CAR 01 - Working at Heights (Vale North Atlantic)

Hello and welcome to the CAR 01 course - CRITICAL ACTIVITIES REQUIREMENTS: WORKING AT HEIGHTS.
The purpose of this awareness module is to provide an overview of the Vale Critical Activity Requirements that have been introduced to Vale's operations globally. These requirements are in the process of being fully implemented across our operations.

- Requirements for People Lifting Equipment
- Requirements Against Falling Objects, Materials or Tools
- Requirements for Training
- Quiz
- Conclusion

Welcome

Watch the video in full to continue.

Context

CARs are part of Vale's safety culture. Their application is essential for the execution of critical activities.

PTP – 00813

Critical Activity Requirements are described in the document number 00813. In December 2019, CARs 01 to 05 were revised.

PTP – 00813 has changed both in form and in content, with the aim of making requirements more robust, making critical activities SAFER and fulfilling our value Life Matters Most.

N1 - Fatal Incidents - N2 - Recordable Injuries With High Potential

In this course, we will deal specifically with CAR 01.

Complete the content above before moving on.

Important: During this video you will hear and see the word "moored", this means "anchored".

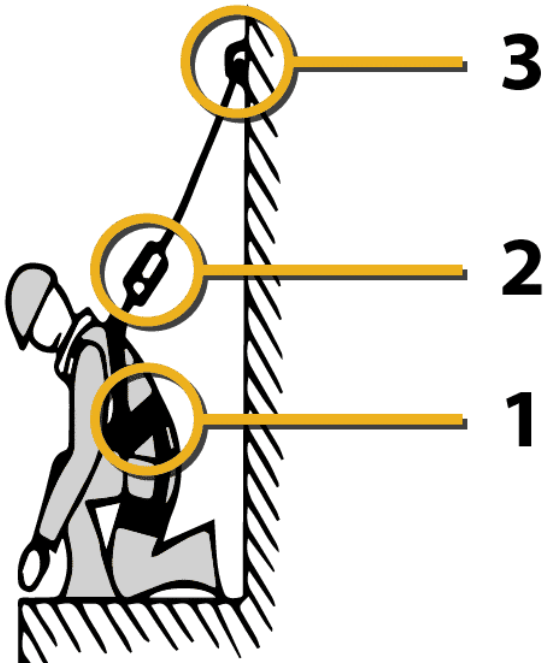
CAR 01
Working at Heights

VALE

Watch the video in full to continue.

Question

Drag and Drop Exercise. Identify the components of a typical fall arrest system. Study the image below, drag each fall protection equipment component from the list on the left and drop it on the corresponding number on the right.



Individual protective equipment.	1
Connecting element.	2
Anchoring system.	3

SUBMIT

Complete the content above before moving on.

All equipment that makes up the personal fall protection system must be inspected before use!

Complete the content above before moving on.

Bowtie

Do you know what a bowtie is?

It is a very efficient risk analysis method that presents the unwanted event, causes and controls visually. The diagram allows us to see the controls that need to be but in place to prevent the event or to mitigate the consequences.

Important: the diagrams were made for the main RAC events and requirements.

Not all requirements in the document will be present in the bowtie. Reading the document is essential.

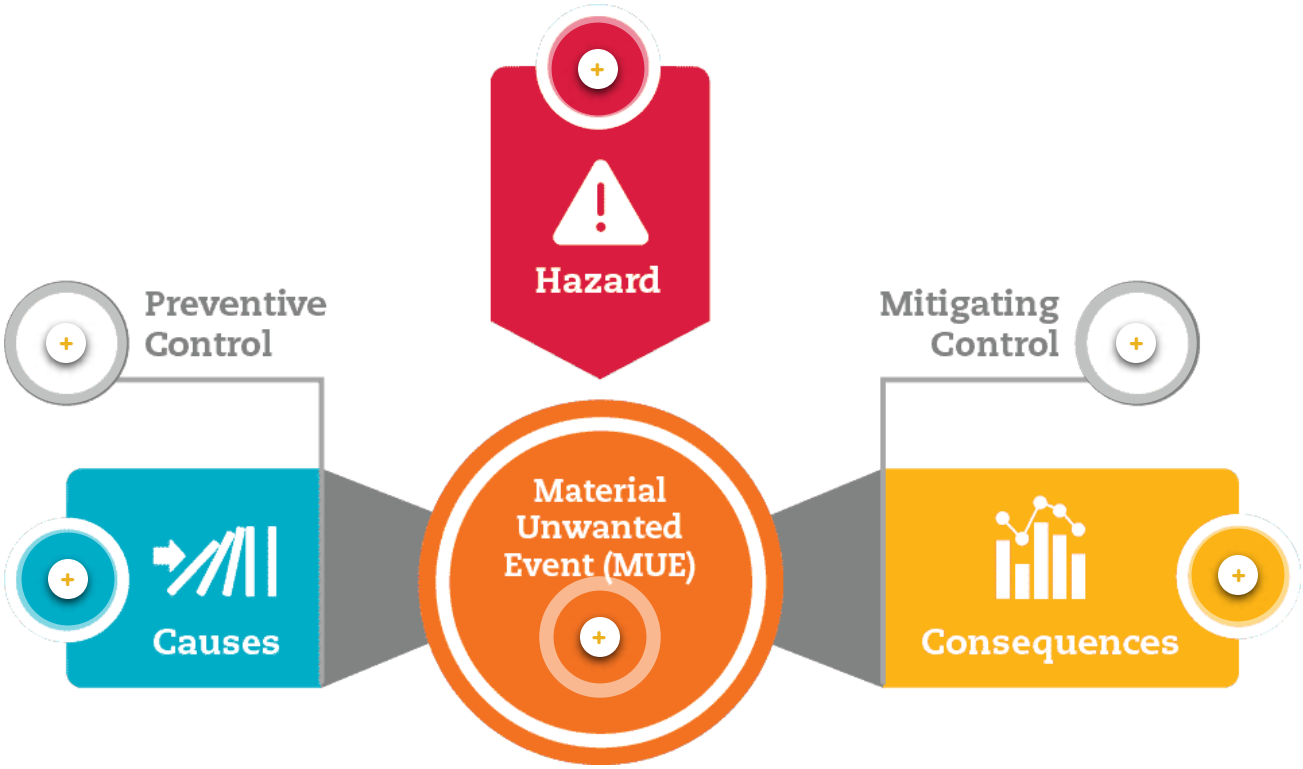
Watch the video below and understand bowties better!

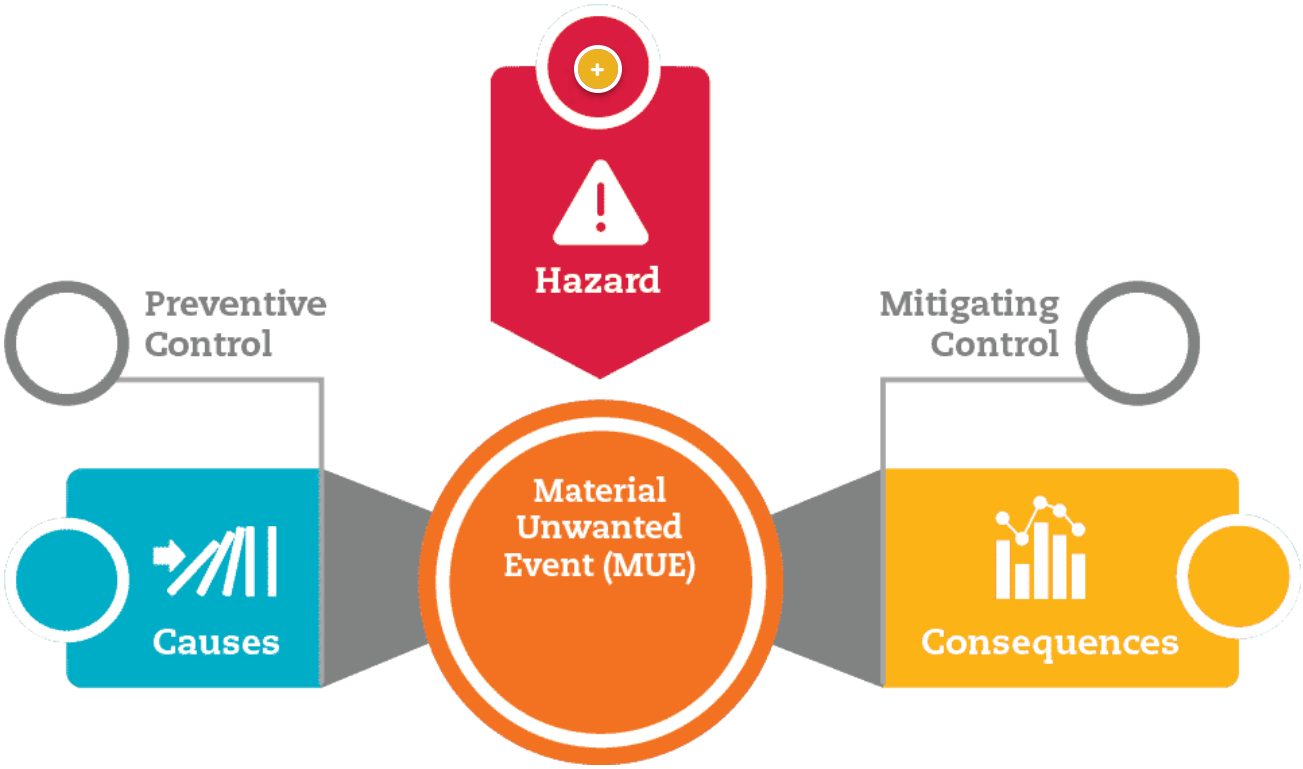
Watch the video in full to continue.

Check out the CAR 01 bow tie related to the main events that can occur at work at height.

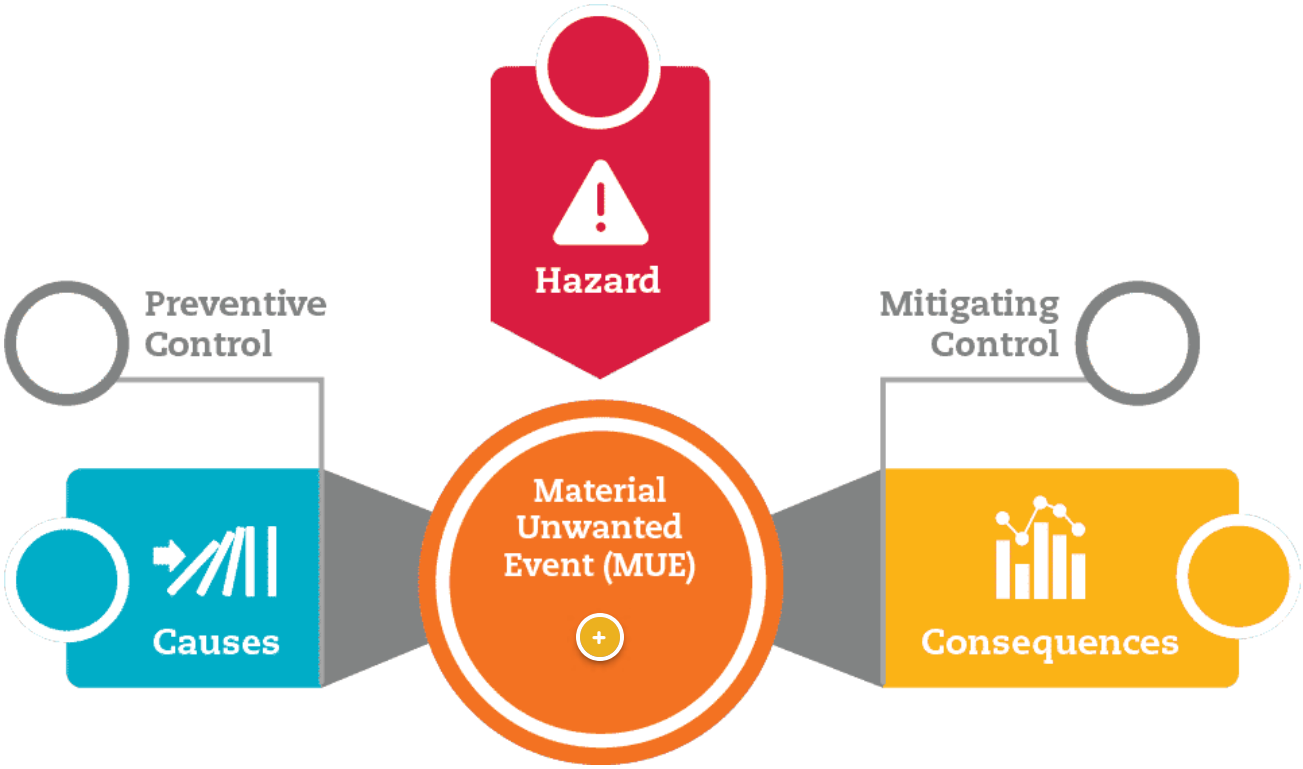
Falling people during anchoring

Click on the indications below and learn more:

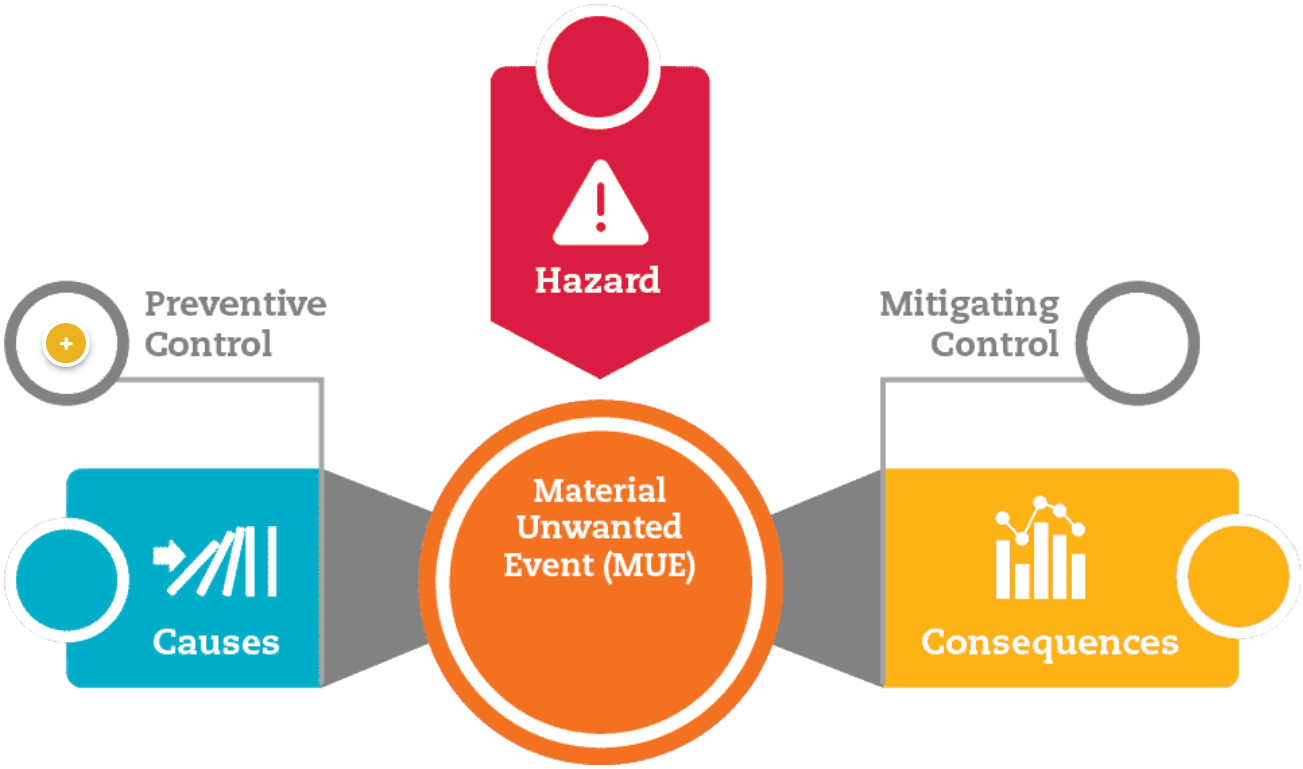

Hazard
Preventive Control
Mitigating Control
Causes
Material Unwanted Event (MUE)
Consequences



Working at heights during anchoring



Falling people during anchoring



Preventive Control

Rope access performed improperly:

- Rope access restrictions;
- Technical criteria for rope access.

