Government of **Western Australia**
Department of **Mines, Industry Regulation and Safety**

WorkSafe
Western Australia
Mines Safety

Safety and Health Snapshot for the Western Australian minerals sector

Welding hazards

Issued October 2021

Exposure to welding hazards can result in serious injuries, illness or fatalities. Some welding hazards include electric shock, radiation, burns, heat stress, fire, explosions, fumes and gas. Always make sure your location is safe, your tools and equipment are suitable, appropriate personal protective equipment is worn and correct materials and procedures are used.

This snapshot covers the period from 1 July 2019 to 30 June 2020 (unless stated otherwise). During this period there were a total of 14 injuries and 50 incidents involving welding hazards.

For more information about occupational safety and health, visit our website **www.dmirs.wa.gov.au**

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Notifiable incidents by area

47 of the 50 notifiable incidents occurred during **surface operations**

3 of the 50 notifiable incidents occurred during **underground operations**

Injuries by employment type

Notifiable incidents by legislative description

60% electric shock or burn or dangerous occurrence involving electricity

28% outbreak of fire above or below ground.

10% potentially serious occurrence

2% serious or appears to be serious injury (including fatality)

Injuries by severity

9 of the 14 injuries related to welding hazards were **classified as serious**

4 of the 14 injuries resulted in **lost time injuries**

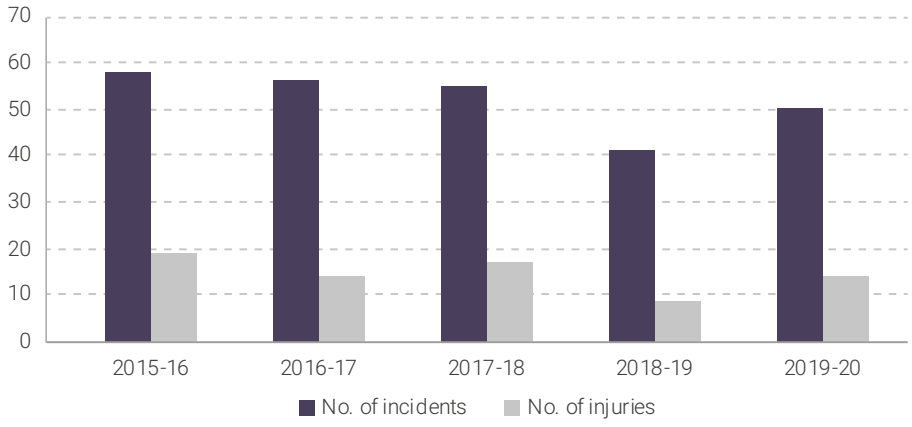
Injuries by part of body (top 3)

29% of the 14 injuries were to **hand**

21% of injuries were to **foot and toes**

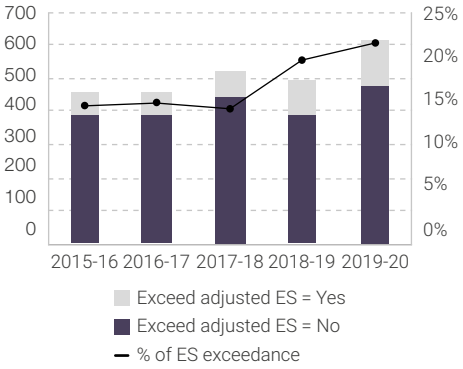
14% of injuries were to the **eye**

Welding incidents and injuries in the last 5 financial years



Note: The information in this snapshot has come from a keyword search of incident reports.

Welding fumes samples and ES exceedance in the last 5 financial years



Exposure standard (ES) represent the airborne concentration of a particular substance or mixture that must not be exceeded to protect the health of workers. It has been developed for conventional work shifts of five consecutive 8-hour work days, followed by two days off (40-hour work week). ES is adjusted accordingly if the work shift is more than 8 hours.

For more information on exposure standards see Guidance about dusts and other airborne contaminants

From the welding samples in 2019-20 it was observed that:

- 22% of the 611 samples taken in this period exceed the adjusted ES
- 28% of samples that exceed the adjusted ES are at least two times over ES.

Health effects of welding fumes include metal fume fever, toxic metal poisoning and lung cancer. Effects of welding fumes can be long term, and symptoms may take decades to show. Therefore, it is important to take all required safety precautions when engaging in welding activities to minimise exposure.

Spotlight on *Mines Safety Bulletin No. 154*

Managing long-term exposure to carcinogenic welding fumes

24 August 2018

Contributory causes

The airborne hazards associated with welding vary depending on the working environment, type of metal and flux, and the chemical nature of paints or cleaners on weld surfaces. Exposure of workers to welding fumes is significantly increased when:

- there is inadequate local exhaust ventilation to draw the fumes away from the breathing zone of the worker
- there is no, or inadequate, personal protective equipment (PPE) used to protect the worker from particulates and gases produced during welding
- welders remove the helmet shield prior to complete dispersion of the fume cloud.

Spotlight on *Mines Safety Bulletin No. 117*

Preventing electric shocks during welding

22 December 2014

Contributory causes

The most common ways that a person becomes part of the welding electrical circuit are by:

- inadvertently touching exposed metallic or conductive parts during welding
- welding in wet or humid conditions, which increases the risk of inadvertent contact through
- water or sweat, which are conductive
- not using fit-for-purpose personal protective equipment (PPE)
- using a welding electrical circuit that is faulty due to inadequate testing and maintenance.

Some recent incidents

Outbreak of fire 20/08/20

A boilermaker was tasked with removing the bottom row of crusher concaves. To complete this task he was using a thermic lance to remove material to release the concave. During this process his trousers ignited, and sustained burns to his right leg. He was then taken to the medical centre for assessment, and then transferred to hospital for further treatment.

Assessing the risks

Before commencing work, assess the potential for exposure to welding hazards, such as:

- electrical shock from contact with live components
- radiation burns to the eyes or body due to the welding arc
- body burns from weld splatter or hot metal
- exposure to fire or explosions
- inhalation of fumes from the welding rod or surface being welded
- contact with noxious process materials in the work area.

Safe work practices

Examples include:

Keep the welding leads clear of your body and other people.

Do not weld while standing in water or out in the rain, and change any clothing that becomes wet.

Make work area safe by removing unnecessary equipment and any flammable material.

For more information see Guidance about welding and other hot work