Collision Avoidance Systems

Background:

- Joseph Oliphant was a loyal employee of Xstrata Alloys

- Whilst removing a rock from the wheel arch of his vehicle he was fatally injured by another approaching vehicle

- The Driver of this vehicle did not see him until it was too late.....
Aim of Project:

To ensure that warning is given to both vehicle operator and pedestrian prior to interaction with one another
Collision Avoidance Systems

Objectives:

- To warn the operator of a vehicle of other vehicles and pedestrians within a 30m radius
- To warn pedestrians of the presence of vehicles or potential dangers
- The system must seamlessly integrate with the existing mines equipment (e.g. Cap lamps)
- Only allow authorised drivers to use vehicles
- System must be failsafe
- The systems must allow for multiple personalities
- Utilise existing transponders for tracking and shift clearance
Collision Avoidance Systems

Plan of action:

• Clearly define the mines requirements
• Clearly define the user requirements
• Find potential OEM’s (Original Equipment Manufacturers)
• Receive feedback from OEM’s offering solutions to the mines requirements
• Evaluate systems from potential OEM’s
Collision Avoidance Systems

Becker’s Fields of Expertise:

- Complete Mine / Tunnel Automation Solutions
- Wireless Communication Solutions (Leaky Feeder, WLAN)
- Communication Backbones – Hard Wired & Radio
- Tagging and Tracking, Access Control, Time & Attendance
- Collision Avoidance and Driver management Systems
- Voice, Video and Data Acquisition Systems
- Software Design-Databases, Visualisation and Reporting
- Wide Range of In-house and OEM Products
Collision Avoidance Systems

Advantages of the Becker System:

- Small compact design
- High level of functionality and fail safe in design
- Retrofit able to all makes of cap-lamps
- Offer personnel and vehicle avoidance systems
- Integrate into tracking and lamp-room solution systems
Collision Avoidance Systems

**Trial System:**

- The Becker Equipment was evaluated by installing systems on 50 pedestrians and 10 vehicles
- The system was tested w.r.t. durability, functionality, reliability, practicality and general acceptance by the mine personnel
- During this trial period adjustments were made to the equipment to better suit the mines needs

CAS System mounted on a LF4.2 L.H.D.
Collision Avoidance Principle

Personnel Transmitter  RF Signal  Receiver
Collision Avoidance System
The CAS Unit

- Detail Display
- Vehicle Count
- Personnel Count
- Power Indicator
- System OK Indicator
- Tag Detected
- Antenna Connection
- 12v to 24V Power
- High bright Flashing Indicator
- Buzzer Alarm
- Buzzer ON/OFF Key Switch
Personnel Avoidance Systems

- The PAS unit is an intelligent receiver which is retrofitted to existing cap-lamps
- It was borne out of the need to warn pedestrians of vehicles within close proximity, by means of flashing the cap-lamp and sounding an internal buzzer
Personnel Avoidance Principle

Vehicle Transmitter  RF Signal  Personnel Receiver
Where Would One Use PAS

**Underground**

**PARK Bay's AND REFUEL Bay's**
Lamps will stay on and buzzer will be activated – in zone +/- 60m – Allow operators to carry out Pre-Start inspection.

**WORKSHOPS**
Lamp and Buzzer will activate on 10 min intervals.

**NON PRODUCTION AREA’S**
Operator to stop machine and examine any warning if visual contact is not established for both Pedestrian and vehicles.

**PRODUCTION AREA’S**
Load haul dumpers have right of way – pedestrians to respond on warning.

**CORNERS AND VENTCURTAINS**
Extreme caution to be exercised and visual contact must be established.
PAS Installed in Accumulator
Personnel Avoidance System
Combination PAS & CAS
People and Vehicle Detection
Lamp-room Control Systems

Equip all the Lamp rooms with the “Lamp room solution” – check battery status and required equipment is in a working and calibrated condition i.e. Gas monitoring equipment – interlocked with turnstile, thus access will be denied.

No-Go – system.
Active Tracking System - Readers
Active Tracking System - CATS
Future Applications

Vehicle Tracking and Monitoring

Fixed Tag Reader

Fixed or Mobile Tag

Leaky Feeder Cable

Tag Reader/C.A.S.

Vehicle Management

Data Radio
Thank you for your Attention.