THALES
Building a future we can all trust

Lifting and Cranage

Guide and Critical Risk Standard

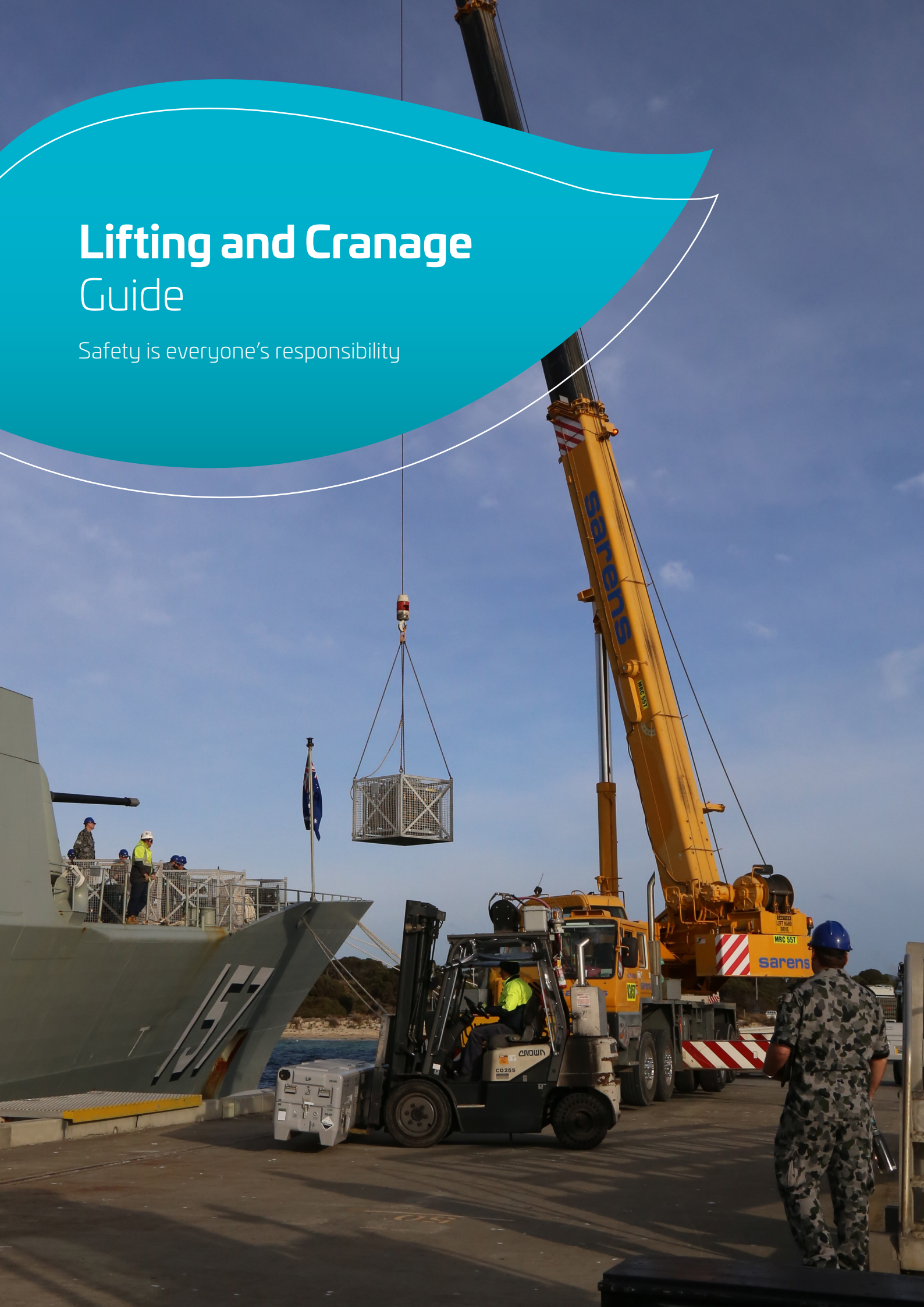
hse
HEALTH SAFETY ENVIRONMENT

SCAN BEFORE YOU BEGIN

LIFTING AND CRANAGE

Lifting and Cranage Guide

Safety is everyone's responsibility



Check before you begin

Are you competent to conduct this work? Do you hold the right high-risk work licence for this crane? Has your competency been assessed within the last 2 years? If you are operating from a pulpit or cabin height, have you had a recent health assessment?