Lack of training:

- Training in risk prevention;
- Specific training for fall protection system.

Damaged or poorly designed anchoring system:

- Elaboration and installation by qualified professional;
- Pre use and periodic inspection.

Lack of fixation:

- Fixed full body safety harness or life line.

Structure collapse:

- Independent life line.

Lack of planing:

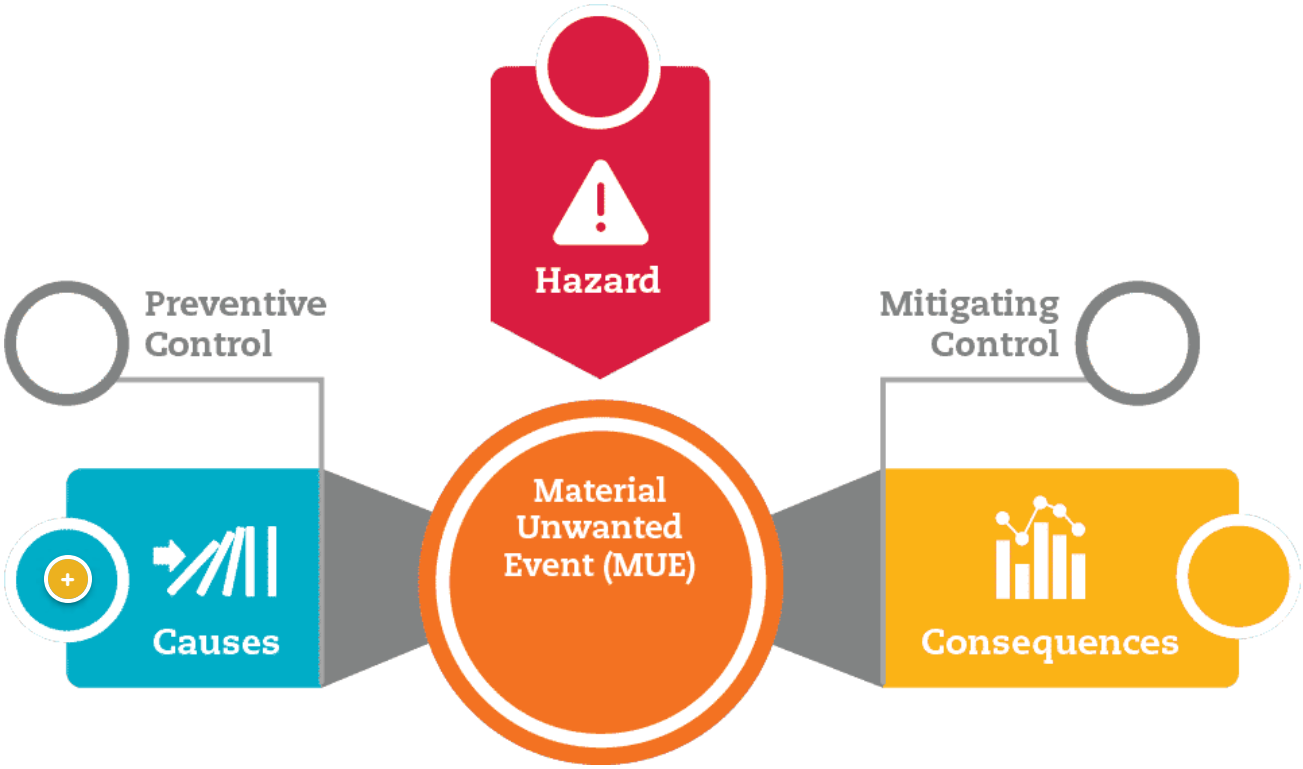
- Analyze about the System of individual and collective protection.

Anchor point / structure fragile:

- Fixation in resistant structure.

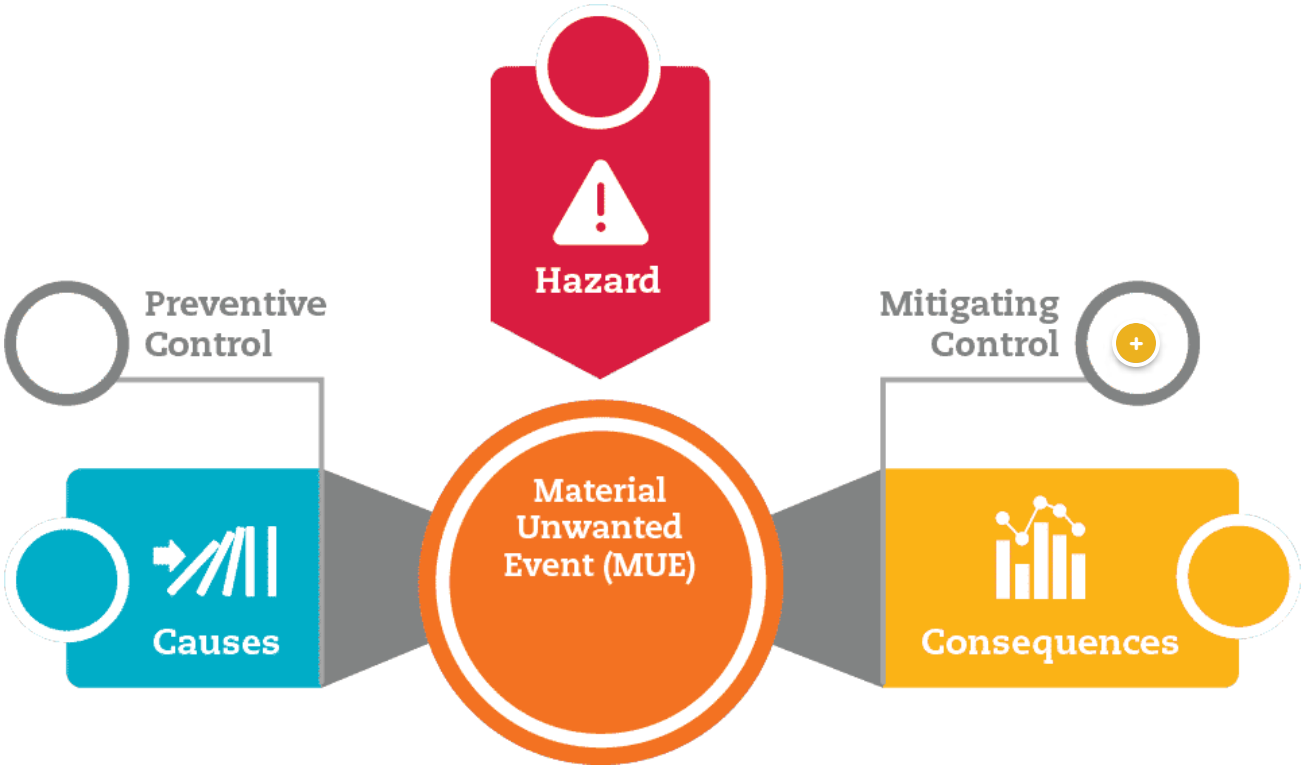
Rescue failed at height:

- Rescue scenarios in emergence response plan.



Causes

- Rope access performed improperly;
- Lack of training;
- Damaged or poorly designed anchoring system;
- Lack of fixation;
- Structure collapse;
- Lack of planing;
- Anchor point / structure fragile;
- Rescue failed at height.



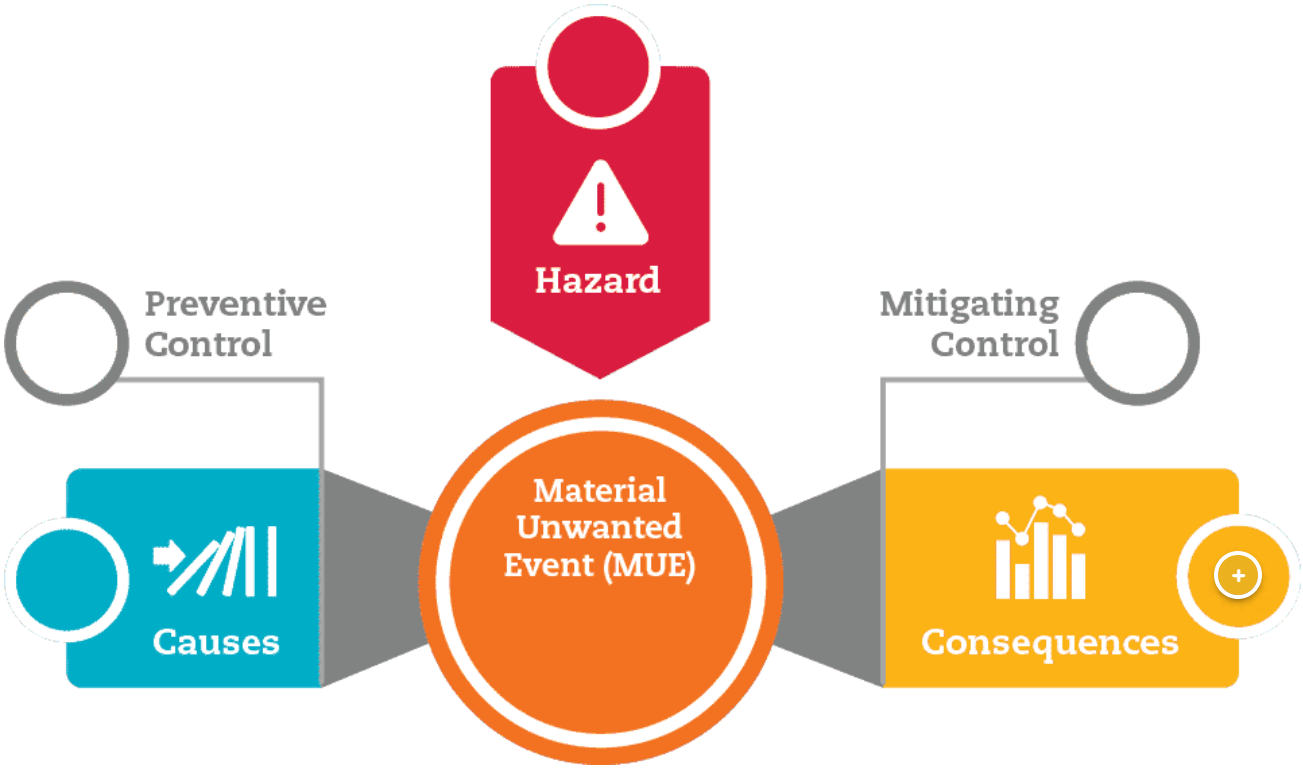
Mitigating Control

Injury:

- Personal protection equipment;
- First aids training.

Fatality:

- Personal protection equipment;
- First aids training.



