

PROCEDURE

Title: **Cranes and Lifting**

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				Appr. Signature:

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1.0 PURPOSE

To provide standards for the safe operation of cranes, mobile cranes and lifting system equipment on the QAL site and to establish a system to ensure that equipment brought on site complies with legal and site requirements.

2.0 SCOPE

This procedure applies to all cranes, mobile cranes and lifting system equipment that move loads on the QAL site. The procedure applies to QAL and Contractor owned equipment and all hired equipment.

The procedure excludes the requirements for:

- Industrial rope access rescue equipment and systems (see AS/NSZ 4488 series).
- Personnel Fall Protection Systems (see P314.311 Work at Height)
- Queensland Fire & Rescue Service / First Response rescue lift equipment.
- Elevators – personnel.
- EWP and Scissor Lifts (see P314.311 Work at Height and P314.701 Operation of Mobile Equipment procedures).

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3.0 RESPONSIBILITIES

Basic Rigger

- Perform a visual inspection of all lifting equipment, prior to use.
- Participate in the development of the work group's **Pre-task Hazard Assessment** and a QAL Load Lift/Rigging JSEA on all load lifts involving rigging methods.
- Sling loads taking into consideration the nature of the load, its mass and its centre of gravity.
- Control a suspended load using a hand held tag line or load control pole.
- Uses mechanical load shifting equipment and associated gear to move, place or secure a load.
- Immediately tag defective equipment and take out of service.

Certified Engineer

- Approve a load being supported by or to a structure, process pipe or framework by lifting equipment.
- Approve modifications or alterations to lifting equipment items.

Crane Base Supervisor (or delegated representative)

- Co-ordinate the selection and provision of all mobile cranes used within QAL under their control.
- Retain completed Load Lift / Rigging Job Safety Environment Analysis (JSEA) performed by crane drivers for current plus previous month.
- Participate in development of all critical lift plans under their control.
- Approve critical lift plan.
- Retain all completed critical lift plans.
- Maintain critical lift plan register.
- Inspect, site approve and maintain inspection records and crane risk assessments for all mobile cranes entering QAL.
- Maintain crane and mobile crane register.

Crane Operator

- Complete and record a pre-start check at the commencement of each shift or the first use of the equipment.
- Participate in the development of the work group's **Pre-task Hazard Assessment** and a QAL Load Lift/Rigging JSEA on all crane load lifts.

De-scale Shift Supervisor

- Approve critical lift plan.

Dogger

- Perform a visual inspection of all lifting equipment, prior to use.
- Immediately tag defective equipment and take out of service.
- Participate in the development of the work group's **Pre-task Hazard Assessment** and a QAL Load Lift/Rigging JSEA for all crane load lifts.
- Sling loads taking into consideration the nature of the load, its mass and its centre of gravity.
- Control a suspended load using a hand held tag line or load control pole.
- Qualified person in control of non-critical lifts.

Engineering and Maintenance Services Manager

- Approve critical lift plan.
- Enforce all standards as outlined or referenced in this procedure, including the design of all lifting equipment systems and that appropriate records are available to demonstrate effective risk management.

Equipment Owner (or delegated representative)

- Maintain register of all lifting equipment items under their control.
- Maintain RGBY tagging system of inspections of lifting equipment items under their control.
- Provide an adequate storage area for lifting equipment items.
- Develop a documented risk assessment for each power operated lifting device under their control and upload the assessment into QAL SAP Risk Register.

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- Maintain all lifting equipment items under their control in safe order, without risks to health and safety of persons.
- Lifting equipment items under their control that require scheduled servicing / maintenance are recorded in SAP (or owner equivalent) and maintenance plans are in place for the inspection, maintenance and servicing requirements of that equipment.
- Make lifting equipment items under their control available for maintenance services.
- Review and revise power operated lifting devices risk assessments under their control.

Health, Safety & Security Superintendent

- Approve use of aluminium components in lifting equipment
- Approve the use of synthetic web / synthetic-fibre slings

Intermediate Rigger

- Perform a visual inspection of all lifting equipment, prior to use. Record a pre-start check for all mechanical aids and power operated lifting devices.
- Sling loads taking into consideration the nature of the load, its mass and its centre of gravity.
- Control a suspended load using a hand held tag line or load control pole.
- Participate in development of the work group's **Pre-task Hazard Assessment** and all lift plans under their control.
- Use mechanical and powered load shifting equipment and associated gear to move, place or secure a load.
- Immediately tag defective equipment and take out of service.
- Act as a Lift Supervisor for a critical lift.

Lead Engineer - Asset Integrity

- Re-register QAL owned mobile cranes with a rated capacity of greater than 10 tonne with WHSQ.

Lift Supervision

- Responsible for the management of all critical lifts under their control.
- Responsible for the selection and provision of the appropriate lifting equipment items under their control.
- Participate in the development of all critical lift plans.
- Responsible for ensuring all stakeholders clearly understand the critical lift plan and their roles in the plan.
- Forward critical lift plan to Crane Base Supervisor.
- Immediately tag defective equipment and take out of service.

Power Operated Lifting Device Operator

- Complete and record a pre-start check at the commencement of each shift or at the first use of the lifting device.
- Participate in the development of the work group's **Pre-task Hazard Assessment** and a QAL Load Lift/Rigging JSEA on all load lifts.
- Immediately tag defective equipment and take out of service.

Project Delivery Superintendent

- Approve the use of synthetic web / synthetic-fibre slings.

Refinery Support Superintendent

- Approve critical lift plan.
- Approve the use of synthetic web / synthetic-fibre slings.
- Approve the use of a work basket in Refinery Support.
- Perform initial registration with WHSQ of any mobile cranes owned by QAL with a rated capacity above 10 tonne.

