Hexagon Proximity Detection PDF

VALE

Hello, welcome to the Hexagon Proximity Detection training course. This course will enable the operator to apply and execute specific operations on this specific equipment.

You must obtain a minimum score of 70% on the evaluation.

Module Duration: About 20 minutes
VES ID: VB_1925
Revision Date: September- 03- 2024

- **Welcome**
- **Course Objectives**
- **About the Equipment**
- **Controlling the Equipment**
- **Safe Operating Procedures**

- Evidence of Good Operation
- Conclusion

Welcome

If you require a refresher on how to navigate online learning courses, please click to play the video below. Otherwise, you may continue with the course.

Upon completion of each section of this module, you will be given an opportunity to submit questions to obtain clarification of any content you are not sure of.

You will also be required to complete a brief survey designed to support continual improvement to your Vale learning experience.

Got a Question?

Submit your question here using Valeforms. Be sure to include your first name, last name, & contact information.

CLICK HERE!

CONTINUE

Course Objectives

00:14

Click play to begin the audio.

After completing this course, you will be able to:

- Identify the main features and components of the equipment
- Describe the indicators in each of the detection zones
- Describe the steps to charge the equipment
- Describe evidence of good operation

Complete the content above before moving on.

00:32

Click play to begin the audio.

Course Outline

The instructions and guidance contained within this course are comprehensive and follow safety standards which you will be required to observe on an ongoing basis.

It is recognized, however, that this course does not cover every circumstance that could arise, and for that reason, it is intended as a training aid only.

This course is to be used as training material and best practice reference. It does not replace detailed technical (equipment manufacturer's documentation) or legal documentation (Mines Acts). We recommend that you be familiar with the information contained in these documents.

Complete the content above before moving on.

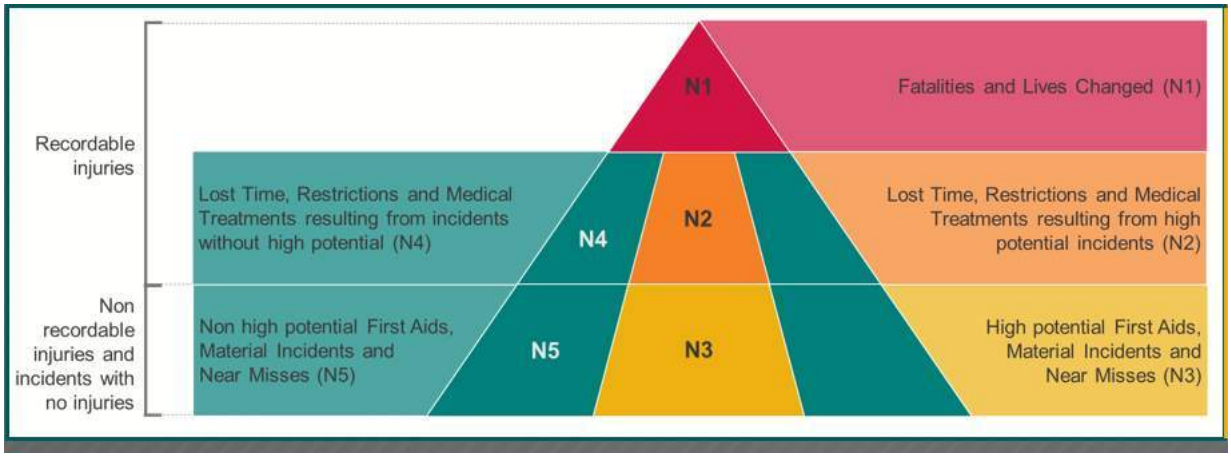
00:18

Click play to begin the audio.

Incident/Accident History

While the overall objective is to reduce or eliminate workplace hazards, it should be recognized that not all workplaces within Vale operations can be made free of all hazards.

Critical to safe operation is the ability to recognize and control hazards that may cause injuries, equipment damage, or even worse, fatalities.



Our injury and fatality index is updated monthly. It shows the numbers for Fatalities and Live Changed (N1), Recordable High-Potential Injuries (N2), Other High-Potential events (N3), Recordable Non-High Potential Injuries (N4), and Other Non-High Potential events (N5)

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CLICK HERE!

Complete the content above before moving on.

About the Equipment

00:05

Click play to begin the audio.

Objective

- **Identify the main features and components of the equipment**

Complete the content above before moving on.

00:49

Click play to begin the audio.

What It Is For

The Hexagon Mine Personal Alert is the first incident-avoidance device worn by field personnel that ensures visibility around vehicles and mobile equipment. Personal Alert is integrated with Hexagon Mining's Collision Avoidance System (CAS) for a comprehensive warning solution.

The CAS enhances the visibility of personnel, vehicles, and equipment in dangerous situations, reducing incidents by alerting about the presence of anyone working around vehicles and mobile equipment in the CAS display.

