

Windrow Delineator

MMG Century

Problem or Initiative

A number of safety measures are in place to ensure that operators of heavy machinery at MMG Century can drive safely within the mine's open-cut pit at night. One of these measures is the erection of reflective pickets at 50 metre intervals on windrows along in-pit roads so that operators can clearly see road boundaries at night.

Haul truck, and other heavy machinery operators, often drive as close to the left hand side of the in-pit ramps as they can, hugging the windrows. This practice leads to a build up of dirt and rock along windrows on the left of the road, often covering the reflective pickets. Extensive damage is also caused to tyres as a result of operators hugging the windrows while driving. This is because the rock and dirt built up along the left hand side of the road causes cuts and abrasions to the tyre itself.

This hazard was identified during discussions regarding safety in the pit and during a review of the causes of tyre damage and deterioration on site.

While regular inspections are carried out on in-pit roads, there may be periods where the reflective pickets are covered by dirt and rock on particular sections of road. The reflective pickets need to be erected manually, meaning that a person has to drive a light vehicle along in-pit roads and have the vehicle stopped for a period of time while they climb up the windrow and hammer in the covered reflective pickets. While all safety procedures are followed during this process, there are inherent risks involved in personnel climbing the uneven and slippery surfaces of windrows to install the reflective pickets and the light vehicle being in close proximity to moving heavy vehicles.

The Solution

A solution was required that ensured that operators could clearly see the side of in-pit roads, and therefore, reduce their tendency to hug the left side of the road.

Discussions occurred during the audit of safety activities in the pit and a review was conducted into the causes of tyre damage and deterioration. During these discussions, it was determined that the best way to ensure that operators could clearly see the edge of the in-pit roads was to develop a device that attached to the windrows, but could not be covered by moved rock or dirt falling from the trucks.

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The team discussed a number of different options that could be used. It was decided that a device with two adjustable arms that could be removed and replaced with different types of arms suitable to each application could be used. The device is known as the Windrow Delineator.

The team then developed a prototype based on this design. The prototype was tested after a review by Century's Safety and Health team to ensure that it was safe for us to use. The device was designed to be made entirely from PVC pipe and in such a way that it rests on the top of the windrow and hugs the sides (Figure One).

The key difference with this new style of windrow delineator is that it does not need to be hammered into the ground and is light enough to be thrown over the windrow from the side – alleviating the need to climb up uneven and slippery surfaces. The device is also large enough to provide excellent visibility for vehicle and mobile equipment operators.

One of the most important features of the Windrow Delineator is that due to its design, it can be used on all windrows, regardless of size or shape.

The device has been successfully tested in a small area of the pit. However, due to the number of the Windrow Delineators required, the device has not yet been rolled out along all in-pit roads.

Benefits and Effects

The purpose of the Windrow Delineator was to provide an effective means for illuminating the edge and centre of in-pit roads at night. As the Windrow Delineator attaches firmly to the windrow itself, it cannot be moved or covered by rock or dirt moved by the trucks. This means that the device is always visible to operators and unlike with the reflective pickets, does not need to be regularly inspected or re-erected.

As a result of its design, the Windrow Delineator:

- > Improves safety by clearly illuminating the edge and centre of in-pit roads.
- > Reduces the potential for light and heavy vehicle interactions by reducing the need for inspection, maintenance and replacement of reflective devices along in-pit roads.

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- > Reduces the time taken to install/remove the delineator because of simple throw-on windrow design
- > Eliminates the risk of injury arising from personnel climb upon windrows to fix the reflective pickets in place.

Transferability

In-pit safety is a priority at any mine site, and the design of the Windrow Delineator means that can be easily used at other operations.

Key design elements that aid transferability within the industry include:

- > Adjustable arms and different angle connections mean that the device can be erected to all windrows, no matter what size or shape
- > The use of lightweight materials to build the device means that it can be easily erected.
- > The windrow delineator could also be utilised on ROM pads for delineating the edges of stock piles

The design of device also means that it could be easily applied outside the mining industry, for example during road works.

Figure One: The Windrow Delineator

