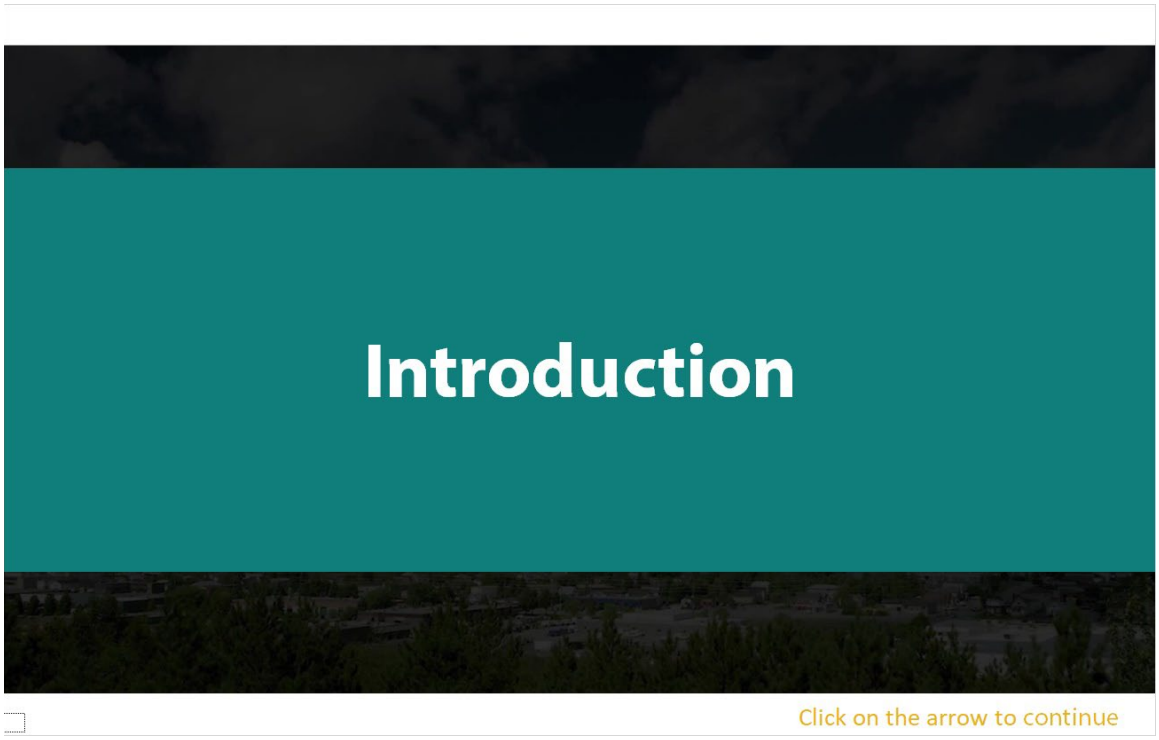
Tier 2: Mines Orientation

1. Underground Entry Requirements



1.2 Disclaimer

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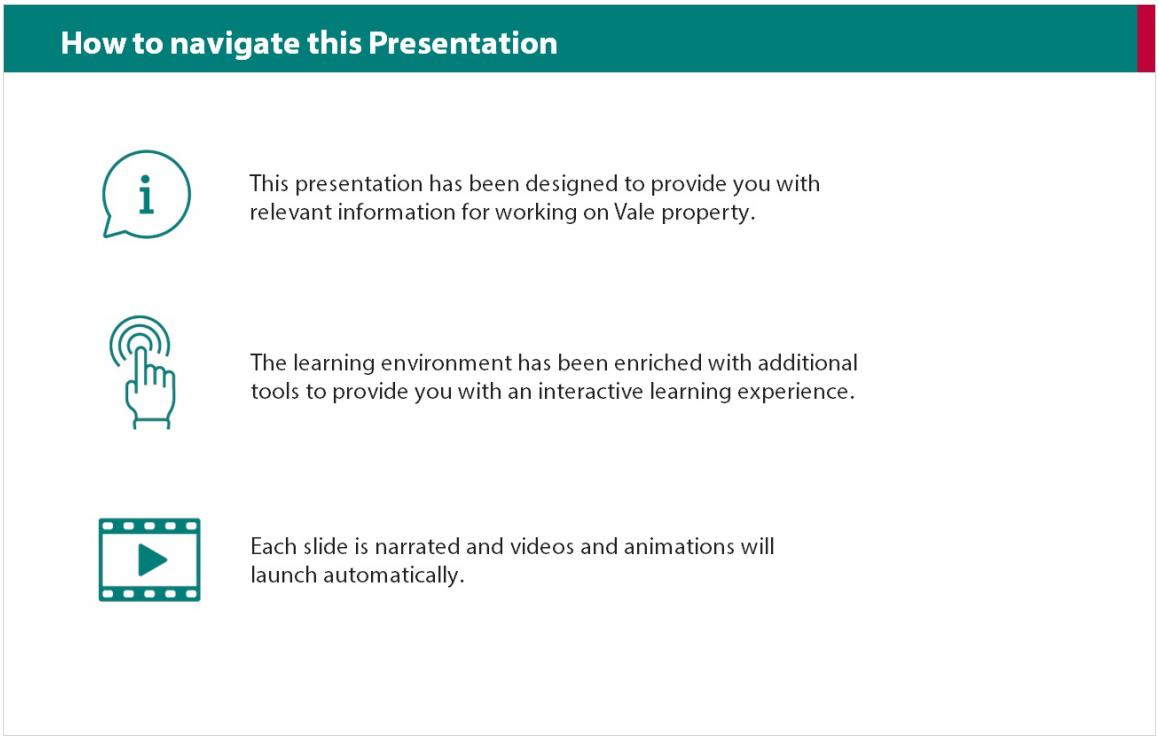
The information contained within this orientation is intended for controlled use within the Learning and Development Department for Ontario Operations. The content and structure of this orientation provides the learner with an overview of Sudbury Operations focusing on HR policies, Health, Safety and Environment and Operational Controls.

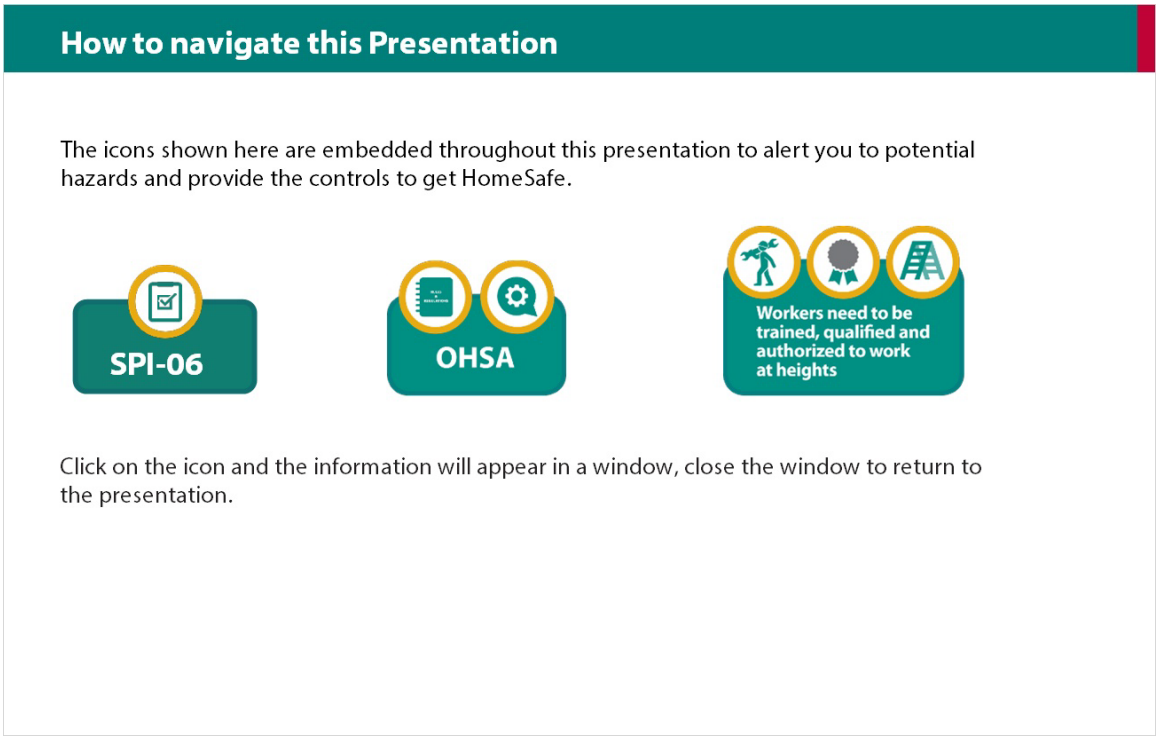
The information herein is intended as a training presentation and is not intended to be the sole source of reference information for this system.

The content of this document is current as of the latest release date. Any discrepancies found should be noted and reported to the Learning and Development Department for action.

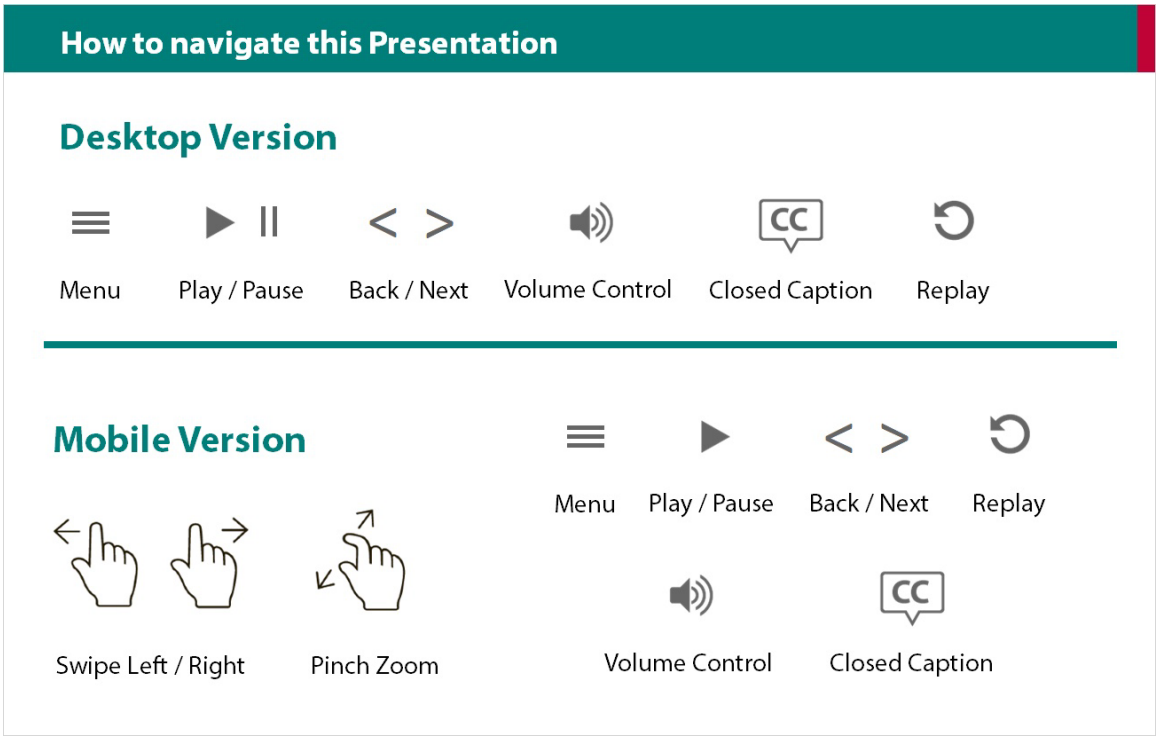
1.3 How to navigate this Presentation



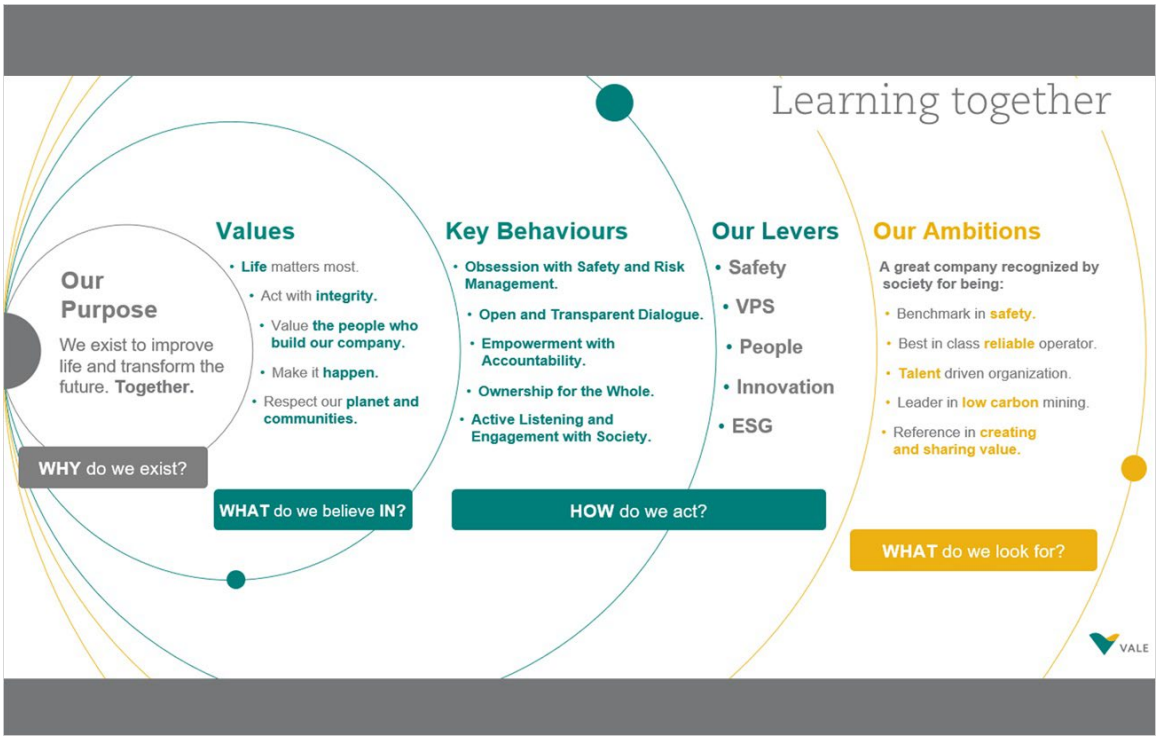
1.4 How to navigate presentation



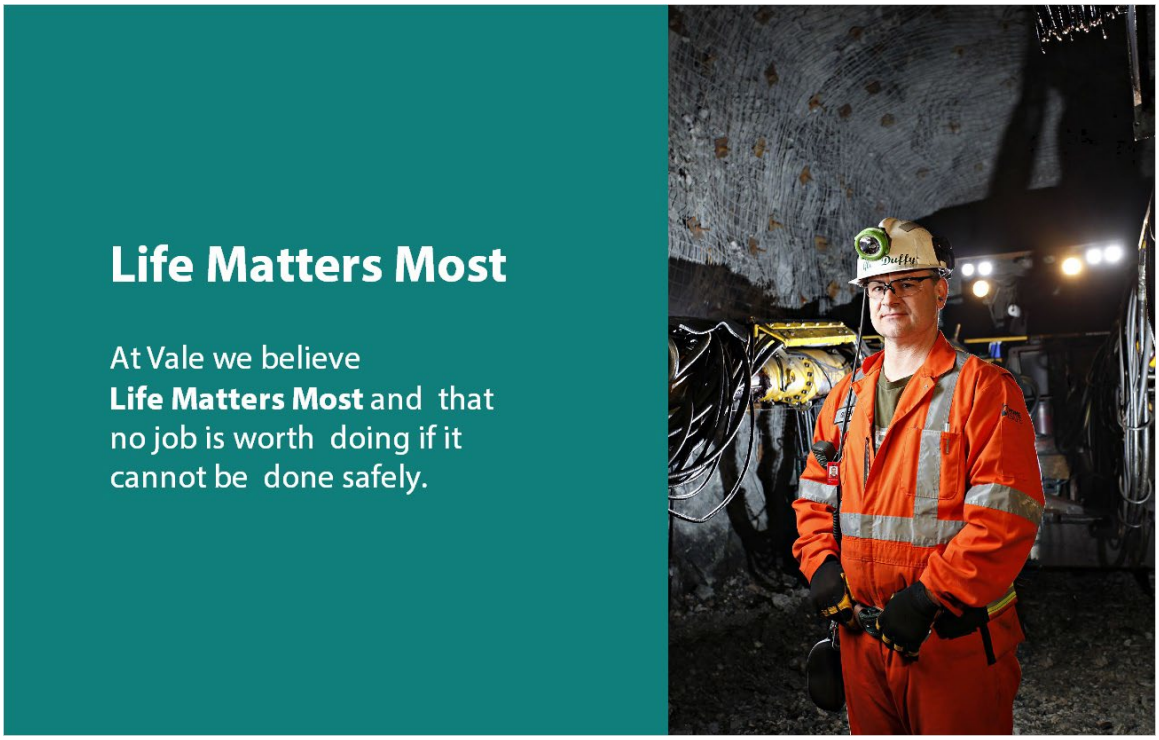
1.5 How to navigate presentation



1.6 Mission Vision Values



1.7 Mission Vision Values



1.8 Underground Entry Requirements

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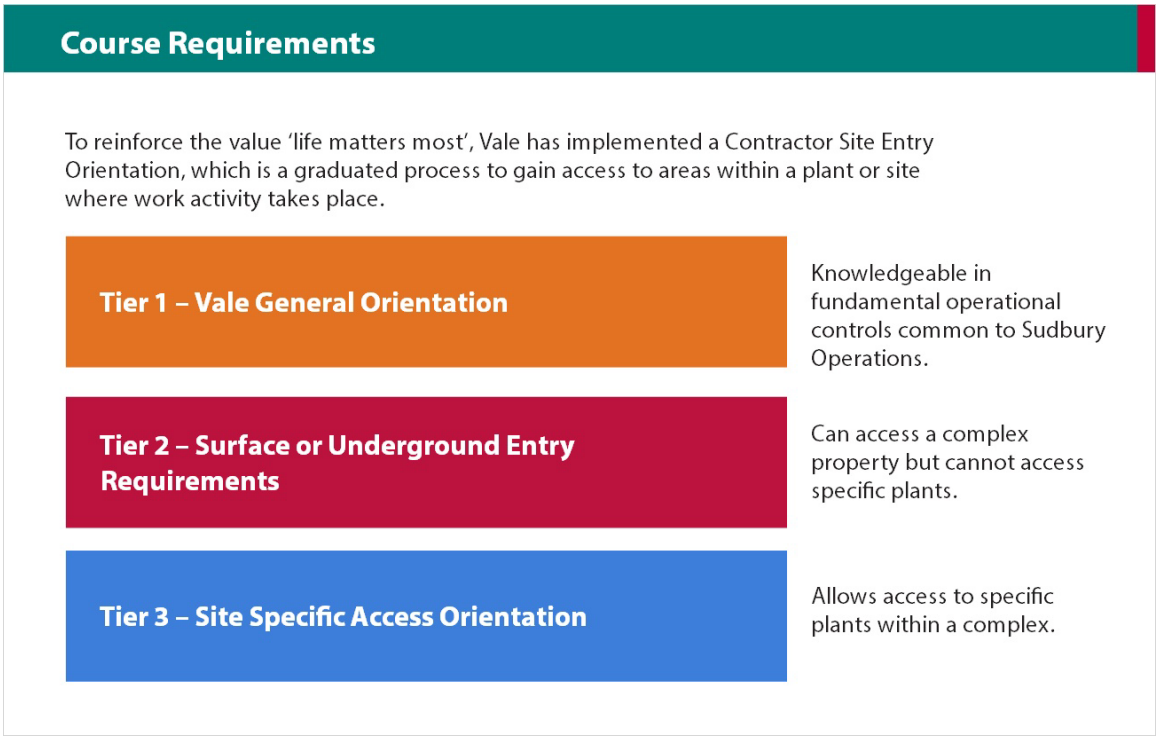
1.9 Course Requirements

1.10 Course Requirements



1.11 Course Requirements

Course Requirements

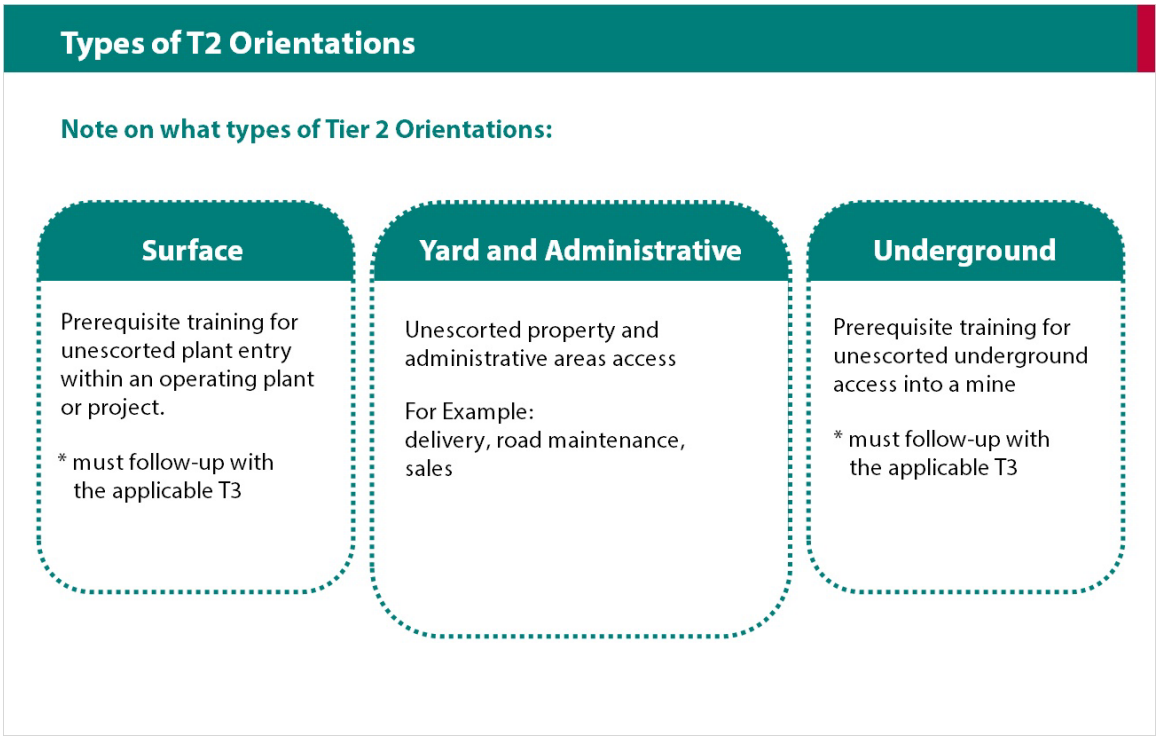
The Tier 1 module provided the prerequisite training elements that can be applied across all Sudbury Operations.

The Tier 2 module provides general information with regards to plant access and traffic plan requirements to enter a defined area within Sudbury Operations.