Position, heading, and path are calculated using the CAS in the vehicle, which together with Personal Alert, accurately determines one or multiple surrounding pedestrian tag distances from the equipment. This distance is then compared to the configured detection zones to alert vehicle operators and pedestrians in case of imminent risk.

Pedestrian Tag

CAS 10 In-cab Display

Complete the content above before moving on.

00:43

Click play to begin the audio.

What the System Does

Hexagon's CAS System provides vehicle operators with audible alerts and a visual display of vehicles and pedestrians within set proximity limits. It is similar to the JAWS proximity detection system used on underground vehicles. The system:

- Provides operator with audio alerts when vehicles or pedestrians exceed set proximity limits.
- Displays position of vehicles and pedestrians for the operator.
- Records alerts on a log in the display unit.
- Uploads alert logs to a central server for analysis of traffic patterns and interactions.

What the System Does Not Do

- The CAS does not provide any automatic intervention inputs such as braking.
- It is not a people tracking system.
- It does not record any audio or video (there is no camera in the unit.)

Complete the content above before moving on.

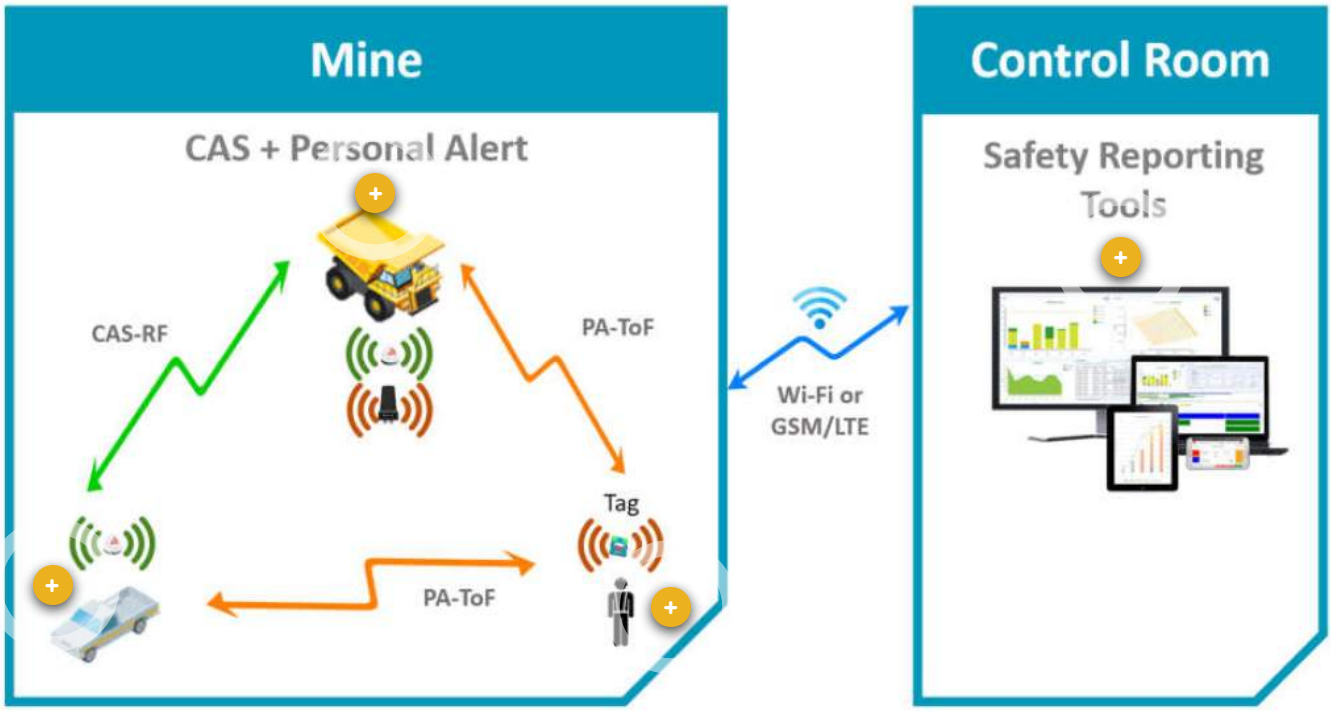
How the Pedestrian Person Alert System Works

