VULCAN MINE

Standard Operating Procedure

Lifting Operations

Contents

Tables

1. PURPOSE

The purpose of this procedure is to describe the requirements and to ensure the effective management of hazards and risk associated with lifting operations at the Vulcan Mine.

This procedure has been developed to ensure compliance with sections 72 (e) and 72 (f) of the CMSHR.

- 72 (e) Selecting, maintaining and using lifting plant; and
- 72 (f) Marking lifting plant to show its date of manufacture and capacity;

2. SCOPE

This procedure is applicable to all persons at the Vulcan Mine including employees, contractors and visitors.

The controls within this procedure are mandatory.

3. DEFINITIONS

Authorised Person	A Person who has been assessed as competent and authorised under the authority of the SSE/SSE delegate to undertake a specific task at Vulcan Mine.
Competent Person	A person for a task at a coal mine that has the demonstrated skill and knowledge required to carry out the task to a standard necessary for the safety and health of persons.
CMSHA	Queensland Coal Mining Safety and Health Act (1999).
CMSHR	Queensland Coal Mining Safety and Health Regulation (2017).
CMW	Coal Mine Worker.
CoP	Code of Practice.
EWP	Elevated Work Platform.
HST	Health, Safety and Training.
JHA	Job Hazard Analysis.
kNm	kilonewton metres.
MMS	Maintenance Management System
OEM	Original Equipment Manual.
MOP	Mine Operating Procedure
RPEQ	Registered Professional Engineer of Queensland.
RSHQ	Resources Safety and Health Queensland
SHMS	Safety and Health Management System.
SOP	Standard Operating Procedure.
SWP	Safe Work Procedure
SSE	Site Senior Executive.
SWL	Safe Working Load.
Take 5	Personal Risk Assessment.
VOC	Verification of Competency.
WLL	Working Load Limit.

4. RISK MANAGEMENT

Where Lifting Operations are to be conducted onsite or where there is a potential of injury when performing lifting operations, the risk management process shall be followed to the level of the task being undertaken in accordance with ***VUL-MOP-049-Risk Management***.

The risk management process should consider the following points:

- The most appropriate Lifting Device;
- The possibility for weather and other environmental conditions to influence the working conditions (e.g., wind, rain, dust, gases, poor lighting, temperature etc.);
- Selection of appropriate equipment;
- Selection of appropriate control measures;
- Selection of anchor and tie off points;
- Condition of surrounding structures;
- Condition of work area;
- Condition of work area interactions;
- Potential for falling objects;
- Potential of suspended loads;
- Lift categorisation;
- Rated capacities of Lifting Equipment;
- Rated capacities of Lifting Devices; and
- Hand operated mechanical lifting devices.

5. TRAINING AND COMPETENCY

- Personnel required to conduct Lifting Operations and tasks shall hold the relevant, and current competencies and who have been assessed as competent and authorised under the authority of the SSE/SSE delegate to undertake Lifting Operations at Vulcan Mine.
- The following competencies are, but not limited to:

Task	**Competencies**
Working at Heights	RIIWHS204 Work Safely at Heights High Risk Work License (with specific competency) VUL-ATN-04 Work at Heights
EWP	RIIHAN301 Operate Elevated Work Platform RIIWHS204 Work Safely at Heights High Risk Work License (with specific competency) VUL-VOC-18-Elevated Work Platform
Dogging	RIIHAN208 – Perform Dogging High Risk Work License (with specific competency)
Basic Rigging	RIIHAN209 – Perform Basic Rigging High Risk Work License (with specific competency)
Intermediate rigging	RIIHAN210 – Perform Intermediate Rigging High Risk Work License (with specific competency)
Vehicle Loading Crane	RIIHAN307 – Operate a Vehicle Loading Crane
Non-Slewing Mobile Crane	RIIHAN212 – Conduct Non-Slewing Crane Operations High Risk Work License (with specific competency)
Slewing Mobile Crane	RIIHAN304 – Conduct Slewing Crane Operations High Risk Work License (with specific competency) C2 High Risk Work License Up To 20 Tonne Capacity C6 High Risk Work License Up To 60 Tonne Capacity C1 High Risk Work License Up To 100 Tonne Capacity C0 High Risk Work License Over 100 Tonne Capacity
Spotter	RIIHAN301 – Operate elevated work platform VUL-VOC-18-Elevated work platform

6. PROCEDURE

6.1. Mandatory Requirements

The core mandatory requirements and expectations of Vulcan Mine are that all workers (including internal employees, contractors and visitors) will follow the SHMS as it applies when working. Should a system gap be identified, a supervisor must be notified immediately, and a risk assessment conducted before the work can continue.

