

National Occupational Health and Safety Commission

NATIONAL GUIDELINES FOR
OCCUPATIONAL HEALTH AND SAFETY
COMPETENCY STANDARDS FOR
THE OPERATION OF
LOADSHIFTING EQUIPMENT AND
OTHER TYPES OF SPECIFIED EQUIPMENT
[NOHSC: 7019 (1992)]

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FOREWORD

The National Occupational Health and Safety Commission is a tripartite body established by the Commonwealth Government to develop, facilitate and implement a national occupational health and safety strategy.

This strategy includes standards development, guidelines, the development of hazard-specific and industry-based preventive strategies, research, training, information collection and dissemination and the development of common approaches to occupational health and safety legislation.

The National Commission comprises representatives of the peak employee and employer bodies - the Australian Council of Trade Unions and the Australian Chamber of Commerce and Industry - as well as the Commonwealth, State and Territory governments.

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PREFACE

These *National Guidelines for Occupational Health and Safety Competency Standards for Operation of Loadshifting Equipment and Other Types of Specified Equipment* [NOHSC: 7019 (1992)] have been developed to assist competency standards bodies and the National Training Board to integrate occupational health and safety (OHS) competencies for use and operation of industrial equipment into national industry competency standards. The guidelines cover the minimum OHS competencies required for safe use and operation of the specified industrial equipment.

At the Special Premiers Conference in November 1991, Premiers and Heads of Government agreed to achieve nationally uniform OHS standards for goods, occupations and dangerous goods by December 1993. The National Occupational Health and Safety Commission has responsibility for achieving a uniform national approach to agreed areas of OHS standards.

A key element of the National Commission's strategy for achieving the OHS objective of the Premiers and Heads of Government is the establishment of nationally uniform arrangements for occupations regulated under OHS legislation.

In the area of users and operators of industrial equipment, the National Commission has agreed to:

- * declare the *National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment* [NOHSC: 1006 (1992)], which covers occupations where certification is justified on OHS grounds; and

issue guidelines for OHS competency standards for operation of specified types of industrial equipment where continuation of OHS certification is either under review or not required.

Therefore the National Commission has issued this guidelines document as a companion document to the national standard. It covers competency standards, to be used as the basis for determining basic training requirements for operation of the following equipment:

- * loadshifting equipment;
certain types of crane; and
refrigeration plant.

The National Commission and the National Training Board have agreed that:

- * the relevant industry competency standards submitted to the National Training Board for endorsement should incorporate the competencies contained in the *National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment* [NOHSC: 1006 (1992)];
- * the manner of this incorporation should facilitate recognition of both vocational skills and OHS requirements, and be able to encompass the expression of full competency and workplace function requirements; and
- * relevant competency standards in the industries concerned must meet, as a minimum, the competency outcomes of the *National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment* [NOHSC: 1006 (1992)].

It is anticipated that the National Training Board will also require the incorporation of the competencies contained in these guidelines into relevant industry competency standards.

Loadshifting equipment operation is the subject of further review to ascertain whether competency-based assessment and training arrangements will be sufficiently advanced by the end of 1993 to justify discontinuation of certification for operation of this equipment. The loadshifting equipment operation competency standards have been included in these guidelines without prejudice to a final decision by the National Commission on justification for OHS certification for this equipment.

1. TITLE

1.1 This national guidelines document may be cited as the *National Guidelines for Occupational Health and Safety Competency Standards for Operation of Loadshifting Equipment and Other Types of Specified Equipment* [NOHSC: 7019 (1992)].

2. OBJECTIVES AND SCOPE

2.1 The objective of these *National Guidelines for Occupational Health and Safety Competency Standards for Operation of Loadshifting Equipment and Other Types of Specified Equipment* [NOHSC: 7019 1992] is to contribute to improved safety standards for operation of potentially hazardous equipment by providing basic OHS competencies for incorporation into relevant industry competency standards and training programs.

2.2 The guidelines cover operation of the following equipment:

Loadshifting Equipment

Cableway/flying fox.

Front-end loader/backhoe.

Front-end loader.

Front-end loader of the skid steer type.

* Excavator.

* Dragline.

Fork-lift truck.

Order-picking fork-lift truck.

Dozer (wheeled and tracked).

Specified Cranes

Bridge and gantry cranes (remote operation only).

Vehicle loading cranes (less than 10 metre tonnes capacity).

* Non-slewing, non-articulating mobile cranes (not exceeding three tonnes capacity).

Miscellaneous

* Concrete placing booms (other than mobile truck mounted with knuckle boom capable of power operation of slewing and luffing).

Pressure Equipment

Refrigeration plant operation.

2.3 The competency standards cover operation of equipment reviewed by the National Commission to determine whether or not national certification of these occupations was justified on OHS grounds. National certification for operation of loadshifting equipment remains subject to review during 1993. The other equipment covered was not considered sufficiently hazardous to require certification. However, the National Commission has determined it essential that uniform national OHS competency standards are defined and incorporated into industry competency standards.

2.4 For purposes of these guidelines, competence in OHS encompasses the exercise of responsibilities under OHS, the identification and assessment of hazards and the application of appropriate control measures. It also encompasses the preparation and completion of operator tasks in accordance with OHS standards and procedures.

2.5 These guidelines rely on the responsibilities of employers and employees specified in duty of care-style OHS legislation that prevails in all Australian jurisdictions. In particular, it assumes that it is the employer's responsibility to ensure that a person entering a workplace is properly informed and trained, as appropriate, about OHS policy and procedures and for operators of industrial equipment, particularly those procedures pertaining to the safe operation of equipment in that workplace, consistent with these guidelines.

2.6 The OHS competencies specified are the minimum core competencies for the safe use and operation of the types of equipment in all relevant industries and enterprises. These core OHS competency standards provide the basis for development of enterprise-level OHS competency standards for the use and operation of industrial equipment, taking into account specific industry and enterprise hazards and conditions. These OHS competency standards will be incorporated into industry competency standards in a manner compatible with requirements of the National Training Board and the National Commission.

2.7 As the competency standards represent only part of the competency standards for particular industries and enterprises, they have not been referenced to the National Training Board's Australian Standards framework*.

2.8 These guidelines are consistent with initiatives to enhance industry productivity and flexibility, including award restructuring reforms.