Superintendent

- Approve physical handling of a suspended load.

Supervisor

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- Retain completed QAL Load Lift and Rigging JSEA for the current plus previous month.
- Forward critical lift plan under their control to Crane Base Supervisor.
- Participate in development of all critical lift plans under their control.

Supervisor of the Contract

- Co-ordinate the selection and provision of all contractor mobile cranes used within QAL.
- Retain completed QAL Load Lift and Rigging JSEA for the current plus previous month.
- Forward critical lift plan to Crane Base Supervisor.
- Participate in development of all critical lift plans under their control.
- Forward inspection records and crane risk assessments for all mobile cranes entering QAL under their control to the Crane Base Supervisor.
- Ensure lifting equipment records and personnel qualifications are current prior to any lift activity.

Utilities Superintendent

- Approve the use of a work basket in the Boilerhouse.

4.0 REFERENCES

P312.402 – Pre-Task Hazard Assessment
 P312.605 – Competent To Operate
 P314.311 – Work at Height
 P314.408 – The Safety Inspection & Non-Destructive Testing of Chain Slings
 P314.411 – Service Inspection and Testing of Hydraulic Jacks
 P314.615 – High Voltage Vicinity Procedure
 P314.701 – Operation of Mobile Equipment
 P314.980 – Lightning Warning System
 P315.102 – Protective Equipment – Plant Minimum Requirements
 P774.008 – Registration of Design Calculations, Computational Models & Reports
 Queensland Workplace Health & Safety Act 1995
 WH&S Regulation 2008
 Code of Practice – Plant 2005
 Code of Practice – Working near live parts (Electrical Safety Office) 2002
 AS1353 series – Flat Synthetic-Webbing Slings
 AS1380 series – Fibre-Rope Slings
 AS1394:2001 - Round Steel Wire for Ropes
 AS1418 series - Cranes, Hoists and Winches
 AS2089:2008 – Sheave blocks for lifting purposes
 AS2318 – Swivels for lifting appliances
 AS2319 – Rigging screws and turnbuckles
 AS2321:2006 – Short-link chain for lifting purposes
 AS2549-1996 - Cranes (including hoists and winches) – Glossary of terms
 AS2550 series - Cranes, Hoists and Winches – Safe Use
 AS2741 series – Shackles
 AS2759:2004 – Steel-wire rope – Use, operation and maintenance
 AS3569 series – Steel-wire ropes
 AS3585 – Hooks for flat-webbing slings
 AS3775 series – Chain slings – Grade T
 AS3776:2006 – Lifting components for Grade T chain slings
 AS3777:2008 – Shank hooks and large eye hooks – maximum 60t
 AS4142 series – Fibre Ropes
 AS4497 series – Round slings – Synthetic Fibre
 AS4991 – 2004 Lifting Devices
 Mobile Crane Code of Practice 2006
 QAL Engineering Standard QM50-041-03 – Lifting Chains for General Purposes
 QAL Engineering Standard QM50-042-03 – Wire Rope for Lifting Purposes
 QAL Engineering Standard QM50-102-02 – In Service Inspection of Alloy Lifting Chains
 QAL Engineering Standard QM50-104-03 – Chain Slings
 QAL Engineering Standard QM50-114-02 – Lifting Gear
 QAL Engineering Standard QM50-132-04 – Lifting Lugs

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QAL Engineering Standard QM50-148-02 – Wire Rope Slings
Rio Tinto Critical Lift Plan – Safe Work Standard (SAF-WSD-0010.08)
Rio Tinto HSE Performance Standard C6 – Cranes and Lifting Equipment
PG 105 – Slings training module
PG 177 – Load Lift and Rigging training module

5.0 DEFINITIONS

Basic Rigger – a person holding a WHSQ Certificate of Competency for Basic Rigging (or other similar State qualification) and a QAL qualification imparted by completing PG177.

Certified Engineer – a qualified mechanical or structural civil engineer who holds a certification as a practicing certified engineer and is qualified to approve designs for lifting equipment and structures.

Chain Sling - any system of chains, rings, hooks or other rigging equipment used to hoist or lower a load by a lifting device. It does not include chains or other fixed rigging used in a fixed load supporting application (i.e., conveyor counterweights).

Competent Operator – a person who holds an appropriate QAL CTO for the piece of equipment being operated.

Competent Person – a person who is suitability qualified (whether by experience, training or both) to carry out the relevant work or function.

Crane - a machine for raising or lowering a load and moving it horizontally, including any supporting structure or foundation, but does not include forklifts, conveyors, backhoes, excavators, front end loaders, bauxite unloaders i.e. Earth moving equipment (AS2549 – 1996 Cranes Glossary of Terms).

Crane Equipment Register – a register that details the description, type or series, inspection, maintenance and disposal records of all cranes.

Crane Operator - a person holding a WHSQ Certificate of Competency (or other State qualification) of a specified crane capacity and a QAL CTO (or Contractor equivalent) and a QAL qualification imparted by completing PG177, who can operate cranes to a specified level of competency.

Critical Lifts - Critical Lifts are:

- Lifts of a load requiring two or more lifting devices, where the combination includes one or more power operated lifting devices.
- Where the load is being lifted onto or passed over occupied buildings.
- Operation or load passing over or within the electrical wires exclusion zone and / or over electrical equipment (i.e., High Voltage yards / transformers) as per 6.4.10.
- Lifts at maximum rated load capacity of crane.
- Lifts involving personnel in workboxes.
- Lifts where a person is identified as being in the fall zone and cannot be repositioned.