Further mandatory requirements identified include the following:

- All workers will comply with CMSHA s. 39 Obligations of persons generally;
- All workers shall be trained, competent and authorised to be on site and to carry out the tasks specific to their role;
- All workers must present themselves in a state fit for duty and unaffected by drugs, alcohol, fatigue and/or other physical or psychological impairment;
- All workers will conduct a personal risk assessment (Take 5) prior to undertaking tasks and in the event of a change to the conditions, process or environment;
- There are risk assessments (JHAs, WRAC) in place under which tasks are being carried out. These risk assessments may indicate controls that go above and beyond the legislative or SHMS requirements and must be followed;
- Workers will follow the direction of all signage as if given as an instruction by their supervisor; and
- Errant behaviours are prevented through compliance to the training scheme, and managed appropriately through supervision and site discipline procedures;

NOTE - At any stage should a worker feel unsafe or at risk when undertaking a task, they are to stop work, make the area safe (if necessary and possible) and immediately report this to their supervisor.

6.2. Site Entry Requirements

All cranes (including specialised lifting equipment and excavators to be used as cranes) brought on site, (by purchase, contractors, hire or any other means) shall undergo a safety inspection prior to operation. They must also have had a certified safety inspection conducted within a period not greater than 12 months prior to commencing operation.

The operation of the visual and audible alarm systems must be inspected upon the entry of the crane to site.

New equipment coming to site must be in accordance with ***VUL-MOP-071-Equipment Compliance.***

6.3. Selection of Cranes and Lifting Equipment

Prior to selecting a crane for a particular operation, a risk assessment shall be conducted, and the following issues are to be considered by a trained and competent operator:

- The mass and nature of the load to be lifted (this includes the weight of all accessories attached e.g. hook, chains etc);
- The maximum loading which can be imposed on the lifting equipment by consideration of the mass of the lift and where it is being lifted from and to. This lifting profile will enable a maximum radius of the lift to be determined in order to compare this with lifting equipment load chart specifications;
- The nature of the slinging to be used;
- The movement limitations of the lift;
- Instability due to ground conditions and the need for engineering assessments;
- If there is a requirement to travel with a load, the potential for a tyre deflating; and
- Where multiple crane lifting is involved;
    - How the load is to be proportioned;
    - How the load proportioning is to be maintained;
    - The operating characteristics of each crane (e.g., speed of hoisting) and the availability of a competent person(s) (with the appropriate dogging or rigging classification) to control the lift;

- Requirement to de-rate the SWL of each crane involved - As per Code of practice Mobile cranes

6.4. Rules for Safe Lifting

Prior to conducting a lift, the risk assessment process is to be followed. In the use of cranes and lifting equipment the following rules apply:

- The weight of the load to be moved and the size of the lifting equipment required for a safe lift shall always be calculated and verified;
- The ground and surface conditions on which the lift is taking place shall be deemed appropriate by a competent person;
- Cranes shall have both audible and visual alarms;
- Lifting equipment shall be inspected prior to use and rated to the appropriate SWL;
- inspection and repairs to cranes, cables and lifting components shall comply with the manufacturer's specifications and regulatory requirements (as a minimum) and records shall be recorded in the MMS.
- All cranes shall be subject to a documented pre-operation inspection and annual inspections to ensure safety devices and load indicators are functioning;
- Never use lifting equipment with the SWL erased. Any such equipment must immediately be tagged, Out of Service (it means the equipment is no longer rated);
- All shackles shall be marked with the manufacturer's identification, the quality of the shackle and the lifting capacity in tonnes (SWL);
- Lifting equipment shall not be operated with an inoperable or defective safety device;
- Loads shall be secured to prevent movement before releasing the slings;
- Loads shall be carried as close to the ground as practicable;
- Taglines must be fit for purpose;
- Beware of overhead projections from buildings, scaffolds, trees etc., potholes, uneven ground, newly filled excavations, sharp pieces of material protruding, reinforcing rods etc. as these can cause the crane to lean and become unstable;
- Before lifting any object, which has been previously bolted or fixed down, embedded, or been in a position for an extended period (suction factor), the crane operator and dogger shall ensure the object is free of the fixings before attempting the lift;
- Before lifting a load to move it, take the weight off first to ensure the load is properly balanced and if not, lower the adjustment before moving off;
- The crane operator and dogger shall ensure a tagline is fitted to all loads whilst travelling. The tagline shall be positioned as near as possible in front and behind;
- Taglines shall be utilised for all loads where the load will be lifted above the dogger and rigger shoulder height;
- Never land the load on the sling and pull the sling from under the load. The load shall always be set down on proper packing;
- The two main factors in determining the size of a sling are the weight of the load and the method of lifting (reeving, sling angle, etc.); and
- No lift shall be conducted if the wind speed exceeds the OEM specifications or other environmental factors (e.g., rain) are deemed to represent an unreasonable risk to the safe completion of the lift.

6.5. Lift Categorisation

Vulcan Mine has three (3) lift categories;

- Standard;
- Non-Standard; and
- Critical

6.5.1. Standard

A standard lift occurs when:

- The total load is less than 25 tonnes;
- The crane operates at less than 70% of rated capacity;
- A Lifting Permit ***VUL-FRM-19-15-Lifting Permit*** must be completed.

