Integrity of structures

When the integrity of a structure is compromised, there is the potential for fatal and serious injuries. The most common types of structural failure include rust and corrosion, cyclones or strong winds, design faults, inadequate alterations of design, poor construction of structures and lack of proper assessment. There are three components to consider when addressing the causation factors for failure: design, construction and maintenance. Communication between competent people during these three phases is important for the integrity of structures.

The snapshot covers the period from 1 December 2016 to 30 November 2017 when there were 1,197 injuries and 2,399 notifiable incidents (specific reporting categories). Of these, 14 injuries and 54 notifiable incidents involved structural integrity.

Injuries by severity
9 of the 14 injuries related to structural integrity were classified as serious
8 of the 14 injuries were lost time

Injuries by type
7 of the 14 injured people were caught between a still and moving object

Injuries by employment type
4 Company
10 Contractor

Injuries by part of body
9 of the 14 injuries were to hand

Injuries by nature
7 of the 14 injuries were high-consequence injuries (amputations, fractures and crushing)

Notifiable incidents by reporting category
- Potentially serious occurrence: 46%
- Incidents affecting registered plant: 28%
- Explosion or bursting of compressed air receivers, boilers or pressure vessels: 2%
- Electric shock or burn or dangerous occurrence involving electricity: 2%
- Breakage of a rope, cable, chain or other gear by which persons are raised or lowered: 2%
- Outbreak of fire above or below ground: 4%
- Serious or appears to be serious (including fatality): 17%
- 22% of the notifiable incidents related to fixed plant
- 20% were crane incidents
- 15% were breakage of rope

Note: The information in this snapshot has come from a keyword search of incident reports.
Spotlight on Mines Safety Bulletin No. 124

Structural safety of buildings, plant and other structures
16 September 2015

Key message:
Structural integrity and safety rely on good practice and communication throughout a structure’s life cycle – from its design, to its construction (including decommissioning) and during its use. If this does not happen, or is ineffective, it compromises worker safety and can lead to structural failure (see alerts below).

Spotlight on Mines Safety Significant Incident Report No. 244

Failed gantry bridge crushes boilermaker working in thickener tank – fatal accident
03 August 2016

A boilermaker died after being crushed and pinned to the floor by the collapse of a corroded gantry in a thickener tank.

Key message:
Maintaining a structure in a safe and stable working condition at all stages is important, including during the cutting and removal of structural components. When demolishing structures there are responsibilities that must be met, including the appointment of competent supervisors and compliance with the relevant Australian Standard.

Spotlight on Mines Safety Bulletin No. 140

Structural collapse of buildings and temporary structures during wind events
27 March 2017

Buildings can collapse when their strength is inadequate for the load applied, such as the action of wind.

Key message:
Consider the site’s wind speed when designing or supplying buildings. Ensure they are constructed to the design specification, and inspected by competent persons to confirm quality of construction and that they are being safely maintained.

Recent example

Incident affecting registered plant 20/09/17

While preparing for a planned rope replacement on a crane, a technician observed that the main boom section had slightly deformed. On closer inspection, it was found that the top wear pad had been forced against the outer boom by the inner boom. The job was stopped and supervisor was informed. The equipment has been tagged out of service, pending an investigation and repair of the crane.

Safe work practices

Examples include:

- Only use the structure for the purpose for which it was designed unless modifications have been design checked, tested and approved by qualified professionals
- Carry out annual structural inspections to produce detailed reports of any repairs required
- For older plant, carry out a structural design audit to ensure structural steel components are not overstressed, and the supporting structure complies with the relevant Australian Standards

For more information see Large working structures – mines safety matters pamphlet

For more information see our safety alerts and summaries for industry awareness at www.dmirs.wa.gov.au
Past issues of monthly safety and health snapshot series can be viewed at www.dmp.wa.gov.au/SafetySnapshots

KNOW YOUR HAZARDS

Are you aware of your workplace hazards?

Know Your Hazards is a video series produced by the Department for the resources industry. The series targets common workplace hazards that have injured or killed. Let’s work together to reduce the risk of these accidents happening.

View or download our hazard awareness videos at www.dmp.wa.gov.au/HazardVideos