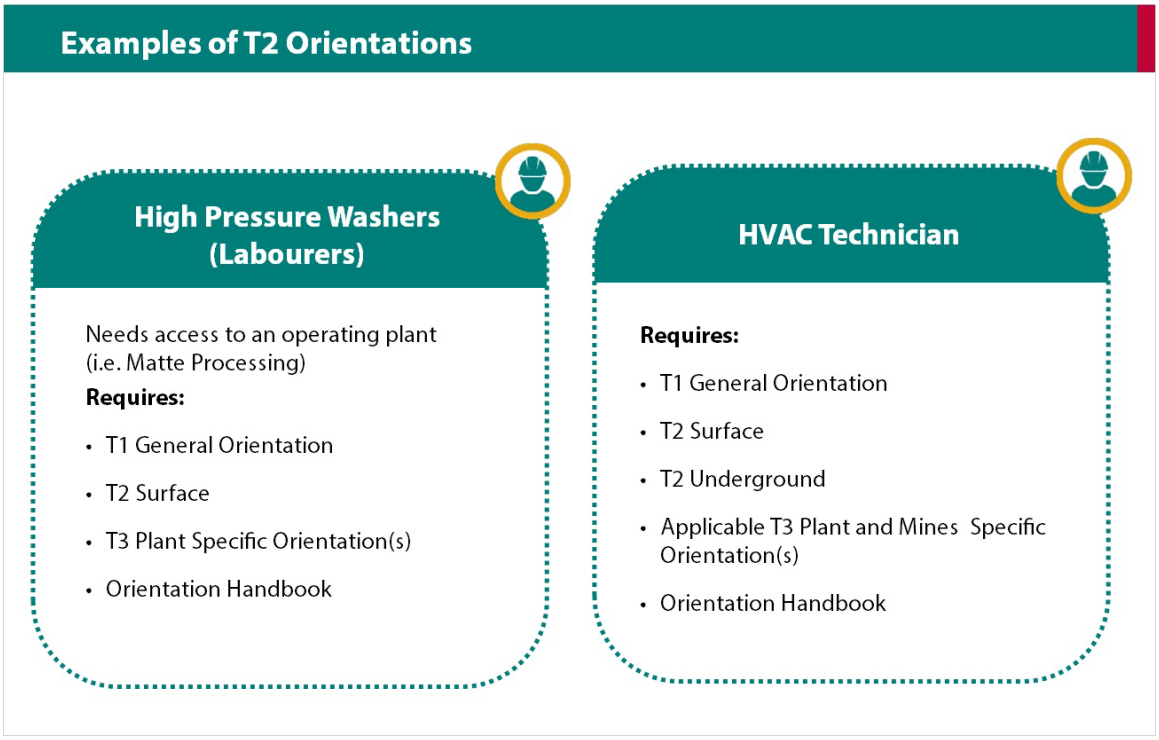
To participate in this Tier 2 Module, you will need the following:

- **Vale Swipe Access Card**
- **Tier 1 Vale Operational Controls**

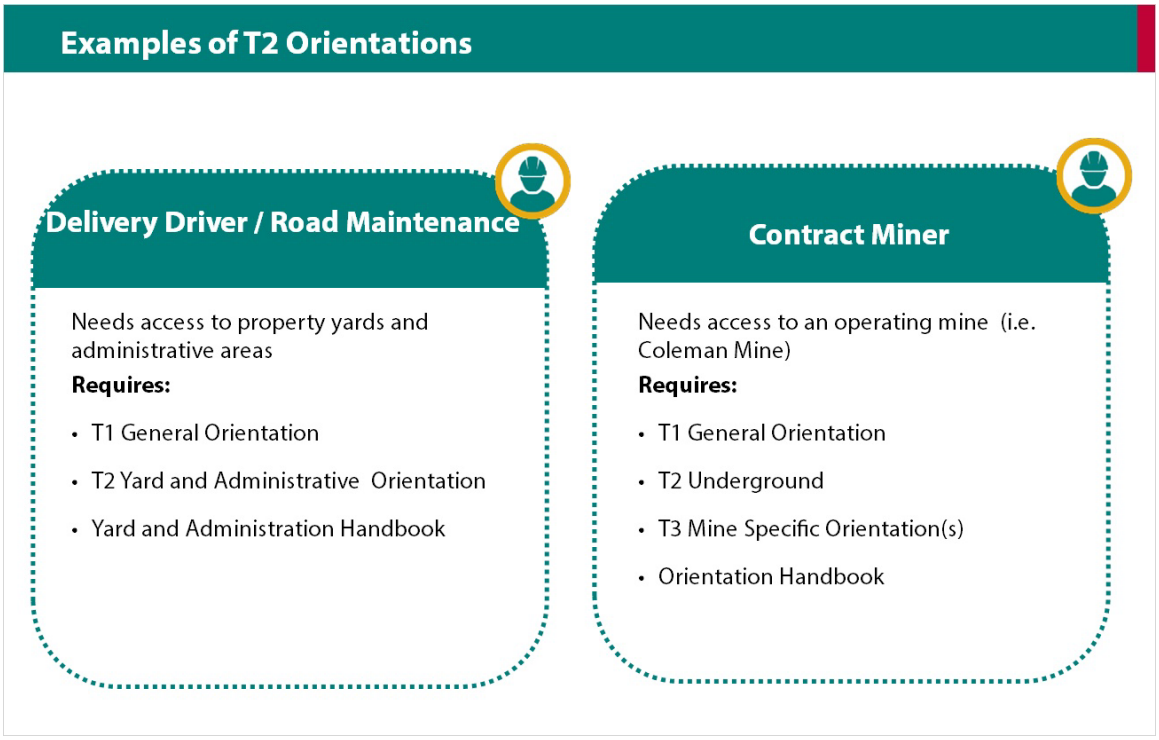
1.12 Types of T2 Orientations



1.13 Examples of T2 Orientations



1.14 Examples of T2 Orientations



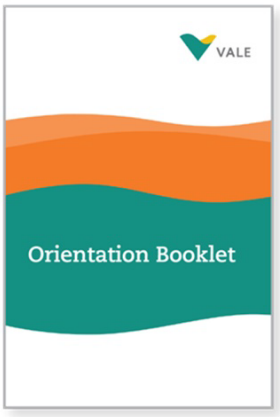
1.15 General Hazards and Controls

General Hazards and Controls

Orientation Booklet

All workers are required to understand hazards and how to mitigate those hazards within specific sites where they are assigned work.

The site specific hazards are referenced in the Tier 2 Mines and Tier 3 site specific Handbook and must be reviewed prior to entering those sites.



1.16 Risk Prevention

General Hazards and Controls

Risk Prevention

However, to aid in attaining the goal of "zero harm", there are numerous risk management methods employed across the organization that help manage Risk to get **HomeSafe** which include;

- Being aware of our surroundings and the risks around us
- Applying good work practices and using knowledge, skills and experiences to safely complete each task
- Asking for help when required and applying the knowledge, skills and experience of others
- Stopping and correcting when necessary - being our brothers' and sisters' keeper
- Following internal policies and procedures that guide us in doing our work and reducing risk
- Following rules and regulations, which can be internal (such as the Golden Rules); or external (such as government regulations)

BE AWARE

APPLY GOOD WORK PRACTICES

STOP & CORRECT

ASK FOR HELP

FOLLOW POLICIES & PROCEDURES

FOLLOW RULES & REGULATIONS

1.17 Course Objectives

1.18 Course Objectives

Course Objectives

Upon completion of this module as a worker you will be able to:

- Understand Mining Plants and the Underground Requirements
- Identify key Access Points and Entry Requirements
- Understand high level general Hazards and Controls with regard to:
  - Traffic Management
  - Occupational Health
  - All Mines Standards
  - Wet Muck
  - Falls of Ground
  - Mobile Equipment
  - Shaft Furnishings
  - Mine Ventilation
  - Radio Communications
  - Working Alone
  - Guardrails and Signs
  - Explosive Awareness
  - Emergency Preparedness

Mill (Slide Layer)

Course Objectives

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  - Mobile Equipment
  - Shaft Furnishings

CCNR (Slide Layer)

Course Objectives

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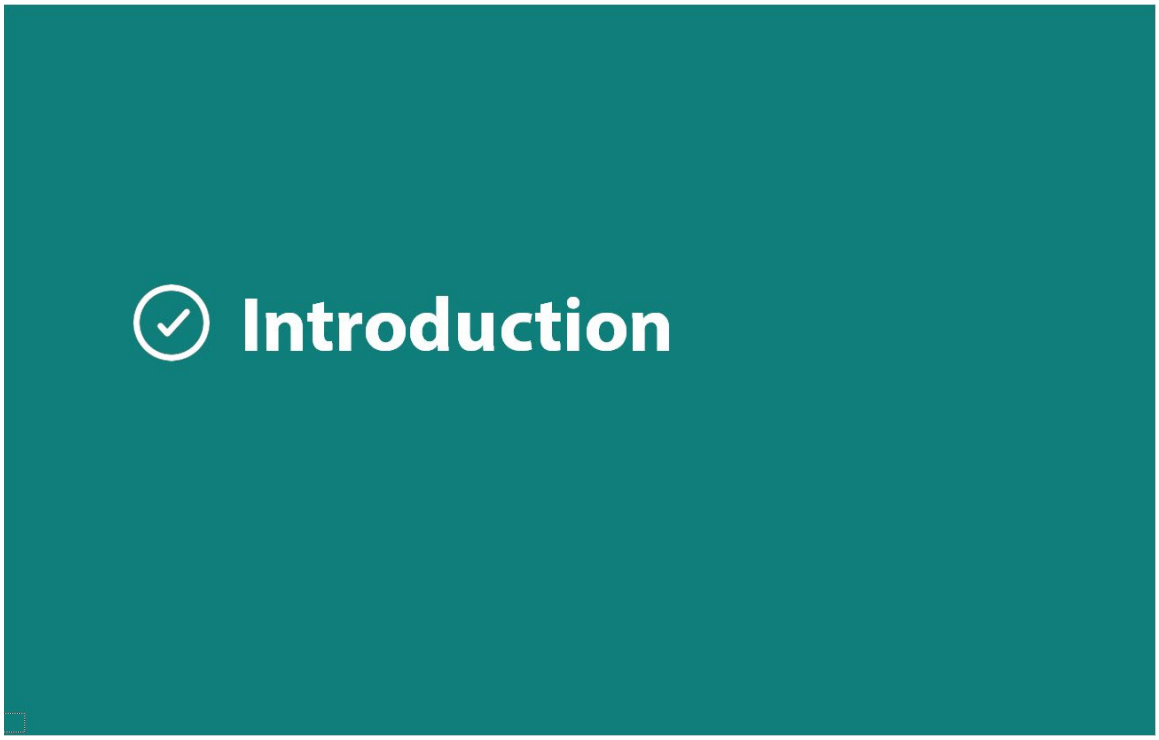
  - All Mines Standards
  - Wet Muck
  - Falls of Ground
  - Mobile Equipment
  - Shaft Furnishings

2. Introduction

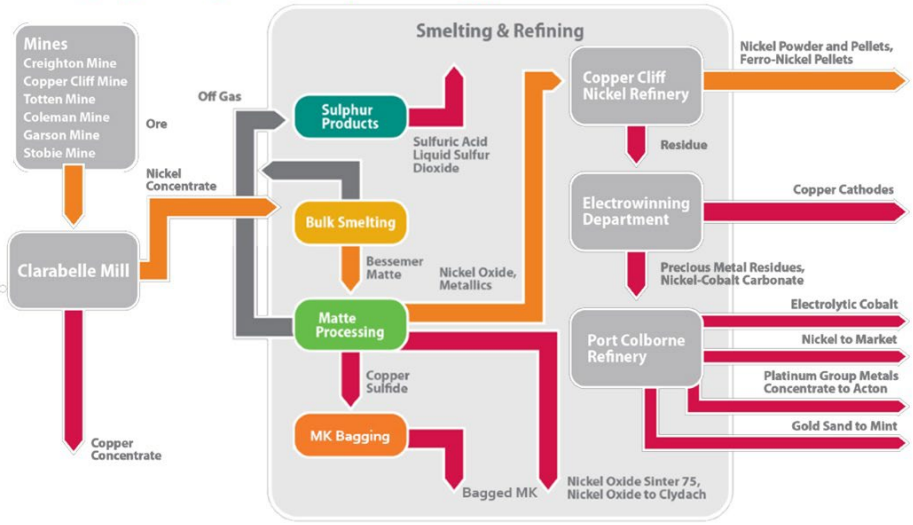
2.1 Untitled Slide



2.2 Vale Operation Overview

Vale Operation Overview

Below is a simplified flow diagram of Vale operations throughout the Sudbury Basin, from the mines to the refineries. The overall operation is quite complex, with many additional site services, logistics systems and process support.



2.3 Complex Layouts and Boundaries

Complex Layouts and Boundaries

Vale, relies upon a complex network of processes and equipment, which require routine planned and scheduled maintenance for continuous operation.

There are times when operations may be affected by non-routine and large scale maintenance periods (PMP) or large scale projects which greatly impact the business.

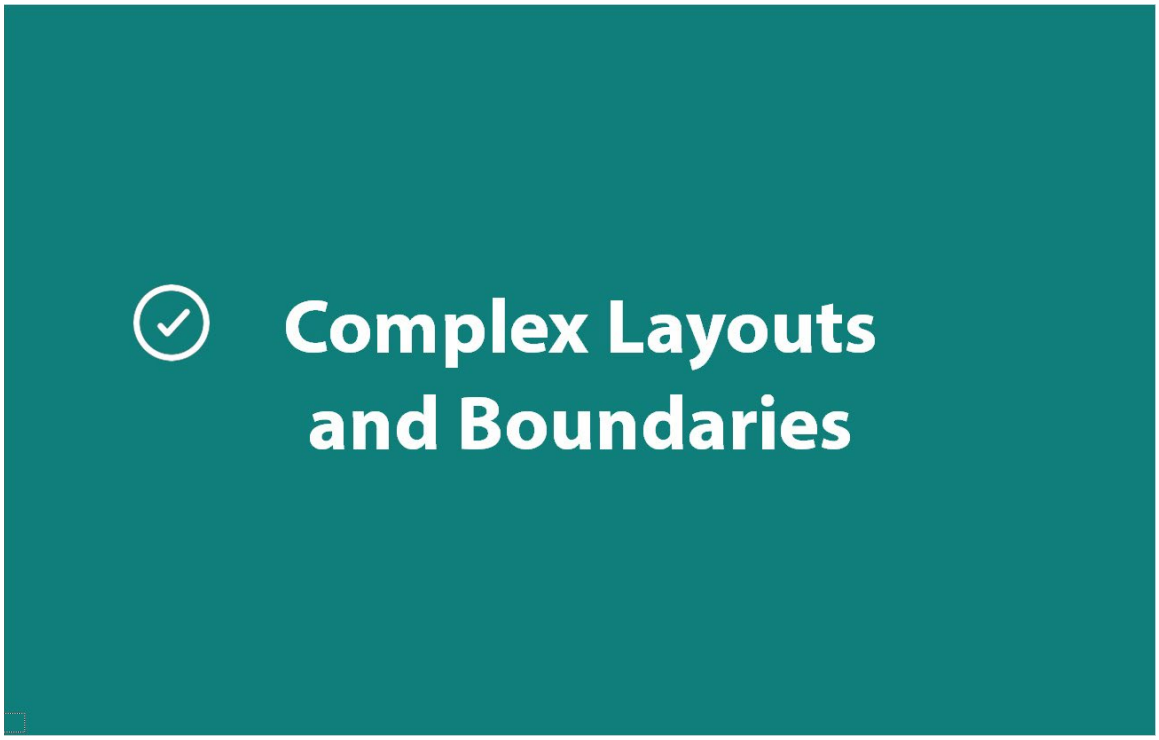
PMP:

A PMP is where production is reduced or stopped to complete infrastructure repairs and upgrades. PMP's can take place at scheduled intervals throughout the year, but are usually once a year.

Please contact your Vale Contact Person to see if there are any other requirements that need to be met before beginning work during these planned work periods.

3. Complex Layouts and Boundaries

3.1 Complex Layouts and Boundaries

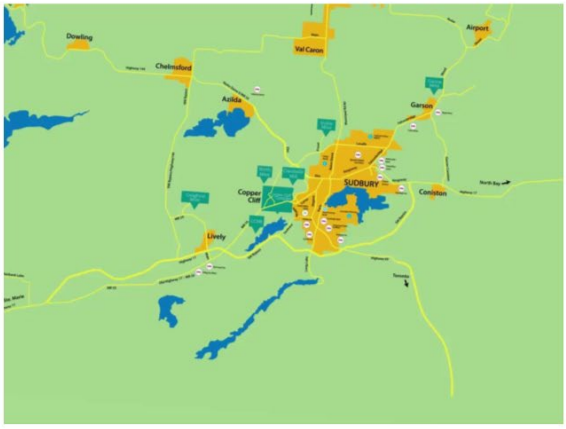


3.2 Complex Layouts and Boundaries

Complex Layouts and Boundaries

The following are Tier 3 Modules that represent the plants or buildings that are within this Tier 2 Boundary:

- Creighton Mine
- Totten Mine
- Copper Cliff Mine
- Coleman Mine
- Garson Mine



4. Access Control Requirements for Vale Sudbury Operations

4.1 Access Control Requirements for Vale Sudbury Operations

4.2 Documentation

Entry Requirements

Documentation

To access areas within Sudbury Operations, you must have the following:

- A Vale Swipe Access Card *(approved by the Contractor's Vale Contact Person)*
- Proof of WHMIS training
- Tier 1 (T1) Module accreditation
- Tier 2 (T2) Module accreditation

Where Applicable:

- Tier 3 (T3) Area Specific module(s)
- Proof of the appropriate level of ZES Training *(Core, Tagger or Supervisor)*
- Approved safety equipment appropriate for the work being performed
- Any other training as mandated by your Vale Contact Person

4.3 Vale Contact Person

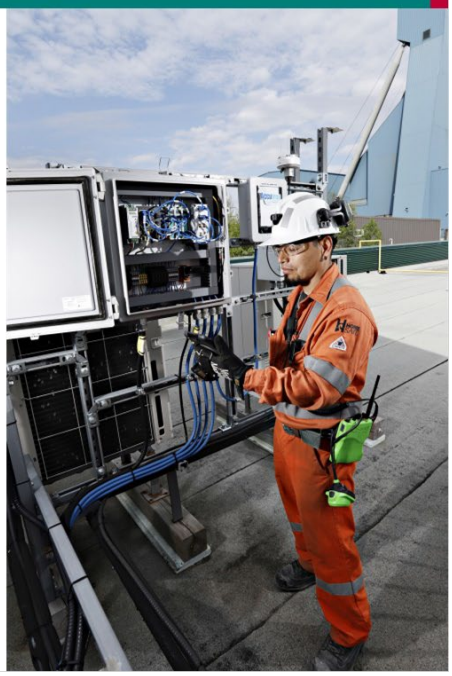
Entry Requirements

Vale Contact Person

All contractors and off-site Vale employees must have an on-site, Vale Contact Person. A Vale Contact Person is somebody who will:

- Communicate area and job hazards
- Monitor work progress
- Coordinate work activities within your work area
- Inspect the work-site to ensure compliance with Vale's work policies, procedures, rules and regulations
- Where required, request your participation in PHR/JHA risk assessments
- Issue required work permits

Contractors must have a Vale contact person responsible for them at each plant and be aware of their contact information.



4.4 Vale Contact Person

Entry Requirements

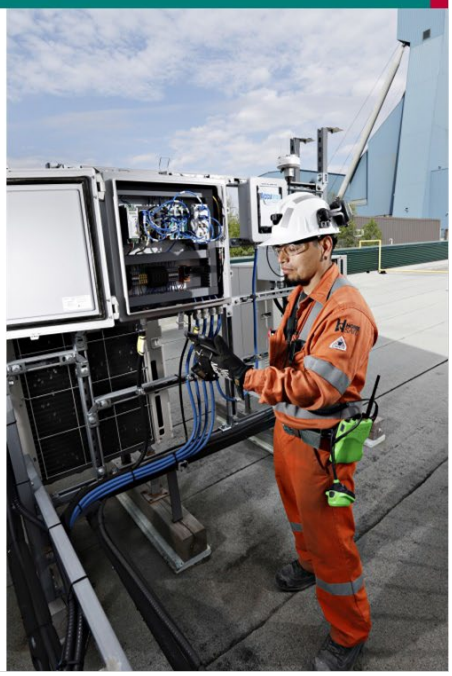
Vale Contact Person

Permission from your Vale Contact Person or designate is required to access areas or buildings within Sudbury Operations.

It would be helpful to have the following information with regards to your Vale Contact Person:

- First and last name
- Job Title
- Office location
- Telephone number
- Cellphone number
- Email address

Your Vale contact Person will arrange a tour upon request.



4.5 Vehicle Passes

Entry Requirements

Vehicle Passes

If workers are required to bring their vehicle through gates, either business or personal, Contractors must provide the required information to their Vale Contact Person, who will submit the completed forms to the Pass Office.

Once the Manager of the area approves the request, the vehicle pass will be issued.

There are a number of vehicle passes and depending on what site one requires access to, different passes are required.

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4.6 Vehicle Passes

Entry Requirements

Vehicle Passes

All vehicles entering through gates that lead into operational areas are required to have a vehicle pass unless the vehicle is a Company Vehicle that has a Company Logo or a sign on the vehicle that makes it identifiable.

Visor passes are assigned for use for the specific vehicles and persons.

The driver of the vehicle is still required to apply for access to the specific gate or plant that they will be working in.

SPI-11

4.7 Inspections

Entry Requirements

Inspections

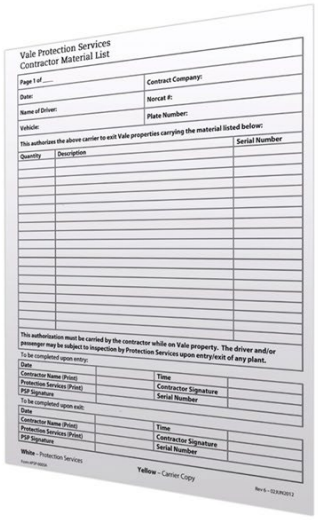
The driver and/or passenger(s) may be subject to inspection by Protection Services upon entry/exit of any plant.

A contractor material list must be completed upon entry to the plant to verify material, tools or equipment.

This authorized form allows the carrier to exit Vale Property carrying items listed on the form.

If a Contractor Material List was not completed upon entry; a pass-out is required from a Vale authorized signer upon exit.

Vale's Protection Services Professionals (PSP's) reserve the right to inspect vehicles and passes before entering or leaving Vale property.


Vale Protection Services
Contractor Material List

Page 1 of ____ | Contract Company:
Date: | Norcat #:
Name of Driver: | Plate Number:
Vehicle:

This authorizes the above carrier to exit Vale properties carrying the material listed below:

Quantity	Description	Serial Number

This authorization must be carried by the contractor while on Vale property. The driver and/or passenger may be subject to inspection by Protection Services upon entry/exit of any plant.

To be completed upon entry:

Date			
Contractor Name (Print)		Time	
Protection Services (Print)		Contractor Signature	
PSP Signature		Serial Number	

To be completed upon exit:

Date			
Contractor Name (Print)		Time	
Protection Services (Print)		Contractor Signature	
PSP Signature		Serial Number	

White – Protection Services

Yellow – Carrier Copy

4.8 Points of Entry

Entry Requirements

Points of Entry

There are various access points throughout Sudbury Operations.