Where an approved SWP is in place for the standard lift a Take 5 can be completed for the task.

If there is no SWP for the task a JHA must be completed. The requirements for the lift may be included in the JHA.

NOTE - A standard lift shall be performed by competent and site authorised personnel and does NOT require a site approved supervisor to directly oversee the task.

NOTE – A site appointed supervisor is to periodically inspect and ensure safe work practices when lifting operations are being conducted.

6.5.2. Non-Standard

A non-standard lift incorporates one or more of the following:

- The suspended load, including all equipment, exceeds 70% of the SWL of the crane;
- Mobilising a load which exceeds 50% of the SWL of the crane, specialised lifting equipment or mobilising on uneven ground;
- The crane must be set-up on soft or uneven ground or near an excavation;
- at any time where a suspended load passes over services such as gas pipes, live conductors, plant or equipment;
- Where light or weather are identified as a hazard in the risk assessment;
- Lifting or positioning tilt-up panels (pre-cast panels);
- Installation of bridge beams during bridge installation work;
- Working near live overhead power lines.

- A Lifting Permit ***VUL-FRM-19-15-Lifting Permit*** must be completed.

When completing a non-standard lift, the following shall occur:

- Task planning including the completion of a JHA. The lifting requirements may be included in the JHA;
- A Lifting Permit must be completed in accordance with ***section 6.6;***
- Trial lifts shall be conducted for every non-standard and critical lift (e.g. check/taking load and checking clearances).

Trial lifts must be conducted as part of the non-standard lift process.

NOTE - A site appointed supervisor is required to oversee all non-standard lifts, including trial lifts.

NOTE – A site appointed supervisor is to periodically inspect and ensure safe work practices when lifting operations are being conducted.

6.5.3. Critical Lifts

A critical lift includes one or more of the following:

- Load is greater than 85% of the SWL for the crane;
- Multiple crane lifts;
- When lifting personnel with a crane - e.g. using a ‘dog box’;
- Where the centre of gravity for the load may change;
- Lifting large pressure vessels or tanks; and
- Where the crane is to operate on structures and foundations which may have a limited load bearing capacity (in these circumstances a certified engineering clearance must be provided by an RPEQ).

When completing a critical lift, the following documentation must be used as a minimum:

- Requires following the risk assessment process and task planning must include a JHA or SWP as available - The lifting requirements may be included in the overall task JHA;
- A Lifting Permit ***VUL-FRM-19-15-Lifting Permit*** must be completed;
- A Lift Study must also be completed by a competent RPEQ (if applicable); and
- The lift study must be attached to the Lifting Permit.

Trial lifts must be conducted as part of the critical lift process.

NOTE - A site appointed supervisor is required to oversee all critical lifts conducted at Vulcan Mine.

NOTE – A site appointed supervisor is to periodically inspect and ensure safe work practices when lifting operations are being conducted.

6.6. Completion of a Lifting Permit

A Lifting Permit ***VUL-FRM-19-15-Lifting Permit*** shall include the following:

- Maximum load radius to be used for the cranes;
- Where spotter duties are required (e.g. for preventing collision or contact with power lines), what the duties are and who is responsible for performing the duty;
- Position of the load to be lifted and the final position of placement, where practicable (a diagram which shows a plan view of the site may assist);
- Verification of the maximum allowable ground bearing pressure;
- Allowance for any factors that may require de-rating of the crane (e.g. for multiple crane lifts, additional radius caused by tilting of tilt-up panels);
- Rigging requirements of the job e.g. sling diameter, sling configuration, hook type;
- Proximity to hazards e.g. energised power lines, ground stability, people or other equipment;
- Lift computation e.g. boom length, outrigger footplate size, lift radius, centre of gravity, wind speed;
- Equipment data e.g. manufacturer, model, size, jib length;
- Load data e.g. total weight, height of lift, item to be lifted; and
- A check shall be conducted prior to the lift to ensure the load being lifted is within the rated capacity of the crane and lifting attachments/rigging equipment set out in the Lift Plan.

The crane operator and dogger shall be responsible for completing the Lifting Permit.

The Lifting Permit shall be reviewed and approved by a competent and authorised person (minimum of dogging competency) who is directly on the task.

NOTE - Once completed, the supervisor for the task shall check to ensure all safety issues have been considered, then sign the Lifting Permit.

6.7. Completion of a Lift Study

A Lift Study is a detailed engineering analysis of the methodology of a specific lift.

A Lift Study is to be completed by a competent person with the relevant qualifications required for the task.

The Lift Study shall be completed in conjunction with the Lifting Permit. ***VUL-FRM-19-15-Lifting Permit.***

NOTE - A Lift Study must be completed for all Critical lifts.

6.8. Authorised Entry to a Restricted Area (drop zone)

No person shall be allowed access or work under any suspended load unless it is adequately supported by a suitably designed stand or structure which meets relevant standards.

Any stand shall be clearly marked with its SWL and be engineered certified by an RPEQ prior to use.

