

RIIHAN305D

Operate a Gantry or Overhead

Learner Guide Instructions

Who is this document for?

The learner.

What is in this document?

- Course information that matches the PowerPoint presentation.
- Review questions.
- Practical assessment instructions for learners.

What do you need to do before you use it for the first time?

1. Rebrand the document.
2. Review the document as part of your validation process.
3. Set the reading and test time limits that are highlighted in pink at the end of the document.

See the 'Read Me First' document for a complete set of instructions on how to use these resources.



LEARNER GUIDE

RIIHAN305D Operate a Gantry or Overhead Crane

Learner Name:	
Learner ID:	
Learner Contact Number:	
Learner Email Address:	
Date Training Commenced:	

This Book Contains:

- Course Information.
- Review Questions.
- Practical Assessment overview and Instructions.

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1.1 Introduction

These training materials are based on the national unit of competency **RIIHAN305D Operate a Gantry or Overhead Crane**.

You will learn about:

- ◆ Planning and preparing for operations.
- ◆ Operating the crane to move loads.
- ◆ Carrying out maintenance.
- ◆ Cleaning up.



This training qualifies you to operate a gantry or overhead crane with 3 or less powered operations, where hoist/raise and lower is one operation.

1.1.1 National High Risk Work Licence

A National High Risk Work Licence is required to operate a bridge or gantry crane if it is:

Controlled from a permanent cabin or control station on the crane.

OR

Remotely controlled and has more than 3 powered operations.

1.1.2 Overhead and Gantry Cranes

An **Overhead Crane** (also called a **bridge crane**) is a crane comprising a bridge beam mounted at each end to an end carriage, capable of travelling along elevated runways and having one or more hoisting mechanisms arranged to traverse across the bridge.



A **Gantry Crane** is a crane comprising a bridge beam, supported at each end by legs, mounted on end carriages, capable of travelling along runways at surface or deck level, and which has a crab with one or more hoisting units arranged to travel across the bridge. Gantry cranes may have fixed runways with or without rails.



Overhead and gantry cranes commonly include the following components:

- ◆ The hook block.
- ◆ The hoist.
- ◆ The carriage.
- ◆ The bridge.
- ◆ The runway.
- ◆ The main isolator switch.
- ◆ Safety devices.
- ◆ Remote controls.



To make sure you know the specific details for the crane you are operating you should access the technical information. This will be found in the operator's manual or manufacturers' specifications.

1.1.2.1 The Hook Block



The hook block is used to raise and lower the hook.

It consists of:

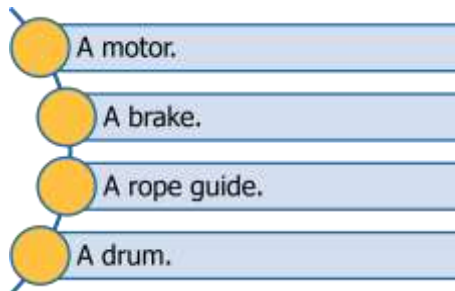
- ◆ Sheaves or pulley wheels.
- ◆ A hook.
- ◆ A safety latch.

Running through the pulley of the hook block is the hoist rope. The hoist rope consists of many small wires formed into a flexible and strong rope. To reduce wear on the hoist rope it should be kept lubricated.

1.1.2.2 The Hoist

The **hoist rope** is wound up and down by the **hoist**.

The hoist consists of:



The hoist travels on the **crane bridge**. The motor that drives the hoist from one side of the bridge to the other is called the **cross travel motor**. The **cross travel brakes** are part of the cross travel motor.

A **serial hoist** is an all in one hoist and cross travel unit. The other kind of cross travel unit is the **crab hoist** where the hoist is mounted onto a trolley with wheels. On a crab hoist, the cross travel brakes may be separate from the cross travel motor.

The **hoist brake** operates when the hoist is not being raised or lowered. When you press the "raise" or "lower" button, the brake is released.

The **hoist drum** is usually grooved so that the rope does not wear quickly or become tangled.

The **over-hoisting limit switch** stops the hook block from being raised too high by stopping the power. Do not use the over hoisting limit switch as a convenient method of stopping the hoisting motion. Continual over-hoisting will wear the limit switch and cause the hoist drum and rope guide to be damaged.



1.1.2.3 The Carriage

The carriage is the main unit of the crane comprising the hook block, hoist, bridge and motors.



1.1.2.4 The Bridge

The bridge extends across the crane structure from rail to rail. It sits on an end carriage that has track wheels.

The bridge of the crane should show the Safe Working Load (SWL). This tells you the maximum load that the crane can lift.

DO NOT operate a crane without a Safe Working Load notice.



