



# PROCEDURE

Title: **Cranes - Inspection and Maintenance**

Procedure No: <b>P314.422</b>	Issue: <b>1</b>	Revision: <b>0</b>	Operative Date: <b>22/12/2016</b>
Department: <b>HSEC</b>	Sect./Classification: <b>Safety / Gear &amp; Equipment</b>	Author: <b>D Steel</b>	Approver Role: <b>Manager - Health, Safety &amp; Environment</b>

## CONTENTS

1.0	PURPOSE .....	1
2.0	SCOPE .....	1
3.0	RESPONSIBILITIES.....	2
4.0	REFERENCES .....	2
5.0	DEFINITIONS .....	2
6.0	ACTIONS .....	3
6.1	Site Approval for Cranes.....	3
6.2	Fixed Crane Inspection and Maintenance/Repair .....	4
6.3	Mobile Crane Inspections and Maintenance .....	5
6.4	Crane Modifications .....	6
6.5	Risk Assessment for Cranes .....	6
6.6	Records.....	6
6.7	Manuals .....	6
7.0	ATTACHMENTS.....	6
8.0	REVISION HISTORY.....	6



### 1.0 PURPOSE

To provide standards for the inspection and maintenance of fixed and mobile cranes on QAL site to ensure they are maintained in a safe and serviceable condition and comply with legal and site requirements.

### 2.0 SCOPE

This procedure applies to all fixed and mobile cranes, vehicle loading cranes and other mobile plant used as a mobile crane to move loads on the QAL site (including the Residue Disposal Area). It applies to QAL owned equipment and all equipment hired by QAL. Contractors using their own equipment on site will have a system in place of equal standing for the maintenance and inspection of their plant verified by the Crane Base Supervisor.

The procedure excludes the requirements for:

- Elevators – personnel
- EWP and Scissor Lifts (see P314.311 Work at Height and P314.701 Operation of Mobile Equipment procedures)

FORM NO: QA-053-0216	IF THIS DOCUMENT IS IN PRINTED FORMAT, AND NOT CONTAINED IN A CONTROLLED MANUAL, THIS IS <b><u>NOT</u></b> A CONTROLLED QUALITY SYSTEM DOCUMENT	PAGE 1 of 6
-------------------------	---	-------------

### 3.0 RESPONSIBILITIES

#### **Contract Administrator (Sourcing)**

- Ensure cyclic maintenance work orders are in place for all QAL owned cranes, and contracts with mobile crane hire Companies meet requirements of AS2500, P314.422 and manufacturer's maintenance and operational requirements.

#### **Crane Base Supervisor**

- Co-ordinate the selection and provision of all mobile cranes used within QAL under their control.
- Inspect, site approve and maintain inspection records and crane risk assessments for all mobile cranes entering QAL.
- Maintain mobile crane register.
- Participate in the auditing of mobile cranes.

#### **Crane Operator**

- Complete and record a pre-start check at the commencement of each shift or the first use of the equipment.
- Perform pre-operational inspections
- Record the results of pre-operational inspection on a Pre-start Check sheet or crane log book – report any issues to:
  - Crane owner or Crane Base Supervisor for mobile cranes
  - Section Superintendent for fixed cranes

**Maintenance Service Provider:** Party responsible for performing the inspection and maintenance activities associated with the equipment (can be a QAL work group or external contractor)

#### **Section Superintendent**

- Develop a documented plant risk assessment for all cranes under their control and upload the assessment into QAL SAP Risk Register.
- Inspect, site approve and maintain inspection records in SAP for all fixed cranes.
- Ensure repairs and maintenance activities are conducted and documented in SAP
- Participate in the auditing of fixed cranes.

