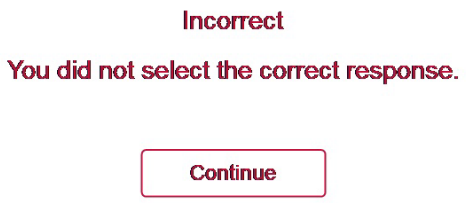
Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)



Incorrect (Slide Layer)



Try Again (Slide Layer)

5. Tags, Locks, and Lockout Devices

5.1 Tags, Locks, and Lockout Devices

5.2 Introduction

Zero Energy State: ZES 003 / ZES 003R

Workers servicing or maintaining machines or equipment may be seriously injured or killed if hazardous energy is not properly controlled.

Injuries resulting from the failure to control hazardous energy during maintenance activities can be serious or fatal.

Injuries may include electrocution, burns, crushing, cutting, lacerating, amputating, or fractured body parts, and others.

Locking protects *Everyone*

***Know* the Rules**

***Follow* the Rules**

5.3 Tags, Locks, and Lockout Devices

Zero Energy State: ZES 003 / ZES 003R

Upon completion of this section of the module you will be able to;

- Identify the different types of Tags, Locks, and Lockout Devices.
- Describe the rules and the safe application of the Personal Protection and Equipment Status Tags.
- Describe the safe procedures for the installation and removal of the different type of Tags, Locks, and Lockout Devices.

5.4 What is Personal Protection?

Zero Energy State: ZES 003 / ZES 003R

What is Personal Protection?

A Personal Protection Tag is an approved red tag that is used to tag an energy isolating device.

The ***Personal Protection Tag*** is used for **PERSONAL PROTECTION ONLY** and is used to Tag an energy isolating device.

The tag is RED in color and is meant to protect the worker and not the equipment.

Proper completion of this tag is not only part of the Vale Critical Activity Requirement (CAR) - *LOCKOUT, TAGOUT AND ZERO ENERGY* it is required by ***LAW***.

5.5 What is Personal Protection?

Zero Energy State: ZES 003 / ZES 003R

What is Personal Protection?

A Personal Protection Tag is an approved red tag that is used to tag an energy isolating device.

A Personal Protection Lock is an approved, single keyed red lock, capable of locking an energy isolating device or a lock box.

A ***Personal Protection Lock*** is an approved **SINGLE KEYED RED LOCK** capable of locking an energy isolating device or a lock box.

The **RED PERSONAL PROTECTION** lock is used in conjunction with a **RED PERSONAL PROTECTION** Tag**.**

The lock is *NOT* to be used for any other purpose. *ONE person ONE lock*.

5.6 What is Personal Protection?

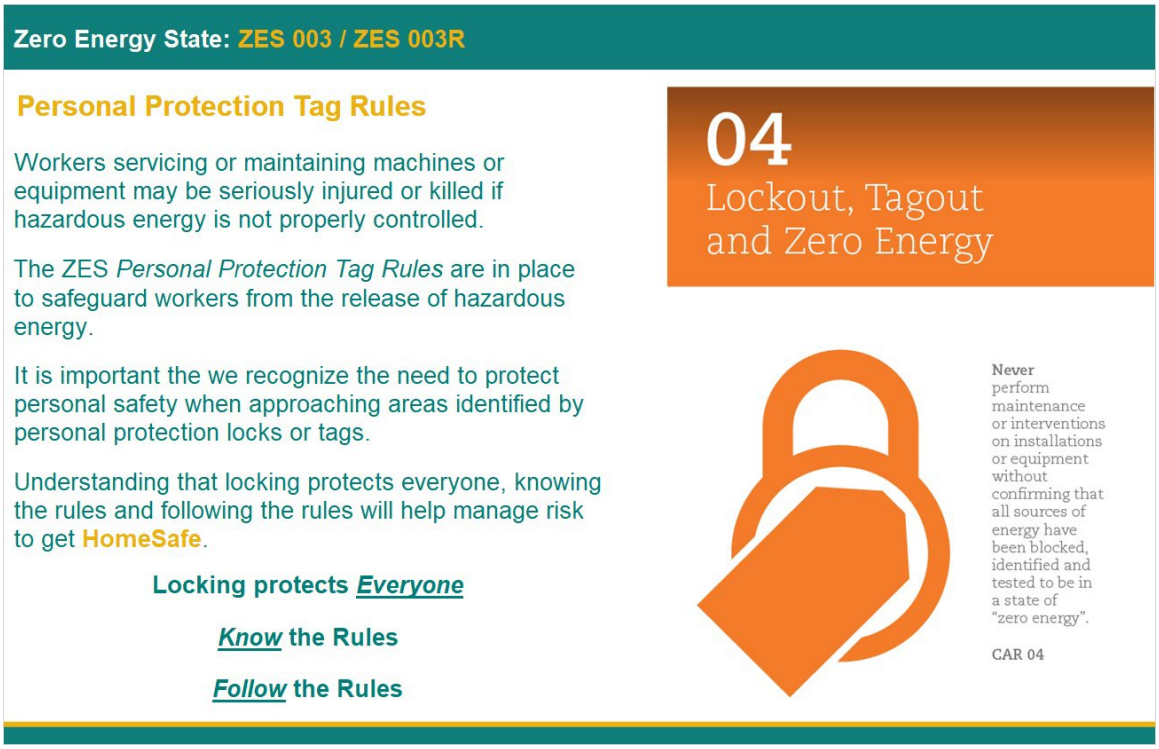
Zero Energy State: ZES 003 / ZES 003R

What is a Project Lock?

Blue Project locks are used on lock box applications.

Like the red personal protection lock, the Blue Project Lock is not to be used for any other purpose.

5.7 Personal Protection Tag Rules



5.8 Rule #1:

Zero Energy State: ZES 003 / ZES 003R

ZES Rules

Rule #1:

One person – One Lock

This means that when an individual is in a position that requires lockout protection then that person must have a lock on either the isolation / de-energization device(s) or on the lockbox.

Where the energy isolating device is not capable of being locked out, or the use of locks is unsafe, then personal protection tags shall be used in conjunction with an approved variance.

ZES Rules

VALE

The rules of the ZES Program support Ontario Regulations and have one goal: to help ensure the safety of workers by reducing stored energy levels to manage risk.

1. One Person – One Lock
2. A RED Personal Protection Tag is the only tag to be used for personal protection on energy isolating devices.
3. Only a Tagger can install / remove his/her personal protection. (If the Tagger is unable to, or fails to, remove their personal protection, the Supervisor can remove the personal protection.)
4. Taggers shall remove their personal protection by the end of their working shift.
5. DO NOT operate an energy isolating device that has personal protection on it.
6. DO NOT operate an energy isolating device unless qualified and authorized to do so.
7. Verify a Zero Energy State before working on machinery.
8. RED personal protection and BLUE project locks are to have ONLY one key.
9. A RED Personal Protection Lock shall ONLY be used for personal protection. It should not be used for any other purposes.
10. A BLUE project lock shall be used ONLY for securing keys in a Lock Box and not be used for any other purposes.
11. Personnel who require personal protection from electrocution shall have positive isolation from all sources of power.
12. Only qualified personnel can install grounds on electrical equipment.
13. Control power or pilot pressure shall not be used for personal protection.
14. Defective energy isolating devices are to be immediately tagged with a Status Tag.
15. A Status Tag is required to identify the condition of equipment or why it cannot to be operated.
16. Do not remove a Status Tag unless authorized to do so.
    Authorization to remove a Status Tag can be given by:
    A) Any Tagger who is continuing the work as stated on the Status Tag.
    B) The Tagger's Supervisor.
    C) The Operating Superintendent or his/her designate in charge of the Equipment or process.
17. A variance to a Zero Energy State Locking and Tagging procedure is only valid in the plant/mine that has developed and approved it.

** See participant manual for all definitions.

5.9 Rule #2

Zero Energy State: ZES 003 / ZES 003R

ZES Rules

Rule #2:

A **Red Personal Protection Tag** is the **ONLY** tag to be used for Personal Protection on energy isolating devices.

Rules

VALE

The rules of the ZES Program support Ontario Regulations and have one goal: to help ensure the safety of workers by reducing stored energy levels to manage risk.

1. One Person – One Lock
2. A RED Personal Protection Tag is the only tag to be used for personal protection on energy isolating devices.
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7. Verify a Zero Energy State before working on machinery.
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    C) The Operating Superintendent or his/her designate in charge of the Equipment or process.
17. A variance to a Zero Energy State Locking and Tagging procedure is only valid in the plant/mine that has developed and approved it.

** See participant manual for all definitions.

5.10 Rule #3:

Zero Energy State: ZES 003 / ZES 003R

ZES Rules

Rule #3:

ONLY a **Tagger** can install or remove their personal protection tag. The only exception is when the tagger has left the property.

ZES Rules

VALE

The rules of the ZES Program support Ontario Regulations and have one goal: to help ensure the safety of workers by reducing stored energy levels to manage risk.

1. One Person – One Lock
2. A RED Personal Protection Tag is the only tag to be used for personal protection on energy isolating devices.
3. Only a Tagger can install / remove his/her personal protection. (If the Tagger is unable to, or fails to, remove their personal protection, the Supervisor can remove the personal protection.)
4. Taggers shall remove their personal protection by the end of their working shift.
5. DO NOT operate an energy isolating device that has personal protection on it.
6. DO NOT operate an energy isolating device unless qualified and authorized to do so.
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13. Control power or pilot pressure shall not be used for personal protection.
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15. A Status Tag is required to identify the condition of equipment or why it cannot to be operated.
16. Do not remove a Status Tag unless authorized to do so.
    Authorization to remove a Status Tag can be given by:
    A) Any Tagger who is continuing the work as stated on the Status Tag.
    B) The Tagger's Supervisor.
    C) The Operating Superintendent or his/her designate in charge of the Equipment or process.
17. A variance to a Zero Energy State Locking and Tagging procedure is only valid in the plant/mine that has developed and approved it.

** See participant manual for all definitions.

5.11 Rule #4:

Zero Energy State: ZES 003 / ZES 003R

ZES Rules

Rule #4:

Tagger's **SHALL** remove their Personal Protection Tags by the **END** of their shift.

Rules

VALE

The rules of the ZES Program support Ontario Regulations and have one goal: to help ensure the safety of workers by reducing stored energy levels to manage risk.

1. One Person – One Lock
2. A RED Personal Protection Tag is the only tag to be used for personal protection on energy isolating devices.
3. Only a Tagger can install / remove his/her personal protection. (If the Tagger is unable to, or fails to, remove their personal protection, the Supervisor can remove the personal protection.)
4. Taggers shall remove their personal protection by the end of their working shift.
5. DO NOT operate an energy isolating device that has personal protection on it.
6. DO NOT operate an energy isolating device unless qualified and authorized to do so.
7. Verify a Zero Energy State before working on machinery.
8. RED personal protection and BLUE project locks are to have ONLY one key.
9. A RED Personal Protection Lock shall ONLY be used for personal protection. It should not be used for any other purposes.
10. A BLUE project lock shall be used ONLY for securing keys in a Lock Box and not be used for any other purposes.
11. Personnel who require personal protection from electrocution shall have positive isolation from all sources of power.
12. Only qualified personnel can install grounds on electrical equipment.
13. Control power or pilot pressure shall not be used for personal protection.
14. Defective energy isolating devices are to be immediately tagged with a Status Tag.
15. A Status Tag is required to identify the condition of equipment or why it cannot to be operated.
16. Do not remove a Status Tag unless authorized to do so.
    Authorization to remove a Status Tag can be given by:
    A) Any Tagger who is continuing the work as stated on the Status Tag.
    B) The Tagger's Supervisor.
    C) The Operating Superintendent or his/her designate in charge of the Equipment or process.
17. A variance to a Zero Energy State Locking and Tagging procedure is only valid in the plant/mine that has developed and approved it.

** See participant manual for all definitions.

5.12 Rule #5:

Zero Energy State: ZES 003 / ZES 003R

ZES Rules

Rule #5:

DO NOT OPERATE AN energy isolating device that has personal protection on it.

Rules

VALE

The rules of the ZES Program support Ontario Regulations and have one goal: to help ensure the safety of workers by reducing stored energy levels to manage risk.

1. One Person – One Lock
2. A RED Personal Protection Tag is the only tag to be used for personal protection on energy isolating devices.
3. Only a Tagger can install / remove his/her personal protection. (If the Tagger is unable to, or fails to, remove their personal protection, the Supervisor can remove the personal protection.)
4. Taggers shall remove their personal protection by the end of their working shift.
5. DO NOT operate an energy isolating device that has personal protection on it.
6. DO NOT operate an energy isolating device unless qualified and authorized to do so.
7. Verify a Zero Energy State before working on machinery.
8. RED personal protection and BLUE project locks are to have ONLY one key.
9. A RED Personal Protection Lock shall ONLY be used for personal protection. It should not be used for any other purposes.
10. A BLUE project lock shall be used ONLY for securing keys in a Lock Box and not be used for any other purposes.
11. Personnel who require personal protection from electrocution shall have positive isolation from all sources of power.
12. Only qualified personnel can install grounds on electrical equipment.
13. Control power or pilot pressure shall not be used for personal protection.
14. Defective energy isolating devices are to be immediately tagged with a Status Tag.
15. A Status Tag is required to identify the condition of equipment or why it cannot to be operated.
16. Do not remove a Status Tag unless authorized to do so.
    Authorization to remove a Status Tag can be given by:
    A) Any Tagger who is continuing the work as stated on the Status Tag.
    B) The Tagger's Supervisor.
    C) The Operating Superintendent or his/her designate in charge of the Equipment or process.
17. A variance to a Zero Energy State Locking and Tagging procedure is only valid in the plant/mine that has developed and approved it.

** See participant manual for all definitions.

5.13 Rule #11:

Zero Energy State: ZES 003 / ZES 003R

ZES Rules

Rule #11:

IEO's need to be aware of the following ZES Rules affecting tagger's:

Personnel who require personal protection from electrocution shall have positive isolation from all sources of power.

ZES Rules

VALE

The rules of the ZES Program support Ontario Regulations and have one goal: to help ensure the safety of workers by reducing stored energy levels to manage risk.

1. One Person – One Lock
2. A RED Personal Protection Tag is the only tag to be used for personal protection on energy isolating devices.
3. Only a Tagger can install / remove his/her personal protection. (If the Tagger is unable to, or fails to, remove their personal protection, the Supervisor can remove the personal protection.)
4. Taggers shall remove their personal protection by the end of their working shift.
5. DO NOT operate an energy isolating device that has personal protection on it.
6. DO NOT operate an energy isolating device unless qualified and authorized to do so.
7. Verify a Zero Energy State before working on machinery.
8. RED personal protection and BLUE project locks are to have ONLY one key.
9. A RED Personal Protection Lock shall ONLY be used for personal protection. It should not be used for any other purposes.
10. A BLUE project lock shall be used ONLY for securing keys in a Lock Box and not be used for any other purposes.
11. Personnel who require personal protection from electrocution shall have positive isolation from all sources of power.
12. Only qualified personnel can install grounds on electrical equipment.
13. Control power or pilot pressure shall not be used for personal protection.
14. Defective energy isolating devices are to be immediately tagged with a Status Tag.
15. A Status Tag is required to identify the condition of equipment or why it cannot to be operated.
16. Do not remove a Status Tag unless authorized to do so.
    Authorization to remove a Status Tag can be given by:
    A) Any Tagger who is continuing the work as stated on the Status Tag.
    B) The Tagger's Supervisor.
    C) The Operating Superintendent or his/her designate in charge of the Equipment or process.
17. A variance to a Zero Energy State Locking and Tagging procedure is only valid in the plant/mine that has developed and approved it.

** See participant manual for all definitions.

5.14 Rule #13:

Zero Energy State: ZES 003 / ZES 003R

ZES Rules

Rule #13:

IEO's need to be aware of the following ZES Rules affecting tagger's:

Control Power or Pilot Pressure **shall NOT** be used for personal protection.

Exception: If Control power or pilot pressure must be used, the Variance procedure must be followed, and an approved procedure must be in place.

Example; some mines are locking out a PLC which controls the power to the mine hoist, this type of lockout is becoming more prevalent as technology evolves.

Rules

VALE

The rules of the ZES Program support Ontario Regulations and have one goal: to help ensure the safety of workers by reducing stored energy levels to manage risk.

1. One Person – One Lock
2. A RED Personal Protection Tag is the only tag to be used for personal protection on energy isolating devices.
3. Only a Tagger can install / remove his/her personal protection. (If the Tagger is unable to, or fails to, remove their personal protection, the Supervisor can remove the personal protection.)
4. Taggers shall remove their personal protection by the end of their working shift.
5. DO NOT operate an energy isolating device that has personal protection on it.
6. DO NOT operate an energy isolating device unless qualified and authorized to do so.
7. Verify a Zero Energy State before working on machinery.
8. RED personal protection and BLUE project locks are to have ONLY one key.
9. A RED Personal Protection Lock shall ONLY be used for personal protection. It should not be used for any other purposes.
10. A BLUE project lock shall be used ONLY for securing keys in a Lock Box and not be used for any other purposes.
11. Personnel who require personal protection from electrocution shall have positive isolation from all sources of power.
12. Only qualified personnel can install grounds on electrical equipment.
13. Control power or pilot pressure shall not be used for personal protection.
14. Defective energy isolating devices are to be immediately tagged with a Status Tag.
15. A Status Tag is required to identify the condition of equipment or why it cannot to be operated.
16. Do not remove a Status Tag unless authorized to do so.
    Authorization to remove a Status Tag can be given by:
    A) Any Tagger who is continuing the work as stated on the Status Tag.
    B) The Tagger's Supervisor.
    C) The Operating Superintendent or his/her designate in charge of the Equipment or process.
17. A variance to a Zero Energy State Locking and Tagging procedure is only valid in the plant/mine that has developed and approved it.

** See participant manual for all definitions.

5.15 Who Can Remove a Personal Protection Lock?

Zero Energy State: ZES 003 / ZES 003R

Who Can Remove a Personal Protection Lock?

Personal Protection Locks can only be removed by:

- The tagger who installed it, or
- The Supervisor under the direction of the Superintendent of the tagger's department if the tagger has left the property.

5.16 Project Personal Protection Tag

Zero Energy State: ZES 003 / ZES 003R

Project Personal Protection Tag

When using a lockbox, the tags that are normally used to tag the equipment in the field for "personal protection" are also used for project personal protection.

When the project box is checked off, the tag is used as a **project** personal protection tag and is associated with a project and a lock box protected by a single keyed **BLUE** project lock.

Designated Tagger NOTE:

- The Designated Tagger is NOT personally protected by the project personal protection.
- If the designated tagger is required to work on the project, they are required to apply their own personal protection tag on the lock box.

5.17 Status Tag

Zero Energy State: ZES 003 / ZES 003R

Status Tag

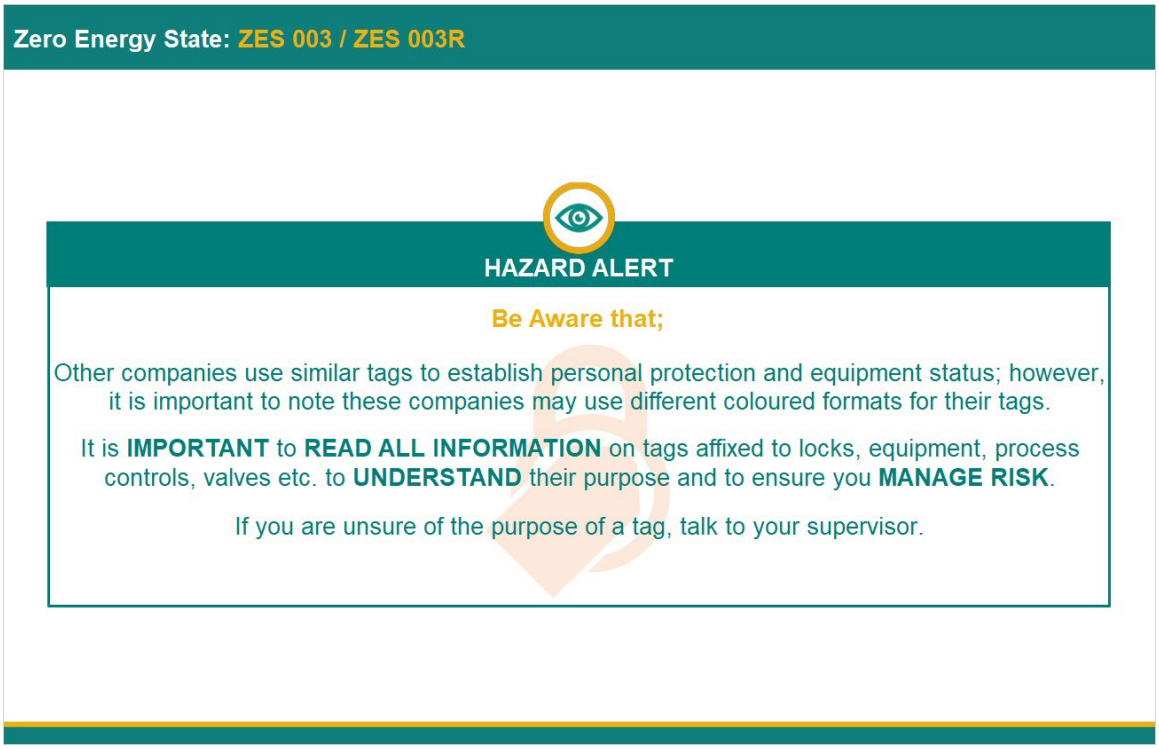
The Status Tag is an approved white tag used to protect equipment and identify why an energy isolating device may not be operated.

Under NO CIRCUMSTANCES is it to be used for Personal Protection.

Status Tags can only be removed by:

- Any tagger continuing the work stated on the status tag,
- The tagger's supervisor,
- The operating superintendent or his/her designate in charge of the equipment or process.

5.18 HAZARD ALERT



5.19 What is a Lock Box?

Zero Energy State: ZES 003 / ZES 003R

What is a Lock Box?

A lock box is a lockable device with provision to secure, see, and count keys and also to hold forms that can be used in two basic applications:

1. By a Designated Tagger to secure keys and hold the lock box form or;
2. By a Local Tagger to secure the remote tagging form and hold the lock box form.

Please Note:
No one is permitted to participate in the generation or management of Lock Boxes *unless they have successfully completed* the ZES003.3-Designated Tagger Program.

5.20 Why use a Lock Box?

Zero Energy State: ZES 003 / ZES 003R

Why use a Lock Box?