These include manned gates, unmanned gates, vehicle and pedestrian entry points, and restricted access points.

When approaching these points of entry, permission is granted by the following:

4.9 Points of Entry

Entry Requirements

Points of Entry

There are various access points throughout Sudbury Operations.

These include manned gates, unmanned gates, vehicle and pedestrian entry points, and restricted access points.

When approaching these points of entry, permission is granted by the following:

Permission through Protection Services Professional (PSP)

- In order to access Vale property, you MUST complete all required training modules.
- If you are unable to access the plant with your swipe card, contact site PSP for access using the intercom or telephone located near the swipe stations. Do not attempt to bypass these locations.

Walk in Access (No vehicular access permitted)

- If you are required to walk to your work location, you will need to use your swipe card at the turnstile located at the entry, exit points.
- Adhere to pedestrian walkway locations and posted signage.

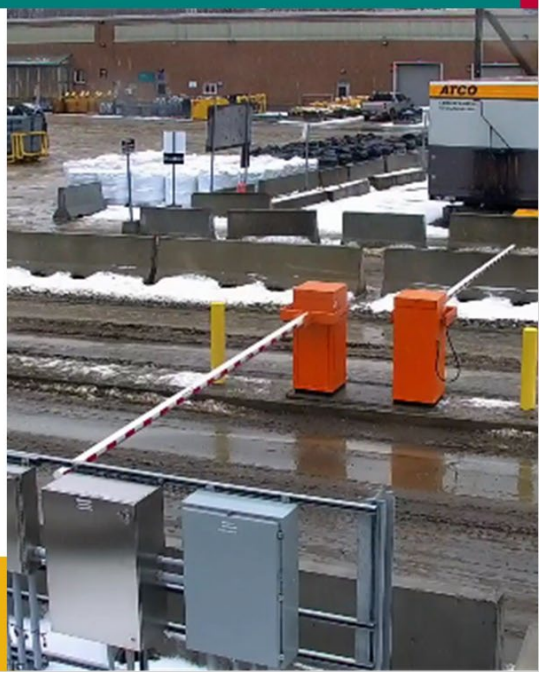
4.10 Vehicle Electronic Gates

Entry Requirements

Vehicle Electronic Card Access Gates

Most Plants and Mines are controlled by an Electronic Card Access System (Genetec).

The system controls access to the plant or mine sites and is designed to allow only one person in and out at a time.



! Only authorized and qualified individuals will be permitted to access the property.

4.11 Vehicle Electronic Gates

Entry Requirements

Vehicle Electronic Card Access Gates

There are card readers at all gates and turnstiles.

Everyone accessing a plant, a mine or a building are required to swipe in, and out on the card reader so that they can be accounted for while onsite, at some sites you are still required to sign in and out.

If for some reason, unless directed by PSP, you pull up to a gate or turnstile that is open you are still required to swipe in and out so that we can account for you while on site.

4.12 Pedestrian Access Turnstiles

Entry Requirements

Pedestrian Access Turnstiles

All turnstiles shelters are equipped with a blue emergency pull station that releases (drops) the turnstile arm to permit egress during an emergency.

When pulled this will activates a strobe light in the turnstile shelter and will activate an audible alarm in the F/A (First Aid Office) or Gatehouse indicating that the pull station has been pulled. The PSP will investigate.

Individuals are not permitted to jump the turnstiles, swipe someone else in/out or piggy back (tailgate) another vehicle to access the property, anyone caught violating these requirements will be subject to discipline, suspension and/or banned from all Vale property.

4.13 Pedestrian Access Turnstiles

Entry Requirements

Pedestrian Access Turnstiles

All Turnstile access points are also equipped with a manual bypass gate. The purpose of this gate is to allow individuals that carry large items in or out (deliveries) or have some restrictions that do not permit them to walk through the turnstiles.

In order to access these gates individuals are required to use the intercom in the turnstiles shelter, PSP will provide access as required.

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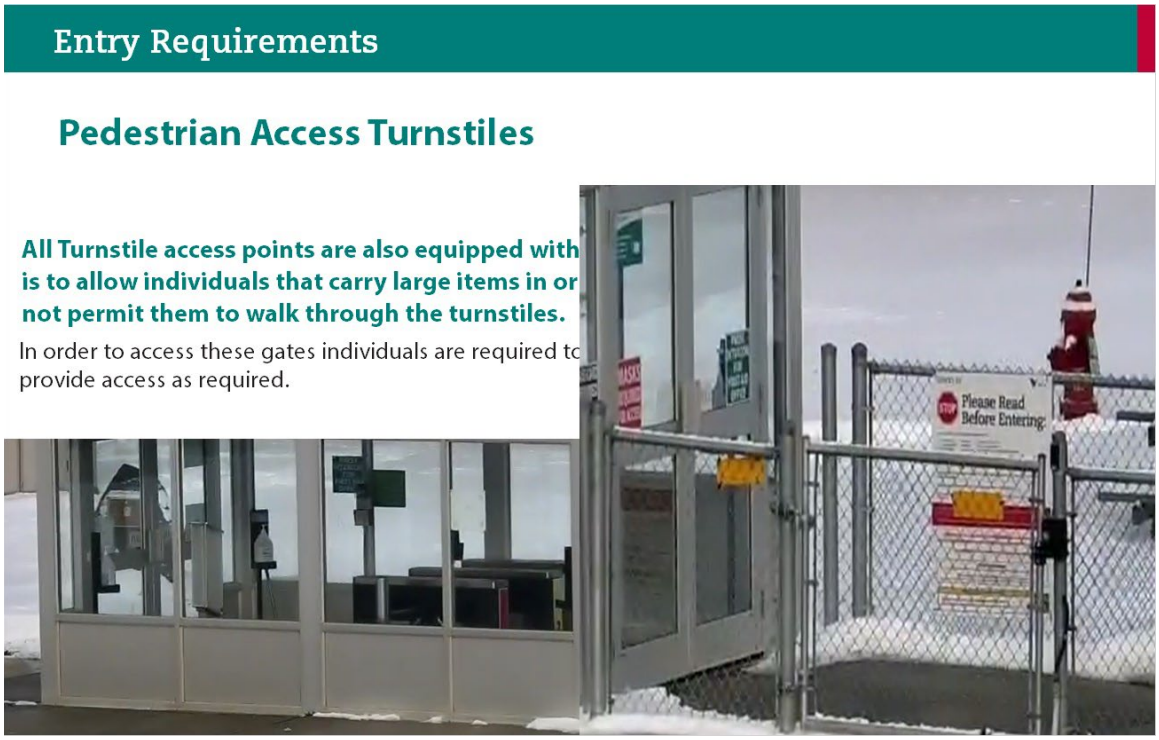
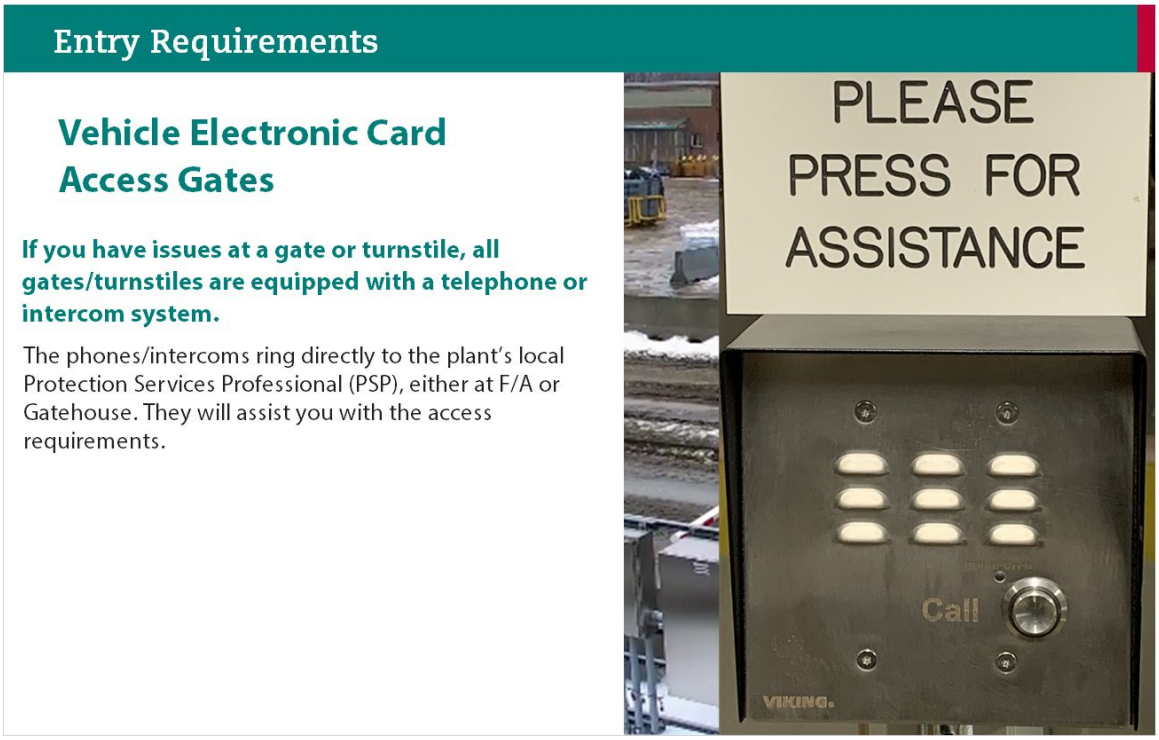


4.14 Telephone or intercom system.



4.15 Telephone or intercom system.

Entry Requirements

Vehicle Electronic Card Access Gates

If an individual arrives at the gate and they don't have a card, depending on the circumstances, the vehicle may be turned away by the PSP and will not be permitted to access the property, and will be asked to turn around and leave (u-turn).

If you are attempting access to this gate and your swipe card isn't working, use the intercom to speak to the site PSP.

You will be asked to state your name, provide your contractor number to verify credentials, where you are reporting to work and your site contact.

! Access to your card may be revoked if you are found using the Godfrey Drive gate as a short cut to or from Copper Cliff. No bicycles are permitted to ride on this road.

Godfrey Drive Gate

5. Tagging Requirements

5.1 Tagging Requirements

5.2 Identification Tag

Tagging Requirements

Identification Tag

Every long term employee coming to a Vale Mine Site will be issued an underground identification tag.

This tag will include:

- Photograph
- Full Name
- Serial Number
- Phone Number

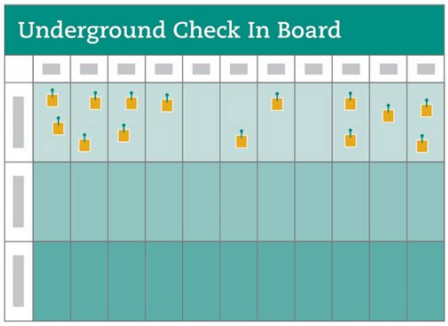
5.3 Identification Tag

Tagging Requirements

Identification Tag

These tags are to be used on tag in boards

- You are required to tag in before going underground.
- Depending on the mine, there may be tag-in boards underground as well.
- Do Not tag in until it is permitted to do so in the case of the board being blocked for blasting or clearing.
- Your name and serial number should be clearly visible (the picture side turned in to the board).
- Always remember to tag out when you return to surface.



Consequences of not tagging out:

- The mine will not blast which affects production
- The tag can only be removed once formal contact has been made
- Disciplinary action may also be a result.

6. High Level General Hazards

6.1 High Level General Hazards

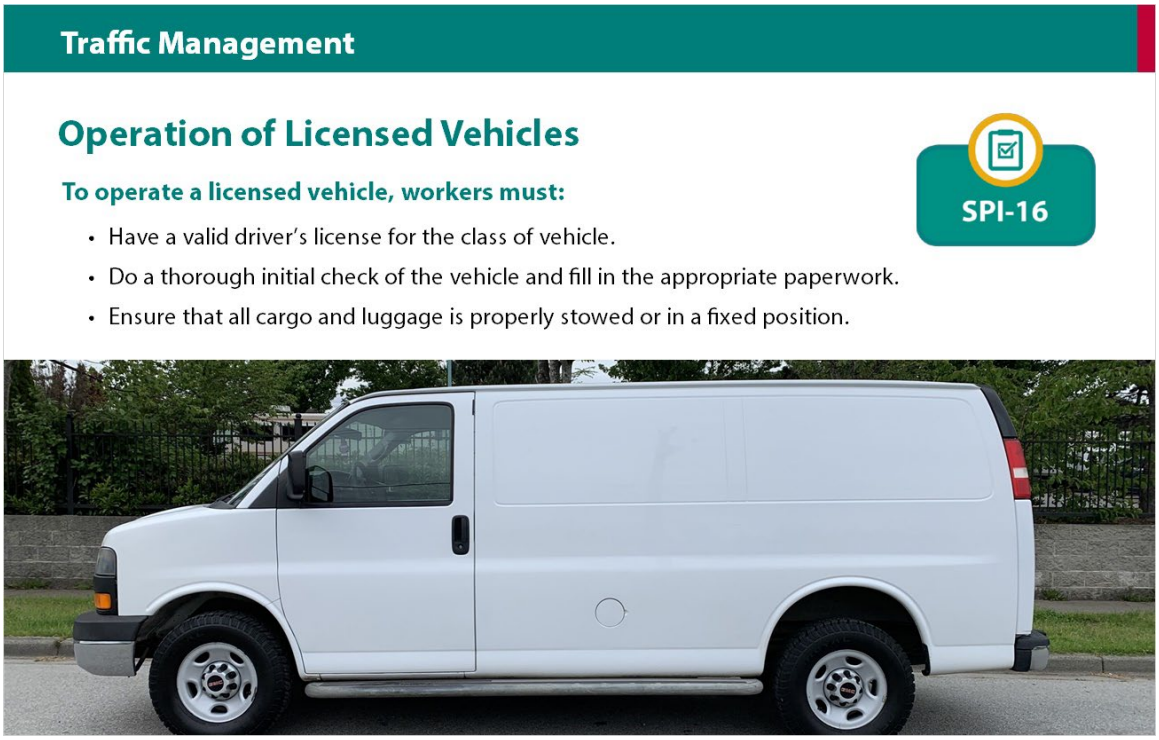
6.2 Introduction

Traffic Management

Vehicles & Mobile Equipment states that you must always use mobile equipment and light vehicles for the purpose they were designed for and adhere to site pedestrian/vehicle traffic rules.

The following section includes general information and standard procedure instructions for the safe interaction with motorized vehicles and workers.

6.3 Operation of Licensed Vehicles



6.4 Requirements While Operating:

Traffic Management

Operation of Licensed Vehicles

To operate a licensed vehicle, workers must:

- Obey the Highway Traffic Act requirements while driving on Vale property such as following posted signs speed limit and warning, use of seat belts.
- Absolutely no cell phone use is allowed while driving on Vale property, including handsfee. Drivers must pull over in a safe location prior to answering or making a call.
- Keep headlights on at all times while your vehicle is in motion.
- Refrain from driving over electrical cables.
- Ensure hazard lights are turned on when stopped at the side of the road.
- No smoking is permitted in company vehicles.
- No watching TV/DVD's or using Personal Electronic Devices while driving.
- Follow all site specific procedures for the safe operation of the vehicle.

6.5 Seat Belts

Traffic Management

Seat Belts

All vehicles operating on Vale property are to be equipped with seat belt assemblies. This includes company and personal vehicles.

All Operators and passengers of motor vehicles or mobile equipment including employees, visitors and contractors shall wear the complete seatbelt assembly.

The seatbelt assembly for the operator and all passengers shall be properly adjusted and securely fastened before the vehicle is set in motion.

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6.6 Railway Crossings

Traffic Management

Railway Crossings

All vehicles required to cross over train tracks must use the approved railroad crossings.

- When at a crossing, you must come to a complete stop at the stop sign, look both ways, then proceed only when it is safe to do so.
- Failing to comply with this procedure will result in a suspension of driving privileges on Vale property.

6.7 Working Around Rail

Traffic Management

Working Around Rail

Any work performed within 12 feet of Transportation Rail System on Vale Property requires a work permit from the Transportation Department Dispatcher.

All contract employees must attend Transportation Orientation before they can take out a work permit from the Transportation Department.

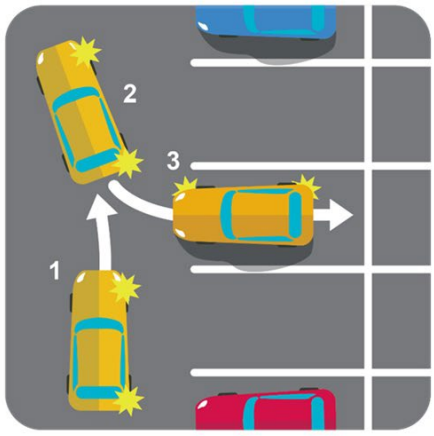
6.8 Parking in Designated Lots

Traffic Management

Parking in Designated Lots

There are designated parking lots for vehicles throughout Surface Operations. Where designated, contractors should park in the "Contractor Assigned Area".

- As a best practice, vehicles should back into parking spots.
- Be aware that some parking lots are divided into dayshift/nightshift sections which help coordinate parking lot maintenance.
- Do not park past lane boundary markers.



6.9 Parking in Non-Designated Areas

Traffic Management

Parking in Non-Designated Areas

Aside from designated parking lots, at times workers are required to park their vehicles in non-designated areas. This should not be confused with restricted areas.

- In areas where heavy equipment is operating, make sure your vehicle is visible and that it's not parked in the path or potential path of mobile equipment.
- Although there are some areas to park, there are other areas that are marked as "do not park". These areas have other hazards associated them.
- There are sites that require the use of safety whips (flags). Check with your Vale Contact Person to see if this is a requirement for the area in which you are working.

Safety Whips (Flags) Engineering Standard SPEC-81003

6.10 Pedestrian Walkways

Traffic Management

Pedestrian Walkways

Pedestrian walkways are areas that can be found either inside or outside of plant buildings. These areas are PPE free however there are exceptions in some areas.

If you are a motorist and come across a pedestrian walkway, slow down to ensure you're able to stop in the event a pedestrian crosses your path.

Vehicles are not permitted to drive inside the hash-marked areas.

6.11 Pedestrian Crossovers

Traffic Management

Pedestrian Crosswalks

A Pedestrian Crosswalk is any portion of a roadway designated by the mine/plant manager at an intersection or elsewhere, distinctly indicated for pedestrian crossing by signs and markings on the roadway.

Pedestrians are to use designated crosswalk areas whenever possible.

If a pedestrian crosswalk does not exist then proceed with caution to mitigate the risk of encountering any form of mobile equipment.

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Pedestrians are not to enter the crosswalk if by doing so, they make it unsafe for the driver to yield the right of way

6.12 Pedestrian Crossovers

Traffic Management

Pedestrian Crosswalks

At a controlled crosswalk, drivers are to yield the right of way to pedestrians by slowing or stopping.

Drivers can proceed once the pedestrian has cleared the crosswalk area.

When a vehicle is stopped at a pedestrian crosswalk, the driver of any other vehicle overtaking the stopped vehicle shall bring the vehicle to a full stop before entering the crosswalk and shall yield the right of way to the pedestrian.

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6.13 Mobile Equipment Awareness

Traffic Management

Mobile Equipment Awareness

Throughout the surface operations there are tasks that require the use of mobile equipment.

These can include equipment such as loaders, graders, forklifts and aerial lifts that move around the operation.

Be aware that the operator is doing the task they are assigned and you may be entering their work area.

Therefore maintain situational awareness with regards to mobile equipment and the associated hazards such as overhead pipes or structures, operator's line of vision and reaction time, as well as the equipment's route of travel.

6.14 Working Around Energized Overhead Transmission Lines

Traffic Management

Working Around Energized Overhead Transmission Lines

Contacting energized power lines can result in fatal electrocutions, if not serious burns or damaged equipment.

Contact with overhead power lines is the most common cause of deaths involving cranes or other high-reaching mobile equipment.

6.15 Working Around Energized Overhead Transmission Lines

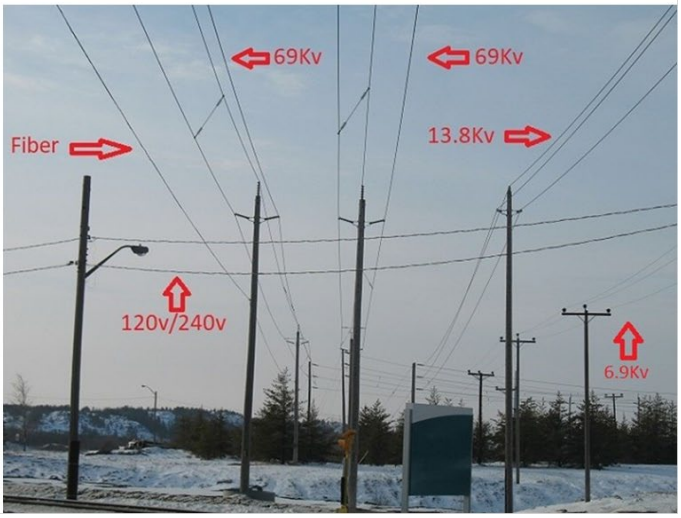
Traffic Management

Working Around Energized Overhead Transmission Lines

Most forms of overhead lines on Vale property are represented in this photo.

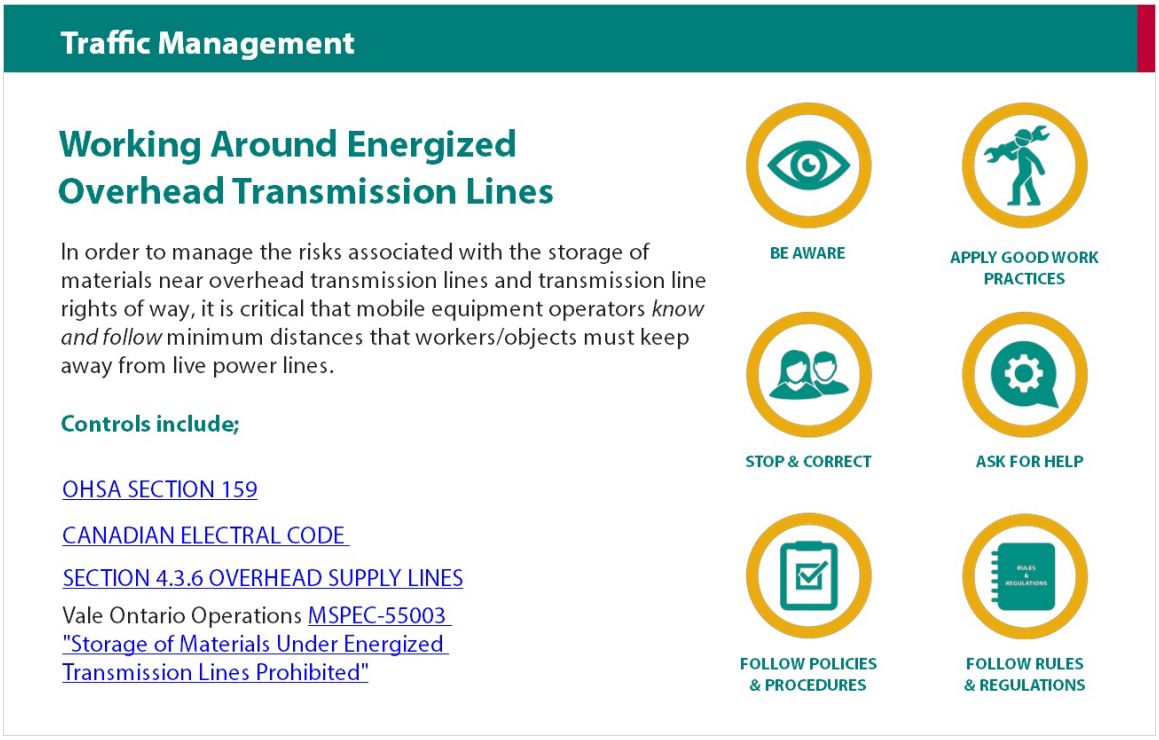
The overhead lines of concern in this photo would be the 6.9 Kv, 13.8 Kv and 69 Kv lines. They have bare conductors.