A drop zone shall be established by signposting and barricading as a restricted area where overhead work is undertaken. Only personnel authorised by the supervisor shall be permitted within the restricted area.

- Overhead work is considered where personnel, equipment or tools could fall 2.0 metres or more, and where workers work or have access to the area below where the work is being carried out. This must be in accordance with ***VUL-SOP-092-Working at Heights;***
- Loads shall not swing over people or occupied buildings;
- No person shall be under a suspended load or in a position where they could be struck by a falling load;
- Be placed between the load and the crane; and
- Be placed between the crane and a structure or other immovable surface.

NOTE - Where there is a risk of a load falling and striking a person, barricading or similar controls to prevent access shall be in place.

6.9. General Operational Requirements

General lifting requirements include:

- With the exception of pick and carry operations, no lifting shall be carried out without outriggers deployed, locked and only used in line with the OEM standards.
- The correct fitting and adjustment of outriggers and jacks.
- Ensuring the correct amount of counterweight is fitted (for the length of boom or jib and weights intended to be handled).
- The need to possibly reset the outriggers and lowering the hook blocks to ground, for boom raising and lowering where a long boom is being used.

The operation of cranes shall be in accordance with AS 2550.1: General requirements for the safe use of cranes. This includes:

- Specific operating instructions to be prepared for each individual crane as per the OEM;
- Pre-operation checks to be conducted on the crane as well as rigging connections and other lifting equipment;
- The requirement to report any irregularities of operation;
- The requirement to stand the crane down if any abnormal noise or movement or actual accidental damage occurs;
- The need for good housekeeping practices;
- Slinging and control/direction of load to be carried out by a competent person;
- Methods of signalling;
- Multiple crane operation;
- Precautions to be taken in adverse weather conditions;
- Requirement for any modifications to be approved by the manufacturer and/or independent competent person;
- Any load testing is to be conducted under strictly controlled and supervised circumstances;
- A person shall not ride on the hook or sling of a crane or on any load whilst being moved; and
- Hooks shall be provided with spring-loaded safety latches and they must be adequately maintained.

6.10. Travel (Pick and Carry)

Where there is a requirement for a crane to travel with the boom/jib fitted (and/or extended), it shall be only done:

- After a route has been selected and prepared and deemed to be safe via a risk assessment. The crane operator is to have the final approval of the route, being aware of services and power lines;
- At a speed to suit road and weather conditions;
- With the boom in line with the direction of travel;
- With an appropriate escort vehicle;
- For normal travel, all boom and outrigger components correctly stowed;
- Tagline must be fitted in pick and carry mode;
- Pick and carry travel speed - 1.44km/hr in franna;
- Load as low as possible to ground when travelling;
- Minimise the amount of winch rope exposed to reduce load swing; and
- Ground angles not to exceed 5% latitude and longitude.

The risk assessment shall consider:

- The swing and shock loading to and from the suspended load by controlling travel speed, acceleration and braking actions when travelling with suspended loads (pick-and-carry);
- Avoid side loading (i.e. the load not vertical to the line of the boom and jib) when travelling across slopes as this substantially affects the effective work radius and the safe lifting capability; and
- Travelling down slopes as this substantially affects the effective work radius and the safe lifting capability.

6.11. Maintenance

Maintenance inspections and repairs shall be carried out in accordance with manufacturer's instructions, relevant standards and site maintenance instructions. The instructions shall give specifications for suitable tools and consumable Included but are not limited to the following items;

- Oils and fluids
- Maintenance consumables
- Tooling

The maintenance planning and management system shall ensure load (tilt and level) indicators and load cells are maintained, correctly calibrated and operate within OEM requirements.

Any modification to cranes and lifting components shall be subject to original equipment manufacturer's approval, conducted in accordance with National Crane Safe Inspection.

NOTE - All inspections, maintenance and repairs shall be carried out by a competent person in accordance with National Crane Safe Inspection requirements (http://cranesafe.com.au/).

6.12. Mobile Cranes

Mobile cranes shall generally be used in accordance with the Mobile Cranes Code of Practice. Where there is conflict between the requirements herein and the CoP, the more stringent standards shall apply.

6.13. Rated Capacity Limiters

All mobile cranes shall be fitted with a rated capacity limiter.

A rated capacity limiter prevents overloading of the crane by stopping all relevant crane functions when an overload is detected. Rated capacity means the maximum load which may be attached and handled by the crane, excluding the weight of the hook block, falls of rope, slings and rigging hardware.

The load to be raised must include the weight of all lifting appliances which are not permanently attached to the crane. The crane's load chart will provide guidance on any deductions which may need to be made.

The limiter should prevent:

- Hoisting of a load greater than the maximum rated capacity; and
- Increasing the working radius to a point where the load exceeds the maximum rated capacity at the particular radius.

The load limiting device must be isolated in the "ON" position upon entry and prior to executing any lifting operations. It is the responsibility of the crane operator and supervisor to ensure this is achieved.