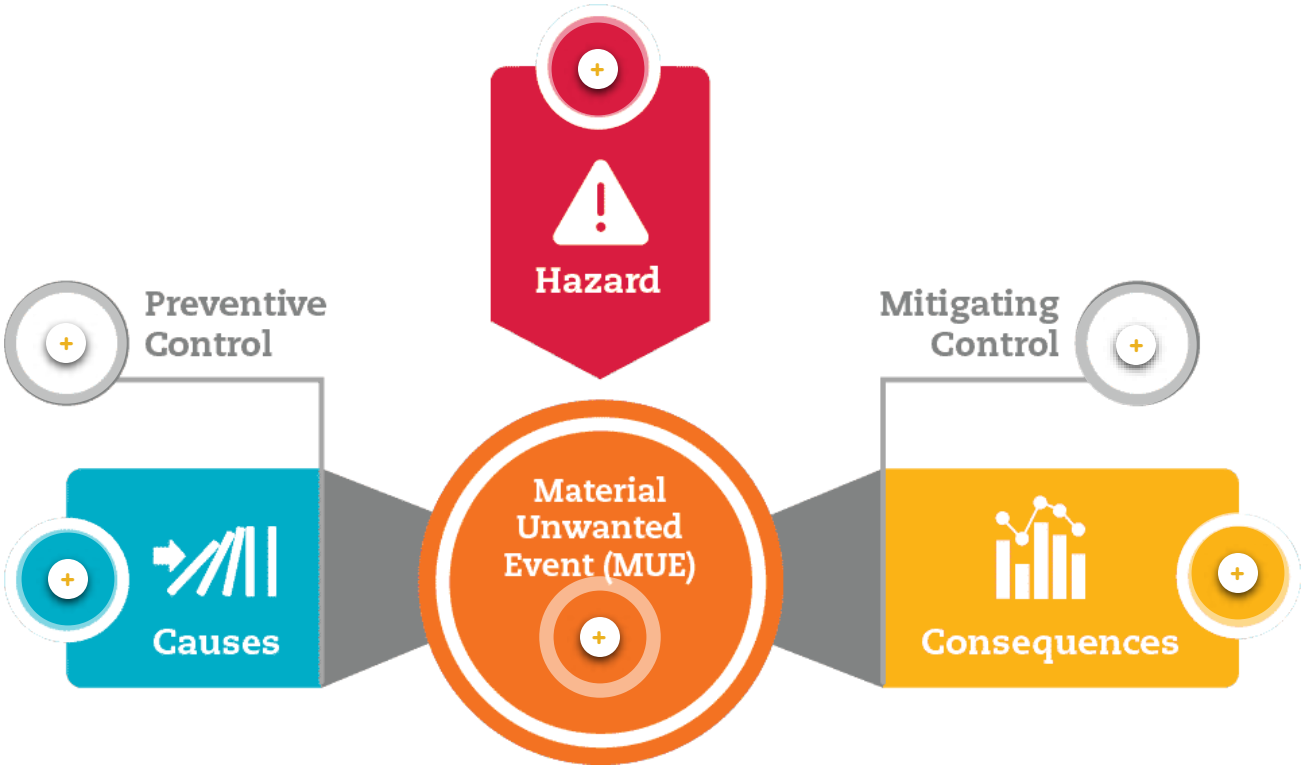
Consequences

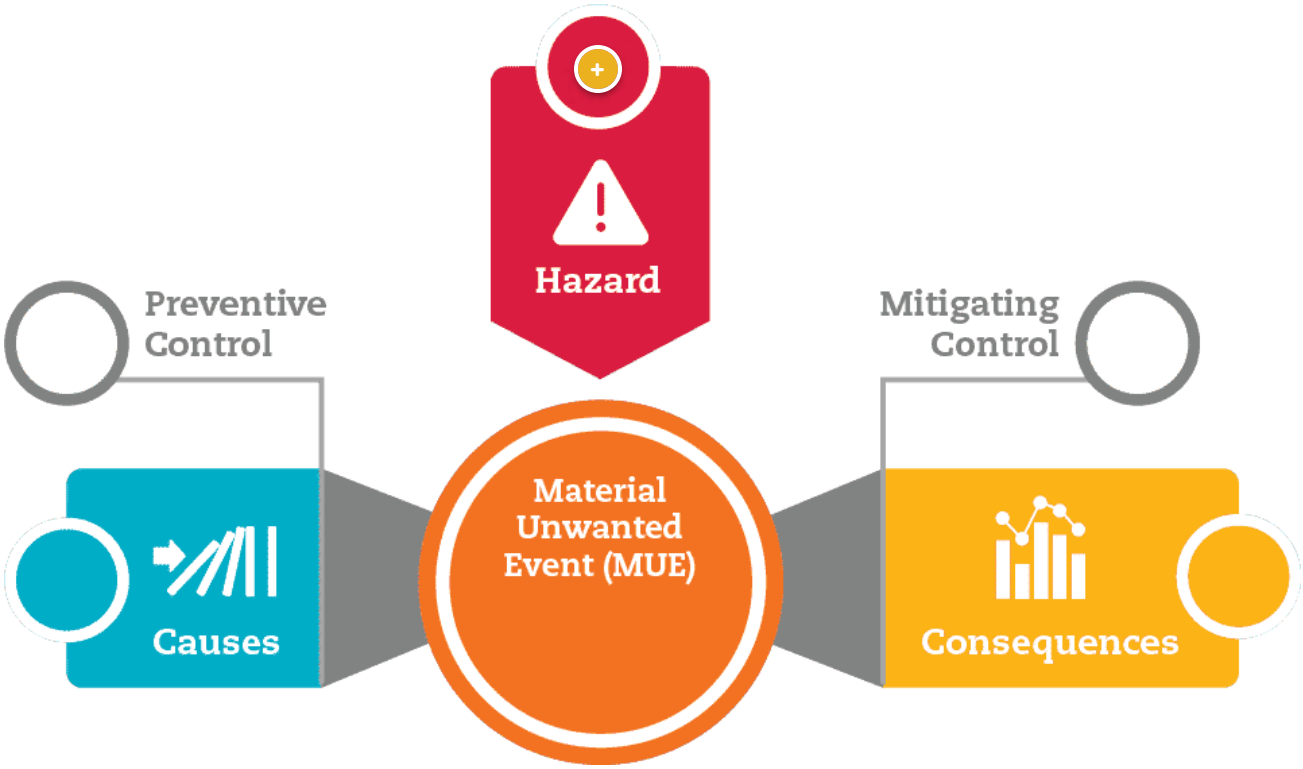
- **Injury;**
- **Fatality.**

Complete the content above before moving on.

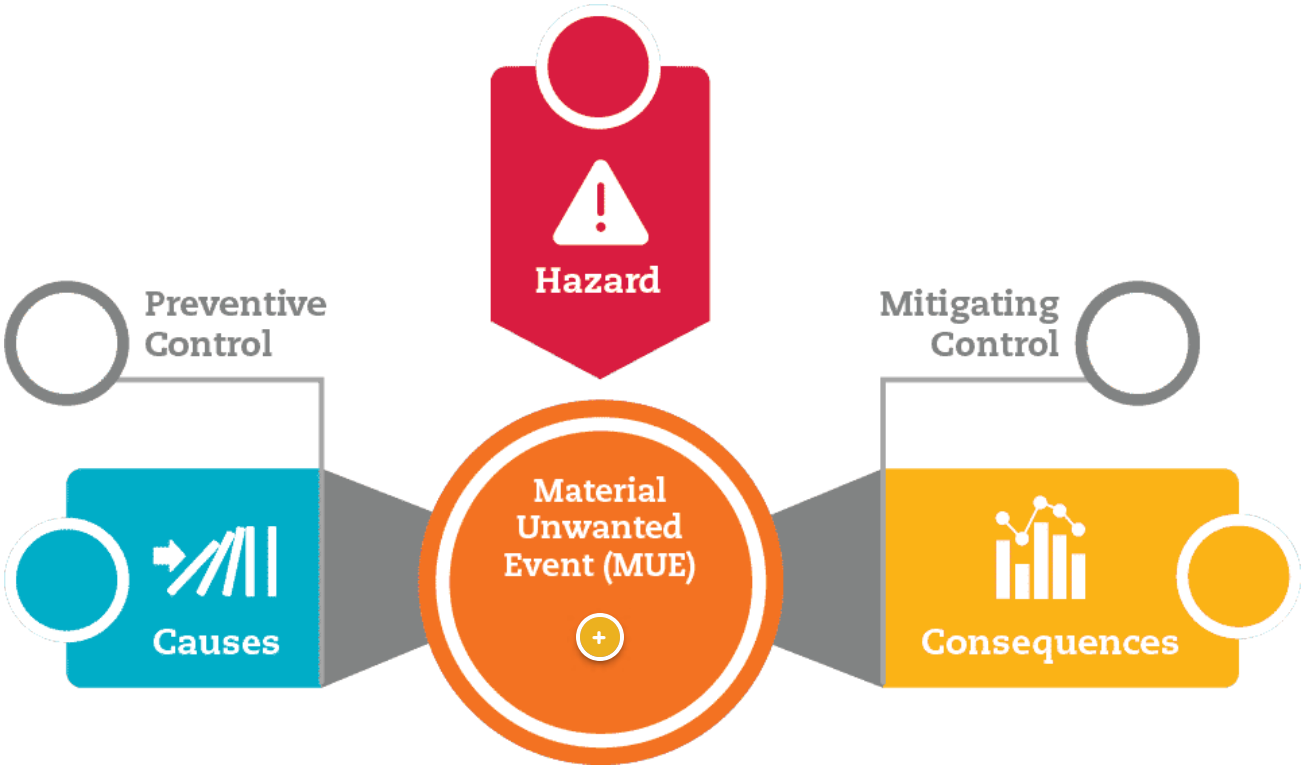
People fall from scaffolding

Click on the indications below and learn more:

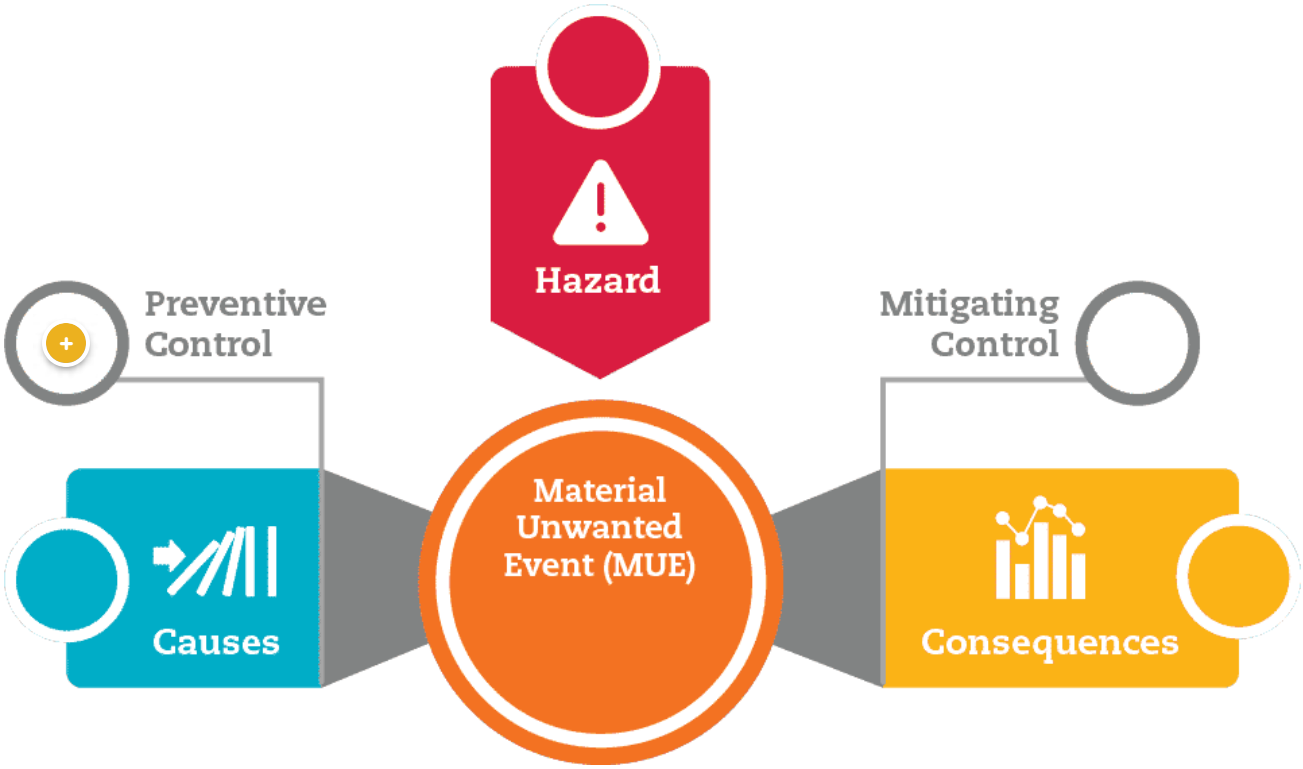

Hazard
Preventive Control
Mitigating Control
Causes
Material Unwanted Event (MUE)
Consequences



Working at height at scaffolding



People fall from scaffolding



Preventive Control

Poor designed scaffolding:

- Designed by a competent professional;
- Formal release requires a tag
  to be placed on the scaffold informing the user the status of the scaffold.
- **Red** means under construction.
- **Yellow** means ready for use and includes a warning identifying hazard(s) and controls required for use.
- **Green** means ready for use.

Trapdoor without barrier or open:

- Closure of the trapdoor;
- Physical barrier around the trapdoor.

Movement of fixed scaffolding:

- Constructed on a flat surface free of damage or deformation;

- Shoes in solid/resistant bases.

Overload:

- Visible plate with maximum allowable workload.

Lack of physical barrier:

- Handrail with upper and mid section railing.

Lack of fixation during scaffolding floor collapse:

- Full body safety harness.

Lack of fixation during suspended scaffolding collapse:

- Independent life line.

Fragile material:

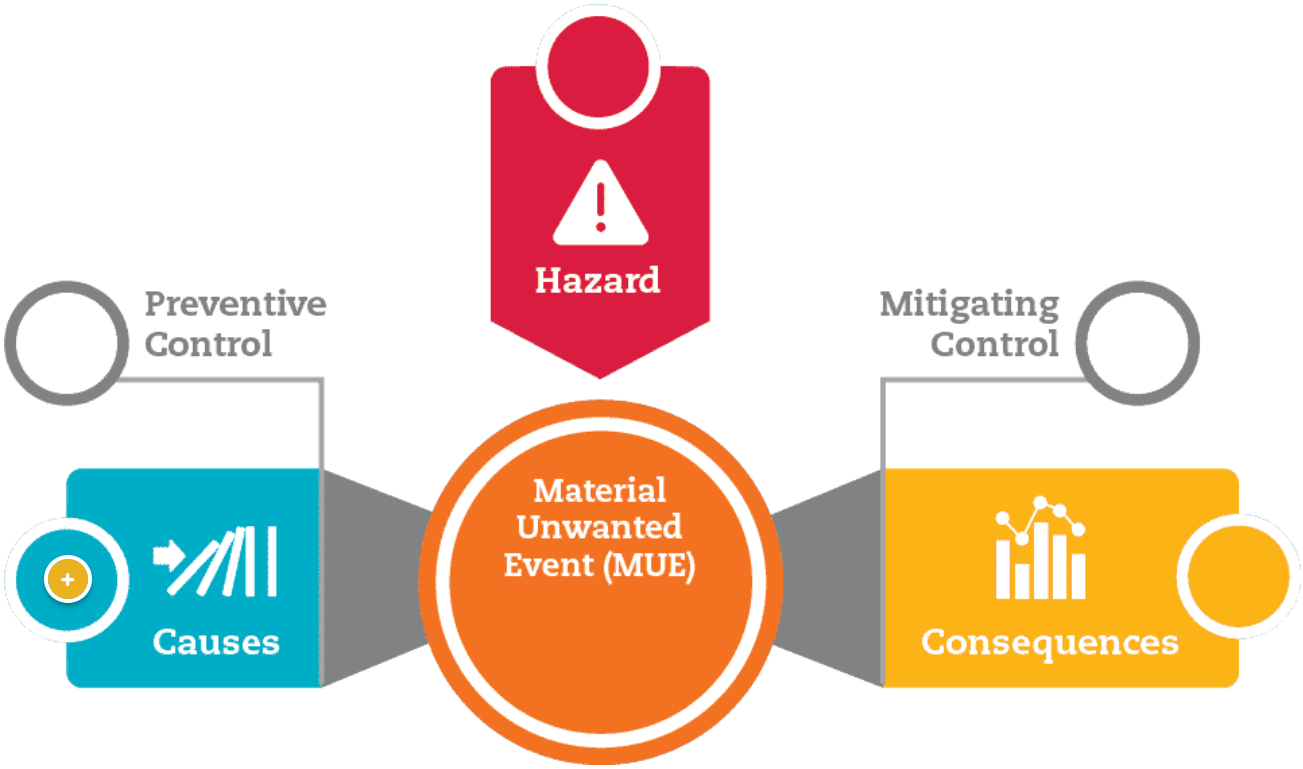
- Metal framing structural members.