Has the crane and its gear been recently inspected? Check the coloured tags to make sure.

Can you see any hazards that might impact your work? Is the ground stable and able to support point and total loads? Could there be underground cavities? Are there overhead structures or obstructions to the lift pathway? Is the lighting adequate? Could the crane interact with site traffic or other mobile plant?

Are appropriate exclusion zones in place? How will you prevent access to lift zones or mobile crane operations? Who will manage access to the exclusion zone?

What environmental conditions should you watch for? Do you know the tide, swell, wind or storm conditions under which you must immediately stop operations?

Do you understand how to conduct the crane lift safely? Have you checked the load chart? In a routine, simple lift, have you applied a 'Take 5' or similar hazard identification process? In a complex lift, do you understand the Lift Plan? Was it prepared by a qualified operator/dogger and reviewed by an engineer?

Are the crane, hoists, lifting gear and taglines all fit for purpose? If the crane needs to lift a workbox, can it lift a 1 tonne load at maximum radius? Is the crane fitted with limiting devices? Has the lifting gear been regularly inspected? Check the tags. Is it better to use a fibre sling or chains? Get the dogger to make the call. When using a soft sling, will the sharpness of materials to be lifted cause a problem?

Is your load properly contained and packaged to protect against being dropped or mishandled? Use a test lift to confirm the security of containment.

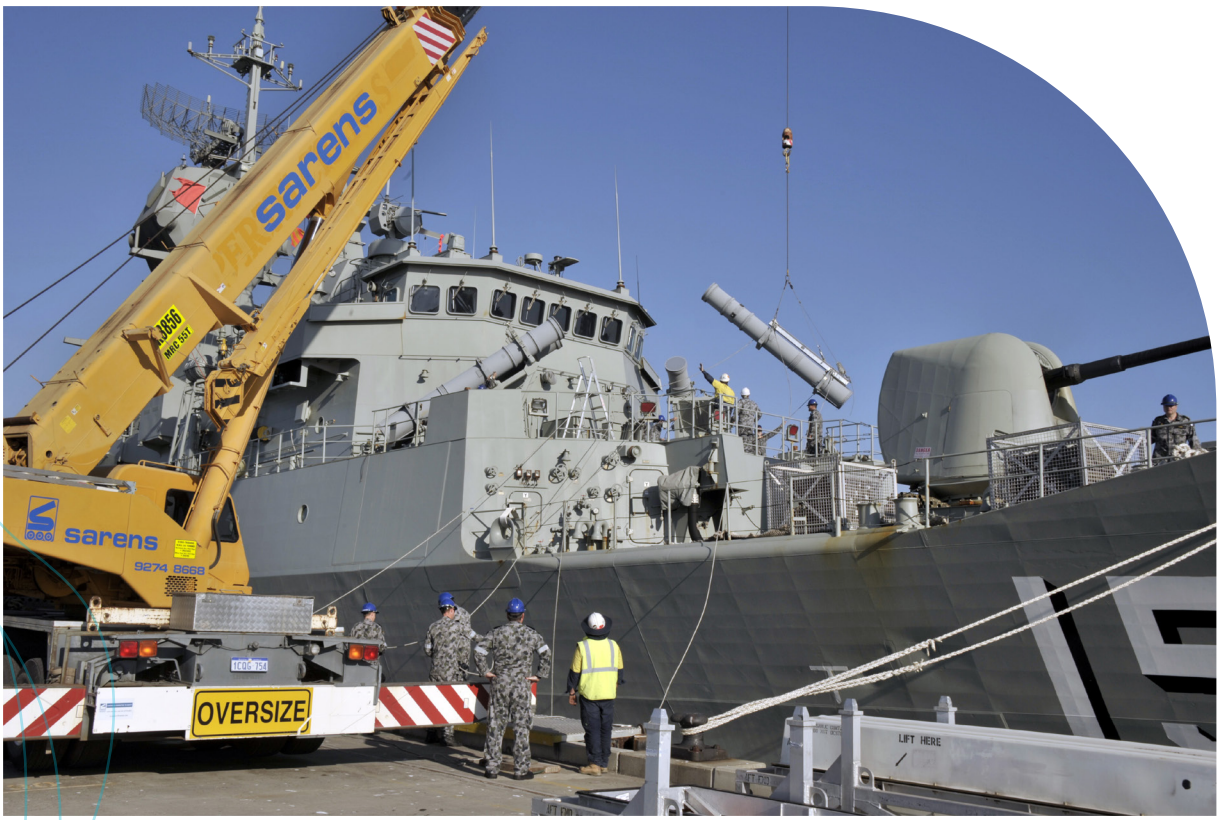
Have you conducted a Thales pre-start check? Have you checked for faults or conditions in cranes, hoists and lifting gear that may lead to a failure? Have you tagged or locked out any faulty equipment to previous inadvertent operation?