#### **Superintendent Process Integrity**

- Manage the major fixed plant inspection register (SAP based)
- Offer technical support for the 10 and 20 year inspections to AS2500
- Manage the in-service inspection strategies for all QAL owned cranes
- Approve variances to in-service inspection s and modifications to cranes

### 4.0 REFERENCES

P312.605 Competent To Operate  
 P314.420 Lifting Equipment – Inspection and Maintenance  
 P314.421 Lifting Equipment – Safe Use  
 P314.423 Cranes – Safe Use  
 P314.701 Operation of Mobile Equipment  
 Queensland Work Health & Safety Act  
 Queensland Work Health & Safety Regulation  
 Code of Practice – Plant  
 Rio Tinto HSE Performance Standard C6 – Cranes and Lifting Equipment  
 PG177A and B Load Lift and Rigging Training Modules  
 PH177C Load Lift and Rigging for Superintendents Training  
 PG277 Load Lift and Rigging Non-licenced Personnel  
 Mobile Crane Code of Practice  
 AS1418 Cranes, hoists and winches  
 AS2500 Cranes, hoists and winches – Safe Use

### 5.0 DEFINITIONS

**Competent Person** – a person who is suitably 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, may include a forklift or excavator with lifting attachments, but does not include conveyors, bauxite unloaders or earthmoving equipment .

- **Gantry Crane** – Overhead crane operating on top of a gantry straddling the work and often running on wheels or rails
- **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
- **Overhead Crane** – consists of parallel runways or rails with a travelling bridge that spans the gap and carries the hoist. The lifting component of the crane travels along the bridge
- **Power operated Lifting Device** – device used for lifting or lowering a load. By means of a drum or lift wheel with rope, wire rope or chain wraps and can be powered by a variety of sources (eg. Forklifts, Hiab, telehandler, pedestrian operated forklift, etc)

**Crane Equipment Register** – details the current list of equipment including a description, date of purchase, last inspection date and condition and WWL / SWL. Mobile Cranes use a paper based system. Fixed Cranes use SAP

**CTO** – Competency to maintain and inspect cranes

**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).

**RPEQ Engineer** – Register Professional Engineer Queensland

**WHSQ** - Work Health and Safety Queensland

**WWL / SWL** – Working Load Limit / Safe working load limit – equivalent meaning

## 6.0 ACTIONS

### 6.1 Site Approval for Cranes

#### 6.1.1 Mobile Cranes (Either QAL purchased or 'dry-hired')

Prior to site entry, mobile cranes shall be inspected and approved by the Crane Base Supervisor. The purpose of this check is to ensure all prescribed inspections have been performed and the crane's safety systems are fully functioning.

Inspection records and crane risk assessment are to be supplied to the Crane Base Supervisor before approval to work on site is issued.

Approval shall be given by the Crane Base Supervisor using the check sheet for approval of mobile equipment entry to site (refer Attachment 7.1). The "site approved" sticker (Attachment 7.2) shall be attached to the equipment in a prominent position on the lower left-hand side window with the expiry date clearly noted. Approval for site will be for a maximum of 12 months.

#### 6.1.2 Registration and Certification

The Section Superintendent shall ensure any power operated lifting device under their control is compliant with WHS annual registration and certification.

Fixed Plant requiring annual registration and certification includes:

- Work boxes designed to be suspended from cranes
- Gantry cranes with a safe working load greater than 5 tonnes

Re-registration and certification is the responsibility of Section Superintendent.

Mobile cranes with a rated capacity greater than 10 tonnes require annual registration and certification.

The Crane Base Supervisor or the QAL Contract Representative shall ensure any hired mobile crane (with a lifting capacity of more than 10 tonne) under their control is compliant with WHSQ annual registration and certification requirements.

For QAL owned mobile cranes (with a lifting capacity of more than 10 tonne), initial and annual registration and certification is the responsibility of the Crane Base Supervisor.

Mobile cranes with a rated capacity less than 10 tonnes do not require annual registration and certification, but do require a documented annual inspection as per 6.1.1.

A current registration sticker must be displayed within the cabin and the current years 'Site Approved' sticker attached to the lower left-hand window.

## 6.2 Fixed Crane Inspection and Maintenance/Repair

To ensure all on site cranes are maintained in a safe and serviceable condition the Section Superintendent is responsible for ensuring the following inspections are performed and documented:

- **Pre-operational inspections**

Results of inspections must be recorded in the Pre-start Check sheet or crane log book with issues reported to Section Superintendent.

