APPROVED CODE OF PRACTICE

Approved code of practice for loading and unloading cargo at ports and on ships

June 2024

Te Kāwanatanga o Aotearoa
New Zealand Government

MARITIME NEW ZEALAND

WORKSAFE NEW ZEALAND

Acknowledgements

Maritime NZ and WorkSafe New Zealand would like to acknowledge and thank the many stakeholders from within industry, unions and government agencies for their time and assistance in developing this guidance. Particular thanks goes to Shane King of Port Nelson, Digby Kynaston of C3 Tauranga, and Mohamed Jassim of Ports of Auckland.

We would also like to thank Safework Australia whose 'Model Code of Practice for Stevedoring' is an important foundation document for this ACOP.

Disclaimer

This Approved Code of Practice has been developed by Maritime New Zealand and WorkSafe New Zealand to provide guidance on compliance with the Health and Safety at Work Act 2015 for dutyholders who load or unload cargo at ports or on ships. Compliance with other relevant legislation can also assist with determining whether HSWA duties have been complied with, therefore this ACOP includes guidance on applicable requirements in the Maritime Transport Act 1994 and the Maritime Rules. It is your obligation to make sure you are operating to current legal requirements and we recommend that you maintain an up-to-date knowledge of relevant law and seek legal advice where appropriate.

Please check www.maritimenz.govt.nz to confirm that you are referring to the current version of this publication.

NOTICE OF APPROVAL

The Approved Code of Practice for Loading and Unloading of Cargo on Ports and on Ships (ACOP) sets out expected practice when identifying and controlling health and safety risks relating to this work on all ports and ships in New Zealand. It will help persons conducting a business or undertaking (PCBU) and workers comply with the Health and Safety at Work Act 2015 (HSWA) and HSWA Regulations.

Maritime NZ, with the support of WorkSafe New Zealand, developed the code in a tripartite way with input from unions, employers and government agencies working on ports and ships. Together with the right focus on improving health and safety practices, positive safety culture, and the actions of PCBUs, workers, and regulators, the ACOP will contribute to reducing the number of serious injuries, illnesses and fatalities among workers who load and unload cargo at ports and on ships in New Zealand.

Accordingly, I Hon Brooke van Velden, and I Hon Matt Doocey, being satisfied that the consultation requirements of section 222(2) of the Health and Safety at Work Act 2015 have been met, approve the Approved Code of Practice for Loading and Unloading of Cargo on Ports and on Ships under section 222 of the Health and Safety at Work Act 2015.

Hon Brooke van Velden
Minister for Workplace Relations and Safety

Hon Matt Doocey
Associate Minister of Transport

FOREWORD

As the Chief Executives of Maritime NZ and WorkSafe New Zealand, we are pleased to introduce the Approved Code of Practice for Loading and Unloading of Cargo on Ports and on Ships (ACOP).

The ACOP is one of the key actions recommended by the Port Health and Safety Leadership Group in its Port Sector Insights Picture and Action Plan. We see the ACOP very much as the port sector's document. It was supported by the Leadership Group and designed in a tripartite way through initial workshops with unions and workers, businesses and government agencies. A number of individuals from the sector also gave generously of their time and expertise. The ACOP draws on international examples and good practice guidance, particularly the Australian Model Code of Practice for Stevedoring.

Consultation on the draft involved extensive contact with port companies, stevedoring firms, unions and workers, marshalling companies, shipping agents and transport operators. Their industry knowledge, active participation and 'buy-in' were critical in creating an ACOP that will be useful to workers, employers and government agencies and, above all, will help us reduce serious injuries, illnesses and fatalities.

The ACOP replaces any other existing industry codes of practice for stevedoring. Most importantly, Maritime NZ, in partnership with the Leadership Group, will work with the sector to ensure the ACOP is widely understood and implemented and over time will publish guidance and other educational material to support the ACOP. Together, we will help those loading and unloading cargo on ports and ships come home healthy and safe.

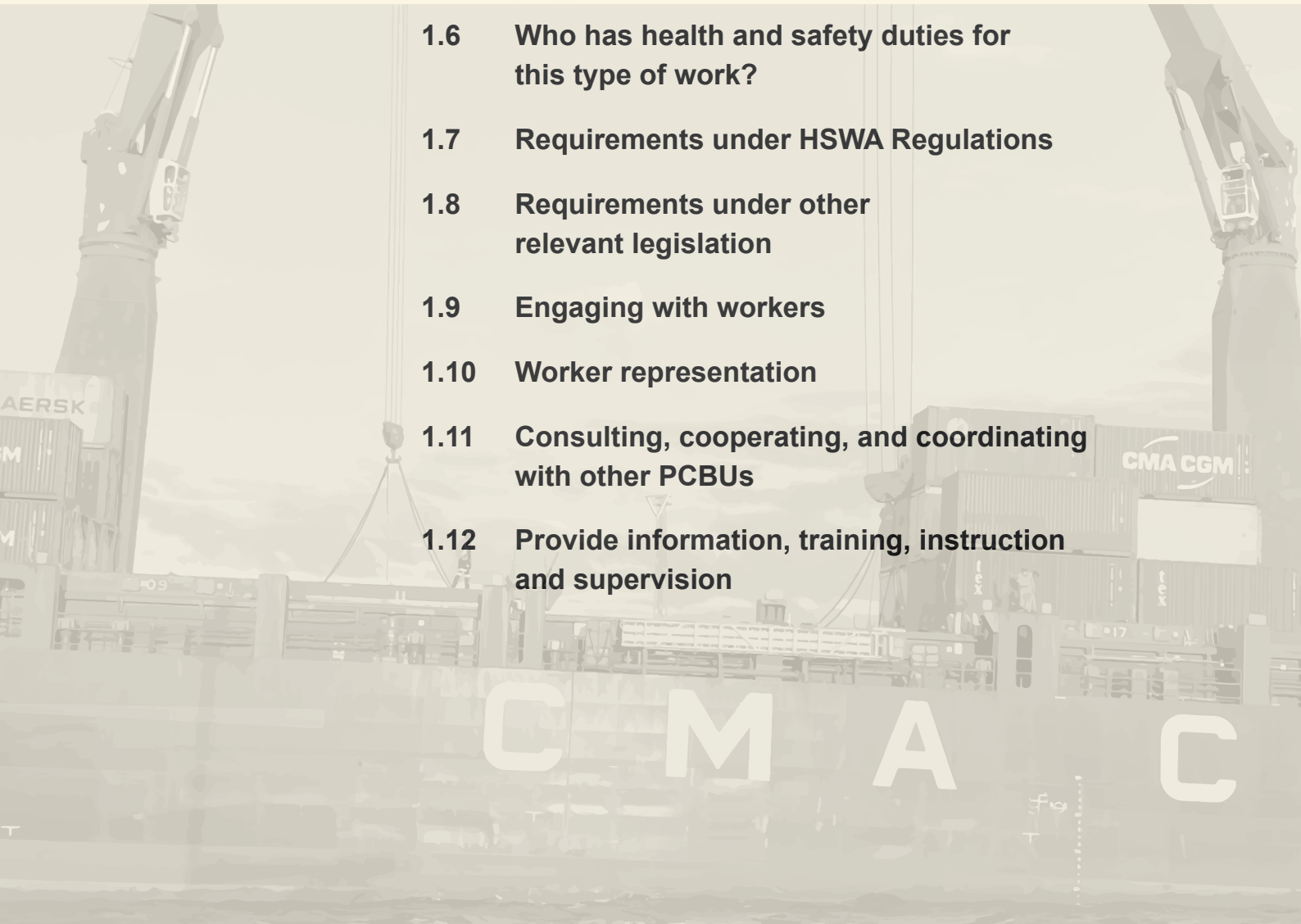
Kirstie Hewlett
Chief Executive, Maritime NZ

