



NEW HOPE
GROUP

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QRC Presentation - Vehicle Interaction Working Group

Proximity Detection System Implementation and Operation



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Background

The Journey

Facts

- Vehicle incidents have resulted in multiple industry fatalities
- Vehicle interaction is recognised within New Hope Group operations as a 'Principle Hazard'.
- Proximity detection has been recognised by the Queensland Coal Mining Regulator as a key tool in managing and improving vehicle interactions on mine sites

Previous industry perception was that Proximity Detection/Collision Avoidance was on a path that may have resulted in the technology being regulated.

New Hope Group identified value and opportunity in proximity detection technology and decided to evaluate potential options with a view to guiding and proactively managing the outcomes.

Industry and potential suppliers were canvassed to identify available technology



Assessment

Justification / Limitations

In assessing the benefits and possible implications of proximity detection, several key considerations were defined;

1. Proximity detection systems would not be considered a 'Safety Critical' device (Mgmt did not wish to create the stigma that Proximity detection would eliminate vehicle collision)
2. Operator interface and Operability
3. Reliability and Maintainability
4. Data capabilities (capacity & storage)



A vehicle equipped with the SAFEmine System must be operated in the same safe manner as if the SAFEmine System were not installed. The system is not a substitute for normal safe driving procedures and may never be relied upon.

The SAFEmine System will provide no warning for some hazards, such as vehicles, obstacles, and other objects not equipped with properly operating SAFEmine devices.

SAFEmine products are intended as an additional tool in determining potential traffic threats, supporting an alert and conscientious driver. SAFEmine products are never to be used in any application where failure of the products could result in personal injury or material damage. Before using, the latest versions of the respective manuals are to be consulted for familiarization with product operation and limitations.

It was proposed that the project would incorporate the installation of proximity detection technology in all self powered vehicles, and that all visitor vehicles that accessed designated mine areas would be either fitted with the system or only travel under escort.

Implementation

Implementation Priorities

Implementation was undertaken in a staged approach. Stages were based on identified potential risk based on vehicle speed and interaction. Stages were identified as 'priorities' and are detailed below;

Priority 1 vehicles included were recognised as vehicles operating with high interactions and included;

Cat 785 Off-Highway Trucks

Service Trucks

Water Trucks

Mining, workshop and field working light vehicles

Priority 2 vehicles included all the other rubber tyred equipment on site.

Priority 3 proposed to include slower moving equipment on site such as Dozers and Excavators,

Priority 4 was identified as including cranes, bobcats, forklifts, EWP's and non working light vehicles. During implementation, it was identified that the risk profile in 'normal' operation within the confines of the industrial area did not support the associated cost and maintenance of a 'fixed' unit. Units are fitted with 'temporary'/'contractor units' as they enter designated areas of the mine site

Initial 'Priority 1' implementation was also utilised to validate reliability/system functionality and develop the control points and software in an operational environment over a longer term (validating system durability prior to progressing to 'Priority 2' equipment).

Functional Scope of Supply specifications for all new equipment purchases now include compatible proximity detection systems at point of purchase.

Operation

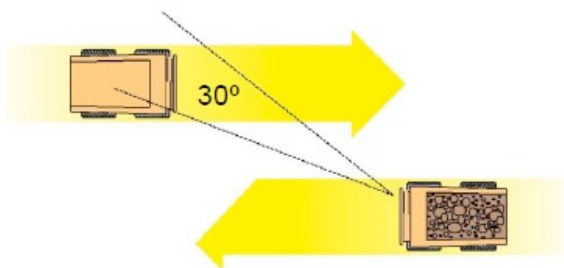
System Operation

SAFEmine is a GPS based 360° proximity detection system for vehicles.

Utilising GPS and RF technology it provides the operators of vehicles equipped with SAFEmine technology with additional awareness of vehicles within their proximity by utilising LED indicators and alarms

