BEST PRACTICE

LOCATION:	Quarry	ARTICLE YEAR	2022
ACTIVITY:	Loading and unloading	COMPANY:	Chepstow Plant International
SUB ACTIVITY:	No Sub Activity Available	COMPANY LOCATION:	Beacon House
BEST PRACTICE No:	BP2120	COMPANY TEL:	0000
COUNTRY OF ORIGIN:			

TITLE	

Safer tipping using telemetry and behavioural nudges

ARTICLE

WINNER - Safer Production

DESCRIPTION

Chepstow Plant International (CPI) runs a fleet of circa 170 Articulated Dump Trucks (ADTs) for a variety of uses within the quarrying and allied industries, including loading and hauling sand and gravel, rock, clay, granulated steel slag, earthworks and restoration. It noticed an increasing trend in overturn incidents at client sites. CPI looked for high impact and sustainable improvements that could mitigate and eventually irradicate this serious challenge.

Working closely with its national client base, it reviewed the feedback from incidents to try and identify common trends and the root causes. This information was reviewed with the machine manufacturers, Volvo and Bell were selected as the manufacturer to work with to resolve this issue .

In 2016, CPI specified inclinometers to be fitted to the extensive fleet of Volvo and Bell ADT's. The inclinometers interact with the tipping controls to refuse a tip when the inclinometer or gradient exceeded 9 degrees. Together with refusing the tipping operation and an in-cab alarm, the telemetry for the ADT allows a report to be generated off site which is collated and monitored at senior management level. This data is then discussed weekly at site level with individual operator teams. All actions taken are recorded and can be mapped against the refused tip reports that are generated each week.

The operators are empowered using the tool to highlight concerns regarding condition of routes and tipping areas, they can halt the operation in order that remedial action can be taken. The display and tip refusal helps less experienced operators better understand the capabilities of the machine in the altering ground conditions

CPI's training department have been instrumental in rolling out the training to both new starters and time served operators. Numerous safety briefings and toolbox talks have been shared with the workforce throughout the UK.

Senior management at CPI have been instrumental in driving change in the industry and encouraging manufacturers of ADTs to develop new technology and fit it as standard to reduce risks on site. By the end of 2016, inclinometers were standardised on all Volvo ADT's.

CPI have shared their information with major clients and believe that the system they have introduced are compliant with the QNJAC Guidance note on the 'Safe Operation of ADTs in Quarries and Surface Mining Operations'

CPI believe the 'Refused-Tip' initiative that it has evolved transitions the telemetry data and looped feedback, from a system based on dependent controls to encouraging interdependent behaviour on sites.

BENEFITS

1. A reduction in the number of overturns
2. Risks to drivers and others on site from overturns and recovery reduced
3. A reduction in time for investigating incidents, recovery and repairing damage/ time lost through injury.
4. Improved productivity and profitability of operations
5. Drivers empowered with a tool that assists them to build their competence and decision making
6. Drivers better understanding the ground condition parameters where a safe tip is achievable
7. Driver's behaviour around ADT overturns has improved
8. Management have clear metrics on performance which are investigated to drive improvements
9. Working with OEMs to improve the systems to alarm when a "static tip" is planned and to better pinpoint clusters of refused tips using Haul Assist and Fleet Matic software
10. Working with clients to share data and ensure that elements of site which are outside of CPI's control can be highlighted and dealt with
11. Initiatives reflect CPI's values of 'Service and Safety through Partnership'

DEVELOPMENTS AND TRANSFERABILITY

Further development areas include alarms to encompass ADT stability risks when travelling rather than just when the tipping action is in play. The use of OEM developed telemetry systems could be adapted further to give GPS data on exact location of refused tip. This would then allow the data to be overlaid with the site map, to generate and identify the refused tip hot spots.

The system used is fully transferable for sites using ADTs across industry. CPI has shared its learnings and process with all its major clients and the Institute of Quarrying through technical events.

ARTICLE IMAGES