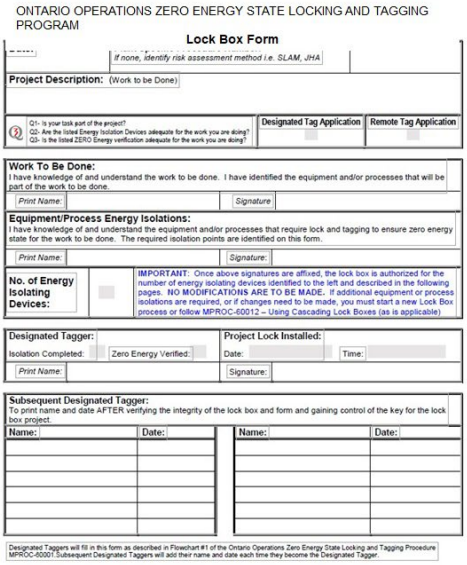
A lock box is used:

- When it isn't practical to use multiple piggy-backed lock extenders.
- When there are multiple isolating devices to tag.
- Where multiple people are participating in a project.
- To minimize the amount of people going into a high risk area.
- To provide a written record that the equipment has been brought to **ZERO** Energy State by the **IEO (Isolation Equipment Operator).**
- To tag out ahead of time as some areas may need to be locked and tagged earlier than others.
- For other tasks associated with the ZES Program (i.e. Cascading).

5.21 Lock Box Form

Zero Energy State: ZES 003 / ZES 003R

Lock Box Form



ONTARIO OPERATIONS ZERO ENERGY STATE LOCKING AND TAGGING PROGRAM

Lock Box Form

If none, identify risk assessment method i.e. SLAM, JHA

Project Description: (Work to be Done)

	Designated Tag Application	Remote Tag Application
Q1- Is your task part of the project? Q2- Are the listed Energy Isolation Devices adequate for the work you are doing? Q3- Is the listed ZERO Energy verification adequate for the work you are doing?		

Work To Be Done:
I have knowledge of and understand the work to be done. I have identified the equipment and/or processes that will be part of the work to be done.

Print Name: Signature:

Equipment/Process Energy Isolations:
I have knowledge of and understand the equipment and/or processes that require lock and tagging to ensure zero energy state for the work to be done. The required isolation points are identified on this form.

Print Name: Signature:

No. of Energy Isolating Devices:

IMPORTANT: Once above signatures are affixed, the lock box is authorized for the number of energy isolating devices identified to the left and described in the following pages. NO MODIFICATIONS ARE TO BE MADE. If additional equipment or process isolations are required, or if changes need to be made, you must start a new Lock Box process or follow MPROC-60012 – Using Cascading Lock Boxes (as is applicable)

Designated Tagger:
Isolation Completed: Zero Energy Verified:

Project Lock Installed:
Date: Time:

Print Name: Signature:

Subsequent Designated Tagger:
To print name and date AFTER verifying the integrity of the lock box and form and gaining control of the key for the lock box project.

Name:	Date:	Name:	Date:

Designated Taggers will fill in this form as described in Flowchart #1 of the Ontario Operations Zero Energy State Locking and Tagging Procedure MPROC-60001.Subsequent Designated Taggers will add their name and date each time they become the Designated Tagger.

Lock box forms communicate the work involved in the project and the steps taken to make the equipment safe.

Each tagger confirms that certain steps have taken place and the equipment is safe by validating against this form.

Are pre-populated lockbox forms an accepted practice?

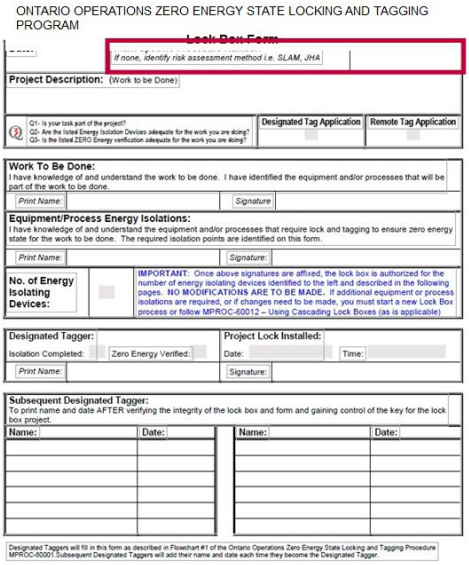
The intent of the program is to have all parties get together each time and evaluate the scenario based on their risk assessment or job procedure.

There are plants that have created pre-populated forms; they need to manage the maintenance and upkeep of those forms as they apply to the processes they cover.

5.22 Risk assessment of the locking and tagging using existing tools:

Zero Energy State: ZES 003 / ZES 003R

Lock Box Form



ONTARIO OPERATIONS ZERO ENERGY STATE LOCKING AND TAGGING PROGRAM

Lock Box Form

If none, identify risk assessment method i.e. SLAM, JHA

Project Description: (Work to be Done)

Q1- Is your task part of the project?
Q2- Are the listed Energy Isolation Devices adequate for the work you are doing?
Q3- Is the listed ZERO Energy verification adequate for the work you are doing?

Designated Tag Application | Remote Tag Application

Work To Be Done:
I have knowledge of and understand the work to be done. I have identified the equipment and/or processes that will be part of the work to be done.

Print Name: | Signature:

Equipment/Process Energy Isolations:
I have knowledge of and understand the equipment and/or processes that require lock and tagging to ensure zero energy state for the work to be done. The required isolation points are identified on this form.

Print Name: | Signature:

No. of Energy Isolating Devices:

IMPORTANT: Once above signatures are affixed, the lock box is authorized for the number of energy isolating devices identified to the left and described in the following pages. NO MODIFICATIONS ARE TO BE MADE. If additional equipment or process isolations are required, or if changes need to be made, you must start a new Lock Box process or follow MPROC-60012 – Using Cascading Lock Boxes (as is applicable)

Designated Tagger:
Isolation Completed: | Zero Energy Verified:

Project Lock Installed:
Date: | Time:

Print Name: | Signature:

Subsequent Designated Tagger:
To print name and date AFTER verifying the integrity of the lock box and form and gaining control of the key for the lock box project.

Name:	Date:	Name:	Date:

Designated Taggers will fill in this form as described in Flowchart #1 of the Ontario Operations Zero Energy State Locking and Tagging Procedure MPROC-60001.Subsequent Designated Taggers will add their name and date each time they become the Designated Tagger.

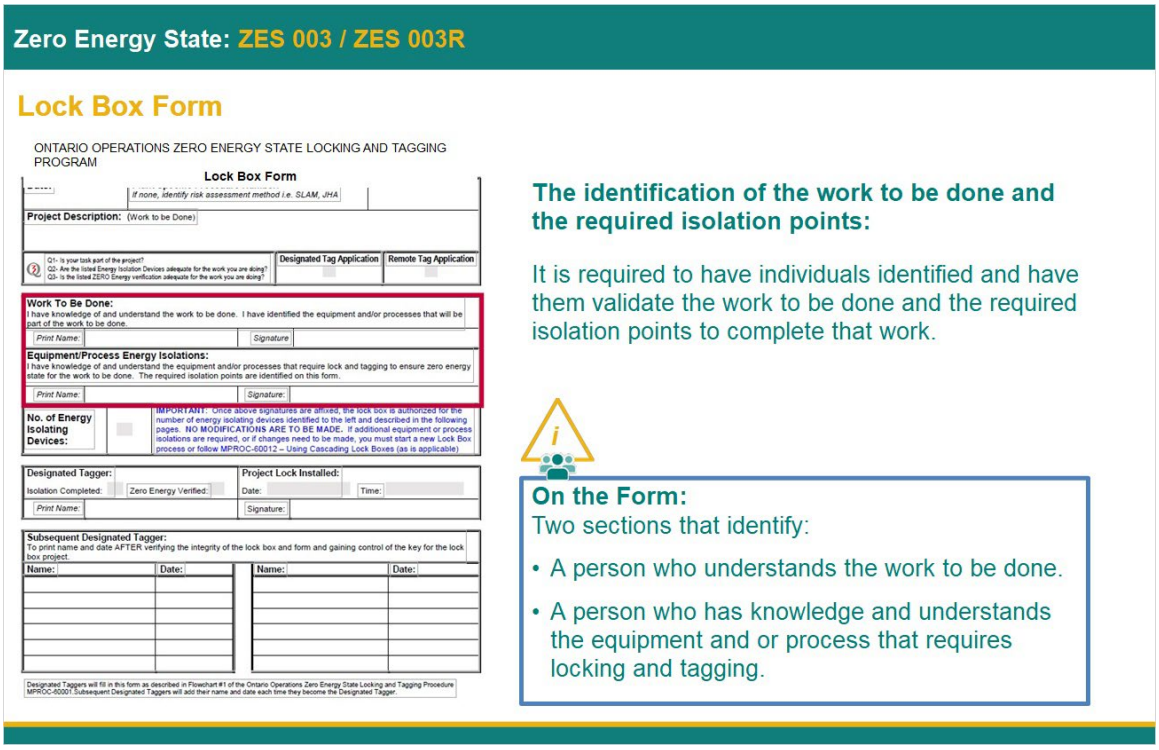
Risk assessment of the locking and tagging using existing tools:

If there is no procedure to do the isolation work, a risk assessment must be completed.

A field level risk assessment such as a Slam, or in the case of abnormal or non-routine tasks, a JHA, shall be performed.

On the Form:
A prompt for conducting a risk assessment has been added if there is no written procedure.

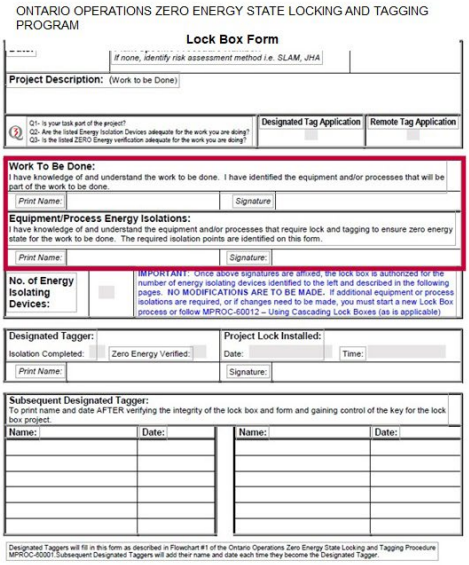
5.23 The identification of the work to be done and the required isolation points:



5.24 Lock Box Form

Zero Energy State: ZES 003 / ZES 003R

Lock Box Form



ONTARIO OPERATIONS ZERO ENERGY STATE LOCKING AND TAGGING PROGRAM

Lock Box Form

If none, identify risk assessment method i.e. SLAM, JHA

Project Description: (Work to be Done)

Q1- Is your task part of the project?
Q2- Are the listed Energy Isolation Devices adequate for the work you are doing?
Q3- Is the listed ZERO Energy verification adequate for the work you are doing?

Designated Tag Application	Remote Tag Application

Work To Be Done:
I have knowledge of and understand the work to be done. I have identified the equipment and/or processes that will be part of the work to be done.

Print Name: Signature:

Equipment/Process Energy Isolations:
I have knowledge of and understand the equipment and/or processes that require lock and tagging to ensure zero energy state for the work to be done. The required isolation points are identified on this form.

Print Name: Signature:

No. of Energy Isolating Devices:

IMPORTANT: Once above signatures are affixed, the lock box is authorized for the number of energy isolating devices identified to the left and described in the following pages. **NO MODIFICATIONS ARE TO BE MADE.** If additional equipment or process isolations are required, or if changes need to be made, you must start a new Lock Box process or follow MPROC-60012 – Using Cascading Lock Boxes (as is applicable)

Designated Tagger:
Isolation Completed: Zero Energy Verified:
Print Name: Signature:

Project Lock Installed:
Date: Time:

Subsequent Designated Tagger:
To print name and date AFTER verifying the integrity of the lock box and form and gaining control of the key for the lock box project.

Name:	Date:	Name:	Date:

Designated Taggers will fill in this form as described in Flowchart #1 of the Ontario Operations Zero Energy State Locking and Tagging Procedure MPROC-60001.Subsequent Designated Taggers will add their name and date each time they become the Designated Tagger.

The identification of the work to be done and the required isolation points:

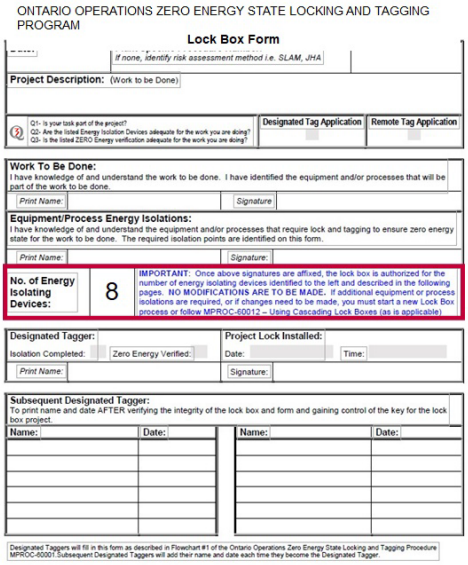
These sections can be completed by a trades person, operator, designated tagger, planner, supervisor, etc, depending on the complexity and type of the work.

On the Form:
This role can be the same person, or separate persons, depending on the situation.

5.25 The recording of isolation points:

Zero Energy State: ZES 003 / ZES 003R

Lock Box Form



ONTARIO OPERATIONS ZERO ENERGY STATE LOCKING AND TAGGING PROGRAM

Lock Box Form

If none, identify risk assessment method i.e. SLAM, JHA

Project Description: (Work to be Done)

Q1- Is your task part of the project?
Q2- Are the listed Energy Isolation Devices adequate for the work you are doing?
Q3- Is the listed ZERO Energy verification adequate for the work you are doing?

	Designated Tag Application	Remote Tag Application
②		

Work To Be Done:
I have knowledge of and understand the work to be done. I have identified the equipment and/or processes that will be part of the work to be done.

Print Name: | Signature:

Equipment/Process Energy Isolations:
I have knowledge of and understand the equipment and/or processes that require lock and tagging to ensure zero energy state for the work to be done. The required isolation points are identified on this form.

Print Name: | Signature:

No. of Energy Isolating Devices:	8	IMPORTANT: Once above signatures are affixed, the lock box is authorized for the number of energy isolating devices identified to the left and described in the following pages. NO MODIFICATIONS ARE TO BE MADE. If additional equipment or process isolations are required, or if changes need to be made, you must start a new Lock Box process or follow MPROC-60012 – Using Cascading Lock Boxes (as is applicable)

Designated Tagger:
Isolation Completed: | Zero Energy Verified:

Project Lock Installed:
Date: | Time:

Print Name: | Signature:

Subsequent Designated Tagger:
To print name and date AFTER verifying the integrity of the lock box and form and gaining control of the key for the lock box project.

Name:	Date:	Name:	Date:

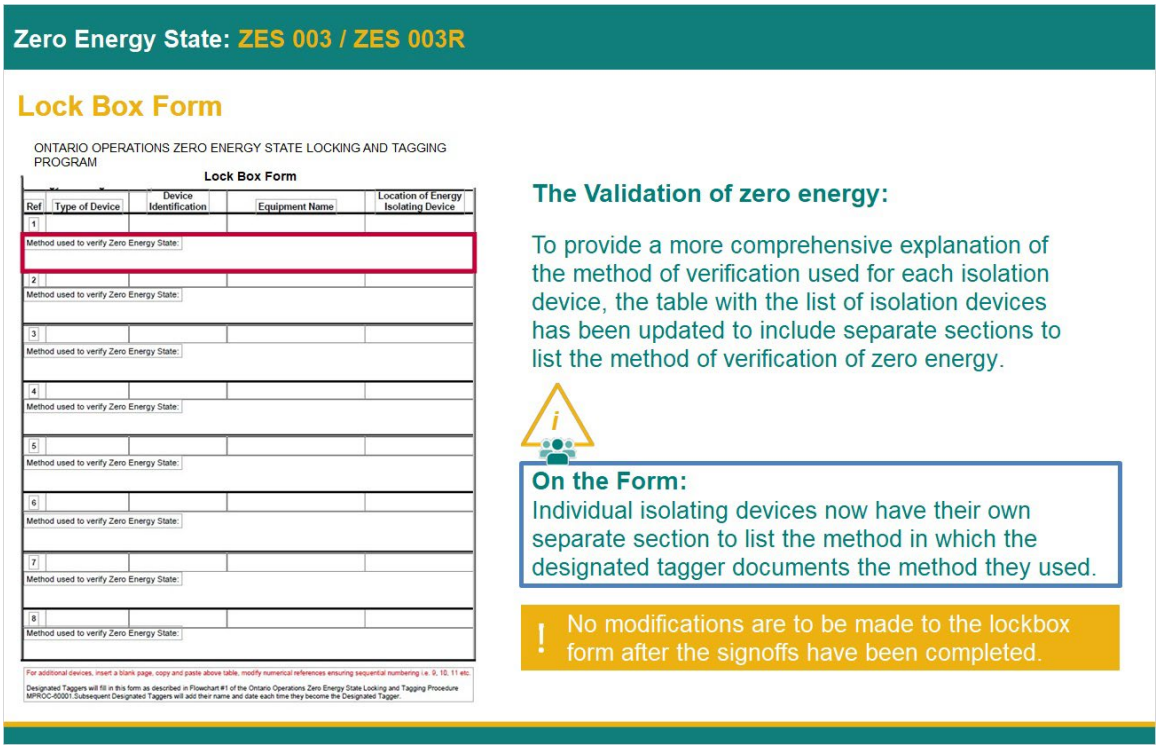
Designated Taggers will fill in this form as described in Flowchart #1 of the Ontario Operations Zero Energy State Locking and Tagging Procedure MPROC-60001.Subsequent Designated Taggers will add their name and date each time they become the Designated Tagger.

The recording of isolation points:

To ensure we execute the work as planned a section has been added to identify the number of isolation points.

On the Form:
A section that identifies the number of isolation points, along with a reminder to everyone that no modifications are to be made.

5.26 The Validation of zero energy:



5.27 How Do You Determine If You Are A Protected Worker?

Zero Energy State: ZES 003 / ZES 003R

Lock Box Form

How Do You Determine If You Are A Protected Worker?

Start by asking yourself the following three questions.

Question 1: Is my task part of the project as listed on the lock box form?

Question 2: Are the energy isolation devices as listed on the lock box form adequate for the work you are doing?

Question 3: Is the zero energy verification as listed on the lock box form adequate for the work you are doing?

Q1- Is your task part of the project?
Q2- Are the listed Energy Isolation Devices adequate for the work you are doing?
Q3- Is the listed ZERO Energy verification adequate for the work you are doing?

5.28 How Do You Determine If You Are A Protected Worker?

Zero Energy State: ZES 003 / ZES 003R

Lock Box Form

How Do You Determine If You Are A Protected Worker?

*If the answer is **yes** to all 3 questions*:

Install your red personal protection lock and tag on the lock box. You are now a ***protected worker*** and can start the job.

Q1- Is your task part of the project?
Q2- Are the listed Energy Isolation Devices adequate for the work you are doing?
Q3- Is the listed ZERO Energy verification adequate for the work you are doing?

5.29 How Do You Determine If You Are A Protected Worker?

Zero Energy State: ZES 003 / ZES 003R

Lock Box Form

How Do You Determine If You Are A Protected Worker?

*If the answer is **no** to any of the 3 questions:*

You ***cannot*** use this lock box.

Individual personal protection is required on isolation devices.

Q1- Is your task part of the project?
Q2- Are the listed Energy Isolation Devices adequate for the work you are doing?
Q3- Is the listed ZERO Energy verification adequate for the work you are doing?

5.30 Locking Devices

Zero Energy State: ZES 003 / ZES 003R

Locking Devices

Shown here are examples of lockout - tagout devices available from suppliers.

I.M. #4490345 Unsafe Condition:

A cable locking device was found to be slightly loose on a hydraulic unit valves. There was potential for some movement of the valves. There was an escalation to resolve the issue.

The lock out was improved to eliminate any potential movement of the valves. Immediate Actions: lock box was redone and 4 lock extenders were used to ensure the 4 valves could not be moved.

5.31 Cascaded Lockboxes

Zero Energy State: ZES 003 / ZES 003R

Cascaded Lock Boxes

Upon completion of this section of the module you will be able to;

- Understand the purpose of Cascading Lock Boxes for Personal Protection.
- Recognize elements of a Cascaded Lock Box.
- Recognize the three applications of a Cascaded Lock Box.
- Know how to go about receiving further training to work with Cascaded Lock Boxes.

5.32 Applications for Cascading Lock Boxes

Zero Energy State: ZES 003 / ZES 003R

Cascaded Lock Boxes

Applications for Cascading Lock Boxes

Another Training Module specifically designed for Designated Taggers includes detailed instruction for how to setup a Cascaded Lock Box.

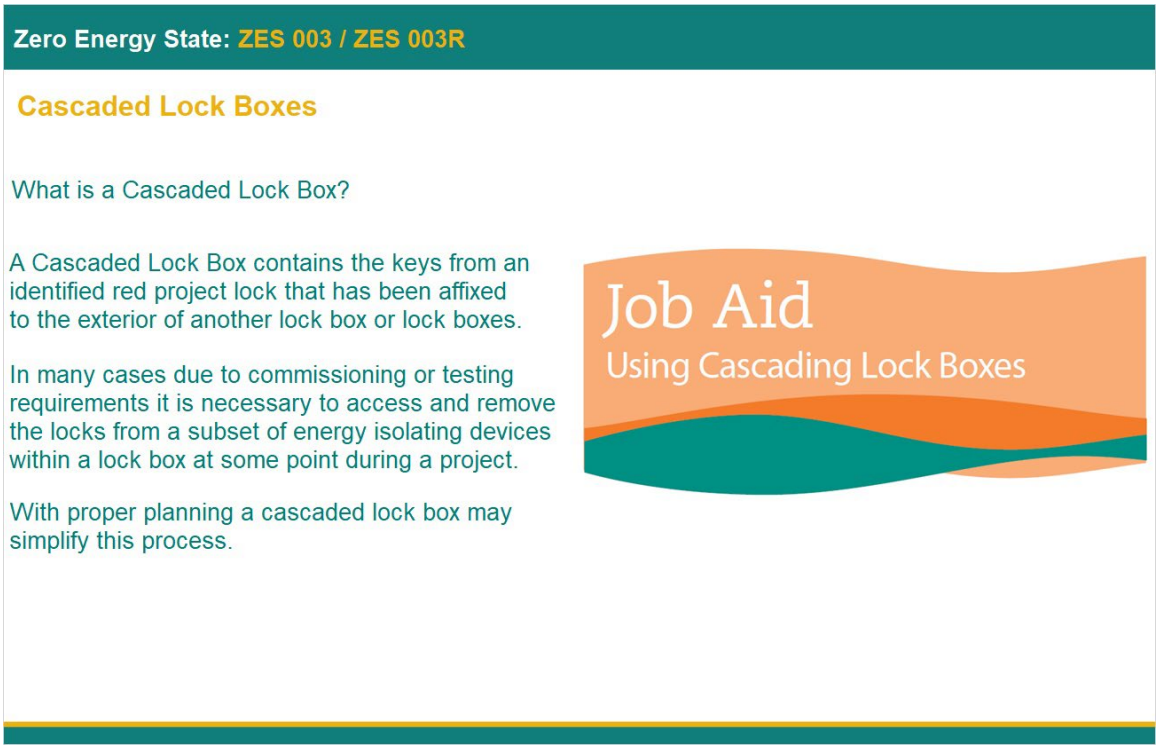
The objective in this module is to simply understand that beyond the scope of regular Lock Boxes, there are additional possibilities for locking and tagging.