The fiber and 120v/240v are of less concern when it comes to contact but care should be taken not to take them down. They have insulated conductors.



6.16 Working Around Energized Overhead Transmission Lines

6.17 Working Around Energized Overhead Transmission Lines



6.18 Overhead Supply Line Clearances

Traffic Management

Working Around Energized Overhead Transmission Lines

Overhead Supply Line Clearances

Material storage in yards, and machines used to load or unload material, creates hazards for personnel and machines in the vicinity of bare overhead supply lines.

To maintain safe clearances and reduce the risk of accidental contact, the following should be considered in yard location, layout, material storage, and operation of machinery:

a) Where possible, and considering the machinery used to load or unload materials, storage yards and product stockpiles should be located a safe distance from supply line rights-of-way.

b) Procedures for maintaining safe clearances should allow for the types of machinery (boom trucks, cranes, large forklifts, excavators etc.) used to load and unload material.

c) Operations such as road dressing, grading, and snow clearing can require protecting poles and guy wires to prevent physical damage.

d) Employees should be trained in procedures for maintaining safe clearances.

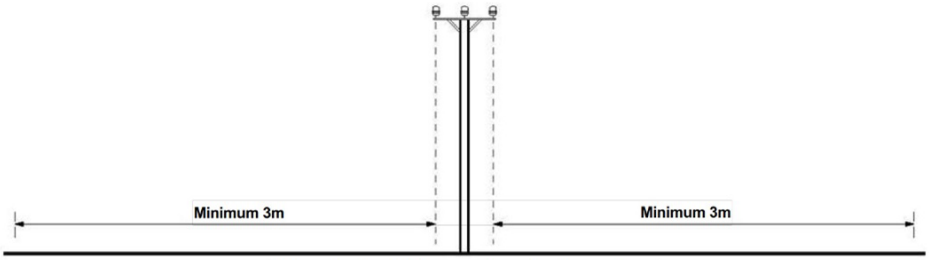
6.19 Minimum Horizontal Clearance

Traffic Management

Working Around Energized Overhead Transmission Lines

Minimum Horizontal Clearance

The minimum horizontal clearance for the storage of equipment, aggregates, construction, or any other materials from any overhead transmission line shall be three (3) meters from the closest bare conductor.



Minimum horizontal distances to overhead power lines

6.20 Minimum Horizontal Clearance

Traffic Management

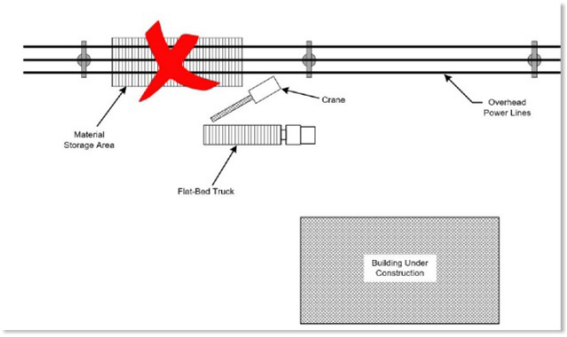
Working Around Energized Overhead Transmission Lines

Loading / Unloading Scenario

Storing material underneath overhead power lines is a hazard for mobile equipment, cranes and dump trucks.

The only way to eliminate the hazard is to prohibit the storage or placement of any material under an overhead power line.

Refer to MPROC-55002 (Electrical Power Department Authorization to Work Around Energized Overhead Conductors) whenever work around overhead power lines is required.



6.21 Occupational Health

6.22 Identification of Hazards

Occupational Health

Identification of Hazards

Occupational health refers to the identification and control of the risks arising from physical, chemical, and other workplace hazards in order to establish and maintain a safe and healthy working environment.

These hazards may include:

- dust particles such as silica
- physical agents such as loud noise or vibration
- chemical agents and solvents

Emergency showers and eyewash stations are necessary to minimize the effects of accident exposure to chemicals.
Depending on your area of work or tasks being performed, you should know how to operate eyewash and safety showers and be familiar with their locations prior to commencing work.

6.23 Eyewashes

Occupational Health

Eyewashes

Emergency eye wash stations are specifically designed to immediately flush contaminants out of the eyes after exposure. Location and familiarization make the difference in how well first aid is performed. The efficiency of emergency eyewash depends on following instructions:

1. Do not panic.
2. Get to the eye wash station and turn the eye wash on.
3. Rinse both eyes with copious amounts of water for a minimum of 15 minutes.
4. Keep your eyelids open by using your hands to ensure adequate flushing of the eyes.

Please note:

The emergency eye wash station is only for first aid. It is not medical treatment for chemical exposures. Proceed to First Aid as soon as possible.

Never pull on handles unless you are using the unit as they will activate when the handle is pulled; eyewashes will fully discharge their bladders.

Report discharged eyewash stations to Supervision

6.24 Emergency Showers

Occupational Health

Emergency Showers

Vale has two types of emergency showers on the property:

Plumbed Showers: An emergency shower permanently connected to a continual source of potable water.

Self-Contained Showers: A stand-alone shower that contains its own fluid source.

1. Do not panic.
2. Shout for help so co-workers can assist you.
3. Enter shower and pull down on the triangular handle.
4. Rinse off clothes, face, hands for a minimum 20 minutes.
5. Control Room / First aid will be signaled by shower activation and will send someone to assist you.

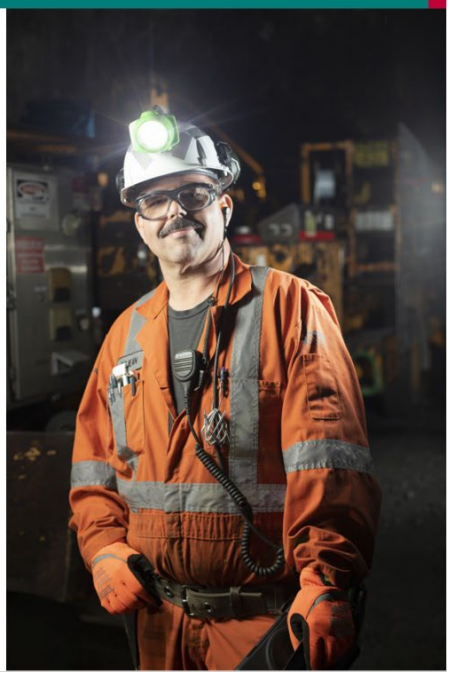
Stay in the shower until you are otherwise instructed.

6.25 Good Practices

Occupational Health

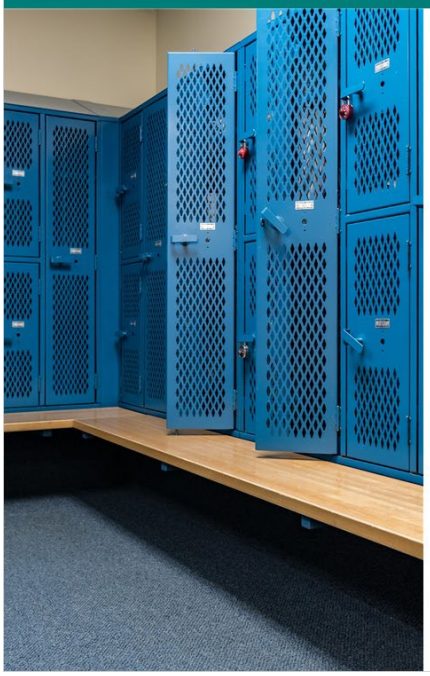
Good Practices

- Minimize dust generation by using an appropriate and available method to contain dust (i.e.: vacuum system, dust retardant, water).
- When handling or working around dust, always wear appropriate respiratory protection, protective "long-sleeve" clothing, gloves, and practice proper hygiene.
- Never eat or drink in the immediate work area.
- Wash hands and face thoroughly with soap (10 - 15 seconds to be effective); especially before eating or drinking.
- Keep cuts and abrasions clean and covered.
- Remove contaminated clothing and PPE before entering eating facilities and lunchrooms.
- Where available, launder work clothes at work and if at home, launder work clothes separately.
- Shower before going home by following the Contractor Hygiene Compliance Plan for your area.



6.26 Contractor Hygiene Compliance Plan

Occupational Health



Contractor Hygiene Compliance Plan

Day use lockers will be left unlocked and will be available for any off site personnel who want to use them for the duration of their shift.

This is effective immediately and includes the following general guidelines:

- Included with the use of a day use locker is the use of the shower and washing facilities in the dry.
- Vale is not responsible for lost or stolen items.
- You will need your own personal toiletries, towel and appropriate lock (Red locks are not permitted).
- All personal belongings and locks are to be removed at the end of the shift (Day use only).
- Locks left on lockers for more than 1 day will result in the locks being cut, and the contents of the locker bagged.
- For unlocked lockers, any items left in the locker will be bagged.

7. Underground Hazards and Controls

7.1 Underground Hazards

7.2 Site Specific Hazards

Underground - Hazards and Controls

Site Specific Hazards

Using the tools that you learned in Tier 1 Orientation, ensure you apply the necessary operation controls to mitigate risk associated with the identified hazards.

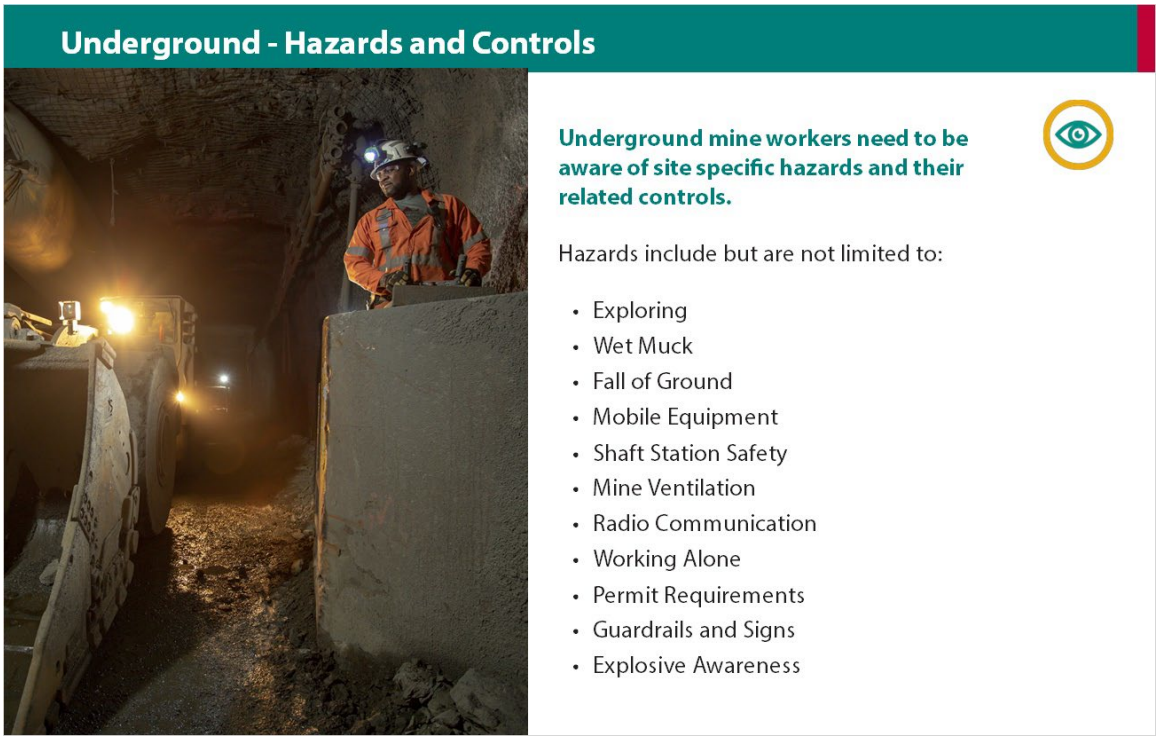
Be Aware
Be aware of your surroundings and the risks around you.

Follow Policies & Procedures
Our internal policies and procedures guide us in doing our work in a manner that reduces risk.

The following section lists identified hazards that may be encountered in the work you're doing. Knowing if these hazards apply to your work can be found through:

- Vale Contact Person
- PHA/PHR (or other Risk Assessment Tools)
- SLAM

7.3 Introduction

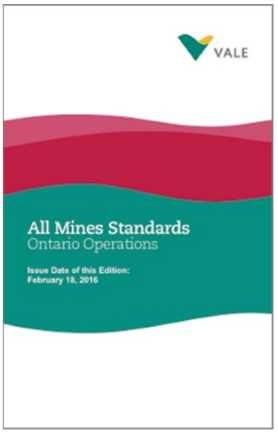


7.4 All Mines Standards

Underground - Hazards and Controls

All Mines Standards

In addition to following the Occupational Health and Safety Act and Regulations for Mines and Mining Plants, those working in any Vale mine in Sudbury must also adhere to the rules and guidelines prescribed in the All Mines Standards. Your plant contact will have access to this document.



This document is to be used as a reference to identify the minimum acceptable standards that must be adhered to in the workplace.

These standards enhance the Act and Regs that apply in Ontario and provide the minimum mandatory requirements to be followed in each mining plant.

In many cases good practices may be in place locally which may exceed these standards even further.

7.5 Abandoned Underground Workplaces

Abandoned Underground Workplaces

There are many areas underground that are no longer maintained due to the mining process.

These un-serviced areas may present hazards not typically found in active areas.

Do not **wander off to go exploring by yourself in old mined out areas and workings.**

7.6 Wet Muck

Wet Muck - Hazard

The mining industry has a long history of working around potential runs of muck from ore passes, storage bins, and drawpoints.

Water entering these areas causes "Impounded Water". If the water and material begin to flow, large amounts can be expelled quickly, leaving no time to react. This is known as a run of muck.

There have been serious incidents involving a run of muck, making it a high risk hazard.

Some items that can contribute to a run of muck:

- Poor water management
- Failure to stop and correct unsafe conditions
- Poor equipment design or maintenance protocols.

High Risk Hazards and Controls of Working in a Mine - November 2014

7.7 Wet Muck

Wet Muck - Hazard

Water is necessary for the mining process.
Ground water and even rain water can add to the hazard.

Storing and removing all of this water is how we keep it from becoming a hazard.

Properly engineered and maintained drainage systems is our main control measure to help reduce risk.

You can help reduce risk by:

- Reporting any unusual water conditions in the mine, including drawpoints and orepasses.
- Reporting any plugged drain holes or damaged drain lines/pumps.
- Not using damaged water hoses.
- Only using water when needed and shutting off all valves when not in use.

High Risk Hazards and Controls of Working in a Mine - November 2014

7.8 Falls of Ground

Falls of Ground - Hazard

A fall of ground is rock or fill falling from the walls or back of the mine that does not include falls occurring as part of blasting or scaling.

A rockburst is an instantaneous failure of rock causing an expulsion of material at the surface of an opening or a seismic disturbance to a mine.

Items that contribute to a fall of ground:

- Geological structures such as slips, faults or dykes.
- Large wedges, blocky ground.
- Incorrect ground support for the condition.
- Improperly installed and/or monitored ground support.
- Not following Ground Control recommendations (enhanced support, re-entry protocol, etc).

High Risk Hazards and Controls of Working in a Mine - November 2014

7.9 Falls of Ground

Falls of Ground - Controls

Vale's Ground Control department identifies proper ground support as a control measure for this hazard.

They monitor ground conditions and help control situations as they arise.

You can help lower the risk by:

- Not exposing yourself or others to unsupported ground.
- Always scaling well by following the 9 scaling rules.
- Reporting to supervision any unusual conditions and barricading appropriately.
- Following protocols and ground control instructions during or after ground movement.

7.10 Falls of Ground

Falls of Ground - Controls

Scaling is one of the most important jobs we do underground. Strict rules must be followed to avoid injury while scaling.

In order to work safely, always follow the 9 scaling rules.

1. Have good footing and a clear area of retreat.
2. Use the proper length of a well dressed bar.
3. Hold the scaling bar properly.
4. Do not take for granted that the ground is solid until proven so.
5. Scale from good ground to bad.
6. Always get help with difficult loose (supervision).
7. Have a proper bed for loose to fall on.
8. Watch for unexpected falls of ground.
9. Scale well.

7.11 Mobile Equipment

Mobile Equipment - Hazard

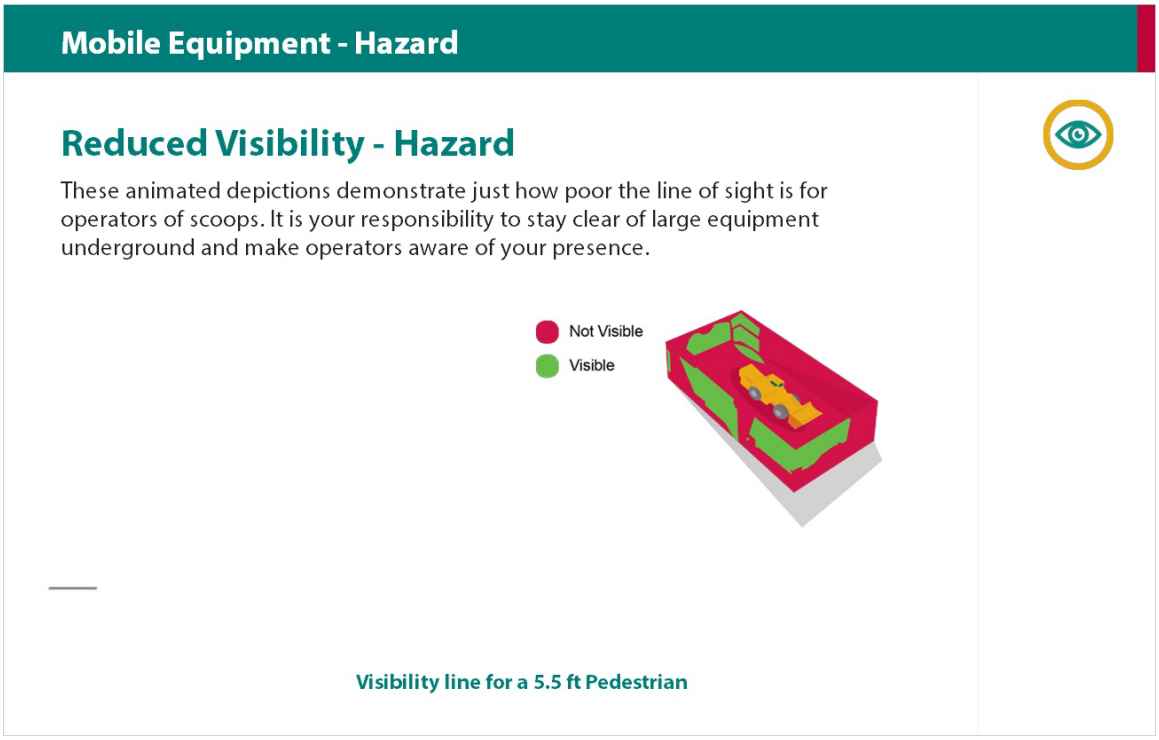
Throughout mining operations there are tasks that require the use of mobile equipment. These can include equipment such as scoop trams, haulage trucks, graders, forklifts that move around the operation.

Be aware that the operator is doing the task they are assigned and you may be entering their work area.

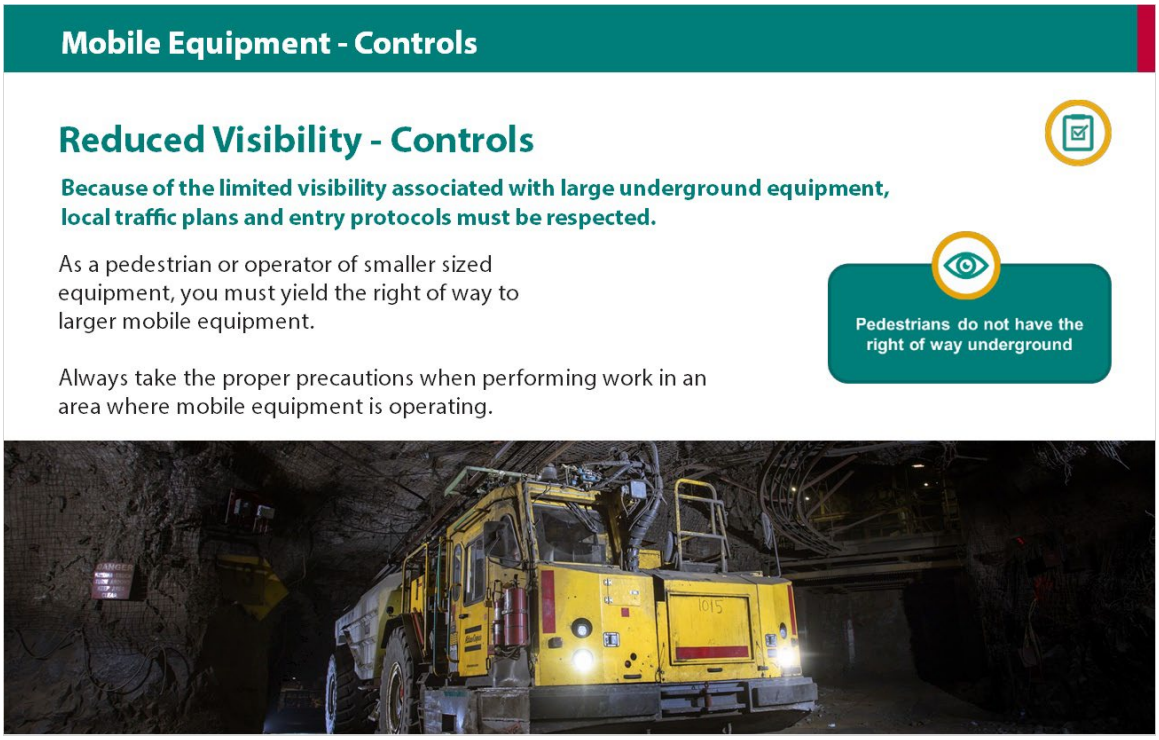
Therefore maintain situational awareness with regards to mobile equipment and the associated hazards such as overhead pipes or structures, operator's visibility and reaction time, as well as the equipment's route of travel.

7.12 Mobile Equipment

7.13 Reduced Visibility



7.14 Reduced Visibility



7.15 Reduced Visibility

Mobile Equipment - Controls

Reduced Visibility - Controls

Mining Regulation 854 require underground haulageways that permit pedestrian travel to be designed with safety stations or safety bays at intervals of no more than 30 metres.

These stations or bays allow pedestrians to stand safely off to one side of the roadway while vehicles pass by.

Pedestrians do not have the right of way underground

7.16 JAWS

Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls

Introduction

JAWS is a proximity detection system that has been implemented at Vale mines to improve situational awareness of vehicle operators and personnel.