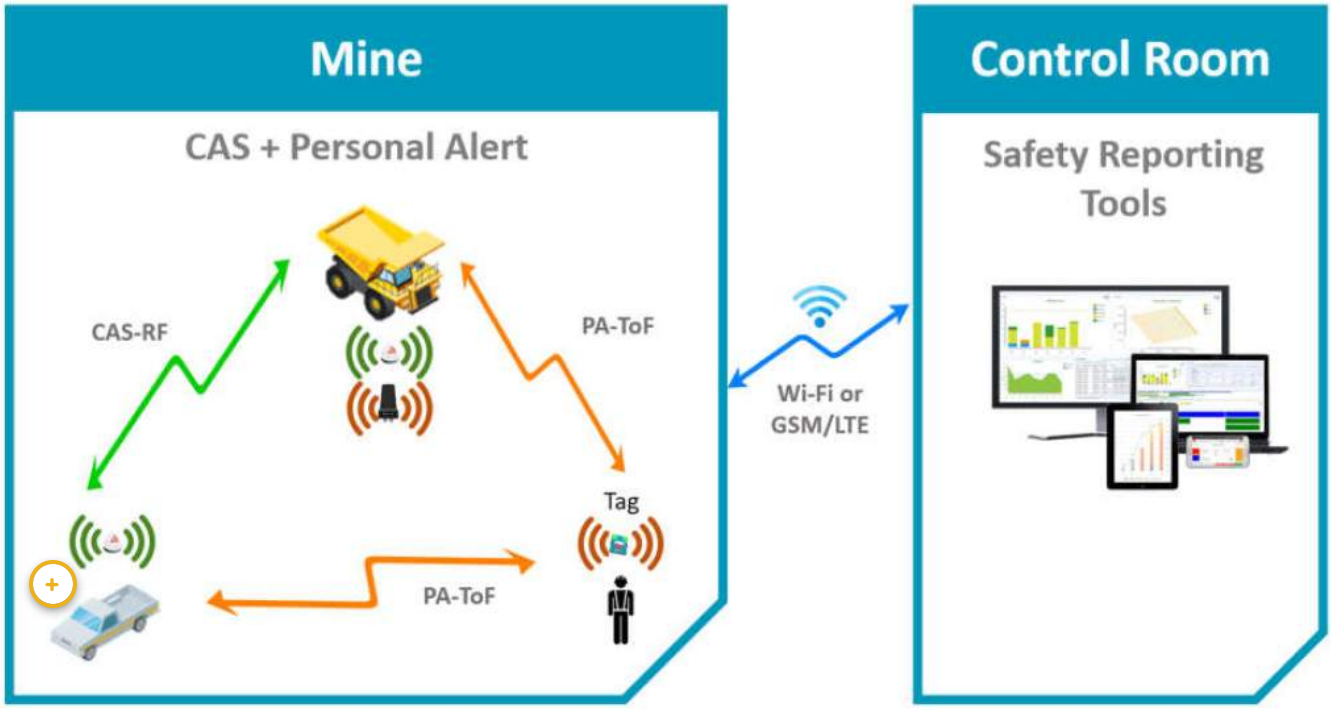
Click play to watch the video below.

Complete the content above before moving on.