2.9 They are also consistent with equal employment opportunity principles.

2.10 Where possible, equipment definitions are consistent with those contained in Australian Standards.

* National Training Board, *National Competency Standards: Policy and Guidelines*, National Training Board Ltd, Canberra, 1991.

3. OCCUPATIONAL HEALTH AND SAFETY COMPETENCY STANDARDS FOR INDUSTRIAL EQUIPMENT

DEFINITIONS

The following definitions for the areas of work covered in this document have been used.

LOADSHIFTING EQUIPMENT

Cableway/flying fox. An arrangement where a wire rope is suspended between two tower structures, on which is supported a carriage or fox from which a load may be suspended. Wire ropes are reeved in an arrangement to allow the carriage or fox to be traversed, and the load raised or lowered.

Front-end loader/backhoe. Self-propelled wheeled machine with a main structural support designed to carry both a front mounted bucket loading mechanism and a rear-mounted backhoe.

When used in the backhoe mode, the machine normally digs below ground level with bucket motion towards the machine; the bucket lifts, swings, and discharges material while the undercarriage is stationary. When used in the loader mode, the machine loads or excavates through forward motion of the machine, and lifts, transports or discharges material.

Front-end loader. Self-propelled wheeled machine with an integral front mounted bucket-supporting structure and linkage, which loads or excavates through forward motion of the machine, and lifts, transports and discharges material.

Front-end loader of the skid steer type. Self-propelled crawler or wheeled machine in which steering is accomplished by skidding or reversing the track or wheels on one side of the machine. Also with an integral front-mounted bucket-supporting structure and linkage, which loads or excavates through forward motion of the machine, and lifts, transports and discharges material.

Excavator. Self-propelled crawler or wheeled machine with an upper structure capable of a minimum of 360° rotation, which excavates, elevates, swings and discharges material by the action of a bucket fitted to the boom and arm or telescoping boom, without moving the chassis or undercarriage during any part of the working cycle of the machine.

Dragline. A lattice boom crane configuration supporting a bucket or scoop which is thrown outwards, and retrieved through materials by a drag cable arrangement.

Fork-lift truck. A powered industrial truck equipped with a mast and an elevating load carriage to which is attached a pair of forkarms or other loadholding attachment.

This definition also includes a truck on which the operator is raised with the attachment for order-picking.

Order-picking fork-lift truck. An industrial truck of a type where the operator's control arrangement is incorporated with the load carriage/lifting media, and elevates with it.

Dozer. Items of plant composed of wheeled or crawler tractors with a dozer blade mounted at the front-end of the machine.

SPECIFIED CRANES

Bridge or gantry cranes (remote operation only).

Bridge. 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.

Gantry. 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.

Vehicle loading cranes. Crane mounted on a vehicle for the principal purpose of loading and unloading such a vehicle - capacity less than 10 metre tonnes.

Non-slewing, non-articulating mobile cranes. Non-slewing or non-articulating mobile cranes not exceeding three tonnes capacity and including vehicle tow truck operations.

MISCELLANEOUS

Concrete placing booms. Other than mobile truck mounted with knuckle boom capable of power operation of slewing and luffing.

PRESSURE EQUIPMENT

Refrigeration plant operation. Any refrigeration plant which is greater than 75kW and uses Class 2 or Class 3 refrigerants as defined in Australian Standard AS1677 *Refrigerating Systems*.

SCOPE OF COMPETENCY STANDARDS

LOADSHIFTING EQUIPMENT

The same competency units apply to each type of equipment. Competency-based assessment for particular types of equipment shall require a separate assessment in each unit for each equipment type.

Units of Competence

- 1.0 Assess and secure equipment and work area.
- 2.0 Shift load.
- 3.0 Shut down equipment and secure site.

SPECIFIED CRANES

Competency units 'Assess and secure equipment and work area' and 'Secure and transfer load' apply to all types of crane. The unit 'Set up and dismantle crane' applies only to mobile cranes. Competency-based assessment for particular cranes shall require a separate assessment in each relevant unit and element for each type of crane.

Units of Competence

- 1.0 Assess and secure equipment and work area.
- 2.0 Secure and transfer load.
- 3.0 Set up and dismantle crane.

CONCRETE PLACING BOOMS

Competency-based assessment for the equipment shall require assessment in each unit.

Units of Competence

- 1.0 Assess and secure equipment and work area.
- 2.0 Pump concrete.
- 3.0 Set up and dismantle boom.

REFRIGERATION PLANT OPERATION

Competency-based assessment for the equipment shall require assessment in each unit.

Units of Competence

- 1.0 Start refrigeration plant.
- 2.0 Operate and monitor refrigeration plant.
- 3.0 Shut down refrigeration plant.

**COMPETENCY STANDARDS
LOADSHIFTING EQUIPMENT**

COMPETENCY UNIT 1 - ASSESS AND SECURE EQUIPMENT AND WORK AREA

- 1.1 Conduct routine checks.**
- 1.2 Plan work.**
- 1.3 Check controls and equipment.**

COMPETENCY UNIT 2 - SHIFT LOAD

- 2.1 Shift load.**

COMPETENCY UNIT 3 - SHUT DOWN EQUIPMENT AND SECURE SITE

- 3.1 Shut down equipment.**
- 3.2 Secure site.**

COMPETENCY STANDARDS

LOADSHIFTING EQUIPMENT

Unit of Competence

1.0 Assess and secure equipment and work area.

Element of Competence

1.1 Conduct routine checks.

Performance Criteria

- 1.1.1 External check of vehicle/equipment is conducted in accordance with manufacturer's specifications or equivalent.
- 1.1.2 Attachments are inspected to ensure security.

Element of Competence

1.2 Plan work.

Performance Criteria

- 1.2.1 Work area is inspected to identify hazards and appropriate prevention/control measures for the following hazards, where identified, are selected and implemented:
- uneven/unstable terrain
 - power lines
 - trees
 - overhead service lines
 - bridges
 - surrounding buildings
 - obstructions
 - structures
 - facilities
 - other equipment
 - dangerous materials
 - underground services
 - recently filled trenches
- 1.2.2 Site/non-site personnel are safeguarded (protected) by a variety of measures including the erection of barricades and posting of signs consistent with principles of the hierarchy of prevention/control:
- Appropriate equipment is selected to ensure personnel safety and protection.