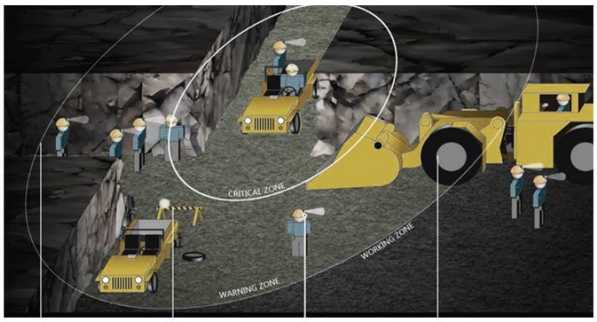
JAWS also alerts personnel that vehicles are approaching or nearby so that workers are made aware of any hazardous situation and can take precautions to avoid accidental contact with mobile equipment.

(JAWS) screen installed in a Toyota Land Cruiser

7.17 JAWS

Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls



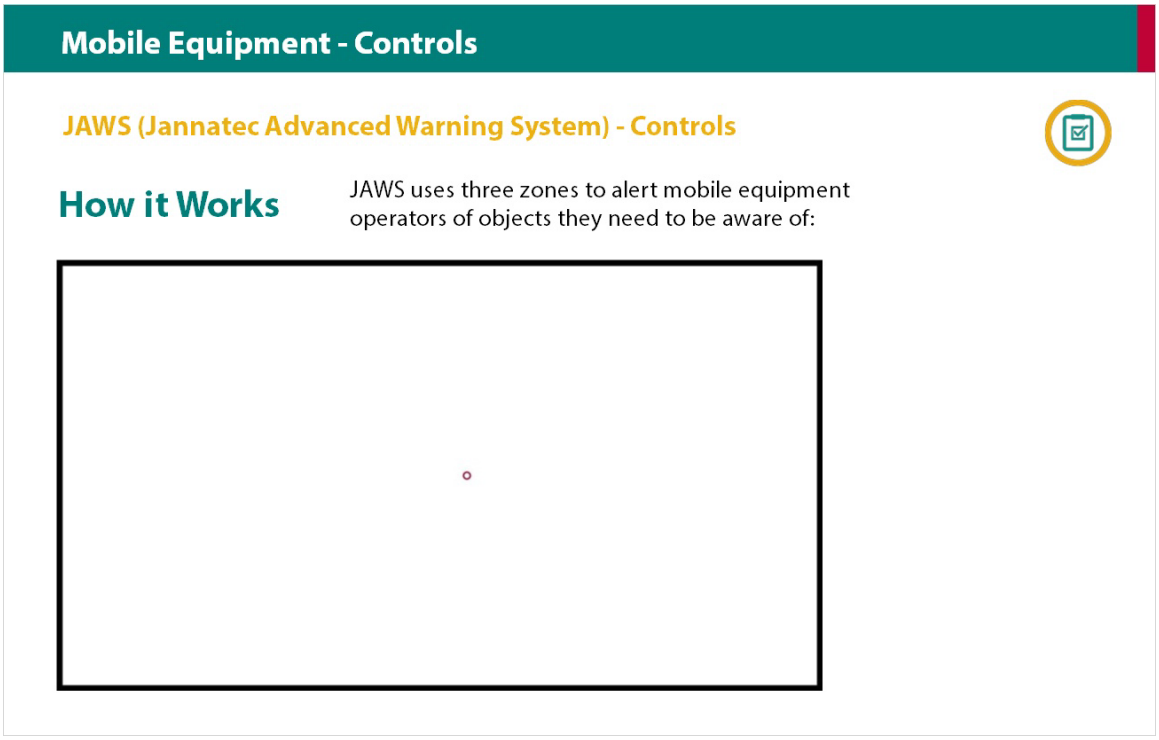
How it Works

Radio signals are used to relay proximity alerts to warn vehicle operators and personnel of potential hazards, such as:

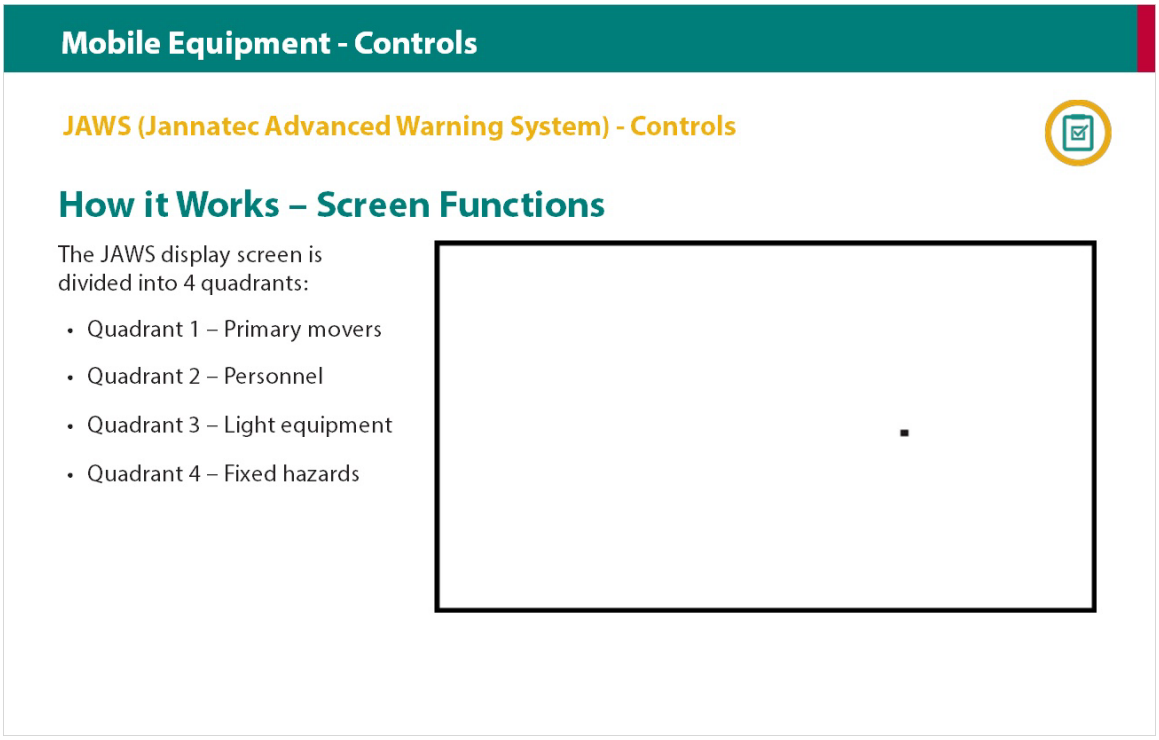
- Personnel to vehicle
- Fixed hazard to vehicle
- Vehicle to personnel
- Vehicle to vehicle

Personnel to Vehicle	Fixed Hazards	Embedded LED Cap Lamp	Vehicle to Vehicle
Working personnel and approaching vehicles receive warnings when within hazard zone.	Personnel and vehicle operators are warned when approaching identified hazards.	Pedestrians are quickly warned of approaching vehicles or hazards.	Operators warned of approaching vehicles before they come into sight.

7.18 How it works



7.19 How it works



7.20 How it works

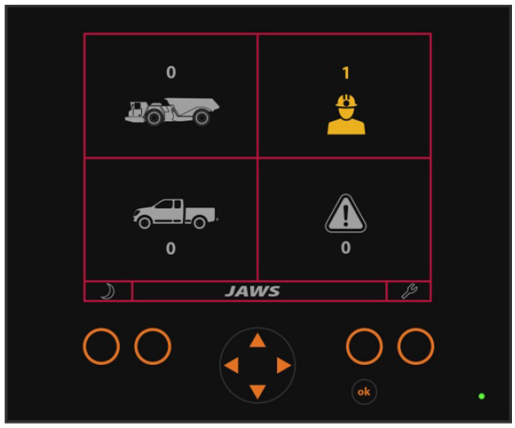
Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls

How it Works – Screen Functions

The display screen provides the following alerts to equipment operators;

- Initial proximity warning
- Critical proximity warning
- Assets remain in critical zone warning



7.21 Initial proximity warning

Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls

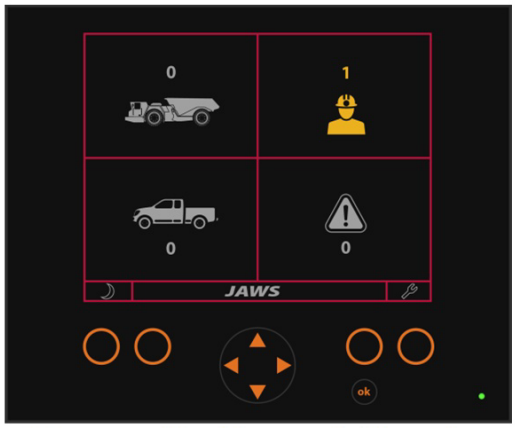
How it Works – Screen Functions

Initial proximity warning

The initial proximity warning alerts operators that an asset has come into the warning zone.

The associated asset turns orange and the quadrant briefly flashes from black to white. The number of assets in warning zone is indicated above the icon.

The number indicates the quantity of asset type(s) within range.



** Operators should proceed with caution.*

7.22 Critical proximity warning

Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls

How it Works – Screen Functions

Critical proximity warning

A critical proximity warning alerts operators that an asset has come into the Critical Zone.

The image of the associated asset type fills the entire screen (red) for short duration, an audible alert provides notification to the operator.

The quadrant remains **RED** indicating the number of assets in critical range below/above number.

** Operators should proceed with extreme caution.*

7.23 Assets remain in critical zone warning

Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls

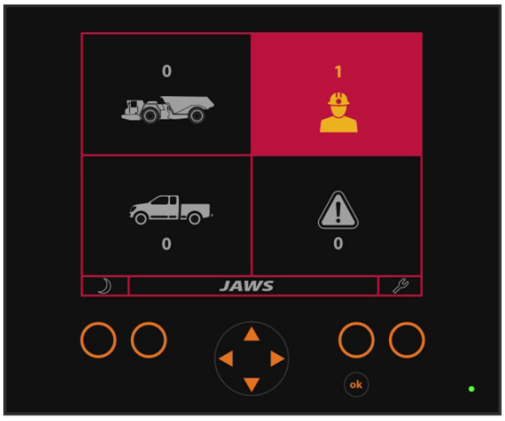
How it Works – Screen Functions

Assets remain in critical zone warning

Any assets that remain in the warning zone will be indicated via a box in the corner of the quadrant that contains the quantity of assets in the warning zone.

If there are assets in both the warning and critical zones, the critical zone assets will take priority and be indicated via a number above that asset.

The quadrant will remain red during the time that asset is in the critical zone.



** Operators should proceed with extreme caution.*

7.24 Assets remain in critical zone warning

Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls

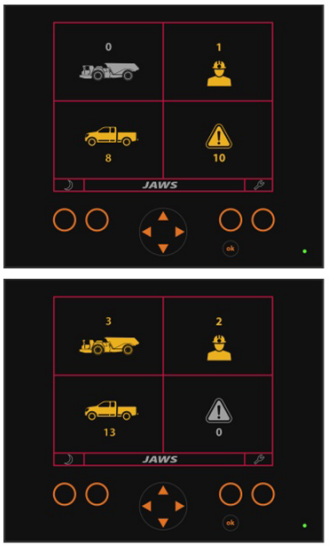
How it Works – Screen Functions

JAWS will display all of the assets within range at one time as shown in these images.

Important note:

Since the JAWS unit is connected to the primary power of the vehicle, it will always be recognized by the JAWS system even when the vehicle is turned off/not running.

Any vehicle turned off will appear as a fixed asset on the system until turned on at which point it will automatically then switch to be recognized as its' vehicle ID type.



7.25 Testing - Vehicle Units

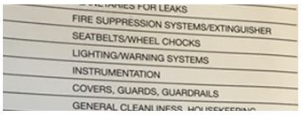
Mobile Equipment - Controls

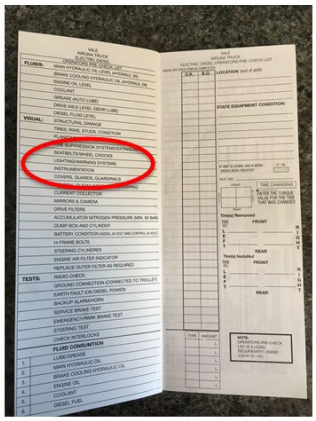
JAWS (Jannatec Advanced Warning System) - Controls

Testing - Vehicle Units

Prior to the start of each shift, vehicle operators are to ensure their JAWS unit is functioning properly by performing the following test.

The verification of the Jaws system must be documented on the vehicles pre-op slip. It is to be noted on the slip under "WARNING SYSTEMS".





7.26 Testing - Vehicle Units p1

Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls

Testing - Vehicle Units

1. Vehicle operator turns on ignition of vehicle.
2. The JAWS unit will power up.
3. Operator will have to acknowledge the disclaimer screen or the unit will start to beep until this has been done.
4. The vehicle operator will be prompted to perform a functional check. (You must be near another vehicle or have your cap lamp on to commence this test.) If this test is not completed, the unit will commence playing the audible tone which will continue until test is complete.
5. The vehicle operator will select the 'OK' button to start test.
6. The test commences to ensure RF functionality is working by displaying the standard JAWS screen with assets.

7.27 Testing - Vehicle Units p2

Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls

Testing - Vehicle Units

7. Each asset quadrant will turn RED one by one verifying screen functionality.
8. Once the test is complete the unit will indicate a PASS/FAIL result on the screen.
9. If it's a **PASS**, there will be an audible tone and the operator can continue with their work. If there is a pass and the audible tone is not heard there may be an issue with audio on the unit and it should be tagged out for service.
10. If it's a **FAIL**, the unit will continue to emit the audible tone as the JAWS unit will need to be serviced.
11. Continued operation after a '**FAIL**' result is not recommended. This can be identified based on reviewing stored data on the vehicle unit.
12. Operators should follow outlined protocol for replacement of the vehicle JAWS Unit.

7.28 Testing - Vehicle Units p2

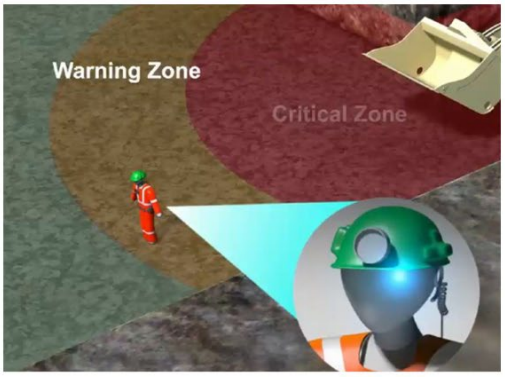
Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls

Cap Lamp Functionality

Proximity alerts

When a vehicle equipped with a JAWS unit comes within the proximity of personnel wearing a JAWS capable cap lamp, a blue LED on the base of the cap lamp will light up notifying the resource of the proximity alert.



7.29 Testing - Vehicle Units p2

Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls

Cap Lamp Functionality

Proximity alerts

The blue LED is very bright and easily visible through a reflection on the pipe clip provided for the workers helmet.

Once there are no vehicles within the proximity of that worker, the LED will turn off indicating to the worker that they are back in the safe working zone.

NEVER IGNORE THE BLUE LIGHT!!

7.30 Testing - Vehicle Units

Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls

Testing – Cap Lamp Units

Prior to heading underground for each shift, EVERY worker is required to test their cap lamps to ensure the JAWS functionality is working.

7.31 Testing - Vehicle Units p1

Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls

Testing – Cap Lamp Units

1. Place your cap lamp on the circular area on one of the personnel verification units. (For best results, always place the lamp front facing the unit while holding the back of the cord to prevent unwanted interference.)
2. Press 'OK' to initiate the test. Test Begins.
3. The screen will turn GREEN for a pass and will turn **RED** for a fail.
4. If your cap lamp fails, obtain a replacement unit and re-perform test.
5. **DO NOT PROCEED UNDERGROUND IF YOUR UNIT HAS NOT PASSED!**

NOTE: The unit should always be placed with the on/off button on top when performing the test for best results.

7.32 Testing - Vehicle Units p1

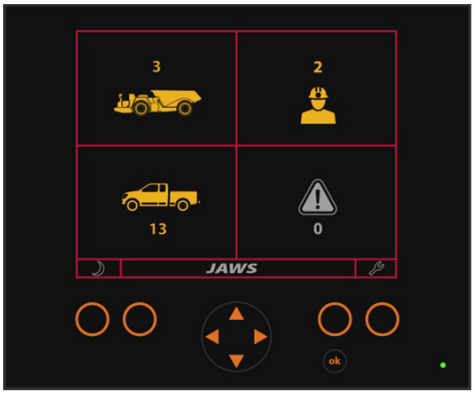
Mobile Equipment - Controls

JAWS (Jannatec Advanced Warning System) - Controls

Additional Features

The operator can adjust the brilliance of the screen using the button located on the lower left corner of the display.

The Jaws unit also records all interactions and alarms. This information is stored within the JAWS unit and can be retrieved for maintenance and/or auditing purposes, or in the event an incident or near miss occurs.

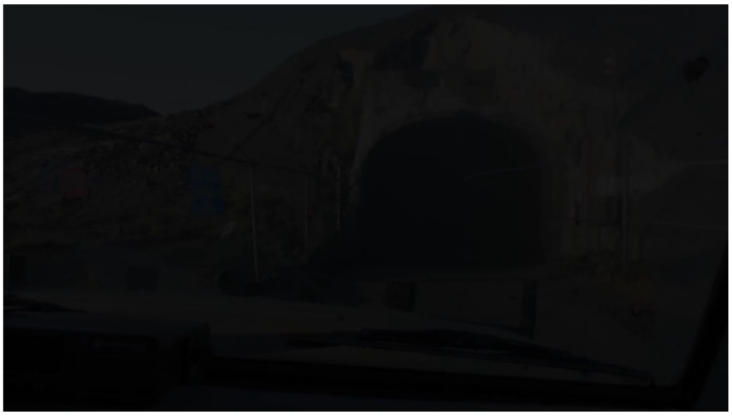


7.33 Entering Mine Portals

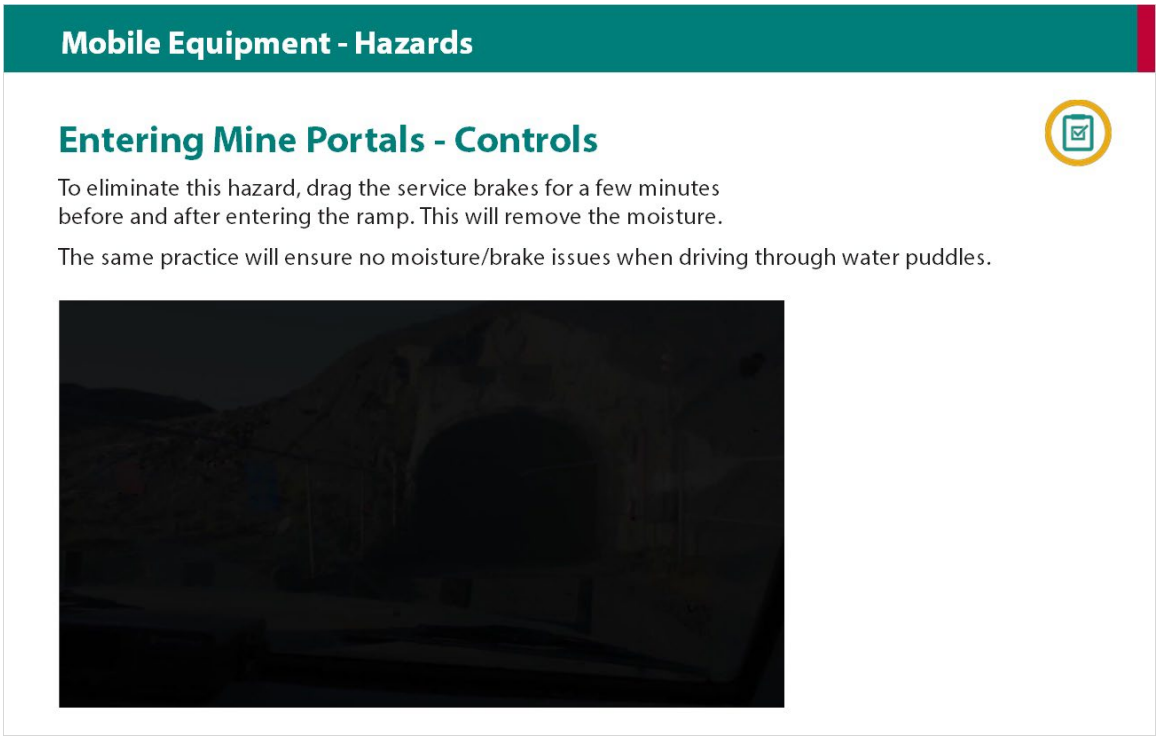
Mobile Equipment - Hazards

Entering Mine Portals - Hazard

In extreme cold weather, when vehicles are parked for more than 30 minutes, "Hoar Frost" develops on brake components as soon as the vehicles enter the ramp portals. When this occurs there are no brakes for a period of time.



7.34 Entering Mine Portals



7.35 Tire Management

Mobile Equipment - Hazards

Tire Management

Wheel assemblies pose significant risks when inadequate precautions and improper procedures are applied.

For example, a 20-inch tire inflated to 100 psi can contain up to 40,000 lbs. of explosive force.

That's enough force to throw a small car 15 feet in the air, and enough to cause a very serious injury or fatality.

Locking rings or other components may be propelled at speeds up to 130 miles per hour.

To change or work on tires at Vale you need to have the appropriate level of recognized training and authorization.
(e.g. Miners accredited in MTCU Module U0015 or HDET's trade-certification)

7.36 Shaft Station Safety-

Shaft Station Safety

One of mining operation's greatest hazards is around shafts and shaft furnishings.

You can help mitigate the risks by following some basic rules:

- Always follow the directions of the cagetender.
- When the cage arrives, no one is to enter or exit the cage without consent from the cagetender.
- Keep hands and arms away from the shaft furnishings.
- Watch for and adhere to all warning lights, sounds, signals and signs.
- No material is to be brought into the cage without proper authorization.
- Be aware of your footing upon entering or exiting the cage.
- Only qualified and authorized personnel may operate the cage or skip signal systems.

