

## Safety Case Studies

**Alliances with Toyota and Caterpillar are reducing sourcing costs while delivering vehicle safety features**

**Safety**



Caterpillar's Work Area Visibility Enhancement System (WAVES) helps to reduce collisions

The Company has developed long-term strategic alliances with suppliers Toyota and Caterpillar with a view to lowering the total cost of our fleets of site vehicles and earthmoving equipment, while focusing on enhancing equipment features in order to reduce HSEC risks and help us achieve our goal of Zero Harm.

### Toyota Alliance

In early 2002, our Strategic Sourcing group began a project with a goal to establish preferred suppliers to meet our light to medium sized motor vehicle fleet requirements. The basic premise of the project was to lower the total cost of ownership of our vehicle fleet in Australia, subject to meeting or exceeding required standards of vehicle safety and performance.

The project, which continues to be managed by our Australian Region Supply group, led to an alliance with Toyota Motor Corporation Australia. Since the agreement was signed, we have purchased fleets of Hilux, Commuter, Prado, Landcruiser and sundry passenger vehicles, all delivered, serviced and maintained by the Toyota dealer network. However, the alliance has had a far greater effect on the way our two organisations do business.

#### ***Applying the Kaizen Principle***

The objective of reducing 'total cost of ownership' is in hand but always subject to what Toyota calls Kaizen: the principle of 'continuously driving for innovation and evolution'. It is the second half of the project objective – meeting or exceeding required standards of vehicle safety and performance – that continues to challenge the BHP Billiton and Toyota staff.

This challenge is about 'forming a long-term vision, meeting challenges with courage and creativity to realise our dreams'. The introduction of the BHP Billiton Fatal Risk Control Protocols in April 2003 has increased the focus of both partners on how to eliminate or reduce the risk to drivers of light vehicles.

The alliance has vastly improved the quantity and quality of communication between the two organisations. Regular stakeholder meetings, quarterly reviews, and site visits (including Toyota engineers) have helped communicate our ongoing vehicle requirements, and much of this information is passed on to Toyota Motor Corporation (Japan) to aid in the continuous improvement of current models and for future model planning.

## **Safety**

Toyota also recognises that the reputation BHP Billiton has earned as a benchmark for vehicle safety best practice in the mining industry means that meeting our current needs will reflect on the not-too-distant future needs of many of their other fleet customers.

The recent release of the 2005 Hilux utilities, Hiace vans and Commuter buses is an example of the results of meeting the safety and performance challenge through the application of Kaizen. Extensive development has gone into body structures, frames and other areas to improve occupant safety, while input from customers has led to numerous safety features and accessories being added to vehicles to be sold in Australia, including:

- standard driver and passenger SRS air bags on all models (Hilux, Hiace and Commuter)
- optional ABS on most models (not available on Hilux Workmate only)
- 3-point, locking retractor seat belts on all outer seats of Hilux and Hiace and all 14 Commuter seats
- driver's seatbelt warning lamp (Hilux, Hiace and Commuter)
- airbag-compatible bull bars and nudge bars (Hilux, Hiace and Commuter).

The philosophies of the Toyota Way and the alliance between our two organisations have been instrumental in the specification and launch of these new models. In line with the original 2002 objective, these vehicles will go a long way towards meeting or exceeding required standards of vehicle safety and performance.

Alan Porich, Divisional Manager National Sales, Toyota Motor Corporation Australia, says, 'I believe the partnership between Toyota Australia and BHP Billiton has strengthened over the years as a result of the mutual challenge to continuously improve. The benefits of the relationship, however, are not restricted to the immediate boundaries of our two companies. Further Toyota product improvements as a result of input through BHP Billiton could also prove beneficial to the greater Australian mining industry'.

## **Caterpillar Alliance**

As reported last year, in early 2003 the Company and Caterpillar committed to an initial five-year strategic alliance with the aim of saving costs and reducing HSEC risks associated with the operation of earthmoving equipment (EME). Caterpillar was selected as the primary supplier to meet our needs for the global sourcing of EME and related parts and services.

Through continuous improvement process projects and R&D initiatives, combined alliance teams are delivering long-term, sustainable solutions to HSEC risks associated with EME. To date, 30 alliance projects have been completed and there are another 26 active projects at sites. Of the completed projects, seven are specifically HSEC-related. These are to improve dozer access, reduce the impact of whole-body dozer vibration and improve fire prevention at BMA; improve operator awareness and collision avoidance at Escondida; and reduce cab noise in drills and improve haul truck visibility at Ingwe. The outcomes are being communicated globally to enable project replication.

### ***HSEC and Sustainable Development benefits arising from the Alliance***

Initiatives to ensure compliance with our Fatal Risk Control Protocols include the provision of options such as:

- high-intensity discharge lighting to improve visibility during hours of darkness
- Three-point seat belts for additional operator restraint and neck support after the completion of trials at various mine sites
- equipment lockout systems fitted to new CAT models being released in 2005
- semi-active suspension seats to reduce vertical vibrations affecting the operator
- heated rear-view mirrors in arctic conditions to prevent build-up of snow and ice
- availability of access systems such as angled stairways, fitted walkways and fenders over the wheels to reduce the risk of slippery surfaces.

Another initiative involves the use of training simulators to develop operator skills without risking their health and safety.

With the support of the Company's HSEC and asset management teams, focus areas for projects were identified, including:

- developing and evaluating vehicle collision detection systems
- reducing and monitoring operator fatigue
- improving ergonomic issues such as whole-body vibration, visibility, comfort and noise affecting both operators and those nearby
- developing powered access systems
- reducing fuel burn, lubricant consumption and engine emissions
- improving fire prevention systems and improving operator visibility on the machines

### ***Fire Prevention Project***

Our BMA coal operation based in Queensland, Australia, has been working with Caterpillar and the regional dealer, Hastings Deering, to improve fire prevention measures on haul trucks and replicate these across other types of EME. Over the last five years, more than 200 incidents of fires have been recorded on mobile equipment across BMA, with 37 of these being directly related to haul trucks.

The project team developed risk mitigation strategies to reduce the risk of fires from mechanical or electrical ignition sources by 75 per cent. The team's full documentation of solutions and recommendations will enable the project to be replicated at other assets and will assist the development of new products by Caterpillar. The solutions include:

- protective covers, shields and sheathing
- inspection strategies
- hose ratings
- improved design such as brushless alternators and fuel rails.

### ***Collision Detection System Project***

We have jointly been developing and testing technologies with the potential to assist in collision detection between vehicles, structures and humans. Caterpillar has developed a camera system – Work Area Visibility Enhancement System (WAVES) – that is in the final stages of testing, including at two BHP Billiton mines, which will significantly assist in enhancing visibility around equipment. The next stages involve incorporating technology such as radar, radio frequency, GPS or other developing technologies into a combined collision detection system.

Phil Kelliher, Caterpillar's Global Manager for the BHP Billiton Alliance, believes that the close working relationship formed through the Alliance will benefit all participants. He says, 'The Collision Detection Forum is a great example of cross-functional, cross-asset and cross-organisation teamwork developing solutions to some of BHP Billiton's major EME challenges while at the same time helping Caterpillar and our dealers design and maintain a safer product offering'.