Significant Incident Report No. 244

Subject: Failed gantry bridge crushes boilermaker working in thickener tank – fatal accident

Date: 03 August 2016

Summary of incident

Note: The Department of Mines and Petroleum's investigation is ongoing. The information contained in this significant incident report is based on materials received, knowledge and understanding at the time of writing.

On 26 July 2016, a boilermaker working inside a thickener tank during a shutdown died when the gantry above him failed and collapsed, crushing and pinning him against the concrete floor.

The worker had been tasked with removing the thickener's rake shaft in the centre of the tank. The rake shaft was no longer in use and the rake arms had previously been removed. The rake shaft passed through the feedwell above, and was attached to the motor on the self-supporting gantry bridge that spanned the tank. The feedwell was attached to the underside of the gantry.

As he stood on the tank floor, cutting into the rake shaft, the gantry failed and collapsed, pinning him to the floor. Another worker in the tank who was assisting the boilermaker raised the alarm. Despite the efforts of the emergency services, the boilermaker died from his injuries.

Left. Gantry bridge that failed and collapsed onto the thickener floor. Right. Corroded structural steel angle.

Direct causes

- The gantry bridge had deteriorated substantially due to corrosion and was no longer self-supporting.
- The rake shaft, which was now providing primary support, failed while being cut.

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Contributory causes

- The structural integrity of the tank had not been assessed by a competent person prior to work being carried out.
- The boilermaker was instructed to remove the rake shaft, which was not designed to provide primary support.

Actions required

The following actions are recommended to manage the structural integrity of plant and structures, and reduce the potential for structural failure and injury while undertaking construction work.

Inspection

- Using a risk-based approach to determine the timing of inspections and monitoring, a competent person should periodically assess all plant and structures on site to confirm structural integrity or advise of remedial measures.

Demolition and maintenance

Mining operators have responsibilities regarding construction work, including demolition and maintenance, of plant and structures under regulations 4.18 to 4.22 of the Mines Safety and Inspection Regulations 1995. This includes the appointment of a competent supervisor for such work and compliance with Australian Standard AS 2601 *The demolition of structures*.

Some recommended work practices are listed below.

- A competent person, with an understanding of job weights and load paths at all stages of the work, plans any job involving the cutting or removal of structural components.
- Maintain the structure, and its components, in a safe and stable condition at all work stages.
- Use temporary bracing, guy ropes, shoring or combinations of these for stability where necessary.

Undertaking work

- Stop work if there are unplanned movements or structural deflections during the job and inform the supervisor. A competent person should assess the situation and advise the measures to be taken to ensure there is no exposure to harm when completing the job.

Further information

- Standards Australia, www.standards.org.au

  AS 2601 *The demolition of structures*

  AS 5104 *General principles on reliability for structures*

- Department of Mines and Petroleum, www.dmp.wa.gov.au/ResourcesSafety

  Mines Safety Bulletin No. 124 *Structural safety of buildings, plant and other structures*

  Toolbox presentations from the *2015 Structural Integrity Forum*

This Significant Incident Report was approved for release by the State Mining Engineer on 03 August 2016