

C6 - Cranes and lifting equipment

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, admin/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and - where applicable - for post closure management.

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

2 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, centre 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; and
 - **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 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 Operators must undertake a pre-operational safety check for each shift the crane or lifting equipment is used and this should be kept with the equipment. The detail required in the pre-operational safety check must be based on a risk assessment for the equipment.
- 3.3 Cranes and lifting equipment 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; and
 - 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 available in the crane cabin.
- 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 Maintenance and inspection

- 4.1 A register of cranes and lifting equipment must be established.
- 4.2 Any crane or lifting equipment brought to site must have a current test certificate and a pre-use safety inspection to ensure the equipment 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 cranes and 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 for example: boom, hoist, brakes, wheels, hooks, baskets, out-riggers, hook-blocks and rails; and

- integrity of load limiting devices, safety devices, limit switches and control systems required for individual equipment eg 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 manufacturer’s specifications and regulatory requirements as a minimum.
- 4.5 Records of maintenance inspections and cable tests must be kept.

5 Training

- 5.1 Personnel must be trained, competent and authorised to:
- operate cranes and lifting equipment;
 - set-up or rig loads;
 - provide signals for controlling lifts; and
 - inspect, maintain or test cranes and lifting 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 and elevated work platform.

6 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	Jan 2001	CEO Safety Adviser	ExCo	
Version no.	Revision date	Revised by	Authorised by	Reason for change
2	December 2008	Paul Dewar; Adrian van Tonder	Rob Davies	Incorporation of suggested changes from operations and alignment with HSEQ management system.