If you are a contractor

- Do you have the correct high-risk work license?
- Have you been inducted and approved to carry out this work?

If you are working at height

- Have you seen and tested the rescue plan?
- Does it include the equipment needed to extract an unconscious person?
- Are the workers nominated to implement the rescue plan trained, competent and properly equipped?



When working on wharves

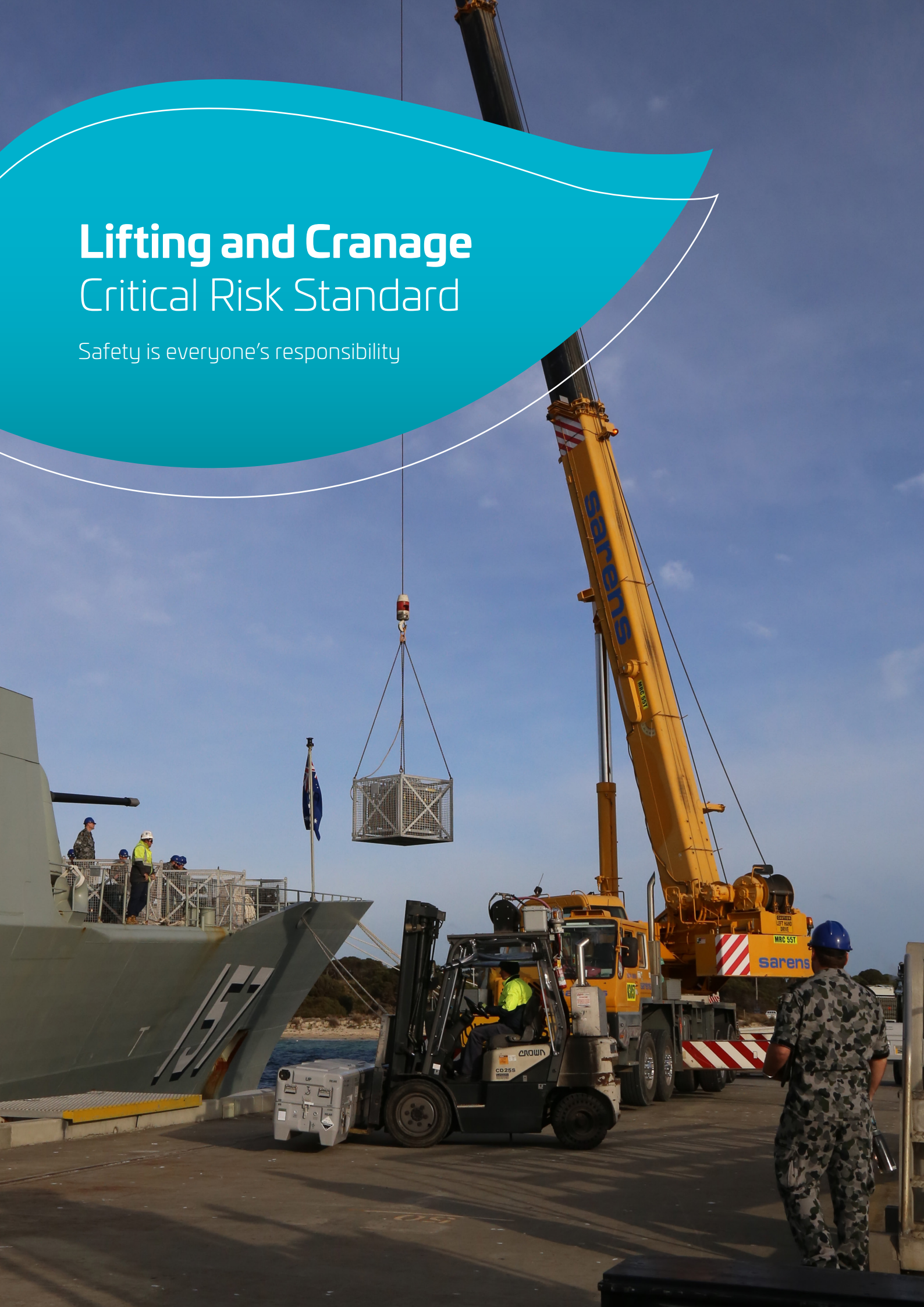
- Is the crane set up so the structure can manage the point loads?
- Can you see where to locate the point loads? There should be permanent markings to help you do this safely.

