BEST PRACTICE

LOCATION:	**Mobile Plant**	**ARTICLE YEAR**	**2016**
ACTIVITY:	**Traffic management**	**COMPANY:**	**Chepstow Plant International**
SUB ACTIVITY:	**Quarry and earth moving**	**COMPANY LOCATION:**	**Panshanger Quarry**
BEST PRACTICE No:	**BP1954**	**COMPANY TEL:**	**0000**
COUNTRY OF ORIGIN:	**United Kingdom**		

TITLE

Preventing articulated dump truck turnover

ARTICLE

DESCRIPTION

Chepstow Plant's analysis of ADT turnovers since April 2013 revealed that there had been 9 skip and 4 cab turnovers, thankfully with no injuries. The analysis showed that irrespective of the location – haul road, tip, and stockpile – all but 2 of the incidents could have been avoided with increased vision or early warning. Of the remaining 2, 1 was due to excessive speed and the other due to unusual ground conditions.

Chepstow Plant approached both Bell Equipment and Volvo Construction Equipment. Bell had an on-board built in inclinometer that could be set to give early warnings of when the ADT went outside of the set parameters. Following a successful trial day in a quarry, the inclinometers were activated across the Chepstow Plant fleet.

Volvo supplied an after-market version of an inclinometer for the Volvo ADTs, the trial with this unit produced similar results. All new Volvo ADTs delivered in 2016, in excess of 50 units, had these installed.

The inclinometer programme is fully supported by in-house training, familiarisation and downloadable data should anything untoward occur. Both visual and sound warnings are included within the system, the system has variable settings that can be set by the company. The inclinometer system will hydraulically stop any "unsafe" tipping action, returning the skip to flat and level. The operator can then reposition the ADT before attempting to tip again.

At Panshanger Quarry, where the turnover was due to excessive speed on the haul road, a similar technical solution was sort. In spite of toolbox talks and driver briefs, it was felt that a more robust solution was required. Bell Equipment suggested a potential solution. The Bell ADTs are fitted with a global positioning system (GPS) that gives access to real time and recorded data such as location, speed and load carried. An additional function of this system is a Geo-fence.

Geo-fencing works by introducing a 'virtual fence' around a fixed point on the ground. In this case, the site compound at Panshanger Quarry was chosen. The longitude and latitude is set into the global positioning system (GPS) fitted to the machine, and a distance from the set point is determined, in this case a radius of 5 Km. A maximum speed limit is set for the area detailed within the virtual fence line. During the set-up various speeds were trialled, 17.5 MPH set as the limit. The GPS system is only accessible via a laptop, ensuring the system security. Upload time is approximately 15 minutes per machine.

The system works in a similar fashion to cruise control on a road going car. In the event of a malfunction, the machine would go into "limp" mode and would not achieve the set speed limit.

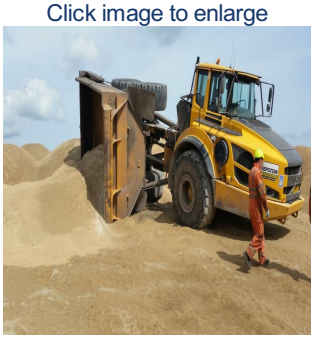
The 'geofence' will only work for the settings made on an individual machine. When operating at a different location, they would be able reach their top speed. However, a new 'geofence' could be implemented, and set, for their new location if required.

BENEFITS

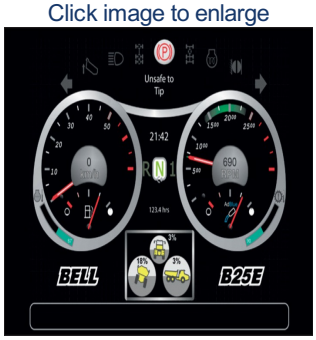
- Significant reduction in turnovers since inclinometer installed
- Drivers maximum speed controlled at Panshanger Quarry
- Speed control does not affect ADT's performance other than top speed
- Operators now safer and able work with more confidence
- Better understanding on sites of need for good working ground
- System is easy to operate and manage
- Cost savings due to turnover reduction
- Effective solution achieved through collaboration with suppliers

ARTICLE IMAGES

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In cab display