



Mobile and fixed plant

Issued May 2020

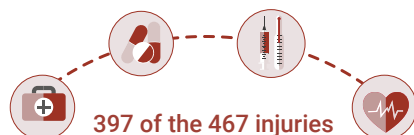
The size, weight and power of mobile and fixed plant used in mining operations can expose workers to lethal hazardous energies if the risks are not adequately controlled. We know this because fatal incidents and serious injuries related to mobile and fixed plant continue to occur. To adequately control the risks, a precautionary approach is required from design through to operation and maintenance of all plant, by all persons involved, and at all stages of the life cycle. Risks should not be tolerated or accepted if there are reasonably practicable means of controlling them.

The snapshot covers the period from August 2018 to July 2019 (unless stated otherwise). There were a total of 1,407 injuries in this period. Of these, 467 injuries were related to plant and machinery.

@DMIRS_WA

Department of Mines,
Industry Regulation and Safety

Injuries by severity



identified as mobile and fixed plant injuries were **classified as serious**

171 of the 467 injuries were **lost time injuries**

Injuries by nature

53% of the 467 injuries were **strains and sprains**

Amputation, fractures and crush had the 2nd highest at 20%

Injuries by occupation (top 3)

Mobile plant operators had the highest proportion of injuries at **60%**

Maintenance personnel had the 2nd highest at **27%**

Fixed plant operators had the 3rd highest at **13%**

Injuries by location

412 of the 467 injuries occurred at **surface operations**



24% of the 412 injuries were at **treatment plant**



55 of the 467 injuries occurred at **underground operations**



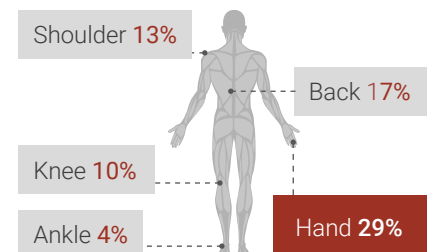
24 of the 467 injuries occurred at **exploration operations**

Injuries by employment type

265
Company

202
Contractor

Part of body (top 5)



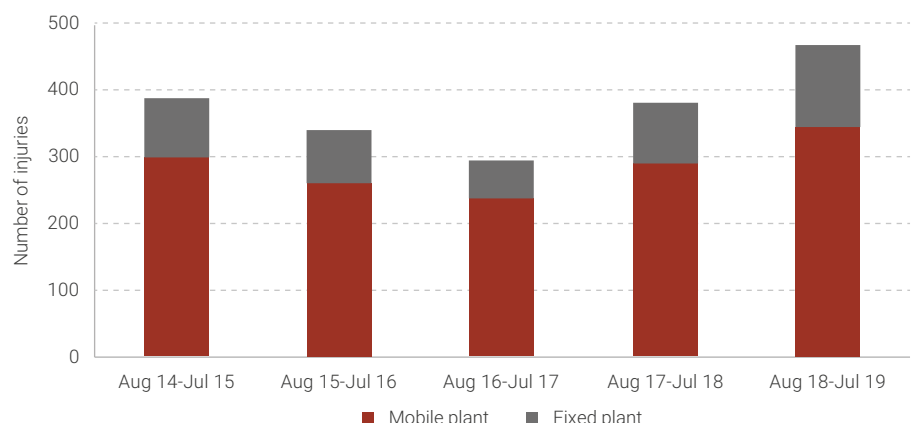
Injuries by commodity (top 3)

35% of injuries were from **iron ore**

Gold had the 2nd highest at **23%**

Bauxite and alumina had the 3rd highest at **13%**

Number of injuries in 5 rolling years (August 2014 to July 2019)



Managing the risk

To control the risk of exposure to all hazards associated with mobile and fixed plant and provide a safe working environment, a holistic approach is required. It is important to ensure that:

- all plant and equipment is fit for purpose and safe to operate
- all operators, maintenance personnel and their supervisors are sufficiently competent (i.e. trained and assessed) for their roles
- adequate safe work procedures and systems of work are in place.

There is no acceptable or tolerable level of risk in the Mines Safety legislation. The general duty of care obligations in the *Mines Safety and Inspection Act 1994* imply that risks are expected to be controlled to SFAIRP levels (so far as is reasonably practicable). Therefore, risk controls should be reviewed periodically to ensure they are consistent with current knowledge about the risks to health and safety and current best practice regarding means of removing or mitigating the risk.

When selecting or designing plant and equipment, training and assessing personnel or designing safe work procedures and systems of work, it is essential that **human and organisational factors (HOF)** are considered. A large proportion of injuries associated with plant and equipment can be attributed to human error. Therefore, it is necessary to ensure that plant, equipment and systems of work are error tolerant and other limitations of human performance (physical and mental) are considered.



Safe, fit-for-purpose equipment

Even the safest fixed and mobile plant still include inherent hazards. Damage and defects from normal use may develop over time that increase the risk of these hazards or introduce new hazards. Mining operations need to ensure all plant is designed, selected, operated, inspected, tested and maintained in accordance with the designer's intent, original equipment manufacturer (OEM) instructions, appropriate standards and sound engineering practices.

Plant and equipment should be just as safe to use on the first and last days of its operational life. Therefore, aged plant and equipment generally requires additional effort to maintain its integrity so that it can continue to be operated safely.

Maintenance strategies play an important part in the continued integrity of plant. These strategies generally fall into three categories:

- predictive (e.g. based on condition monitoring)
- preventative (e.g. based on prescribed periodic inspection or replacement)
- run-to-breakdown (e.g. repair after failure).

Generally, run-to-breakdown is not a safe strategy unless the equipment is designed to fail in a safe manner.



Competency

Competency is usually defined as an appropriate combination of qualifications, knowledge and experience. Qualifications and experience are easy to verify but a person's knowledge must be assessed through a suitable combination of verbal and/or written examination as well as practical tests and/or observation.

All plant and equipment, no matter how well designed, manufactured and maintained, has performance limits and vulnerabilities. Part of being a competent operator is understanding these limitations and vulnerabilities so that the plant and equipment is operated in a safe manner.

Maintenance personnel also need to be adequately competent. General trade qualifications and general industry experience is often not sufficient. Specialist knowledge and experience of particular types, sizes and makes of plant and equipment may be required.

All personnel should understand the limits of their own competency and not work outside of these limits unless they are closely supervised or assisted by others who are sufficiently competent.



Safe procedures and systems of work

Generally, all routine tasks associated with plant and equipment should be documented in complete, concise, accurate and easily accessible safe work procedures (SWPs). Relevant personnel should be trained and assessed in these procedures.

For routine or repeated tasks, personal risk assessments and task or team-based risk assessments should not be used as a substitute for adequate SWPs. These risk assessments should be used in conjunction with SWPs to cover any risks or hazards not covered by the SWP (e.g. from changes to the working environment or necessary deviations from the standard procedure).



Further information

- What are safe work procedures (SWPs)?
- How is a safe work procedure (SWP) developed?
- Useable procedures

Mines safety significant incident reports

- SIR No. 267 *Haul truck operator loses control descending ramp on haul road – fatal accident*
- SIR No. 270 *Operator trapped between elevated work platform (EWP) and overhead structure*

For more mines safety significant incident reports visit
www.dmp.wa.gov.au/Safety/Mines-safety-alerts-13194.aspx