Critical Lift Plan – a document that specifies the crane class and configuration, rigging techniques, load details, hazards and controls required to perform a critical lift.

Critical Lift Register – a register of all critical lift plans held by the Crane Base Supervisor.

CTO – Competent to Operate

Davit – a lifting beam that can rotate or move on a horizontal plane.

Dogger - a person holding a WHSQ Certificate of Competency for Dogging (or other similar State qualification) and a QAL qualification imparted by completing PG177.

Fall Zone – the area underneath the load where the load would likely fall to or through if it was inadvertently released or dropped.

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Intermediate Rigger – a person holding a WHSQ Certificate of Competency for Intermediate Rigging (or other similar State qualification) and a QAL qualification imparted by completing PG177.

Lifting Attachment – an attachment designed to be used in conjunction with lifting devices and similar lifting equipment to raise, lower or haul, arrest and sustain a load.

Lifting Device – a device equipped with mechanical means that will raise, lower or haul, arrest and sustain a load in any working position within the full range of hoisting or haulage without adverse effects on any components. Cranes and mobile cranes are inclusive. The lifting device may be manually, engine or power operated (electric, hydraulic, and pneumatic).

Lifting Device Operator - a person holding the relevant WHSQ Certificate of Competency (or other State qualification) and / or a QAL CTO (or Contractor equivalent) who can operate the lifting device to a specified level of competency.

Lifting System Equipment Register – the document that details the description, type or series, inspection, maintenance and disposal records of lifting system equipment items.

Lifting Equipment – lifting attachments and rigging equipment that will raise, lower or haul, arrest and sustain a load or object.

Lifting Equipment Inspection team (LEI Team) – Onsite team tasked to perform the inspection of lifting equipment on site to Australian Standards and update lifting equipment registers with inspection results.

Lift Supervision – a competent person who manages a critical lift and at a minimum holds an Intermediate Rigger qualification.

Load Control Pole – a piece of non-conductive equipment that is manageable in length, sturdy to control and light enough to assist in controlling and guiding a load for placement where tag lines are not suitable. An example is a length of wooden dowel (i.e., broom handle) and / or conduit tube which may have a recessed “V” notch (minimising slippage) or a hook attached.

Mobile Crane – a crane capable of travelling over a supporting surface without the need for fixed runways (i.e., railway tracks) and relies only on gravity for its stability.

RGBY System – a colour coded system that defines the sequence of colours to be used and the frequency of change to ensure all lifting equipment items are inspected, load tested and tagged on a continuous basis. Colours signified by RED – GREEN – BLUE – YELLOW. See 6.7.6 for details.

Suspended Load – a load suspended by lifting equipment and not fully supported by a structure or stands from below or fixed into position e.g. welded or bolted. A suspended load is not a load attached to a structure in a manner that has been approved by a Certified Engineer. The method of attachment may include equipment normally classified as rigging equipment.

Tagline - a rope attached to an object before a lift takes place and used to control the sway, stability and placement of the object. It will be a minimum of 16 mm fibre rope, dry and of a non-conductive material.

Workbox - a device designed to AS 1418.17 to be suspended from a crane to provide a working area for a person.

Workbasket - a device designed to be elevated by a forklift or similar having tyne arrangements to provide a working area for a person. Use of a workbasket involving personnel in the basket is restricted to the Boilerhouse and Refinery Support.

WHSQ - Workplace Health and Safety Queensland

WLL – maximum load limit as defined in AS 1418.2

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6.0 ACTIONS

6.1 Site Approval for Cranes

6.1.1 Site Access - Cranes

Prior to site entry, mobile cranes shall be inspected and approved by the Crane Base Supervisor (or delegated representative). Approval shall be given by the Crane Base Supervisor using the check sheet for approval of mobile equipment entry to site as shown in Attachment 7.1. The "site approved" sticker (Attachment 7.2) shall be attached to the equipment in a prominent position. The QAL Supervisor of the Contract shall forward any inspection records and crane risk assessments for all mobile cranes entering QAL under their control to the Crane Base Supervisor prior to this approval being given for work on site.

A minor defect that does not affect the safe operation of a crane or mobile crane shall be logged in the machines daily pre-start check sheet for the equipment owner to rectify.

6.1.2 Registration and Certification - Cranes

The Crane Base Supervisor (or delegated representative) or the QAL Supervisor of the Contract shall ensure any mobile crane (with a lifting capacity of more than 10 tonne) under their control is compliant with WHSQ annual registration and certification. Registration and certification is the responsibility of the equipment owner. For QAL owned mobile cranes (with a lifting capacity of more than 10 tonne), initial registration and certification is the responsibility of the Crane Base Supervisor. Re-registration and certification is the responsibility of the QAL Lead Asset Integrity Engineer. The registration sticker must be displayed clearly within the cabin.

The equipment owner or QAL Supervisor of the Contract shall ensure any power operated lifting device under their control is compliant with WHSQ annual registration and certification. Registration and certification is the responsibility of the equipment owner.

6.2 New Lifting Equipment to site

6.2.1 Slings & Mechanical Aides (Chain blocks, Chain lever blocks, Mechanical hand lever winch & Sheave blocks)

All new lifting equipment brought to site must be taken to the on-site Lifting Equipment Inspection team (LEI Team) for initial inspection and registration before being used.

During the initial inspection the item will be:

- **Checked against a predefined inspection criteria**
- **Current inspection tag fitted (refer 6.7.6)**
- **Equipment identification tag fitted (refer 6.7.6)**
- **Details of the item added to the lifting equipment register (refer 6.7.7)**

The on-site LEI Team will then deliver the compliant equipment to the owner where it is available for immediate use.