COMPETENCY STANDARDS
LOADSHIFTING EQUIPMENT

Range Statement

This range statement applies to the whole unit.

All elements are to be satisfied in the normal workplace environment(s) or equivalent.

The performance criteria for this unit of competence will apply to all configurations of the following loadshifting equipment:

- cableway/flying fox;
- front-end loader/backhoe;
- front-end loader;
- front-end loader of the skid steer type;
- excavator;
- dragline;
- fork-lift truck;
- order-picking fork-lift truck; and
- dozer (wheeled and tracked).

Evidence of competency is to encompass the satisfactory application of:

- the hierarchy of hazard control measures with elimination, substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment;
- current State/Territory OHS legislation, standards and codes of practice; and
- workplace communication procedures.

Attachments are to be installed and operated in accordance with manufacturer's specifications.

COMPETENCY STANDARDS

LOADSHIFTING EQUIPMENT

Unit of Competence

2.0 Shift load.

Element of Competence

2.1 Shift load.

Performance Criteria

- 2.1.1 Material is shifted using appropriate equipment.
- 2.1.2 Weight of load is assessed to ensure compliance with equipment load plate specifications.
- 2.1.3 Controls and levers are applied to ensure safe and effective operation of equipment ensuring:
- force applied to shift load is appropriate to bulk of material
 - path of movement is monitored for obstacles and hazards
 - hazard prevention control measures are selected and applied to ensure safe movement of load.
- 2.1.4 Speeds of vehicle/equipment are maintained to safe operating limits.
- 2.1.5 Communications are correctly given and interpreted with co-workers and other relevant persons to ensure the application of the principles of the hierarchy of control in the co-ordination of work activity.
- 2.1.6 Loads are placed to ensure stability of material and the avoidance of hazards on site.
- 2.1.7 Emergency procedures are carried out minimising risk to personnel.

COMPETENCY STANDARDS
LOADSHIFTING EQUIPMENT

Range Statement

This range statement applies to the whole unit.

All elements are to be satisfied in the normal workplace environment(s) or equivalent.

The performance criteria for this unit of competence will apply to all configurations of the following loadshifting equipment:

- cableway/flying fox;
- front-end loader/backhoe;
- front-end loader;
- front-end loader of the skid steer type;
- excavator;
- dragline;
- fork-lift truck;
- order-picking fork-lift truck; and
- dozer (wheeled and tracked).

Evidence of competency is to encompass the satisfactory application of:

- the hierarchy of hazard control measures with elimination (for example, insulation of sources of thermal hazards), substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment;
- current State/Territory OHS legislation, standards and codes of practice; and
- workplace communication procedures.

Attachments are to be installed and operated in accordance with manufacturer's specifications.

COMPETENCY STANDARDS

LOADSHIFTING EQUIPMENT

Unit of Competence

3.0 Shut down equipment and secure site.

Element of Competence

3.1 Shut down equipment.

Performance Criteria

3.1.1 Parking avoids equipment hazards ensuring:

- vehicle/equipment safety locks are in place
- implements/attachments to be rendered safe.

3.1.2 Shut down is conducted in accordance with manufacturer's specification to isolate vehicles.

3.1.3 Post operational check is complete ensuring:

- minor servicing requirements are carried out
- defect and damage reported to site requirements

Element of Competence

3.2 Secure site.

Performance Criteria

3.2.1 Parking avoids site hazards ensuring:

- access ways are clear
- equipment/vehicle is away from overhangs/fuelling sites
- excavations are fenced off and made secure
- securing against unauthorised movement.

COMPETENCY STANDARDS
LOADSHIFTING EQUIPMENT

Range Statement

This range statement applies to the whole unit.

All elements are to be satisfied in the normal workplace environment(s) or equivalent.

The performance criteria for this unit of competence will apply to all configurations of the following loadshifting equipment:

- cableway/flying fox;
- front-end loader/backhoe;
- front-end loader;
- front-end loader of the skid steer type;
- excavator;
- dragline;
- fork-lift truck;
- order-picking fork-lift truck; and
- dozer (wheeled and tracked).

Evidence of competency is to encompass the satisfactory application of:

- the hierarchy of hazard control measures with elimination (for example, insulation of sources of thermal hazards), substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment;
- current State/Territory OHS legislation, standards and codes of practice; and
- workplace communication procedures.

Attachments are to be installed and operated in accordance with manufacturer's specifications.

**COMPETENCY STANDARDS
SPECIFIED CRANES**

COMPETENCY UNIT 1 - ASSESS AND SECURE EQUIPMENT AND WORK AREA

- 1.1 Conduct routine checks.**
- 1.2 Plan work.**
- 1.3 Check controls and lifting gear.**
- 1.4 Shut down crane.**

COMPETENCY UNIT 2 - SECURE AND TRANSFER LOAD

- 2.1 Secure load.**
- 2.2 Conduct trial lift.**
- 2.3 Transfer load.**

COMPETENCY UNIT 3 - SET UP AND DISMANTLE MOBILE CRANE

- 3.1 Plan assembly/dismantling.**
- 3.2 Set up crane.**
- 3.3 Dismantle crane.**

COMPETENCY STANDARDS

SPECIFIED CRANES

Unit of Competence

1.0 Assess and secure equipment and work area.

Element of Competence

1.1 Conduct routine checks.

Performance Criteria

- 1.1.1 Routine pre-operational equipment checks are carried out in accordance with the checklist provided for the crane.
- 1.1.2 The service log book for the crane is checked to ensure all service requirements have been met and action taken as required.
- 1.1.3 Prior to operation, equipment and site area are visually checked for any evidence of damage, structural weakness or interference, and any faults reported to an authorised person for corrective action.

Element of Competence

1.2 Plan work.

Performance Criteria

- 1.2.1 A workplace operations plan is developed in consultation with the relevant authorised workplace personnel. The plan takes into account job requirements, priorities, workplace rules and procedures, identified hazards and hazard control measures.
- 1.2.2 Site hazards including:
- power lines
 - trees
 - overhead service lines
 - bridges
 - surrounding buildings
 - obstructions
 - structures
 - facilities
 - other equipment
 - dangerous materials
 - underground services
 - recently filled trenches

are identified and correct hazard control strategies developed in accordance with AS 2550 Clause 2.5 (Siting of the Crane).