6.13.1. Load Indicators

All mobile cranes shall have a tilt (pick and carry) or level (slewing) indicator displayed in the visual range of the crane operator.

Load indicators measure and display the mass of the load being lifted. This indicator assists the crane operator to stay within the load chart and SWL of the crane. The load indicator must be capable of displaying the weight of the suspended load in relation to SWL at all times.

NOTE - The overload key shall be removed from the crane prior to the commencement of the task by the supervisor for the area and returned to the crane operator at the completion of the task.

6.13.2. Load Charts

A load chart shall be supplied with all cranes. Crane operators are required to ensure they are familiar with the contents of the load charts. Where the crane has one main load chart, this should be fixed in the operator's cabin in a clearly visible location. Where the crane has numerous load charts (e.g. for different boom and fly jib configurations), the charts shall be kept in a book, folder or envelope in the operator's cabin at all times.

The lift shall be conducted within the limitations of the load charts and the crane's OEM.

Lifting shall not commence unless the load charts are in the crane cabin. Although the crane's load movement system may appear to be operating correctly, the load charts shall be available to verify the crane is not being overloaded.

6.13.3. Working Radius Indicator

A radius indicator displays the radius of the suspended load generally measured from the centre of the slew ring, or centre of the front axle for pick-and-carry cranes. A radius indicator should be fitted on all mobile cranes that were originally designed with this feature.

6.13.4. Motion Limiting Devices

All mobile cranes shall be fitted with motion limiting devices.

Motion limiting devices are used to prevent physical damage to the crane or part of the crane due to movement of the crane past its designed range of motion.

These devices cause braking, including deceleration where appropriate and stopping, when the following extreme permissible positions have been reached:

- The highest position of the hook (this is generally known as 'anti-two block');
- The extreme permissible operating positions of the jib (luff limiter); or
- The end positions of horizontally telescoping or movable jibs.

Cranes manufactured with an anti-two block device or limit switch shall be inspected to ensure the device is operational and not overridden prior to use.

6.13.5. Original Equipment Manufacturer Manual

The OEM manual shall be kept with the crane. Crane operators are required to ensure they are familiar with the contents of the OEM manual.

6.13.6. Crane Markings

All cranes shall be fitted with a compliance plate.

A crane and its lifting components shall be marked permanently and legibly.

NOTE – This information is to be stored in the MMS.

6.14. Mobile Elevated Work Platforms (EWP) and Lift (Dog/Work) Boxes

The guidelines for the general operational requirements of cranes also apply to EWPs and dog/work boxes. The use of these to access jobs at height is covered in ***VUL-SOP-092-Working at Heights.***

CMW's need to undertake ***VUL-VOC-18-Elevated Work Platform*** to be assessed as competent and authorised under the authority of the SSE/SSE delegate.

At the Vulcan Mine, lift boxes are classified as a restricted article and require SSE approval prior to being brought to and or used site.

Refer to the ***VUL-SOP-140-Prohibited and Restricted Articles***.

6.15. Vehicle Loading Cranes

6.15.1. Crane and Vehicle Suitability

Vehicle loading cranes should be mounted on vehicle types and models specified by the crane manufacturer.

Any vehicle loading cranes shall be designed, constructed and tested in accordance with AS 2550.11 (evidence sighted and record kept).

Vehicle loading cranes are to be readily identified (at a minimum) by their registration number. If a vehicle loading crane is not of a class requiring registration, it shall be marked with an appropriate plant identification number.

6.15.2. Design of Controls on Vehicle Loading Cranes

Controls on vehicle loading cranes must be of constant pressure (dead-man) type, and permanently marked with clearly visible symbols.

The following points shall be adhered to:

- Vehicle mounted cranes used to lift persons (i.e., in a workbox) shall be fitted with full dead-man levers and pedals (AS 2550.10);
- For normal operation (i.e., not lifting persons) of the levers the dead-man function operates, but the lever can be pushed into a "detent" position at the end of its travel;
- Any vehicle mounted crane designed and manufactured with full or partial dead-man levers and pedals must not have the levers and pedals altered;
- Designed so it cannot be operated to lift load over the operator; and
- The position and layout of controls on vehicle loading cranes shall be positioned so the risk of the operator being crushed against the controls by inadvertent operation of the crane is eliminated. If administrative controls are provided to prevent injury, a high level of training must be provided for operators on this issue.

An emergency stopping device shall be provided at every control station on the vehicle loading crane. The emergency stopping device shall:

- Remove the energy supply to the crane and bring the crane to a complete stop when activated;
- Be readily visible and coloured red;
- Be arranged for easy access and located so the operator will not be exposed to other hazards when activating the device; and
- Locked in the 'stop' position when activated.

6.15.3. Rated Capacity Limit

Rated capacity limit shall be provided on all vehicle loading cranes with:

- A maximum rated capacity of one tonne or greater; or
- A gross lifting moment of 40 kNm or greater.

Where smaller vehicle loading cranes are not fitted with a rated capacity limiter, relief valves and fittings shall be used to provide overload protection.

