

# Safety is our business too

## Working in the potentially hazardous manufacturing industry, Bell Equipment is extremely safety conscious and strives for an injury-free workplace at its production and administration facilities.

The company is just as aware of the need to incorporate safety features into its products to ensure that customers have machines that exceed application safety standards to improve safety at their respective workplaces.

It was back in 2009, with the introduction of the D-series Mark VI ADT, that Bell Equipment took huge strides in ADT safety, positioning the company as an industry benchmark and cementing its position as an ADT specialist. Recalls Bell Equipment's Product Marketing Manager, Llewellyn Roux: "At that time there was an increased awareness of site safety, particularly on mine sites. By listening to our customers and reacting quicker to a changing workplace we were able to provide innovative safety features to exceed application safety standards. We've made safety our business and are always looking to incorporate safety improvements into our machine upgrades and designs."

At the heart of many safety features is the CANbus language protocol used by all Bell ADTs to communicate between a truck's Central Processing Unit (CPU), 15 system controllers and 57 sensors. This allows

instantaneous feedback on ADT health and production data. The electrical system also uses a current feedback loop, which allows the CPU to determine whether the ADT is working optimally and provides immediate feedback to the operator. The operator's display contains over 100 diagnostics screens that are easily viewed from the driver seat.

Importantly Bell uses one operator interface design throughout all ADT models thereby reducing training and risk when an operator moves to different size ADTs. Bell ADT cabs are also standard with ROPS/FOPS certification and an air suspension operator seat. Both the operator and trainer seat have safety belts and the new E-series Bell will feature a multi-point safety harness for the operator seat. In addition, high convex mirrors reduce machine blind spots to improve visibility and safety.

### Guaranteed no rollback

Says Roux: "Today safety features are a major consideration for most customers when they buy an ADT and our engineers have incorporated many of our safety improvements as standard features. For

example, the park brake application is automatic when selecting neutral and neutral cannot be selected at speed. Improper use of the park brake is often identified as the root cause for on-site accidents, by automating the application the possibility of operator error is greatly reduced."

"Importantly most of the safety features are simple yet highly effective, such as the Hill Assist feature whereby the inclinometer measures the angle of the vehicle and cross-references this with the exclusive on-board weighing feature. The beauty of this feature is that the park brake will only be released once a pre-programmed engine torque has been reached to ensure a controlled pull away with no rollback, even on the steepest of inclines," says Roux.

Similarly the machine angle and payload are cross-referenced on pull away so that if the vehicle is unladen and on relatively flat terrain it will automatically pull away in second gear. Apart from guaranteeing a smooth pull away and shifting, this feature also saves fuel by cutting out the unnecessary shift from first to second gear.

### Tipping with safety

"With 'I-Tip' the operator simply brings the ADT to a halt and engages the tip lever. The truck automatically does the rest of the steps. When leaving the stockpile the operator simply engages drive and as the ADT starts moving it will control the speed safely whilst the bin lowers itself. This means that both processes are automated in the safest possible way and the cycle times are further reduced because there is no need to wait for the bin to be fully down before driving off," he adds.

A Pitch and Roll sensor in the vehicle can be used on site to set limits for when the bin tip function can be activated. If the vehicle is sitting at an angle where lifting the bin might cause instability, the software will prevent the bin from tipping. The operator will be warned of the potentially dangerous action on the display monitor. The customer can set up the limiting angle for site-specific conditions.

### Safety on the move

To foster safety on the haul, speed control is built into the Bell ADT operator interface giving the operator two speed levels that he can programme, select and toggle between to ensure that the top speed is not exceeded. The ADT also has site selected speed control. This is done in service mode and can be set at any value below the rated top speed. Operator speed control cannot be set higher than the site speed control value.

The best-in-class retarder and engine braking automatically applies when the operator lifts his foot off the accelerator. Retarder aggressiveness can be adjusted

on the sealed switch module sensing maximum descent for all conditions.

According to Roux, other features aimed at safer operation include the option to activate an automatic hooter, which will sound when changing between drive and reverse as well as when the payload has been reached during loading.

Meanwhile several features of Bell Equipment's satellite monitoring system, Fleetm@tic are geared towards safety/security, for example geo-fencing, which limits an ADT to operate in a specific area. Should the ADT move outside this area controls can be activated including reducing speed, putting the ADT in 'limp home mode' or preventing the ADT from starting.

As a preventative measure the customer can also choose to have the vehicle automatically enter a limp home mode if it is significantly overloaded. This will limit the vehicle speed to ensure safety but will still allow the vehicle to finish the haul cycle.

### Improved security for improved safety

Safety and security work hand in hand and therefore Bell ADTs incorporate a keyless start, driver identity and access codes to ensure no unauthorised operation of the machine. Driver identity also enables the fleet manager to evaluate drivers through Fleetm@tic so that driving issues can be picked up early and training can be provided.

Tyre pressure monitoring is offered as a factory-fitted option. The system, which is linked to Fleetm@tic, is integrated into the ADT's electronics enabling the operator to check tyre pressures on a graphical interface. A warning light is displayed should tyre pressure drop below a safe limit.

Other factory-fitted safety options include reverse cameras, which are available for factory or on-site fitment to ensure an optimal view when reversing. Similarly full handrails, to the ISO 2876 specification, can be installed to provide even more safety when performing engine checks.

Says Roux: "As a customer-focused company we are pleased with our achievements in terms of incorporating meaningful safety features into our ADTs and are confident that our customers around the globe will find value in these features in terms of safeguarding employees and ensuring that operational productivity is not lost on unnecessary incidents."