Scaffolding built in non-resistant structure:

- Supported by a resistant structure.

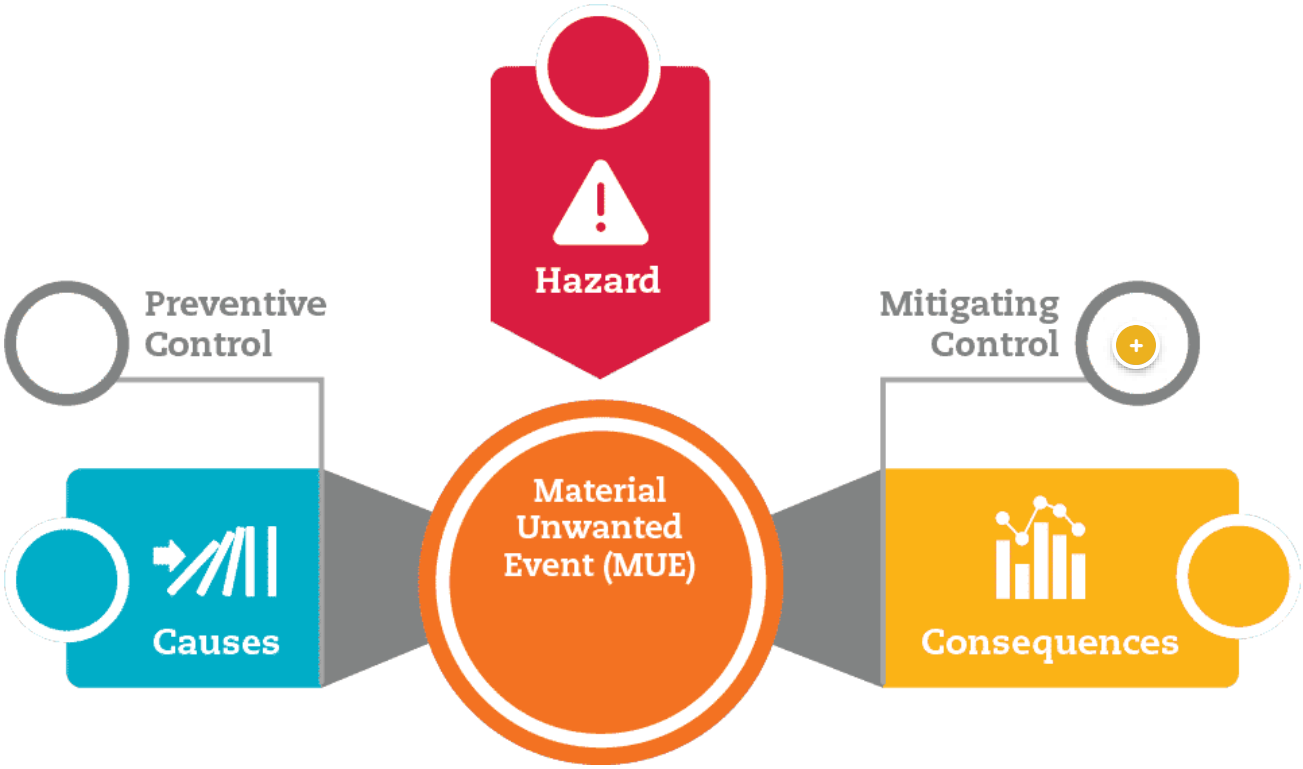
Lack of training of worker:

- Training in risk prevention.



Causes

- Poor designed scaffolding;
- Trapdoor without barrier or open;
- Movement of fixed scaffolding;
- Overload;
- Lack of physical barrier;
- Lack of fixation during scaffolding floor collapse;
- Lack of fixation during suspended scaffolding collapse;
- Fragile material;
- Scaffolding built in non-resistant structure;
- Lack of training of worker.



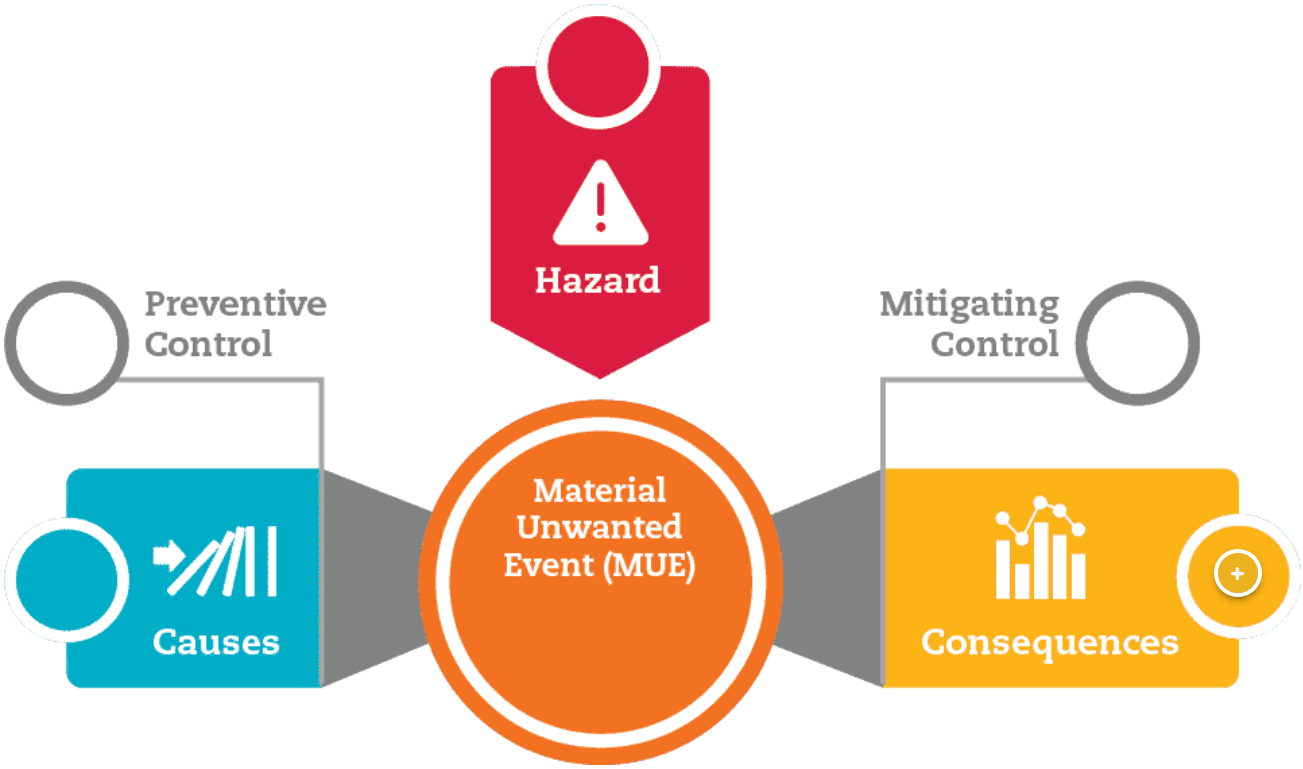
Mitigating Control

Fatality due fall:

- Personal protection equipment;
- First aids training.

Injury due fall:

- Personal protection equipment;
- First aids training.



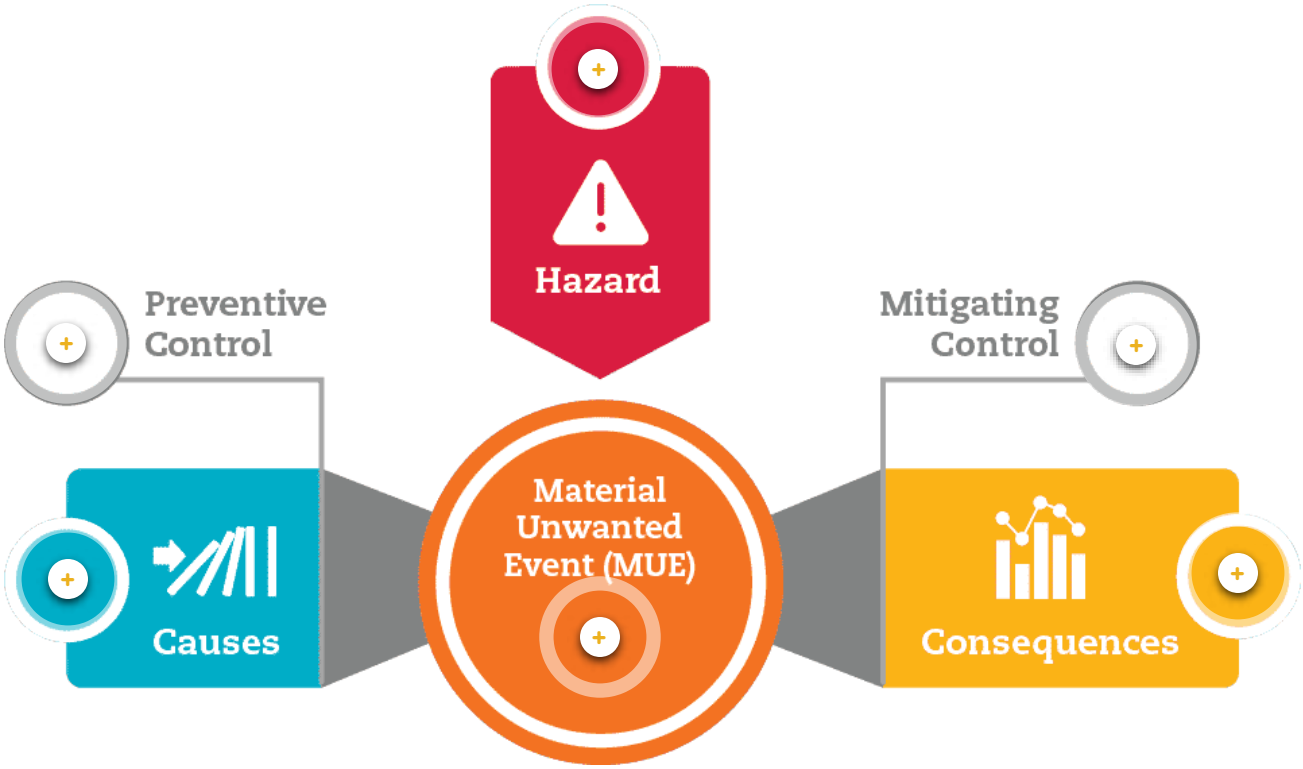
Consequences

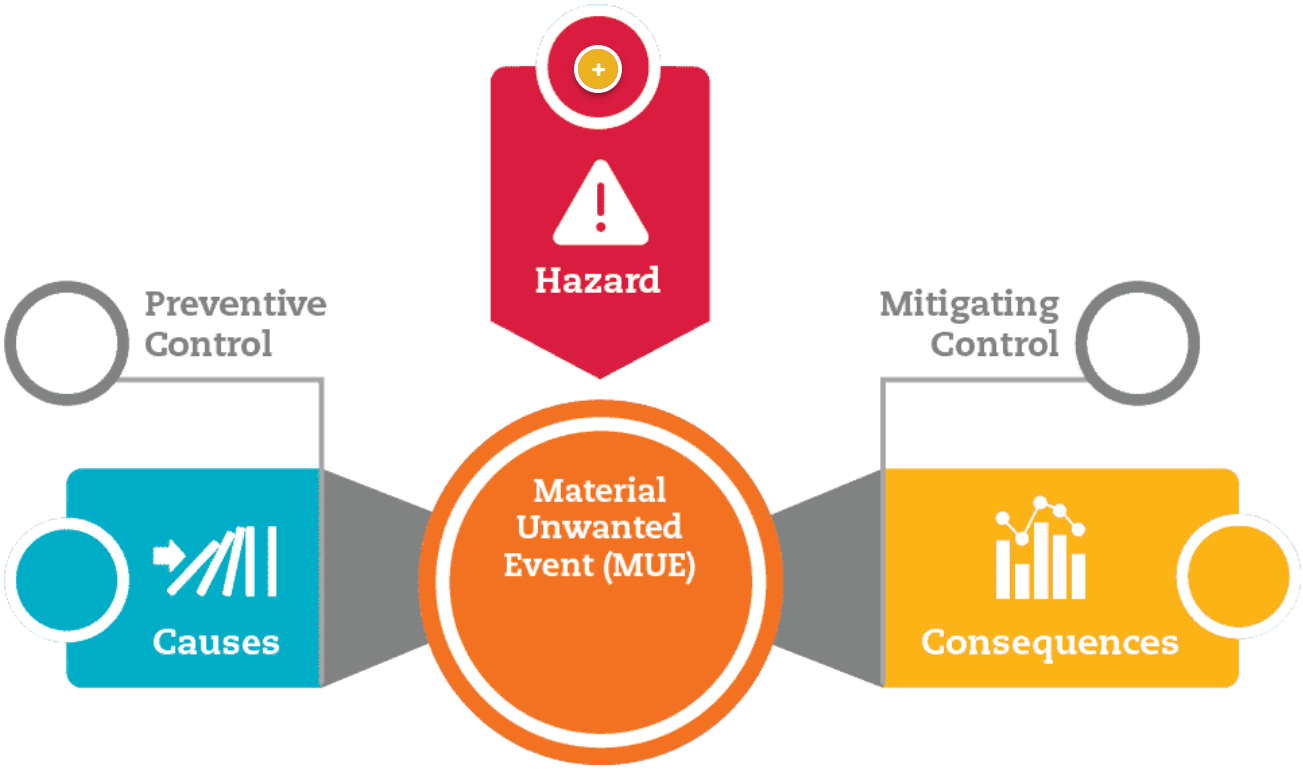
- Fatality due fall;
- Injury due fall.

Complete the content above before moving on.