Steve Haszard
Chief Executive, WorkSafe New Zealand

Contents

1.0 Introduction

IN THIS SECTION:



1.1 Scope and application

This Approved Code of Practice (ACOP) has been developed with relevant industry and union stakeholders to assist persons conducting a business or undertaking (PCBUs) to comply with the Health and Safety at Work Act 2015 (HSWA) and HSWA Regulations, and to reduce the number of serious injuries, illnesses and fatalities among workers who carry out the work of loading and unloading cargo at ports and on ships in New Zealand.

This ACOP applies to all ports and ships in New Zealand where cargo is loaded or unloaded. This is a broad scope of work that includes:

- loading cargo onto a ship
- unloading cargo from a ship
- stacking and storing cargo at a port
- receiving cargo from road or rail transport at a port
- preparing cargo for export
- preparing cargo for dispatch by road or rail transport.

Maritime NZ will work closely with WorkSafe New Zealand where the ACOP may be usefully applicable to work loading and unloading cargo at inland ports.

ACOPs are admissible in court proceedings under HSWA. Courts may have regard to an ACOP as evidence of what is known about a risk, hazard or control and may rely on the ACOP in determining what is reasonably practicable in the circumstances. An inspector may refer to an ACOP as a means of achieving compliance, when issuing an improvement or prohibition notice.

A PCBU may achieve compliance with HSWA and HSWA Regulations by following another method, such as a technical or an industry standard, if it provides an equivalent or higher standard of work health and safety than this ACOP.

OUT OF SCOPE

Out of scope of this ACOP are dangerous goods including liquid chemicals and liquefied gases, and the loading and unloading of livestock.

1.2 How to use this ACOP

'SHOULD' AND 'MUST'

Where it is written that a PCBU 'should' do something, this means this is a recommended course of action. Where it is written that a PCBU 'must' do something, this indicates a legal requirement. As a regulator, we can only write that a particular action 'must' be taken where it explicitly says this in the legislation.

This is why, on occasion, there may be 'shoulds' in this ACOP that commonsense would dictate be written as a 'must'. For example, 'no person should stand under a suspended load'.

HSWA is ‘outcomes-based’ and generally does not set out particular steps or checklists that must be followed. An exception to this are the steps in the general risk management process, which are regulations 5 to 8 in the Health and Safety at Work (General Risk and Workplace Management) Regulations 2016.

However, PCBUs have more flexibility than the regulator. As long as they comply with HSWA and HSWA Regulations (and other legislation that may apply), PCBUs can instruct workers that they 'must' (as a term of their employment) follow whatever checklists, steps, procedures or control measures the PCBU implements.

A NOTE ABOUT EXAMPLES

It would be impractical for this ACOP to include examples of every type of plant and equipment used on a port or ship to load or unload cargo, or every type of interaction between plant, equipment and person. And while this ACOP provides many examples of control measures and how to perform tasks, every port, ship, or cargo is different. Together with workers, PCBUs must identify the hazards and assess the risks of their own work to decide what control measures will be most effective and reasonably practicable for their situation.

Where there is an example which mentions a type of plant or equipment or interaction not commonly used by a PCBU (for example, straddle carriers may not be used at some ports), PCBUs are still expected to apply the risk management process behind the example to their work. See section 2 for more information on each step of the risk management process.

OTHER GUIDANCE RELEVANT TO LOADING AND UNLOADING CARGO

Each section in this ACOP has references to additional guidance that PCBUs are encouraged to read in conjunction with this ACOP. For example, WorkSafe New Zealand has a wide range of guidance on how to identify the hazards, assess the risks, and select and implement control measures relevant to the loading and unloading of cargo at ports and on ships – there is far more guidance on these

subjects than can be contained in this ACOP. The Code of Practice: Safety and Health in Ports by the International Labour Organization (ILO) is also a useful resource.