7.37 Mine Ventilation

7.38 Radio Communication

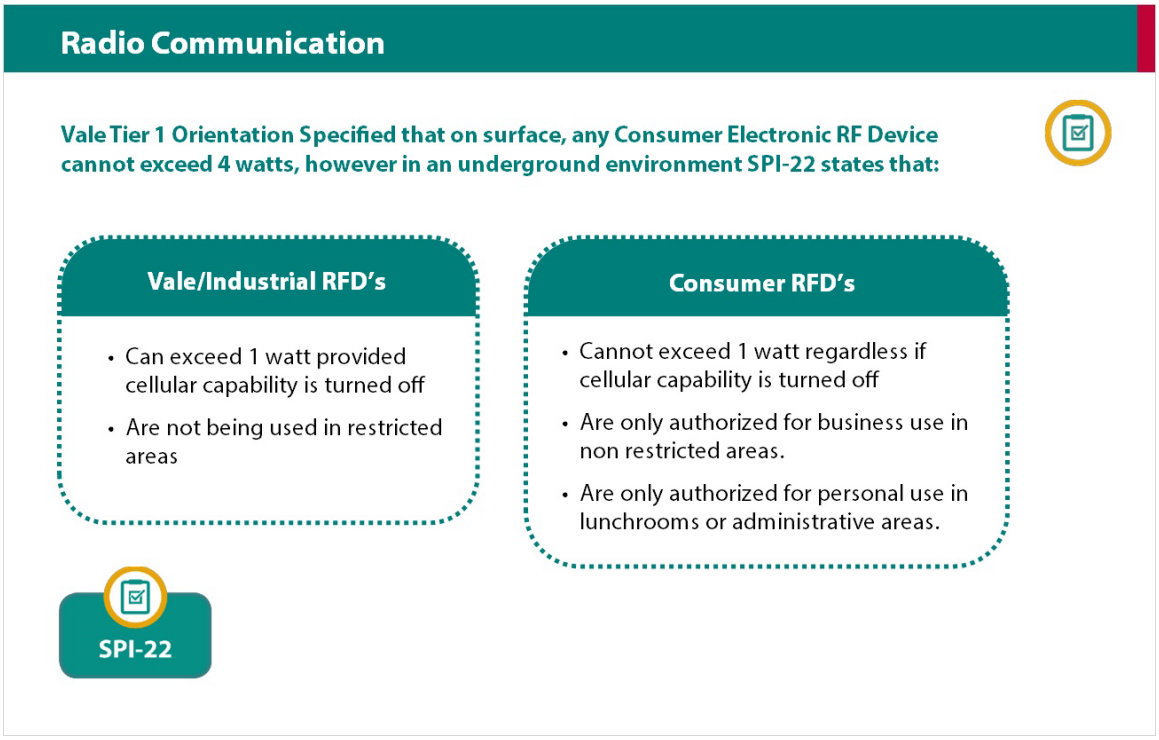
Radio Communication

RF Devices in the Underground Environment

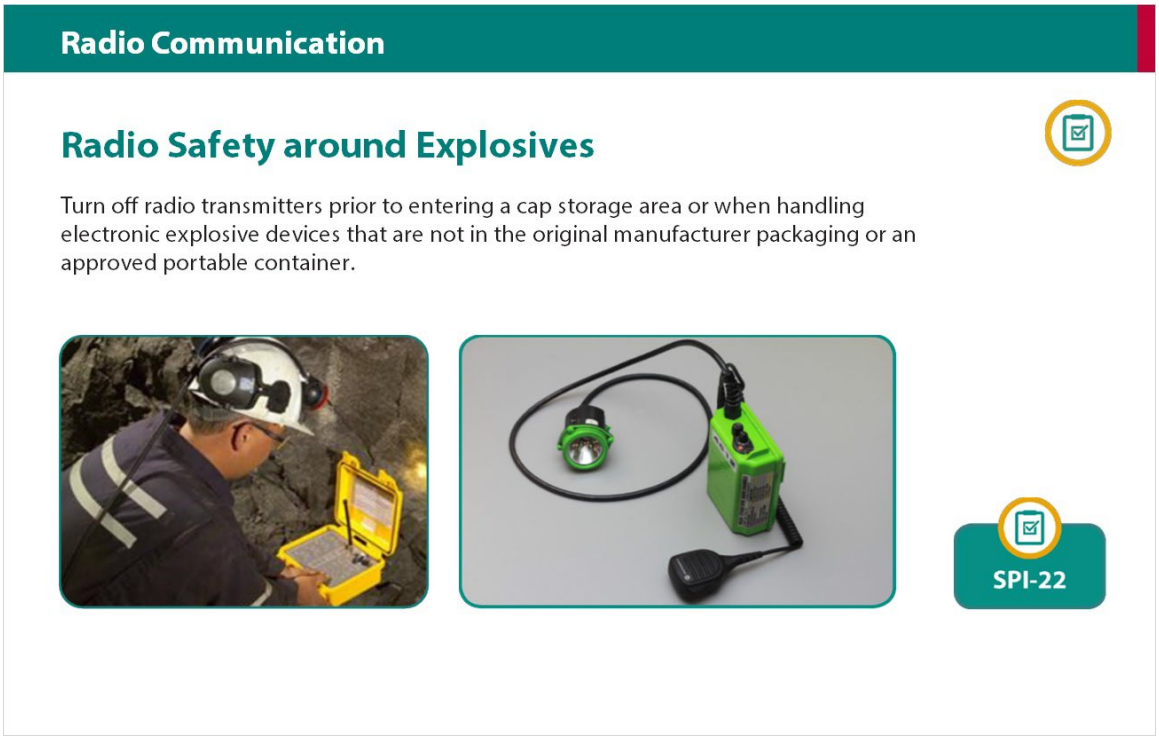
In the Tier 1 Orientation we discussed the use of Radio Frequency Devices while on Vale Property.

When working underground, there are additional hazards mostly due to the use of explosives that can be affected by radio frequency devices (RFD).

7.39 Radio Communication



7.40 Radio Communication



7.41 Radio Communication

7.42 Working Alone

Working Alone

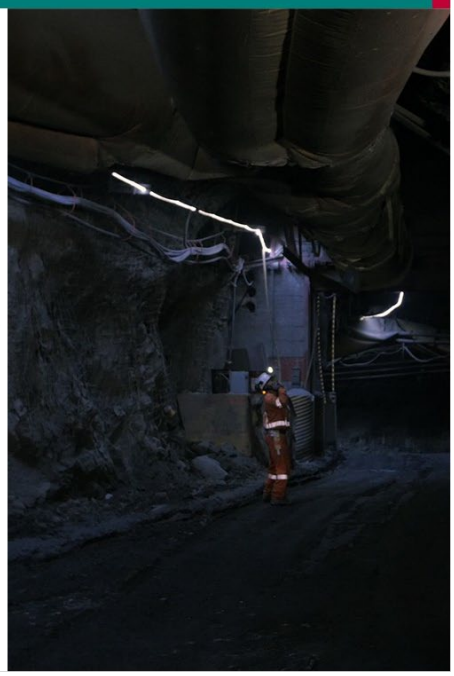
Radio Protocol

A person is "Working Alone" when they are working without a partner. While a worker may not always be performing hazardous tasks, working alone introduces the risk of not being located in case an incident does occur.

To manage employees Working Alone, the Safety Trak System is used. It's a computerized system that links workers, Supervisors, and System Operators through Radio Cap Lamps.

There are 6 key areas to Working Alone:

- Get logged into the system
- Automatically advancing the next call-in time
- Getting paged when late
- Supervisor being notified
- Logging off the system
- "Person-Down" Button



7.43 Working Alone

Working Alone

Get logged into the system:

The System Operator is located in the First Aid Office at the Mine. Request that you be put on the Safety Trak system by contacting the System Operator, either in person, by phone or by designated radio channel; provide information. **If there is additional risks associated with the work you are doing, you can have the System Operator manually reduce your designated time to go into late status**

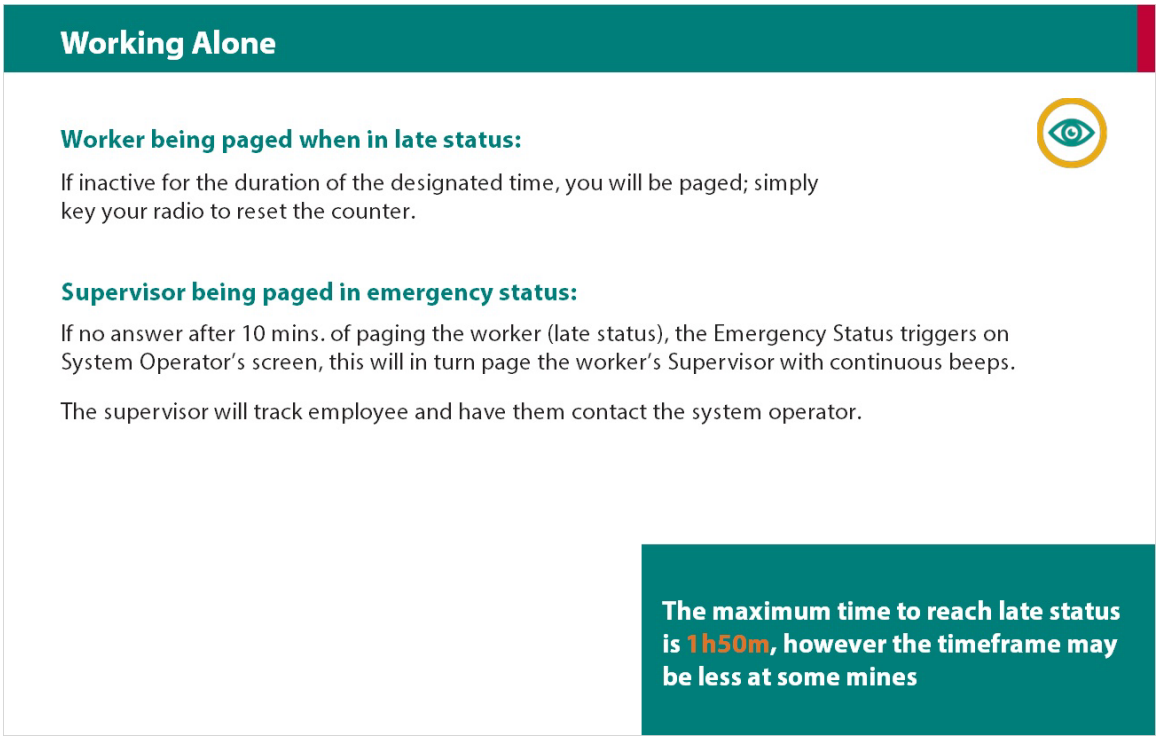
To be verified, the system will page you (radio will begin to beep). Simply key your radio.

Automatically advancing the next call-in time:

Each time you key your radio, the counter will re-start. EXAMPLE: If you are working on a ramp and are announcing yourself every 20 minutes, you may never get paged (you are never inactive long enough for the designated time to expire).

The maximum time to reach late status is 1h50m, however the timeframe may be less at some mines.

7.44 Working Alone



7.45 Working Alone

Working Alone

Logging off the system:

When shift or working alone is over, the employee needs to contact the System Operator to have their ID removed from the system. If not, their radio will page at their regular call in time.

"Person-Down Button":

Another feature of the Safety Trak system is the use of an emergency button that the worker can press if they are in distress. This will immediately alert both System Operator and the worker's Supervisor.

7.46 Permit Requirements

Permit Requirements

It is a requirement to ensure all proper documentation and plant procedures are followed while conducting work on Vale property.

Contact your Vale Contact Person for instruction on:

Work Permits - Burning Permits - Confined Space Permits

7.47 Guardrails and Signs

Guardrails and Signs

As a minimum, a double guardrail, or a single guardrail with a worker attending will eliminate access to a restricted area.

Never pass through, or remove, a double guardrail without authorization from your Supervisor.

7.48 Guardrails and Signs

Guardrails and Signs

Signs notify workers by informing them of work being done in an area or where hazards or possible hazards exist.

There are three main categories of signs:

Regulatory Signs: identify actions that are forbidden or mandatory, i.e. "Do Not Enter".

Warning Signs: identify potential or definite hazards, i.e. "Caution" or "Danger".

Information Signs: provide information, i.e. "Fire Extinguisher", "Safety Station".

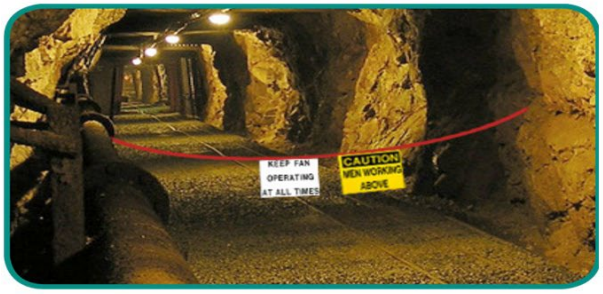
7.49 Guardrails and Signs

Guardrails and Signs

Combined together, signs and guardrails can protect workers by restricting or limiting access as well as being a means of providing information to workers coming into an area.

Single Guardrail:

Provided the entrants understand the hazards that exist and have permission to enter, they can proceed according to the directions found on the sign.



All guardrails require appropriate signs specifying the hazard.

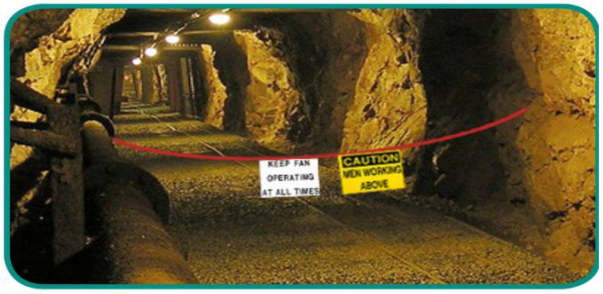
7.50 Guardrails and Signs

Guardrails and Signs

Combined together, signs and guardrails can protect workers by restricting or limiting access as well as being a means of providing information to workers coming into an area.

Double Guardrail:

No persons may pass through a double guardrail without the accountable supervisor's permission.



All guardrails require appropriate signs specifying the hazard.

7.51 Guardrails and Signs

Guardrails and Signs

Combined together, signs and guardrails can protect workers by restricting or limiting access as well as being a means of providing information to workers coming into an area.

Double Guardrail with Screen:

Installed when complete restriction to an area exists, i.e. Inactive Manway.

All guardrails require appropriate signs specifying the hazard.

7.52 Guardrails and Signs

Guardrails and Signs

Selection

- Make sure guardrails are installed securely and clearly
- 1ft spacing is ideal for a double guardrail
- NEVER remove a guardrail without authorization
- NEVER work behind a double guardrail
- Whenever a double guardrail is installed, it must be reported to your Supervisor
- No guardrails are to be placed across main travel areas without accompanying reflective markers

Refer to All Mines Standards for further instruction.

7.53 Guardrails and Signs

Guardrails and Signs

The minimum acceptable materials for guardrails are:

- Chain: ¼″ minimum
- Rope: ¼″ polypropylene rope (yellow rope)
- Screen: Metal screen (preferred) or other suitable material such as plastic fencing
- Cari-strap: Emergency only. Must be replaced as soon as proper materials are found

Refer to All Mines Standards for further instruction.

7.54 Explosive Awareness

Explosive Awareness

Hazards involving explosives used in mines can result in serious injuries as well as damage to property.

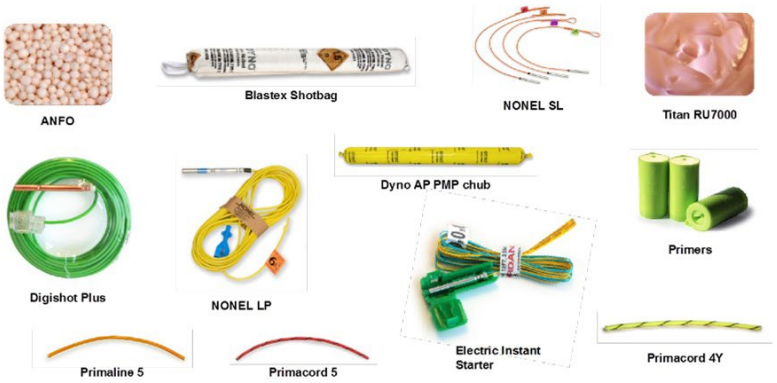
While there are controls put in place to minimize risk to employees, such as safeguards, inventory control, procedures and training, the best way for general underground workers to protect themselves is to simply be aware of their surroundings.

7.55 Explosive Awareness

Explosive Awareness

If you find anything that you suspect are explosives and they're not in an approved storage area:

Guard the area leaving the explosives where they are found and notify your Supervisor immediately and await direction.



7.56 Explosive Awareness

Explosive Awareness

Types of Explosives

Explosive materials outside of their original containers still present the same risk as a packaged material.

In some cases, especially trucks, scissor lifts etc. it is possible for loose gel to get underneath tool boxes, machines and equipment during the cleaning process.

It is necessary to always check under obstacles and ensure they are thoroughly cleaned.

7.57 Explosive Awareness

Explosive Awareness

Types of Explosives

Trucked-in and pre-packaged emulsions range in consistency but can generally be identified from their "gel-like" consistency and smell of ammonia.

Any spill of emulsion should be regarded as an explosive and treated seriously.

If you're using equipment associated with the loading of emulsion, make sure everything is cleaned out per your procedure.

Emulsion type explosive on the deck of a scissor truck

7.58 Explosive Awareness

Explosive Awareness

Remember…

If you are not authorized and qualified to handle explosives, **you don't !!**

However…

You are still responsible to safeguard and alert supervision immediately to the findings of ANY explosives not in an approved location.

8. Process Hazards/Upsets

8.1 Process Hazards/Upsets

8.2 Introduction

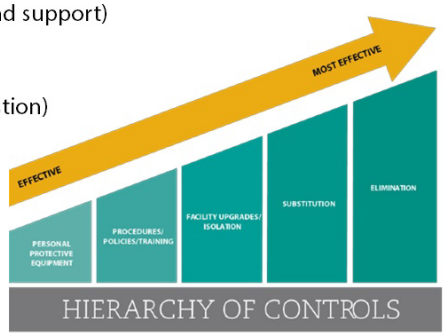
Process Hazards/Upsets

Vale's Mining Operations involve various mining methods and equipment.

There are associated hazards such as:

- Mechanical (mobile or stationary equipment)
- Inadequate ventilation (equipment use, fire)
- Ground conditions (geological structure, failed ground support)
- Heat sources (exposure)
- Designated Substances (inhalation, absorption, ingestion)
- Physical (musculoskeletal, slips, trips, falls)

Vale has a hierarchy of controls to manage the exposure to hazards such as process hazard reviews (PHR), PPE, procedures and training.



8.3 Introduction

Process Hazards/Upsets

Harm is the physical injury or damage to the health of people either directly or indirectly, or damage to property or the environment as a result of a failed operational control or Process Upset.

Process upsets can occur in many different situations and can be caused by:

- Inefficiencies in the process design, organization and control,
- Human factors,
- Natural disasters and other emergencies,
- Exhaustion or failure of equipment,
- Unsafe use of machinery,
- Random upsets,

Depending on the type of upset, a response to the emergency may be required.

9. Equipment Safeguarding

9.1 Process Hazards/Upsets

9.2 Equipment Safeguarding

Equipment Safeguarding

Equipment Protection & Guarding

- Equipment and systems are not to be operated without safeguarding in place and in working order.
- Unless required and authorized to do so under controlled conditions, no one is allowed to remove or disable an equipment safeguard device.
- Where guarding has been removed to maintain a piece of equipment, a final check of all guarding should be made in order to ensure the equipment is safe to operate.
- Any guards that are modified or manufactured must be done with the permission of the operating groups, and be done in accordance with appropriate standards.

9.3 Equipment Safeguarding

Equipment Safeguarding

Proper Hand Tool Use

- Inspect all hand tools and hand held power tools before use.
- All hand tools should be operated with the supplied guards, shields and handles in place.
- Where appropriate both hands should be used to operate a tool.
- Electrical cords should be free of defects, and an electrical cord with a GFI circuit interrupter should be used whenever water or wet conditions are present.
- Face shields are required for cutting and grinding operations.
- Select the right tool for the job. Substitutes increase the chance of having an accident.

9.4 Equipment Safeguarding

Equipment Safeguarding

Open Blade Knives

Open bladed knives are not permitted at Vale Ontario operations except for designated personnel for designated activities.

- Electrical Department.
- Employees working with explosives.
- Other trades that have been granted an exemption through General Safety.
- Cutting Snips and Shielded Blades are the preferred cutting tools and should be used whenever possible.
- If these tools cannot be used for the work you are performing, stop and discuss with your supervisor.

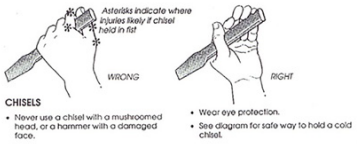
SPI-38

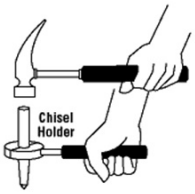
9.5 Equipment Safeguarding

Equipment Safeguarding

Struck Tool Safety

- Struck Tools include cold chisels, punches, nails sets, and wedges.
- Always use the correct tool for the job and tools in good condition. Discard broken and damaged tools.
- For chisels and chipping, use an angle that holds the bevel tip flat along the plane.
- Use tools with a rubber hand protector on the shaft of the tool.
- NEVER use cold chisels to break stone or concrete.
- NEVER hold a struck tool while another employee strikes the tool.
- NEVER use a flat screwdriver as a struck tool.
- ALWAYS were proper eye protection (glasses or face shield).
- If trained, restore flattened points or mushroomed heads by grinding.
- Use a chisel tip angle of 70° for hard metal, 60° for soft metal.

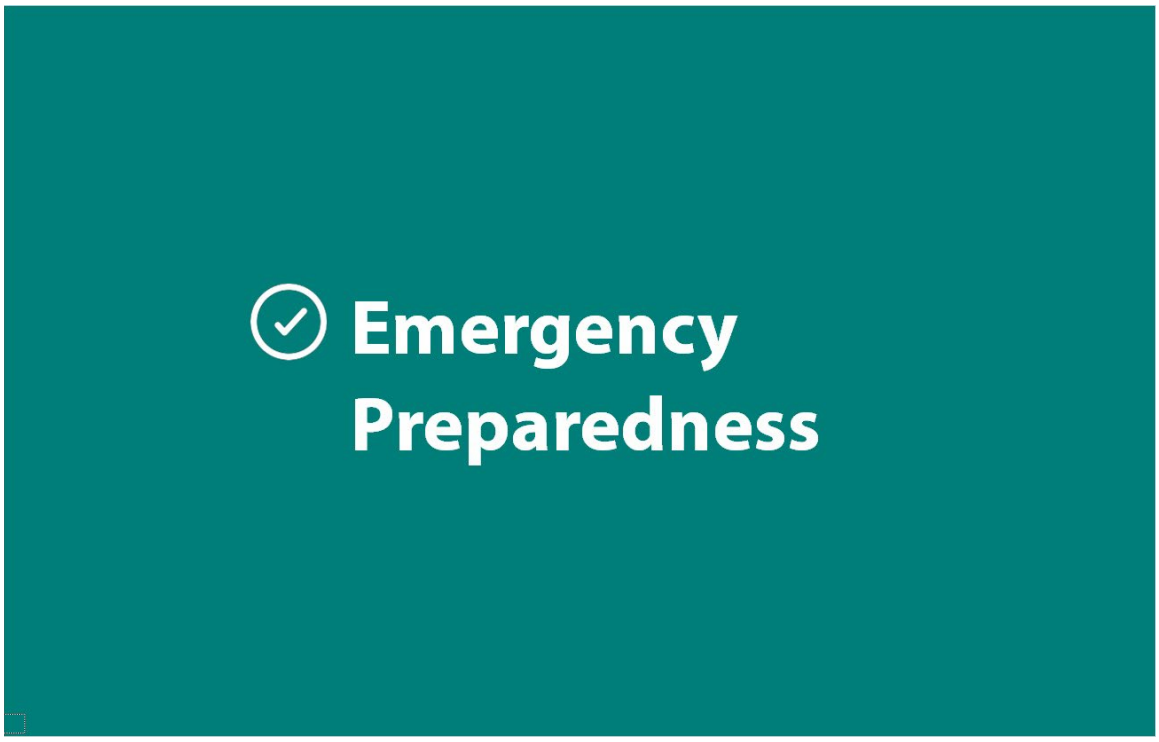




10. Emergency Preparedness

10.1 Emergency

Preparedness



10.2 Emergency Preparedness

Emergency Preparedness

Vale's Emergency Policy defines an emergency as:

- a situation or a set of circumstances which, if not promptly eliminated, controlled, or contained, results or could result in significant injury to people (including the community) and/or damage to the plant, property or the environment."
- Vale has developed an Emergency Preparedness plan to provide an appropriate and consistent response to any reasonably foreseeable emergency situation likely to occur at the Company's Sudbury operating facilities.