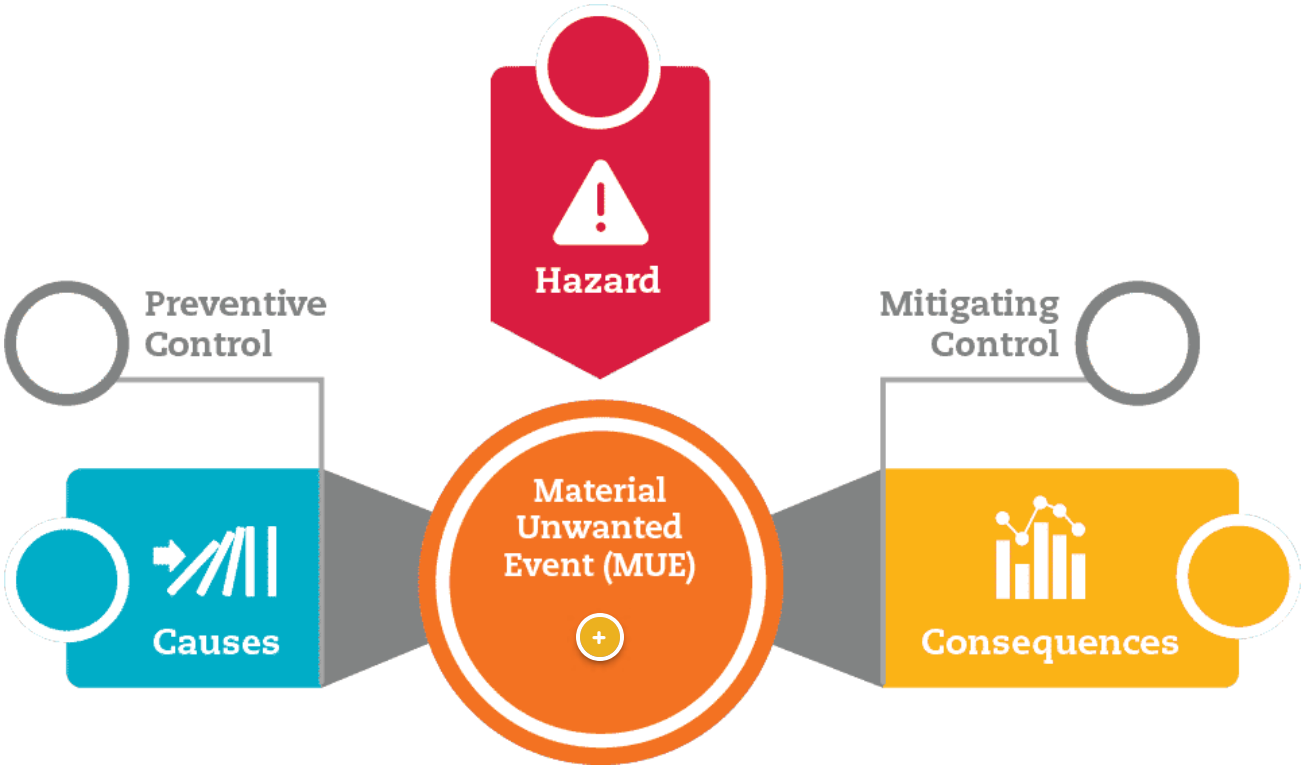
People fall from ladder

Click on the indications below and learn more:

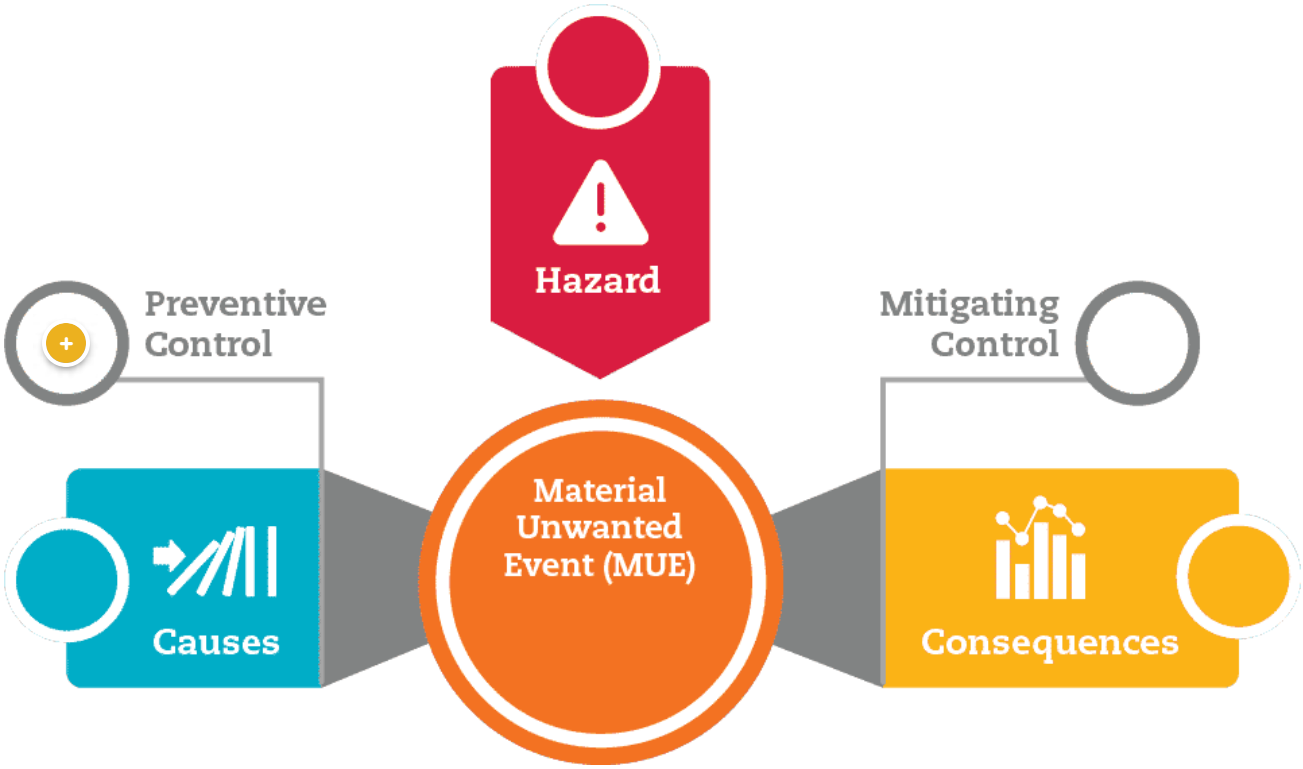

Hazard
Preventive Control
Mitigating Control
Causes
Material Unwanted Event (MUE)
Consequences



Working at height at ladder



People fall from ladder



Preventive Control

Movement of mobile ladder:

- Non-slipes shoes;
- Stabilization device /locking of casters.

Poor designed ladder:

- Specific maximum length;
- Intermediate levels.

Lack of barrier (platform ladder):

- Handrail.

Lack of fixation in sailor ladder:

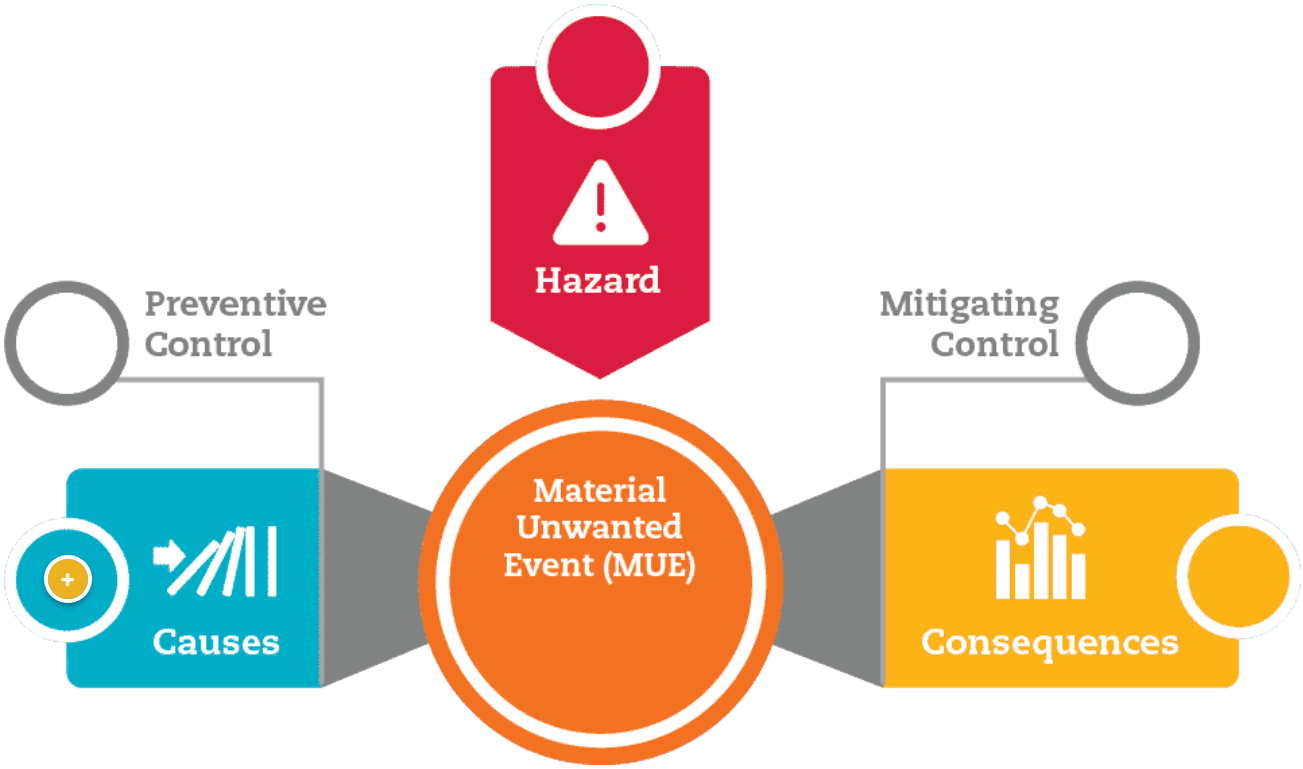
- Fixed life line / retractable life line / anchoring rod.

Slippery surface:

- Non-slip surface.

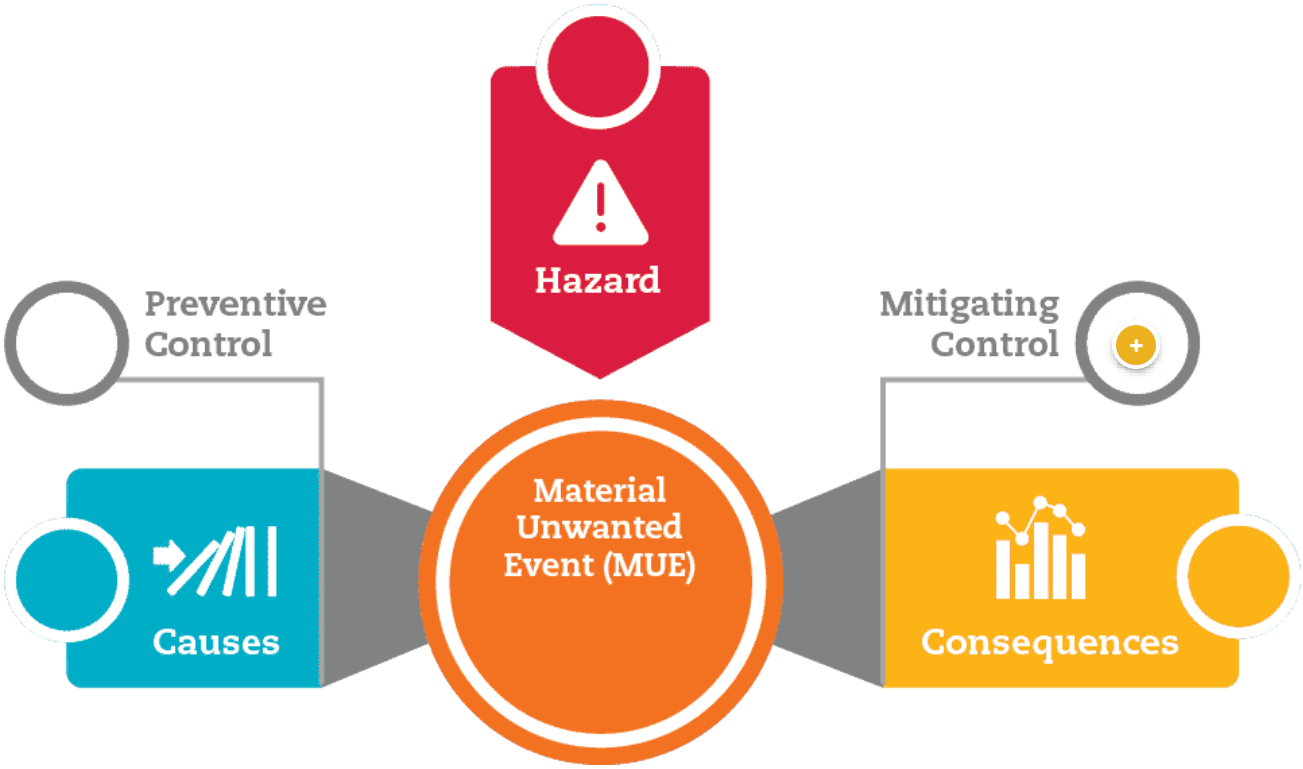
Lack of training of worker:

- Training in risk prevention.



Causes

- Movement of mobile ladder;
- Poor designed ladder;
- Lack of barrier (platform ladder);
- Lack of fixation in sailor ladder;
- Slippery surface;
- Lack of training of worker.



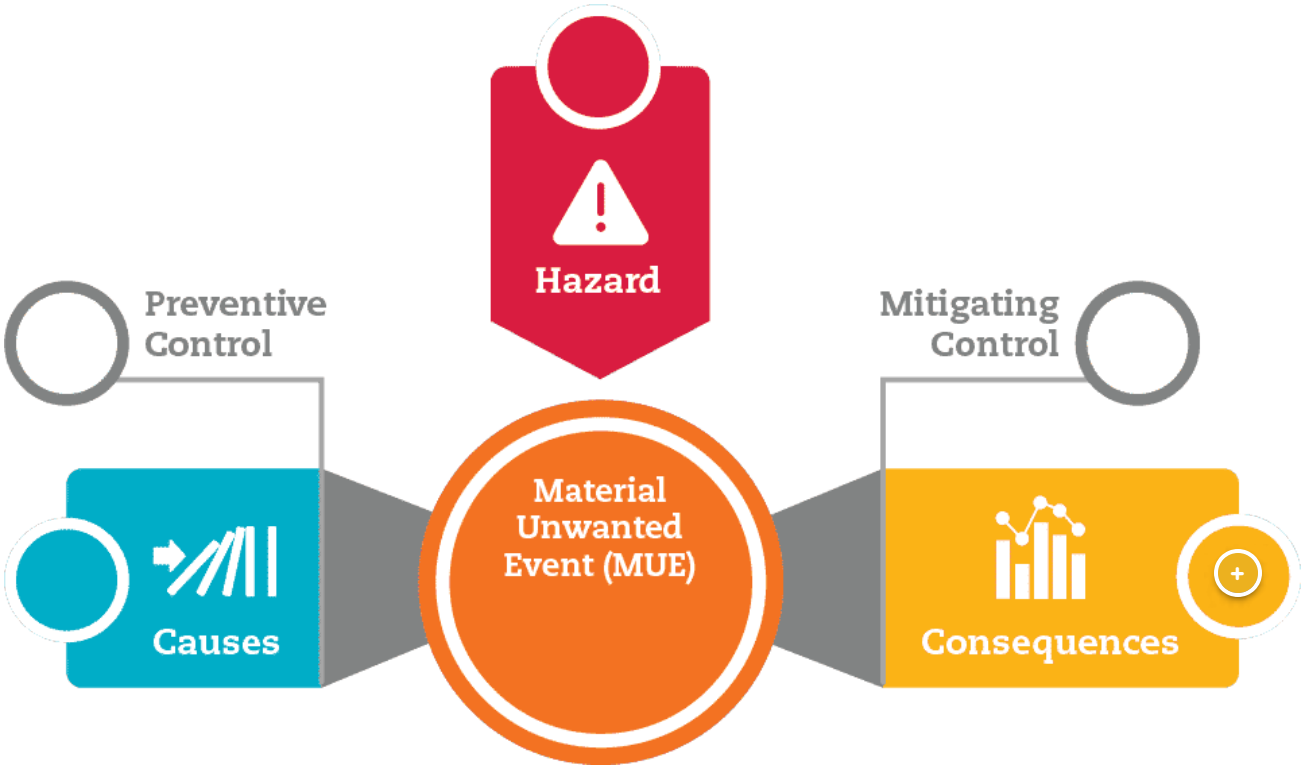
Mitigating Control

Injury:

- Personal protection equipment;
- First aids training.

