



Mines Safety Bulletin No. 173

Subject: Inspection and maintenance of handrails

Date: 26 March 2020

Background

During inspections, Mines Safety inspectors frequently identify handrails in poor condition or not fit for purpose, including handrails that have collapsed in areas where they need to protect people from falling. This is especially notable where structures are prone to corrosion such as above tanks, in saline or moist environments, or are adjacent to vibrating equipment and mobile plant work areas.

Inspectors are also finding inadequate repairs to handrails.



Handrail post failure after inappropriate repair. The corrosion was removed and the area painted without strengthening.

Handrails are an engineered safety device required by regulation 4.4(1) of the Mines Safety and Inspection Regulations 1995 to reduce the risk of falling from heights. Any reduction in their capacity increases risks to workers. It is common practice for fall protection systems such as fall arrest equipment to be taken out of service when defects are observed; however, defective handrailing often remains in service without consideration of its reduced protective capacity.

In general, handrails in use on mine sites are mass produced to a specified Australian standard. Most do not have engineered reserve capacity to allow for damage or corrosion. They are not designed as anchor points for fall arrest devices, stabilisation points for scaffolding, or to be extended in height by scaffolding tube or other means.

Summary of hazard

Workers are exposed to increased risk of falling from heights with potentially serious or fatal injuries when:

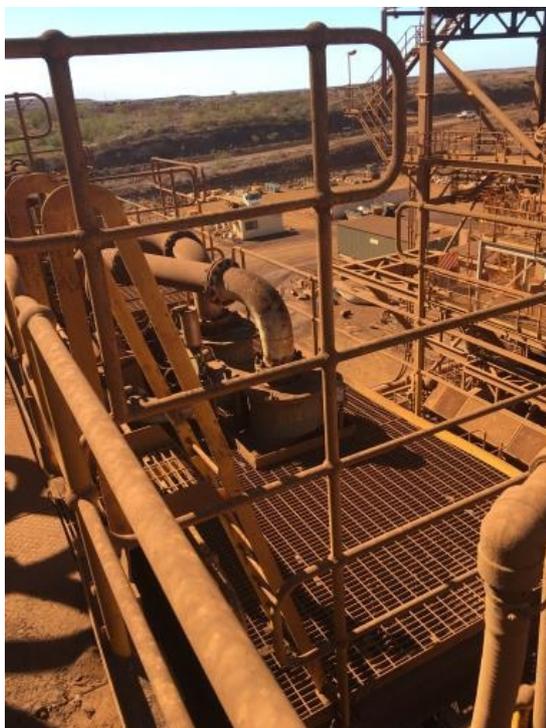
- maintenance and repair of handrails is delayed
- inspection of handrails is not undertaken by a competent person
- handrails are modified or extended in height
- repairs are not specified by a competent person.

The fall can expose workers to other hazards including drowning, harmful atmospheres and other hazardous materials.



Delayed maintenance led to handrail failure.

Workers are exposed to additional risks when handrails are modified locally and/or are increased in height. These modifications create a misleading sense of safety and expose workers to increased risks of falling from heights.



Handrails with six rails not in accordance with manufacturer's specifications of two rails.

Contributory factors

- Cursory or overlooked inspection of the handrails contributes to corrosion remaining unidentified until it affects the structural capacity of the handrail and fatigue cracks being identified only after failure of the handrail.
- Competent person(s) have not inspected the damaged or corroded handrails before specifying simple repairs.
- Competent person(s) have not designed the handrails for the conditions on-site.
- A mistaken belief that handrails are an item of plant, as opposed to a safety item, and can be risk assessed in the same manner.

Actions required

To ensure handrails are adequately maintained, the Department recommends the following actions.

- A competent person inspecting handrails needs to be able to:
 - identify the maximum heights and spans of the handrail system, along with original equipment manufacturer (OEM) specifications and requirements relevant to the site
 - identify rust and corrosion that affects the performance of handrails and posts
 - recognise those areas of a handrail that are critical to its performance.
- The following should always be referred to a competent person for appropriate action:
 - rust or damage to the post or rails
 - handrails with more than two rails
 - rails that move excessively under hand.
- When defects are observed in critical handrail components, temporary measures must be put in place, such as alternate hard barricading and restricting access to the affected area.
- Repairs should be undertaken as soon as corrosion appears or damage is notified.
- Repairs must be specified by a qualified person and parts replaced in accordance with the OEM's specifications and based on the site conditions.

Further information

- AS 1657 Fixed platforms, walkways, stairways and ladders – Design, construction and installation
- Toolbox presentations from the 2015 Structural Integrity Forum
www.dmp.wa.gov.au/Safety/Toolbox-presentations-16177.aspx
- Mines Safety Bulletin No. 124 Structural safety of buildings, plant and other structures
www.dmp.wa.gov.au/Documents/Safety/MSH_SB_124.pdf ;
- NSW Safety Alert SA08-06 Worker falls through guardrail
www.resourcesregulator.nsw.gov.au/__data/assets/pdf_file/0008/219491/SA08-06-Worker-falls-through-guardrail.pdf

This Mines Safety Bulletin was approved for release by the State Mining Engineer on 26 March 2020