1.1.2.5 The Runway



When the carriage travels the length of an area it is called **long travelling**. For this a crane needs a **runway**.

On a gantry crane the runway would be the concrete floor.

On an overhead crane the runway is two strong steel beams supported from the columns of the building.

The **long travel motors** drive the crane along the long travel rails. They usually have internal brakes.

There are usually two long travel motors, one for each end carriage. Older cranes may have only one motor with long shafts that drive the wheels on both sides of the crane.

Once a crane has reached the limit switch position, it will automatically shut off. It can be reactivated at a slow speed.

Electricity is supplied through bus bars and contact is made through collector shoes. Only maintenance personnel are authorised to work in this area.

1.1.2.6 The Main Isolator Switch

The **main isolator switch** controls the electric power to the **bus bars** and any crane using them. There may be one switch to each crane or a number of cranes may share a switch.

Some switches have a **key lock** so that the bus bars and crane can be made safe when they are not being used, or when they are being worked on.



1.1.2.7 Safety Devices



Most cranes are fitted with **emergency stop buttons**, which are provided so that other people can stop the crane if they see any danger.

Usually the crane operator presses the stop button on the remote control in an emergency situation.

A warning device warns people away from the crane while it is working. The warning device fitted to your crane could be a bell, buzzer or siren.

1.1.2.8 Remote Controls

Remote controls can be pendant, infrared or radio controlled. Both infrared and radio controlled remote controls have a limited range.



Infrared controls must be pointed towards the crane during operation or the crane will stop.

Pendant controls are connected directly to the crane and the operator must walk with the crane as it travels.

When using a remote control it is important to be in a position to review the load and the travel path.

A **direction notice** tells you which way the crane will move when you push each remote control button.

1.1.3 Working with Doggers/Riggers

You will often need to work with doggers (or riggers) during your crane operations.

It is important to know what doggers are responsible for and what you need to do to assist them so that you can safely carry out lifting operations.



1.1.3.1 What is a Dogger

A dogger (or rigger) is someone who is qualified and holds a High Risk Work Licence to carry out dogging work.



Dogging work includes:

- ◆ Assessing the weight of a load.
- ◆ The selection and/or inspection of lifting gear.
- ◆ The application of slinging techniques.
- ◆ The directing of a crane/hoist operator in the movement of a load when the load is out of the operator's view.
- ◆ Communicating with the crane operator in regards to the capabilities of the crane.

Dogging Duty of Care

It is the Duty of Care of a person who is involved with the slinging of a load to ensure they have their dogging licence in the following situations:

- ◆ When selecting/inspecting slings and the selection of a slinging technique.
- ◆ When directing the crane operator in the movement of the load, particularly when the load is out of view of the crane operator.

It is the responsibility of the person who can legally sling the load, generally the dogger, to determine the weight of the load to be lifted.



1.1.3.2 Crane Operators and Dogging

In some situations you may be able to sling the load without a dogging licence. This is only in cases where there is no decision required specific to any of the following:

- ◆ The selection of slinging equipment.
- ◆ The inspection of slinging equipment.
- ◆ The lift points (as they are clearly defined).
- ◆ Directing the crane operator in the movement of the load.
- ◆ Determining the weight of the load.



For example, you may move the same type of load regularly that always has the same weight, shape and size. In some workplaces crane operators will be instructed on the correct equipment and technique to use with that particular load by a dogger, and must always sling the load as instructed.

You **must** have a dogging licence, or be supervised by a person with a dogging/rigging licence, as soon as you need to do **ANY** of the following:

- Select/inspect slings.
- Select a slinging technique.
- Direct the crane operator.
- Determine the weight of the load.

The crane operator is responsible for communicating with the person who is slinging the load (the dogger) and providing information on the crane capacity.

If you are not sure if you are allowed to sling a load or not, speak to your supervisor.

Review Questions

1.	Do you need a High Risk Work Licence to operate a bridge or gantry crane if it has three (3) or less powered operations?	<input type="checkbox"/>

1.2 Site Policies and Procedures

You must follow all safety rules and instructions when performing any work. If you are not sure about what you should do, ask your boss or supervisor. They will tell you what you need to do and how to do it in a safe way.



1.2.1 Load Handling and Crane Operation Documentation

Before starting your work you need to make sure you have access to all load handling and crane operation documentation for the job. This will help you to do your work in the safest way and make sure all work is compliant.