COMPETENCY STANDARDS

SPECIFIED CRANES

- 1.2.3 Plans for emergency procedures take into account the location of first aid and fire fighting equipment, amenities and access/egress points in the workplace.
- 1.2.4 Precautions are taken to accommodate the effects of weather conditions in accordance with AS 2550 Clause 2.9.18 (Weather Conditions). This includes, where necessary, deciding to abort crane operation where weather conditions exceed acceptable limits.
- 1.2.5 The operations plan ensures that the work area is correctly illuminated.
- 1.2.6 The rig's load chart is located and information on permissible loads, radii, weights, boom and jib configurations noted and taken into account in operational plans.
- 1.2.7 The signals and signalling systems to be used are confirmed with associated personnel. in accordance with AS 2550 Clause 2.9.10 (Signals).
- 1.2.8 The use of safety tags on electrical switches/isolators (where relevant) is noted and correct hazard control procedures developed in consultation with authorised personnel.

COMPETENCY STANDARDS

SPECIFIED CRANES

Element of Competence

1.3 Check controls and lifting gear.

Performance Criteria

- 1.3.1 The crane is started in accordance with equipment procedures and checks made for any abnormal noise or movement. Any abnormal operation is reported to an authorised person for corrective action.
- 1.3.2 The operating and emergency controls and safety devices are located and identified and their correct operation tested in accordance with prescribed procedures.
- 1.3.3 All communication equipment, lighting and alarm systems are checked for correct operation.
- 1.3.4 Defective controls, communication equipment, safety devices, lighting, or alarms are reported to authorised personnel for corrective action and the defects entered into the crane's service log book.
- 1.3.5 The operating radii of the crane for planned operations is/are verified and measured taking into account the estimated increase in radius due to boom deflection. The boom is slewed at the planned radii to check that there are no unanticipated complications or obstructions.
- 1.3.6 Slings and lifting gear are checked. Defective slings or lifting gear are identified and segregated and reported to an authorised person for disposal, repair and/or replacement in accordance with AS 2550 Clause 2.12.3.3 (Lifting Equipment).

COMPETENCY STANDARDS

SPECIFIED CRANES

Element of Competence

1.4 Shut down crane.

Performance Criteria

- 1.4.1 The crane is shut down using the correct sequence of procedures in accordance with manufacturer's instructions.
- 1.4.2 Routine post-operational equipment checks are carried out in accordance with the checklist provided for the crane.
- 1.4.3 The relevant motion locks and brakes are applied.
- 1.4.4 All lifting equipment is checked in consultation with associated personnel for any signs of wear or damage in accordance with AS 2550 Clause 2.12.3.3 (Lifting Equipment).
- 1.4.5 All defective equipment is segregated and reported to an authorised person for corrective action and/or replacement.
- 1.4.6 The crane and equipment are correctly stowed and secured in accordance with manufacturer's instructions and AS 2550 Clause 2.7.1 (Leaving the Crane Unattended).

COMPETENCY STANDARDS

SPECIFIED CRANES

Range Statement

This range statement applies to the whole unit.

All elements are to be satisfied in the normal workplace environment(s) or equivalent.

The performance criteria for this unit of competence will apply to all configurations of the following cranes:

bridge or gantry cranes (remote operation only);
vehicle loading cranes (capacity 10 metre tonnes capacity); and
non-slewing, non-articulating mobile cranes (not exceeding three tonnes capacity).

Evidence of competency is to encompass the satisfactory application of:

current State/Territory OHS legislation, standards and codes of practice; and
the hierarchy of hazard control measures with elimination, substitution, isolation and
engineering control measures being selected before safe work practices and personal
protective equipment.

COMPETENCY STANDARDS

SPECIFIED CRANES

Unit of Competence

2.0 Secure and transfer load.

Element of Competence

2.1 Secure load.

Performance Criteria

- 2.1.1 The weight of the load is correctly estimated in consultation with associated personnel.
- 2.1.2 The sling configuration and choice of lifting gear are checked, in consultation with associated personnel, to ensure:
- they are appropriate for safe operation
 - they will not damage the load
 - they satisfy the requirements of AS 2550 Clause 2.9.8 (Lifting Attachments) and 2.9.9 (Control of Load).
- Corrective action is taken if required.
- 2.1.3 The use of packing or dunnage to protect the load or to facilitate the connection of lifting gear is checked for correct application in consultation with associated personnel. Corrective action is taken if required.

Element of Competence

2.2 Conduct trial lift.

Performance Criteria

- 2.2.1 A trial lift, particularly for near capacity loads or loads of unusual weight distribution or shape, is carried out according to workplace procedures.
- 2.2.2 With the load just suspended off the lifting plane, checks are made in consultation with associated personnel that:
- the load is correctly slung
 - all crane equipment is functioning properly
 - hydraulic or pneumatic systems (where relevant) are at the required operating pressure.
- 2.2.3 Where a trial lift reveals an unacceptable operational situation, the load is lowered and appropriate corrective action taken.

COMPETENCY STANDARDS

SPECIFIED CRANES

- 2.2.4 Where load measuring devices are fitted, the estimated weight is verified and load/radius calculations are revised as required.
- 2.2.5 Planned hazard control strategies are implemented.

Element of Competence

2.3 Transfer load.

Performance Criteria

- 2.3.1 Load is hoisted and lowered into position using all relevant crane movements in accordance with AS 2550 Clauses 2.9.6 (Crane Operations), 2.9.12 (Operational Conditions) and 2.9.17 (Special Duties) are correctly satisfied.
- The necessary movements may include:
- luffing
 - slewing
 - hoisting (raising and lowering)
 - telescoping boom
 - travelling.
- 2.3.2 Boom is positioned to ensure load to be lifted is plumbed under hook.
- 2.3.3 Each load is assessed in consultation with associated personnel for the need for a tag handline. Where control of the load is critical, a decision is made to attach a suitable tagline.
- 2.3.4 All required signals are correctly given and interpreted in accordance with AS 2550 Clause 2.9.10 (Signals).
- 2.3.5 Planned hazard control strategies are implemented.

COMPETENCY STANDARDS

SPECIFIED CRANES

Range Statement

This range statement applies to the whole unit.

