NSW Resources
Resources Regulator

Investigation report

Serious injury to a worker conducting maintenance work on a mobile screen

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Table of Contents

Introduction

At Mt Magometon Quarry, a worker's arm was surgically amputated by emergency services personnel in order to free him after it was entangled in the idler drum of a moving conveyor belt on a mobile screen on 28 August 2023.

The worker survived but was exposed to the risk of death.

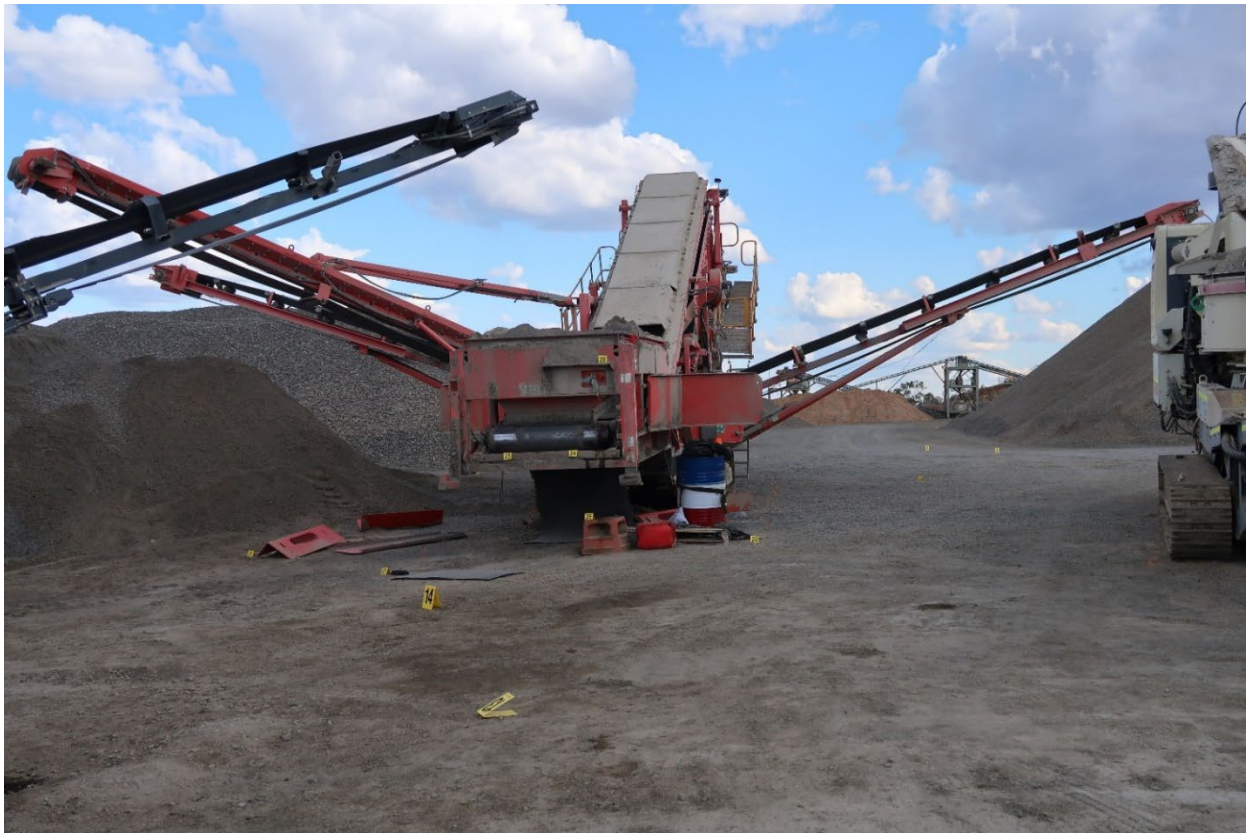
The mine

Mt Magometon Quarry is about 25 kilometres east of Coonamble and has operated for over 50 years producing aggregates and road base. Coonamble Shire Council (the mine operator) directly employed 4 workers at the quarry and contracted a statutory quarry manager provided by Groundwork Plus Pty Limited. At the time of the incident, Lynch Contractors Pty Ltd provided 3 workers to supply, operate, and maintain mobile crushing and screening equipment under a contract with the mine operator.