If the equipment fails the initial inspection the item will be yellow tagged and owner notified to arrange for its replacement in conjunction with supply department. The tagged equipment will be returned to the warehouse by the LEI Team.

6.2.2 Tackle – Shackles, Swivels Rings, Hammerlocks, Hooks, Turnbuckles, Eyebolts and Lockets

Tackle (with the exception of Hammerlocks and hooks) are to be delivered by warehouse to the equipment owner.

Hammerlocks and hooks are to be delivered to the LEI Team for installation and testing.

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QAL has elected not to register these items prior to putting them into service and as a result tackle will not be recorded on the equipment register and will not require unique identification numbers or individual inspection tags to be fitted.

Tackle will be inspected prior to use by a competent person when used in conjunction with other lifting equipment.

6.2.3 Lifting Attachments and Mechanical Aides (Winches, Hoists, Davits and Loading arms/blind spacer hoist)

All new lifting equipment brought to site must be taken to the on-site Lifting Equipment Inspection team (LEI Team) for initial inspection and registration before being used.

During the initial inspection the item will be:

- ***Approved for use and ID number sort from the Certified Engineer***
- ***Arrange for a new equipment SAP functional location to be created and details of the item recorded in the SAP lifting equipment register for the Section or Work group (refer 6.7.7)***
- ***Equipment identification tag fitted (refer 6.7.6)***
- ***Current inspection tag fitted (refer 6.7.6)***
- ***Ensure the supplied Certificate of Inspection and Test is attached to the equipment functional location on SAP***
- ***Ensure inspection record is attached to the equipment number on SAP***
- ***Create a cyclic work order for the require inspection period***

The on-site LEI Team will then deliver the compliant equipment to the owner where it is available for immediate use.

If the equipment fails the initial inspection the item will be yellow tagged and owner notified to arrange for its replacement in conjunction with supply department. The un-tagged equipment will be returned to the warehouse by the LEI Team.

6.3 Mobile Crane Selection

If a mobile crane is required, the selection and provision of the appropriate crane and crane operator (if applicable) must be co-ordinated by the QAL Crane Base Supervisor / or the QAL Supervisor of the Contract / or Lift Supervision.

6.4 Loads transported on Vehicles

Vehicle mounted loading cranes (eg. Hi-Ab cranes) **shall not** be used to load/unload loads from vehicles. This activity shall be done using a forklift, crane or other suitable power operated lifting device.

When loading objects on vehicles the load shall be fundamentally stable prior to tie down. Appropriate controls shall be put in place when unloading objects off transport vehicles. Loads secured for transport purposes that potentially may move on unloading shall not be unsecured until rigging equipment that will be used to unload the load is in place and the load is supported by a suitable power operated lifting device.

Over Centre Load Binders (otherwise known as Dog, Chain Dog or Bulldog) shall not be used by QAL employees, QAL Contractors or QAL contracted transport companies to secure loads transported on site. Ratchet style tensioners may be used as an alternative. Webbing straps and webbing tensioners are not to be used to secure loads on site due to potential damage from caustic. Appropriate unloading controls shall be put in place by the Warehouse for non-contracted transport companies that deliver to the Warehouse.

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6.5 Operation of Cranes and Lifting System Equipment

6.5.1 Operation

All cranes and lifting system equipment shall be operated strictly in accordance with the manufacturers operating handbook.

Overhead travelling cranes shall be fitted with audible travel alarms or an equivalent warning device.

6.5.2 Mobile Crane and Lifting Device Risk Assessment

All mobile cranes and power operated lifting devices shall have a risk assessment completed by the Owner prior to initial use. The risk assessment shall:

- involve operators and maintainers who will use the equipment, **and**
- address all aspects of safe operation including handling, driver/operator vision, brake failure, mechanical failure, tyre blow out and access and egress for operators and maintainers.

A comprehensive risk analysis shall be conducted to clearly identify the behavioural and conditional factors for safe operation. The risk analysis must cover all aspects of operation and will have up-to-date action plans in place to manage identified issues.

6.5.3 Pre-Operational Inspections of Cranes and Lifting System Equipment

Pre-Operational Inspections of Cranes

All mobile cranes and power operated lifting devices shall be inspected by a competent person prior to use and the results recorded in the onboard crane pre-start checklist or vehicle checklist. The vehicle checklist can be obtained from **Portal** / Health, Safety & Environmental / Pre Start Vehicle Checklist S-156. Fixed cranes shall be inspected by a competent person prior to use and the results recorded in the Crane Service Record Logbook. Any damage or defects shall be reported to supervision.

The mobile crane or power operated lifting device shall also be parked fundamentally stable as per procedure P314.701.

All lifting hooks except for grab and chain shortening hooks shall have a fully operational safety latch.

Pre-Use check of Lifting System Equipment

All lifting system equipment required to undertake a lift shall be inspected by a competent person prior to use.

- Check for:**
- **Current Inspection Tag**
 - **Equipment ID tag is attached and legible**
 - **Safe Working Load (SWL) is visible and appropriate to task**
 - **Equipment is free of defects**

Pre-use check OK

Use equipment as designed.

Pre-use check identifies an item with no ID tag or inspection tag, tag is not current or equipment is defective/damaged

Any lifting system equipment component found to be non-compliant shall be taken out of service immediately. Attach a yellow tag with information stating the date and why the equipment is defective, then:

If no ID tag or inspection tag, tag is not current:

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a) ***Raised a work order against the equipment functional location for the LEI Team (Work centre 537BC) to undertake inspection and tagging if the item is required before the next scheduled inspection date, or***

b) ***Set tagged equipment aside for inspection during the next inspection round.***

If equipment is defective/damaged:

c) ***Repairs on equipment with a purchase price of \$150 or less is not considered viable and should be disposed of and replaced only if required. Advise the LEI Team of the equipment number for disposal so the register can be updated.***

d) ***Equipment with a high replacement cost will require a notification for off-site repairs and load testing to be conducted.***

Tackle is to be treated as a consumable item. If damaged: replace for new and destroy the damaged item - discard appropriately.