All elements are to be satisfied in the normal workplace environment(s) or equivalent.

The performance criteria for this unit of competence will apply to all configurations of the following cranes:

bridge or gantry cranes (remote operation only);
vehicle loading cranes (less than 10 metre tonnes capacity); and
non-slewing, non-articulating mobile cranes (not exceeding three tonnes capacity).

Evidence of competency is to encompass the satisfactory application of:

current State/Territory OHS legislation, standards and codes of practice; and
the hierarchy of hazard control measures with elimination, substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment.

COMPETENCY STANDARDS

SPECIFIED CRANES

Unit of Competence

3.0 Set up and dismantle mobile or tower cranes.

Element of Competence

3.1 Plan assembly/dismantling.

Performance Criteria

- 3.1.1 A suitable unobstructed level workplace site is selected for the assembly of the boom or jib.
- 3.1.2 A suitable firm and level standing is correctly chosen and prepared for the location of the crane.
- 3.1.3 The qualifications of person(s) authorised to supervise the crane erection/dismantling are checked to verify they hold the required certificates of competency.
- 3.1.4 Planned procedures for both the assembly and dismantling of the crane are developed in accordance with the AS 2550 Clauses 2.6 (Erection and Dismantling), 3.5.4 (Booms or Jib Suspension), AS1418 (Part 5) (Mobile Cranes) and other statutory regulations.

Element of Competence

3.2 Set up crane.

Performance Criteria

- 3.2.1 The planned procedures for the assembly of the boom/jib are carried out in accordance with manufacturer's instructions and the requirements of AS 2550 Clauses 2.6 (Erection, Dismantling and Transportation) the relevant parts of AS 1418 and other relevant statutory regulations.
- 3.2.2 The outriggers and stabilisers are correctly deployed in accordance with manufacturer's instructions and AS 2550 Clause 3.5.6 (Outriggers) and other relevant statutory regulations.
- 3.2.3 Plates or packing are correctly used under the footplates, as required, to adequately distribute the loading to ensure that the bearing capacity of the crane standing is not exceeded.
- 3.2.4 The block is reeved and the boom raised in accordance with the manufacturer's instructions.

COMPETENCY STANDARDS

SPECIFIED CRANES

Element of Competence

3.3 Dismantle crane.

Performance Criteria

- 3.3.1 The planned procedures for the dismantling of the boom/jib are carried out in accordance with manufacturer's instructions and the requirements of AS 2550 Clauses 2.6 (Erection and Dismantling), 3.5 (Erection, Dismantling and Transportation), the relevant parts of AS 1418 and other relevant statutory regulations.
- 3.3.2 The outriggers and stabilisers are secured and stowed in accordance with manufacturer's instructions.
- 3.3.3 Planned hazard control measures are implemented.

COMPETENCY STANDARDS

SPECIFIED CRANES

Range Statement

This range statement applies to elements 3.1, 3.2 and 3.3.

All elements are to be satisfied in the normal workplace environment(s) or equivalent.

The performance criteria for these elements of competence will apply to all configurations of the following cranes:

non-slewing, non-articulating mobile cranes (not exceeding three tonnes capacity).

Evidence of competency is to encompass the satisfactory application of:

current State/Territory OHS legislation, standards and codes of practice; and the hierarchy of hazard control measures with elimination, substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment.

**COMPETENCY STANDARDS
CONCRETE PLACING BOOMS**

COMPETENCY UNIT 1 - ASSESS AND SECURE EQUIPMENT AND WORK AREA

- 1.1 Conduct routine checks.**
- 1.2 Plan work.**
- 1.3 Check controls and equipment.**
- 1.4 Shut down boom.**

COMPETENCY UNIT 2 - PUMP CONCRETE

- 2.1 Prepare boom.**
- 2.2 Operate boom.**

COMPETENCY UNIT 3 - SET UP AND DISMANTLE BOOM

- 3.1 Plan assembly/dismantling.**
- 3.2 Set up boom.**
- 3.3 Dismantle boom.**

COMPETENCY STANDARDS

CONCRETE PLACING BOOMS

Unit of Competence

1.0 Assess and secure equipment and work area.

Element of Competence

1.1 Conduct routine checks.

Performance Criteria

- 1.1.1 Routine pre-operational equipment checks are carried out in accordance with the checklist provided for the boom.
- 1.1.2 The service log book for the boom is checked to ensure all service requirements have been met and action taken as required.
- 1.1.3 Prior to operation, equipment and site area are visually checked for any evidence of damage, structural weakness or interference, and any faults reported to an authorised person for corrective action.

Element of Competence

1.2 Plan work.

Performance Criteria

- 1.2.1 A workplace operations plan is developed in consultation with the relevant authorised workplace personnel. The plan takes into account job requirements, priorities, workplace rules and procedures, boom movement limitations, boom support requirements, recommended length / thickness of placing hoses, identified hazards and hazard control measures.
- 1.2.2 Site hazards including;
- power lines
 - trees
 - overhead service lines
 - bridges
 - surrounding buildings
 - obstructions
 - structures
 - facilities
 - other equipment
 - dangerous materials
 - underground services
 - recently filled trenches
- are identified and correct hazard control strategies developed.

COMPETENCY STANDARDS

CONCRETE PLACING BOOMS

- 1.2.3 Plans for emergency procedures take into account the location of first aid and fire fighting equipment, amenities and access/egress points in the workplace.
- 1.2.4 Precautions are taken to accommodate the effects of weather conditions. This includes, where necessary, deciding to abort operations where weather conditions exceed acceptable limits.
- 1.2.5 The operations plan ensures that the work area is correctly illuminated.
- 1.2.6 The boom's load chart is located and information on permissible loads, radii, weights, and boom and jib configurations noted and taken into account in operational plans.
- 1.2.7 The signals and signalling systems to be used are confirmed with associated personnel.
- 1.2.8 The use of safety tags on electrical switches/ isolators (where relevant) is noted and correct hazard control procedures developed in consultation with authorised personnel.