The incident

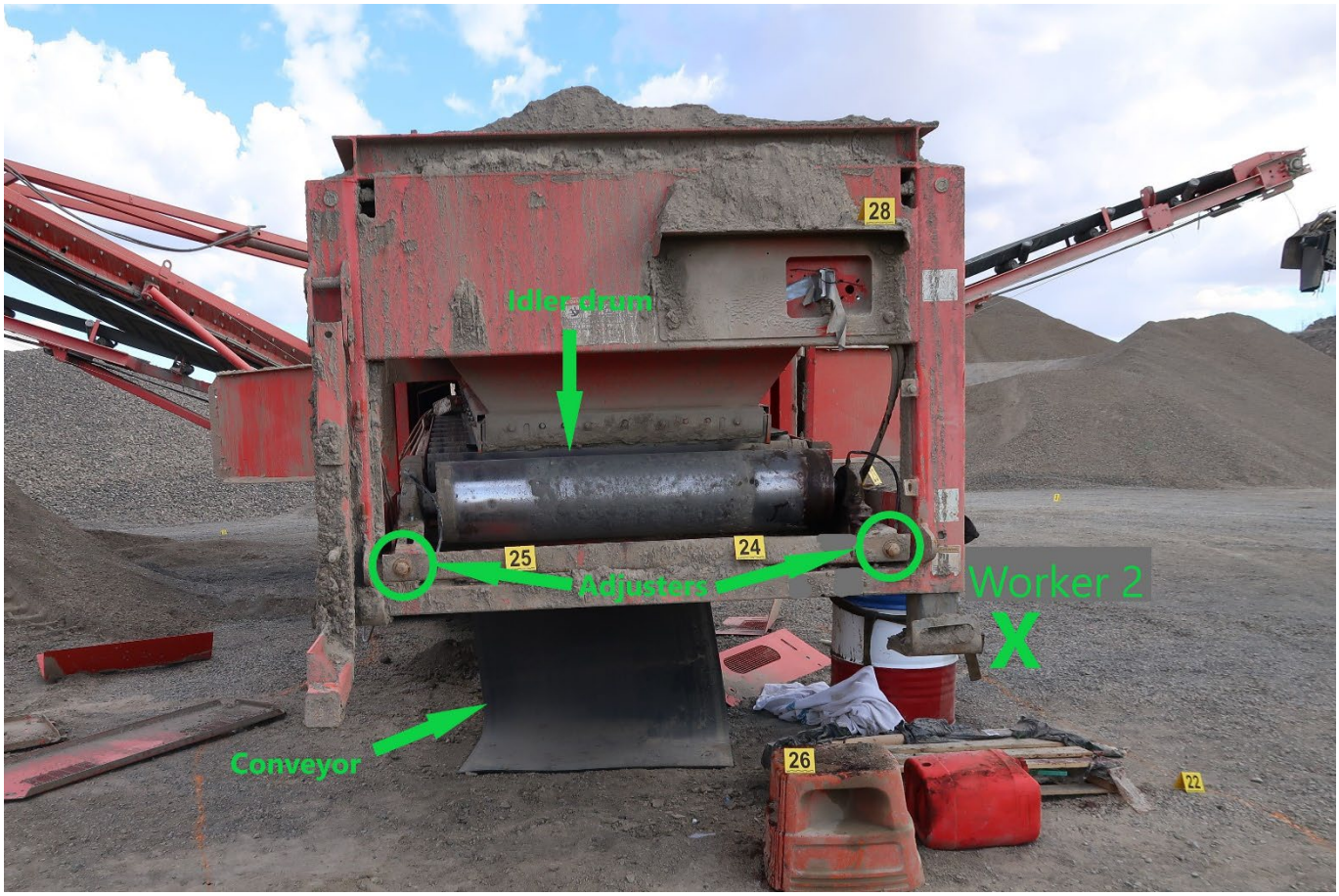
Three Lynch Contractors workers were conducting general maintenance on company-owned mobile plant at the quarry, which included 2 mobile crushers and 2 mobile screens on 28 August 2023. As part of their maintenance activities, the contract workers commenced cleaning mud and debris from the inside of a Terex Finlay 694+ mobile screen by opening various fixed guards before using an air cleaning gun to blow dirt out of the machine which had built up around the conveyors.

Figure 1: Depicts the rear view of the mobile screen at the incident scene (Note: items were placed under the right rear of the machine with additional panels and guards removed following the incident to assist in rescue efforts)



Worker one noticed the belt feeder conveyor was tracking to one side and decided to track the belt to recentre it on the idler drum and rollers. Guards previously opened for cleaning the machine were left open during this process. Before tracking the belt, Worker one loosened the bearing housing bolts on either side of the tail drum to allow adjustments to the drum's position. He then activated the conveyor belt at idle speed and adjusted the belt tracking by turning 2 adjusters on the rear body of the mobile screen to the right and left sides. To track the belt, a small adjustment was made to one of the adjusters and then the belt was operated for several minutes to observe the adjustment effect. If the belt was not centred, then another small adjustment was made and the belt was run again, with the process continuing until the belt tracked to the centre of the drum and rollers.