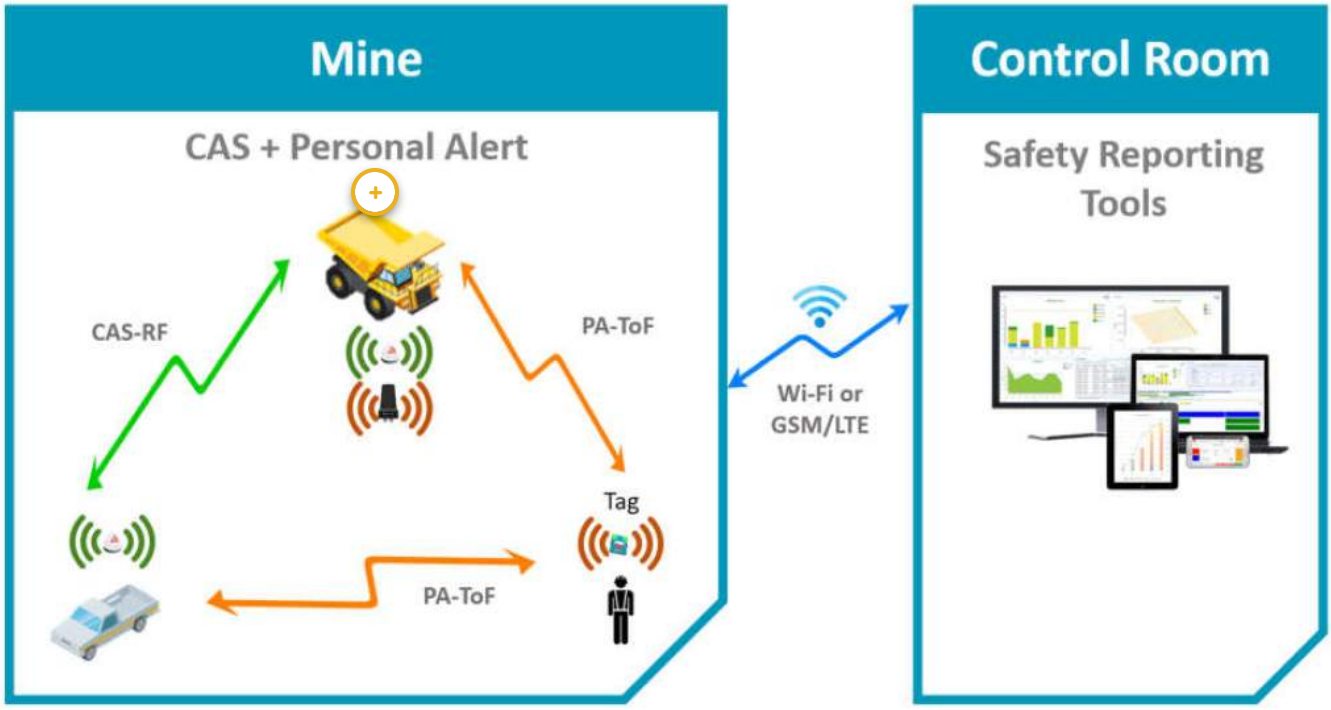
Components

Click on the markers below to learn more:

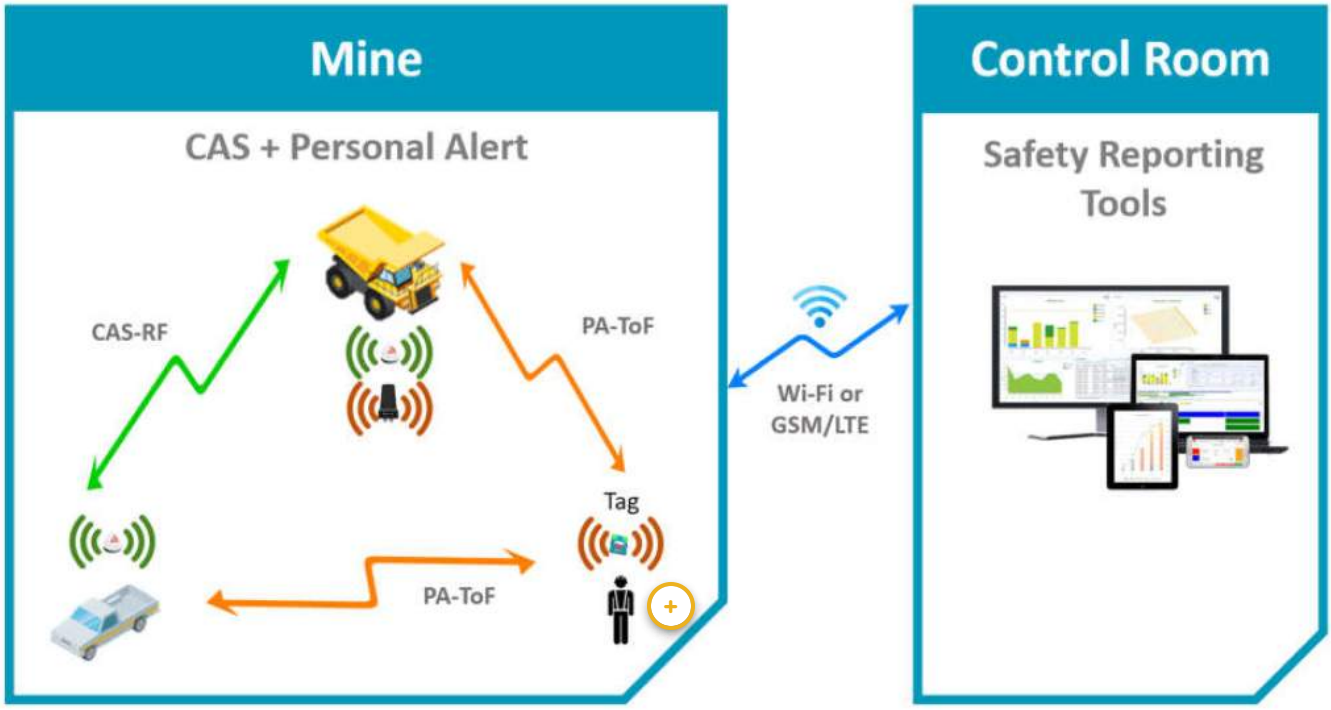




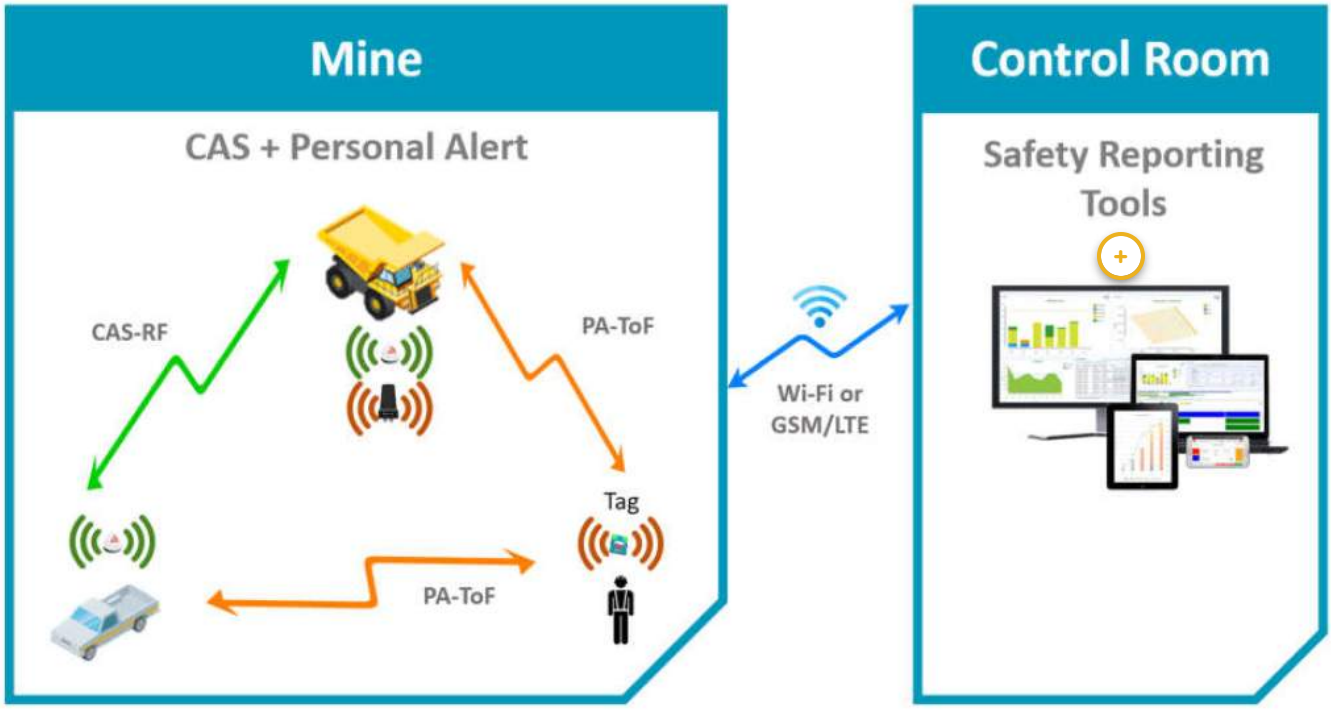
Collision Avoidance System (CAS)



Vehicle: LED Display and Anchor Points



Pedestrian Tags



Reporting Tools

Complete the content above before moving on.

Question

Which of the following does the system do? *Select all that apply.*

- [ ] Provides audio alerts when vehicle or pedestrian exceeds

proximity limits

- [ ] Stop the vehicle
- [ ] Displays position of vehicle and pedestrians for operator
- [ ] Track people
- [ ] Records alerts on a log
- [ ] Record audio and video
- [ ] Uploads alert logs to server

SUBMIT

Got a Question?

Submit your question here using Valeforms. Be sure to include your first name, last name, & contact information.

CLICK HERE!

Complete the content above before moving on.

Controlling the Equipment

00:06

Click play to begin the audio.

Objective

- **Describe the indicators in each of the detection zones**

Complete the content above before moving on.

00:53

Click play to begin the audio.

Detection Zones

The detection zones are configurable distances around the Vehicle Anchors. When a pedestrian tag is detected by a vehicle anchor in the immediate proximity of the vehicle, it processes the location of the Pedestrian Tag and its distance relative to the Vehicle Anchor. The Personal Alert system will react differently providing visual, audible, and vibratory alerts to vehicle operators and pedestrians.