When operating a crane

- **STOP** immediately if lightning storms comes within a 10km radius – or if wind speeds exceed the safe operating standard.
- Perform a test lift for all complex lifts or if you are uncertain about the weight of the load.
- Use two-way radio communication in preference to, or as well as, hand signals.
- Maintain strong radio communications discipline, including acknowledging calls and using risk-based commentary when driving.

Lifting and Cranage
Critical Risk Standard

Safety is everyone's responsibility



Contents

Introduction

The Thales Australia Critical Risk Standards describe the minimum requirements for controlling each of the critical work health and safety risks that are common to our operations and workplaces. The Critical Risk Standards provide a high-level framework for managing health and safety hazards.

Scope

This Critical Risk Standard describes the Critical Controls for lifting and cranage activities and applies to all Thales sites and operations.

The intent is to eliminate or minimise the risk of fatalities and serious injuries arising from tasks involving lifting and cranage.

The aim is to prevent harm to persons resulting from:

- The process of using cranes and other lifting equipment.
- Harsh Environments.
- Lifting heavy loads.
- Traffic around the site during a lift.

Where Thales Australia does not have control of the worksite or is working under a client's safety management system, then:

- The client's standards shall be applied if they are equal or higher, and
- The Thales Australia Standard shall be applied for all aspects where the client's system is "silent".
- If the client's standards are lower and this presents a material risk then this must be escalated with the Thales Australia Project Manager.

What if a Critical Control Cannot Be Applied?

If for any reason there are circumstances where the Minimum Requirement for a Critical Control cannot be met, then a formal Control Standard variation is required.

Deviation from the requirements set out in each Control Standards shall be formally approved by a variation which involves:

- A documented and detailed risk assessment of the situation;
- A documented recommendation supported by the Business Safety Manager;
- A documented recommendation from a Technical Expert where appropriate; and
- Formal approval from the Business General Manager or Business Vice President that the level of risk as a result of the alternate control measures is understood, and considered acceptable to the organisation.

Contracted Work

Contracted workers and their Supervision must be inducted in this Critical Risk Standard.

Contractors are required to meet or exceed this Standard when undertaking work for Thales Australia Where there is a risk of fatalities and serious injuries arising from lifting and cranage.

Definitions

The following terms are used in this Risk Standard. Additional definitions can be found in the reference documents.