Fatality:

- Personal protection equipment;
- First aids training.



Consequences

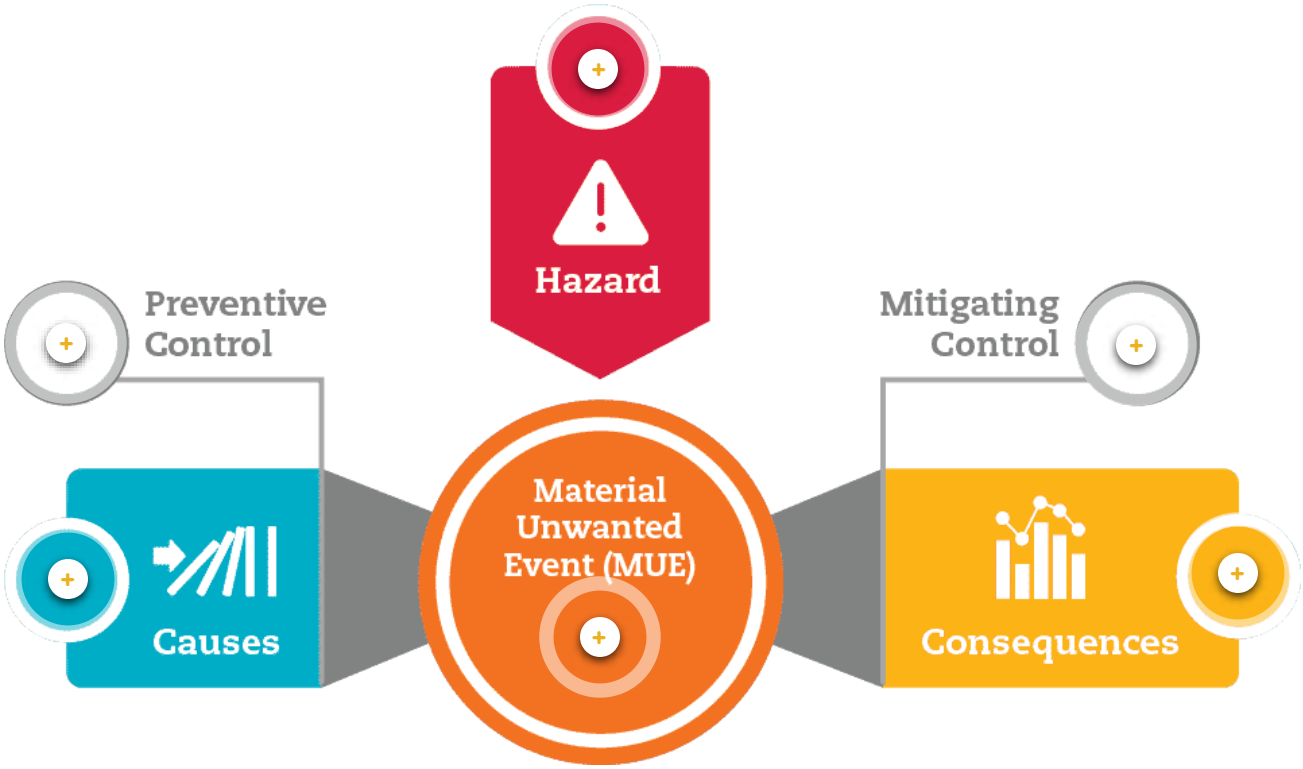
- Injury;
- Fatality.

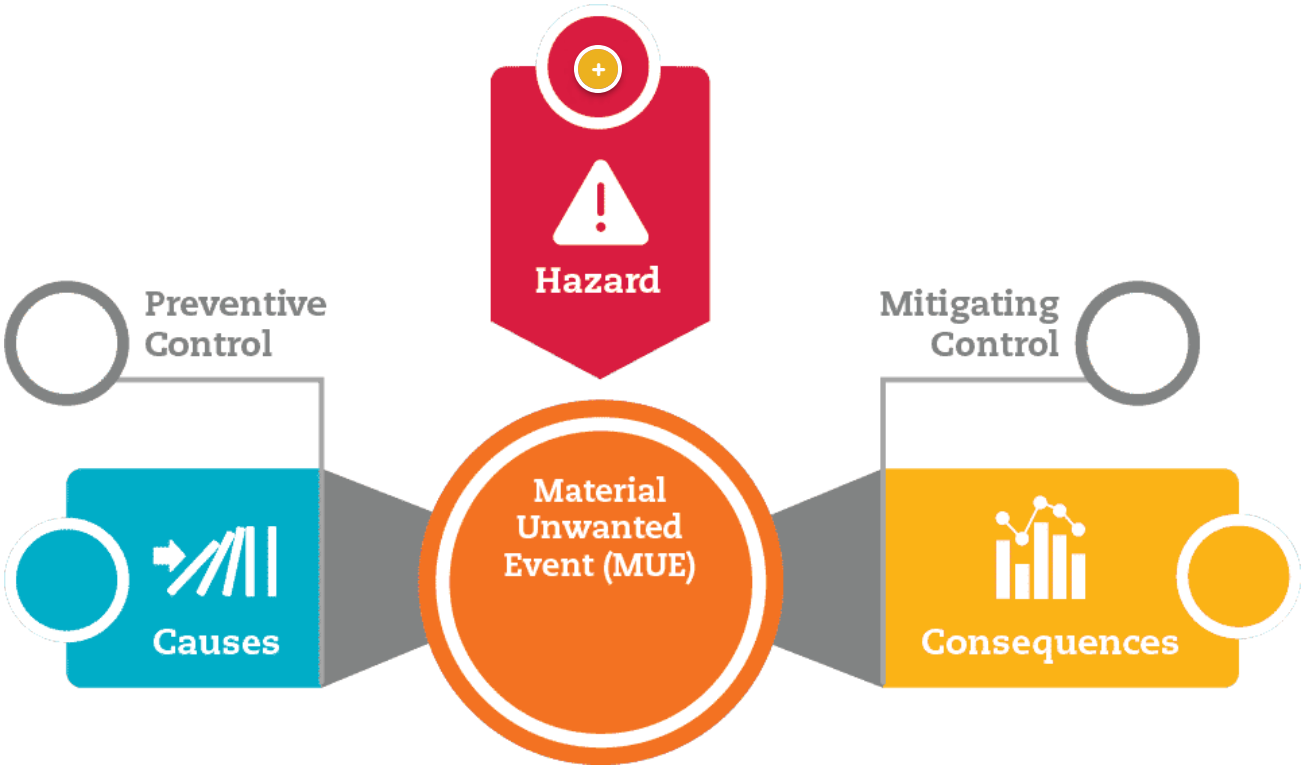
> Note: Ladders are to be used for access tool/equipment only, and are not to be used as a work platform.

Complete the content above before moving on.

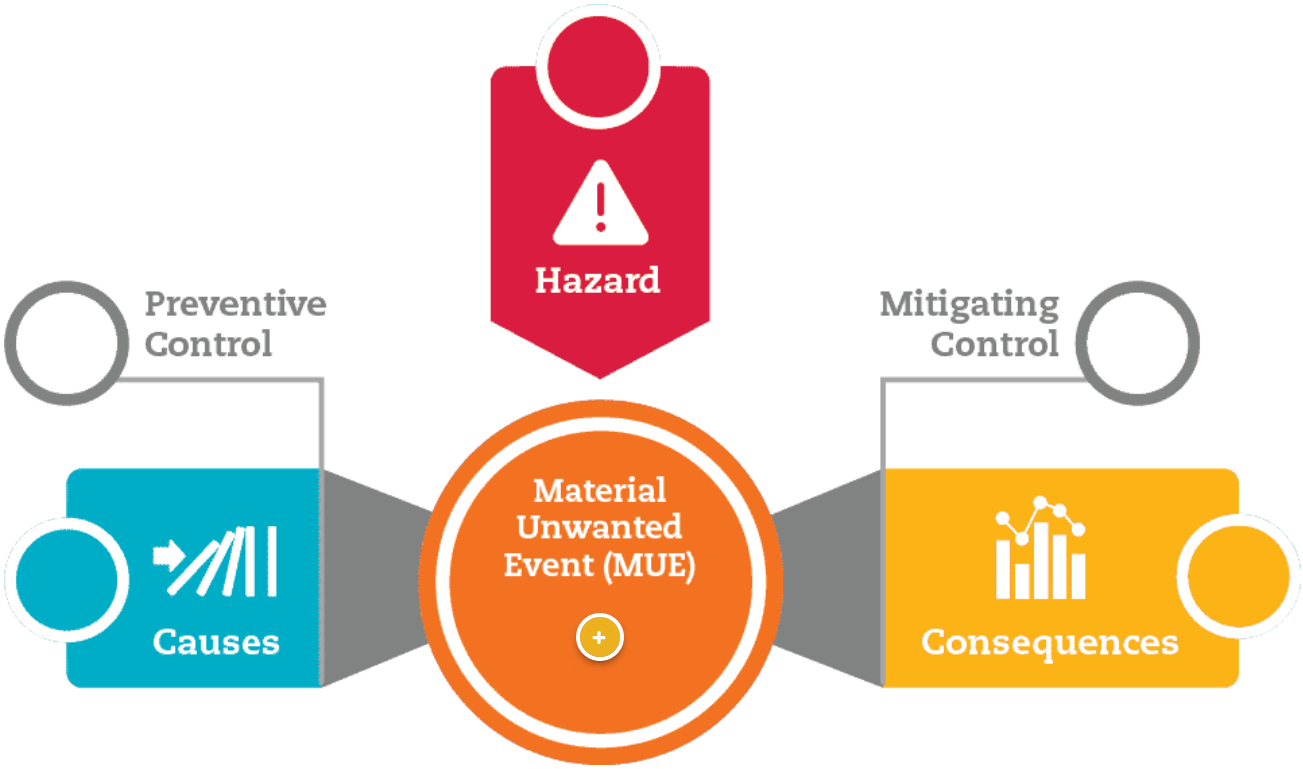
Falling Objects

Click on the indications below and learn more:

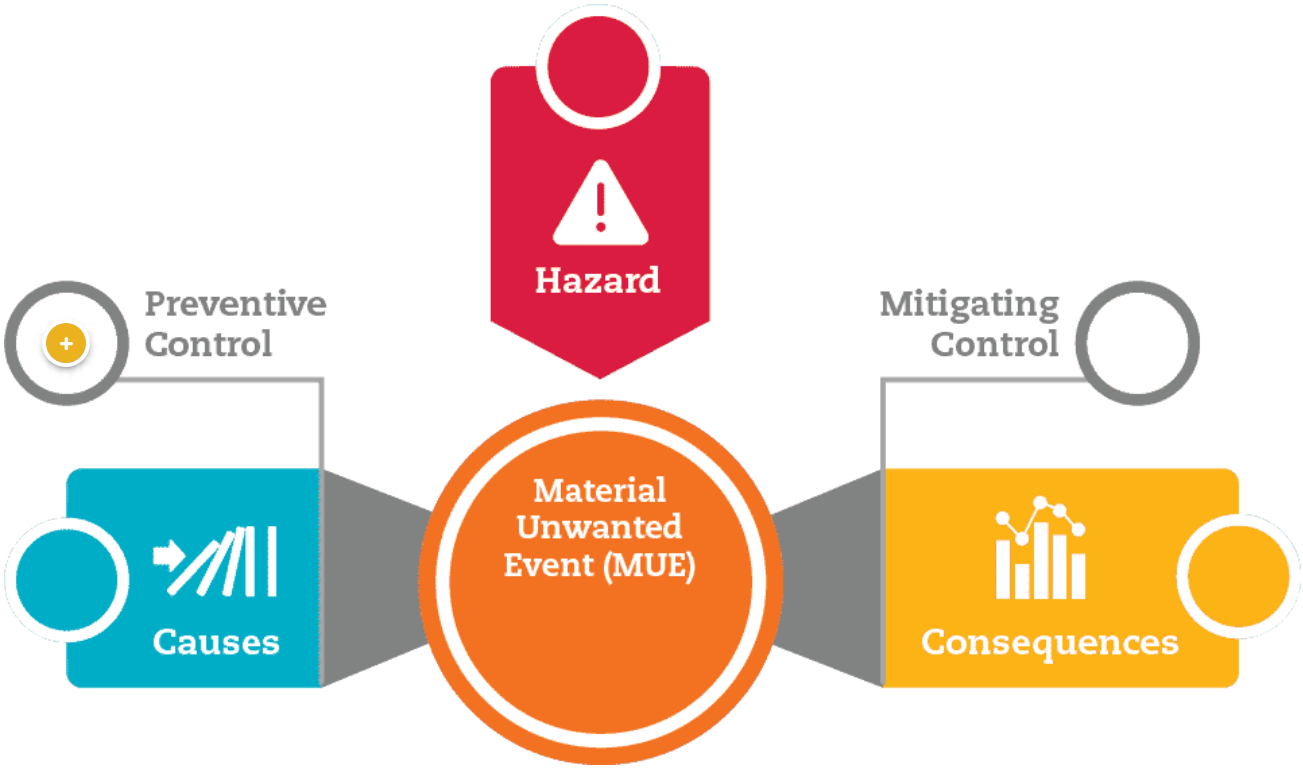




Working at height



Falling Objects



Preventive Control

Overload in scaffolding:

- Visible plate with maximum allowable workload;
- Automatic mechanical locking device (for suspense scaffolding).