6.4.4 Lift Plans

All lifts that use rigging, slinging or winching methodologies shall have a lift plan completed prior to the lift commencing. This plan shall be documented in Part A and Part B of the Load Lift/Rigging JSEA that can be sourced on **Portal / HSE / Load Lift Rigging JSEA>HSE-046**.

When completing a risk assessment for the lift plan, the fall zone of a suspended load shall be considered. **Under no circumstances shall a person work under or be positioned under a suspended load. Where a person is identified as being in the fall zone and cannot be repositioned, the requirements of a critical lift shall be followed. In this case the critical lift plan can only be approved by the General Manager or delegate.**

If the lift is defined as a critical lift (see definition in 5.0), a documented and approved lift plan shall be developed prior to the lift commencing. The plan will address the crane or lifting device configuration, rigging techniques, load details and the associated hazards of the lift.

For critical lifts involving any cranes or lifting devices, Part A and Part B of the Load Lift/Rigging JSEA shall be completed.

For critical lifts involving personnel in workbox, Part A and Part C of the QAL Load Lift/Rigging JSEA shall be completed.

The critical lift plan shall be approved by one of the following roles (or their delegate):

- **Turnaround Superintendent**
- **Maintenance Services Manager**
- Crane Base Supervisor
- **Turnaround Mechanical Supervisor**
- **General Manager** for lifts where persons are identified as being in the fall zone and cannot be repositioned

Critical lifts must be carried out in accordance with the critical lift plan and be under the control of Lift Supervision. Lift Supervision must be present throughout the duration of the critical lift. If the task scope changes or there is a need to move away from the original lift plan, the lift must stop and the critical lift plan must be up-dated and re-approved. Lift Supervision shall position themselves so as to have a good view of the overall lift, and have the ability to stop the lift at any time.

All critical lift plans shall be submitted to the QAL Crane Base Supervisor who shall maintain a register of critical lifts.

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6.4.5 Pre-Task Hazard Assessment for All Load Lifts

For all load lifts a QAL **Take 5** shall be completed at the worksite as a pre-task hazard assessment. This needs to consider the requirements of the Work at Height procedure P314.311 and Barricades and Cordons procedure P314.301. Before operating a crane from the towered position, a check for the presence of overhead conductors and powerlines shall be undertaken.

Part A and B of the Load Lift/Rigging JSEA shall be completed for all work performed from a work basket and approved by the section Superintendent prior to operation.

Persons in control of a lift using a lifting device shall inspect the device for any defects, that an identification tag is affixed and that the device is inside its inspection period before using the device.

6.4.6 Slinging the Load

Slinging shall only be carried out by persons holding a Rigger or Dogger qualification or under direct supervision of a qualified Rigger or Dogger for the purpose of training, i.e., completion of logbook hours. Critical lift slinging shall **ONLY** be undertaken under the direct supervision of the Lift Supervisor. Where the entire load can be seen whilst performing the slinging, the Lift Supervisor may also be the person slinging the load.

If the load is outside the vision of the Crane or power lifting device Operator, a Dogger must direct load lift operations.

6.4.7 Rigging the Load

Operations involving rigging and winching the load (including sheave blocks) shall only be undertaken by persons holding as a minimum, a Basic Rigging qualification, or is under direct supervision of a qualified Rigger for the purpose of training, i.e., completion of logbook hours.

When the chosen rigging method has the ability to be mechanically adjusted (eg chain block, cum-along, turn buckle etc) or shortening chains can be adjusted beyond 60°, the rigging shall be connected to a common piece of lifting equipment (eg. shackle or lifting ring) effectively locking the rigging together. This piece of lifting equipment shall then attach to the hook of the lifting device.

When a load has the ability to be adjusted through a mechanical lifting device (e.g. chain block, cum-along) whilst suspended for positioning, a dogger/rigger shall be in place to monitor the lift and its rigging arrangements. The dogger/rigger needs to be positioned so that the entire lift can be seen and assessed.

Rigging equipment that is exposed to sharp edges of structural members shall be protected.

Lifting equipment (chains, slings etc) normally used for lifting and rigging purposes **SHALL NOT** be used for towing, snigging or pulling mobile equipment.

Design approval by a Certified Engineer is required prior to:

- A load being supported to a structure, process pipes or framework by rigging equipment. The design shall be reviewed, approved and registered in accordance with QAL Procedure P774.008 "Registration of Design Calculations, Computational Models and Reports"
- Modifications or alterations to lifting equipment.

Prior to the use of synthetic slings, approval by the **Maintenance Services Manager**, Health Safety & Security or Project Delivery Superintendent shall be obtained. The approval form can be sourced in **Portal** / Synthetic Sling Permit HSE-021 and attached to the **QAL Load Lift / Rigging** JSEA.

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6.4.8 Load Transfer

An Intermediate Rigger shall be in control of all load transfers involving fleeting from a mobile crane to other lifting devices. A minimum of a Basic Rigger shall be in control of all load transfers involving skating or snigging.

All load transfer methodologies shall have completed a pre-task hazard assessment and a QAL Load Lift / Rigging JSEA as per 6.4.5.