Critical Risk	A risk where there is potential for a fatality or life-altering injury.
Critical Control	A control that is crucial to preventing the event or mitigating the consequences of the event. The absence or failure of a critical control would significantly increase the risk despite the existence of the other controls.
Minimum Requirements	Aspects of the Critical Control that must be applied in all Thales Australia controlled operations.
Additional Requirements	Aspects of the Critical Control that may be applied based on a site-specific or task-specific risk assessment.
Elevating Work Platform (EWP)	EWPs are powered mobile plant designed to lift or lower people and equipment by a telescopic, hinged or articulated device, or any combination of these, from a base support. EWPs can move over a supporting surface without the need for fixed runways. There are various types of EWPs, including but not limited to: • Scissor lift • Boom lift • Trailer lift • Truck or vehicle mounted lift • Vertical mast lift
Competent Person	A person who has acquired through training, qualification, competency or experience the knowledge and skills to carry out the task.
SWMS	Safe Work Method Statement
JSEA	Job Safety and Environment Analysis
OEM	Original Equipment Manufacturer
Secondary Crush Protection	Secondary Crush Protection is a secondary protection barrier or device that provides the EWP operator/s protection against potential crush injuries. Examples of these barriers are as follows: • physical barriers attached to the platform, which reduce the likelihood of employees being crushed against structures • pressure sensing devices positioned over the control panel, which detect pending crush incidents and prevent further hazardous movements • proximity sensing devices which prevent an EWP's platform from maneuvering into high-risk areas near to fixed structures.

Lift planning must be completed to identify the hazards associated with the work environment, loads, slinging and crane configurations. Planning assessments must be completed for each new crane set-up in accordance with the table below.

Overhead Cranes e.g. Bridge & Gantry Cranes		
Lift Type/Characteristics		Risk Assessment Needed
Simple Lift	A "simple" lift is a lift meeting all of the following criteria: • Equal to or less than 10 tonne load within 80% of the crane's capacity at any point in the lift., Gantry crane won't know what the weight is. If the crane can't lift the weight it will cut out. • Unobstructed pathway, adequate clearances from live services, plant, infrastructure or occupied space. • Stable load with defined lifting points. • Stable ground conditions or solid sub-structure. • Routine following documented safe work method. • Single crane or hoist and; • Does not meet any characteristics of a complex lift	• A JSEA must be prepared for any non-routine "simple" lift • An SOP must be prepared for any routine "simple" lift Must be: • Prepared by a crane operator rigger/dogger who is deemed competent by the appointed person • No further review or approval required
Complex Lift	A "complex" lift is a lift featuring one or more of the following criteria: • Greater than 10 tonne load. • Greater than 80% of the crane's capacity at any point in the lift. • Pathway over live plant, live services or near an occupied space, partially "blind" pathway. • Non-routine lift of an awkward or abnormal load due to centre of gravity, shape, lack of containment or lack of lifting points. • Obstructed or restricted pathway with limited clearances.	For complex lifts a Lift Plan, a SWMS, an SOP must be prepared for any "complex" lift • Prepared by a crane operator rigger/dogger who is deemed competent by the appointed person • Reviewed and approved by Thales appointed person

Table 1.

Lift planning must be completed to identify the hazards associated with the work environment, loads, slinging and crane configurations. Planning assessments must be completed for each new crane set-up in accordance with the table below.

