



Mines Safety Bulletin No. 108

Subject: Testing of cranes to address the potential for uncontrolled descent of load during power failure

Date: 22 November 2013

Background

Investigations have revealed cranes operating at mine sites with inadequate records of commissioning and load testing. This is partly the result of uncertainty over the Standards Australia Ruling SA RUL CR.1-2013 *Rulings to cranes, hoists and winches*, and its application under the *Mines Safety and Inspection Act 1994* and *Mines Safety and Inspection Regulations 1995*.

Clarity is required regarding performing and recording commissioning tests on cranes in accordance with the Act and regulations.

Testing of crane brakes under power failure conditions is required by Australian Standard AS 1418.3 *Cranes, hoists and winches - Bridge, gantry, portal (including container cranes) and jib cranes*. Clause 12.2.4 of AS 1418.3 requires checking of the hoist brake application when lowering on power failure.

Enquiry C of SA RUL CR.1-2013 indicates that using the emergency stop satisfies power failure load testing requirements if "it simulates sufficiently conditions under a power failure (when the braking is done purely by mechanical means)".

Other relevant legislation includes:

- Section 14 of the Act, which requires testing of plant to ensure that it is compliant with design
- Regulation 6.33, which requires all cranes to be compliant with AS 1418
- Clause 8.7.2 of AS 1418.1, which requires a crane's control system and equipment to provide fail-safe operation at all times including when there is a power supply failure
- Clause 8.7.4 of AS 1418.1, which requires an electrical control malfunction to not result in an unsafe condition of the crane
- Clause 8.10.4.2 of AS 1418.1, which requires a crane isolator to be readily accessible at a location that provides a clear view of all crane operations
- Regulation 6.20, which requires the installation and commissioning of plant to be performed by a competent person who is provided with adequate information to carry out the task
- Regulation 6.25, which requires records of testing to be kept for registered classified plant.

Note: The intent of the legislation is that employers must be able to prove that they have complied with minimum requirements of testing. Plant must comply with AS 1418, which requires a load to stop in the shortest possible time without causing shock to the structure. Visible acceleration is not stopping in the shortest possible time and therefore it is not an acceptable condition. AS 1418 also requires that the test performed simulates the conditions under power failure. The employer must prove this compliance with relevant records.

Summary of hazard

A power supply failure to a crane at a mine site is a conceivable event that can lead to the uncontrolled descent of a load. Using the emergency stop for load testing may not replicate all the conditions of a power outage.

Recommendations

When performing and keeping records of crane load testing, more rigorous processes and attention to detail will improve the identification and control of hazards associated with crane operation.

Crane designers and suppliers

- When the crane isolator is not used to simulate power failure during commissioning testing, the record of testing must include:
 - justification as to why it is not practicable to use the crane isolator for this testing
 - verification that the testing performed simulates the conditions under a power failure.
- Verify the competence of the person performing the testing, and include details with the record of crane load testing.
- Provide all test acceptance criteria to the person performing the load test.

Site representatives

- Ensure operating hazards addressed by the load testing of the crane are identified, risk assessed and have quantified criteria to establish a successful load test.
- Ensure load test procedures and acceptance criteria are in place before allowing a load test to commence.

Persons conducting a load test

- Set targets for all load test criteria prior to testing.
- For a load test to be successful, there must be no visible acceleration of a load after a power failure occurs or is simulated.



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