

C: OPERATIONS STANDARDS

C6. CRANES AND LIFTING EQUIPMENT

1.0 Scope

- 1.1 This standard applies to all cranes including vehicle-mounted cranes, equipment used as cranes, hoists, lifting and rigging equipment. The standard does not apply to hoisting operations in underground mines.

2.0 Planning

- 2.1 Each operation must develop a register of critical lifts and a documented plan for each critical lift to address the associated hazards. Critical lifts include all multiple crane lifts; lifts over operating facilities where this may endanger personnel; lifts over power lines; lifts involving personnel cages; and lifts at maximum rated loads. The lift plan must include:
- **Lift data:** equipment weight, rigging weight, total weight, height of lift, radius of lift and equipment surface area, center of gravity.
 - **Equipment data:** manufacturer, model, size, boom length, jib length, load block, material size.
 - **Rigging data:** sling diameter, length, sling configuration, capacity, hook type, shackle size and capacity.
 - **Lift computation:** boom length, radius of lift, equipment capacity, size of outrigger footplates, and wind speed.
 - **Proximity to power lines and process areas:** mobile cranes working in proximity to energised power lines must operate under a proximity permit, which must define exclusion zones and spotter duties.
 - **Local hazards and their controls:** including the route for the crane, ground stability, proximity of people or equipment and agreed communication method.
- 2.2 Crane drivers and rigging crews involved in critical lifts must have input into the lifting plan and be consulted prior to finalisation of the plan.
- 2.3 Lifts not subject to detailed lift plans must be subject to a risk assessment.
- 2.4 Where practicable or where the weight of a lift is uncertain, cranes should be fitted with a load cell with the weight of the load displayed in the visual range of the operator.
- 2.5 Where practicable, cranes should be equipped with an anti two-block device or limit switch that includes audible and visual alarms.

3.0 Operation

- 3.1 There must be a documented process that ensures all critical components are inspected and in place prior to a crane being commissioned and put into service.
- 3.2 Crane operators must undertake a pre-operational safety check for each shift the crane is used and this should be kept with the crane. The detail required in the pre-operational safety check must be based on a risk assessment for the crane.
- 3.3 A crane must not be operated with an inoperable or defective safety device.
- 3.4 There must be documented procedures that require:
- All rigging connections to be checked and correct prior to commencing a lift.
 - Checks that the load being lifted is within the rated capacity of the crane and lifting attachments and is also within the limits set out in the lift plan.
 - Checks of all safety devices or overload limiters to ensure they are not overridden or cut out.
- 3.5 All lifting hooks (except for grab and chain shortening hooks) will be fitted with a safety latch to prevent the load from accidentally detaching, unless otherwise specified in a risk assessment.
- 3.6 Loads must not swing over people or occupied buildings and no person shall be under a suspended load or in a position where they could be struck by a falling load. Where there is a risk of a load falling and striking a person, barricading or similar controls to prevent access must be in place.
- 3.7 The operator shall not leave the crane controls while a load is suspended.
- 3.8 Overhead travelling cranes must be fitted with audible travel alarms or an equivalent warning device.
- 3.9 Tag lines must be attached to loads that require steadying or guidance while suspended. The load must be well secured and properly balanced in the sling or lifting device.
- 3.10 There must be a documented and approved method for communication between the crane driver and those assisting with the lift.
- 3.11 A procedure must be in place to prevent the use of lifting or rigging equipment in lifting operations if such equipment has been used for towing.
- 3.12 Mobile cranes must have a rating capacity chart fixed in a position visible to the crane operator or available in the crane cabin.

2.

Rio Tinto Safety Standards

- 3.13 Operator control stations for vehicle-mounted cranes must be located in an area protected from swinging loads and from the crane jib.
- 3.14 Slew pins must be secured in place in mobile cranes while travelling.
- 3.15 Slewing to test the integrity of outriggers on mobile cranes must be conducted prior to commencing lifts.

4.0 Maintenance and Inspection

- 4.1 A register of cranes, hoists, rigging attachments and lifting slings must be established.
- 4.2 Any crane brought to site must have a current test certificate and a pre-use safety inspection to ensure the crane is fit for purpose. As a minimum, this inspection must satisfy regulatory and manufacturer requirements for frequency of inspection and physical condition of the machine.
- 4.3 There must be a system for the inspection, maintenance and approval of lifting equipment, including a process that verifies the equipment is able to function to its design specifications and the integrity of:
 - Mechanical and electrical components.
 - Controls for each piece of lifting or rigging equipment.
 - Crane cables and all lifting attachments.
 - Structural components of the hoist, brakes, wheels, hooks, hook-blocks and rails.
 - Integrity of load limiting devices, safety devices, limit switches and control systems required for individual equipment e.g. independent fail-safe braking systems, a device to stop the crane such as a “dead-persons” switch, and emergency shut-off switch.
- 4.4 Inspections and repairs to cranes, cables and lifting equipment must comply with the manufacturers specifications and regulatory requirements as a minimum.
- 4.5 Records of maintenance inspections and cable tests must be kept.

5.0 Training

- 5.1 Personnel must be trained, competent and authorised if they operate cranes; set-up or rig loads; provide signals for controlling lifts; or inspect, maintain or test cranes, hoists, personnel cages, lifting or rigging equipment.
- 5.2 There must be a system for establishing minimum operating time, frequency of operation and testing to ensure competency for each class of crane.