The guidance documents that this ACOP mainly relies on for source material are listed below:

WorkSafe New Zealand

Approved Code of Practice for Cranes

Approved Code of Practice for Load-Lifting Rigging

Approved Code of Practice: Management of Noise in the Workplace

Approved Code of Practice: Operator Protective Structures [on vehicles and plant]

Best Practice Guidelines for Working at Height in New Zealand

Code of Practice for Manual Handling

Good Practice Guidelines: Managing Work Site Traffic

Good Practice Guidelines: Worker Engagement, Participation, and Representation

Interpretative Guidelines: General Risk and Workplace Management Part 1

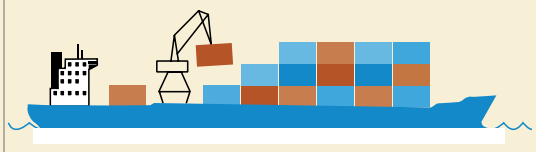
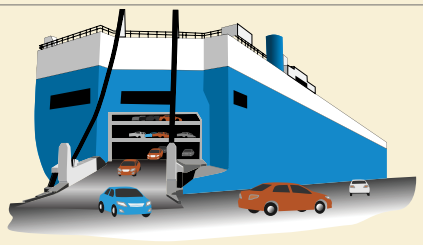
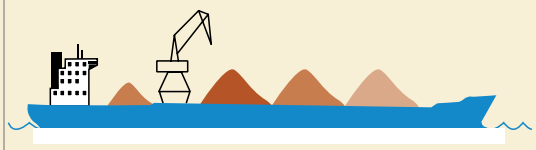
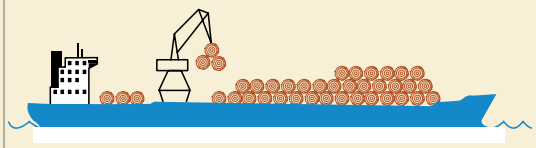
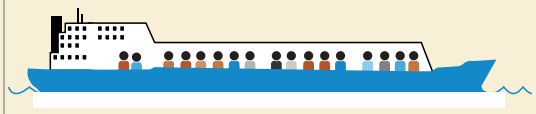
Interpretative Guidelines: General Risk and Workplace Management Part 2

Quick Guide: Identifying, Assessing and Managing Work Risks

ILO

International Labour Organization Code of Practice: Safety and Health in Ports

1.3 Types of cargo

	Example
Containers. Loading/unloading containers (including import/export containers).	
Roll on/roll off (RoRo). Loading and unloading of cargo with wheels or tracks (such as cars, trucks, heavy machinery/plant and trailers containing breakbulk cargo. The trailers may be towed or driven off the vessel).	
Bulk. A product that is loaded onto a ship in loose, unpackaged form. For example, grain, coal, soda ash, gypsum, liquids such as tallow and molasses, cement (in liquidised form).	
Breakbulk. Loading and unloading of non-standardised cargo not suitable for containers due to size or weight. For example, logs and timber are too big and heavy to put in a container in large quantities. Other examples include rail sleepers, some building materials, paper rolls, steel coils, steel beams and scrap metal.	
Cruise ship cargo. Apart from passengers and supplies from ships' providores, cruise ships may carry some cargo.	

1.4 Key terms or acronyms

For the purposes of this ACOP, the following terms mean:

Cell guide	Containers are commonly stowed below deck and sometimes on deck within fixed vertical cell guides (rather than being secured by lashing) which guide them into place and ensure they do not move during a voyage.
Competent person (except in relation to ship's lifting appliances and loose cargo gear)	A person who has the appropriate skills, training, knowledge, and experience to perform the task or role. (For example, a qualified diesel mechanic may be a competent person to undertake an inspection/maintenance/repairs of a piece of mobile plant they are familiar with. Competent person can mean different things at different times, as illustrated by there being two definitions in this ACOP – this one and the next one which is the definition in Maritime Rule Part 49: 'Ships' Lifting Appliances'.
Competent person in relation to ship's lifting appliances and loose cargo gear	As defined in Maritime Rule Part 49: 'Ship's lifting appliances and loose cargo gear'.
Egress	To go out, to leave a place. Also the method used to leave a place (for example, 'forms of access and egress such as a ship's ramp or gangway should be certified in line with Maritime Rule Part 49').
Fume	Has the same definition as in Appendix 1 of the Glossary in the 14th Workplace Exposure Standards and Biological Exposure Indices (November 2023) available on the WorkSafe website.
GRWM Regulations	Health and Safety at Work (General Risk and Workplace Management) Regulations 2016.
Hatch	The entryway through which cargo is loaded into the hold. The hatch should be kept closed when loading is not in operation.
Hatchperson	A person who stands by the ship's hold to assist with loading and unloading of cargo. May be called the foreperson at some ports.
Hold	The part of a ship below deck where cargo is stowed. Ships can have more than one hold.

HSE Regulations	Health and Safety in Employment Regulations 1995.
HSWA Regulations	The term used in this ACOP to jointly describe any regulations made under HSWA as well as the HSE Regulations.
Lifting appliance	Has the same meaning as in Maritime Rule Part 49: Ships' Lifting Appliances and Loose Cargo Gear.
Lifting gear in relation to a (land-based) crane	As defined in Schedule 1 of the PECPR.
Load-handling device in relation to a (land-based) crane	As defined in Schedule 1 of the PECPR.
Loose cargo gear	Has the same meaning as in Maritime Rule Part 49: 'Ships' Lifting Appliances'.
Must	A legal requirement that has to be complied with.
Notifiable event	Has the meaning given in HSWA, s25.
Notifiable incident	Has the meaning given in HSWA, s24.
Notifiable injury or illness	Has the meaning given in HSWA, s23.
PCBU	**See 1.6, page 16**
PECPR	Health and Safety in Employment (Pressure Equipment, Cranes and Passenger Ropeways) Regulations 1999
PKE	Palm-kernel extract.
Reefer	Refrigerated container.
Responsible person	As defined in Maritime Rule Part 49: 'Ships' Lifting Appliances' (at 49.2).