6.4.9 Suspended Load Control

The physical touching of a suspended load is restricted to the load being less than 450mm from the final attachment, mounting or set-down point. A tagline or load control pole shall be attached to the load and not the actual lifting equipment and be of an appropriate length where its use does not introduce additional hazards. The use of taglines or load control poles shall be used to guide suspended loads into that position and to control the sway and stability of the load in transit.

Where a suspended load requires physical handling outside the restriction zone, a detailed documented risk assessment with Section Superintendent approval shall be completed.

Where work is performed under a PPM approved by the Section Superintendent, and the PPM specifies physical touching of the load outside of 450mm from the final resting place or set down point, this shall be considered as the approval to perform this task in the specified manner.

6.4.10 Working Near Live Electrical Lines

A person must not operate any part of a crane or other lifting device within 3 metres of bare electrical conductors (eg. overhead power lines) rated low voltage up to 132 kV and within 6 metres of electrical conductors rated above 132 kV.

For all crane lifts within 6 metres of electrical conductors greater than 1,000 volts, a High Voltage Vicinity Permit is required as per Procedure P314.615.

6.4.11 Environmental Conditions

Persons involved in lifts are to be aware of wind conditions throughout the lift. Wind shall be monitored by the on-board crane wind speed meter (if applicable) or the hand held wind speed meter available from the Crane Base Supervisor. Crane operators shall follow Procedure P314.980 when a lightning warning is issued.

6.4.12 Communication

A method of communication must be established and documented in the lift plan before commencement of work. The chosen method must take into account the operating environment in which the lift will occur. If radio communication is chosen, it must be conducted on a closed channel.

For critical lifts there must be a means of communication between people involved in the lift from Lift Supervision through to Crane and lifting device operators.

If a mobile phone has to be used by a person directly involved in the lift, the lift must be stopped.

6.6 Inspection and Maintenance - Cranes

The equipment owner is responsible for inspecting and maintaining the equipment to the manufacturer's specification.

6.5.1 Crane Modifications and Maintenance

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Modifications to crane or mobile cranes can only be authorised by a professional engineer, and the design must be re-registered with Workplace Health and Safety Queensland.

Maintenance on cranes or mobile cranes shall be in accordance with the manufacturer's specification and regulatory requirements and only be undertaken by authorised persons who have the appropriate qualifications and CTO's.

6.5.2 Crane Inspections

Crane and mobile crane owners are responsible to have the crane inspected by a competent person prior to registration each year.

The frequency of major inspections shall be in conformance with the manufacturer's recommendations and the requirements of AS2550.1 and the Mobile Crane Code of Practice.

- 10 Year Major Inspection
Cranes and mobile cranes shall be subjected to a major inspection after 10 years for mechanical components. The 10 year major inspection is to be certified by an Engineer who has experience in the inspection of cranes.
- 25 Year Major Inspection
Cranes and mobile cranes shall be subjected to a 25 year major inspection for their structural integrity. The 25 year major inspection is to be certified by an Engineer who has experience in the inspection of cranes.

6.7 Inspection and Maintenance - *Lifting System Equipment*

6.7.1 Scheduled Inspection and Testing

The equipment owner is accountable for ensuring their equipment is safe for use, this can be achieved by ensuring scheduled inspections and testing are undertaken. Attachment 7.6 lists the lifting equipment used on site and identifies the frequency of scheduled inspections (inspection frequencies have been established to align with legislation requirements and RioTinto standards - where variation exists QAL has elected to adopt the more frequent inspection regime).

Scheduled inspections and testing are to be performed by an on-site Lifting Equipment Inspection team who are notified of inspection requirements via cyclic work orders established for the either the individual item or groups of items (eg. a work groups lifting equipment)

Inspection of equipment will be conducted as per pre-defined inspection sheets developed for each equipment type.

Upon receipt of the cyclic work order the LEI team will:

- ***Contact the equipment owner to arrange an inspection time and location.***
- ***Check each item against a predefined inspection criteria***
- ***Current inspection tag fitted (refer 6.7.6)***
- ***Update the Lifting equipment register with inspection outcomes & attach a copy of the inspection report for each item***
- ***Ensure a copy of the Lifting Equipment Register is attached to the relevant equipment number or functional location on SAP***

If equipment ID tag is not available/legible and the equipment cannot be identified as an item on the register then it will be treated as a new item – refer 6.2

If the equipment fails the inspection the item will be yellow tagged, photographed and owner notified and provided with a copy of the inspection report. Depending on the severity of the damage the equipment owner may decide to:

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- a) *Arrange for repair and load testing (refer 6.7.2), or*
- b) *Release the item for destruction (refer 6.7.3).*

6.7.2 Maintenance and Repairs

Repair or maintenance work on lifting equipment items that has failed inspection may performed by the onsite LEI team or off-site service provider via the work order or notification system. Employees are not to undertake repairs to lifting equipment.

Repairs and maintenance shall be in accordance with the manufacturer's specification and regulatory requirements (ie. Load test performed where identified). Where off site repairs were required the LEI Team will witness the repair certificate prior to attaching a current inspection tag.

All repairs shall be documented and recorded in the lifting system equipment register.

Unrepairable items shall be destroyed in accordance with section 6.7.3.

6.7.3 Unrepairable items

When repairs to an item are not deemed cost effective or are not possible, the LEI team will:

- *Advise the equipment owner (who have the right to challenge the decision)*
- *Update the status as "Removed from Service" against the item in the lifting system equipment register*
- *Destroy the item to prevent future use*

6.7.4 Modifications and Alterations to lifting equipment or structures

Modifications or alterations to lifting equipment or structures used to support a load lift requires design approval by a Certified Engineer. Approval is required prior to:

- *A load being supported to a structure, process pipes or framework by rigging equipment.*
- *Modifications or alterations to lifting equipment.*

The design shall be reviewed, approved and registered in accordance with QAL Procedure P774.008 "Registration of Design Calculations, Computational Models and Reports" by the certifying engineer.