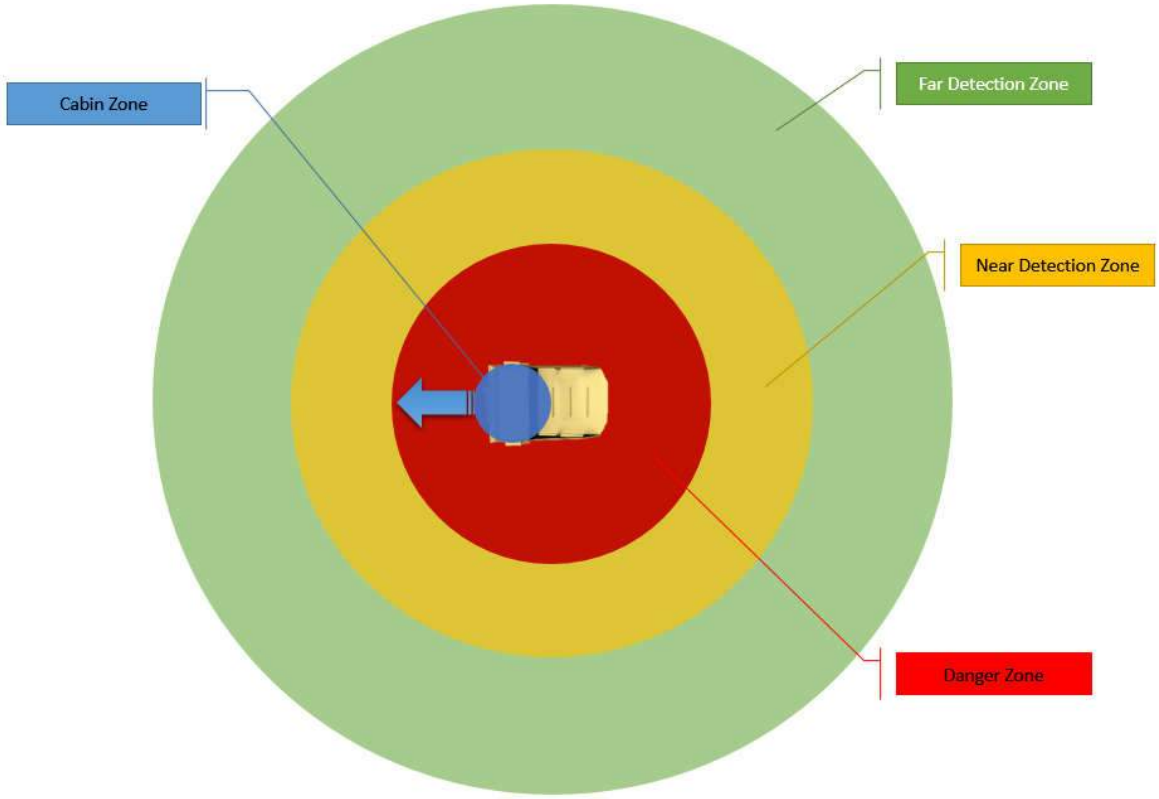
The four detection zones are:

1. **Cabin Zone:** determines if a person with a Pedestrian Tag is within the cabin of the vehicle. This prevents unwanted alarms for drivers and other vehicles.

2. **Close Zone (Danger Zone):** determines if a person is within the danger zone and will escalate to the highest priority awareness and alarms.

3. **Near Zone:** determines if a person is in a medium danger distance to the vehicle.

4. **Far Zone:** determines if a person is in the proximity of the vehicle but does not represent an immediate threat.



Click image to zoom

Detection Zone	Vehicle Alerts	Pedestrian Tag Alerts
Cabin Zone	None	None
Close/Danger Zone	Visual awareness + Audible alarm + Red display background	Visual awareness + Audible alarm + Vibration
Near Zone	Visual awareness (CAS 10 Traffic Awareness distance scale applies)	Visual awareness
Far Zone	Visual awareness (CAS 10 Traffic Awareness distance scale applies)	Visual awareness

Complete the content above before moving on.

00:11

Click play to begin the audio.

Vehicle Alerts on the Display

Several colors and sounds indicate different threat levels to the vehicle operator. The center compass displays direction and distance of personnel within the detection zones as explained below:

Far Zone

The display shows yellow for the Far Zone, indicates the location of the person on the graph, and displays how far away the person is in relation to the vehicle.

Near Zone

The display shows orange for the Near Zone, indicates the location of the person on the graph, and displays how far away the person is in relation to the vehicle.

Close/Danger Zone

The display shows a red background for the Close/Danger Zone, indicates the location of the person on the graph, and displays how far away the person is in relation to the vehicle.
If the vehicle movement is not standstill or parked, an audible alarm is also generated.

*The audible alarm will also be dependent on the direction of movement of the vehicle. For example, if there is a person detected by the rear Vehicle Anchor and the vehicle is moving forward, no audible alarm is raised.

Complete the content above before moving on.

Pedestrian Alerts on the Personal Alert System

Several colors and sounds indicate different threat levels to the pedestrian as explained below:

Far Zone

A green alternating left/right light blinks every 0.5 seconds when in the far zone.