Self-propelled mobile plant	Forklifts and clamp machines, telehandlers or forklifts used to lift and carry a suspended load, reach stackers and container handlers (laden and empty), straddle carriers, mobile gantries, log loaders, construction plant (for example, excavators or diggers fitted with hooks or grapples that are used for purposes other than their primary function of digging or trenching).
Should	A recommended practice or approach.
SOLAS	International Convention for the Safety of Life at Sea 1974.
SOPs	Standard Operating Procedures.
SWI	Safe Work Instrument. This is an instrument developed by the regulator under HSWA that provides additional detail to support or complement HSWA or HSWA Regulations. It can have the status of secondary legislation under HSWA.
Vapour	Has the same definition as in Appendix 1 of the Glossary in the 14th Workplace Exposure Standards and Biological Exposure Indices (November 2023) available on the WorkSafe website.
Work platform	May also be known by a variety of other terms, for example, personnel cage, work box, man cage, man basket.
Worker	In New Zealand, the terms ‘stevedore’ or ‘marshaller’ can mean different things depending on the port or cargo-handling company. For this reason, this ACOP uses the term ‘worker’ to describe the people who load or unload cargo at ports and on ships. **See also 1.6, page 17**
WLL	Working Load Limit. The maximum working load (mass) that an item of plant or lifting equipment is designed to raise, lower or suspend (under ideal conditions) as designed by the manufacturer. Sometimes referred to as ‘maximum SWL'. In most cases the working load limit and the SWL will be the same. However, depending upon the conditions of use, it may be necessary for the Competent Person to reduce this to a lower SWL and it is in these cases that the WLL and the SWL will differ.

1.5 A note about managing risks onboard foreign ships

Much of the work undertaken by New Zealand workers who load or unload cargo at ports is on foreign-flagged ships. HSWA generally does not create legal duties for the foreign operators of foreign-flagged ships in relation to matters onboard ships such as management of their crew.

However, a foreign ship may be a 'workplace' for New Zealanders who go onboard to work. New Zealand PCBUs conducting work onboard foreign ships must comply with all HSWA duties, including eliminating risks to the health and safety of workers and other people (such as foreign crew), so far as is reasonably practicable or, if this is not reasonably practicable, minimising those risks so far as is reasonably practicable.

Where a PCBU undertakes work onboard a foreign-flagged ship, this may limit the degree of control that the PCBU has over the hazards and risks on that ship, in which case the PCBU will need to determine the extent to which work can safely occur on the ship.

While foreign-flagged ships are not generally subject to HSWA and HSWA Regulations, they are subject to the laws of the state where the ship is registered (the 'flag state'), including any health and safety obligations and international conventions that address health and safety. This means that foreign-flagged commercial ships are likely to be operating to a safety management system (SMS). Under the International Safety Management Code ('ISM Code'), the master is responsible for implementing and periodically reviewing the SMS.

1.6 Who has health and safety duties for this type of work?

A duty holder is a person who has a duty under HSWA. There are four types of duty holders: PCBUs, officers, workers and other persons at workplaces.

A PCBU as the primary duty under HSWA to ensure, so far as is reasonably practicable, the health and safety of workers, and that workers and other people are not exposed to health and safety risks arising from the business or undertaking. This duty includes providing and maintaining a work environment that is without risks to health and safety. When loading or unloading cargo at a port or on a ship, this duty means that a PCBU must eliminate risks arising from this work so far as is reasonably practicable, or if that is not reasonably practicable, minimise the risks so far as is reasonably practicable.

Duty holders include PCBUs who operate a business involved in loading or unloading cargo at a port or on a ship, and PCBUs who have management or control of, or influence over, a workplace where this type of work is carried out, for example, port authorities.

A PCBU who manages or controls a workplace must ensure, so far as is reasonably practicable, that the workplace, the means of entering and exiting the workplace, and anything arising from the workplace are without risks to the health and safety of any person.

Officers including company directors and chief executives, have a duty to exercise due diligence to make sure the PCBU complies with HSWA and HSWA Regulations. This includes taking reasonable steps to ensure the PCBU has and uses appropriate resources and processes to eliminate or minimise risks arising from its work.

Workers. Under HSWA, a worker is an individual who carries our work in any capacity for the PCBU. A worker may be an employee, a contractor or sub-contractor, an employee of a contractor or sub-contractor, an employee of a labour hire agency, an outworker (including a homeworker), an apprentice or trainee, a person gaining work experience or on a work trial, or a volunteer worker.

Workers have a duty to take reasonable care for their own health and safety and must not adversely affect the health and safety of other persons. Workers must comply with any reasonable instruction and cooperate with any reasonable policy or procedure relating to health and safety at work. If personal protective equipment (PPE) is provided by the PCBU, workers must use it in accordance with the information, instruction and training provided.

Other people at the workplace. Under HSWA, other persons at a workplace are individuals who are visiting the workplace for work or non-work purposes. At a port, examples of 'other persons' are a truck driver delivering cargo, a courier dropping off a parcel, and a tour group being shown around the facilities.

Other persons at a workplace must take reasonable care for their own health and safety and must not adversely affect the health and safety of others. They must comply, so far as reasonably able, with any reasonable instruction given by the PCBU to allow the PCBU to comply with HSWA and HSWA Regulations.

1.7 Requirements under HSWA Regulations

As well as the duties under HSWA, the Health and Safety at Work (General Risk and Workplace Management) Regulations 2016 (‘the GRWM Regulations’) and the Health and Safety in Employment Regulations 1995 (‘the HSE Regulations’) include requirements to manage specific risks in areas relevant to the loading and unloading of cargo at ports or on ships.

GRWM REGULATIONS

The GRWM Regulations require a PCBU to use the general risk management process described in Regulations 5 to 8 to manage the risks associated with the following hazards:

- remote or isolated work
- atmospheres with potential for fire or explosion
- ignition sources

- working under raised objects
- falling objects
- loose but enclosed materials
- substances hazardous to health.

See **Chapter 2 Risk Management** for guidance on how to apply regulations 5 to 8.

HSE REGULATIONS

The HSE Regulations require a PCBU to manage risks associated with:

- noise
- working at heights
- self-propelled mobile plant.

