

SAFETY ALERT

DATE: September 2021

Lift arm failure on load haul dump (LHD)

This safety alert provides safety advice for the NSW mining industry.

Issue

Load haul dumps (LHDs) in underground coal mines are multipurpose utility vehicles, often used to lift personnel or material in work baskets, with other workers assisting in close proximity to the machine. Catastrophic structural failure of the lift arm presents a serious risk to worker safety in these scenarios.

Circumstances

On 2 September 2021, an operator connected a loaded four-pallet duck-bill pod to an Eimco 130 LHD via the quick detach system (QDS) at pit bottom. The operator then drove the LHD a distance underground before stopping to wait at a set of block lights. As the operator stopped, the lift arm frame welds failed and the pod and lift arms dropped to the ground. No one was injured in the incident.

Figure 1: Weld failure at lift arm pivot boss connection



Investigation

The NSW Resources Regulator is currently working with the mine operator to obtain information about the incident. Initial findings include:

- The lift arm appears to be the ED7 or LS170 lift arm identified as BD0002087 in the “Sandvik rubber-tyred vehicles technical bulletin TB0819”.
- The lift arm had not been upgraded in accordance with the TB0819 technical bulletin.
- The lift arm had undergone non-destructive testing (NDT) using magnetic particle test methods for crack detection on 22 June 2020 and previously on 18 April 2017, with a ‘nil detectable cracks’ result.
- The lift arm remained in the LHD front frame for both above mentioned NDT examinations.
- The failed weld was not inspected during the NDT examinations as it was deemed inaccessible (see Figure 2).
- A portion of the failed weld has visible dust and corrosion indicating the crack had existed for some time. This is in an area where a partial visual inspection is possible. (See Figure 1).

Figure 2: Area not accessible to NDT



Recommendations

Mine operators of underground coal mines and suppliers of hire equipment to underground coal mines should:

- Review any Eimco 130, ED7 or LS170 LHD models that has not had the recommended upgrades in accordance with the OEM technical bulletin.
- Develop a risk-managed approach to implement the recommended OEM technical bulletin upgrades, as required.

More broadly, owners and workers in control of LHD plant, integrated tool carriers and similar plant used with work baskets or jibs should:

- Review the effectiveness of structural inspection and NDT programs. The review should include:
 - OEM NDT recommendations, operating duty cycles and site environmental conditions have been considered in the development of NDT protocols.
 - NDT reports adequately meet the site NDT protocols for each specific plant model.
 - NDT and inspection programs consider difficult to access areas.
 - Where safe to do so apply a load to areas being examined when conducting visual inspections to facilitate easier visual detection of cracks between NDT examinations.
- Ensure OEM safety alerts and technical bulletins regarding recommended structural improvements have been reviewed and implemented as required.
- Plant is operated within maximum limits of operating loads and capacities. This should extend to ensuring maximum loads for attachments are clearly identified and workers are provided with the necessary information and tools to ensure plant is not overloaded.

NDT service providers of crack testing for mobile plant should:

- Provide advice to customers (mine operators) of areas that are inaccessible or untested which should be included for a complete assessment, compliant with OEM or mine standards or procurement specifications.

NOTE: Please ensure all relevant people in your organisation receive a copy of this safety alert and are informed of its content and recommendations. This safety alert should be processed in a systematic manner through the mine's information and communication process. It should also be placed on the mine's common area, such as your notice board where appropriate.

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