Figure 2: Depicts the rear view of mobile screen with relevant parts identified and the approximate location of worker 2 at the time of the incident labelled (Note: the conveyor belt was cut during rescue efforts)

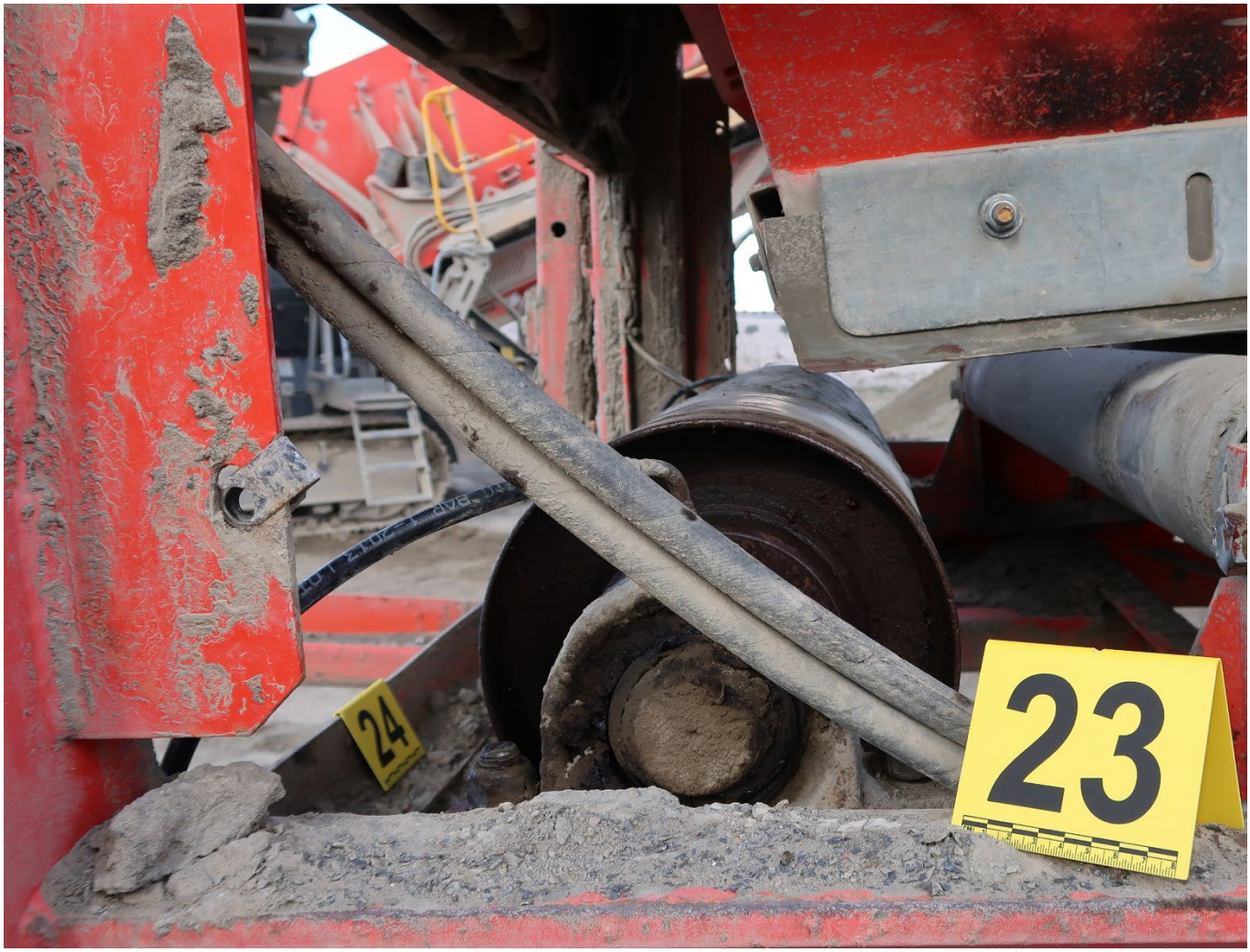


By 3:30 pm, Worker one had been tracking the belt for about 30 minutes but was having problems centring it. He increased the belt speed to track it more quickly. As Worker one continued working at the rear of the machine, Worker 2 stood to the right-rear of the mobile screen, talking with Worker one, but not engaged in any specific task. Worker one walked away to his light vehicle parked about 5 metres to the rear of the mobile screen. At this time, Worker 2 accessed the belt feeder conveyor through the open right-hand side guard door for an unknown reason. His right arm became entangled in the idler drum that was turning at speed. Worker 2's arm was pulled under the rotating drum up to his shoulder by the moving conveyor. Worker one then became aware of Worker 2's entanglement and shut down the mobile screen using the key at the control panel.