Mobile Cranes		
Lift Type/Characteristics		Risk Assessment Needed
Simple Lift	A "simple" lift is a lift meeting all of the following criteria: •Lifts are less than 75 per cent of the load chart capacity and do not meet any and do not meet any lift •characteristics of a significant lift •Equal to or less than 10 tonne load. •Unobstructed pathway, adequate clearances from live services, plant, infrastructure or occupied space. •Stable load with defined lifting points. •Stable ground conditions or solid sub-structure. •Routine pick and carry following documented safe work method. •Single crane or hoist.	•Crane Pre-lift Check used for each lift or series of lifts where the conditions are constant; or •Pick and Carry Lift Plan and Study Tool; and •A SWMS must be prepared for any non-routine "simple" lift •Prepare a standardised lift plan template, SP to provide GI template, add to document as an annexure Must be: •Prepared by a crane operator rigger/dogger who is deemed competent by the appointed person
Complex Lift	A complex lift is a lifting operation which involves one or more of the following: •Exceeds a gross weight of 10 tonnes (including rigging and lifting gear); •Requires two or more cranes; •Involves lifting over live operational plant; •Exceeds 75% of the crane's rated capacity in that particular configuration; •Involves lifting tilt-up or pre-cast panels; •Involves turning or flipping the load where shock loading and/or side loading is likely to occur; •Involves lifting in areas of poor or •Unknown ground conditions or sub-structure; or •Lifting a person in a man-box / cage.	For complex lifts a Lift Plan and a SWMS or SOP must be prepared for any "complex" lift •Prepared by a crane operator rigger/dogger who is deemed competent by the appointed person and; •Reviewed and approved by Thales appointed person Note: for lifts exceeding 90% of the rated crane capacity, and/or multiple crane lifts, additional approval of the Lift Study is required by RELEVANT OPERATIONS DIRECTOR or WORKPLACE MANAGER

Table 2

Lifting and Cranage Roles and Responsibilities

RELEVANT OPERATIONS DIRECTOR or WORKPLACE MANAGER

- Holds overall responsibility for lifting operations in the workplace or on the project under their control

APPOINTED PERSON

- A person approved by the Operations Director or Workplace Manager as having sufficient knowledge, qualifications and experience to approve Competent Workers.
- A person that can provide satisfactory evidence to a responsible authority that they have the qualifications and experience to be competent to independently perform the required tasks.
- Responsible for all lifting operations within the scope defined by the Operations Director or Workplace Manager for development, review and maintenance of the lifting operations plan.

CRANE OPERATOR

- Is appointed by the Appointed Person to ensure lifting activities are carried out in accordance with the lifting operations plan. Is a competent person who must hold either the same qualifications as an Appointed Person, and hold one of the following qualifications:

1) A National License to Perform High Risk Work for crane operation
2) A Crane Supervisor qualification issued by Crane Supervisor & Appointed Person

QUALIFIED AND COMPETENT PERSONS

- **Qualified Person** is a person who holds a National License to Perform High Risk to undertake Scheduled Work
- **Competent Person** is a person who has acquired through training, qualification or experience the knowledge and skills to carry out a task

Lifting and Cranage Safety Critical Controls

The minimum requirements for lifting and cranage from causing serious injury or fatality are:

LC1	Prior to conducting a crane lift, the site must be assessed for hazards that may impact the work and incorporated into the Lift Plan.
LC2	All cranes, hoists, lifting gear and taglines are suitable for the task and the load characteristics.
LC3	All personnel involved in a crane lift are qualified and assessed for competency in their role for the different types, capacities and operations of cranes.
LC4	Exclusion zones must be established using continuous physical barriers.
LC5	Lifting activities will be conducted and controlled in accordance with documented lifting operations and safe systems of work.
LC6	All loads must be suitably contained, correctly packaged and restrained prior to lifting.
LC7	Where crane operators work at height, a rescue plan must be documented and tested.

LC1 Site Assessment and Lift Planning

Prior to conducting a crane lift, the site must be assessed for hazards that may impact the work and incorporated into the Lift Plan.

MINIMUM REQUIREMENTS

The site assessment must include, as a minimum:

- Ground conditions including stability and potential for underground cavities.
- Capacity of ground/structure to support point and total loads.
- Presence of overhead structures and services.
- Potential obstructions to the lift path, or loss of visibility of the load by the operator.
- Potential interactions with site traffic and other mobile plant.
- Adequacy of lighting.

The method and considerations for conducting all crane lifts shall be described in Lift Plans, Safe Work Method Statements, or standard operating procedures:

- A Lift Plan and SWMS must be prepared for any “complex” lift
- For complex lifts a Lift Plan, a SWMS, an SOP must be prepared by a suitably qualified and competent operator, rigger or dogman and reviewed by a competent crane operator with experience relevant to the task
- A SWMS must be prepared for any non-routine “simple” lift by a qualified operator/dogger
- An SOP must be available for any routine “simple” lift .
- Systems must be in place to predict, monitor and communicate tide, swell and weather conditions for crane lifts.
- All crane and hoists must be operated in accordance with the Load Chart, Lift Plan, SWMSs and/or SOP.