When HSWA was introduced, the transition provisions set out in Schedule 1 of the Act carried over some Regulations that had originally been made under the Health and Safety in Employment Act 1992 and, in some cases, the earlier Factories Act:

Transitional provision relating to regulations made under former Acts and Factories Act 1946

(1) The following regulations made under the former Acts and the Factories Act 1946 are to be treated as regulations made under this Act and may be amended or revoked accordingly:

- Amusement Devices Regulations 1978
- Health and Safety in Employment (Pipelines) Regulations 1999
- Health and Safety in Employment (Pressure Equipment, Cranes, and Passenger Ropeways) Regulations 1999
- Health and Safety in Employment Regulations 1995
- Lead Process Regulations 1950
- Spray Coating Regulations 1962.

1.8 Requirements under other relevant legislation

People involved in work loading and unloading cargo at ports and on ships must also comply with all other legislation applicable to their work. For example, the IMDG Code (the IMO Dangerous Goods Regulations), relevant Maritime Rules, bylaws, relevant port- specific regulations, and harbourmasters' directions.

The Rules relevant to loading and unloading cargo are:

- Maritime Rule Part 19: Maritime Transport Operator – certification and responsibilities
- Maritime Rule Part 24A: Carriage of Cargoes - Dangerous Goods
- Maritime Rule Part 24B: Carriage of Cargoes - Stowage and Securing
- Maritime Rule Part 24C: Carriage of Cargoes - Specific Cargoes
- Maritime Rule Part 24D: Carriage of Cargoes - Convention Containers
- Maritime Rule Part 24E: Carriage of Cargoes - Offshore Containers
- Maritime Rule Part 49: Ships' Lifting Appliances.

Maritime Rules are available at maritimenz.govt.nz

1.9 Engaging with workers

HSWA **s 58**

A PCBU must, so far as is reasonably practicable, engage with workers who carry out work for them who are (or are likely to be) directly affected by a work health and safety matter.

HSWA **s 59**

Relevant information about the matter must be shared with workers in a timely manner. Workers must be given a reasonable opportunity to express their views and to raise work health or safety issues in relation to the matter, and to contribute to the decision-making process relating to the matter. The PCBU must take the views of workers into account and advise workers of the outcome of the engagement in a timely manner. If workers are represented by a health and safety representative, the engagement must involve that representative.

HSWA **s 60**

Engagement with workers is required in relation to the following health and safety matters:

- when identifying hazards and assessing risks to work health and safety arising from the work carried out or to be carried out as part of the conduct of the business or undertaking
- when making decisions about ways to eliminate or minimise those risks
- when making decisions about the adequacy of facilities for the welfare of workers
- when proposing changes that may affect the health or safety of workers
- when making decisions about the procedures for:
  - engaging with workers
  - monitoring the health of workers
  - monitoring the conditions at any workplace under the management or control of the PCBU
  - providing information and training for workers
- when making decisions about the procedures (if any) for resolving work health or safety issues at the workplace
- when developing worker participation practices, including when determining work groups
- when carrying out any other activity prescribed by regulations for the purposes of this section.

Engagement involves sharing information, giving workers a reasonable opportunity to express views and taking those views into account before making decisions about health and safety matters.

When workers are engaged in work health and safety, then everyone benefits. The business is a healthier and safer place for everyone, and performance and productivity increase.

In research carried out by Maritime NZ in 2022, workers said they would like to be more involved in creating and influencing the standard operating procedures (SOPs) that cover their work, and

their increased involvement would lead to more practical SOPs and greater buy-in from workers in reducing their own risk tolerance and tendencies ‘to take shortcuts’.

The research found workers value a manager or company that ‘walks the talk’ on health and safety – that is, their commitment to health and safety at work is visible and consistent and they respond appropriately to workers who raise a health and safety concern. Engaging with workers and their representatives on health and safety matters is an opportunity to demonstrate good leadership and implement good practice.

See the Links to More Information at the end of this chapter to go to the full report.

Ways to engage

Ways to engage with workers may include workplace inductions, toolbox talks, workplace health and safety committee meetings, phone and email sessions, workshops or events held for a specific purpose. Learning sessions with workers after near misses or events also provide valuable insights on whether controls are operating effectively on the port or need to be changed.

Engagement may mean developing documented processes and procedures for plant and equipment together that enable workers to:

- perform tasks safely with a clear understanding of the plant’s capabilities and limitations
- understand the plant’s safety features, why they are installed, how they are fitted, checked, and how they function. For example:
    - the tripping of safety relays, such as safety gates, and electrical or mechanical faults
    - identifying and using emergency stop devices on machinery
    - stopping self-propelled mobile plant in an emergency without causing harm to any person, or damage to plant or cargo
- perform pre-work inspections
- report faults, wear and damage at any time (pre-work, during operation and after operation)
- identify safety critical faults and, where relevant, remove plant or items of equipment from use
- isolate energy and implement and follow lockout/tagout procedures
- have ready access to documentation and the time to observe, discuss and plan any changes to the work.

1.10 Worker representation

Workers can be represented by a Health and Safety Representative (HSR), a union representing workers, or a person that workers authorise to represent them (for example, a community or church leader, or another trusted member of the community). HSRs and Health and Safety Committees (HSCs) are two well-established methods of participation and representation.

If workers are represented by an HSR, worker engagement must also involve that representative.

PCBUs must not discriminate or take other negative steps against a worker because of their involvement in work health and safety. For example, a worker who:

- is an HSR
- raises a health and safety issue or concern
- takes part in resolving a health and safety issue
- notifies the regulator
- ceases work because they believe continuing it would put the health and safety of themselves or other people at risk.

1.11 Consulting, cooperating, and coordinating with other PCBUs with the same health and safety duty

HSWA **s 34**

If more than one PCBU has a duty in relation to the same matter, each PCBU with the duty must, so far as is reasonably practicable, consult, cooperate with, and coordinate activities with all other PCBUs who have a duty in relation to the same matter.