Worker 2 said he was not aware of how he became entangled in the idler drum and said he did not intentionally reach into the open guard door. He said he could not recall what caused his arm to

enter the open guard door. Neither of the other workers were observing him when he became entangled.

Figure 3: Depicts a close-up view of the tail drum taken through right-hand guard door where the injured worker was positioned



Worker 2 was trapped in the machine for several hours until freed by emergency services and airlifted to hospital where he remained as an inpatient for 2 weeks. His right arm was amputated at the shoulder in-situ during the emergency response.

Investigation

The Resources Regulator's Major Safety Investigation Unit investigated the incident to determine its cause and circumstances.

The investigation found several factors contributed to the worker being exposed to the risk of serious injury or death, including:

- It was common practice for workers to track the mobile screen's conveyor belt with guards removed contrary to the original equipment manufacturers (OEM) user manual that required:
  - guards to be removed for the purpose of cleaning be replaced before belt tracking; and
  - the rear guard door remain fixed to the mobile screen at the time of belt tracking with adjustments to the belt made by manipulating 2 adjusters on the rear body of the mobile

screen (outside the rear guard) and the progress of adjustments observed through a viewing window incorporated in the rear guard.

- an internal guard originally fitted over the tail drum immediately inside the rear panel was missing from the machine.
- There was no safe work procedure for tracking conveyor belts on the mobile screen and the OEM's user manual (which contained a procedure for belt tracking) was not made available to workers.
- Many aspects of the contractor's safe work method statement were not followed by workers in practice, nor enforced by their supervisor, including:
  - isolation of plant prior to starting maintenance
  - replacement of guards removed for maintenance prior to operating the machine
  - conduct of daily checks of emergency stops (which had not been undertaken for approximately 4 months at the time of the incident)
  - the conduct of daily risk assessments by the supervisor to identify key hazards in work areas (no such risk assessments were conducted).
- The supervision of contract workers at the mine was inadequate.

The investigation also identified numerous instances where health and safety features of the mobile screen including guarding, emergency stops and lanyards were not installed, removed or not functioning appropriately.

Recommendations

Mine operators and contractors must manage entanglements risks posed by the moving parts of plant by:

- developing and implementing introduction to site procedures, including conducting comprehensive risk assessments of plant purchased second-hand, to ensure that safety features have not been removed or otherwise compromised
- applying the hierarchy of controls including:
  - ensuring, to the extent it is reasonably practicable to do so, that all guards are securely fixed in place during maintenance (including belt tracking) work
  - ensuring, where it is not reasonably practicable to securely fix guards in place during maintenance work, that plant is electrically isolated and not re-energised until all panels and guards are securely fixed
  - development and implementation of safe work procedures for belt tracking that operationalise OEM user manual procedures and electrical isolation i.e. general references in operational procedures to the OEM manual should be avoided in recognition that workers may not read it
  - provision of adequate information, instruction and training to workers in procedures
  - provision of adequate supervision and monitoring to ensure implementation of the abovementioned.

Workers must:

- never start plant for the purpose of maintenance (including belt tracking) unless all guards are securely fixed in place unless it is not reasonably practicable to do so
- electrically isolate plant, where it is not reasonably practicable to securely fix guards in place during maintenance work, and not re-energise until they are securely fixed
- intervene when safe working procedures are not followed and other workers exposed to risks to their health and safety
- not undertake a work task for which they have not been provided adequate information, instruction and training or otherwise (as mandated by section 84 of the WHS Act 2011 (NSW)) harbour a reasonable concern they would be exposed to serious risks to their health and safety emanating from an immediate or imminent exposure to a hazard.

For further information and recommendations, refer to the following information published by the Resources Regulator or SafeWork NSW:

- Investigation information release IIR23-07 on 19 September 2023
- Investigation information release IIR25-01 on 16 January 2025
- Investigation report- serious hand injury to worker while operating a mobile-screen on July 2024
- MDG 15 - Guideline for mobile and transportable plant for use at mines other than underground coal mines
- MDG 40 - Guideline for hazardous energy control (isolation or treatment)
- SafeWork NSW code of practice – Managing the risks of plant in the workplace
- SafeWork NSW Plant, Equipment and Machinery Energy Isolation Guidelines