In the case of Cascaded Lock Boxes, there are three possible applications.

Step by step instructions for cascading lockboxes are also provided on the job aid form.

! No one is permitted to participate in the generation or management of Lock Boxes unless they have successfully completed the Vale Designated Tagger Program (ZES003.3).

5.33 What is a Cascaded Lock Box?



5.34 How Do I use a Cascaded Lock Box?

Zero Energy State: ZES 003 / ZES 003R

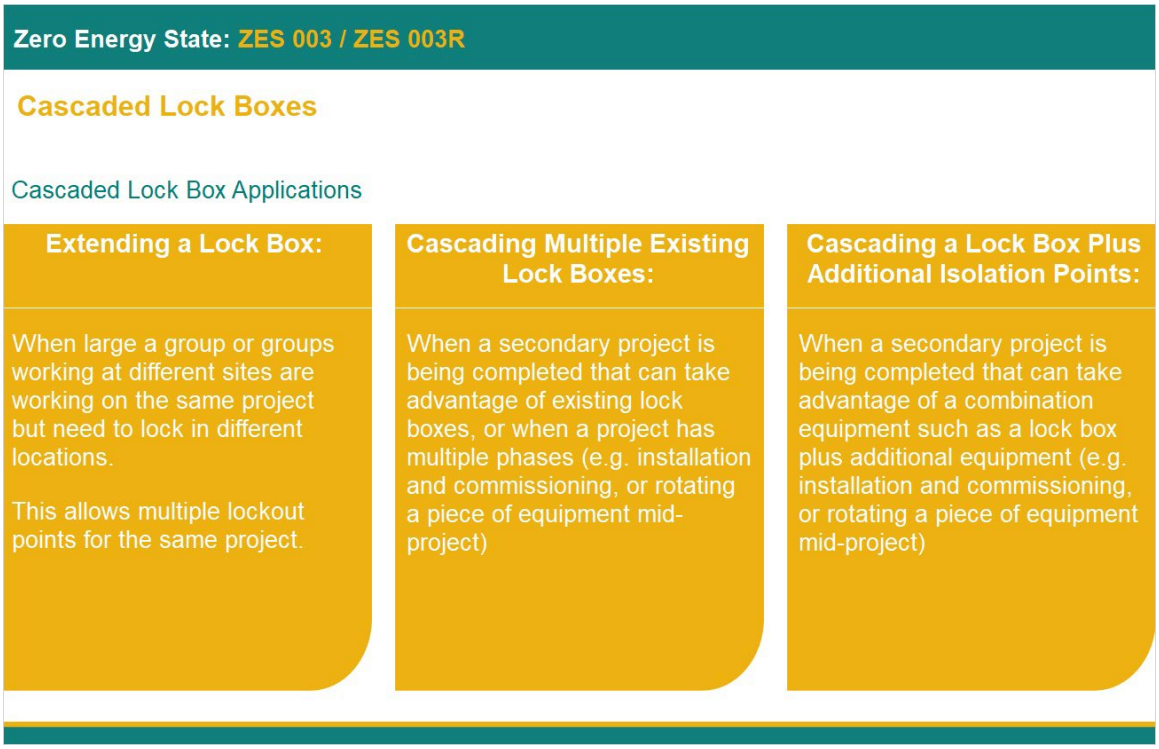
Cascaded Lock Boxes

How Do I use a Cascaded Lock Box?

Any Tagger using a Cascaded lockbox is accountable for:

- Ensuring that they are working on the same project as on the Cascaded lock box form.
- Installing their personal protection on the correct Cascaded lock box.
- Removing their personal protection at the end of the shift.
- Communicating the status of the equipment to the designated Tagger.
- If work is incomplete ensure a status tag is installed.

5.35 Cascaded Lock Box Applications



5.36 Cascaded Lock Box Applications

Zero Energy State: ZES 003 / ZES 003R

Cascaded Lock Boxes

Cascaded Lock Box Applications

All lock boxes, both regular and cascaded shall be secured with a blue lock by a designated tagger(s).

The keys to the blue lock must be secured by the designated tagger(s) and shall not be placed inside another lock box.

If a key to a blue lock changes hands to a subsequent designated tagger, the lock box form for that lock box (and that lock box only) shall record the name of the subsequent designated tagger, regardless, of whether the lock box is cascaded or not.

5.37 Other Tags Used by Electrical Tradespeople

Zero Energy State: ZES 003 / ZES 003R

Other Tags Used by Electrical Tradespeople

The Power Department has several specific tags that *only* they use:

These tags should not be removed unless authorized by the Power Department power system operator.

5.38 Other Tags Used by Electrical Tradespeople

Zero Energy State: ZES 003 / ZES 003R

Other Tags Used by Electrical Tradespeople

The Power Department has several specific tags that *only* they use:

DO NOT OPERATE TAG
Re-usable information tag stating authorization from the System Operator must be obtained before removing tag or operating of the device.

5.39 Other Tags Used by Electrical Tradespeople

Zero Energy State: ZES 003 / ZES 003R

Other Tags Used by Electrical Tradespeople

The Power Department has several specific tags that *only* they use:

HOLD OFF TAG
Affixed by a linesman or P&C technician but issued by the Systems Operator. It is hung on fused disconnects or breaker control handles to prevent individuals from reclosing a tripped device.

5.40 Other Tags Used by Electrical Tradespeople

Zero Energy State: ZES 003 / ZES 003R

Other Tags Used by Electrical Tradespeople

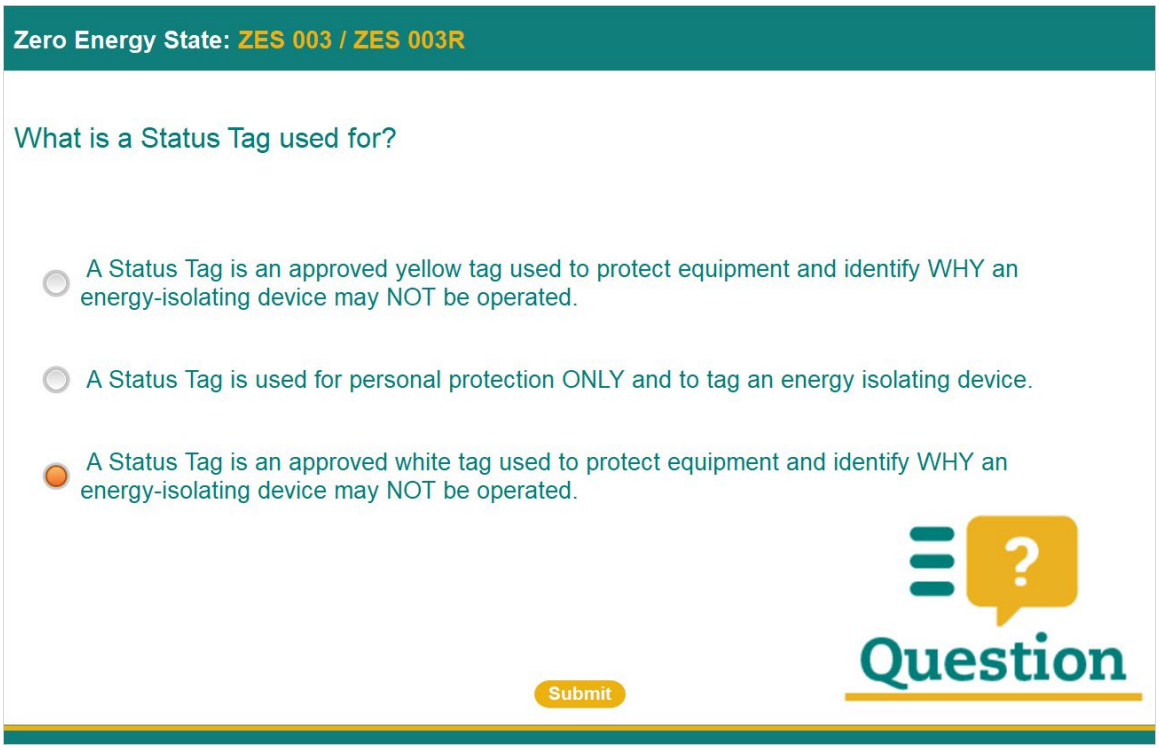
The Power Department has several specific tags that *only* they use:

STATION GUARANTEE TAG
A white, reusable numbered tag used by Power Department to identify the fact that a certain device is being used to protect a person or group of persons while working on or near equipment.

5.41 Other Tags Used by Electrical Tradespeople

5.42 Question 1

(Multiple Choice, 10 points, unlimited attempts permitted)



Correct	Choice
	A Status Tag is an approved yellow tag used to protect equipment and identify WHY an energy-isolating device may NOT be operated.
	A Status Tag is used for personal protection ONLY and to tag an energy isolating device.
X	A Status Tag is an approved white tag used to protect equipment and identify WHY an energy-isolating device may NOT be operated.

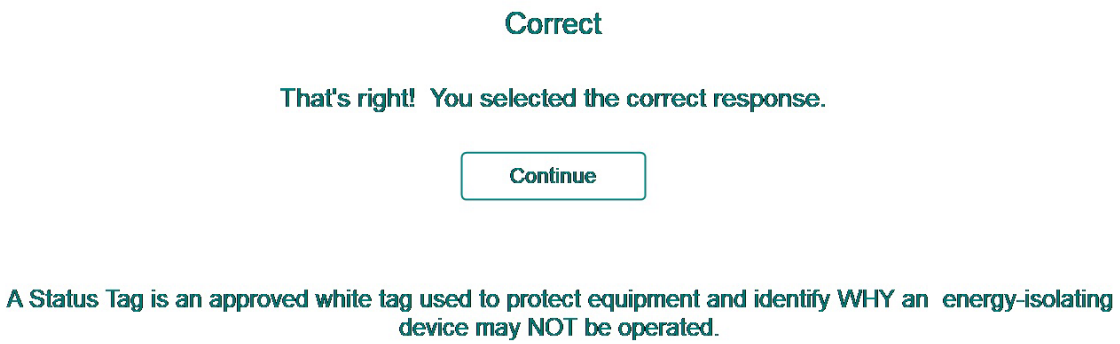
Feedback when correct:

That's right! You selected the correct response.

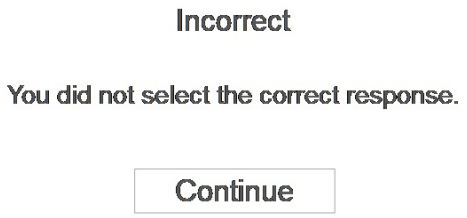
Feedback when incorrect:

You did not select the correct response.

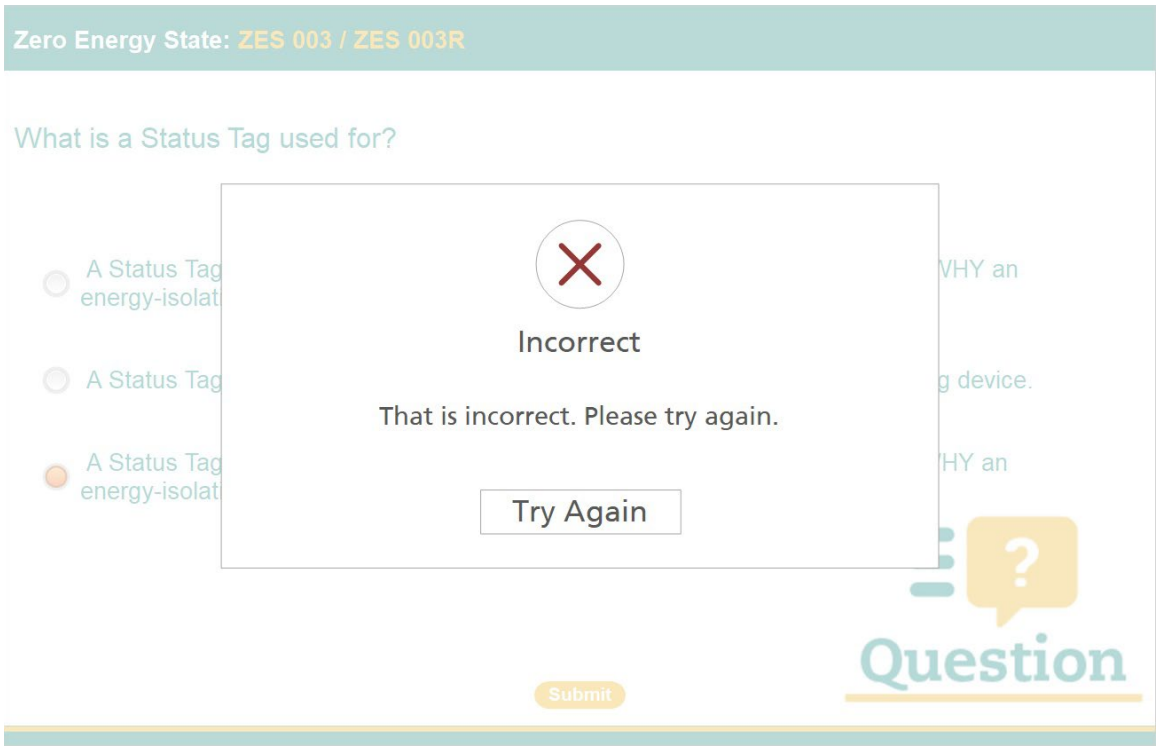
Correct (Slide Layer)



Incorrect (Slide Layer)

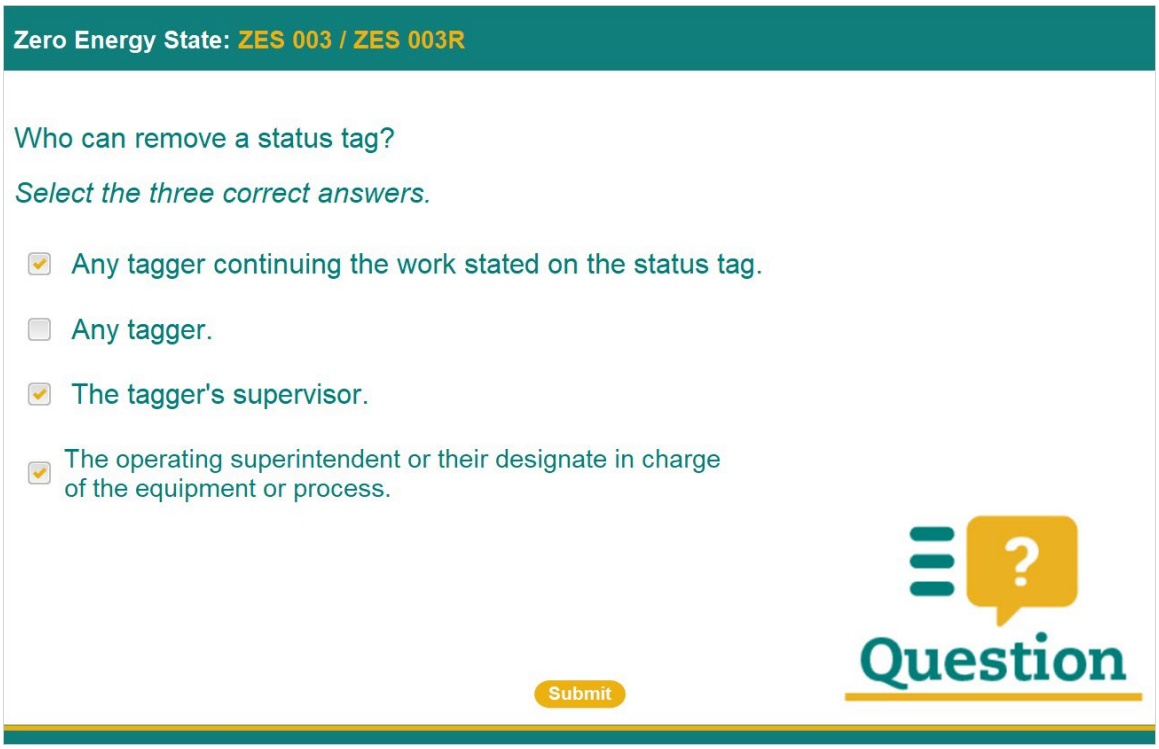


Try Again (Slide Layer)



5.43 Question 2

(Multiple Response, 10 points, unlimited attempts permitted)



Correct	Choice
X	Any tagger continuing the work stated on the status tag.
	Any tagger.
X	The tagger's supervisor.
X	The operating superintendent or their designate in charge of the equipment or process.

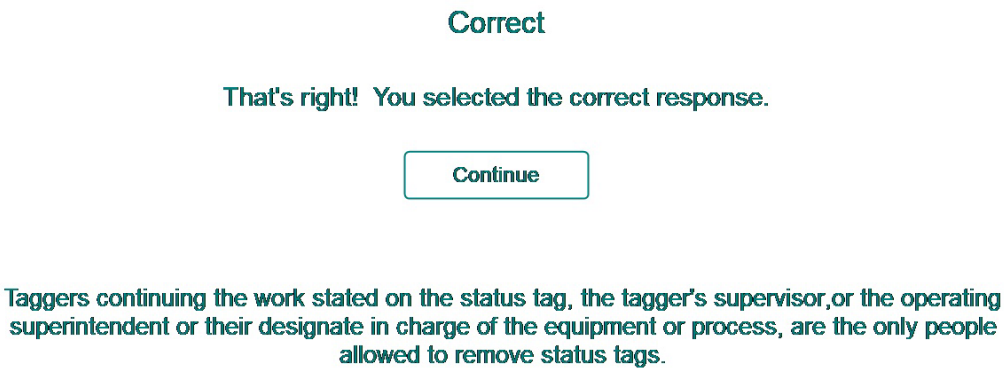
Feedback when correct:

That's right! You selected the correct response.

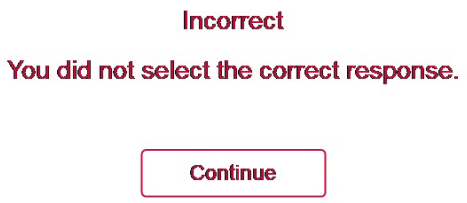
Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)



Incorrect (Slide Layer)



Try Again (Slide Layer)

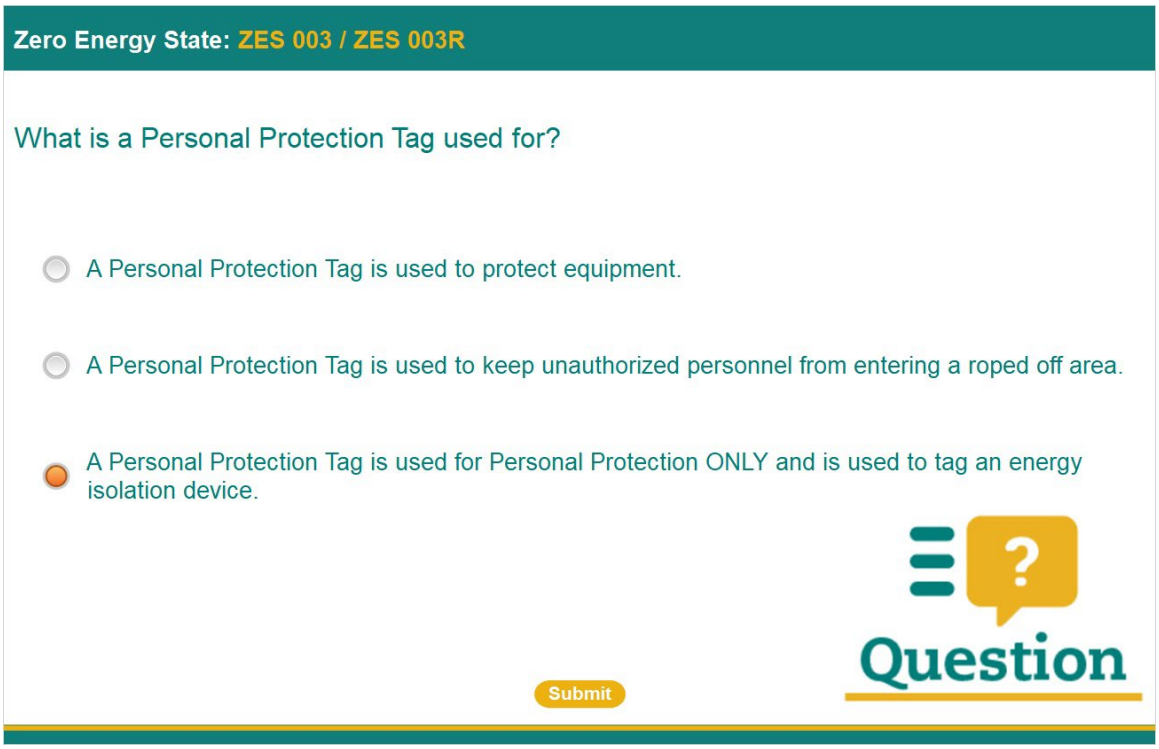
Incorrect

That is incorrect. Please try again.

Try Again

5.44 Question 3

(Multiple Choice, 10 points, unlimited attempts permitted)



Correct	Choice
	A Personal Protection Tag is used to protect equipment.
	A Personal Protection Tag is used to keep unauthorized personnel from entering a roped off area.
X	A Personal Protection Tag is used for Personal Protection ONLY and is used to tag an energy isolation device.

