

1.1 Introduction

These training materials are based on the National High Risk Work Licence Unit of Competency **TLILIC0023 Licence to operate a slewing mobile crane (up to 60 tonnes)**.

You will learn about:

- Planning the job.
- Selecting and inspecting equipment.
- Preparing the site and equipment.
- Performing the task.
- Shutting down the job and cleaning up.



1.1.1 What is a Slewing Mobile Crane?

A slewing mobile crane is a crane with a boom or jib that is capable of being slewed.

This course covers slewing mobile cranes with a capacity up to 60 tonnes.



This **does not** include:

- A front-end loader or
- A backhoe or
- An excavator or
- Other earth moving equipment, when configured for crane operation.

1.1.2 High Risk Work Licence Requirements



Once you pass your assessment you will have **60 days** to apply for your licence.

You must renew your licence within 12 months of its expiry otherwise:

- ◆ Your licence can't be renewed.
- ◆ You need to repeat the course and re-apply for your licence.
- ◆ You need to enrol in the course again and be supervised by somebody who has a current licence for the same class.

You can still do high risk work without a licence as long as:

- You are enrolled in a high risk course for the class, and
- You are being **supervised by somebody who has a licence for the same class.**

Any licensed worker must take reasonable steps to make sure the way they work does not impact on the safety of themselves or any other worker. This is their legal duty of care. Failing to work safely can result in the health and safety regulator:

Suspending or **cancelling** your licence.

Refusing to renew your licence.

Ordering that you are **reassessed** to ensure you are competent.

Take **legal action to prosecute** you.



Your employer might ask you for evidence that you have a high risk licence before you start any high risk work. You can show them:

- Your licence.
- Proof from the training company that you have passed your assessment.
- Proof that you are currently completing a course for high risk work.

If you hold a HRW licence, your employer is expected to provide you with information on how to operate any equipment you may be unfamiliar with. This may be, but is not limited to: provision of verbal or written instruction, practical training or potentially supervision while becoming comfortable with the equipment.



1.1.3 Crane Operator, Dogger, Rigger – Summary of Responsibilities

Licensed Dogman or Rigger	Determining the weight of a load. The dogman is required to check and determine the weight of the load and inform the crane operator.
	Legally sling a load
	Identifying lifting points and lifting methods
	Put a load in a crane hook
	Inspect rigging gear
	Direct a crane
	Select rigging gear
Crane operator	Understand dogging signals
	Ensure the crane can lift the load. The crane operator is responsible of ensuring the load being lifted is within the capacity of the crane.
	If the crane driver is unsure if the rigging is correct or safe: Do not lift Stop work until it is confirmed as safe and rectified if necessary

1.2.2 How to Keep Everyone Safe

OHS information:

The main types of WHS/OHS legislation, requirements and guidelines (where you can **source OHS information**) include:

- ◆ **OHS Acts.**
- ◆ **OHS Regulations.**
- ◆ **Australian Standards.**
- ◆ **Codes of Practice/Compliance Codes.**
- ◆ Management plans.
- ◆ Workplace OHS policy and procedures.
- ◆ **Manufacturer’s instructions.**
- ◆ **Logbook.**
- ◆ **Load chart.**
- ◆ **Operations manual.**

1.3 Identify Hazards and Control Risks

Before you start work, you need to check for any hazards or dangers in the area. If you find a hazard or danger you need to do something to control it. This will help to make the workplace safer.

HAZARDS CREATE RISK. CHECK FOR HAZARDS BEFORE YOU START ANY WORK.

A **HAZARD** is the thing or situation that causes injury, harm or damage.

A **RISK** is the chance of a hazard hurting you or somebody else or causing some damage (the chances of a hazard hurting you or causing injury, harm or damage to someone or something else.).

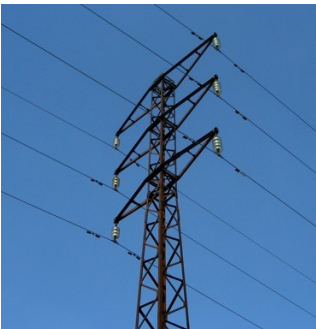
If you can remove or at least control a **HAZARD** you can reduce the **RISK** involved.

Each worksite has its own specific risks and hazards.

When you start checking for hazards, make sure you look everywhere. A good way to do this is to check:

- ◆ **Up high** above your head.
- ◆ All around you **at eye level**.
- ◆ **Down low** on the ground (and also think about what is under the ground).

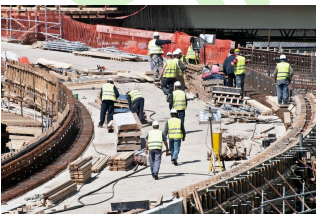
Some **common hazards related to slewing mobile crane operations** include:



- ◆ Overhead hazards such as power lines, service lines, and service pipes.
- ◆ Underground services.
- ◆ Ground surfaces and conditions including:
 - Surfaces that may not bear the weight of the crane or other equipment.
 - Recently filled trenches.
 - Slopes.



- ◆ Bad weather conditions such as strong winds, lightning or storms that may cause:
 - Load spin.
 - Load swing.
 - Uncontrolled slewing.
 - Possible crane damage or instability.



- ◆ Insufficient lighting/lack of illumination.
- ◆ Vehicle traffic.
- ◆ Plant and equipment.
- ◆ Pedestrians and workers.

- ◆ Site specific hazards such as dangerous materials.
- ◆ Trees.
- ◆ Buildings, facilities and other surrounding structures.












