



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **MEM11023A Operate a bridge and gantry crane**

**Release: 1**

## MEM11023A Operate a bridge and gantry crane

### Modification History

Not applicable.

### Unit Descriptor

This unit of competency applies to the operation of bridge and gantry cranes that are operated from a permanent cabin/control station on the crane.

### Application of the Unit

This unit applies to operation of a bridge and gantry crane in a manufacturing related environment, such as a factory, raw material or finished goods store. It covers safe and efficient operation of the crane and applies where the operator has responsibility to plan the work, transfer loads as well as the conduct of routine checks and shutting down and securing of the crane.

This unit does not cover the bridge and gantry crane types that are controlled from a location remote to a permanent cabin/control station on the crane and that have three or less powered operations, that is hoist/raise and lower in one operation. It also does not cover the slinging or rigging of loads.

While this unit applies to work covered by licensing requirements, it also includes other manufacturing related skills, such as integrating crane operations with production, jobbing, maintenance or warehouse operations.

This unit is not recognised by regulators for licensing requirements. In order to satisfy licensing requirements, the imported unit TLILIC3003A Licence to operate a bridge and gantry crane will be required.

Band A

Unit Weight 4

### Licensing/Regulatory Information

Not applicable.

## Pre-Requisites

Not applicable.

## Employability Skills Information

This unit contains employability skills

## Elements and Performance Criteria Pre-Content

Not applicable.

## Elements and Performance Criteria

- |                          |  |
|--------------------------|--|
| 1 Plan work              | 1.1 Load transfer authorisation is obtained, including lift time and load destination  |
|                          | 1.2 Potential hazards for load lift and transfer are identified  |
|                          | 1.3 Hazard control measures are identified consistent with appropriate standards to ensure the safety of personnel and equipment |
|                          | 1.4 Weight (mass) of the load is estimated in consultation with associated personnel   |
|                          | 1.5 Appropriate paths for the movement of loads in the work area are determined  |
|                          | 1.6 Crane capacity is checked as appropriate to the load   |
|                          | 1.7 Appropriate communication methods are identified with associated personnel   |
| 2 Conduct routine checks | 2.1 Appropriate hazard prevention/control measures are applied to the work area according to procedures                          |
|                          | 2.2 Crane is accessed in a safe manner   |
|                          | 2.3 Crane is visually checked for any damage or defects  |
|                          | 2.4 All signage and labels are visible and legible according to the appropriate standard   |
|                          | 2.5 Routine pre-operational crane checks are carried out according to procedures   |
|                          | 2.6 All controls are located and identified  |

- 2.7 Crane service logbook is checked for compliance
  - 2.8 Crane is started according to procedures and checked for any abnormalities
  - 2.9 Crane safety devices are tested according to procedures
  - 2.10 Post-start operational checks are carried out according to procedures
  - 2.11 All communication equipment is checked for serviceability
  - 2.12 All damage and defects are reported and recorded according to procedures, and appropriate action is taken
- 3 Transfer loads
- 3.1 Hoist block is positioned over load following directions from associated personnel
  - 3.2 Test lift is carried out according to procedures
  - 3.3 Loads are transferred along planned path
  - 3.4 All crane movements are according to procedures and the appropriate standard
  - 3.5 Communication signals are interpreted correctly according to procedures and the appropriate standard
  - 3.6 Crane is operated according to procedures
  - 3.7 Load movements are monitored constantly ensuring safety to personnel and load, and structural stability
  - 3.8 Unplanned and/or unsafe situations are responded to in line with procedures
- 4 Shut down and secure crane
- 4.1 Crane is parked according to procedures
  - 4.2 Crane and equipment are stowed and secured according to procedures and the appropriate standard
  - 4.3 All relevant motion locks and brakes are applied, where applicable
  - 4.4 Crane is shut down according to procedures
  - 4.5 Routine post-operational crane checks are carried out according to procedures
  - 4.6 Hazard prevention/control measures are removed, where applicable

- 4.7 All damage and defects are reported and recorded according to procedures, and appropriate action is taken

## Required Skills and Knowledge

Required knowledge includes:

- appropriate mathematical procedures for estimation of loads
- bridge and gantry crane characteristics
- federal, state or territory occupational health and safety (OHS) legislation, standards and codes of practice relevant to the full range of processes for the crane class
- emergency procedures, including escape routes
- the hierarchy of hazard identification and control
- organisational and workplace standards, requirements, policies and procedures for conducting operations for the crane class
- typical hazards in manufacturing related environments, including:
  - process areas that must be avoided, ceased or special procedures adopted before load transfers occur, including welding, machining, melting and casting
  - transfers across areas frequented by personnel, including workstations and walkways
  - hazardous loads, including hot or liquid metals, chemicals, heavy and non-standard shaped loads
- procedures for the recording, reporting and maintenance of workplace records and information
- typical routine problems encountered in the operation of the crane and equipment and adjustments required for correction

Required skills include:

- accurately recording and maintaining information relating to bridge and gantry crane operations
- using communication techniques in the workplace, including hand signals, whistles and two-way radios
- using interpersonal and communication skills at a level sufficient to communicate with other site personnel
- operating a bridge and gantry crane, including all functions to their maximum for the lifting and moving of loads to the maximum rated capacity, in conjunction with other associated personnel
- applying risk assessment and hazard control strategies, including hierarchy of control, as applied to the safe operation of the crane (particular awareness of the risks associated with the workplace, including location of utilities, such as overhead powerlines, other electrical cables, water and compressed air lines, access to cabin, location of equipment, fixtures and workstations, vehicles and clear access whilst travelling)
- planning load transfer paths for safety and efficiency in a manufacturing related environment
- using and interpreting crane manufacturer specifications and data, including maximum load information, to ensure the crane is not overloaded
- identifying problems and equipment faults and demonstrating appropriate response procedures
- reading and comprehending manufacturer instructions, procedures and safety signs



## Evidence Guide

<p><b>Overview of assessment</b></p>	<p>A person who demonstrates competency in this unit must be able to operate a bridge and gantry crane to industry and enterprise standards, manufacturer specifications, and in accordance with safety regulations and procedures.</p>
<p><b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b></p>	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> <li>• comply with OHS licensing legislation</li> <li>• communicate and work safely with others in the work area</li> <li>• apply risk assessment and management procedures (particular awareness of the risks associated with overhead powerlines/electrical cables, access to cabin, other personnel and equipment in the work area, including vehicles and clear access whilst travelling)</li> <li>• conduct pre- and post-operational checks of the bridge and gantry crane</li> <li>• operate a bridge and gantry crane, including all functions to their maximum capacity in the lifting and moving of loads to the maximum rated capacity, in conjunction with other associated personnel</li> <li>• apply appropriate mathematical procedures for estimation of loads.</li> </ul>
<p><b>Context of and specific resources for assessment</b></p>	<ul style="list-style-type: none"> <li>• Assessment must be undertaken either in the workplace or in a realistically simulated workplace setting.</li> <li>• Assessors must ensure that the assessment in the workplace is organised to ensure that all the required equipment and materials and a suitable working area is made available to suit the assessment and the workplace.</li> <li>• Assessment must occur under standard and authorised work practices, safety requirements and environmental constraints.</li> <li>• Assessment is to comply with relevant appropriate standard requirements.</li> <li>• Applicants must have access to: <ul style="list-style-type: none"> <li>• personal protective equipment for the purpose of the Performance Assessment</li> <li>• appropriate bridge and gantry crane and associated equipment in safe condition</li> </ul> </li> </ul>



	<ul style="list-style-type: none"> <li>• suitable loads as specified by the endorsed Assessment Instrument</li> <li>• communication equipment (e.g. two-way radios and whistles)</li> <li>• other associated personnel to sling and direct the loads.</li> </ul>
<b>Method of assessment</b>	<ul style="list-style-type: none"> <li>• The use of ‘simulators’ in the assessment of this unit of competency is not acceptable.</li> <li>• Assessment may be in conjunction with the assessment of other units of competency.</li> <li>• Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge.</li> <li>• Assessment must confirm a reasonable inference that competency is not only able to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.</li> </ul>
<b>Guidance information for assessment</b>	

## Range Statement

<b>Hazards</b>	<p>Hazards may include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• ground stability (e.g. ground condition or slopes for load placement)</li> <li>• overhead hazards (e.g. powerlines and service pipes)</li> <li>• insufficient lighting</li> <li>• traffic (e.g. pedestrians, vehicles and plant)</li> <li>• environmental conditions (e.g. dust, wind, lightning and storms)</li> <li>• other specific hazards (e.g. dangerous materials)</li> </ul>
<b>Hazard control measures</b>	<p>Hazard control measures refer to the systematic process of eliminating or reducing the risk to personnel and property through the application of controls.</p> <p>It includes the application of the hierarchy of control, the six-step preference of control measures to manage and control risk:</p> <ol style="list-style-type: none"> <li>1) elimination</li> <li>2) substitution</li> <li>3) isolation</li> <li>4) engineering control measures</li> <li>5) using safe work practices</li> <li>6) personal protective equipment</li> </ol>
<b>Appropriate standards</b>	<p>Appropriate standards may include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• codes of practice</li> <li>• legislation</li> <li>• Australian standards</li> <li>• crane manufacturer specifications</li> <li>• industry and workplace standards, where applicable</li> </ul>
<b>Appropriate paths</b>	<p>Appropriate paths are paths that:</p> <ul style="list-style-type: none"> <li>• ensure clearances of fixed machinery, equipment, fixtures and work in progress</li> <li>• minimise transfers across workstations and walkways</li> <li>• minimise disruption to work unrelated to the load transfer</li> <li>• minimise transfer time and distance subject to safety and disruption assessments</li> </ul>
<b>Associated personnel</b>	<p>Associated personnel may include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• riggers</li> <li>• doggers</li> <li>• supervisory and expert personnel to advise on any</li> </ul>