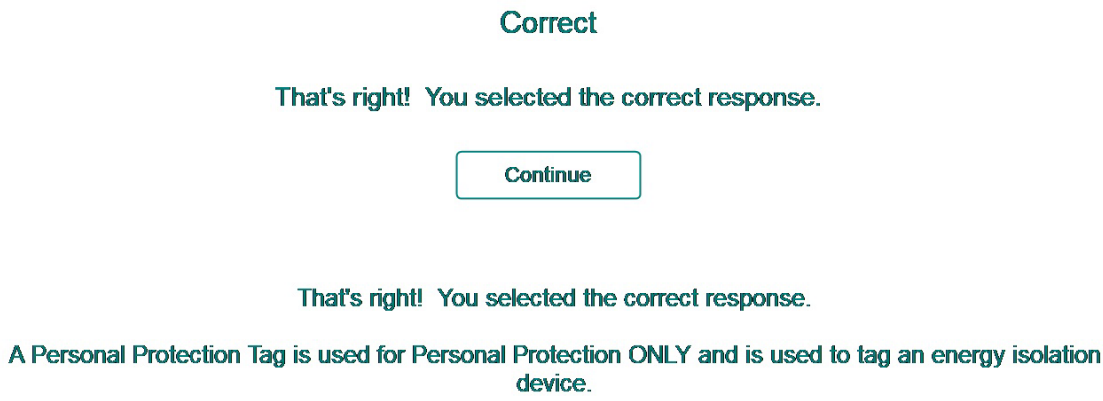
Feedback when correct:

That's right! You selected the correct response.

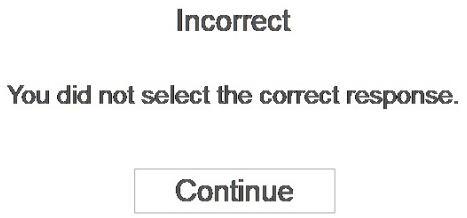
Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)



Incorrect (Slide Layer)



Try Again (Slide Layer)

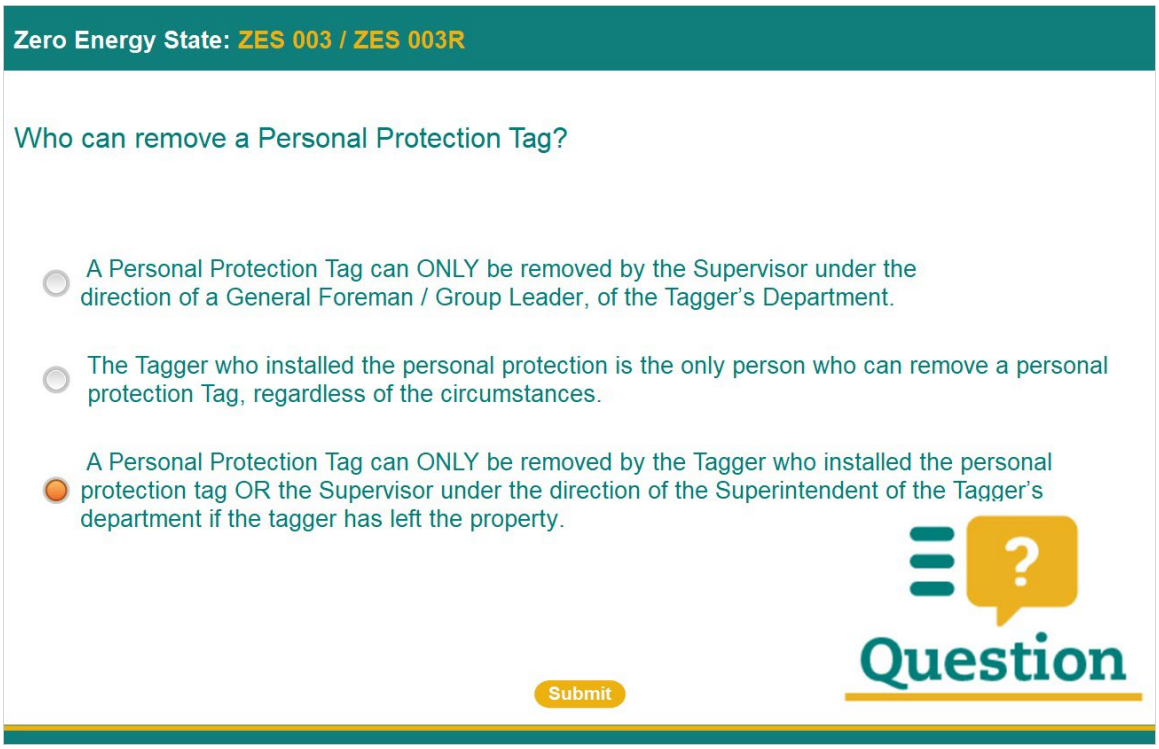
Incorrect

That is incorrect. Please try again.

Try Again

5.45 Question 4

(Multiple Choice, 10 points, unlimited attempts permitted)



Correct	Choice
	A Personal Protection Tag can ONLY be removed by the Supervisor under the direction of a General Foreman / Group Leader, of the Tagger's Department.
	The Tagger who installed the personal protection is the only person who can remove a personal protection Tag, regardless of the circumstances.
X	A Personal Protection Tag can ONLY be removed by the Tagger who installed the personal protection tag OR the Supervisor under the direction of the Superintendent of the Tagger's department if the tagger has left the property.

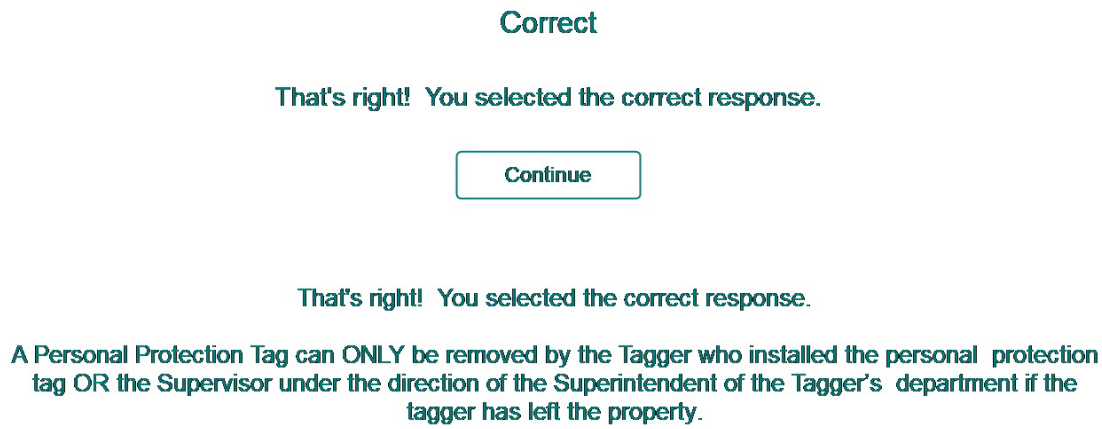
Feedback when correct:

That's right! You selected the correct response.

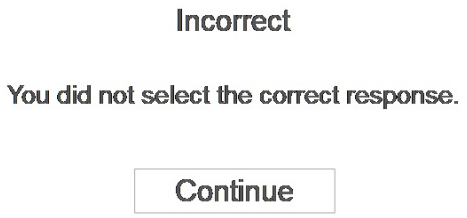
Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)



Incorrect (Slide Layer)



Try Again (Slide Layer)

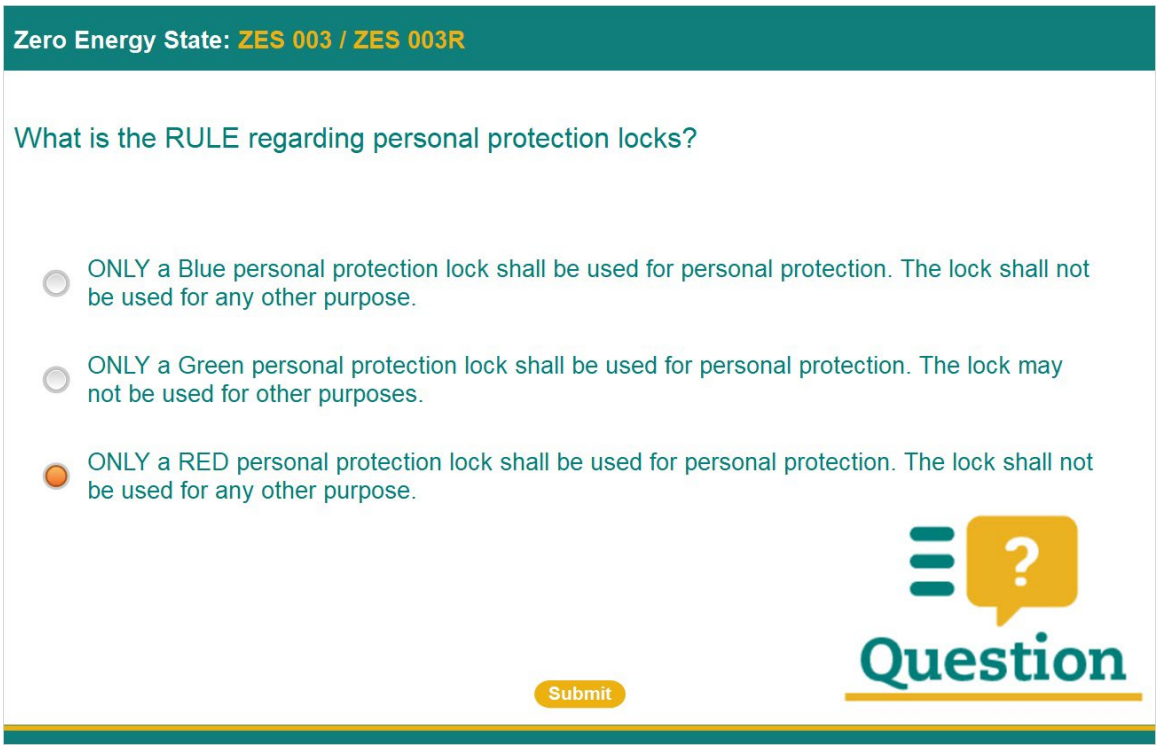
Incorrect

That is incorrect. Please try again.

Try Again

5.46 Question 5

(Multiple Choice, 10 points, unlimited attempts permitted)



Correct	Choice
	ONLY a Blue personal protection lock shall be used for personal protection. The lock shall not be used for any other purpose.
	ONLY a Green personal protection lock shall be used for personal protection. The lock may not be used for other purposes.
X	ONLY a RED personal protection lock shall be used for personal protection. The lock shall not be used for any other purpose.

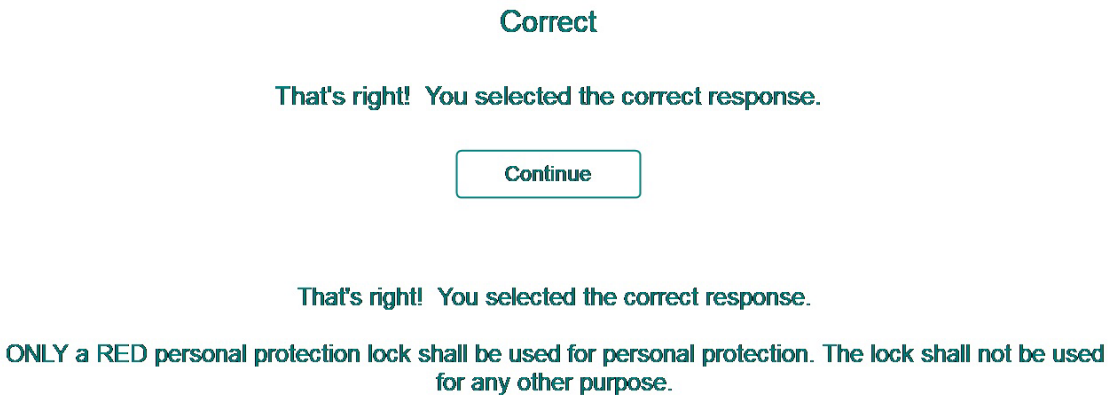
Feedback when correct:

That's right! You selected the correct response.

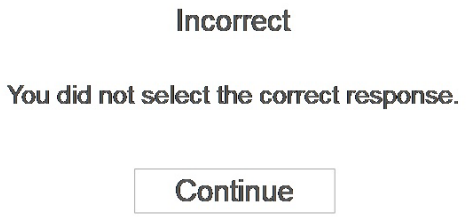
Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)



Incorrect (Slide Layer)



Try Again (Slide Layer)

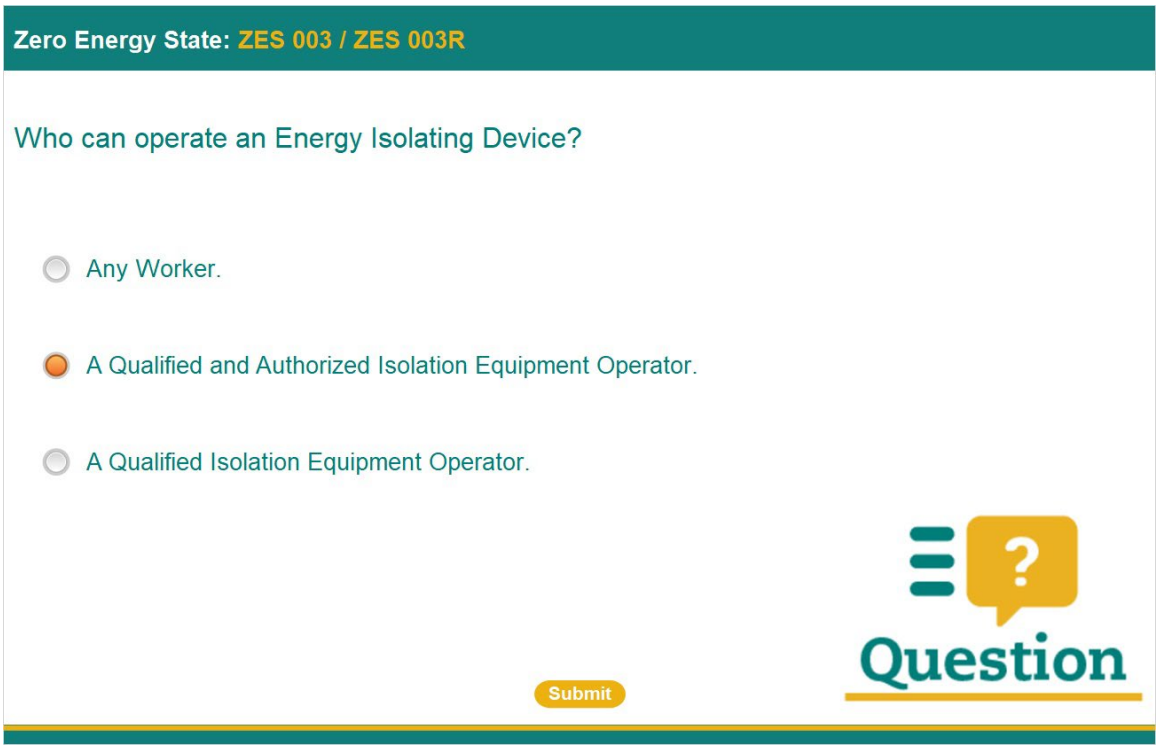
Incorrect

That is incorrect. Please try again.

Try Again

5.47 Question 6

(Multiple Choice, 10 points, unlimited attempts permitted)



Correct	Choice
	Any Worker.
X	A Qualified and Authorized Isolation Equipment Operator.
	A Qualified Isolation Equipment Operator.

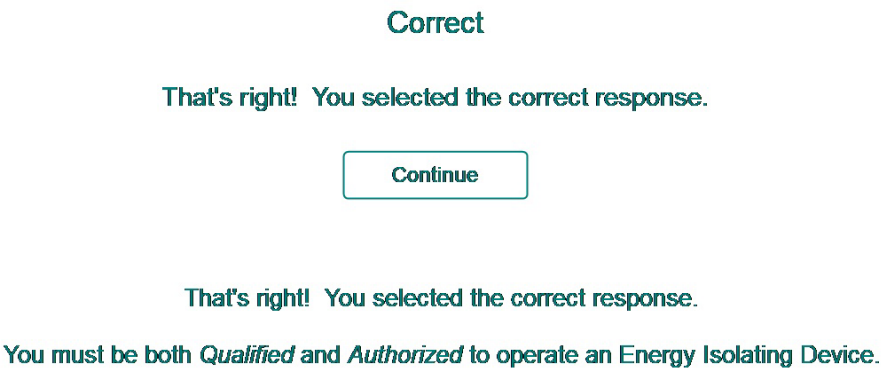
Feedback when correct:

That's right! You selected the correct response.

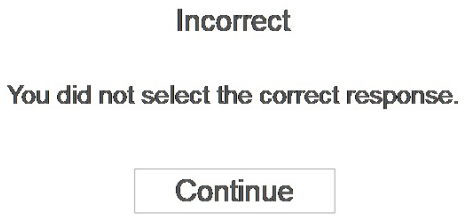
Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)



Incorrect (Slide Layer)



Try Again (Slide Layer)

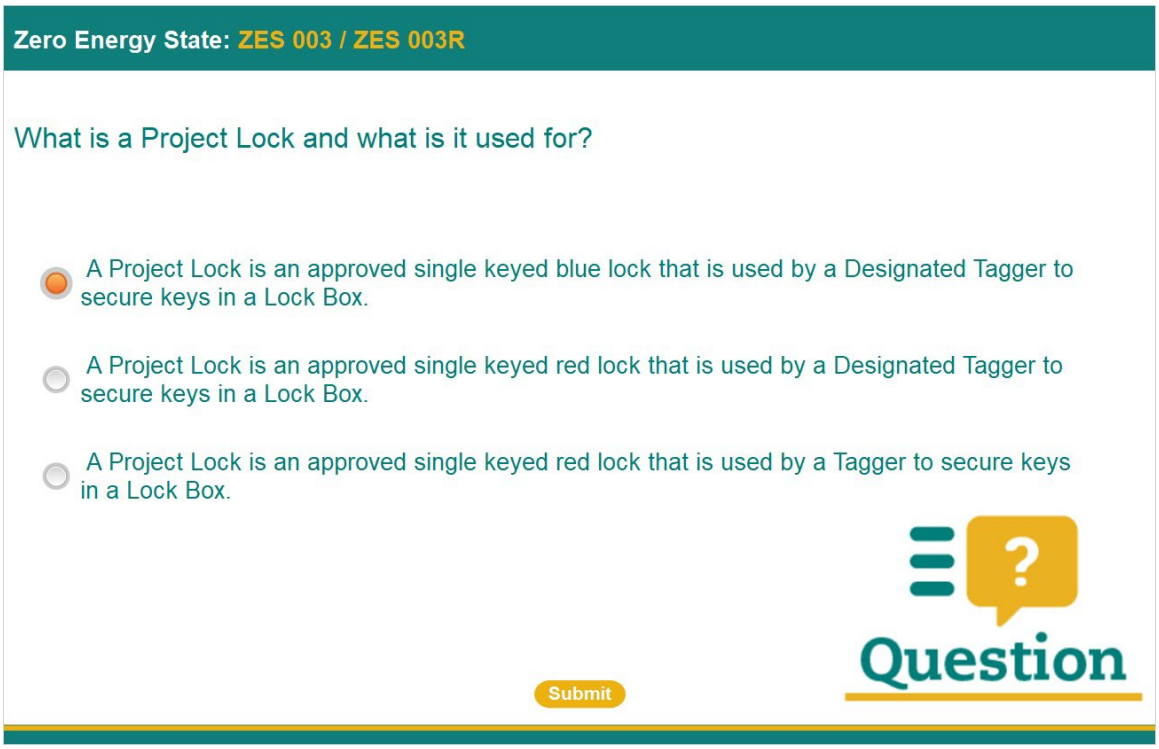
Incorrect

That is incorrect. Please try again.

Try Again

5.48 Question 7

(Multiple Choice, 10 points, unlimited attempts permitted)



Correct	Choice
X	A Project Lock is an approved single keyed blue lock that is used by a Designated Tagger to secure keys in a Lock Box.
	A Project Lock is an approved single keyed red lock that is used by a Designated Tagger to secure keys in a Lock Box.
	A Project Lock is an approved single keyed red lock that is used by a Tagger to secure keys in a Lock Box.

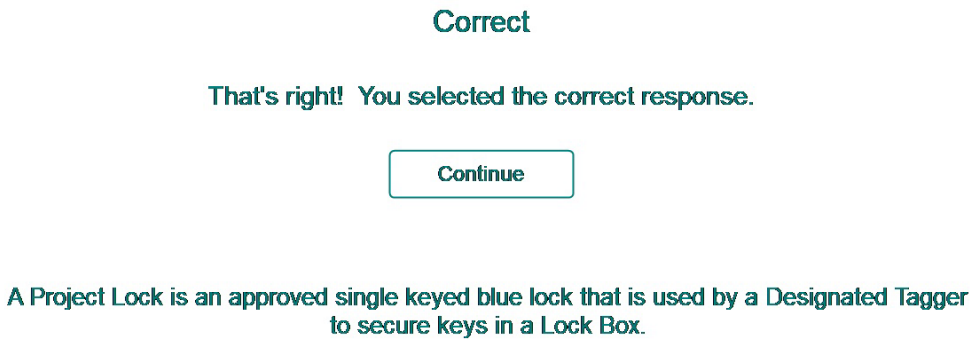
Feedback when correct:

That's right! You selected the correct response.

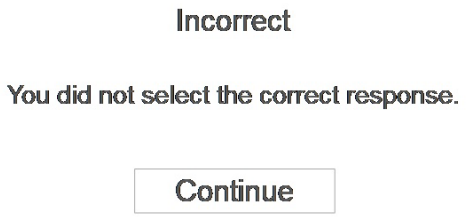
Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)



Incorrect (Slide Layer)



Try Again (Slide Layer)

5.49 Question 8

(Pick One, 10 points, unlimited attempts permitted)

Zero Energy State: ZES 003 / ZES 003R

Click to select which tag tells you that someone is actually working on equipment in the area?

Question

Submit

Correct	Choice
X	Red Tag
	White Tag

Feedback when correct:

That's right! You selected the correct response.

Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)

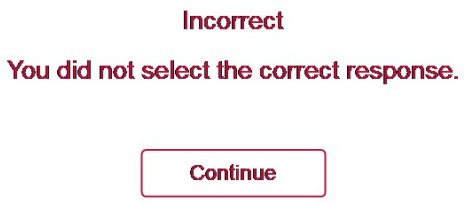
Correct

That's right! You selected the correct response.

Continue

A Red Personal Protection Tag is the ONLY tag to be used for Personal Protection on energy isolating devices.