Lack of a physical barrier to prevent falling objects:

- Toe board;
- Safety nets.

Lack of fixation of object:

- Tool securing system.

Damaged object fixating equipment:

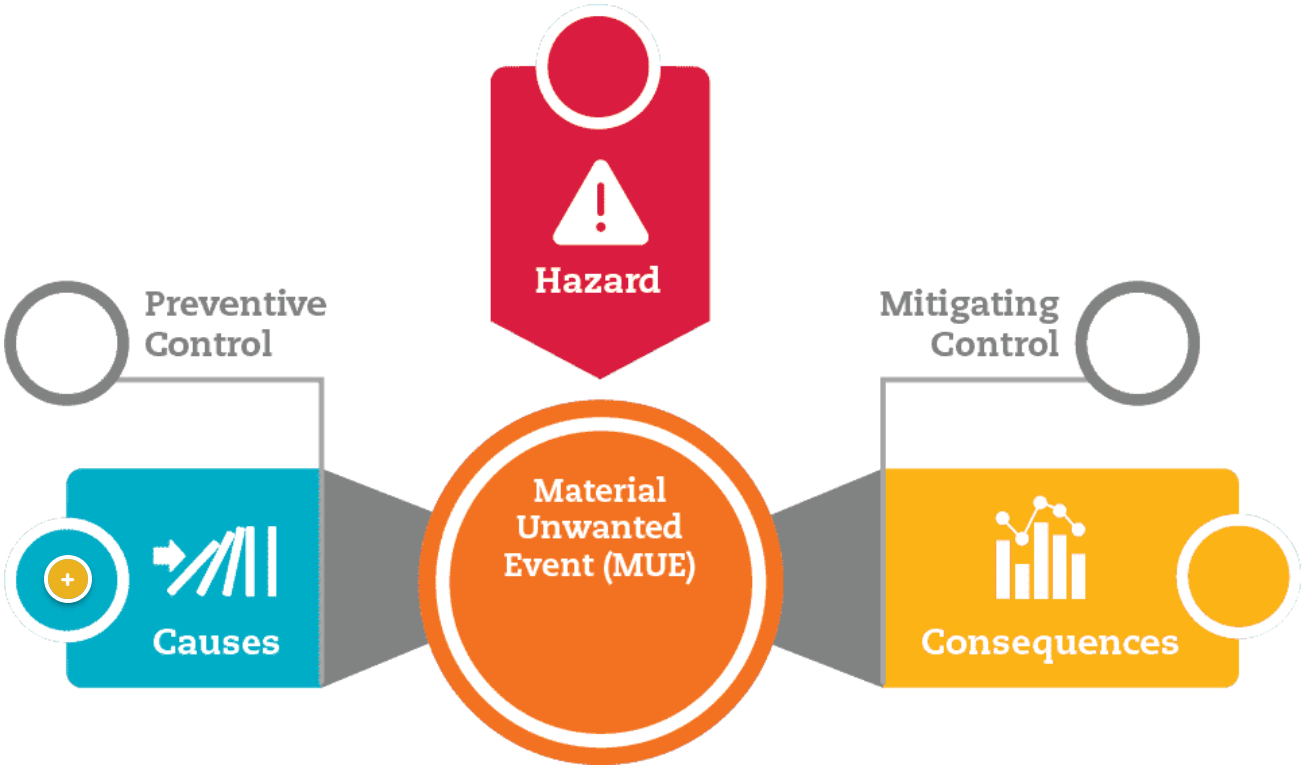
- Pre-use inspection.

Movement of scaffolding with object on top:

- Prohibition of moving scaffolding with object on it.

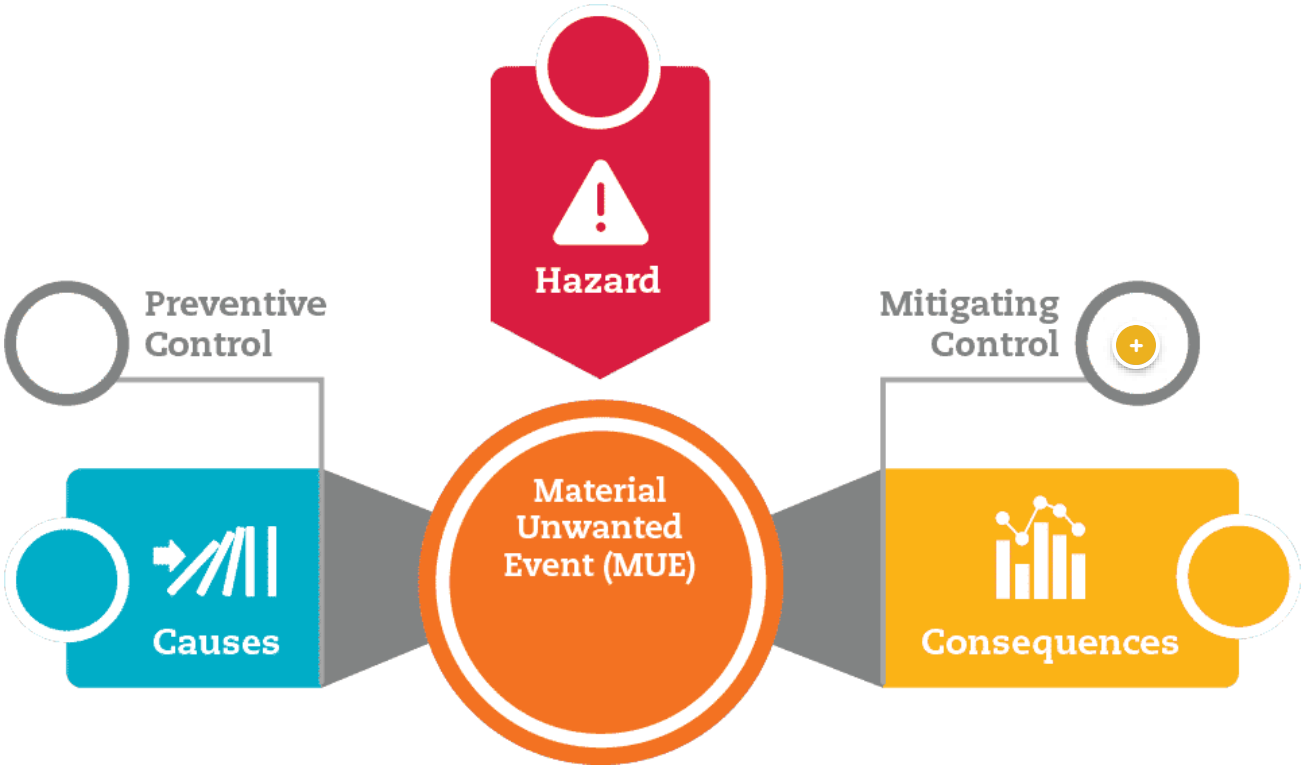
Lack of training of worker:

- Training in risk prevention.



Causes

- Overload in scaffolding;
- Lack of a physical barrier to prevent falling objects;
- Lack of fixation of object;
- Damaged object fixating equipment;
- Movement of scaffolding with object on top;
- Lack of training of worker.



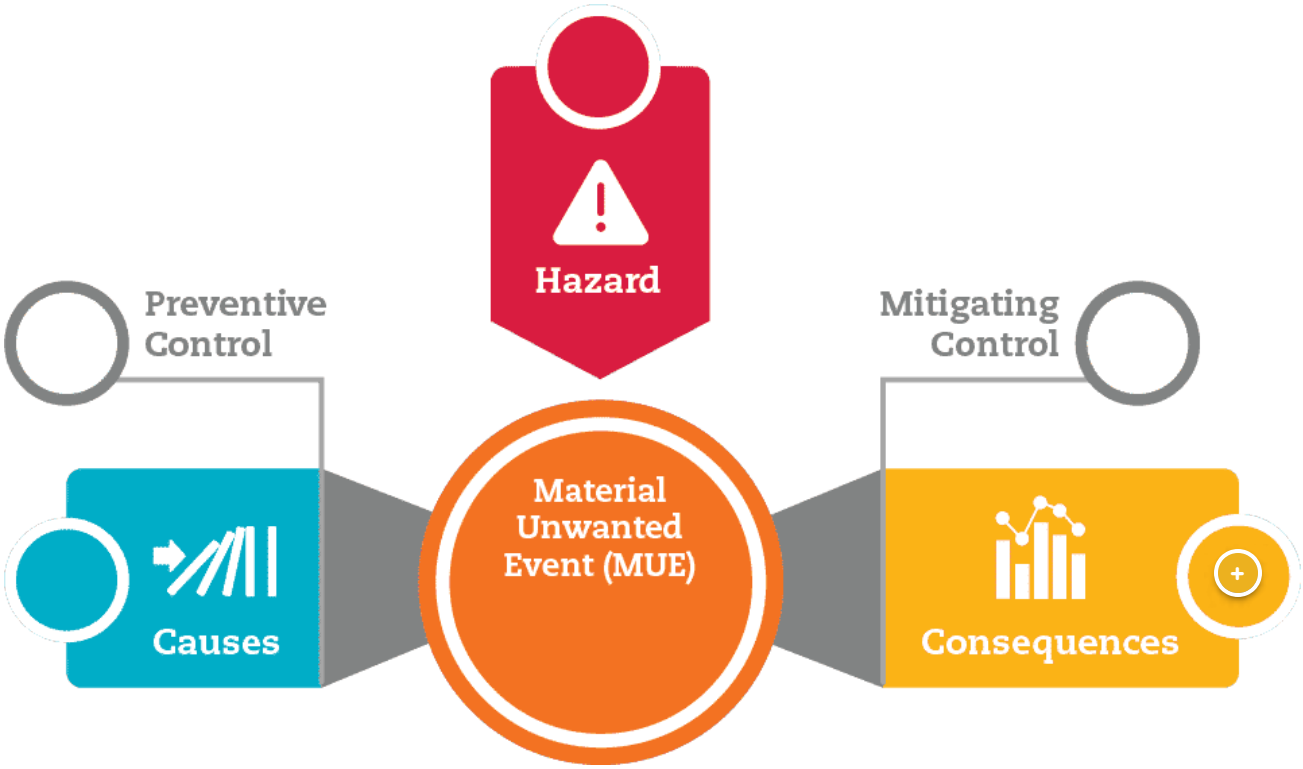
Mitigating Control

Fatality due person hit by object:

- Area isolation;
- Personal protection equipment;
- First aids training.

Injury due person hit by object:

- Area isolation;
- Personal protection equipment;
- First aids training.



Consequences

- Fatality due person hit by object;
- Injury due person hit by object.

Complete the content above before moving on.

During this training, these bowties will be used to exemplifying the requirements of CAR 01. Carefully analyze the bowties and learn more about CAR requirements!

Complete the content above before moving on.

Requirements for Falling People

In this chapter we will learn about the requirements of CAR 01 for **FALL OF PEOPLE**.

Which of these correspond to proper Fall Protection equipment?

- ◯ Safety belt.
- ◯ Full body harness.

SUBMIT

Complete the content above before moving on.

In which of these situations should the independent lifeline NOT be obligatorily adopted?

- Activities with rope.
- Suspended scaffolding.
- Suspended chair.
- Places where there is a risk of falling due to surface collapse.
- Swing scaffolding.
- Air work platforms.

SUBMIT

Complete the content above before moving on.

In rope activities, there is a risk of the main rope breaking, so another lifeline must be used. In suspended chairs and swing scaffolding, there is a risk of collapse of these structures, a situation in which the employee must be anchored on an independent lifeline. Finally, places where there is a risk of collapse are fragile roofs or surfaces, which can be broken.

The **independent lifeline** is a fall prevention control that **prevents the worker from falling** in the event of a structural collapse

An **accident is an unexpected and undesirable event** that causes personal, material, financial damage and that occurs unintentionally

Complete the content above before moving on.

This entire course is aimed at explaining the importance of CAR 01 and its requirements for the safety of people in works at height. And for that, we must know some real cases of accidents that occurred in the company in order to have a clear view of the importance of safety requirements for everyone.

Worker Fell through the Roof

Employees performed the activity of removing telephone cables on the slab of an office. At a certain point, when the employee was no longer tied off, one of the employees stepped on an asbestos plate, which broke, leaving the employee suspended and supported on the structure, at a height of approximately 2 meters.

What control provided for in CAR 01 could have prevented this event?

- Worker should be tied off throughout the activity in an independent structure.
- Installation of the guardrail.
- Worker fixed on the roof itself.

SUBMIT

Complete the content above before moving on.

Scaffolds Requirements

In this chapter we will learn about the requirements of CAR 01 for use of **SCAFFOLDS.**

Important Note: You must both be a Competent person and an Authorized person prior to performing any work on scaffolds.

Scaffolds are a common cause of worksite injury. Although they are often erected to aid safety on a worksite, incorrect installation and use can make a worksite more hazardous.

Falling from a scaffold can be fatal. Even a 1.8 metre fall can cause injury, or worse a fatality.

The most common causes of scaffolding accidents include the following:

- Scaffolding collapse (before, during and after placement of the scaffold);
- Work near overhead electric lines;

- Mobile equipment and other workplace traffic;
- Mixing components from different scaffold systems (for example, do not mix aluminum tubing with steel tubing);
- Falls from heights; and,
- Objects falling from overhead scaffolding.

The minimum requirements for the SCAFFOLD inspection checklist:

- [ ] You must be both Qualified and Authorized to build *or* alter a scaffold.
- [ ] Appropriate fall prevention or fall protection must be used when working at heights.
- [ ] Some types of scaffold require engineered drawings. *Always* follow the drawings.
- [ ] Ensure the scaffold is built on a good base. Use base plates, sole boards, etc.
- [ ] Before the scaffold is used, inspect the scaffold and install the appropriate tag:

Green Tag

A green tag with, "Safe for Use", or similar wording, shall be used to indicate that a scaffold is safe for use. A green tag shall be marked with at least the following information:

1. Name, number, or location that provides a distinct identification of the scaffold;
2. Date of completion, alteration, or last inspection of the scaffold, whichever is most recent;
3. Name of the competent person verifying the scaffold; and
4. Duty rating of the scaffold.

Yellow tag

A Yellow tag with, “Caution: Potential or Unusual Hazard”, or similar wording, shall be used to indicate that a scaffold could present a hazard to the user.

A yellow tag shall be marked with at least the following information:

1. All items previously listed for a green tag; and
2. The nature of the hazard and any precautions to be taken.

All efforts should be made to return the scaffold to a green tag status as soon as possible.