	special features of the load or transfer
<b>Crane</b>	<p>Crane may include:</p> <ul style="list-style-type: none"> <li>• bridge crane, 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</li> <li>• gantry crane, a bridge beam, supported at each end by legs mounted on end carriages, capable of travelling on supported surfaces or deck levels, whether fixed or not and which has a crab with one or more hoisting units arranged to travel across the bridge</li> </ul> <p>Bridge and gantry:</p> <ul style="list-style-type: none"> <li>• excluded are cranes of the type that are controlled from a location remote to a permanent cabin/control station on the crane and that have three or less powered operations, that is hoist raise and lower is one operation</li> </ul>
<b>Communication methods</b>	<p>Communication methods may include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• verbal and non-verbal language</li> <li>• written instructions</li> <li>• signage</li> <li>• hand signals</li> <li>• listening</li> <li>• questioning to confirm understanding</li> <li>• appropriate worksite protocol</li> </ul>
<b>Signage and labels</b>	<p>Signage and labels may include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• crane data plates/labels</li> <li>• load charts</li> <li>• crane decals</li> <li>• control labels</li> </ul>
<b>Procedures</b>	<p>Procedures may include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• manufacturer guidelines (instructions, specifications or checklists)</li> <li>• industry operating procedures</li> <li>• workplace procedures (work instructions, operating procedures and checklists)</li> </ul>
<b>Controls</b>	<p>Controls may include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• long travel levers</li> <li>• cross travel levers</li> <li>• hoisting and lowering levers</li> <li>• rotating hook levers, where applicable</li> </ul>

<b>Service logbook</b>	Service logbook may include, but is not limited to: <ul style="list-style-type: none"> <li>• any logbook</li> <li>• service book</li> <li>• history record system where the service and maintenance history is kept</li> </ul>
<b>Safety devices</b>	Safety devices may include, but are not limited to: <ul style="list-style-type: none"> <li>• horns/sirens</li> <li>• audible and visual motion devices</li> <li>• operator restraint devices, where applicable</li> <li>• lights</li> </ul>
<b>Communication equipment</b>	Communication equipment may include, but is not limited to: <ul style="list-style-type: none"> <li>• two-way radios</li> <li>• whistles</li> <li>• bells</li> <li>• buzzers</li> </ul>
<b>Hazard prevention/control measures</b>	Hazard prevention/control measures may include, but are not limited to: <ul style="list-style-type: none"> <li>• safety tags on electrical switches/isolators</li> <li>• insulated powerlines</li> <li>• safety observer used inside exclusion zone</li> <li>• disconnected power</li> <li>• traffic barricades and controls</li> <li>• pedestrian controls</li> <li>• movement of obstructions</li> <li>• personal protective equipment</li> <li>• adequate illumination</li> </ul>
<b>Test lift</b>	Test lift means the load is lifted just clear of the lifting plane to allow for checks to be safely made in consultation with associated personnel to ensure that: <ul style="list-style-type: none"> <li>• near capacity loads do not overload the crane</li> <li>• loads of unusual shape or weight distribution are correctly slung</li> <li>• load measuring equipment can be used to verify the calculated weight of the load</li> <li>• all crane equipment is functioning properly</li> <li>• adjustments to the slinging can be made in a safe manner</li> </ul>
<b>Relevant crane movements</b>	Relevant crane movements may include, but are not limited to: <ul style="list-style-type: none"> <li>• hoisting (raise and lower)</li> <li>• traversing (moving hoisting mechanisms along</li> </ul>

	<p>bridge)</p> <ul style="list-style-type: none"> <li>travelling (at minimum speed, gentle acceleration and braking, to minimise load swing)</li> </ul>
<b>Communication signals</b>	<p>Communication signals may include, but are not limited to:</p> <ul style="list-style-type: none"> <li>stop - hand</li> <li>stop - whistle</li> <li>hoist up - hand</li> <li>hoist up - whistle</li> <li>hoist down - hand</li> <li>hoist down - whistle</li> <li>traverse - hand</li> <li>travel - hand</li> <li>creep - hand</li> </ul>
<b>Unplanned and/or unsafe situations</b>	<p>Unplanned and/or unsafe situations may include, but are not limited to:</p> <ul style="list-style-type: none"> <li>failure/loss of control (e.g. brakes and steering)</li> <li>failure of equipment (e.g. hydraulic system)</li> <li>environmental conditions (e.g. wind, lightning and storms)</li> </ul>
<b>Shutdown</b>	<p>Shutdown may include, but is not limited to:</p> <ul style="list-style-type: none"> <li>retracting hoist rope and hook block</li> <li>travelling crane to park position</li> <li>removing key from control panel, where applicable</li> <li>locking and securing cabin, where applicable</li> <li>isolating power to crane</li> </ul>

## Unit Sector(s)

Materials handling

## Custom Content Section

Not applicable.