Incorrect (Slide Layer)



Try Again (Slide Layer)

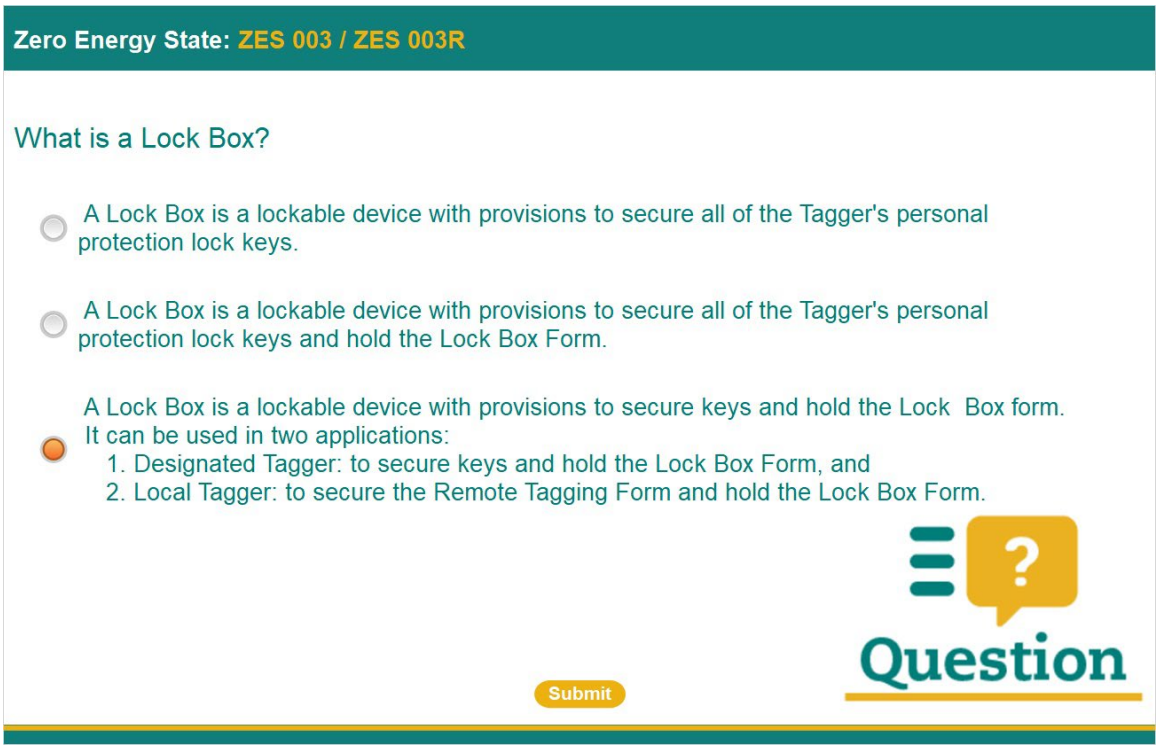
Incorrect

That is incorrect. Please try again.

Try Again

5.50 Question 9

(Multiple Choice, 10 points, unlimited attempts permitted)



Correct	Choice
	A Lock Box is a lockable device with provisions to secure all of the Tagger's personal protection lock keys.
	A Lock Box is a lockable device with provisions to secure all of the Tagger's personal protection lock keys and hold the Lock Box Form.
X	A Lock Box is a lockable device with provisions to secure keys and hold the Lock Box form. It can be used in two applications: 1. Designated Tagger: to secure keys and hold the Lock Box Form, and 2. Local Tagger: to secure the Remote Tagging Form and hold the Lock Box Form.

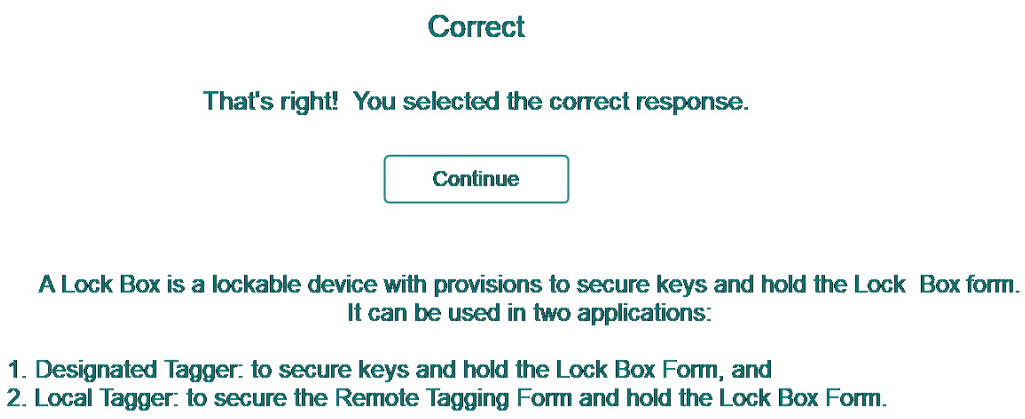
Feedback when correct:

That's right! You selected the correct response.

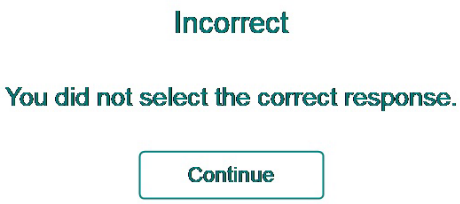
Feedback when incorrect:

You did not select the correct response.

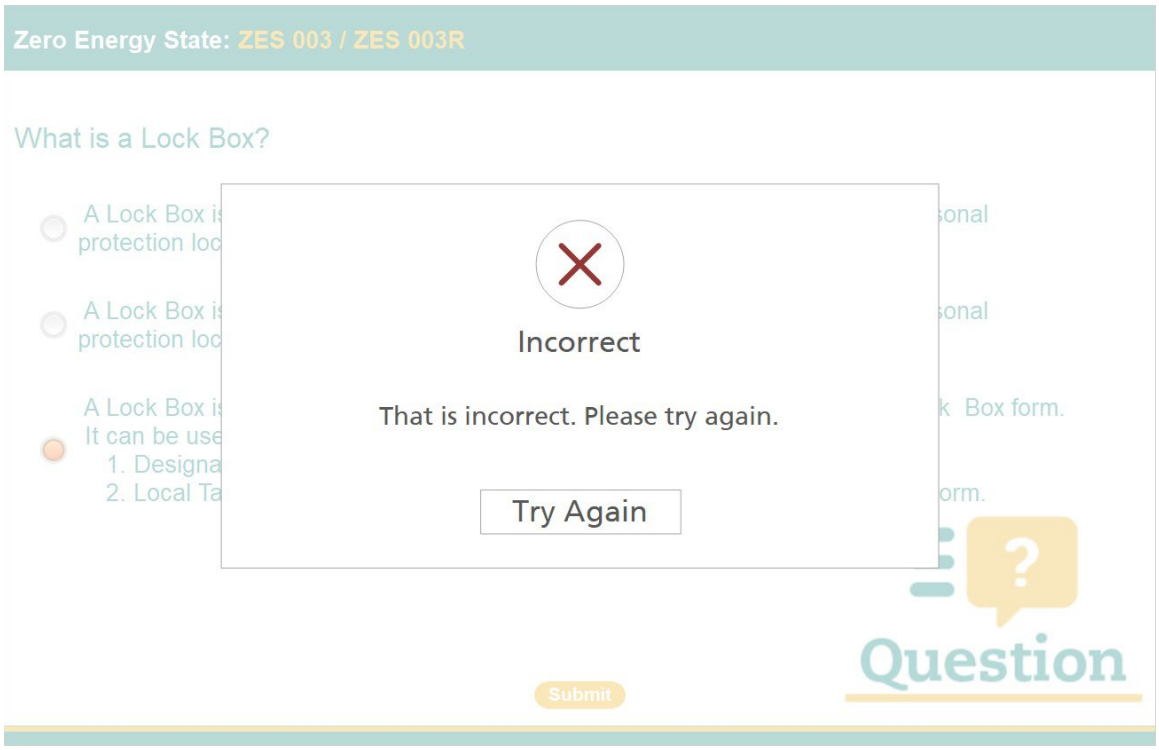
Correct (Slide Layer)



Incorrect (Slide Layer)

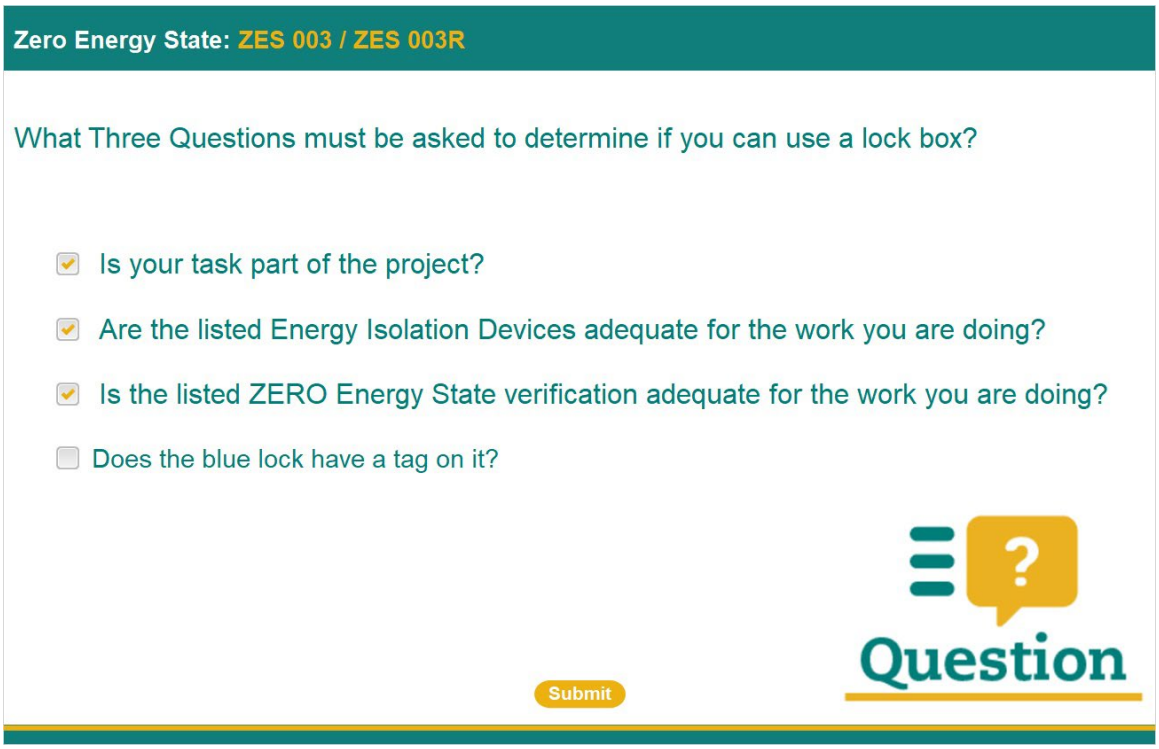


Try Again (Slide Layer)



5.51 Question 10

(Multiple Response, 10 points, unlimited attempts permitted)



Correct	Choice
X	Is your task part of the project?
X	Are the listed Energy Isolation Devices adequate for the work you are doing?
X	Is the listed ZERO Energy State verification adequate for the work you are doing?
	Does the blue lock have a tag on it?

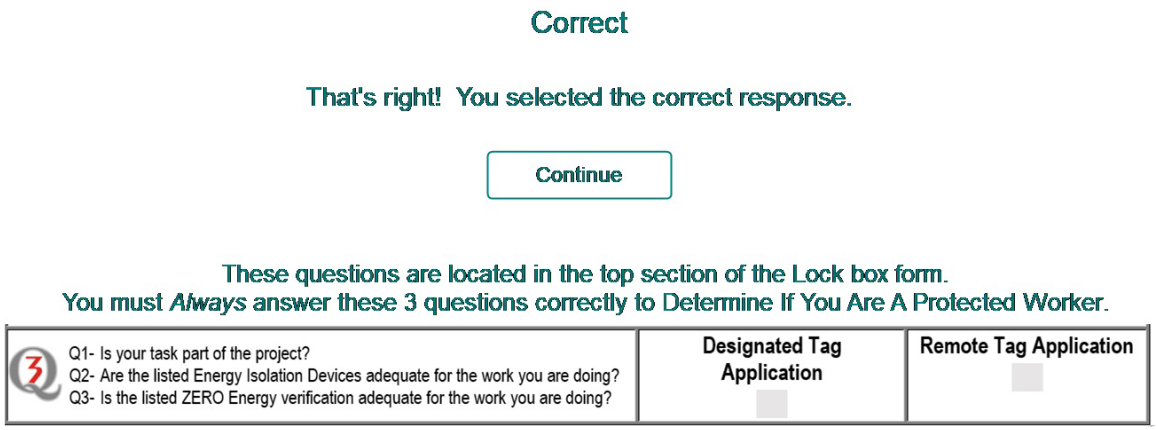
Feedback when correct:

That's right! You selected the correct response.

Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)



Incorrect (Slide Layer)

Incorrect

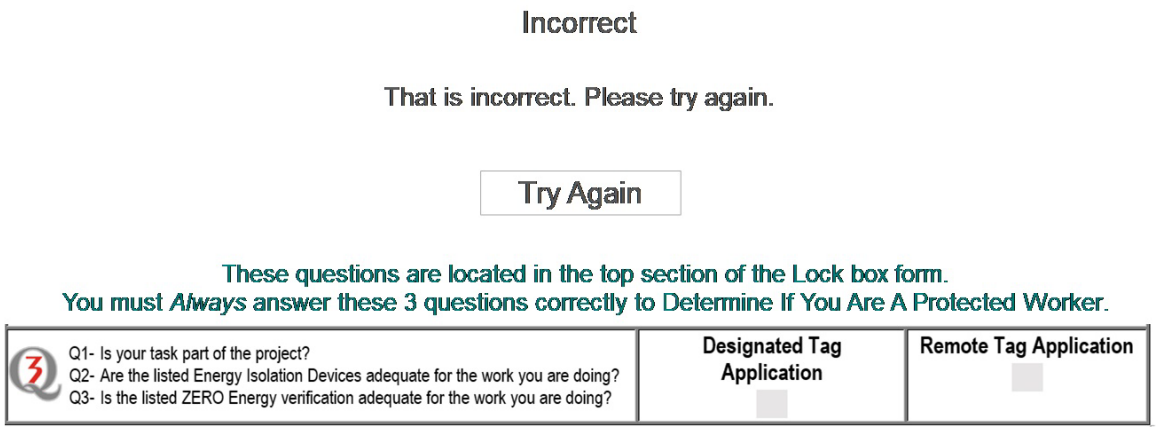
You did not select the correct response.

Continue

These questions are located in the top section of the Lock box form.
You must *Always* answer these 3 questions correctly to Determine If You Are A Protected Worker.

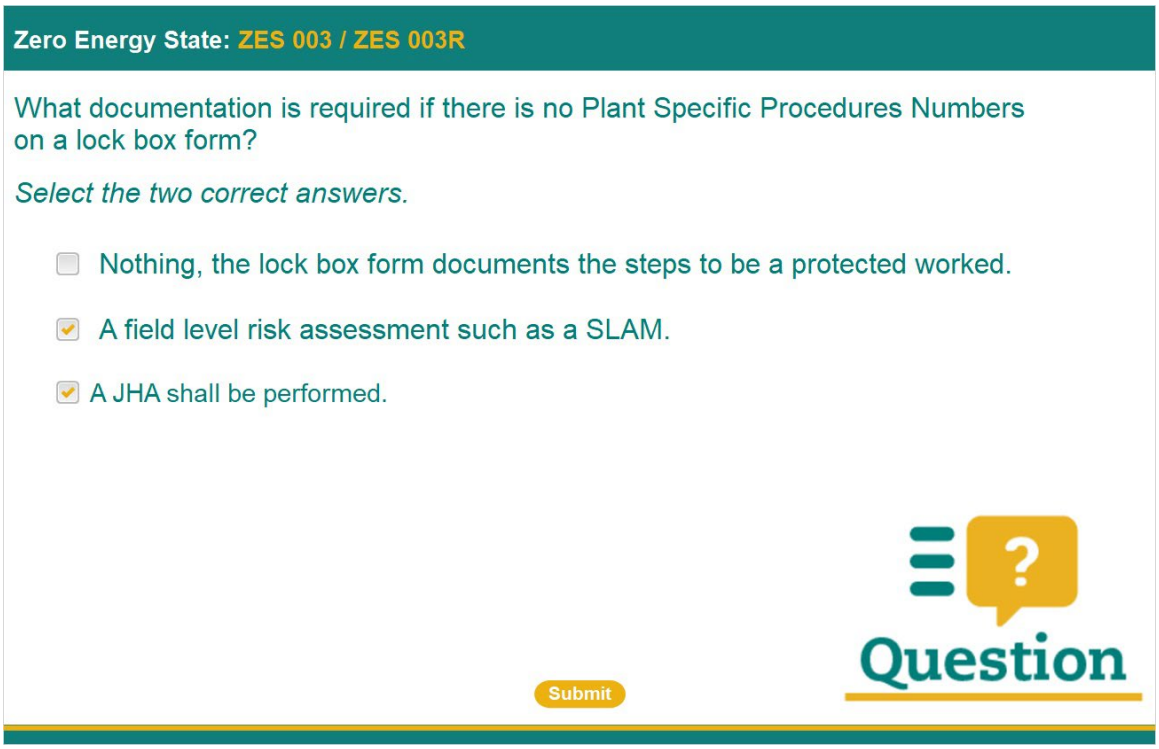
Q1- Is your task part of the project? Q2- Are the listed Energy Isolation Devices adequate for the work you are doing? Q3- Is the listed ZERO Energy verification adequate for the work you are doing?	Designated Tag Application	Remote Tag Application

Try Again (Slide Layer)



5.52 Question 11

(Multiple Response, 10 points, unlimited attempts permitted)



Correct	Choice
	Nothing, the lock box form documents the steps to be a protected worked.
X	A field level risk assessment such as a SLAM.
X	A JHA shall be performed.

Feedback when correct:

That's right! You selected the correct response.

Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)

Correct

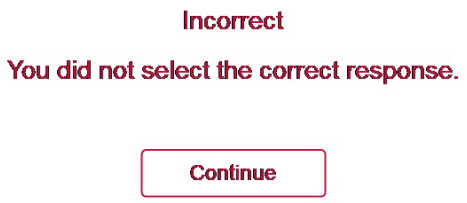
That's right! You selected the correct response.

Continue

If there is no procedure to do the isolation work, a risk assessment must be completed.

A field level risk assessment such as a Slam, or in the case of abnormal or non-routine tasks, a JHA, shall be performed.

Incorrect (Slide Layer)



Try Again (Slide Layer)

Incorrect

That is incorrect. Please try again.

Try Again

5.53 Question 12

(Pick One, 10 points, unlimited attempts permitted)

Zero Energy State: ZES 003 / ZES 003R

This image has been staged to show an example of a Lockout/Tagout infraction.

Click where you suspect the infraction might be.

Submit

Question

Correct	Choice
X	Red lock
	BlueLock
	Form
	Keys

Feedback when correct:

That's right! You selected the correct response.

Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)

Zero Energy State: ZES 003 / ZES 003R

This image has been staged to show an example of a Lockout/Tagout infraction.

Click where you suspect the infraction might be.

That's right! You selected the correct response.

Personal Locks always need to be associated with a red personal protection tag (and vise versa).

Every individual must ensure their own safety by applying a Personal Protection Lock and Personal Protection Tag.

Continue

Incorrect (Slide Layer)

Zero Energy State: ZES 003 / ZES 003R

This image has been staged to show an example of a Lockout/Tagout infraction.

Click where you suspect the infraction might be.

Incorrect

You did not select the correct response.

Continue

Try Again (Slide Layer)

Zero Energy State: ZES 003 / ZES 003R

This image has been staged to show an example of a Lockout/Tagout infraction.

Click where you suspect the infraction might be.

Incorrect

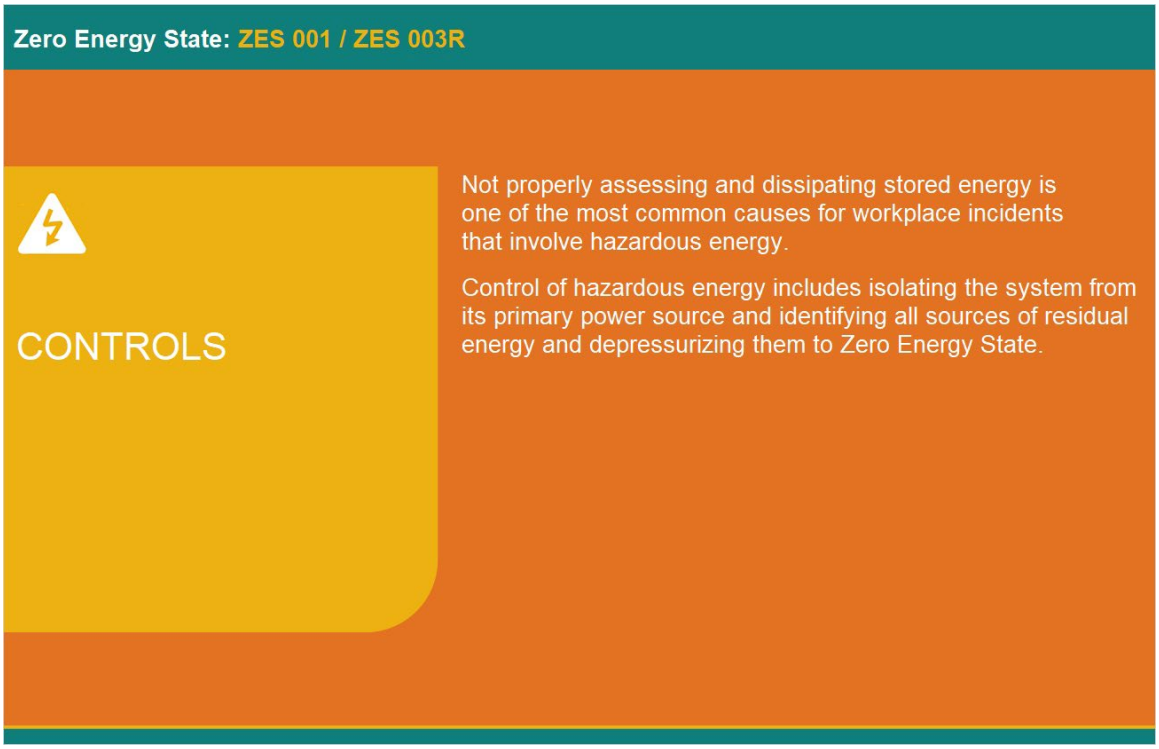
You did not select the correct response.