COMPETENCY STANDARDS

CONCRETE PLACING BOOMS

Element of Competence

1.3 Check controls and equipment.

Performance Criteria

- 1.3.1 The boom is started in accordance with equipment procedures and checks made for any abnormal noise or movement. Any abnormal operation is reported to an authorised person for corrective action.
- 1.3.2 The operating and emergency controls and safety devices are located and identified and their correct operation tested in accordance with prescribed procedures.
- 1.3.3 All communication equipment, lighting and alarm systems are checked for correct operation.
- 1.3.4 Defective controls, communication equipment, safety devices, lighting, or alarms are reported to authorised personnel for corrective action and the defects entered into the booms service log book.
- 1.3.5 All equipment components are checked. Defective equipment is identified and segregated and reported to an authorised person for disposal, repair and/or replacement.
- 1.3.6 All pumping lines are checked to ensure that they are properly secured to the boom and structures and appropriate corrective action taken as required.
- 1.3.7 Planned hazard control strategies are implemented including the securing of the safety chain to the placing hose.

COMPETENCY STANDARDS

CONCRETE PLACING BOOMS

Element of Competence

1.4 Shut down boom.

Performance Criteria

- 1.4.1 The boom is shut down using the correct sequence of procedures in accordance with manufacturer's instructions.
- 1.4.2 Routine post-operational equipment checks are carried out in accordance with the checklist provided for the boom.
- 1.4.3 Pumping lines and equipment are cleaned using sponges, compressed air and water.
- 1.4.4 All equipment is checked in consultation with associated personnel for any signs of wear or damage.
- 1.4.5 All defective equipment is segregated and reported to an authorised person for corrective action and/or replacement.
- 1.4.6 The boom and equipment are correctly stowed and secured in accordance with manufacturer's instructions.
- 1.4.7 Planned hazard control strategies are implemented, particularly communication procedures during the cleaning of pumping lines and equipment.

COMPETENCY STANDARDS

CONCRETE PLACING BOOMS

Range Statement

This range statement applies to the whole unit.

All elements are to be satisfied in the normal workplace environment(s) or equivalent.

The performance criteria for this unit of competence will apply to concrete placing booms as defined.

Evidence of competency is to encompass the satisfactory application of:

current State/Territory OHS legislation, standards and codes of practice; and the hierarchy of hazard control measures with elimination, substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment.

COMPETENCY STANDARDS

CONCRETE PLACING BOOMS

Unit of Competence

2.0 Pump concrete.

Element of Competence

2.1 Prepare boom.

Performance Criteria

- 2.1.1 Boom is configured so that it can adequately cover the job while avoiding obstructions.
- 2.1.2 Supports are placed under boom arms while working on pressure valves, cylinders or hydraulic lines.
- 2.1.3 Concrete is checked to ensure that it meets job specifications and appropriate corrective action taken where it fails to meet specifications.
- 2.1.4 Planned hazard control strategies are implemented particularly the securing of pumping lines to boom and structures and the use of a safety chain on the placing hose.

Element of Competence

2.2 Operate boom.

Performance Criteria

- 2.2.1 The concrete is pumped in accordance with manufacturers' instructions and relevant statutory regulations.
- 2.2.2 All required signals are correctly given and interpreted as planned.
- 2.2.3 Blockages are identified and cleared in accordance with manufacturers specifications and accepted industry practice.
- 2.2.4 Fault conditions are identified and appropriate corrective action taken in accordance with established procedures.
- 2.2.5 Before maintenance or repairs are undertaken, the engine (or drive) is switched off and made safe and the line system relieved of pressure.
- 2.2.6 Planned hazard control strategies are implemented.

COMPETENCY STANDARDS

CONCRETE PLACING BOOMS

Range Statement

This range statement applies to the whole unit.

All elements are to be satisfied in the normal workplace environment(s) or equivalent.

The performance criteria for this unit of competence will apply to concrete placing booms as defined.

Evidence of competency is to encompass the satisfactory application of:

current State/Territory OHS legislation, standards and codes of practice; and the hierarchy of hazard control measures with elimination, substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment.

COMPETENCY STANDARDS

CONCRETE PLACING BOOMS

Unit of Competence

3.0 Set up and dismantle boom.

Element of Competence

3.1 Plan assembly/dismantling.

Performance Criteria

- 3.1.1 A suitable unobstructed level workplace site with firm and level standing is selected for the locations of the boom.
- 3.1.2 The qualifications of person(s) authorised to supervise the boom erection/dismantling are checked to verify they hold the required certificates of competency.
- 3.1.3 Planned procedures for both the assembly and dismantling of the boom are developed.

Element of Competence

3.2 Set up boom.

Performance Criteria

- 3.2.1 The planned procedures for the assembly of the boom are carried out in accordance with manufacturer's instructions and relevant statutory regulations.
- 3.2.2 Any outriggers and stabilisers are correctly deployed in accordance with manufacturer's instructions.
- 3.2.3 Plates or packing are correctly used under the footplates, as required, to adequately distribute the loading to ensure that the bearing capacity of the crane standing is not exceeded.
- 3.2.4 In the case of climbing tower-type booms, manufacturers instructions for assembly are implemented and the structure confirmed as ready for climbing against manufacturer's specifications.

COMPETENCY STANDARDS

CONCRETE PLACING BOOMS

Element of Competence	Performance Criteria
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3.3 Dismantle boom.	
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3.3.1	The planned procedures for the dismantling of the boom are carried out in accordance with manufacturer's instructions and relevant statutory regulations.
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3.3.2	Any outriggers and stabilisers are secured and stowed in accordance with manufacturer's instructions.
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3.3.3	Planned hazard control measures are implemented.
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Range Statement

This range statement applies to the whole unit.

All elements are to be satisfied in the normal workplace environment(s) or equivalent.

The performance criteria for this unit of competence will apply to concrete placing booms as defined.

Evidence of competency is to encompass the satisfactory application of:

current State/Territory OHS legislation, standards and codes of practice; and the hierarchy of hazard control measures with elimination, substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment.