Crane operations must be immediately terminated if lightning storms are within a 10km radius.

ADDITIONAL REQUIREMENTS

The following additional requirements should be considered in the site assessment:

- For pick and carry operations the lift pathway must be walked and assessed.
- Where reasonably practicable, overhead/adjacent services must be isolated prior to crane operation.
- The route used for pick and carry operations should be isolated from pedestrians and traffic where reasonably practicable. Pilots shall be used where practicable.
- Permanent markings shall be installed to assist in locating point loads above wharf piers or other structural supports.

The following additional requirements should be considered in planning the lift:

- A “Take 5” or similar hazard identification process should be applied before all routine simple lifts to identify any change in conditions that may impact the lift.
- Specialist software should be used in planning complex lifts.

NOTES AND REFERENCES

- The blind pathway is included in the traffic management plan which is reviewed annually.
- Different loads need different load plans.

LC2 All equipment and Plant is inspected

All cranes, hoists, lifting gear and taglines are suitable for the task and the load characteristics.

MINIMUM REQUIREMENTS

All cranes, hoists, lifting gear and taglines must have, at minimum:

- All cranes, hoists and lifting gear must not be used at greater than the manufacturer guidelines.
- All lifting gear, including slings, chains, workboxes, lifting cages, lifting beams and frames must be engineered to relevant standards, marked with the SWL and fit for the intended use.
- All cranes shall be fitted with limiting and indicating devices such that the capacity cannot be exceeded, and the stability compromised, at any point in the lift.
- All crane and workbox designs must be registered as required by legislation. Cranes used for workboxes must be capable of lifting a minimum 1 tonne load at maximum radius.
- Fibre slings must only be used in preference to chains if chains are deemed unsuitable, for example, due to the potential to damage the load. This to be determined by the Dogger/Slinger overseeing the operation.
- Lifting gear must be stored in an appropriate environment to prevent deterioration.

All lifting gear should also be inspected and tagged at the required intervals in the standards. Scheduled within site Maintenance System e.g. MEX, Maximo

ADDITIONAL REQUIREMENTS

The following additional requirements should be considered in fit for purpose cranes, hoists, lifting gear and taglines:

- Overhead cranes shall be remote operated where practicable.
- Only dry fibre slings should be used. If wet, fibre slings must be de-rated to half(?) their nominal capacity.
- Where limiting and indicating devices are to be installed on a crane the safety circuits of these devices should generally meet either: „ a reliability level of Category 4 under AS 4024.1-2006: Safety of machinery, or „ a safety integrity level (SIL) of 3 under AS 61508-2011: Functional safety of electrical/electronic/ programmable electronic safety-related systems.

Major inspections are part of the preventative maintenance program outlined in AS 2550 and should be conducted in addition to other inspections including pre-operational, routine periodic and third-party periodic inspections.

NOTES AND REFERENCES

Refer to Table 1 &2 for Simple and Complex Lifts on page 5/6

LC3 Licenses and Competency

All personnel involved in a crane lift are qualified and assessed for competency in their role for the different types, capacities and operations of cranes.

MINIMUM REQUIREMENTS

High risk work licenses must be held by Crane Operators, Riggers and doggers as required by legislation.

All Operators, Riggers and doggers must be assessed for competency initially and every two years by a qualified Assessor.

Where additional spotters, pilots, guides or tagline operators are engaged for a lift, they must be specifically instructed and supervised to ensure they remain clear of the line of fire of the crane and the load. (Must be qualified dogman/rigger for mobile and deemed competent for overhead crane)

Supervisors must undergo training in their responsibilities for overseeing crane operations.