Continue

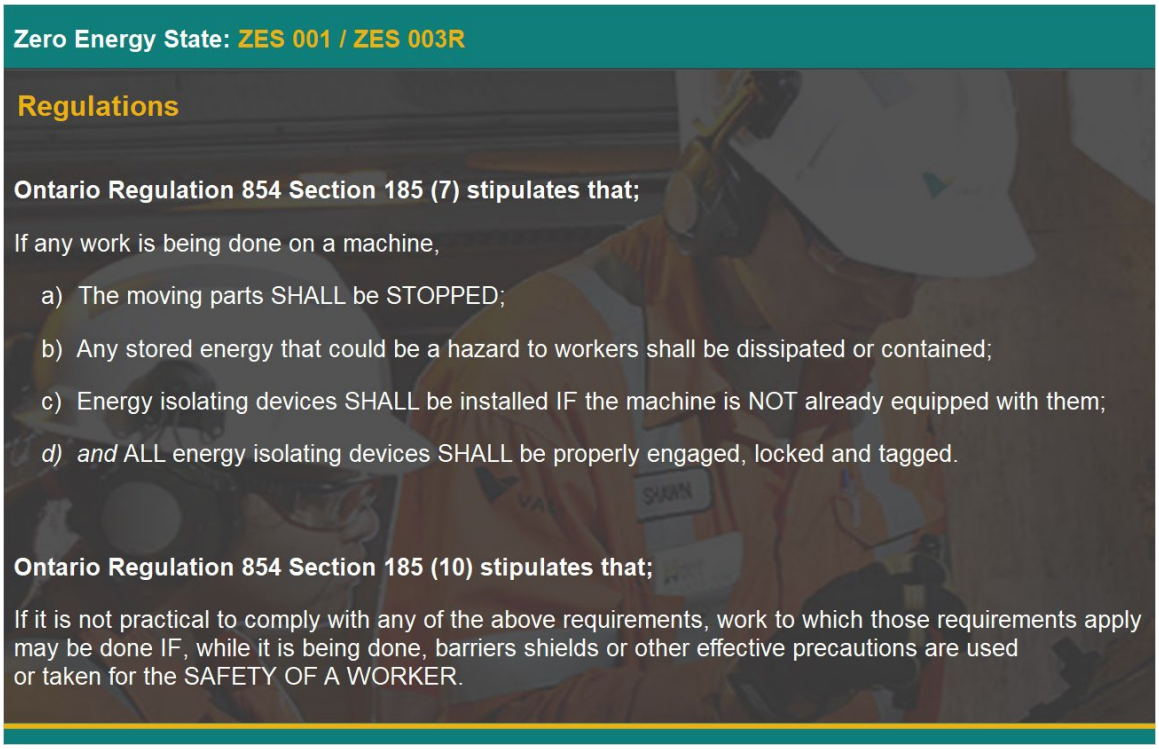
6. Controls

6.1 Introduction

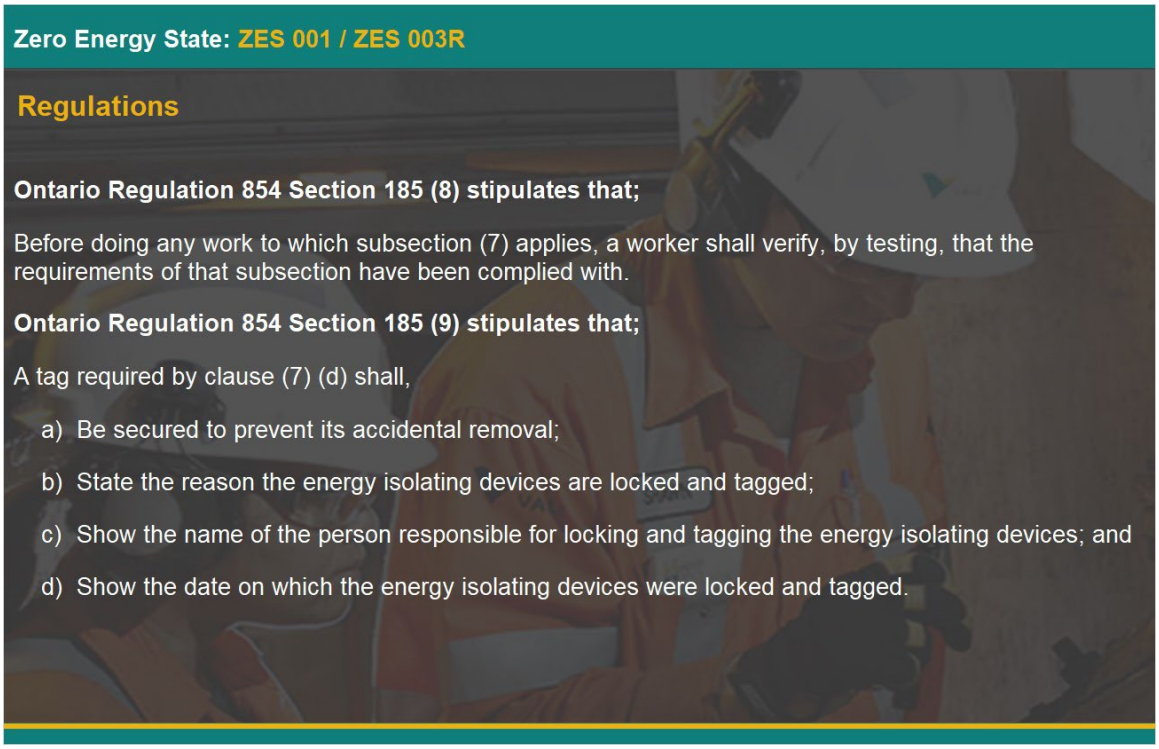
6.2 Control


Zero Energy State: ZES 001 / ZES 003R
CONTROLS
Not properly assessing and dissipating stored energy is one of the most common causes for workplace incidents that involve hazardous energy.
Control of hazardous energy includes isolating the system from its primary power source and identifying all sources of residual energy and depressurizing them to Zero Energy State.

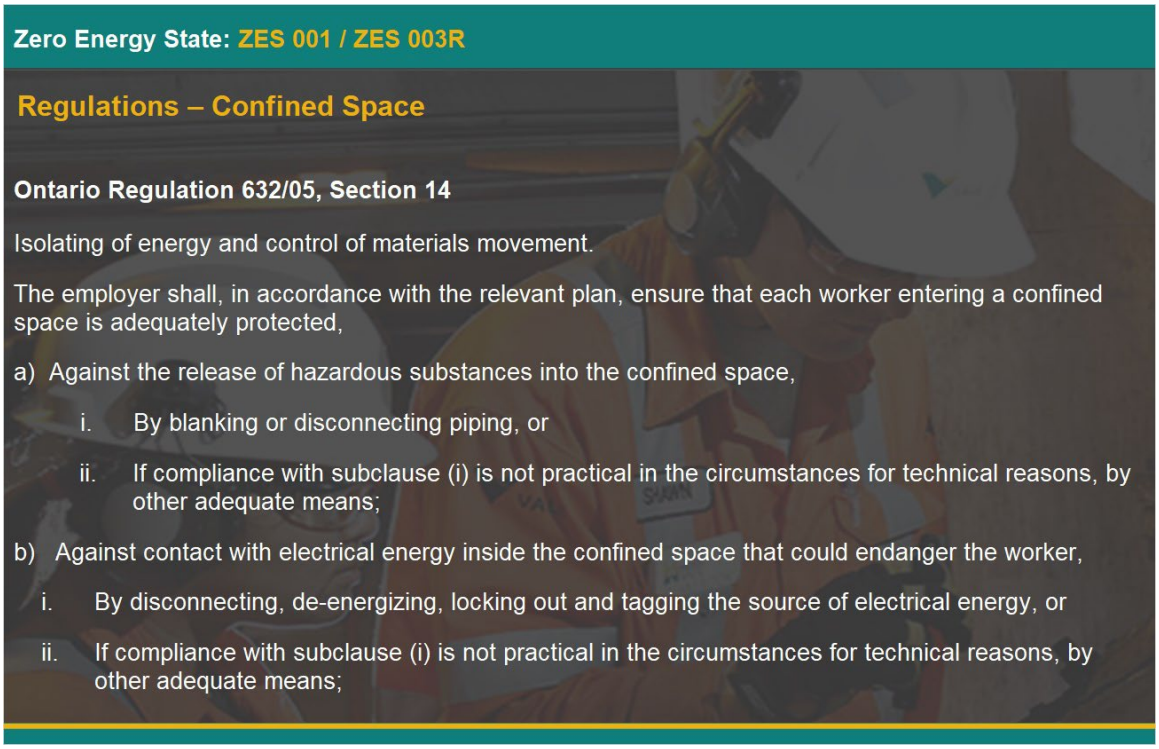
6.3 Regulations



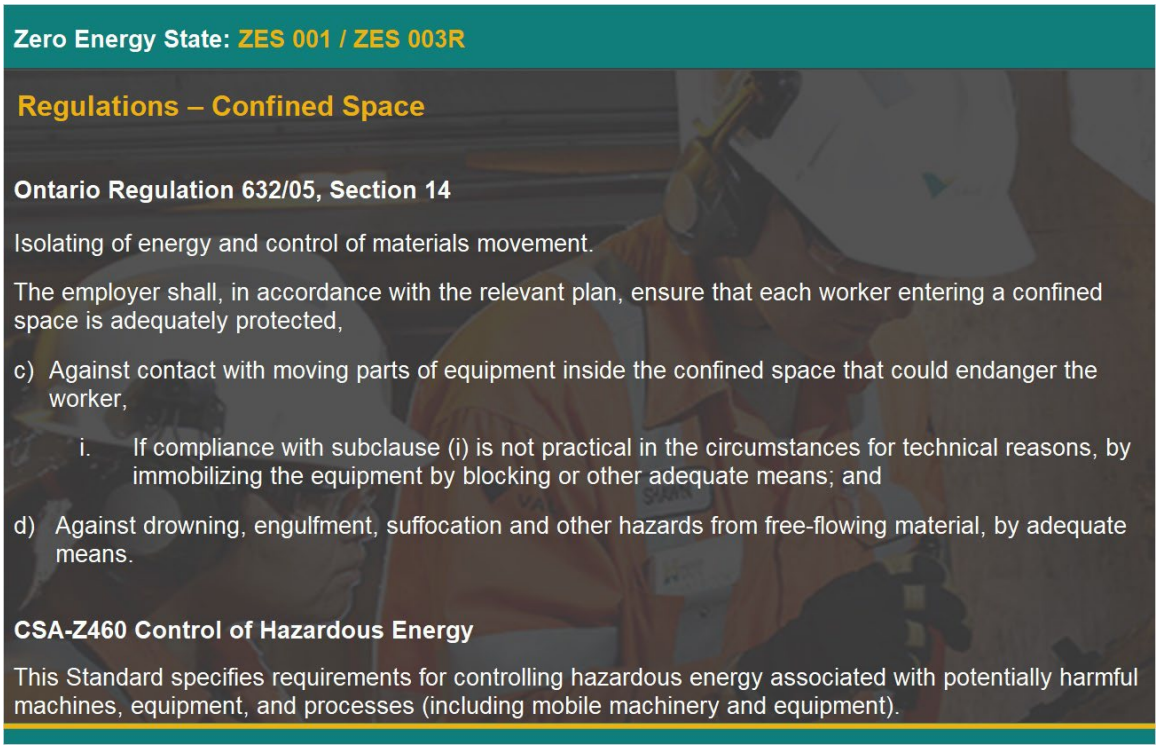
6.4 Regulations



6.5 Regulations



6.6 Regulations



6.7 Accountabilities of the IEO

Zero Energy State: ZES 001 / ZES 003R

As an Isolating equipment Operator, you are *Accountable and Responsible* for;

Following the steps of the ZES Installing Personal Protection procedure with regard to isolating energy.

Safely operating the energy isolating devices.

Stating readiness to lock and tag, once the energy is isolated and de-energized.

Returning isolating devices to operating status once all tags and locks are removed.

6.8 Accountabilities of the Tagger

Zero Energy State: ZES 001 / ZES 003R

As the Tagger, you are *Accountable and Responsible* for;

Ensuring all tags are properly filled out and information is legible.

Attaching tags securely so they will not fall or be blown off.

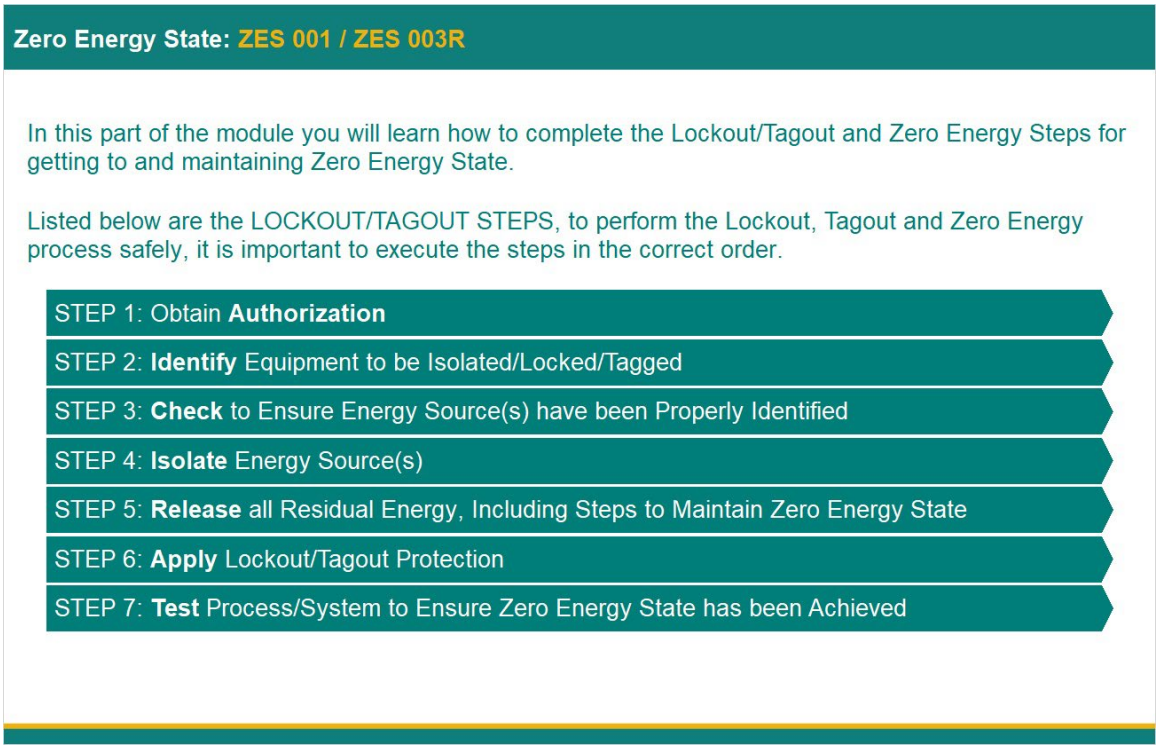
Listening to information communicated from the IEO's

Informing IEO's or other workers in the area when removing personal protection.

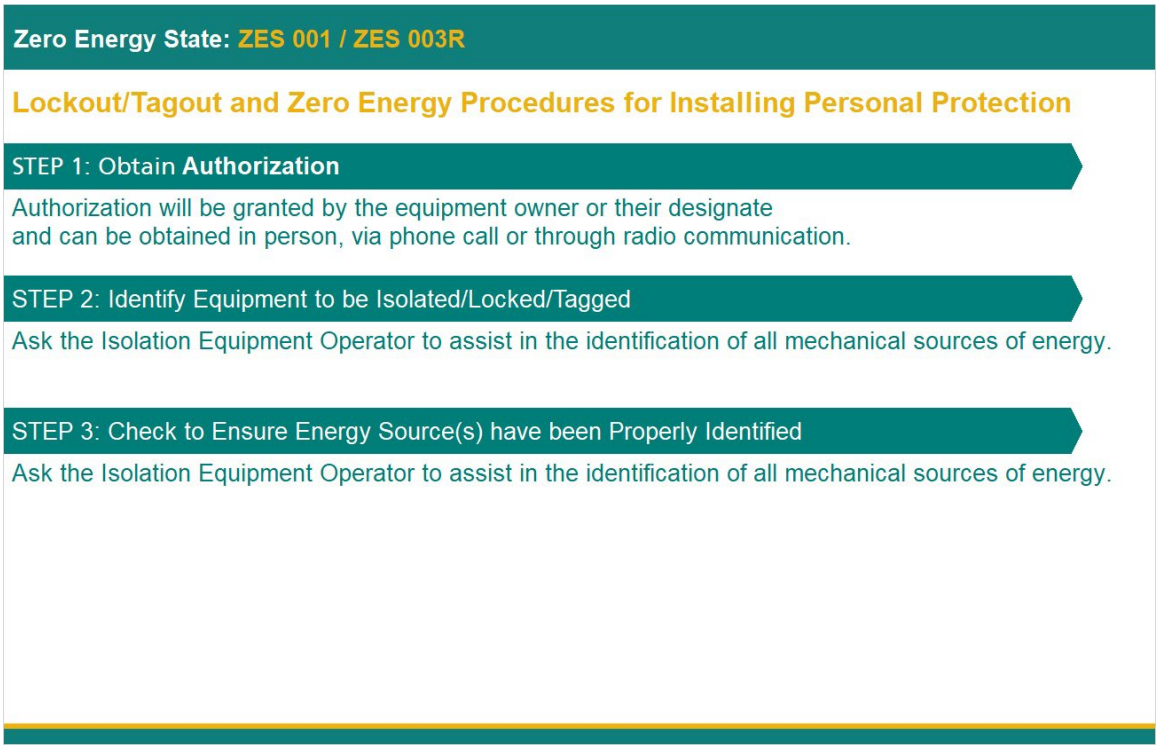
Do NOT operate an energy isolating device that has Personal Protection on it.

Do NOT operate an energy isolating device unless **qualified *and* authorized** to do so.

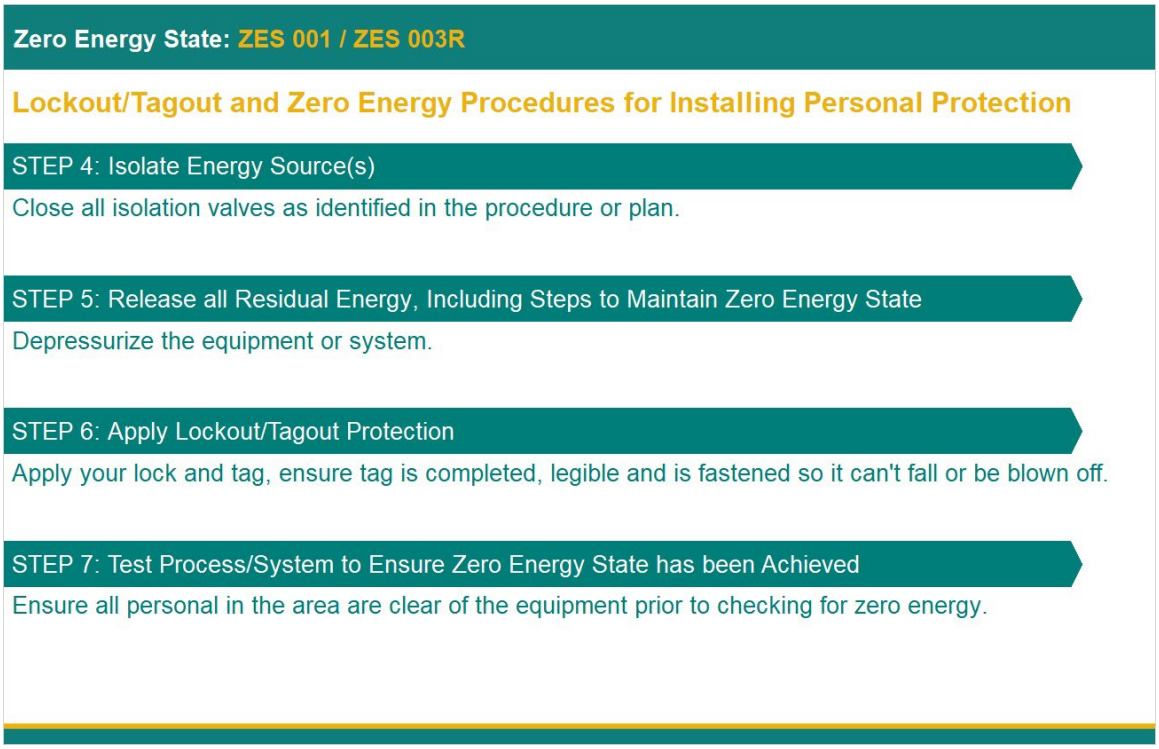
6.9 Lockout/Tagout



6.10 Lockout/Tagout

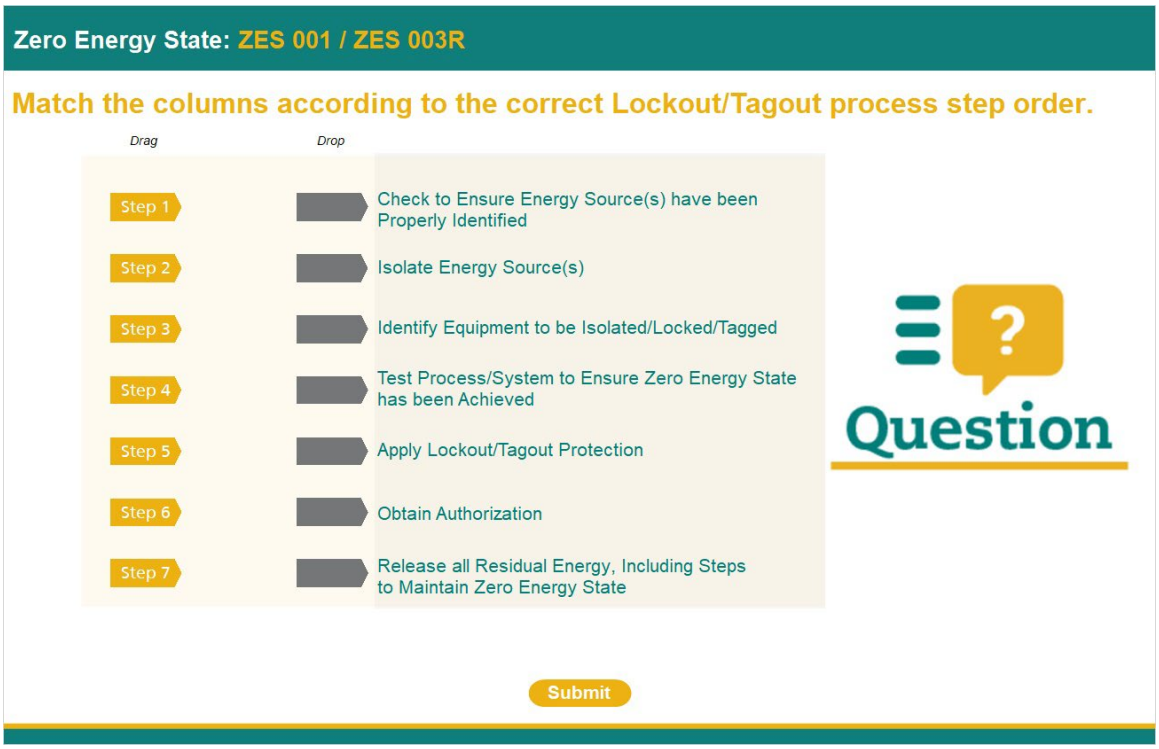


6.11 Lockout/Tagout



6.12 Lockout/Tagout - Activity

(Drag and Drop, 10 points, unlimited attempts permitted)



Drag Item	Drop Target
Step 1	Step 1
Step 2	Step 2
Step 3	Step 3
Step 4	Step 4
Step 5	Step 5
Step 6	Step 6
Step 7	Step 7

Drag and drop properties
Snap dropped items to drop target (Stack random)

Delay item drop states until interaction is submitted

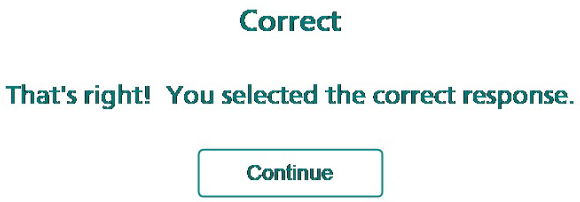
Feedback when correct:

That's right! You selected the correct response.