Identified issues that have the potential to impact the safety of people or plant must be rectified prior to use.

- **Routine inspections and maintenance**

Maintenance on cranes shall be in accordance with the manufacturer's specification and regulatory requirements. Inspection and maintenance activities shall be performed by authorised persons who have appropriate qualifications, experience, skills and knowledge to perform the task.

Cranes are inspected and maintained under cyclic work orders by an onsite Maintenance Service provider. Inspections are performed as per agreed checklists, repairs documented and records attached to the equipment functional location or equipment number in SAP.

- **Commissioning inspection and testing of new cranes**

This shall be performed in accordance with the Manufacturers / Designers specifications and regulatory requirements.

- **Annual inspections**

Section Superintendents are to ensure cranes are inspected by a competent person prior to registration each year.

Annual inspections should include all items specified by the crane manufacturer for annual inspection as well as all items included in the routine inspection and maintenance program.

Annual inspections should include:

- The effective functioning and calibration of all limiting and indicating devices
- Detailed visual inspections and tolerance checks of all structural and wear components
- Checking of tolerances for wear limit
- A detailed check for corrosion

- A detailed examination of critical areas for evidence of cracking

The Superintendent Process Integrity will obtain a copy of the 10 and 20 year major inspections.

### 6.3 Mobile Crane Inspections and Maintenance

- **Pre-Operational Inspections:**

Visual inspection and functional tests are to be performed before the start of each shift on the following:

- All relevant items indicated in the operations manual;
- Operating and emergency controls;
- Brakes;
- Safety switches and interlocks, including limiting and indicating devices;
- Visual inspection of the structure; and
- Wire ropes to ensure they are on the drum and correctly reeved on the sheave.

Results of inspections must be recorded in the Pre-start Check sheet with issues reported to supervision.

Identified issues that have the potential to impact the safety or integrity of people or plant must be rectified prior to use.

All lifting equipment not covered by a logbook (eg davits) shall have the pre-use inspection recorded on the Lift Plan.

- **Routine inspections and maintenance/repair:**

Mobile cranes on hire will be inspected and maintained based on the hours of operation by the equipment owner. Records are maintained by the owner and available upon request.

QAL owned mobile cranes will be inspected and maintenance based on hours of operation by an external crane contractor. Records are maintained by the Crane Base Supervisor.

- **Annual Inspections:**

Crane and mobile crane owners shall ensure the crane is inspected by a competent person prior to registration each year.

Annual inspections should include all items specified by the crane manufacturer for annual inspection as well as all items included in the routine inspection and maintenance program.

Annual inspections should include:

- the effective functioning and calibration of all limiting and indicating devices
- a detailed visual inspection and tolerance checks of all structural and wear components
- checking of tolerances for wear limit
- a detailed check for corrosion
- a detailed examination of critical areas for evidence of cracking

The Crane Base Supervisor will obtain a copy of the Annual Registration for dry hire cranes as confirmation that an annual inspection has been performed. Copies of the document are filed for each crane.

- **Major Inspections:**

Registered mobile and tower cranes are subjected to a major inspection at the end of their design life (as recommended by the manufacturer) or where this is unknown, in accordance with the recommendations of a competent person, or every 10 years for the mechanical components and 20 year structural inspection.

The major inspection is to be certified by an Engineer who has experience in the inspection of cranes.

Inspection records are held by the Crane Base Supervisor for QAL owned mobile cranes, the equipment owner for hire cranes (with a copy to the Crane Base Supervisor) or against the equipment location/functional location in SAP for fixed cranes.

#### **6.4 Crane Modifications**

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

#### **6.5 Risk Assessment for Cranes**

A risk assessment for cranes will be housed in the Plant Risk Register in SAP.

#### **6.6 Records**

Inspection and maintenance records should clearly describe the work undertaken and parts replaced, be dated, note the name of the person conducting the inspection or maintenance and be signed by the person conducting the work.