STATUS LED INDICATORS

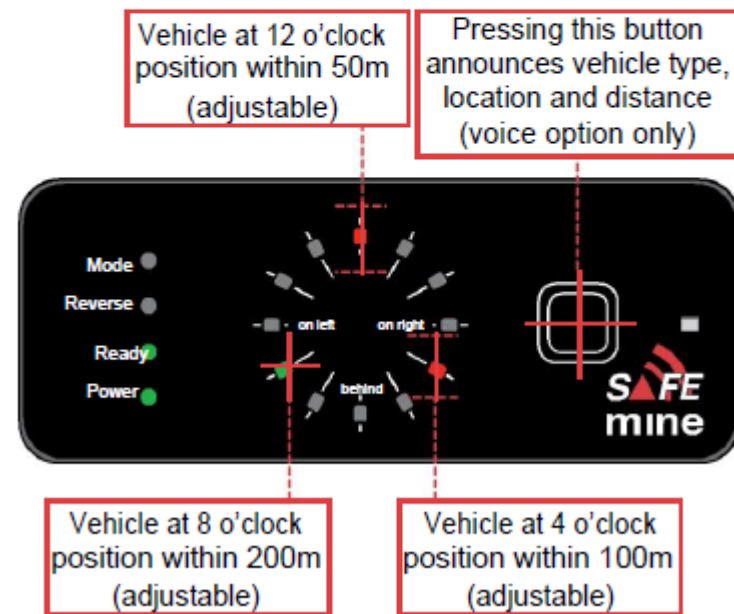
Mode	● Not used
Reverse	● Forward ● Reverse ● Direction unknown
Ready	● Unit operational ● GPS reception poor (proceed with caution) ● No GPS reception ● Unit indoors or faulty
Power	● Power supply fault ● Normal ● No power/o



COMPASS LED INDICATORS

The compass LED indicators show a specific pattern depending on the vehicle's proximity to another vehicle/ object or if there is a problem with the system.

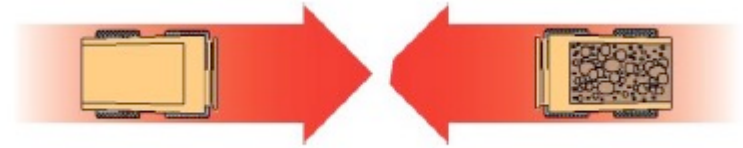
Awareness alert



Type	LED	Sound
1	Green steady	-
2	Red steady	-
3	Red flashing	-
4	Red flashing	buzz

Operation

Operational Learnings and Maturation



The focus within New Hope Group operations has always been and remains to be operator confidence and acceptance. A number of system configurations and commercial conditions have been matured during the course of the vendor/supplier partnership. These include;

- ✓ **Loader to truck transaction exceptions** (recognising the interactions in general loading practices and removing nuisance/false positive alarming)
- ✓ **Side by side dozer interactions** (catering for 'dozer push' activities without compromising projected collisions)
- ✓ **Reliability in system hardware installations** (standardised installations and aerial/hardware design)
- ✓ **Redundancy in system configuration** (synchronised in-field trailers for automated uploads and software 'roll-back' features)
- ✓ **Commercial training and support** (including commercial warranty and new equipment replacement agreements)
- ✓ **3rd Party independent auditing processes**
- ✓ **Life Cycle Asset Management Plans** (system)

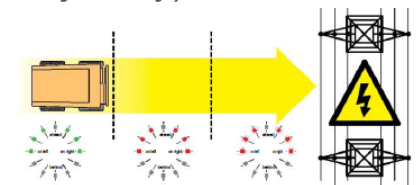
Operation

What has Proximity Detection delivered to New Hope Group

Since the introduction of proximity detection technology to the operational fleet, New Hope have seen a significant reduction in incidents involving vehicle interactions. It is difficult to quantify the direct contribution that proximity detection technology has had on these outcomes due to on on-going focus on continuous improvement.

That said, the SAFEmine Proximity Detection System has delivered a number of unquestionable key outcomes;

1. 'Real time' alarm and notification to the equipment operator of vehicles within a 200m radius of the vehicle (elevated on reduced distance or projected trajectory)
2. Fixed infrastructure and area alarm (geo-fencing)
3. Alarmed vehicle speed management
4. Incident investigation and analysis (including the overlay of multiple vehicle interactions)
5. Auditing capabilities of operator behaviour and techniques



Current & Future

System improvements over time and going forward.....

Since its introduction, New Hope have introduced a number of improvement measures along with SAFEmine from January 2011 to reduce vehicle interaction hazards based on operating experience and industry information. These include:

- ✓ Modification to system hardware and configurations
- ✓ Modifications to Light Vehicle pit park up arrangements external to work areas
- ✓ Installation of In-vehicle Camera Systems in all site operational equipment
- ✓ Modified pit dump working procedures
- ✓ Trial radar proximity detection integration

Questions?

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