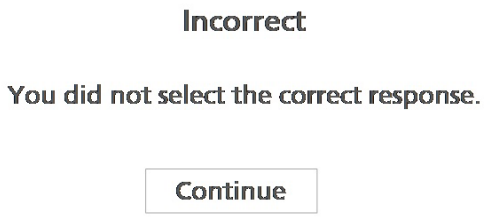
Feedback when incorrect:

You did not select the correct response.

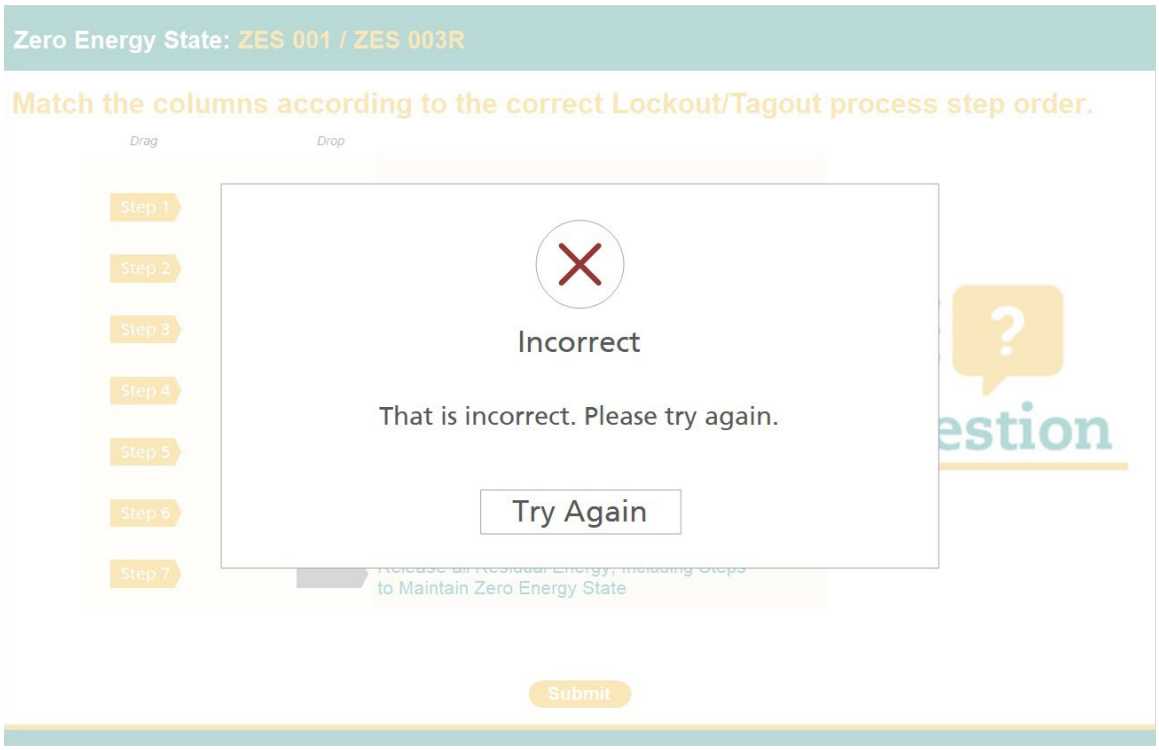
Correct (Slide Layer)



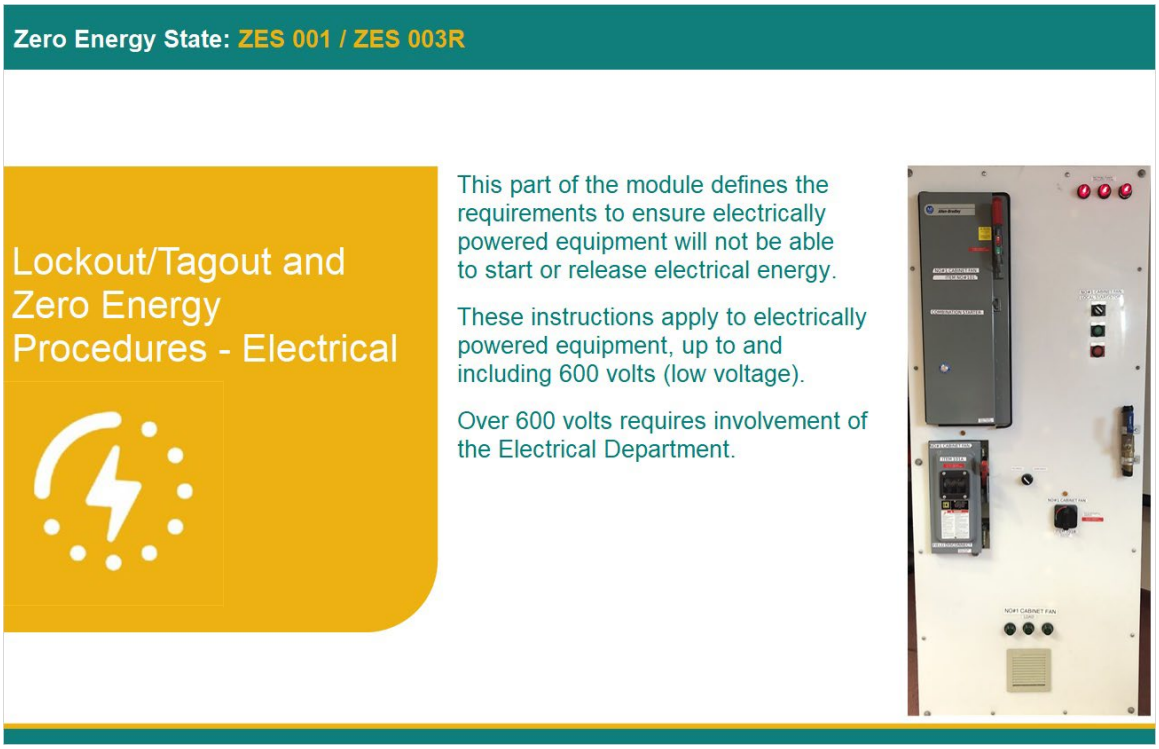
Incorrect (Slide Layer)



Try Again (Slide Layer)



6.13 Electrical Lockout/Tagout Procedures



6.14 Hazards of Electricity

Zero Energy State: ZES 001 / ZES 003R

Hazards of Electricity

Electricity finds the easiest path to ground by attempting to find a conductor. Conductors include metal, water, or YOUR BODY.

8 milliamps under the right conditions can be FATAL.

Household ground fault plugs are set to trip at 5 milliamps, which is just below shock level.

Electricity is often referred to as an electrical flow, energy flows when the circuit is **closed.**

To interrupt electrical flow, we **OPEN** the circuit.

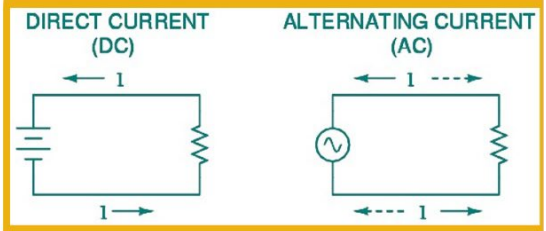
6.15 Hazards of Electricity

Zero Energy State: ZES 001 / ZES 003R

Hazards of Electricity

There are two types of electricity, alternating current (AC), for example, household power, or electric motors. Direct current (DC) examples include batteries and generators.

As an Isolating Equipment Operator, you will be trained to isolate power up to and including **600 volts (low voltage).**



Both types can be equally fatal!

6.16 Hazards of Electricity

Zero Energy State: ZES 001 / ZES 003R

Hazards of Electricity

Delayed Starts, used to delay the operation of a process or start of a motor, pump, fan, etc. The time can be varied depending on the requirements and typically uses time delay relays to accomplish it.

Soft Starts are used with AC motors to reduce the load and torque on the powertrain and current surge during start up. Allow the motor to slowly (softly) ramp up to full speed.

Frequency Drives are used with AC motors, it is a type of motor controller that varies the frequency and voltage supplied to the motor. In doing so it can vary the motor speed to match the load requirements of the motor such as controlling the speed of a conveyor belt, fan, mine hoist, etc.

6.17 Hazards of Electricity

Zero Energy State: ZES 001 / ZES 003R

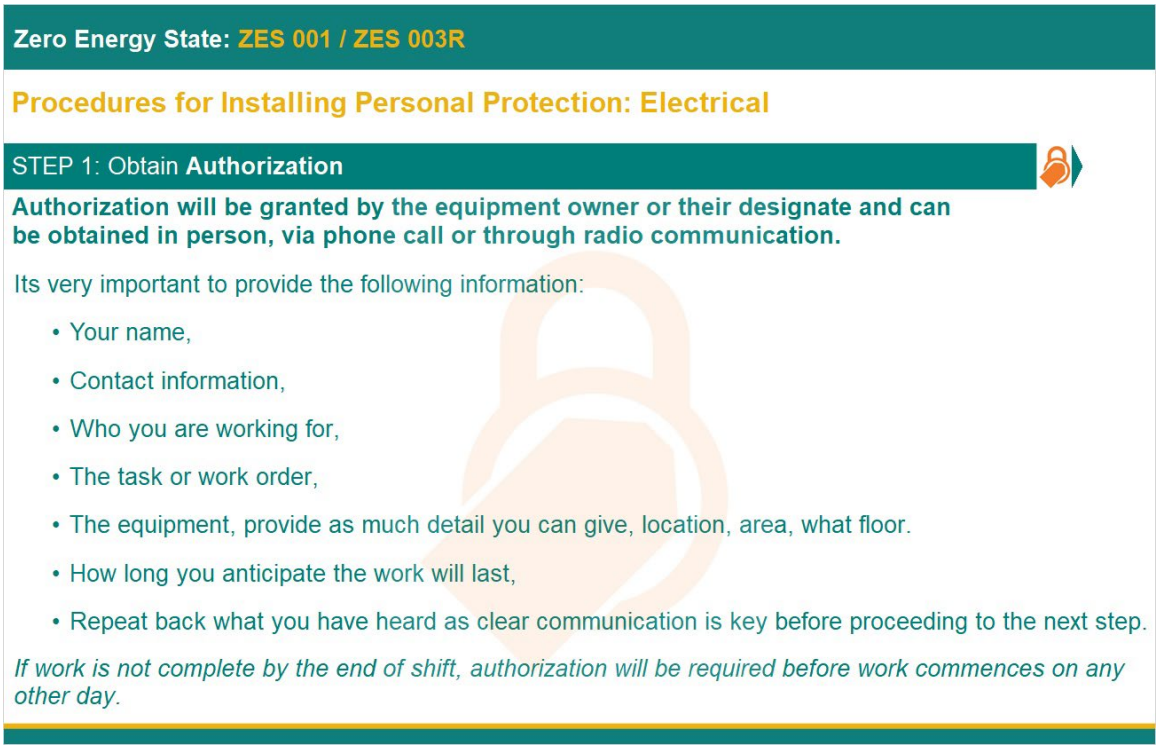
Hazards of Electricity

In addition each of these devices can have **interlocks** present in their circuits. The interlocks prevent the devices from energizing their output devices (motors, fans, etc.) until certain conditions are met to satisfy the interlocks, allowing the device to energize their output devices.

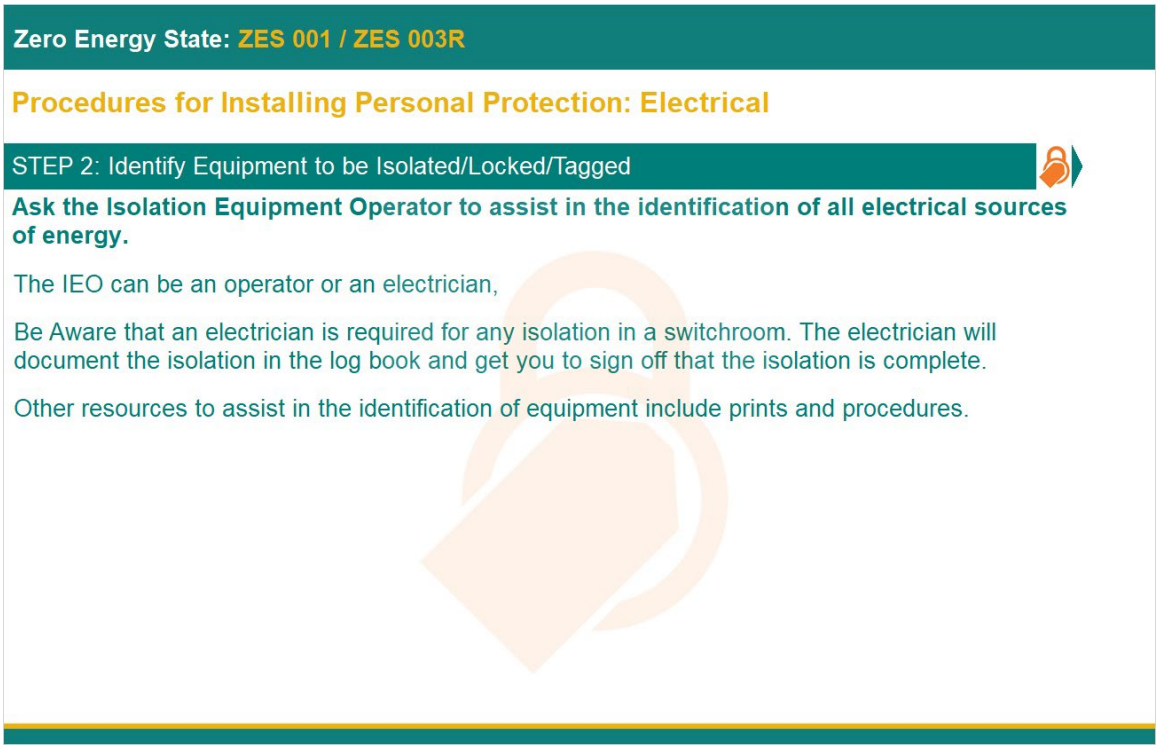
When attempting to electrically isolate these devices the only safe way is to disconnect power feeding these devices or disconnect power (field disconnect) going to the devices they operate (motors, pumps, fans, etc.)

Delayed Starts, Soft Starts and Frequency Drives all require knowledge and experience to know how they function and when they are safe to work on.

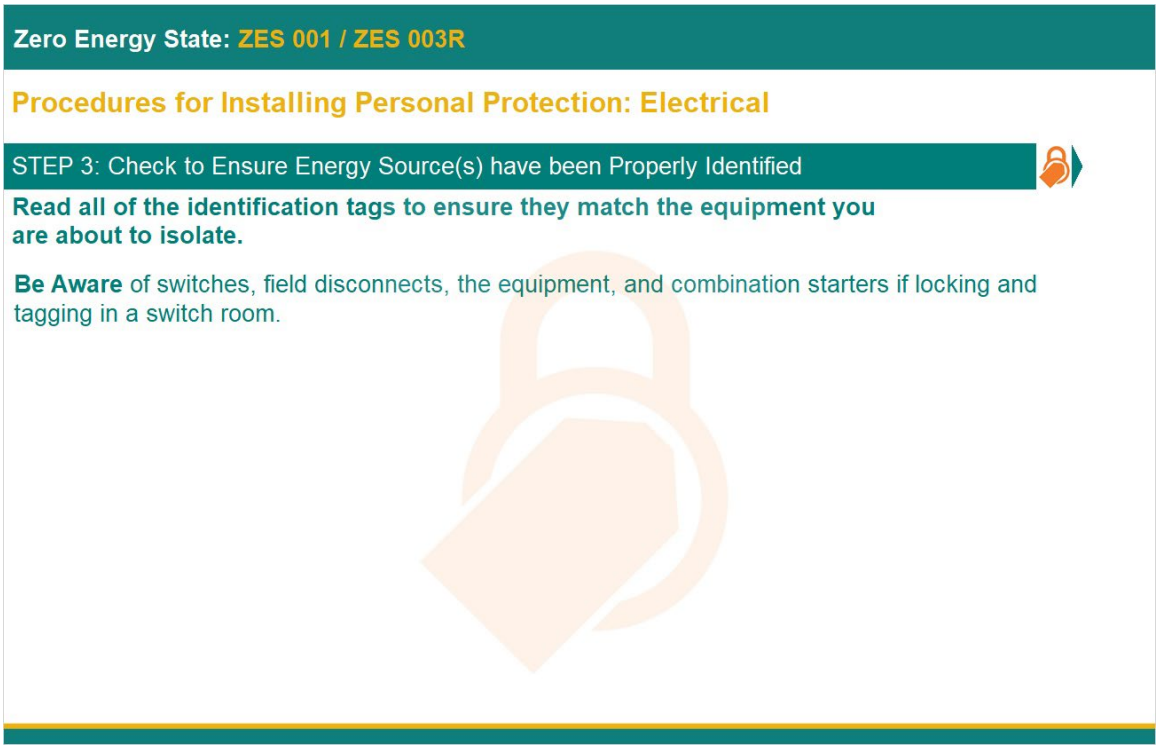
6.18 Installation - Step 1



6.19 Installation - Step 2



6.20 Installation - Step 3



6.21 Installation - Step 4

Zero Energy State: ZES 001 / ZES 003R

Procedures for Installing Personal Protection: Electrical

STEP 4: Isolate Energy Source(s)

Follow the ISOLATE-LOCK-TAG-CHECK steps below when isolating energy sources:

- If equipped, turn the local/remote (or manual/auto) switch to local (or manual) (turn the Hand-Off-Auto Selector to the off position).
- Stop the energy source by depressing the STOP button.
- Visually check the equipment to ensure it is not running,

6.22 Installation - Step 4

Zero Energy State: ZES 001 / ZES 003R

Procedures for Installing Personal Protection: Electrical

STEP 4: Isolate Energy Source(s)

Follow the ISOLATE-LOCK-TAG-CHECK steps below when isolating energy sources:

Use the Left-Hand Rule, if you are not able to, discuss with your supervisor to assess and decide how best to manage risk.

1. Look AWAY from the switch.
2. Do NOT stand in front of the disconnect while controlling the switch.
   - Do NOT allow anyone else in front of disconnect, and,
   - Ensure that other tagger's or people in surrounding area are in a safe position.
3. Stand an arms length from the switch.
4. Plant your feet solidly on the ground.

6.23 Installation - Step 4

Zero Energy State: ZES 001 / ZES 003R

Procedures for Installing Personal Protection: Electrical

STEP 4: Isolate Energy Source(s)

Follow the ISOLATE-LOCK-TAG-CHECK steps below when isolating energy sources:

Use the Left-Hand Rule, if you are not able to, discuss with your supervisor to assess and decide how best to manage risk.

5. IEO is now to call control room or any areas with remote capabilities, to ensure the local button is working properly and it CANNOT BE STARTED before using left hand rule. This ensures total control from area of isolation.
6. Close your eyes, hold your breath and turn your head away from the switch to ensure no vapour or heat is inhaled if mechanism fails.
7. Use a good, dry leather glove, using an open hand, open the switch.

6.24 Installation - Step 5

Zero Energy State: ZES 001 / ZES 003R

Procedures for Installing Personal Protection: Electrical

STEP 5: Release all Residual Energy, Including Steps to Maintain Zero Energy State

Ensure there are no other electrical sources of energy backfeeding the system such as, battery banks etc.

- Always push the stop button after attempting to start the equipment to prevent engaging the equipment into a load condition.

6.25 Installation - Step 6

Zero Energy State: ZES 001 / ZES 003R

Procedures for Installing Personal Protection: Electrical

STEP 6: Apply Lockout/Tagout Protection

Apply your lock and tag to the electrical device(s).

- Ensure you clearly enter 100 percent of required information on the tag, and that it is legible.
- Ensure the tag is securely fastened, so that it cannot fall or be blown off.
- Once applied test that the electrical device cannot be thrown into a closed position and the key to the lock is under your control and not left in the lock.

Flip Tag Over

Untitled Layer 1 (Slide Layer)

Zero Energy State: ZES 001 / ZES 003R

Procedures for Installing Personal Protection: Electrical

STEP 6: Apply Lockout/Tagout Protection

Apply your lock and tag to the electrical device(s).

- Ensure you clearly enter 100 percent of required information on the tag, and that it is legible.
- Ensure the tag is securely fastened, so that it cannot fall or be blown off.
- Once applied test that the electrical device cannot be thrown into a closed position and the key to the lock is under your control and not left in the lock.