Load handling and crane operation documentation may include:

Site Details	The information and safety requirements of the workplace environment (where you will be working).
Hazard Details	Any hazards in the work area or related to the work. This could also include instructions on how to handle dangerous or hazardous materials.
Task Details	Instructions of what the work is or what you will be doing (this can include diagrams or plans). Also instructions on how to safely do the job.
Faulty Equipment Procedures	Isolation procedures to follow or forms to fill out.
Signage	Site signage tells you what equipment you need to have, or areas that are not safe to be in.
Emergency Procedures	Instructions on what to do in emergency situations, for example if there is a fire, accident or emergency where evacuation or first aid is needed.
Equipment and Work Instructions	Details of how to operate plant and equipment and the sequence of work to be done.

All work needs to follow worksite, environment and company safety procedures.

Procedures help to make sure that all work is done in a safe way, without damaging equipment or putting people in unsafe situations. They also help to make sure that work is done in the correct order and doesn't interrupt or get in the way of other work that is happening on the site.

Review Questions

2.

List four (4) things that may be included in 'operations documentation'.



1.

2.

3.

4.

1.3 Work Instructions

You need to be clear about what work you will be doing. Make sure you have everything about the job written down before you start. This includes what you will be doing, how you will be doing it and what equipment you will be using.



1.3.1 Work Instructions and Details

Make sure you have all of the details about where you will be working. For example:

- ◆ **The Site** – Is there clear access for all equipment? Are there obstructions in the way? Is there a safe place for the load to be moved to?
- ◆ **The Weather** – Is there wind, rain or other bad weather? Is it too dark?
- ◆ **Facilities and Services** – Are there power lines or other overhead or underground services to think about?
- ◆ **Traffic** – Are there people, vehicles or other equipment in the area that you need to think about? Do you need to get them moved out of the area? Do you need to set up barriers or signs?
- ◆ **Hazards** – Are there dangerous materials to work around or think about? Will you be working close to power lines or other people?



You also need to make sure you have all of the details about the kind of work you will be doing:



- ◆ **The Task** – What load is being moved? How big is it? How much does it weigh?
- ◆ **Plant and Equipment** – What type of plant or equipment will be used? How big is it? How much room does it need?
- ◆ **Communications** – How are you going to communicate with other workers?
- ◆ **Procedures and Rules** – Do you need any special permits or licences? Are there site rules that affect the way you will do the work?

All work needs to follow worksite, environment and company safety procedures.

Procedures help to make sure that all work is done in a safe way, without damaging equipment or putting people in unsafe situations. They also help to make sure that work is done in the correct order and doesn't interrupt or get in the way of other work that is happening on the site.

Your work instructions will tell you the safest way to do the job, and the equipment that you will need to use. It is a good idea to check your work instructions with your boss or supervisor to make sure you know exactly what you need to do.

If you don't know where to get your instructions or you can't understand them, you can ask your boss or supervisor. They will tell you where to find your work instructions and explain what they mean.



1.3.2 Worksite Communications

It is important to coordinate your activities with other workers when you are planning for and carrying out the work to make sure everyone knows:

- ◆ The work being completed.
- ◆ How, when and where you will be operating.
- ◆ What they need to do.



All workers on site must understand their own role and the roles of others before starting work. It helps to make sure work is done safely and efficiently.

You will also need to alert personnel to any hazards you notice during your work activities, including changing work environments.

Review Questions

3.	What details about the work area can you get from your work instructions? Provide three (3) examples.	<input type="checkbox"/>
1.		
2.		
3.		

4.	Why is it important to coordinate your activities with other workers when you are planning for and carrying out the work?	<input type="checkbox"/>

1.4 Hazard Identification and Control

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.



1.4.1 Identify Hazards

Part of your job is to look around to see if you can find any hazards before you start any work.

A **hazard** is the thing or situation with the potential to cause injury, harm or damage.

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 hazards you should check for in the work area:

Environment	e.g. wind, lightning, storms.
Dangerous Materials	e.g. fuels, chemicals.
Traffic and People	e.g. pedestrians, vehicles.
Facilities	e.g. insufficient lighting, obstructions.
Other Equipment	e.g. plant, other cranes on the runway.

1.4.2 Control Hazards

After you have found hazards or dangers you need to work out how bad they are:



1. What is the chance that the hazard will hurt someone or cause damage?
2. If it does happen, how bad will the injury or damage be?

Thinking about these things will help you to choose how to control the hazards. Hazards controls need to follow:

- ◆ Legislation (laws).
- ◆ Australian Standards.
- ◆ Codes of Practice.
- ◆ Manufacturers' specifications.
- ◆ Industry standards.



The best way to control hazards is to use the Hierarchy of Hazard Control. The Hierarchy of Hazard Control is the name given to a range of control methods used to eliminate or control hazards and risks in the workplace.



You start at the top of the list and see if you can take away (eliminate) the hazard or danger.

If you can't take it away you move down the list to see if you can swap it for something safer (substitution).

Keep working through the list until you find something that controls that hazard or danger.