Approval may require load testing to be performed before use.

6.7.5 Lifting System Equipment Storage

All lifting system equipment must be correctly stored preferably off the ground or on a frame in a clean designated area according to 5S principles.

6.7.6 Lifting System Equipment Identification/inspection tags

All lifting equipment on site will be fitted with:

Equipment identification tag

- *For equipment requiring quarterly inspections
Identification number will consist of the Work centre number followed by the next available number on the register (Eg. 553PC_01, 553PC_02) imprinted on a metal tag securely attached to the equipment.*
- *For equipment with inspection other than quarterly
Identification number will consist of the area SAP code and the last 4 digits of the items unique SAP equipment number (Eg. 'DIGN D025' for*


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QDNALREDAVT.D025 DIGN Davit U2 Charge Pump G/Box), imprinted on a metal tag securely attached to the equipment.

Inspection tags

QAL uses two types of inspection tags:

For equipment requiring quarterly inspections - the RGBY colour code system is used to demonstrate that equipment was fit for service at the time it was last inspected. Inspection tags remain current for 3 months only.

Tag Colour	Inspection period	Material #	Sample: QAL Tag
Red	January to March	5000 24120	
Green	April to June	5000 24202	
Blue	July to September	5000 24203	
Yellow	October to December	5000 24204	

For equipment with inspection other than quarterly – a tag will be fitted and stamped with the last inspection date.

Note: For the LEI team to perform all of site inspections when they fall due they will commence checks two weeks prior and up to 2 weeks after the expiry date, with tags changed over as equipment is identified as compliant.

6.7.7 Lifting System Equipment Register

It is a legislated requirement that a register be established and maintained for lifting equipment for site.

Lifting equipment will be registered in one of two ways:

- a. As an individual item in SAP with its own unique SAP functional location or equipment number, this method will be selected for items that have an inspection/testing requirement other than quarterly.**

 - **Cyclic work order to be established for the LEI Team to undertake the inspection/testing of the item.**
 - **Results of inspection/testing attached to the SAP Item**
 - **Identified repairs to be initiated by adding a new work step to the current work order, with approval to proceed issued by the equipment owner.**
- b. As an item listed on an excel register. Each item has its own unique ID number which corresponds to the next available number on the register. This method will be selected for low cost items that require quarterly inspection only.**

 - **The register will have its own unique SAP equipment number**
 - **A cyclic work order will be established for the register – not individual items**
 - **Results of the quarterly inspection/testing documented on the excel register**
 - **A copy of the register to be attached to the SAP equipment number once work group equipment has been inspected**
 - **Identified repairs to be initiated by adding a new work step to the current work order, with approval to proceed issued by the equipment owner.**
 - **ID number will consist of the Work centre number followed by the next available number on the register (553PC_01)**

Work groups are not required to keep a hard copy of the register.

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Records of lifting equipment inspections can be accessed from SAP for auditing purposes as required. Records must be retained for the life of the equipment, and if the equipment is sold, then a copy of the inspection records form part of the sale.

6.8 Training and Qualifications

All crane operators must hold a WHSQ Certificate to work in a prescribed occupation relevant to the type of crane being operated and a QAL CTO (or Contractor equivalent). Familiarisation training shall be provided upon identification by the QAL Crane Base Supervisor or Contractor Supervisor of the crane operator.

For a gantry crane operated by remote control, (defined as load shifting equipment), a Certificate of Competency and a QAL CTO is required if the load being lifted is greater than 5 tonne. For loads less than 5 tonne, a competent operator shall have an appropriate QAL CTO.

Lifting device operators must hold a WHSQ Certificate to work in a prescribed occupation and/or a QAL CTO or Contractor equivalent that is relevant to the type of lifting device being operated, where applicable.

Any QAL employee or contractor performing dogging operations must hold a WHSQ Certificate of Competency for Dogger (or other similar State qualification) and a QAL qualification imparted by completing PG177.

Any QAL employee or contractor performing Basic or Intermediate Rigging operations must hold the relevant WHSQ Certificate of Competency (or other similar State qualification) and a QAL qualification imparted by completing PG177.

6.9 Records

All critical lift plans shall be forwarded to the Crane Base Supervisor. A copy of the critical lift plan shall be attached to the functional location in SAP and the original shall be kept in the register indefinitely.

Load Lift/Rigging JSEAs for all other crane or load lifts shall be retained by either the Crane Base Supervisor / Supervisor of the Contract / Lift Supervisor for the current plus previous month.

All mobile crane inspection records and crane risk assessments shall be forwarded to the Crane Base Supervisor for lodgement against the crane in the Plant Risk Register.

Mobile crane risk assessments shall be filed indefinitely in P:\general\Safety\Risk Register\Vehicles & Mobile Equipment. Contractor mobile crane risk assessments shall be filed in the Contractor's system on site for the duration the crane is on site.

Lifting equipment item risk assessments shall be filed indefinitely in P:\general\Safety\Risk Register\Lifting Equipment. Contractor lifting equipment item risk assessments shall be filed in the Contractor's system on site for the duration the lifting equipment item is on site.

6.10 Manuals

Manufacturer supplied manuals and other service books and pre-start check books are to be kept in situ or made easily accessible.

The maintenance manual, service record (log book) and parts book can be kept at the office of the equipment owner.