There is often more than one PCBU sharing the workplace at a port or on a ship. In some instances, each of these PCBUs will legally have an individual duty in relation to the same risk arising from a particular situation. These duties can be referred to as ‘overlapping duties’. For example, situations may occur when workers for different PCBUs are exposed to the same risks either through contractual agreements, work arrangements or through working in same proximity.

Each PCBU has a duty to make sure, so far as is reasonably practicable, the health and safety of their workers. To achieve this, PCBUs that have overlapping duties are required to consult, cooperate and coordinate activities with each other.

The Port Sector Insights Picture and Action Plan, compiled by the Port Health and Safety Leadership Group in 2022, highlights that workplace culture in the sector varies widely. While this is due to a number of factors, they include how PCBUs partner with other PCBUs operating on ports to deliver collective safety outcomes.

PCBUs should exchange information about planned activities and consider who is best placed to eliminate or minimise the risks, so far as is reasonably practicable. When loading or unloading cargo at a port or on a ship, PCBUs should share their SOPs and discuss how they will manage the parts of the work where there is a common interface. This will be an ongoing conversation, not a one-off occurrence.

In a work area where more than one PCBU is working (for example, at the same berth), each PCBU should tell each other where it will be carrying out the work, how it will carry it out, the number of workers there will be, where they will be, and what plant or equipment they will be using.

PCBUs should agree on how workers will signal or call for work to stop if they see something unsafe, and agree on how workers will communicate with each other. This may mean involving the health and safety committee of the business and/or cooperating with the health and safety committee of the port.

PCBUs should review how they will work together whenever changes are made to how work is done, new plant and equipment is introduced, or new risks emerge. It is critical that PCBUs clearly communicate all changes to processes and schedules to workers as well. Changes from routine ways of working often contribute to work accidents.

The outcome of consulting, cooperating with and coordinating activities with other PCBUs is that each PCBU understands how their activities may affect health and safety and the actions they each take to control risks are complementary.

Example 1

A labour hire agency contracts out workers to a company that loads and unloads cargo at the local port and on ships that visit that port. Both PCBUs have a duty to ensure the health and safety of workers, so far as is reasonably practicable. Before any workers are assigned to carry out the work, both PCBUs agree to meet to:

- identify the health and safety risks that need to be managed
- agree together which PCBU is best placed to control each risk
- plan ahead, by thinking through each stage of the work
- recognise how the work could affect other PCBUs and the public
- clearly define roles, responsibilities and actions, and explain these so everyone knows wha to expect
- do reasonable and proportionate monitoring, to make sure the arrangements are working.

Talking things through in detail helps each PCBU to know who is doing what on this particular job By following this process, the labour hire agency and the cargo-handling company can be confident they are both doing what they can to ensure, so far as is reasonably practicable, the health and safety of workers who will carry out the work.

As mentioned previously, it is the nature of the port environment that one or more PCBUs may hold one or more overlapping duties under HSWA, regardless of the type of contractual arrangement (for example, a lease-type arrangement) or whether or not direct contractual arrangements exist.

PCBUs need to consider:

- A PCBU is not only responsible to the workers they employ or contract. They are also responsible to workers they influence and direct, and for other people exposed to risks that arise from their work. PCBUs must cooperate with each other to fulfil these duties.
- A PCBU cannot contract out of its duties.
- It does not mean a PCBU has to duplicate another PCBU's work.
- PCBUs must manage their overlapping duties and risks to the extent of their ability to influence and control the health and safety matter.
- PCBUs may enter into reasonable arrangements with other PCBUs about their overlapping duties to plan how to control and monitor risks, and to ensure risks are not passed on or increased due to the arrangement. This can make risk management more efficient, and improve communication between PCBUs.

PCBUs should be able to explain the steps they have taken to consult, cooperate and coordinate with other PCBUs, and their arrangements to manage risks and to test whether arrangements are working well.

PCBUs and contracting chains

A PCBU at the top of a contracting chain should be a leader in encouraging good and health and safety practices throughout the chain. They should use sound contractor management processes. For example:

- choosing competent contractors
- exchanging information
- planning and monitoring carefully
- doing post-contract reviews.

A PCBU at the top of a contracting chain should not push risk down the chain.

Example 2

There are several ships expected into port on the same day next week. They will be berthed next to each other and there will be workers from four PCBUs loading and unloading at each ship and sharing the port workspace. Two of the PCBUs will each have a crane driver onboard one of the ships, operating the ships' cranes.

Each PCBU needs to think about how they will share information with the other PCBUs and how they will plan and coordinate their work activities. All of them need to find out or decide:

- who is doing what
- where they have shared or overlapping duties
- where and when the overlapping work will be carried out (in a designated exclusion zone, for instance)
- how they will all work together in a cooperative and coordinated way so that risks are eliminated or minimised so far as is reasonably practicable.

The week before the ships arrive, the PCBUs meet to decide and clearly define the shared and overlapping risks, including in relation to those risks:

- what each PCBU is doing and when
- the risks to health and safety that must be eliminated or controlled so far as is reasonably practicable
- how the PCBUs will manage overlapping or shared risk, and
- what control measures will be put in place for each risk.

The PCBUs should also discuss what actions they will take if there is an emergency. They should agree to give their workers the same or coordinated information about what to do in an emergency. Giving a consistent message to all workers in the same workspace reduces the chances of workers and PCBUs becoming confused about what to do if an evacuation or other emergency measures are required.

1.12 Provide information, training, instruction and supervision

GRWM **r 9**

Duty to provide information, supervision, training, and instruction

A PCBU must ensure, so far as is reasonably practicable, that every worker who carries out work of any kind, uses plant of any kind, or deals with a substance of any kind that is capable of causing a risk in a workplace either:

(a) has adequate knowledge and experience of similar places, and work, plant, or substances of that kind, to ensure that the worker carrying out the work, using the plant, or dealing with the substance is not likely to adversely affect the health and safety or cause harm to the worker or any other person, or is adequately supervised by a person who has that knowledge and experience, and

(b) is adequately trained in the safe use of:

- all plant, objects, substances, or equipment that the worker is or may be required to use or handle, and
- all personal protective equipment that the worker is or may be required to wear or use.