The rated capacity indicator shall warn the crane operator when the load exceeds 90% of the rated capacity.

The rated capacity indicator shall give an additional warning to the operator and persons in the vicinity of the crane if the rated capacity is being exceeded.

6.15.4. Operational Issues for Vehicle Loading Cranes

The vehicle loading crane shall be operated in accordance with the OEM provided by the crane manufacturer. Additionally, the following points must be complied with:

- If the load is out of the operator's view at any stage during the lifting process, the movement of the load must be directed by a dogger or rigger;
- The crane shall only be used with all stabilisers extended in accordance with the crane manufacturer's instructions. Where multiple positions can be used on stabiliser legs, the legs shall be set up in compliance with the manufacturer's load chart;
- The crane shall only be used so it is level in accordance with the crane manufacturer's specifications (usually not exceeding one degree or less);
- Timbers or other pads specified by the crane manufacturer should be placed under the stabiliser feet;
- Where it is possible to apply a side load to the crane hook, the hook must be provided with an appropriate swivel;
- Vehicle loading cranes are not to be used for lifting work boxes unless burst protection is fitted to luffing hydraulic cylinders. The burst protection is to consist of pilot-operated check valves which sense a difference in hydraulic pressure and lock the boom in position. Velocity fuses are not considered to be a reliable form of burst protection;
- Where provided, spring lockouts on the vehicle are to be activated during crane operation; and

- The crane must only be used with a load suspended vertically from the hook. The crane is not to be used to drag a load across a supporting surface; and
- The crane must never be used in 'pick and carry' mode.

NOTE - The operator of a Vehicle Loading Crane shall hold the current RII as outlined in the training requirement table. Section 5 Training and Competencies.

NOTE – Where possible Mobile Cranes are to be used in substitute to Vehicle Loading Cranes.

6.16. Other Lifting Equipment

Other mobile plant may be used as a mobile crane to lift or lower freely suspended loads (i.e. the load is not pinned to the boom or on tines but is hanging from the boom by means of a chain or rope). Other mobile plant sometimes used in this way includes backhoes, front-end loaders, excavators and telescopic handlers (also known as 'load-all's' and 'tool carriers' and require their own competency requirements). Always refer to the OEM for specific requirements – In particular requirements for rated lift points.

NOTE - When these types of mobile plants are used as a mobile crane, the level of safety provided by the lifting set-up shall be at a minimum, equal to when a mobile crane is used.

6.16.1. Rated Capacity of Other Mobile Plant

The rated capacity of other specialised lifting equipment is the maximum mass which may be handled at the maximum lift point radius, or reach, for each lift point, without the strength and stability requirements being exceeded. When determining the allowable load to be lifted, the mass of any attachments, such as buckets or quick hitch, shall be deducted, unless the rated capacity chart allows otherwise.

To ensure the stability of the specialised lifting equipment, the rated capacity of the plant shall not exceed:

- 75% of tipping load in the stationary mode;
- 66% of tipping load in the pick-and-carry mode; or
- 50% of tipping for articulated wheel loaders and tool carriers.

6.16.2. Load Chart

The load chart for the specialised lifting equipment should identify each lift point location and the corresponding rated capacity for each position.

The appropriate load chart will be fixed inside the operator's cabin.

6.16.3. Lifting points on Earthmoving Plant

Lifting attachments on earthmoving plant are sometimes supplied by the plant manufacturer. If this is not the case, the attachments shall be certified by an RPEQ.

Hooks shall not be used on the dipper arm or other attachments of earthmoving plant, because the load may become unintentionally disengaged as the arm rotates. This can even occur when the hook is fitted with a latch, because the latch may be damaged e.g. with a mobile crane, the hook hangs vertical; with an excavator, the lifting point rotates.

When using lifting points on earthmoving plant, a pre-lift visual inspection of the lift point shall be completed.

NOTE - The attachment of lifting lugs to buckets is prohibited.

6.16.4. Quick Hitches

All quick hitch devices shall be fitted with a locking pin unless the following can be ensured:

- A system is provided to ensure the quick hitch device is fully engaged on the bucket or other attachment (the system must not rely on the operator carrying out a visual check on the quick hitch attachment from the operator's cabin); and
- Where the quick hitch latching device relies on stored energy (e.g. hydraulic fluid pressure or a spring) to be activated, the latching device must be designed so it remains engaged in the event of failure of the source of stored energy (e.g. drop in hydraulic pressure or spring breakage).

Any factors which affect the reliability of the latching device are listed in the quick hitch manufacturer's instruction manual. This includes the need to ensure any contaminants in the hydraulic fluid do not exceed limits as specified by the manufacturer of the pilot-operated check valve, or other equivalent device. Evidence to demonstrate these conditions are being complied with must be provided and kept with the earthmoving plant (e.g. in the plant's logbook).