7.0 ATTACHMENTS

- 7.1** Check Sheet for Mobile Crane Entry On to Site
- 7.2** Site Approved Sticker
- 7.3** ***Onsite Lifting Equipment & Inspection Frequencies***

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<h2 style="margin: 0;">CHECK SHEET</h2> <h3 style="margin: 0;">FOR MOBILE CRANE ENTRY ONTO SITE</h3>
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Company Name: Crane Manufacturer:

Crane Type: Crane Serial No:

WHSQ Plant Registration I.D.: Crane Date of Manufacture:

	<u>Yes</u>	<u>No</u>	<u>N/A</u>
1. Annual inspection report current (Where applicable).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Crane 10 Year major mechanical inspection & recommendations completed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Current WH&S Registration (Where applicable).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. All warning systems operational, e.g., reverse alarm, computer cut outs, anti two block alarm (where required), flashing light.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. No synthetic slings in situ.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. No aluminium ferrules on winch ropes or slings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. All chains and chain slings tested and tagged within last 12 month period, in serviceable condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. All operating levers clearly marked with their function.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Winch clearly marked with loading capacity and rope specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Crane Operator certificated and authorised to operate crane on QAL site plant.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Crane Operator site and area inducted to deliver mobile crane on site.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Fire extinguisher attached in a readily accessible position and is current.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Current roadworthy certificate (When required to be operated on public access roads).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. No visible major mechanical defects, e.g., worn tyres, body damage, oil leaks, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. QAL Site Approved sticker applied and is clearly visible (preferably left lower side).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please Circle: - PASS / FAIL

This mobile crane has been inspected and is approved for QAL site use.

Signed: Print Name:

Date:



QUEENSLAND ALUMINA

SITE APPROVED

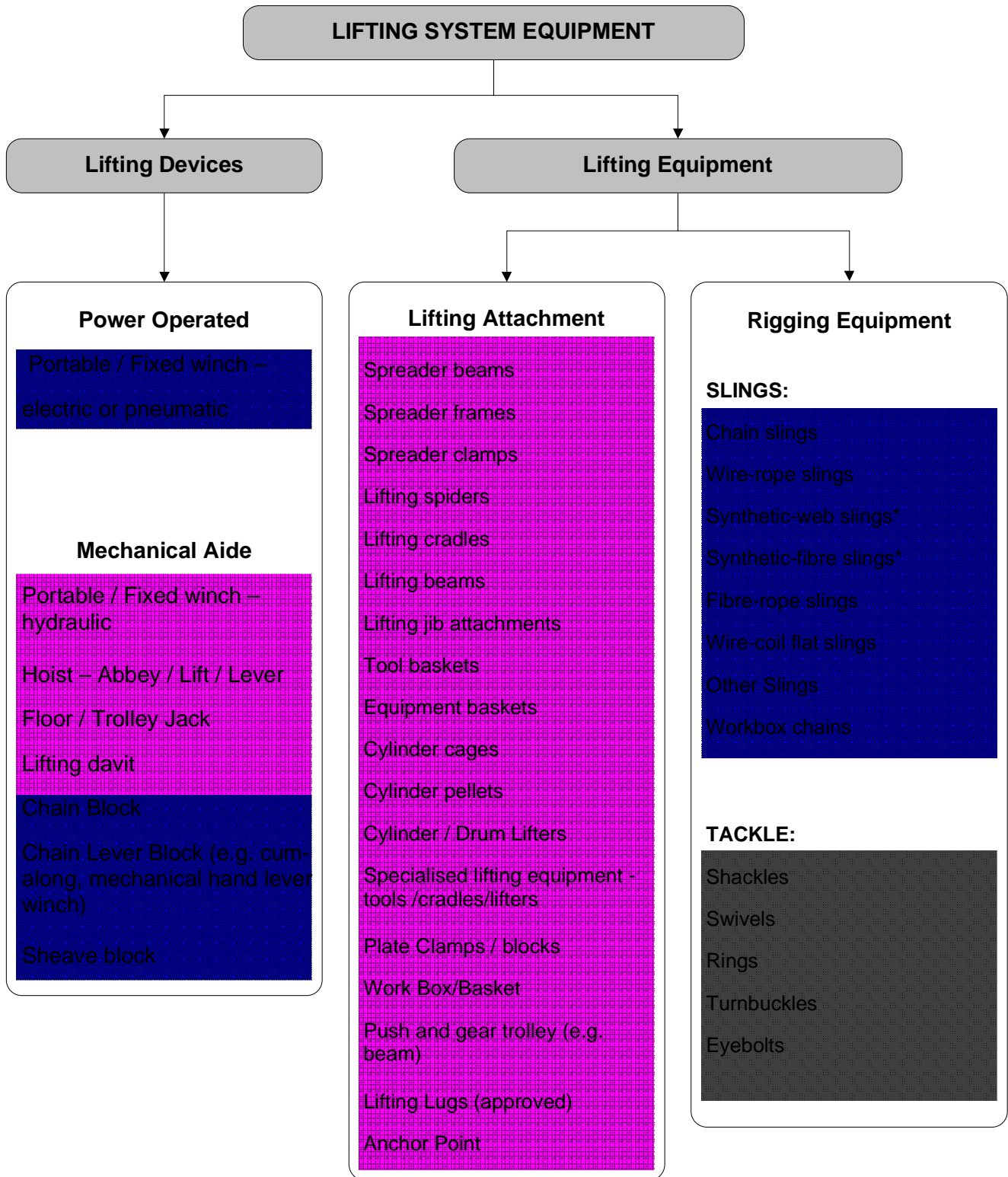
Company:.....

Equip I.D.:.....

Signed:.....

Next Inspection Date:

.....



- Annual Inspection
- Quarterly Inspection
- Pre-use inspection only

* Annual testing required or dispose of