The PCBU must ensure that the supervision and training provided to a worker are suitable and adequate, having regard to the:

- nature of the work carried out by the worker
- nature of the risks associated with the work at the time the supervision or training is provided
- control measures implemented in relation to the work the worker is doing.

The training must, so far as is reasonably practicable, be readily understandable by any person to whom it is provided.

In this regulation, ‘training’ includes the provision of information or instruction.

Providing information to workers

Information should be provided to workers in a way that is appropriate for them, taking into account such things as their language and literacy level. PCBUs should satisfy themselves that workers have clearly understood the information delivered, especially information related to health and safety and work procedures.

Information provided to workers who are loading or unloading cargo at a port or on a ship should include:

- the results of any relevant risk assessment
- relevant safe work procedures
- manufacturer's instructions on the safe use of plant and equipment where available
- emerging risks
- changes to processes, schedules and supervision arrangements
- where to find a copy of the SOPs (for future reference after being trained in them). PCBUs should explain their SOPs to workers, be available for questions and answers, and check that workers understand the SOPs. It should not be that the only way workers will learn about the SOPs is to have to read them
- how the port environment operates and how the PCBU's business (and worker's own work) fit into that context.

Procedures should be in place so all workers know what the hazards and risks are of the work they are about to carry out, including at the change of shift.

Training

Training should be provided by a competent person. The content and methods of delivering training material should be tailored to meet the specific needs of each worker or group of workers, including being delivered in a language and learning style that is suitable for them. Some suggested methods for delivering training are:

- on-the-job training
- one-off sessions or events for a specific purpose
- training courses.

TOOLBOX TALKS OR PRE-START MEETINGS SHOULD NOT BE USED TO TRAIN WORKERS

Toolbox talks or pre-start meetings should focus on the day's work and how risks will be managed and do not replace the need for training and supervision. They are not the right setting for delivering training. Introducing new ideas or training on process that are not relevant to the immediate work requirements may be a source of distraction and act against the intent of the toolbox talk.

Toolbox talks work best when workers are engaged in them rather than just standing and receiving information from management. To make toolbox talks engaging and interactive, encourage questions and use visual aids such as videos, images, infographics. Try using role-plays involving the workers themselves. Workers take notice when one of their work group is called on to demonstrate a behaviour or process.

A training session will require a longer period of dedicated, uninterrupted time than a toolbox talk or pre-start meeting. Also, training may need to be carried out in a different location, such as when learning to operate new or different plant or equipment.

There must be arrangements in place to ensure workers who have English as a second language or low literacy can understand the training. This may mean using interpreters or seeking the skills of a professional in low literacy communications to help develop the training session.

The person giving a toolbox talk may not necessarily be the same person who delivers training. It is more likely that the PCBU will need to seek the services of a professional external trainer – an expert in the subject in which workers are to be trained. This trainer should also be competent in assessing whether or not workers have understood the training and can fully apply the learning back at work.

REFRESHER TRAINING

PCBUs should provide refresher training at regular intervals to make sure workers' skills and knowledge stay up to date. It is a good idea to arrange for the trainer to come back after the initial training to assess whether workers are still using their training correctly and have retained their knowledge - in effect, that their work is up to the required standard.

TRAINING TOPICS

Training should be relevant to the work being carried out and include information or instruction about:

- the health and safety duties of everyone involved in the work
- the relevant legislation and how it is applied in the workplace
- the nature and extent of hazards and risks associated with the work
- what workers should do if there is an incident
- systems for reporting defects in plant or equipment
- arrangements for worker engagement and their participation in health and safety
- safety documents, policies, procedures and plans
- safe work procedures including instruction on:
    - specific cargo management
    - use of communication systems
    - operation of vehicles, other types of plant and associated equipment
    - emergency and first aid procedures

- when and how to use PPE including the selection, fitting, proper care and maintenance of PPE
- other control measures
- accessing health and safety information
- access, egress and security.

When training workers to use plant or equipment, they may require both general training and site-specific training. For example, there is general training on how to operate forklifts but site-specific training means to train workers to operate the specific forklift at their workplace.

Supervision

PCBUs must provide adequate supervision to ensure workers can carry out their work safely. Supervisors should have the information, training and authority to competently direct and control their team's work and make sure work is done safely. The level of supervision will depend on the nature of the hazards and risks, the experience and competence of workers, and the effectiveness of control measures. Workers carrying out high-risk or complex work may require greater supervision.

New starters or young workers may require more direct supervision and ongoing instruction until they can demonstrate they have the skills to perform the work safely.

