Significant Incident Report No. 273

Subject: Near miss when a failed rod ejected from a hydraulic pulling kit

Date: 27 February 2019

Summary of incident

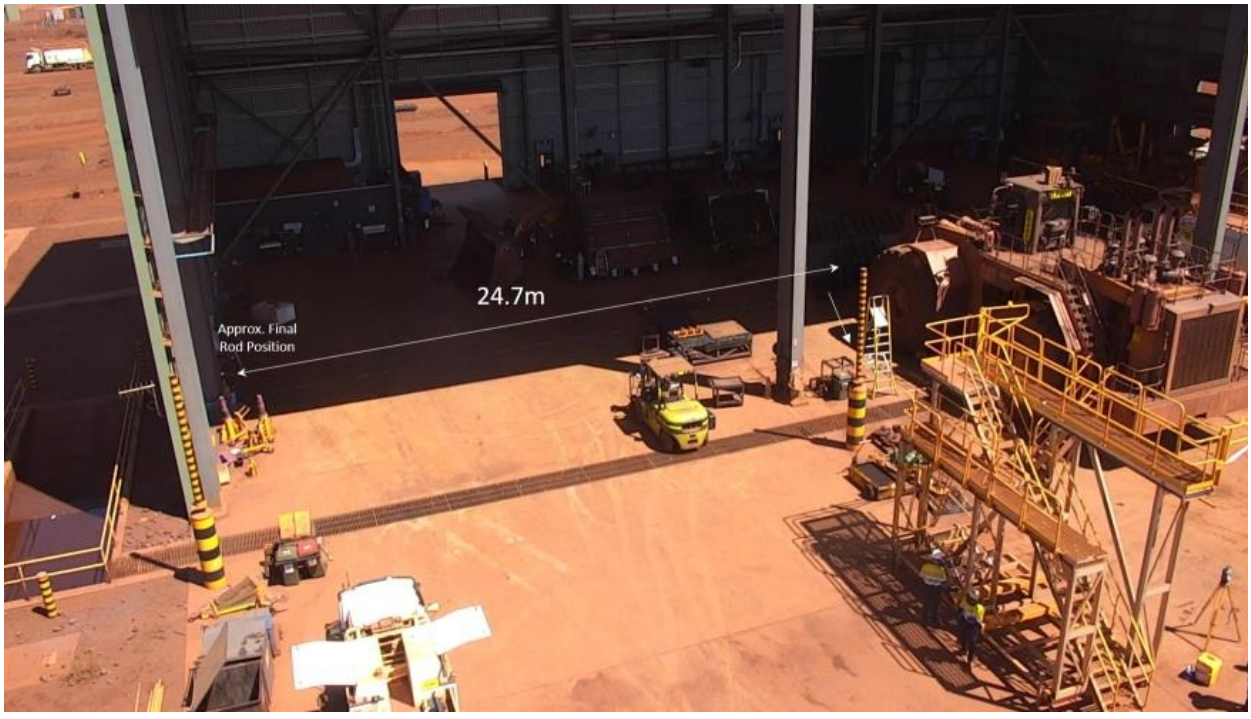
Note: The Department of Mines, Industry Regulation and Safety's investigation is ongoing. Information contained in the significant incident report is based on findings at the time of writing.

Workers have been exposed to potentially serious injuries when using hydraulic tools to extract pins from articulated joints on heavy earthmoving machinery. Recent examples include:

- In September 2018, a 13 kg pulling rod failed and was projected approximately 26 metres during pin cartridge removal from the boom of a front end loader.
- In January 2019, a 19 kg pulling rod was projected approximately 25 metres and embedded itself into the workshop wall, during removal of bucket pin on a front end loader.

Direct causes

Failure of incorrectly selected pulling rod under tension generated by hydraulic cylinder actuator.



Trajectory of 19kg pulling rod.

Contributory causes

- Pulling rods were incorrectly matched with the higher capacity hydraulic cylinders.
- Purpose designed and built original equipment manufacturer (OEM) tooling was not used.
- Selected engineering control (special purpose tooling) was ineffective at managing identified hazards.
- Workers were not trained and assessed as competent in the task they were carrying out.
- Safe system of work relating to the task and contractor management was not adequate.

Actions required

To prevent similar incidents, implement a safe system of work that ensures that:

- Preventative maintenance, rebuilds and change out program are carried out following original equipment manufacturer's (OEM) life cycle management plan. These works should be carried out by competent persons, in accordance with a safe work instruction (SWI) with purpose built tooling.
- If OEM has not specified a maintenance regime or specified purpose built tooling to assist in proper maintenance of the plant, risk management principles are used to develop a system of work in consultation with OEM.
- Any special purpose tooling (SPT), is designed and tested by competent persons to a specific load rating. Evidence of this could include certified drawings, calculations and proof load testing.
- SPT is clearly marked with the load rating.
- SPT is periodically inspected by competent person to verify and validate as fit for purpose.
- The use of SPT is covered by a safe work instruction (SWI) so the tooling is safely used in accordance with the designers intent (i.e. for the purpose it was designed for).
- The repair of SPT is undertaken by competent person(s) in accordance with the original designers intent.
- Any modifications to SPT is done using appropriate change management processes.
- The components of SPT from different designers or manufacturers are not interchanged unless the change has been assessed by a competent person.

Further information

Visit www.dmirs.wa.gov.au/ResourcesSafety for information on occupational safety and health in the resources sector.

This Significant Incident Report was approved for release by the State Mining Engineer on 27 February 2019