10.3 Emergency Preparedness

Emergency Preparedness

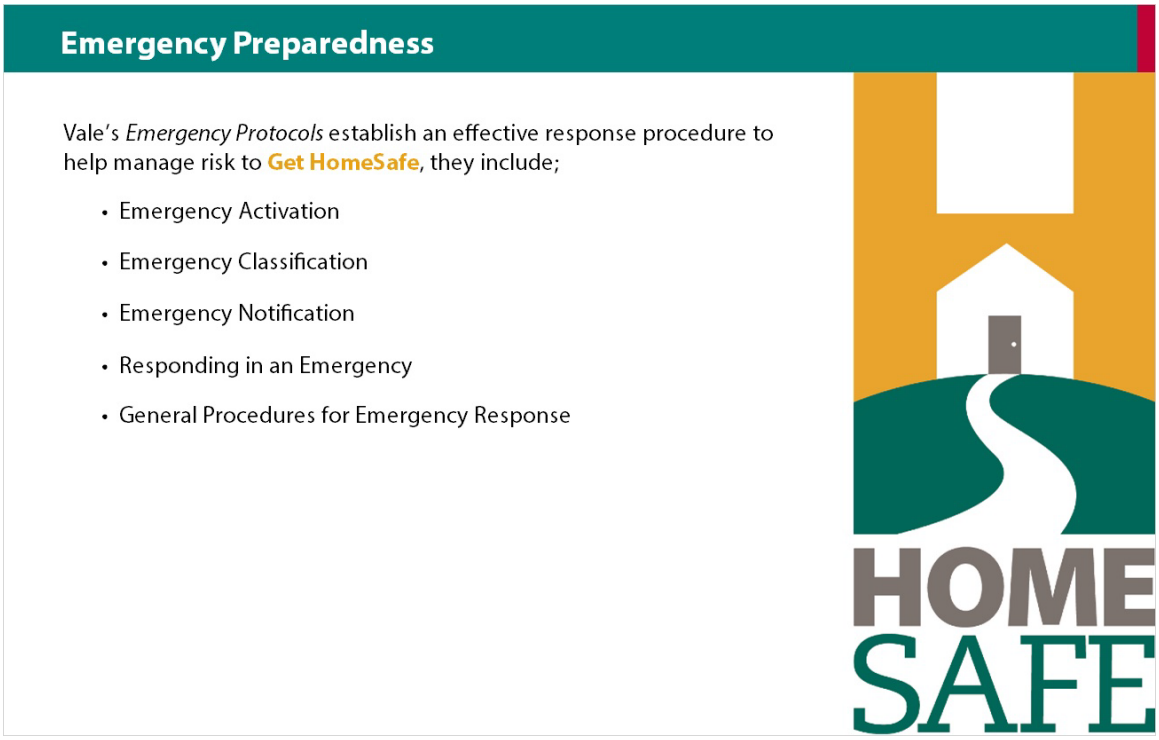
Each mine surface site has a set of Emergency Procedures that include;

- Emergency Protocols
- Fire Safety
- Emergency Management

Your worksite pre-entry requirements will include an orientation to these area-specific procedures and protocols as they apply to your work area.

***Everyone* is to *know* and *understand* their role in the event of an emergency.**

10.4 Emergency Preparedness



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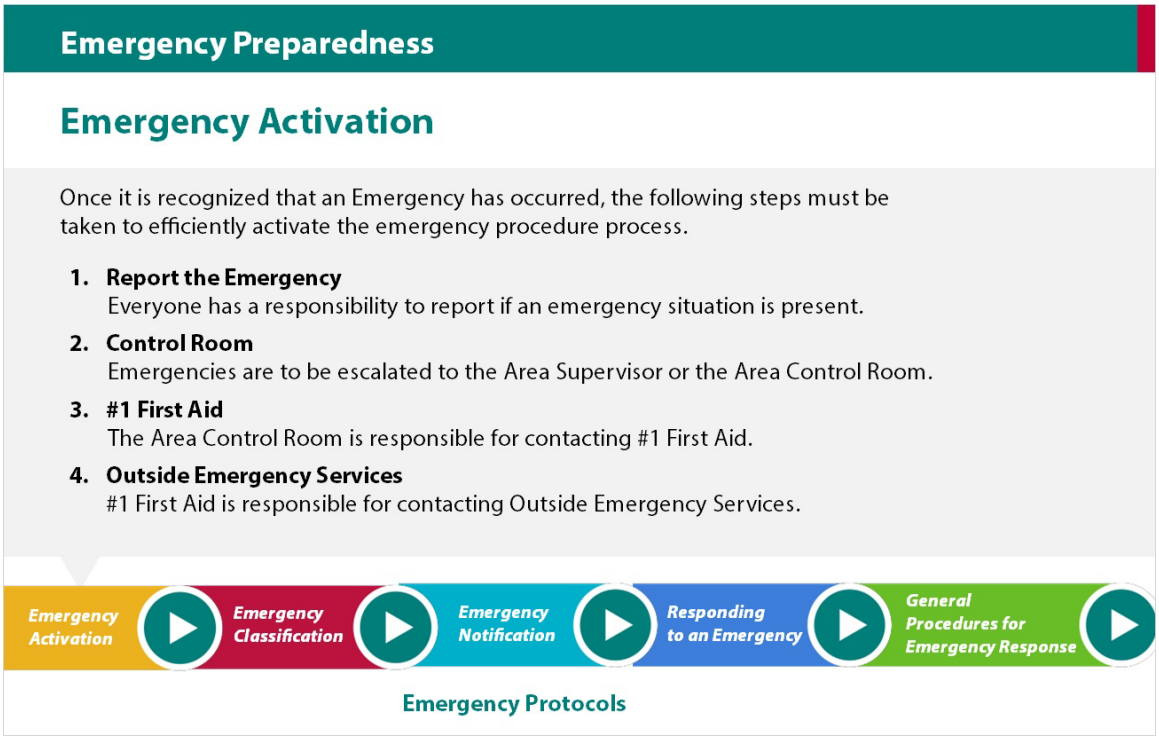

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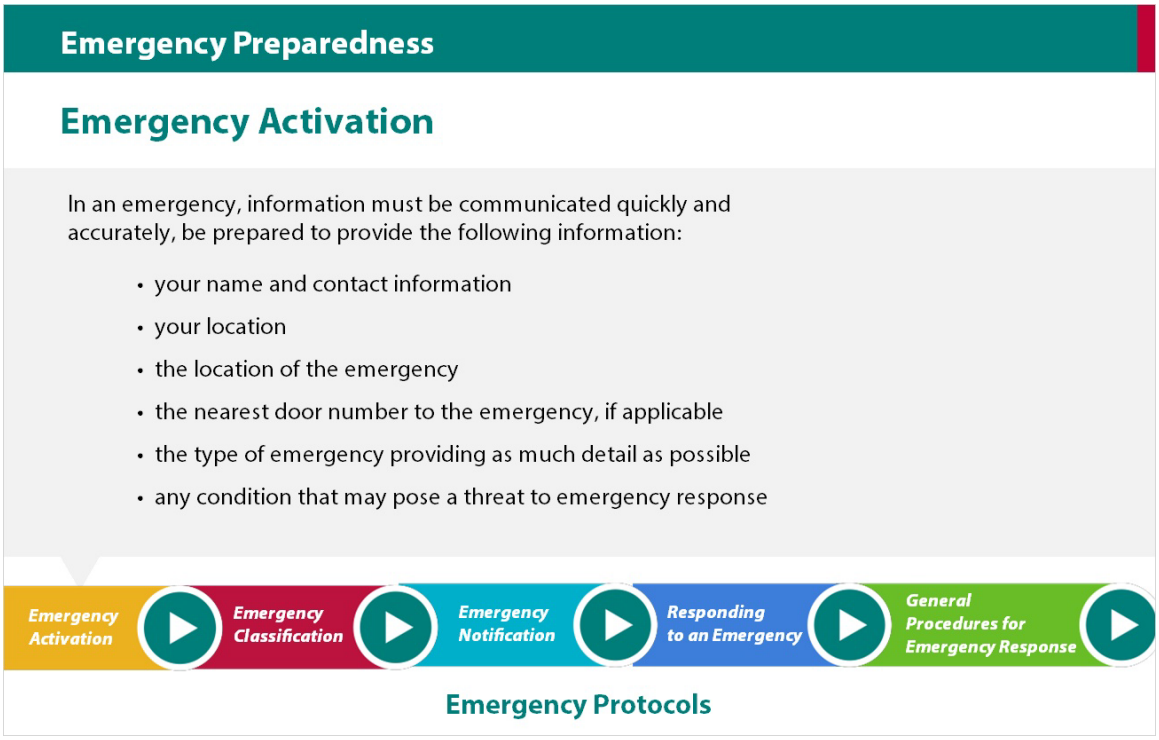

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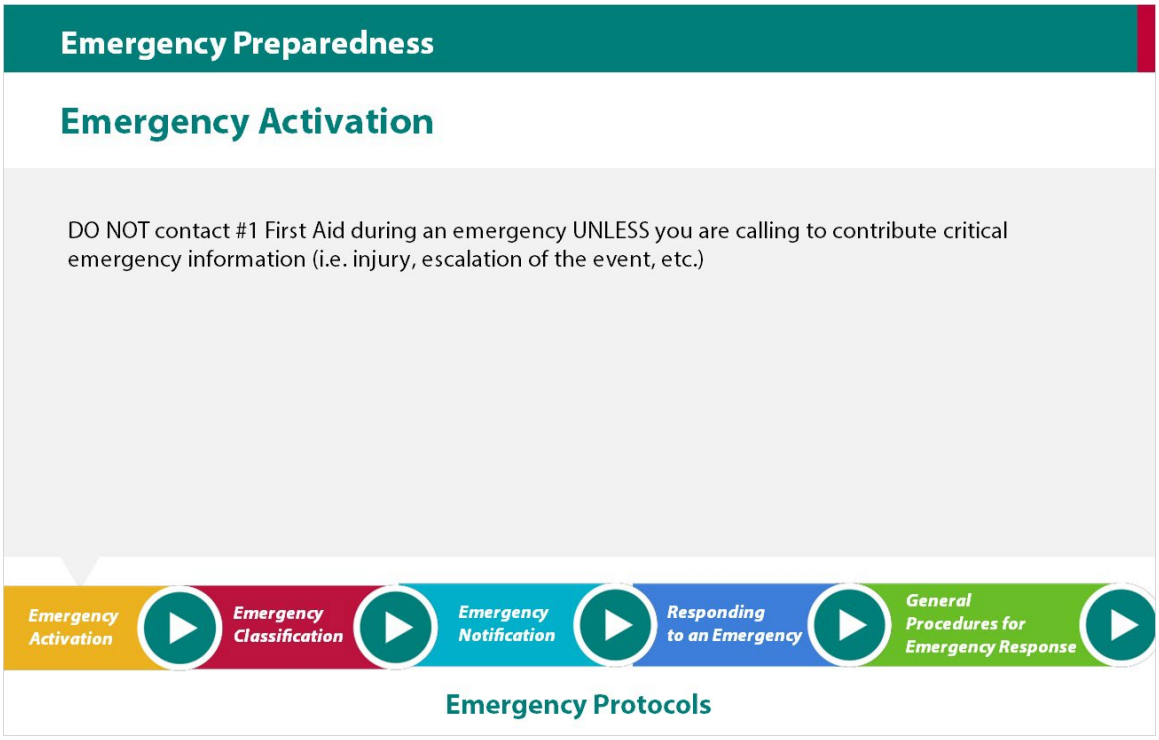

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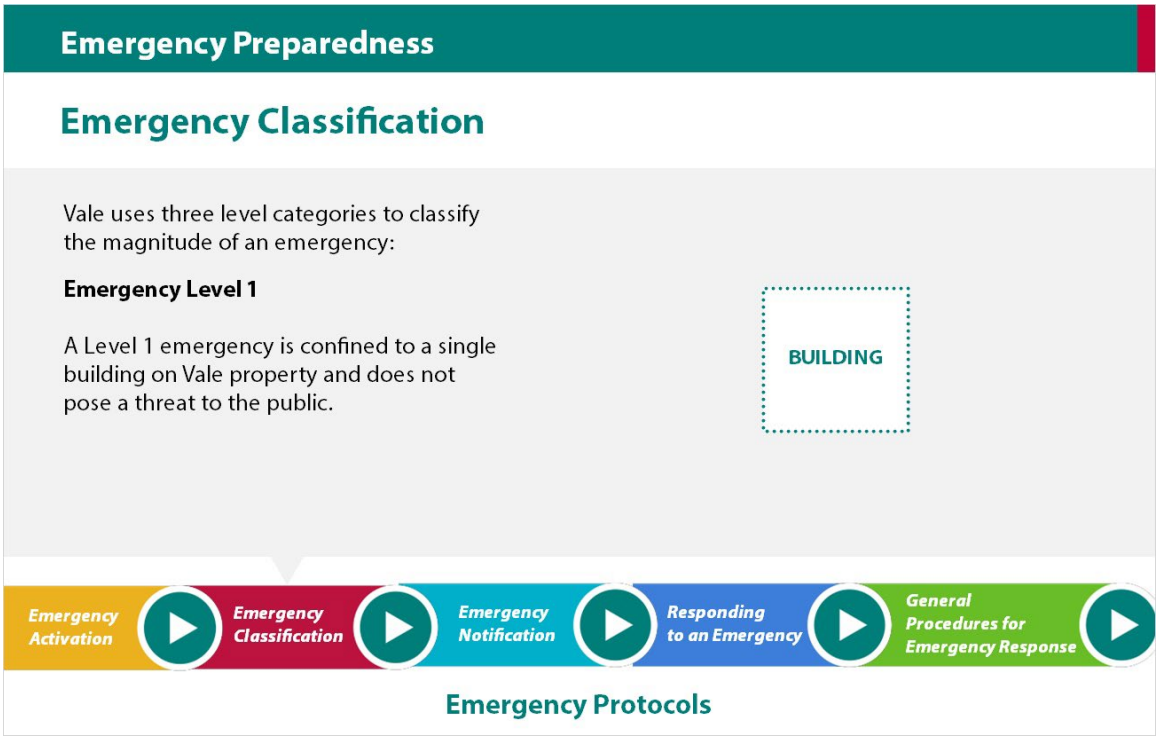

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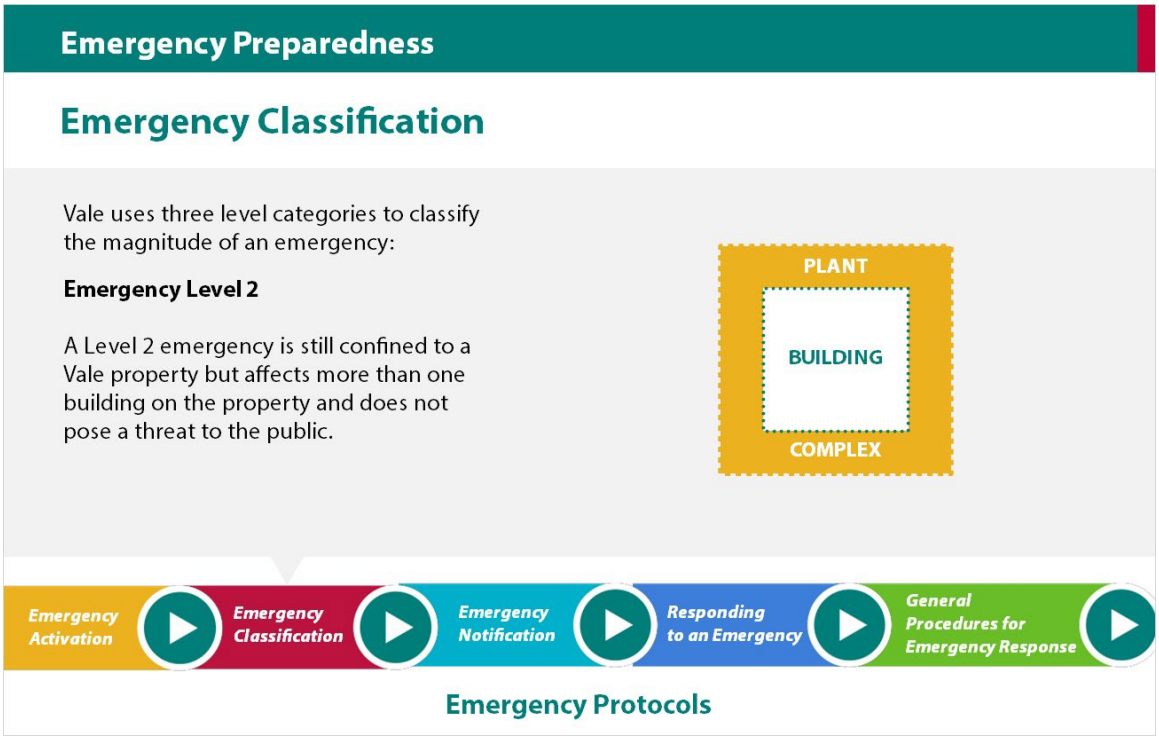

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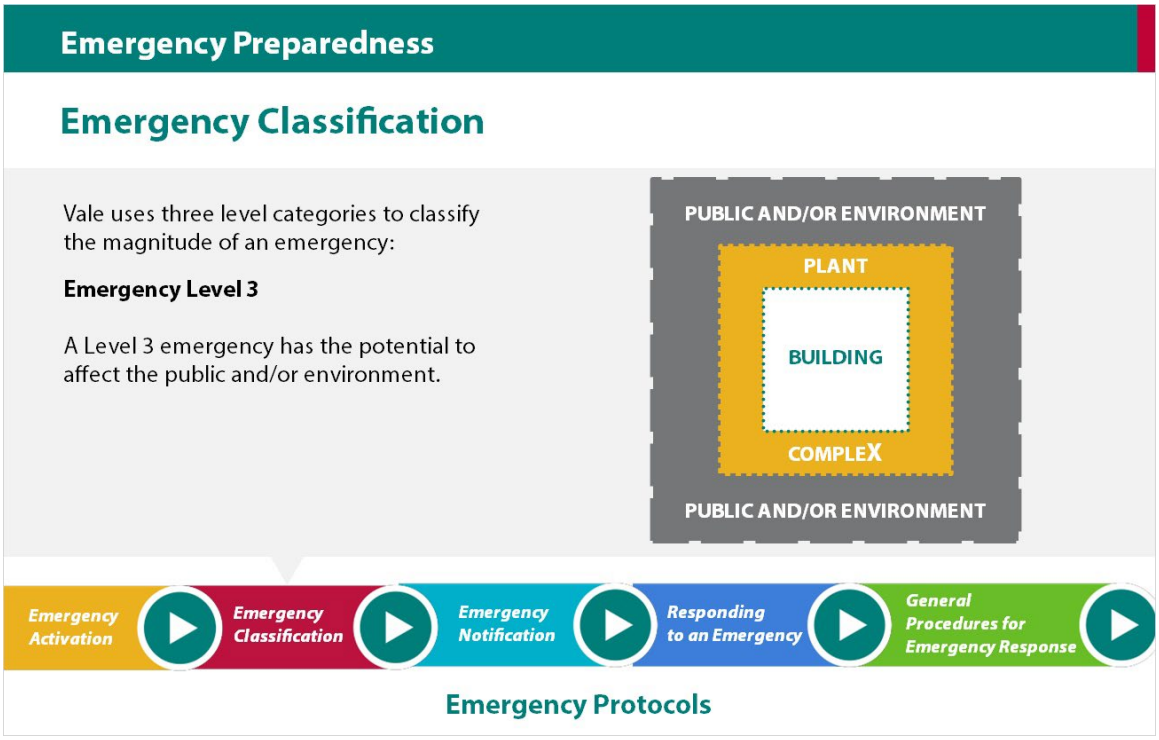

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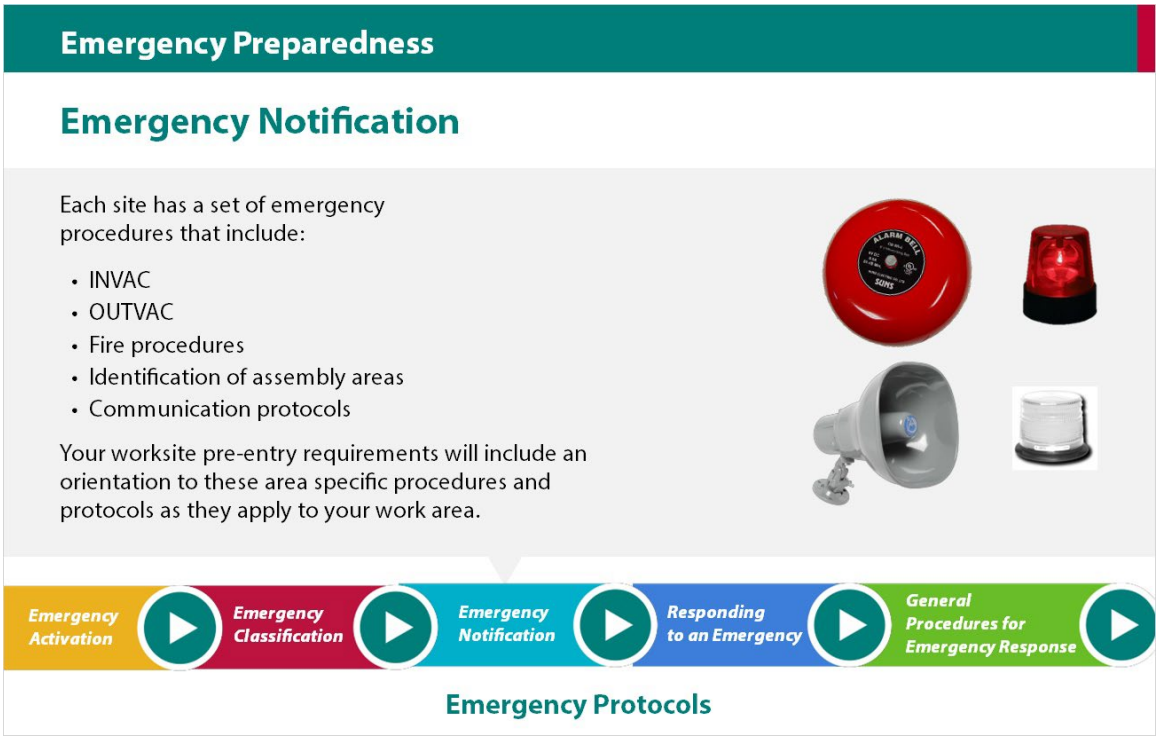