**COMPETENCY STANDARDS
REFRIGERATION PLANT OPERATION**

COMPETENCY UNIT 1 - START REFRIGERATION PLANT

- 1.1 Personal protective clothing and equipment is selected for use.**
- 1.2 Carry out charge of refrigerant.**
- 1.3 Carry out pre-operational safety checks.**
- 1.4 Maintain health and safety standards in work area.**
- 1.5 Start refrigeration plant.**

COMPETENCY UNIT 2 - OPERATE AND MONITOR REFRIGERATION PLANT

- 2.1 Conduct take/hand over procedures for refrigeration plant which is on line.**
- 2.2 Monitor refrigeration plant operation.**
- 2.3 Maintain health and safety standards during refrigeration plant operation.**

COMPETENCY UNIT 3 - SHUT DOWN REFRIGERATION PLANT

- 3.1 Carry out operational shutdown of refrigeration plant.**
- 3.2 Carry out plant shutdown for maintenance.**

COMPETENCY STANDARD

REFRIGERATION PLANT OPERATION

Unit of Competence

1.0 Start refrigeration plant.

Element of Competence

3.1 Personal protective clothing and equipment is selected for use.

Performance Criteria

- 1.1.1 Select and use personal protective clothing and equipment, ensuring statutory requirements and work place procedures are followed.
- 1.1.2 Functions that require the use of personal protective clothing and equipment are reported to enable the function to be assessed using the hierarchy of prevention/control procedure.

Element of Competence

1.2 Carry out charge of refrigerant.

Performance Criteria

- 1.2.1 The appropriate refrigerant/s are identified.
- 1.2.2 Charging is carried out in accordance with the relevant Australian Standard (AS 1677) and the manufacturer's recommendations and operating procedures including:
- that the refrigerant is compatible with that already in the plant
 - that the filling line is secure and leak free
 - that the system is not overfilled.
- 1.2.3 Refrigerant charging emergency is responded to in accordance with statutory requirements, manufacturer recommendations and workplace procedures.

COMPETENCY STANDARD

REFRIGERATION PLANT OPERATION

Element of Competence

1.3 Carry out pre-operational safety checks.

Performance Criteria

1.3.1 Pre-operational safety checks of the refrigeration plant are conducted in accordance with statutory requirements, manufacturer's recommendations and plant operating procedures, including checks of:

- refrigerant level and/or charge
- position and operation of refrigeration plant valves
- lubrication system
- drainage/gas purging system
- auxiliary equipment
- safety devices
- pressure relief and control devices.

1.3.2 Maintenance requirements are identified and reported in accordance with work place procedures.

Element of Competence

1.4 Maintain health and safety standards in work area.

Performance Criteria

1.4.1 Hazards and potential hazards in work area are identified in accordance with statutory requirements and work place procedures, including:

- chemical hazards
- thermal hazards
- manual handling hazards
- guarding of machinery requirements
- illumination of work area
- rubbish and combustibles in area
- leakage of refrigerant
- obstructions in work area.

1.4.2 Hazards are reported in accordance with statutory requirements and work place procedures.

1.4.3 Prevention/control measures are selected in accordance with the hierarchy of control.

COMPETENCY STANDARD

REFRIGERATION PLANT OPERATION

Element of Competence	Performance Criteria
1.5 Start refrigeration plant.	<p>1.5.1 Refrigeration plant is started and brought on line safely, in accordance with statutory requirements, manufacturer's recommendations and work place procedures, including checks of:</p> <ul style="list-style-type: none">- power input- lubrication system- drainage system- refrigerant level and pressure and system balance- operation of auxiliary equipment.
	<p>1.5.2 Maintenance requirements are identified and reported in accordance with work place requirements.</p>

Range Statement

This range statement applies to the whole unit.

All elements are to be satisfied in the normal workplace environment(s) or equivalent.

Competency is to be demonstrated on refrigeration plants, as defined.

Evidence of competency is to encompass the satisfactory application of:

selection and use of personal protective clothing and equipment;
inspection procedures as specified in the manufacturer's recommendations and workplace procedures;
identification of maintenance requirements;
the hierarchy of hazard control measures with elimination (for example, insulation of sources of thermal hazards), substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment;
current State/Territory OHS legislation, standards and codes of practice; and
workplace communication procedures.

COMPETENCY STANDARD

REFRIGERATION PLANT OPERATION

Unit of Competence

2.0 Operate and monitor refrigeration plant

Element of Competence

2.1 Conduct take/hand over procedures for refrigeration plant which is on line.

Performance Criteria

- 2.1.1 Operating status of refrigeration plant is diagnosed.
- 2.1.2 Operating log is maintained clearly and accurately, in accordance with statutory requirements and workplace procedures.
- 2.1.3 Information regarding refrigeration plant, its status and operation is communicated clearly in accordance with workplace procedures.

Element of Competence

2.2 Monitor refrigeration plant operation.

Performance Criteria

- 2.2.1 Refrigeration plant is monitored in accordance with statutory requirements, manufacturer's recommendations and work place procedures, including checks of:
- safety devices
 - vibration level
 - lubrication system
 - operation and function of valves and fittings
 - drainage system
 - operation of control/safety devices
 - refrigerant levels and pressures and system balance.
- 2.2.2 Engine room chemicals are stored and handled in accordance with statutory requirements, manufacturer's recommendations and work place procedures.

COMPETENCY STANDARD

REFRIGERATION PLANT OPERATION

Element of Competence	Performance Criteria
2.3 Maintain health and safety standards during refrigeration plant operation.	2.3.1 Maintenance requirements are identified and reported in accordance with work place procedures.
	2.3.2 Engine emergency is responded to in accordance with statutory requirements, manufacturer's recommendations and work place procedures, including: <ul style="list-style-type: none">- identification of emergency- selection and application of appropriate fire fighting equipment- isolate power- isolate refrigerant- notification of downstream users- operation of plant only when safe to do so.

Range Statement

This range statement applies to the whole unit.

All elements are to be satisfied in the normal workplace environment(s) or equivalent.

Competency is to be demonstrated on refrigeration plants, as defined.

Evidence of competency is to encompass the satisfactory application of:

selection and use of personal protective clothing and equipment;
inspection procedures as specified in the manufacturer's recommendations and workplace procedures;
identification of maintenance requirements;
the hierarchy of hazard control measures with elimination (for example, insulation of sources of thermal hazards), substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment;
current State/Territory OHS legislation, standards and codes of practice;
procedures for dealing with accidents; and
workplace communication procedures.

COMPETENCY STANDARD

REFRIGERATION PLANT OPERATION

Unit of Competence

3.0 Shut down refrigeration plant

Element of Competence

3.1 Carry out operational shutdown of refrigeration.

Performance Criteria

3.1.1 Plant is shutdown in accordance with Statutory requirements, manufacturers recommendations and work place procedures including checks of:

- refrigerant supply
- return to ambient conditions
- auxiliary equipment.