Contractor workers that perform crane operations under Thales control are inducted to site and approved to operate subject to holding the correct high-risk work licenses

ADDITIONAL REQUIREMENTS

Where cranes are operated from a pulpit or cabin at height, operators must undergo regular health assessments.

Where practicable, crane access will be restricted to authorised operators (for example, through swipe card, isolation locks etc.)

If the person needs to use their judgement in deciding how to sling the load, what slings or chains to use etc. then they need a dogger's license. If they are following an SOP that pre-defines how to do the lift and this has been written by a qualified person, then they do not need a dogger's HRWL (regardless of whether it is a forklift with a jib, overhead crane or hoist etc.).

Refer to: Information Sheet: High risk work licensing for dogging: (safeworkaustralia.gov.au)

NOTES AND REFERENCES

LC4 Exclusion Zones

Exclusion zones must be established using continuous physical barriers.

MINIMUM REQUIREMENTS

For mobile crane operations, temporary exclusion zones shall be established using a continuous physical barrier to stop people entering the area around the crane and the lift pathway. The size of the exclusion zone must be determined through a risk assessment and documented in the lift plan.

For overhead crane and hoist operations, access to the lift zone shall be restricted using physical barriers, such as fences/gates or temporary barricading, when the lift is underway.

Only when continuous physical barriers are not reasonably practicable, shall exclusion zones be identified through painted markings, cones and/or signage.

A single point of accountability must be established for managing access to any exclusion zone.

ADDITIONAL REQUIREMENTS

No lifts are conducted in public areas without a hard barrier exclusion zone in place preventing access under the pathway of a suspended load. Hard barriers to include temporary construction fencing.

NOTES AND REFERENCES

LC5 Control of the load

Lifting activities will be conducted and controlled in accordance with documented lifting operations and safe systems of work.

MINIMUM REQUIREMENTS

A lift rehearsal must be performed for all complex lifts to confirm pathways and clearances.

A test lift must be performed for all complex lifts and where there is uncertainty regarding the weight of the load.

Lifts must be assessed regarding the need for taglines by the operator/dogger with consideration to load and wind conditions. Only compliant taglines may be used.

Communication between a crane driver and a dogman must be maintained in accordance with relevant Australian Standards.

Where remote controls are used, the remote must be isolated to prevent inadvertent operation when slinging the load.

ADDITIONAL REQUIREMENTS

Only one dogger should give signals at a time. Signals may be visual, audible or a combination of both. When more than one dogger is involved in a lift, each dogger should understand when responsibility for their part of the lifting operation should be handed over to another dogger.

Effective communication is particularly important where the crane operator cannot:

- see the load, the load's landing area or the path of travel of the load or the crane
- make an accurate judgement of distance, and
- see if the crane or the load may contact overhead electric lines or other obstacles.

People using radio equipment should be familiar with the manufacturer's operating instructions. A secure dedicated radio frequency should be selected for the duration of the crane operations to prevent interference with other radio equipment being used in the vicinity of the crane. A constant talk method should be used so the people involved are aware of the progress of the lifting operations. Work should stop immediately if there is a loss of radio communication.

NOTES AND REFERENCES

LC6 Load Packaging

All loads must be suitably contained, correctly packaged and restrained prior to lifting.

MINIMUM REQUIREMENTS

Fit for purpose containment and packaging must be used to restrain and protect the load in the event of being dropped or mishandled.

ADDITIONAL REQUIREMENTS

Test lifts should be used for EO to confirm the security of containment.

NOTES AND REFERENCES

LC7 Rescue Plan

Where crane operators work at height, a rescue plan must be documented and tested.

MINIMUM REQUIREMENTS

Where cranes are operated from a pulpit or cabin at height, rescue plans must be documented and available. The rescue plan must include the equipment and method to extract a crane operator in both a conscious and unconscious state.

The rescue plan must nominate worker(s) to implement the plan who are:

- not included in the crane operation
- trained and competent
- equipped and able to implement the rescue plan

The rescue plan must be practiced at a frequency determined by site risk assessment.

ADDITIONAL REQUIREMENTS

NOTES AND REFERENCES

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