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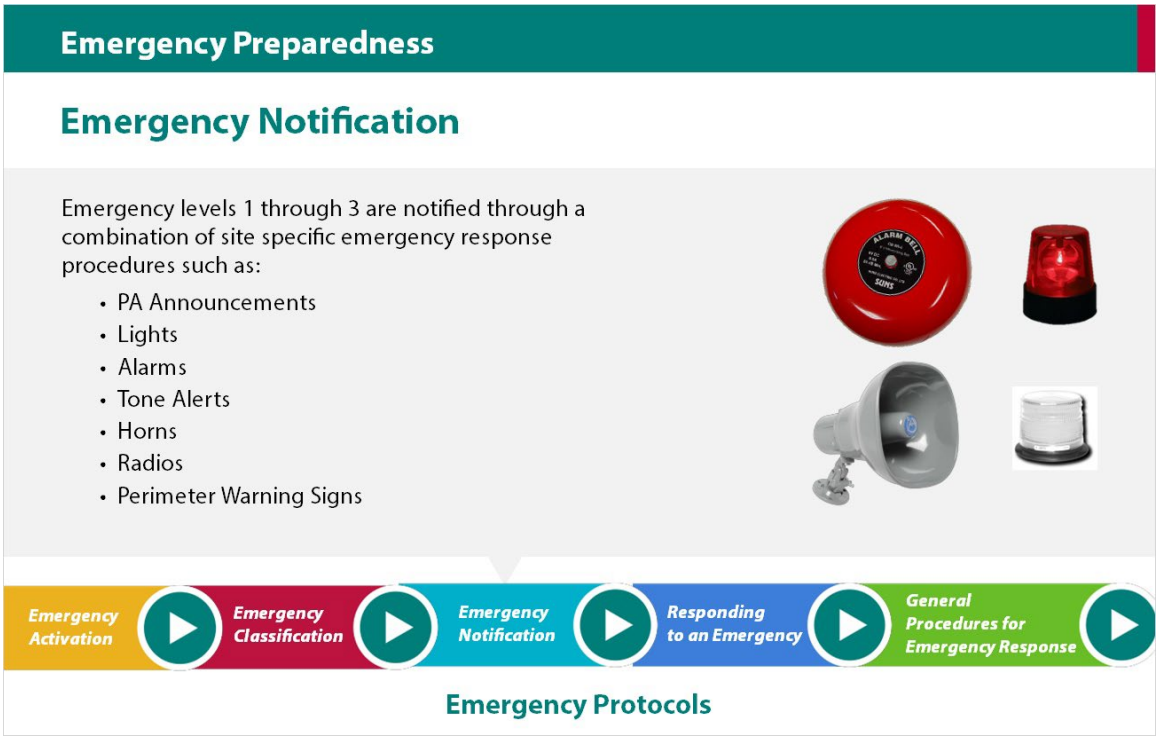

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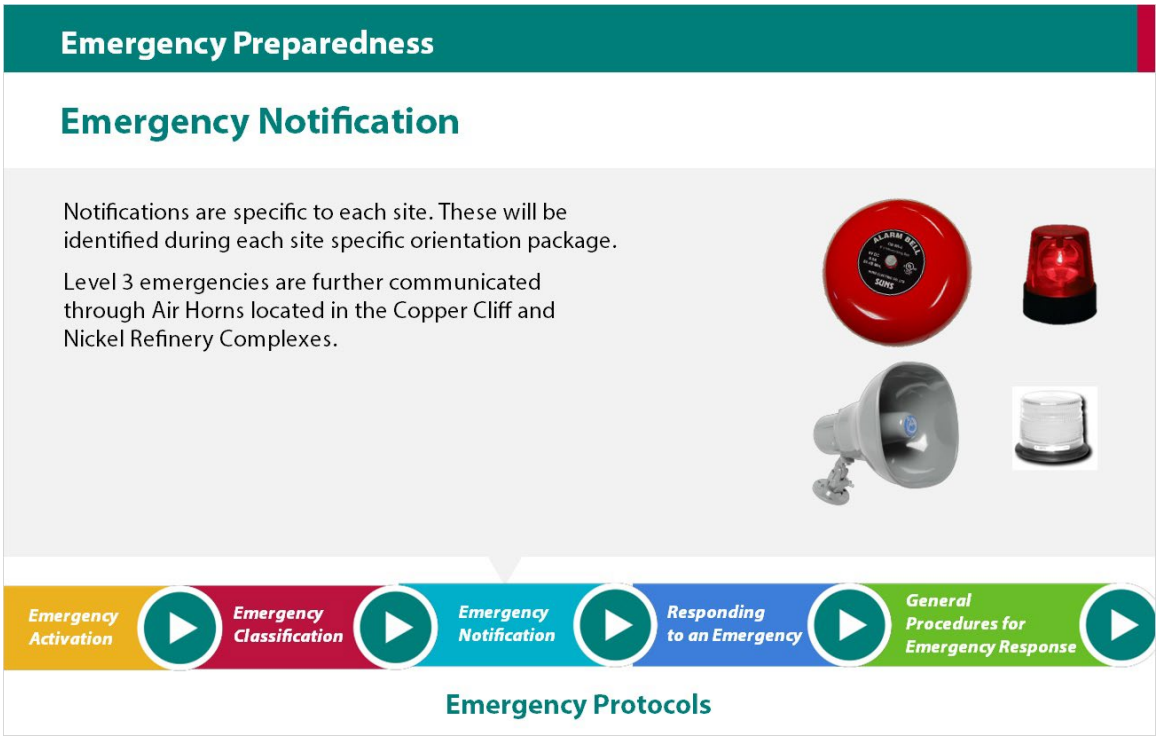

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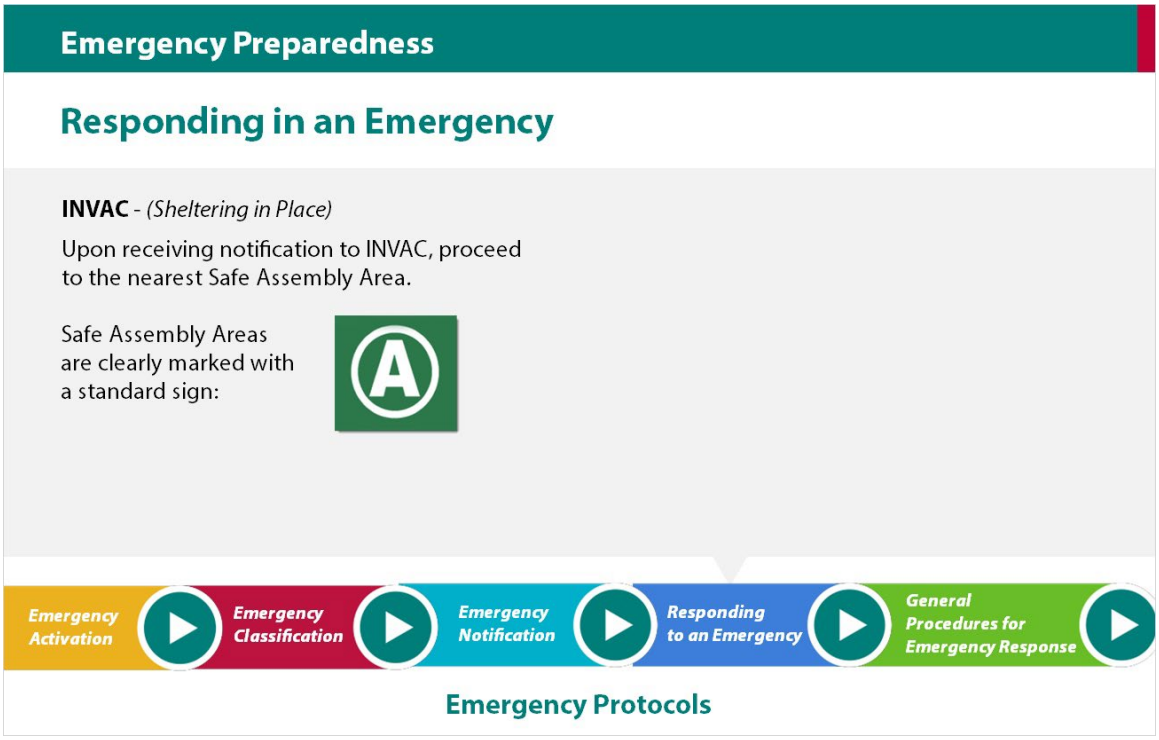

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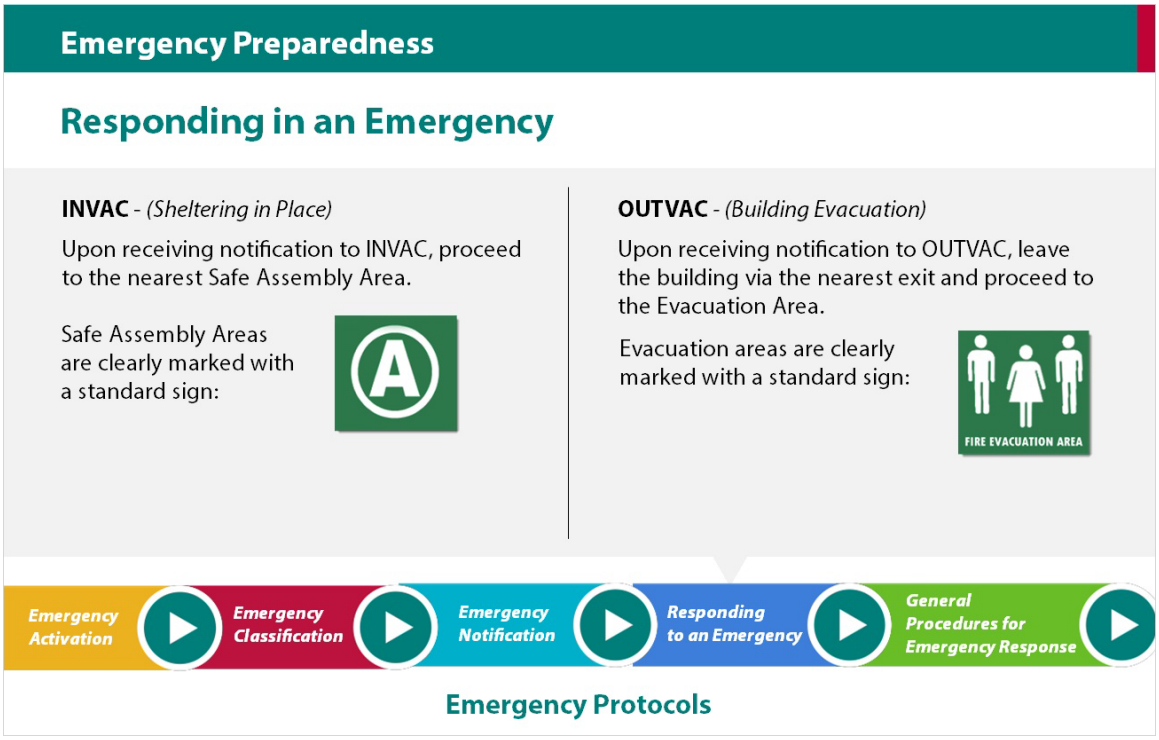

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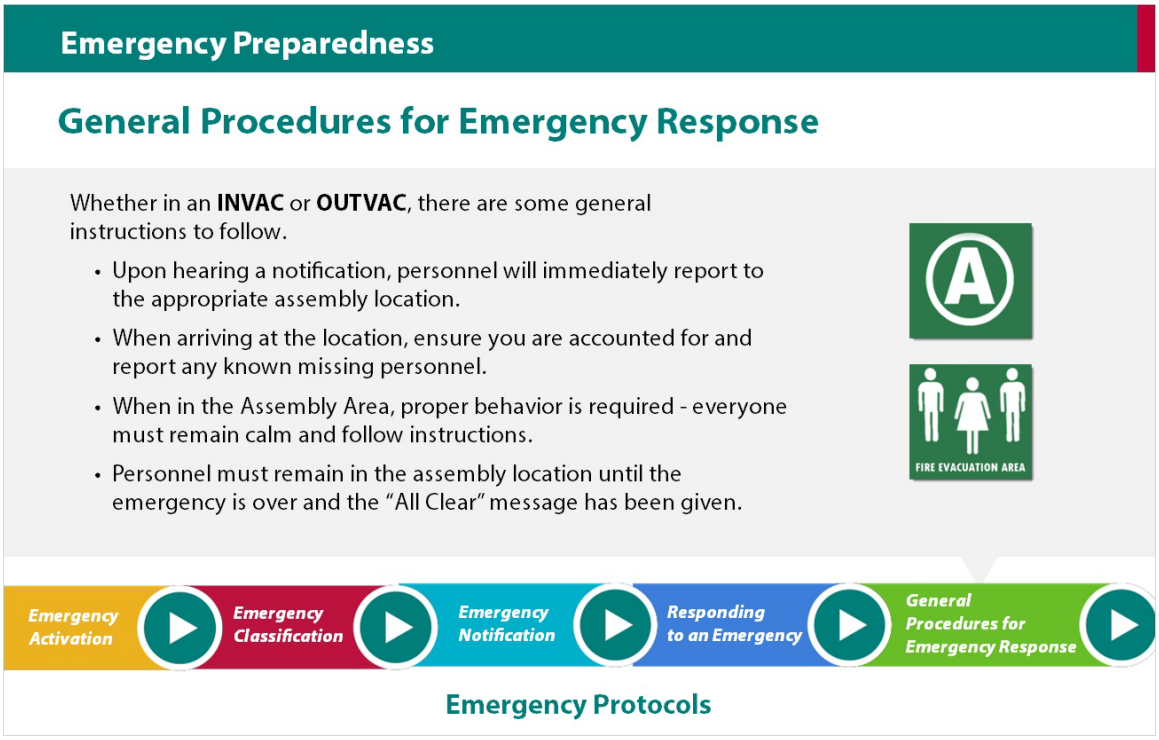
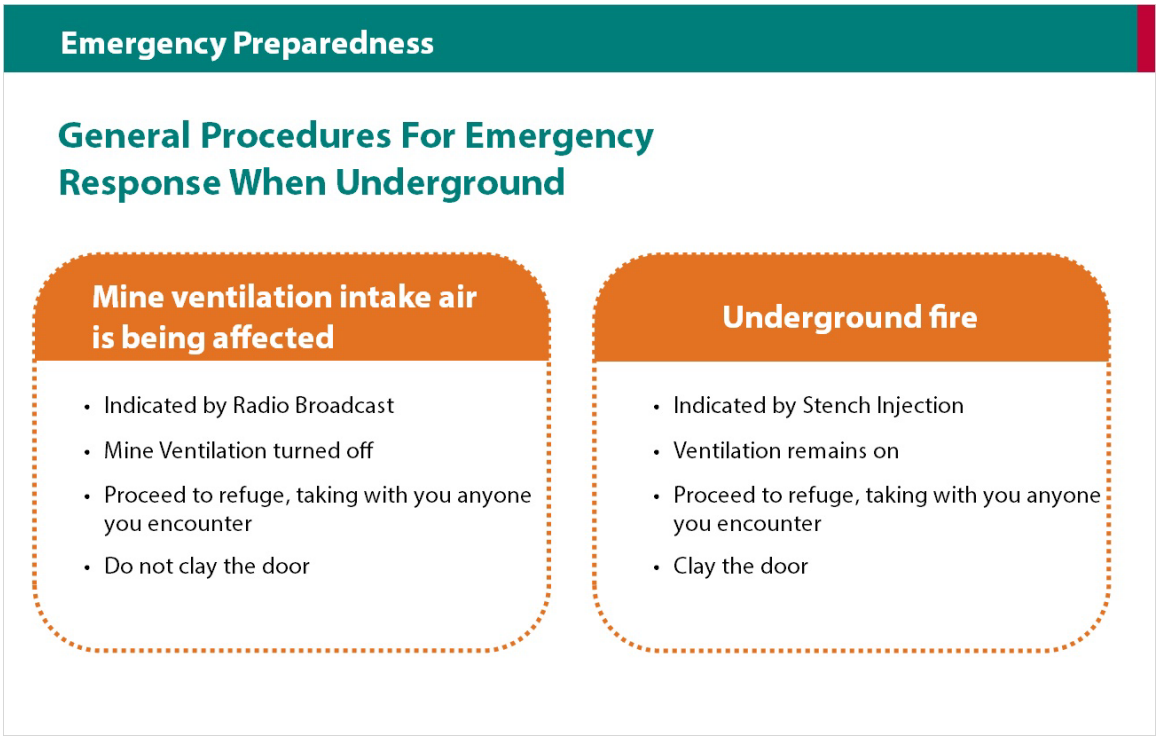


10.17 Emergency Preparedness

10.18 Emergency Preparedness



10.19 Emergency Preparedness

Emergency Preparedness

Underground when mine air intake affected

- Indicated by a broadcast on the radio that there's a Level 3 and for everybody to go to the nearest refuge station.
- The situation could be level 2, but will always be communicated as a Level 3.
- Ventilation is turned off throughout the mine.
- Proceed to the refuge station, taking with you anyone encountered and await further instructions.
- All work will cease underground until the All Clear is given.

Each Plants Tier 3 Orientation will include the site specific application of this procedure in accordance with their local Fire Procedure.

10.20 Emergency Preparedness

Emergency Preparedness

Underground when mine air intake affected

- Don't use the phone.
- Conserve food.
- Turn off cap lamps and radios (except for one) to conserve battery power.
- Ration water.
- Do NOT clay the door.
- The "All Clear" will be given when the situation is rectified and a hazard is no longer present.

This process is also to be followed whenever critical services are lost. Ie. Loss of power or water.

10.21 Emergency Preparedness

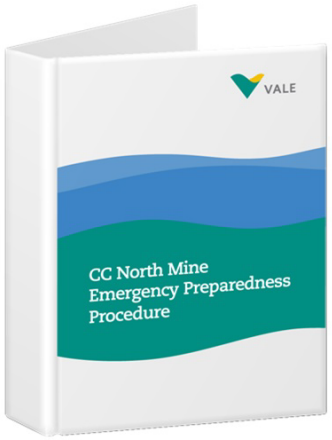
Emergency Preparedness

Underground in an Underground Fire

There are certain actions to be taken during a fire underground at any Vale mine in Sudbury.

We will cover the generic items in this section of Tier 2 Orientation.

You will be presented with specifics for the local Fire Procedure during the Tier 3 – Plant/Mine Specific Orientation Presentation.



10.22 Emergency Preparedness

Emergency Preparedness

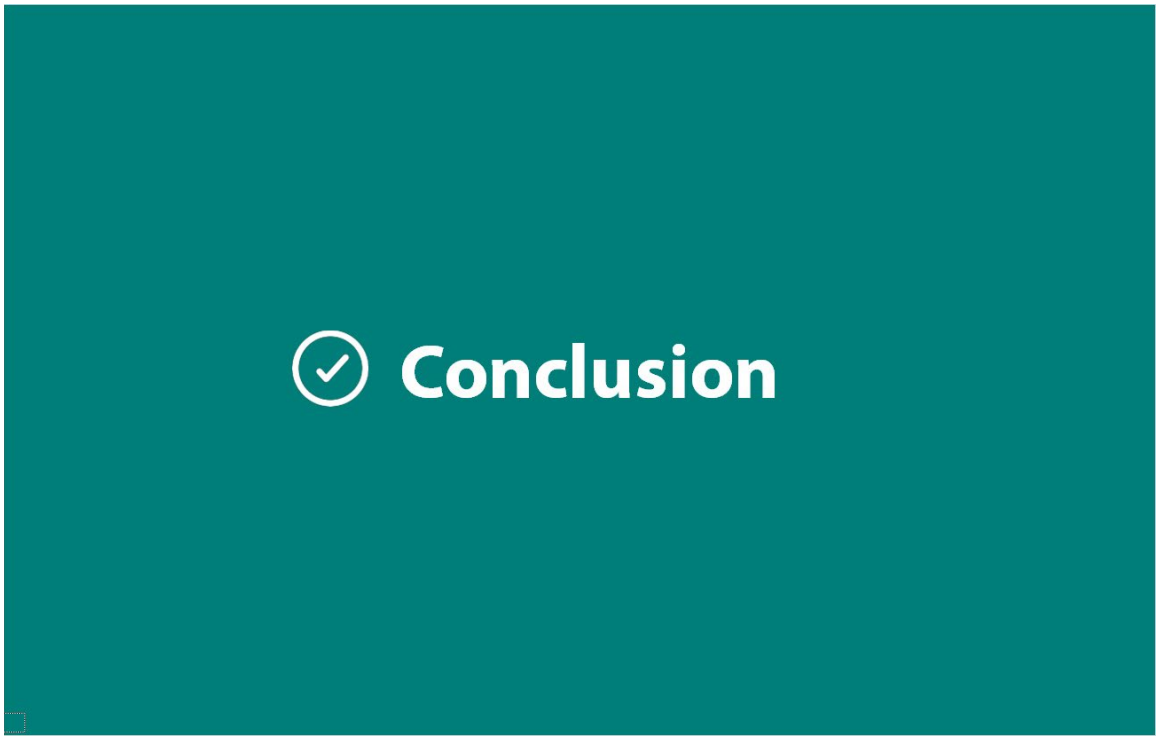
Underground in an Underground Fire

Follow these practices while in refuge station:

- Indicated by the smell of stench, may be accompanied by a radio broadcast that there is a fire underground and to report to the nearest refuge station.
- Ventilation to the mine remains **ON.**
- Normally ventilation doors are to be left in the position posted, however in a fire, you must leave ventilation doors in the position found.
- Proceed to the nearest refuge station, taking with you anyone encounter.
- One person in each refuge station will be designated to take charge of the following standard tasks:
    - Record all names of personnel in refuge.
    - Clay around the doors and any holes leading outside the refuge.
    - Open the air header (or the cascade system).
    - Report names to the surface recorder, once contacted.

11. Conclusion

11.1 Conclusion



11.2 Conclusion

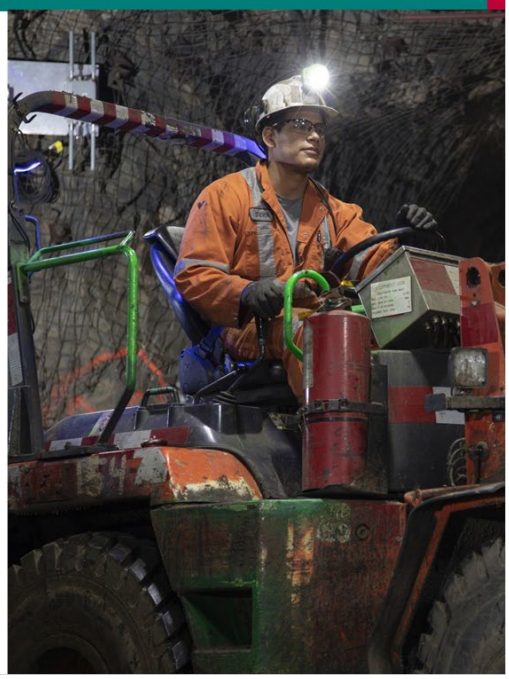
Conclusion

This concludes the material for Tier 2 Vale Mine Orientation.

You should now have a working knowledge and understanding of:

- The surface layout and boundaries
- The key access points and entry requirements
- The high level general hazards and controls with regard to:
    - Traffic plans
    - Occupational health
    - Process Hazards/Upsets
    - Emergency Preparedness

This module only serves as a prerequisite to a Tier 3 Plant Specific Orientation and is not an isolated module. You can request further training in Tier 3 as per instructions from your Vale Contact Person.



11.3 Conclusion