Flip Tag Over

6.26 Installation - Step 7

Zero Energy State: ZES 001 / ZES 003R

Procedures for Installing Personal Protection: Electrical

STEP 7: Test Process/System to Ensure Zero Energy State has been Achieved

Ensure all personnel in the area are clear of the equipment prior to checking for zero energy,

- Push the start button giving ample time for the equipment to start.
- **Be Aware** of soft starts, interlocks, delays and frequency drives.
- Always follow through by pushing the stop button to prevent engaging the equipment into a load condition.

6.27 Removal of Personal Protection - Returning Equipment to Service

Zero Energy State: ZES 001 / ZES 003R

Procedures for Removal of Personal Protection and Restoring Energy: Electrical

Removal of Personal Protection - Returning Equipment to Service

Obtain Authorization from operations personnel prior to returning equipment to service.

- Confirm, either in person or by phone, that all workers are clear of the area and all tools and materials are safely stored.
- Confirm that the equipment is ready for service, ensure the name and number on the equipment being restored is the same as the number at the switch.
- Remove your lock and tag at the switch. Tear the tags and dispose of them in the proper recycling container.
- If there are locks and tags on the equipment which you are not authorized to remove, then the equipment cannot be returned to service until these locks and tags are removed by authorized personnel.

** All workers require plant specific training to be qualified and authorized IEO's*

6.28 Removal of Personal Protection - Returning Equipment to Service

Zero Energy State: ZES 001 / ZES 003R

Procedures for Removal of Personal Protection and Restoring Energy: Electrical

Removal of Personal Protection - Returning Equipment to Service

Restore Energy

1. Ensure the Hand-Off-Auto Selector is in the off position and press the stop pushbutton, if one exists at the switch. This is a final check to ensure the equipment will not start as the switch closes.
2. Using the left-hand rule / best practice, CLOSE the switch.
3. Stand at arms length from the switch in a position which does not require you to reach across the door of the switch to operate the handle.
4. Turn your face and body away from the switch, close your eyes, take a deep breath and hold it. This position will minimize injuries should there be a catastrophic failure of the switch as it is closed.
5. Plant your feet solidly on the ground.
6. Use a good, dry leather glove, open hand, close the switch.

6.29 Removal of Personal Protection - Returning Equipment to Service

Zero Energy State: ZES 001 / ZES 003R

Procedures for Removal of Personal Protection and Restoring Energy: Electrical

Removal of Personal Protection - Returning Equipment to Service

Restore Energy

7. Communicate the condition of the equipment to the person in charge of the equipment: Inform the owner/user that the electrical devices are closed, and the equipment is in the remote or local mode.

6.30 Non - Electrical Lockout/Tagout Procedures

Zero Energy State: ZES 001 / ZES 003R

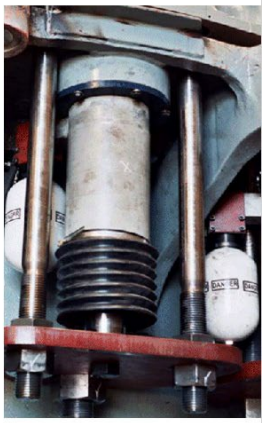
Lockout/Tagout and
Zero Energy
Non - Electrical

This part of the module defines the requirements to ensure mechanically powered equipment will not be able to move or release energy.

These instructions apply to all pneumatic and hydraulic powered equipment, regardless of the operating pressure.

Know the product you are isolating and the hazards you may encounter.

Some systems or equipment require special attention and training BEFORE isolation (e.g., acids, nickel carbonyl, slurries, oxygen, etc.).



6.31 Installation - Step 1

Zero Energy State: ZES 001 / ZES 003R

Procedures for Installing Personal Protection: Mechanical

STEP 1: Obtain **Authorization**

Authorization will be granted by the equipment owner or the their designate and can be obtained in person, via phone call or through radio communication.

Its very important to provide the following information:

- Your name,
- Contact information,
- Who you are working for,
- The task or work order,
- The equipment, provide as much detail you can give, location, area, what floor.
- How long you anticipate the work will last,
- Repeat back what you have heard as clear communication is key before proceeding to the next step.

If work is not complete by the end of shift, authorization will be required before work commences on any other day.

6.32 Installation - Step 2

Zero Energy State: ZES 001 / ZES 003R

Procedures for Installing Personal Protection: Mechanical

STEP 2: Identify Equipment to be Isolated/Locked/Tagged

Ask the Isolation Equipment Operator to assist in the identification of all mechanical sources of energy.

All equipment which could cause a hazard to personnel, or damage if operated, shall be closed or placed into a safe position, locked, tagged and checked. This includes valves, service lines, gates, doors, chutes, etc.

Be aware of other valves for pressure elimination or reduction, cleaning, purging, washing, etc.

Other resources to assist in the identification of equipment include prints and procedures.

** Non-Vale workers require plant specific training to be a Qualified and Authorized Isolating Equipment Operators (electrical and mechanical).*

6.33 Installation - Step 3

Zero Energy State: ZES 001 / ZES 003R

Procedures for Installing Personal Protection: Mechanical

STEP 3: Check to Ensure Energy Source(s) have been Properly Identified

Read all of the identification tags to ensure they match the equipment you are about to isolate.

Be Aware of the locations of other valves to reduce the risk of failure, such as a valve not fully closing, or a bleed valve becoming plugged, resulting in the inability to isolate the system or equipment.

Restraints, valve lockout covers, or similar locking devices shall be installed to secure equipment in a safe position and shall be Locked and Tagged. All blocking valves shall be locked in the closed position and all bleed valves locked in the open position.

6.34 Installation - Step 4

Zero Energy State: ZES 001 / ZES 003R

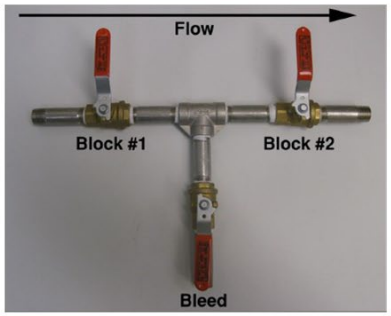
Procedures for Installing Personal Protection: Mechanical

STEP 4: Isolate Energy Source(s)

Follow the ISOLATE-LOCK-TAG-CHECK steps below when isolating energy sources:

Following the procedure for the equipment or system:

- Close all isolation valves in the procedure or plan.
- Begin upstream first, to STOP the flow.
- If required, close the downstream valve(s) to prevent backflow.



6.35 Installation - Step 5

Zero Energy State: ZES 001 / ZES 003R

Procedures for Installing Personal Protection: Mechanical

STEP 5: Release all Residual Energy, Including Steps to Maintain Zero Energy State

Particular care is required when isolating pressurized systems or equipment which incorporates stored energy devices.

- Some examples are pressurized service lines, system headers, air receivers, accumulators, tanks, and charged springs.
- Ensure the pressure or stored energy is released, or isolated, prior to working on the equipment.

6.36 Installation - Step 6

Zero Energy State: ZES 001 / ZES 003R

Procedures for Installing Personal Protection: Mechanical

STEP 6: Apply Lockout/Tagout Protection

Apply your lock and tag to the mechanical device(s).

- Ensure you clearly enter 100 percent of required information on the tag, and that it is legible.
- Ensure the tag is securely fastened, so that it cannot fall or be blown off.
- Restraints, valve lockout covers, or similar locking devices shall be installed to secure equipment in a safe position and shall be Locked and Tagged.
- All blocking valves shall be locked in the closed position and all bleed valves locked in the open position.

Once applied always test that the mechanical device cannot be opened and the key to the lock is under your control and not left in the lock.

Flip Tag Over

Untitled Layer 1 (Slide Layer)

Zero Energy State: ZES 001 / ZES 003R

Procedures for Installing Personal Protection: Mechanical

STEP 6: Apply Lockout/Tagout Protection

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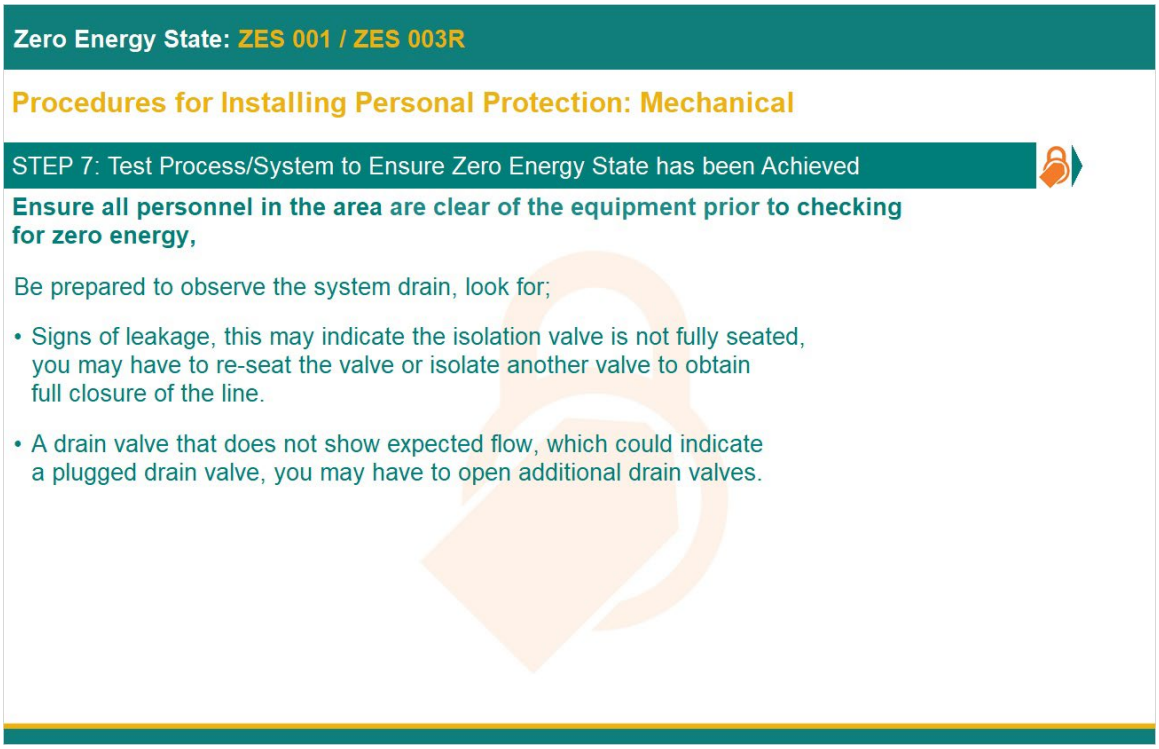
- All blocking valves shall be locked in the closed position and all bleed valves locked in the open position.

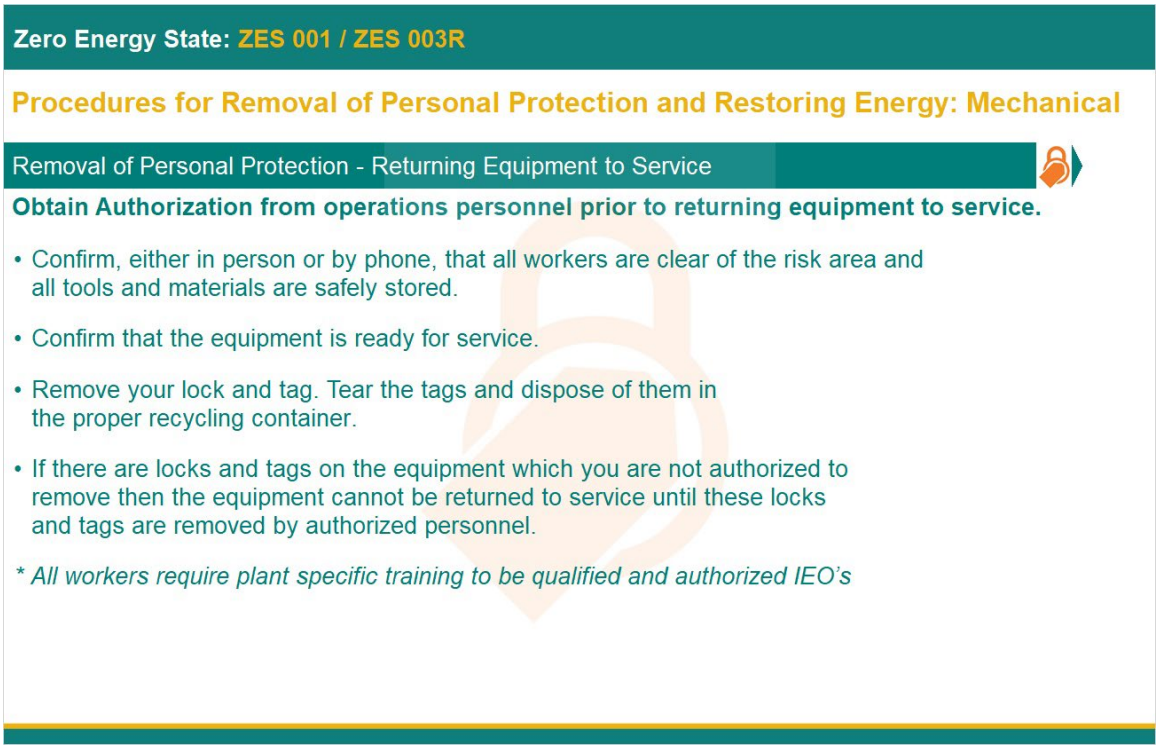
Once applied always test that the mechanical device cannot be opened and the key to the lock is under your control and not left in the lock.

Flip Tag Over

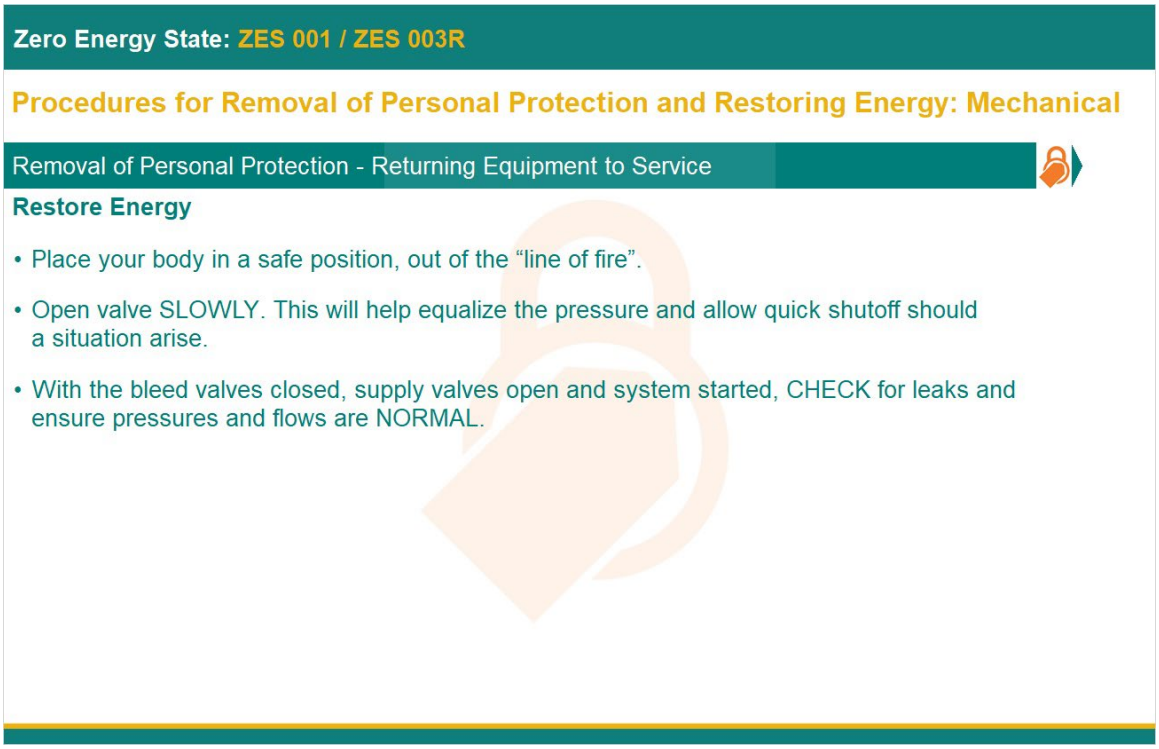
6.37 Installation - Step 7



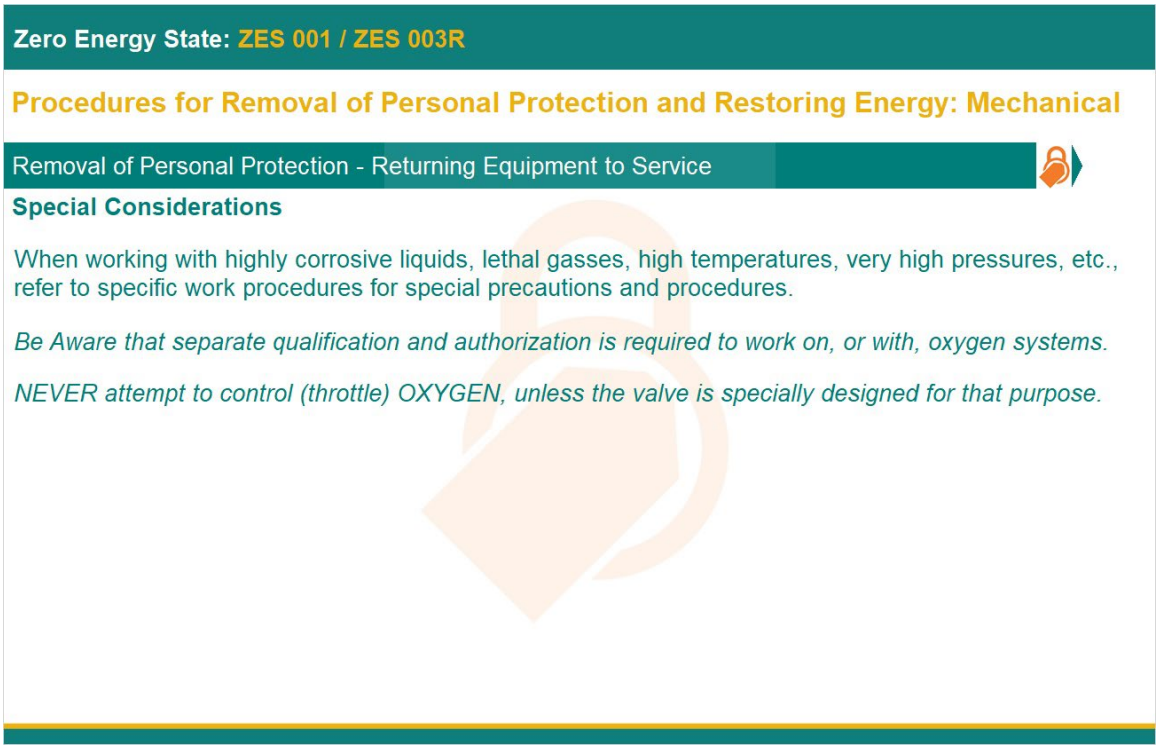
6.38 Removal of Personal Protection - Returning Equipment to Service



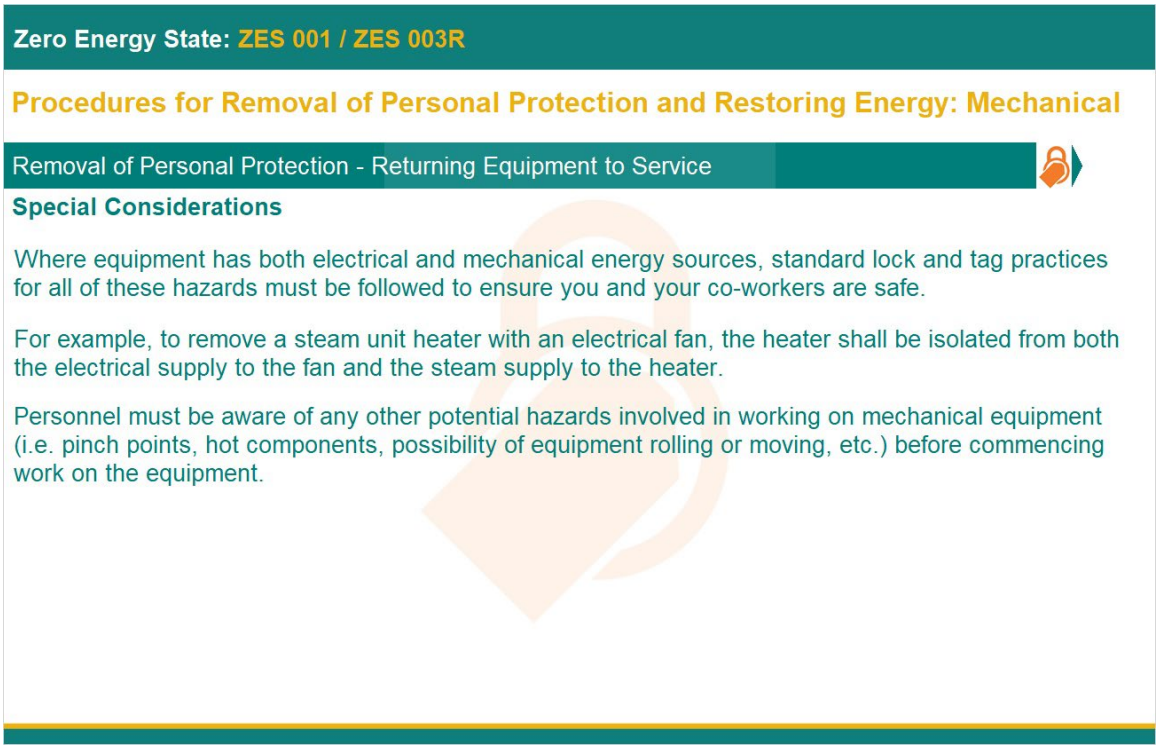
6.39 Removal of Personal Protection - Returning Equipment to Service



6.40 Special Considerations



6.41 Special Considerations



7. Conclusion

7.1 Mobile Equipment

Zero Energy State: ZES 001 / ZES 003R

Congratulations, you have successfully completed your study of this LOCKOUT, TAGOUT AND ZERO ENERGY module.

- Explain the concept of energy.
- Describe the nine types of energy (Electrical; Gravitational energy or gravitational potential energy: Hydraulic or water; Mechanical; Pneumatic; Chemical; Radioactive or Nuclear; Thermal; Residual or Stored).
- Identify the types of lockout devices and their uses.
- Describe the risks they are subject to when not using the safety devices and PPE.
- Describe the risks if they use them incorrectly and the preventive measures.
- List each step of the lockout and tagout procedure and activities that must be performed in the installation and removal of lockout/tagout protection.
- Recognize the existence and importance of Vale's instructions, local legislation, and the local procedures for safe lockout and tagout activities.