Mines Safety Bulletin No. 180

Subject: Welding quality and qualifications of welders

Date: 10 June 2020

Background

Mines safety inspectors have identified serious safety issues related to the performance and management of on-site structural welding. Structural welds include welds associated with lifting lugs, safety devices and safety protection systems, which are often only loaded during critical safety events.

Failure of structural welds can lead to catastrophic structural collapse and expose workers to the risk of serious or fatal injury.

Failure of welds on drill rig's boom clevis plate (locating tab/plate) results in boom and mast falling.

Regulation 6.4(2) of the Mines Safety and Inspection Regulations 1995 (MSIR) requires site welding to be undertaken to Australian Standards (AS) unless a higher standard is available.

The AS/NZS 1554 set covers the requirements of welding, with AS/NZS 1554.1 section 1.7.2 stating that a weld shall:

- be made in accordance with a qualified welding procedure
- be carried out by a welder suitably qualified to carry out such a procedure
- be carried out under the supervision of a welding supervisor
- comply with the appropriate requirements of this Standard.

Qualifications
Regulation 4.13 of the MSIR requires that each responsible person must ensure that persons conducting welding work at a mine site be adequately instructed, trained and assessed as competent to do so, before commencing such work.

Welding supervisor qualifications are covered by AS/NZS 1554.1 section 4.12.1.

AS/NZS 1554.1 section 4.12.2 covers qualifications for welding personnel and requires that records are kept showing that the welder was qualified to carry out the respective welding procedures.

In Western Australia, a boilermaker or maintainer qualification, and other basic welding qualifications, do not qualify a person to carry out structural repairs and/or carry out welding to safety critical devices such as lifting lugs, attachment points and fixings, and handrails, unless covered by an original equipment manufacturer's documented specification.

Summary of hazard

Welds that are not carried out to the required standard expose workers to the risk of serious or fatal injury if the weld fails at a safety critical time, such as:

- collapsing plant or sections of plant
- lifted loads falling from height
- falling from heights if the handrail or safety attachment point fails
- uncontrolled movement of plant if welded connections fail.

Cracks in site welds after the crane runway was upgraded and structural repairs undertaken.

Contributory factors

- Weld requirements not specified by a competent person.
- Welds not made in accordance with qualified welding procedures.
- Welds not carried out by suitably qualified welders.
- Welds not carried out under the supervision of a qualified welding supervisor.
- Welds not inspected by a qualified welding inspector.

Actions required

The Department recommends that the system of work for on-site welding includes:

- provision of a structural design for all structural welds for construction, structural alterations and repairs, lifting devices, attachment points, and other safety devices
- provision of a welding specification, in accordance with the requirements of AS/NZS 1554, with the structural design
- appointment of a qualified welding supervisor to supervise and be responsible for all welding operations
- verification of the qualifications and competency of the welders to be used
- appointment of qualified welding inspectors to verify the welds as complying with the design
- maintaining records in accordance with AS/NZS 1554 Set for all welders on site, or visiting site, along with their competency and most recent tests
- re-testing welders regularly in accordance with AS/NZS 1554 for the specified weld types
- auditing the site records on a regular basis to ensure ongoing welding compliance.

Further information

- AS/NZS 1554 SET:2014 Structural steel welding Set
- WorkSafe Victoria

  On-site structural welding

  d3n8a8pro7vhmx.cloudfront.net/amwu/pages/1689/attachments/original/1473986872/Structura
  1473986872

- Weld Australia

  A guide to the qualification of weld procedures

  weldaustralia.com.au/wp-content/uploads/2019/02/Weld-Australia-Guidance-Note-TGN-SG06-AS-NZS-1554.1-A-Guide-to-the-Qualification-of-Weld-Procedures.pdf

This Mines Safety Bulletin was approved for release by the State Mining Engineer on 10 June 2020