6.16.5. Controlled Lowering Devices

Controlled lowering devices shall be fitted to the boom and dipper arm (where attached) hydraulics of all specialised lifting equipment used as a crane, regardless of the rated capacity of the plant. Controlled lowering devices shall include pilot-operated check valves or other mechanisms that sense a difference in hydraulic pressure and lock the boom in position or allow for controlled lowering.

6.17. Hand Operated Mechanical Lifting Devices

Hand operated mechanical lifting devices include chain blocks, pullers (come-a-longs-lever hoist), turfers and other similar equipment.

Hand operated mechanical lifting devices shall be operated in accordance with the manufacturer's instructions.

The maximum SWL shall be clearly marked in a visible position and any loads shall not exceed this.

6.18. Training

Personnel involved in lifting activities shall be competent to do so. Doggers, riggers and crane operators shall hold a current RII or nationally recognised High-Risk Work Licence.

For full detail on competency requirements refer to ***Section 5*** and the ***VUL-REG-18-19-Training Needs Analysis.***

6.19. Defects And Reporting

During lifting operations, a visual inspection shall be made at the beginning and the end of each task.

Defects shall be reported to a supervisor and the maintenance department.

Should the defect render the equipment unsafe to operate it shall be tagged Out of Service as per the ***VUL-SOP-078-Isolation and Tagging.***

6.20. Lifting Equipment

All lifting equipment shall be stored on the ***third-party equipment register.***

The SWL or WLL shall be clearly identified and marked on all relevant lifting equipment and shall not be exceeded.

All lifting equipment shall be stored on suitable racks, shelves, pallets or hooks off the ground, out of direct sunlight and away from chemicals in a clean dry area.

Lifting equipment (excluding all shackles) shall be numbered and recorded on the third-party lifting equipment register. They will be inspected at regular intervals not exceeding three months, by a competent person.

Damaged, corroded or excessively worn lifting equipment shall not be used and shall be tagged with an Out of Service Tag and put aside for inspection, repair or disposal.

Lifting equipment must never be forced into position, dragged from under a load, placed directly on the ground under load (use dunnage), or slung over sharp edges without protective padding being provided.

Lifting equipment shall meet the relevant Australian Standards.

An inspection process is in place which ensures colour tagging is employed to indicate currency of testing. Table 2: Lifting Equipment Inspection Tagging Requirements outlines the tagging colours required for each quarter.

A clearly marked and known colour coded sign must be in plain sign to allow all personnel to know the lifting equipment due dates for inspection.

NOTE - Lifting gear (slings) used for towing purposes shall not be subsequently used for lifting.

Table 1: Load Rating Colours for Lifting Gear

The load rating colours for lifting gear is detailed in the below table 1;Colour Code		Maximum Load Rating – tonnes
Violet		1.0
Green		2.0
Yellow		3.0
Grey		4.0
Red		5.0
Brown		6.0
Blue		8.0
Orange		10.0+
Pink		Towing

Table 2: Lifting Equipment Inspection Tagging Requirements

Tag	Period
Red tags	January – March
Green tags	April - June
Blue tags	July - September
Yellow tags	October - December

6.20.1. Chains

Chains shall be inspected prior to use:

- Chain links should be individually inspected for wear, twisting, stretching, nicks, or gouging;
- Worn links should be measured to determine the degree of wear, which should not exceed the wear allowed for by the manufacturer;
- Upper and lower terminal links, hooks etc. should be inspected for any signs of wear at their load-bearing points and for any signs of distortion, e.g. widening of any hook throat; and
- Connecting devices inspected for signs of wear at their load-bearing points, for excessive play of the load pin within the body halves, and for impaired rotation of the body halves around the load pin.
- Chain links or fittings having any defects shall be clearly marked to indicate rejection, and the chain shall be withdrawn from service. Always ensure:
- The chain is inspected before use and free of damage or wear;
- Any load is evenly distributed on all legs of the chain;
- The chain is free of twists and is protected from any sharp corners on the load;
- The chain is used by a competent person; and
- If a tag or label becomes detached, the chain should be taken out of service, unless the necessary information is stamped on the chain or attachments.

6.20.2. Wire Rope Slings

The weight of the load shall never exceed the rating of the sling. Where possible, when attaching slings to a load, sling legs shall be loaded equally. The SWL of each component in the sling shall be not less than the SWL of the part of the sling.

The person responsible for the control of any load shall re-check all slings are properly connected prior to it being hoisted and lifts shall commence slowly to prevent undue shock.

Slings shall never be forced into position, dragged from under a load, placed directly on the ground under load (use dunnage), or slung over sharp edges without protective padding being provided.

All wire rope slings shall be inspected prior to use for any defects or damage (including kinks). Damaged, corroded or excessively worn slings should be disposed of and recorded in the third party lifting equipment register.

6.20.3. Synthetic Slings

Synthetic slings shall be inspected before use. If damaged or defective they shall be disposed of and the lifting equipment register updated.

Synthetic slings shall be protected from sharp edges and corners, to prevent damage while lifting.

Synthetic slings shall be stored so as to minimise their exposure to UV, dust, moisture and chemicals.