Near Zone

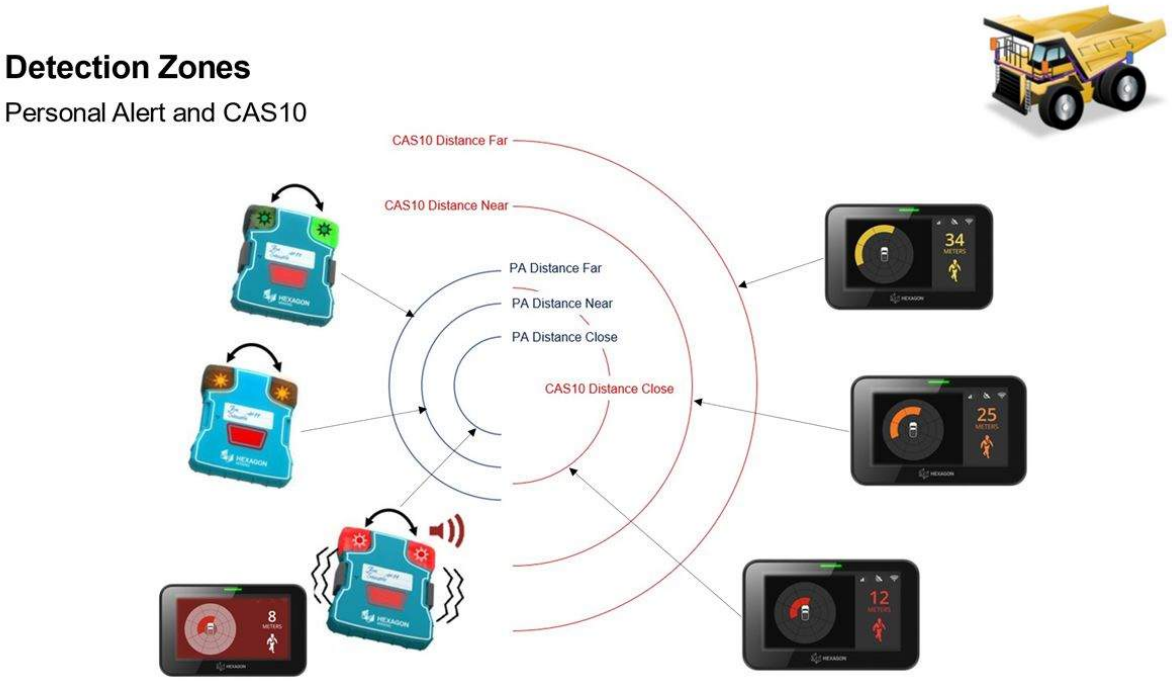
An amber alternating left/right light blinks every 0.15 seconds when in the near zone.

Close/Danger Zone

A red alternating left/right light blinks every 0.25 seconds, while also buzzing and vibrating at a high frequency when in the close/danger zone.

Alerts on Both Systems

Let's now look at the two systems together to see how each system responds relative to one another.



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01:00

Click play to begin the audio.

Acknowledge Button

Personnel wearing Pedestrian Tags can silence the tag's alerting threats. This does not acknowledge all other vehicle alarms, only the sound and vibratory alarms from the current

situation once the button is pressed. There will be another alarm if a second vehicle approaches, even if alerts with the first vehicle have already been silenced.

To acknowledge alarms on a pedestrian tag, press the center button only once. All current vehicles, at their current ranges, will be acknowledged and sounds and vibrating alarms will be silenced.

If a vehicle moves to a closer zone and the highest risk range, the pedestrian tag will rearm the sound and vibrating alarms again, for the vehicle at its close range. Only increasing the risk (e.g. going from near to close) will rearm the alarms. Vehicles moving further away (e.g. going from close to near) should not cause the sound and vibratory alarm to be rearmed. If a vehicle moves out of range of the detection zones, it is forgotten by the tag's acknowledge function, so that if it reappears, it will cause a new alert.

Complete the content above before moving on.

Match the color of the blinking lights of the Pedestrian Tags to the detection zone.

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Complete the content above before moving on.

Safe Operating Procedures

00:04

Click play to begin the audio.

Objective

- **Describe the steps to charge the equipment**

Complete the content above before moving on.

00:45

Click play to begin the audio.

Battery Charge Level

Every 30 seconds, the pedestrian tag LEDs show a heartbeat signal. This is a short simultaneous blink on both LEDs, and only shows up when no other threat is around. The color changes based on the battery charge level:

- **Green:** sufficiently charged
- **Amber:** medium charge, approximately 3 hours of battery life left
- **Red:** low charge, approximately 1 hour of battery life left
- **Constant Red:** battery charge depleted, tag is no longer operational, recharge now

To check the battery charge level at any time, double-click the Acknowledge Button. The Pedestrian Tag will show the battery power status as a short simultaneous blink on both LEDs.

Complete the content above before moving on.

00:25

Click play to begin the audio.

Battery Duration

Pedestrian Tags have a 1000mAh nominal capacity of the battery. This allows for at least a 12-hour shift at 20◦ C. When operating below 0° C, you remove 20% of battery life, so the battery will have approximately 10 hrs of