Note: For example, a scaffold that has had part of the guardrail system removed to meet work requirements would display a yellow tag(s) marked to indicate that a guardrail is

missing, the location from which it is missing, and the requirement that personal fall protection be used at that location.

Red tag

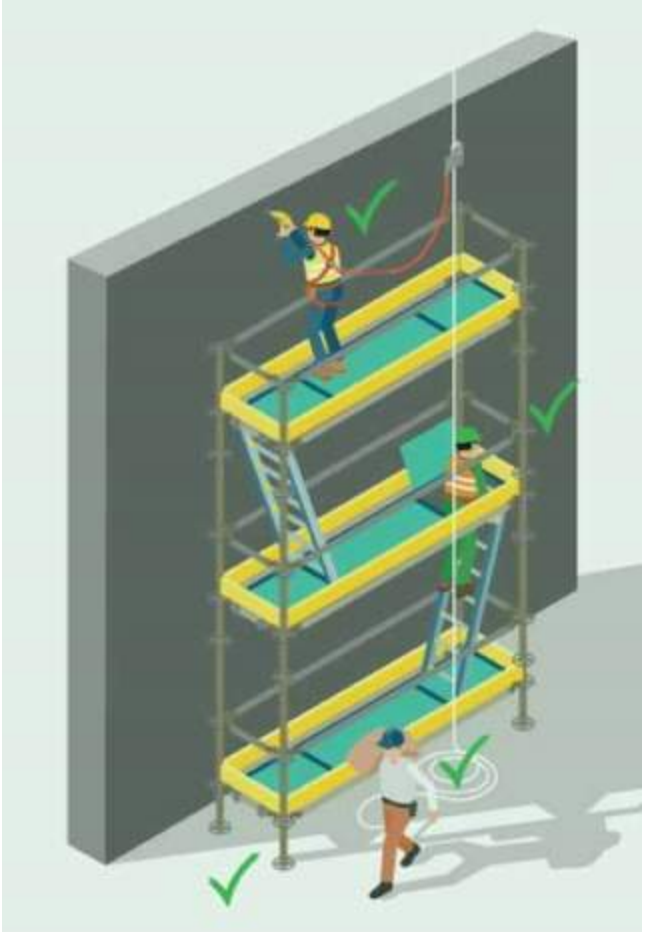
A red tag with “DANGER: DO NOT USE SCAFFOLD”, or similar wording, shall be used when a scaffold is left unattended during erection and also when a scaffold has been deemed unfit for use.

Hazard awareness for users

Check the scaffolding before using it.

Look for:

- Gaps or open holes in platforms.
- Missing handrails or toe-boards.
- Loose or damaged bracing or wedges.
- Improperly installed ladders.
- Never use a scaffold that you think is unsafe. Check with your supervisor, and tagout the scaffold if it is unsafe to use.
- Do not overload platforms with materials.
- Good housekeeping is essential.
- Do not alter a scaffold unless you are Qualified and Authorized.



Hazard awareness for others

When working in an area where scaffolding is being

built, or is in use, always;

- Avoid walking under or close to a scaffold that is being built or is in use.
- Watch for hazards when material is being hoisted or work is being done overhead.
- When operating mobile equipment, take extra care near scaffolding, or have solid barricades installed around them.

Complete the content above before moving on.

See now an incident occurred in scaffolding, at Vale:

Scaffolding Fall

During the maintenance of the lining of the ore loading silo, the employee moved from one scaffold to another, where he got unstable, falling from a height of 4.2 meters.

Complete the content above before moving on.

Question

What control provided in CAR 01 could have prevented this event?

- ◯ Respecting the load capacity of the scaffold.
- ◯ Correctly using fall protection throughout the work activity.
- ◯ Proper guardrail installed.
- ◯ Before the scaffold is used, inspect the scaffold and install the appropriate tag.

SUBMIT

Which tag should be on a scaffold if the scaffold is safe to use, but with restrictions?

- ◯ Green tag
- ◯ Yellow tag
- ◯ Red tag

SUBMIT

Which tag should be on a scaffold if the scaffold is safe to use?

- Green tag
- Yellow tag
- Red tag

SUBMIT

Which tag should be on a scaffold if the scaffold is not safe to use?

- Green tag
- Yellow tag

Red tag

SUBMIT

Never use a scaffold that you think is unsafe. Check with your supervisor, and tag out the scaffold if it is unsafe to use.

Complete the content above before moving on.

Ladder Requirements

In this chapter we will learn about the requirements of CAR 01 for use of **LADDERS**.

Ladders are the most commonly used equipment that allow workers to work at heights. They are easy to use, allow workers to travel vertically, up or down, from one elevation to another.

They come in a wide range of varieties. They may be portable or fixed, and can be made of metal (steel or aluminum), wood or fiberglass.

Each type of ladder and ladder material has advantages and disadvantages that may make them a better choice for specific tasks.

The Canadian Standards Association classifies portable ladders in three grades:

Grade 3 – Light duty – 91 kg (200 lb.) load capacity.

Grade 2 – Medium duty – 102 kg (225 lb.) load capacity.

Grade 1 – Heavy duty – 113 kg (250 lb.) load capacity

On Vale property only CSA-certified Grade 1 ladders or better shall be used. Portable ladders with frames made of a non-conducting material, may be used to either gain temporary access to areas, or to carry out minor services.
Inspect ladder upon receipt and before each use; never climb a damaged, bent or broken ladder; all working parts must be in good working order.

Specific requirements for each type of ladder:

Simple Ladder

A simple, straight ladder or single ladder consists of two side rails
and evenly spaced rungs or steps. They do not have any moving parts, are not self-supporting, and are not adjustable in length. They are available in various sizes or lengths but are limited to a single section.

Extension Ladder

An extension ladder is a non-self-supporting ladder that is adjustable in length. It consists of two or more sections. Its size is defined by the sum of each section, but because an extension ladder must maintain a minimum of overlap between sections, its effective use is less than its size. For example, when properly extended a '20 foot" extension ladder is only 17 feet long.

A step ladder is a self-supporting portable ladder, non-adjustable in length, with flat steps and a hinged top. the size of a step ladder is determined by the length of the front side, but because the two top steps should not be used, its effective use is less than its size.



The slope of the ladder is designed so that when the ladder is properly opened and secured, the angle of inclination of the front is more than 75 degrees. Step ladder are available in different configurations including trestle, extension trestle, platform, extendable and articulated.

Ladder Inspection

Prior to use, ladder must be inspected to ensure they are in good condition and safe to use.

Watch for;

- Missing or loose steps or rungs (For example, they are loose if you can move them by hand).
- Damaged or worn non-slip feet.
- Loose screws, bolts or nuts.
- Loose or faulty spreaders, locks and other hardware parts in poor condition.

- Cracked, split, worn or broken rails, braces steps or rungs.
- Sharp edges on rails or rungs.
- Rough or splintered edges.
- Corrosion, rust, oxidation and excessive wear, especially on treads.
- Twisted or distorted rails. (Check ladders for distortion by sighting along the rails).
- Missing identification and warning labels.
- Insufficient lubrication of moving parts

Damaged or defective ladders should be tagged and taken out of service immediately. Repairs must only be done by manufacturers or manufacturer-approved personnel.

Specific Requirements	Simple ladder	Double ladder (Opened)	Extendable ladder	Mobile Platform Ladder
(a) Steps and platforms with material non-slip surface.	X	X	X	X
(b) Non-slips shoes.	X	X	X	X
(c) Specific maximum length.	X	X	X	
(d) Stabilization devices / Locking of casters.				X

Below is an accident at Vale:

Fall From Platform Ladder

Employee performed maintenance on an excavator using a platform ladder. At one point, a piece of equipment broke off and hit the ladder, causing it to move. At that moment, the employee became unbalanced and fell off the platform ladder.

Complete the content above before moving on.

What control provided for in CAR 01 could have prevented this event?

- Area isolation.
- Respect the maximum capacity of the platform ladder.
- Caster lock.

SUBMIT

Complete the content above before moving on.

Requirements for People Lifting Equipment

In this chapter we will learn about the requirements of CAR 01 for use of PEOPLE LIFTING EQUIPMENT.

Be Aware that all operators must be qualified for the specific type of Mobile Elevated Work Platform (MEWP) they will be operating. Always follow local Local Legislation and procedures.

Mobile Elevating Work Platforms (MEWPS)

Mobile Elevating Work Platforms provide a safe, steady way for you to concentrate on your work, even high above the ground. They are easy to set up and move; they're stable and allow you to move more freely while you work.

Even the best mobile elevating work platforms however, are only a safe as their operators. It only takesa moment of neglect to cause and accident that could injure or kill you or a co-worker.

Some of the common types of MEWPs you may find in your workplace include; Manually Propelled, Self Propelled, Boom Supported and Vehicle Mounted.

Manually Propelled

A manually propelled MEWP must be moved by hand, the base of the lift rides on wheels or casters and supports the elevating portion of the lift.

Self Propelled

Self propelled MEWPs move under their own power with controls mounted on the platform and base.

Boom Supported

Boom supported MEWPs use a boom that extends beyond the chassis to support the work platform.
The boom may articulate, telescope or rotate on the chassis.

Vehicle Mounted

A vehicle mounted MEWP may be any boom lift, ladder or tower mounted on a commercial truck chassis.

These devices are designed to travel on public roads and are commonly used for power, telephone and cable companies.

Safety requirements for people lifting

Tie offs are engineered rings and loops for attaching lanyards as part of a fall restraint system. They are located in strategic spots on the platform to ensure the fall restraint equipment keeps the worker inside the platform cage, basket, or bucket.

Anchoring points

This is the location for all of the switches, buttons, and controls used to operate the entire lift.

Control Station

As with other Mobile Elevating Work Platforms, the bucket is equipped with controls that allow the worker to maneuver the lift.

Control Station at Bucket

Complete the content above before moving on.

Now, see an event that took place at Vale in people lifting equipment:

Incident at Vale!

Failure In People Lifting Equipment

During the leveling activity of de-energized electric cables, the Munck lifting equipment failed during operation, no longer complying with the operator's commands, lifting the uncontrolled aerial basket and getting stuck between the network cables under construction, causing damage to the equipment insulation.

Complete the content above before moving on.

What control provided for in CAR 1 could have prevented this event?

- ◯ Stabilizer system.
- ◯ Emergency shutdown system.
- ◯ Anchoring point independent of the basket.

SUBMIT

Continue

Requirements Against Falling Objects, Materials or Tools

In this chapter we will learn about the requirements of CAR 01 **AGAINST FALLING OBJECTS, MATERIALS OR TOOLS**.

Always follow local procedures whenever isolating/barricading an area is required.

Watch the video in full to continue.

According to the requirements for falling objects, materials or tools, drag the items to the corresponding box:

Prevention

Mooring

Baseboard

Protection net

Mitigation

Barrier Mesh

Chain

Nylon tape

The strip plastic tape must be used to isolate the area when works of:

- ○ Short term.
- ○ Long term.
- ○ Strip tape should not be used.

SUBMIT

Complete the content above before moving on.

Remember: the strip tape can never be used to isolate the area, regardless of the duration of the activity!

Now, we will see an incident at Vale, related to falling objects:

Fall of Object

A Vale employee was carrying out work at a height, in the maintenance of equipment, when he dropped a spanner from a height of approximately 3 meters. The key hit the head of an outsourced worker, who passed under the Vale employee.

Complete the content above before moving on.

Question

What control provided for in CAR 01 could have prevented this event?

- ◯ Tool mooring belt.
- ◯ Area isolation.
- ◯ Both alternatives.

SUBMIT

Continue

Requirements for Training

In this chapter we will learn about the requirements of CAR 01 for **TRAINING**.

Be Aware it is a requirement that operators must be qualified prior to using any lifting equipment.

Watch the video in full to continue.

Quiz

You will now take an evaluative test regarding the content of the training.

The test has 7 questions about CAR01.

You will be considered approved if you answer 70% of the questions correctly.

Good luck.

Question

01/07

Considering situation where CAR 01 requirements apply, check the correct alternative (s):

- [ ] Where there is a risk of falling persons or objects.
- [ ] Where there is a risk of falling persons or objects by a level difference of less than 2.00 meters.
- [ ] Where there is a risk of falling of persons or objects by a difference of level equal to or greater than 1.80 meters.
- [ ] Where there is no risk of falling persons or objects.

Question

02/07

The protection against falls of materials, objects and tools is one of the focuses of CAR 01.

Mark the incorrect alternative to fall protection for materials, objects, and tools.

- ◯ Isolation and signaling.
- ◯ Never use objects and tools while performing a work at height.
- ◯ Tool securing system.
- ◯ Toe board.

Question

03/07

Mark the correct alternative with respect to general requirements for protection against falling people.

- Handrail, in lifting equipment, scaffolding, platform ladders, excavations and places where there is a risk of falling people.
- Full Body Safety Harness including double safety strap with double lock rigging gear.
- Life line fixed to independent structure.
- All alternatives are correct.

Question

04/07

An employee needs to isolate an area for a working at height and suggests to the group of employees involved in the activity that they should use the plastic zebra tape to perform it. The employee said that the activity will be short term, that he did a risk analysis and guaranteed that the zebra plastic tape is a resistant barrier for the area isolation.

Based on the situation described, indicate the correct alternative:

- The zebra plastic tape can be used, as it is a short duration activity.
- The zebra plastic tape can be used because it is a short duration activity and the risk analysis was done.
- The zebra plastic tape can be used if there is approval from the performer of activity immediate supervisor.
- The zebra plastic tape cannot be used, as it is a fragile barrier for area isolation.

Question

05/07

Elevated work areas and walkways should not be considered as falling risk locations, except:

- When properly designed.
- If damaged structural elements exist or when floor grids are removed.
- Answers (a) and (b) above are correct.
- None of the above answers.

Question

06/07

Analyze the items below and check the correct option with respect to the general requirements for procedures involving work at height.

- ◯ Full body safety harnesses shall be secured throughout the activity.
- ◯ Only the scope of the activity.
- ◯ Equipment of working at height does not need to undergo pre-use inspection.
- ◯ None of the above answers.

Question

07/07

Analyze the alternatives below and check the incorrect option.

- An elevated work area has damaged elements and, therefore, should be considered an area with a risk of falls.
- Always use engineer tied off in the elevated work platform.
- The upper and intermediate guardrails of a section of an elevated work area were removed for the passage of materials, but as this activity was planned, there is no need to consider this area as a risk of falling people.
- All the alternatives are correct.

Conclusion

Remember, the purpose of this awareness module is to provide an overview of the Vale Critical Activity Requirements that have been introduced to Vale's operations globally. These requirements are in the process of being fully implemented across our operations.

00:13

Thank you for completing the Vale Online Module Training.

Complete Your Module Validation

PLEASE CLICK HERE