The checks, adjustments, replacement of parts, repairs and inspections performed and all irregularities or damage concerning the crane's safe use should be recorded.

#### **6.7 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 in the crane.

### **7.0 ATTACHMENTS**

**7.1** Check Sheet for Mobile Crane Entry On to Site

**7.2** Site Approved Sticker

### **8.0 REVISION HISTORY**

<b>Issue</b>	<b>Revision</b>	<b>Revision date</b>	<b>Change Reason</b>
1	0	22/12/2016	Complete review and rebuild of system

## CHECK SHEET FOR MOBILE CRANE ENTRY ONTO SITE

Company Name: ..... Crane Manufacturer: .....

Crane Type: ..... Crane Serial No: .....

WHSQ Plant Registration ID.: ..... Crane Date of Manufacture: .....

COMPLIANCE CHECKS / INSPECTIONS	YES	NO	N/A	Comments / Notes
1. Annual inspection report current attach copy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Crane 10yr major mechanical inspection & recommendations completed attach copy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Current WH&S Registration (Where applicable) <sup>(1)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>SAFETY FEATURES</b>				
4. Rated capacity limiters fitted and functioning <sup>(2)</sup> <small>(required on all cranes manufactured since 2002 with a SWL &gt; 3t)</small>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Motion limiting devices & alarm fitted and functioning <sup>(3)</sup> <small>(required on all cranes)</small>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6. Working radius indicator fitted and functioning <sup>(4)</sup> <small>(required on all cranes originally designed with this feature)</small>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7. Load indicators fitted and functioning <sup>(5)</sup> <small>(required on all cranes with a SWL &gt; 3t)</small>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8. Free fall lock-out function locked out with a key arrangement <sup>(6)</sup> <small>(required on all cranes manufactured since 2002 with a SWL &gt; 3t)</small>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9. Fire extinguisher attached in a readily accessible position and is current	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10. All warning systems operational, e.g., reverse alarm, flashing light	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11. Operator controls station for vehicle mounted cranes is located in an area protected from swinging loads & the crane jib (14)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12. Potential crush zones identified & guarding or identification of crush zone in place (eg. Signage / stickers legible)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ERGONOMICS</b>				
13. There is a safe means of access to the cabin & frequently accessed areas of the crane <sup>(7)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14. Seating is height adjustable, comfortable & provides back support <sup>(8)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15. Windows are clean & provide clear vision (no cracks) <sup>(9)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>CRANE OPERATION</b>				
16. Load chart (rated Capacity charts) is fixed in the operators cabin in a visible location <sup>(11)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
17. Crane operator manual is available in the operators cabin <sup>(12)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
18. All operator control/levers are suitably marked to indicate function & operation <sup>(13)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
19. No synthetic slings in situ.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
20. No aluminium ferrules on winch ropes or slings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
21. 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"/>	
22. Winch clearly marked with loading capacity and rope specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>CRANE OPERATOR (if applicable)</b>				
23. Crane Operator certificated and authorised to operate crane on QAL site plant.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
24. Crane Operator site and area inducted to deliver mobile crane on site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
25. Current roadworthy certificate (Required if operating on public access roads)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
26. No visible major mechanical defects, e.g., worn tyres, body damage, oil leaks, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
27. QAL Site Approved sticker applied and is clearly visible (preferably lower left).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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

Signed: ..... Print Name: .....

Date: .....

	YES	NO
QAL "Site Approved" sticker has been applied and is clearly visible (preferably left lower side window).	<input type="checkbox"/>	<input type="checkbox"/>
Review the Plant Risk for this type of crane – does a new risk assessment need to be developed or an existing assessment amended?	<input type="checkbox"/>	<input type="checkbox"/>



QUEENSLAND ALUMINA

# SITE APPROVED UNTIL

\_\_\_\_/\_\_\_\_/\_\_\_\_

Company: ..... Crane Owner: .....

Crane Make: ..... Crane Model: .....

Crane Serial #: ..... Year of Manufacture: .....

Annual Inspection date: ..... Site Approved by: .....(Signature)