Synthetic slings that have been taken out of service shall be cut in half and disposed of in the correct waste bin.

6.20.4. Hooks

The throat of each hook shall be measured when new and recorded. During subsequent inspections, the hook shall be re-measured. If the throat opening is distorted by 10% or more, the hook shall be taken out of service immediately.

Hooks (except for grab and chain shortening hooks) are to have safety latches. If the latches are damaged or do not close properly, the hook is to be tagged Out of Service.

6.20.5. Disposal of Lifting Gear

Where disposal of lifting gear is deemed appropriate, such gear is to:

- Have its tag cut off and destroyed;
- Be cut up into unusable lengths and disposed of; and
- Be removed from the third-party lifting equipment register.

7. ROLES AND RESPONSIBILITIES

SSE	• Shall review and approve this procedure.
Asset Manager	• Ensure the Registers are being maintained • Shall ensure that all provisions of this procedure are implemented, and that compliance is achieved.
HST Manager	• Ensure CMW's are familiar with and have access to this SOP and associated documents Provide adequate training and information for this SOP.
Supervisor	• Shall be responsible for their area of operations and the implementation and application of this procedure; • Provide adequate supervision to ensure that this procedure is implemented; • Carry-out a periodic review of activities to ensure the appropriate application and understanding of this procedure; and • Ensure immediate and appropriate steps are taken to investigate and rectify any risks to health and safety arising from these activities. • Ensure all CMWs are familiar with, have access to and comply with the requirements set out in this procedure. • Ensure the Registered are being updated and maintained.
All CMWs (including visitors and contactor)	• Shall comply with the requirements of this procedure.

8. REFERENCES

- AS 1418.1-2002 Cranes, hoists and winches – General requirements
- AS 1418.11:2014 Cranes, hoists and winches - Vehicle-loading cranes
- AS 1418.5-2013 Cranes, hoists and winches - Mobile cranes
- AS 2550.10-2006 Cranes, hoists and winches - Safe use of Mobile elevating work platforms
- AS 2550.11 Safe use of vehicle-loading cranes
- AS 10896.1:2019 Rough-terrain trucks – Safety requirements and verification – Variable-reach trucks
- Coal Mining Safety and Health Act 1999 (Qld)
- Coal Mining Safety and Health Regulation 2017 (Qld)
- Coal Inspectorate | Bulletin | No.199 V 2 | 03 August 2023 - Pick and Carry Cranes
- Coal Inspectorate | Bulletin | No.203 V 1 | 27 June 2022 - Lifting and Rigging Incidents
- RSHQ Safety Alert 3 Uncontrolled fall of a crane load
- RSHQ Safety Alert 28 Mobile crane splits in two
- RSHQ Safety Alert 86 Mobile crane drops load
- RSHQ Safety Alert 147 Vehicle loading cranes - operating hazards
- Mines safety bulletin no. 181 | 09 April 2019 | Version 1 - Using non-slewing mobile cranes
- RSHQ Safety Bulletin 10 Use of earth moving equipment as mobile cranes
- RSHQ Significant Incident 28 Overload failure of a lifting device
- RSHQ Significant Incident 35 Rigger struck on head by 500kg assembly
- RSHQ Significant Incident 66 Crane rope breaks while anti two-block overridden
- https://www.safeworkaustralia.gov.au/safety-topic/managing-health-and-safety/licences/high-risk-work-licence-classes
- Workplace Health and Safety QLD, Mobile Crane Code of Practice 2006
- https://www.worksafe.qld.gov.au/__data/assets/pdf_file/0019/17128/mobile-crane-cop-2006.pdf

9. Related Documents

- VUL-SOP-078-Isolation and Tagging
- VUL-SOP-092-Working at Heights
- VUL-SOP-140-Prohibited and Restricted Articles.
- VUL-REG-18-09-Training Needs Analysis
- VUL-PLN-049-Risk Management
- VUL-ATN-07-Dogger Authorisation
- VUL-ATN-08-Basic Rigger Authorisation
- VUL-ATN-09-Intermediate Rigger Authorisation
- VUL-FRM-19-15-Lifting Permit
- VUL-VOC-20 Non Slew Crane (Franna)

10. REVIEW

This document shall be reviewed at minimum two yearly, or as follows:

- When there is a change of method and/or technology and/or legal or other requirement that may affect the accuracy of this document;
- When operational changes occur that effect the currency of the document;
- When there has been a significant event to which this document was relevant; and
- As a result of relevant audit findings.

11. DOCUMENT CONTROL

Version	Date	Description	Document Controller
01	28/05/2020	Initial Draft	Rachael Dacker
02	29/06/2020	Risk Workshop	Shane Johnson
03	22/04/2021	Review and formatting	Nicole Davey
04	1/9/2021	Review and formatting	Rachael Dacker
05	17/08/2022	Review of Supervision Requirements	Shane Walters
06	31/10/2023	Review and Revise as per WRAC completed 5/9/2023	Kelly Jensen