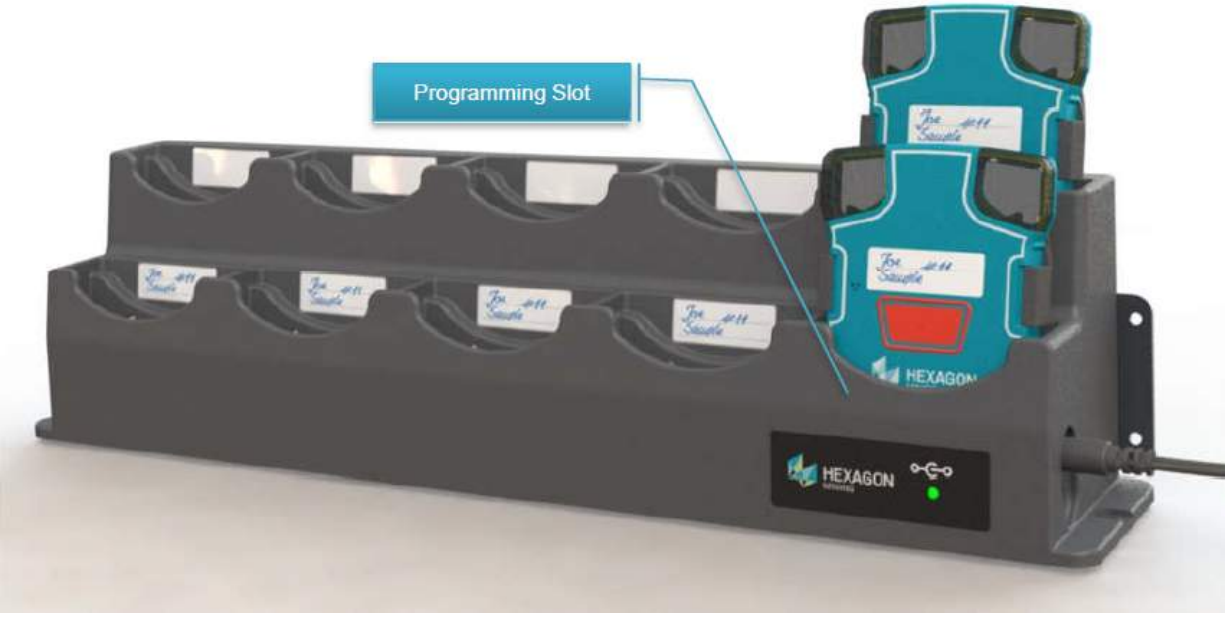
life. This number also depends on how many times the Tag is in range of anchors. The more interactions and vibration alerts from the Tag, the faster the battery is depleted.

Complete the content above before moving on.

00:30

Click play to begin the audio.

Charging



The Pedestrian Tags Gang Charger QT365 device provides battery charging capabilities for up to ten Pedestrian tags simultaneously and provides one special slot for updating the Pedestrian Tag Firmware. The charging station has an LED that lights up green, showing that the charger is successfully connected to the power adapter when it is plugged in.

Place the pedestrian tag into a charging slot to charge it. While charging, the LEDs change color to represent the charging status:

Battery Charging

The right LED blinks blue every 2 seconds.

Battery Not Charging

The right LED blinks red every 2 seconds.

Fast Charge

The right LED blinks blue every 0.5 seconds.

Battery Fully Charged

The right LED is green and constantly on.

Battery OK

The left LED is green and constantly on.

Battery End-of-Life

The left LED is red and constantly on.

Complete the content above before moving on.

00:18

Click play to begin the audio.

Battery Charging & Replacement

It takes approximately 4 hours to completely charge the Pedestrian Tag. The battery on the Tag can be replaced as needed and is suggested to be replaced after 1000+ charges. There is a charge counter that can be accessed via the PA Tool when Tags are connected to the programming slot on the gang charger.

Complete the content above before moving on.

The Pedestrian Tag LED is blinking red. What does this mean?

- Medium charge, approximately 3 hours of battery life left
- Low charge, approximately 1 hour of battery life left
- Battery charge depleted, tag is no longer operational, recharge now

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Complete the content above before moving on.

Lesson 6 of 7

Evidence of Good Operation

00:05

Click play to begin the audio.

Objective

- Describe evidence of good operation

Complete the content above before moving on.

00:53

Click play to begin the audio.

Evidence of Good Operation

The equipment is operating well if:

- All components are in place and functional.
- The flashing indicators blink approximately every 30 seconds with the battery charge level.
- The gang charger has an LED that lights up green, showing that the charger is successfully connected to the power adapter when it is plugged in.
- The CAS display in the vehicle cab correctly displays the direction of other equipped vehicles or pedestrians within the detection zone(s).
- The Pedestrian Tag and CAS System audibly alarm when the Close Zone is triggered.
- All LEDs on the Pedestrian Tag and lights on the CAS Display are functional.
- The Pedestrian Tag battery life lasts as expected during the shift.
- The Pedestrian Tags are not damaged or deformed due to rough service.

Reminder: Tampering with safety systems is unacceptable. Any modifications, removal, or alterations in any way to this equipment is strictly prohibited.

Got a Question?

Submit your question here using Valeforms. Be sure to include your first name, last name, & contact information.

CLICK HERE!

Complete the content above before moving on.

Conclusion

00:18

Click play to begin the audio.

You should now be able to:

- Identify the main features and components of the equipment
- Describe the indicators in each of the detection zones
- Describe the steps to charge the equipment
- Describe evidence of good operation

If needed, you can review any part of this course again to gain a better understanding of these tasks.

Online Training Survey

Submit your evaluation here using Valeforms.

All submissions are anonymous. Thank you.

CLICK HERE!