- ◆ Obstructions or obstacles.
- ◆ Unusual or difficult terrains.
- ◆ Ultraviolet radiation.

Hazards may also include those related to erecting the crane and packing up after the job (e.g. manual handling hazards, heavy lifting, unsafe body postures).

1.4.2.1 Follow Communication Signals

Shown here are the **hand and whistle signals** used in Australia:

HAND SIGNALS			
Motion	Signal	Motion	Signal
Hook up		Hook down	
Luff up/ Boom up/ Jib up		Luff down/ Boom down/ Jib down	
Slewing Right		Slewing Left	
Jib/Trolley Out; Telescoping Boom Extend		Jib/Trolley In; Telescoping Boom Retract	
		Stop	

Creep Speed: Appropriate hand signal for motion with hand opening and closing

1.4.2.2 Check Communication Equipment

Inspect all communication equipment **before starting the crane work** to make sure that it is working correctly and that effective communication can be established and maintained at all times.

Communication equipment used in crane operations may include whistles, bells, buzzers or fixed channel two-way radios.

Where radio communication equipment is used, the transmitting frequencies of the equipment must be selected to prevent interference to or from other radio equipment being used in the vicinity of the crane.



Consult the manufacturer's instructions to make sure the equipment is working correctly.

Check for channel setting, radio interference and make sure you are not interfering with other workers on-site who may also be using radios. Use a dedicated frequency to prevent interference with other equipment. Make sure batteries are fully charged and that you have spare batteries in case they are needed. Look for the visual damage or defects. Check handset volume. Ensure microphones or speakers are clear and audible.



1.5.2.2 Setting Up and Operating Close to Buildings

If you were working near a building, there are number of things to consider and actions to take:

- **Crane access and egress.**
- If possible, set up the **boom to slew away from the building.**
- **Can outriggers be extended as per manufacturer's instructions?**
- Is any **protection** required for buildings?
- Are **screens required for windows** and other easily damaged areas of the building?
- **Underground services.**
- **Counterweight swing zone.**
- Take extra care of **back-filled trenches** placed close to the building.
- Pay close attention to the **effect of wind on loads**, as wind speeds tend to increase around buildings.

2.5 Post-Start Checks

Post-start or operational checks are done after pre-start checks and only if no faults or defects were found. Make sure you have plenty of room to test out the crane before starting it up.

It is important that the crane is tested to the full range of its capacity to ensure that the crane is safe and functioning correctly.



Post-start checks include:

- All hazard controls are in place.
- You have a clear view from the operating position across all work zones, wherever possible. This will ensure that your view is not obscured when carrying out operations.
- **All crane movements and controls are smooth and tested to the full extent of their capacity (to ensure correct functioning of the crane and its safety)** including:
 - Boom movements including in and out (extending/telescoping) and luffing.
 - Hoist movements including slew, raise and lower.
 - Controls, including the throttle control.
- Inspecting the travel limits.
- Warning devices and systems.
- Warning lights and devices.
- Horn, lights and drive indicator.
- Communications.
- Brakes.
- Steering.
- All gauges are functioning correctly.
- Slew brake lock.
- Two-block/double block system present and in good condition.

You may also be required to input data into the crane's computer and make sure that it is accurate and matches the configuration of the crane.

5.3.2 Packing

5.3.2.1 Calculating the Required Size of Packing

Working out the size of the packing area required is an important step in safely setting up the crane.

You may need to use packing or mats under the outriggers to make the crane stable on soft ground.

When working out the area of required packing you will need to know:

- ◆ Total mass of the crane.
- ◆ Total mass of the load to be lifted.
- ◆ The soil bearing pressure.

If this information is known you can then use the following formula to work out the required size of packing in metres squared (m²).

$$\text{Area of packing (m}^2\text{)} = \frac{0.65 \times (\text{Crane Mass} + \text{Load Mass})}{\text{Soil Bearing Pressure (V)}}$$



Example – Calculating the Required Area of Packing

If a mobile slewing crane that weighs 29200kg is to be set up to lift a 15t load on compacted gravel. What is the smallest packing pad needed for each outrigger?

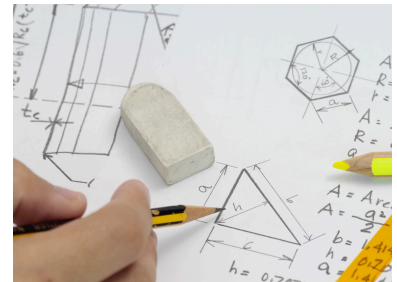
The following sized outrigger pads are available:

- ◆ 0.25m²
- ◆ 0.5m²
- ◆ 0.75m²
- ◆ 1m²

The first step is to deduce all the information required.

- ◆ Total Crane Mass = 29200kg = 29.2t
- ◆ Load to be lifted = 15 tonne.
- ◆ Compacted Gravel = 40 tonnes/m².

Now that the data is in an easily accessible format we can use it to find the minimum required area of packing for this configuration.



Calculations

$$\begin{aligned}
 \text{Area of packing (m}^2\text{)} &= \frac{0.65 \times (\text{Crane Mass} + \text{Load Mass})}{\text{Soil Bearing Pressure (V)}} \\
 &= \frac{0.65 \times (29.2 + 15)}{40} \\
 &= \frac{0.65 \times (44.2)}{40} \\
 &= \frac{28.73}{40} \\
 &= 0.72 \text{ m}^2
 \end{aligned}$$

Therefore the smallest packing pad needed for each outrigger would have an area of 0.72m², so the required outrigger size would be 0.75m².