

Queensland Mining Industry Health and Safety Innovation Awards 2008

Hitch Post Guide Mandrel
Rio Tinto Alcan

The Problem

The task of reconnecting a haul truck and its trailer after maintenance was identified as a high risk activity at Rio Tinto Alcan's Heavy Equipment Workshop. This followed an incident where an employee was observed without the correct personal protective equipment (PPE) while completing the task.

The standardised process for reconnecting a trailer to a truck included an employee being positioned on top of the truck at the hitch point to line up the hitch post with the trailer's upper bearing. The hitch point is positioned behind the truck's cabin and is approximately four metres from ground level. The height of the hitch point and lack of a fall prevention structure exposed the person positioned at the hitch point to risk of injury.

Using an elevated work platform is not a suitable option for the task as the area surrounding the hitch point is restricted and not accessible for the equipment.



Figure 1: A haul truck with trailer attached.



Figure 2: Side view of a haul truck and trailer at the hitch point.

The Solution

The innovation was developed by the East Weipa Heavy Equipment Workshop in conjunction with the Brisbane Technical Engineering Group and Hastings Deering Australia Limited.

Following on from the investigation into the incident, the East Weipa Heavy Equipment Workshop together with the equipment supplier Hastings Deering Australia Limited and the Brisbane based Manager Engineering cooperated to find a safer way to carry out the task.

The solution found was to engineer a mandrel that guides the trailer over the hitch post while keeping the two components aligned.

The mandrel is designed to self guide the hitch post through the trailer attachment point without damaging either the upper or lower bearings on the trailer.

The leading taper of the mandrel is designed to engage with the lower bearing and then guide the hitch post through. The mandrel eliminates the need for an employee to work at heights using fall protection. To install the mandrel on the hitch post safe access can be gained via the tray floor.



Figure 2: 3D view of mandrel .

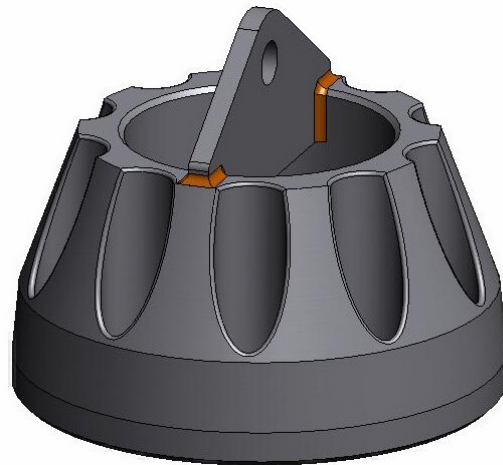


Figure 3: 3D side view of mandrel.

When the trailer has been lowered into position on the hitch post, the mandrel is removed and the standard retainer plate fitted.

The mandrel was tested at the East Weipa Heavy Equipment Workshop by the maintenance and crane teams with success. The mandrel is now stored with the crane so it can be used in both mine areas at Weipa (East Weipa and Andoom).

Benefits / Effects

The benefits of using this innovation include:

- Elimination of working at heights for employees.
- Removing employees from a load red zone.

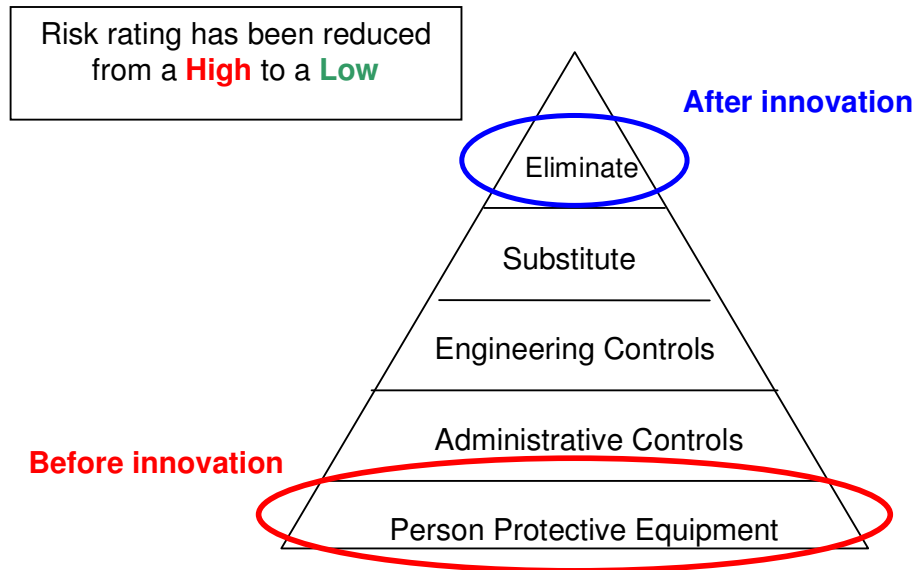


Figure 3: Hierarchy of Controls – The innovation has removed the need to work at height.

Transferability Across Industry

The innovation could be directly applied across the industry for the application of attaching heavy trailers to trucks, eliminating the need to work at height and in close proximity to a heavy load. The device could also be utilised in other tasks where loads need to be manually guided onto a supporting device such as the hitch post.

Innovation

The innovation was to manufacture a device that temporarily changed the shape of the hitch post so that it would guide itself into position while connecting the trailer rather than requiring human intervention to achieve the correct alignment.