3.1.2 Maintenance requirements are identified and reported in accordance with workplace procedures.

Element of Competence

3.2 Carry out plant shutdown for maintenance.

Performance Criteria

3.2.1 Plant is shutdown in accordance with statutory requirements, manufacturer's recommendations and work place procedures, including checks of:

- system decontamination
- isolation from any common connection
- opening of all access points required for inspection.

3.2.2 Plant valves and fittings are removed for maintenance in accordance with statutory requirements, manufacturer's recommendations and work place procedures.

COMPETENCY STANDARD

REFRIGERATION PLANT OPERATION

Range Statement

This range statement applies to the whole unit.

All elements are to be satisfied in the normal workplace environment(s) or equivalent.

Competency is to be demonstrated on refrigeration plants, as defined.

Evidence of competency is to encompass the satisfactory application of:

selection and use of personal protective clothing and equipment;
inspection procedures as specified in the manufacturer's recommendations and workplace procedures;
identification of maintenance requirements;
the hierarchy of hazard control measures with elimination (for example, insulation of sources of thermal hazards), substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment;
current State/Territory OHS legislation, standards and codes of practice;
workplace communication procedures; and
confined space entry procedures, including checks of:

- opening size
- available room to manoeuvre in confined space
- lighting voltage
- air quality in confined space
- air supply
- need to enter.

Appendix 1

MEMBERSHIP OF THE NATIONAL OCCUPATIONAL HEALTH AND SAFETY CERTIFICATION STANDARD FOR USERS AND OPERATORS OF INDUSTRIAL EQUIPMENT STEERING GROUP AND EXPERT WORKING GROUPS *

STEERING GROUP

Members

Roberta Moore
Construction, Forestry, Mining and Energy Union

Anna Russell
Construction, Forestry, Mining and Energy Union, **and then**

Sonya Hendricks
Construction, Forestry, Mining and Energy Union

Bill Bodkin
Australian Workers Union, **and then**

Graham Jones
Federation of Industrial, Manufacturing and Engineering Employees

Trevor Taylor
Australian Mines and Metals Association

Andrew Synnott
The Association of Employers of Waterside Labour

John Evans
Myer Ltd

David Wong
Victorian Occupational Health and Safety Authority

John Smith
WorkCover Authority of New South Wales

Michele Patterson
South Australian Occupational Health and Safety Commission

Michael Chan
Department of Employment, Vocational Education, Training and Industrial Relations,
Queensland

Individual members were nominated to the four expert working groups on the basis of their expertise in equipment use and operation; in certification and training of equipment users and operators; and in OHS, award restructuring and competency standards. The recommendations of the expert working groups were subject to review by the tripartite Steering Group and the National Commission where the social and economic implications of these recommendations are considered.

Neil Scott
Department of Occupational Health, Safety and Welfare, Western Australia

Peter Jackson
Work Health Authority, Northern Territory

Robert Pearce
Department of Employment, Industrial Relations and Training, Tasmania

Mick Peterson
Australian Capital Territory Occupational Health and Safety Office

Richard Culliford
National Building and Construction Industry Training Council, **and then**

Keith Hancock
National Building and Construction Industry Training Council

Phil Clarke
Department of Industrial Relations, Commonwealth

David Lundberg
Department of Employment, Education and Training, Commonwealth **and then**

Paul Pfluger
Department of Employment, Education and Training, Commonwealth

Project Manager

Frances Bray
Worksafe Australia,
assisted by staff of the OHS Occupational Standards Unit

Advisors

Mark Collins
Australian Council of Trade Unions

Rohini Krishnapillai
Australian Chamber of Commerce and Industry

Bob Cooper
National Training Board

Vincent McBride
National Training Board

SCAFFOLDING AND RIGGING EXPERT WORKING GROUP

Chairperson

Michele Patterson
South Australian Occupational Health and Safety Commission

Members

Cliff Fisher
Department of Labour, South Australia

Geoff Thomas
Building industry, Victoria

Bruce McGuinness
Building industry, South Australia

Roy Cullen
WorkCover Authority of New South Wales

Phil Court
Victorian Occupational Health and Safety Authority

Lindsay Fraser
National Office, Construction, Forestry, Mining and Energy Union

Frances Bray
Worksafe Australia

Advisor

David Foreman
Workplace Resource Centre, South Australia

CRANE AND HOIST EXPERT WORKING GROUP

Chairperson

Peter Barrett
WorkCover Authority of New South Wales

Members

Frank Welch
Building Industry, Queensland

John Ayton
Federation of Industrial, Manufacturing and Engineering Employees, New South Wales

Vic Fitzgerald
National Office, Construction, Forestry, Mining and Energy Union

Daryl Gillie
Department of Employment, Industrial Relations and Training, Tasmania

Frances Bray
Worksafe Australia

Advisor

David Rumsey
J P Young and Associates, NSW Pty Ltd

PRESSURE EQUIPMENT EXPERT WORKING GROUP

Chairperson

David Wong
Victorian Occupational Health and Safety Authority

Members

Peter Martin
Petrochemical industry

David Singh
WorkCover Authority of New South Wales

Anthony Mealor
Federation of Industrial, Manufacturing and Engineering Employees, New South Wales

Christopher Gibbs
Victorian Occupational Health and Safety Authority, **and then**

Frank Busch
Victorian Occupational Health and Safety Authority

Frances Bray
Worksafe Australia

Advisor

Andrea Shaw
Labour Research Centre, Victoria

LOADSHIFTING EQUIPMENT EXPERT WORKING GROUP

Chairperson

Keith Buchanan
Department of Employment, Vocational Education, Training and Industrial Relations,
Queensland

Members

James Brown
Mount Isa Mines

Peter Hopner
Australian Capital Territory Occupational Health and Safety Office

Michael Grey
Construction, Forestry, Mining and Energy Union

William Hind
Department of Employment, Vocational Education, Training and Industrial Relations,
Queensland

Bevan O'Shea
Construction Industry Training Council, Queensland

Ralph Catts
Worksafe Australia

Advisor

Reg Bond
Workplace Resources Centre, Queensland