LINKS TO MORE INFORMATION

MARITIME NZ

HSWA and foreign-flagged ships

Port Sector Insights Picture and Action Plan

WORKSAFE NEW ZEALAND

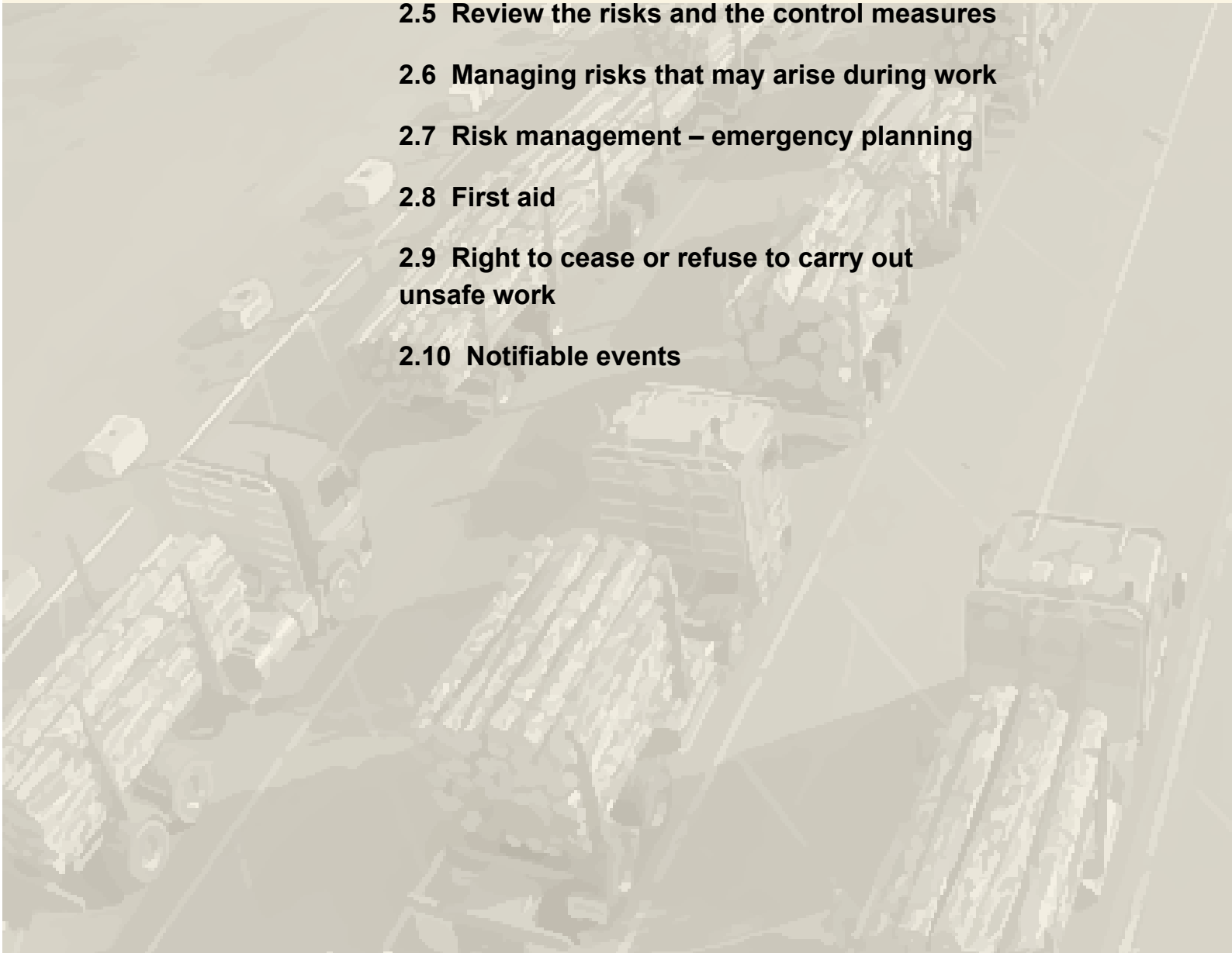
Introduction to the Health and Safety at Work Act 2015: Special Guide

Worker Engagement and Participation Case Studies

Quick Guide to Overlapping Duties

2.0
Risk management

IN THIS SECTION:



This section offers guidance for PCBUs on ways they can apply good risk management principles at work on ports and on ships.

Effective risk management practices are essential for the safe loading and unloading of cargo at ports and on ships.

What follows is a description of the suggested risk management process outlined in the GRWM Regulations (Regulations 5 to 8). PCBUs **must** use the process described in Regulations 5 to 8 to manage specific risks. See also 1.7, page 17

HSWA requires PCBUs to engage with workers when undertaking a risk management process. See 1.9, page 20

2.1 Identify the hazards

The first step in managing the risks of loading and unloading cargo at a port or on a ship is to find out what could potentially cause harm to workers and other people. This may be done by:

- inspecting the work environment, plant and equipment
- talking to workers about how work is carried out
- reading product labels and manufacturer's instruction manuals
- talking to manufacturers, suppliers, industry associations, and health and safety specialists
- reviewing reports of incidents and near misses.

The table below lists some of the common hazards of loading and unloading cargo at a port or on a ship, examples of when they could occur, and the potential consequences if they do. HSWA and HSWA Regulations require PCBUs to consider all risks associated with their work, not only those mentioned in this ACOP.

Hazard	Examples of tasks	Consequences
Working at height without a harness.	Working at height on platforms or walkways, on top of containers or other cargo (for example, logs). Using ladders.	Slips, trips, falls resulting in a fatality or serious injuries.

Hazard	Examples of tasks	Consequences
Damaged or poorly maintained equipment, for example, ladders, electrical cables, ropes, chains, hooks.	Working in and around mobile plant.	Collision between people and mobile plant resulting in fatalities and serious injury, for example, crushing.
Suspended loads.	Failure of equipment. Uneven loads.	Load falling on, or near, people resulting in fatalities or serious injuries.
Stored energy.	Pressurised liquids and gases. Tensioned cables or ropes. Lithium batteries in electric vehicles.	Uncontrolled release of stored energy resulting in serious injury or death. Includes snapback from tensioned cables, ropes and mooring lines.
Lighting.	Working with inadequate light, for example, at night or in holds.	Slips, trips and falls. Collisions between plant/plant and plant/person.
Noise.	Using or constantly being around noisy plant or equipment. Ship's engine noise.	Hearing loss.
Obscured plant or equipment.	Operating plant with dirty or dusty windows and/or windscreens. Blind spots. Obstructions blocking driver's view of workers, for example, workers in the hold obstructed by cargo.	Collision between plant/person or plant/plant resulting in fatalities or serious injuries.

Substances hazardous to health, including hazardous substances.	Loading and unloading cargo emitting hazardous gases or fume, for example, carbon monoxide, diesel particulate matter from RoRo cargo. Exposure to chemicals used to fumigate holds or cargo.	Rashes or burns from contact with the skin. Respiratory illness, serious injuries or fatalities from inhalation or ingestion.
Ventilation.	Working in holds or on car decks without adequate ventilation. Working with dry bulk cargo and/or fumigated cargo such as logs.	Fatalities, for example, from carbon monoxide poisoning, suffocation through engulfment.
Ventilation (whole body).	Working with plant with non-existent, or poor, suspension. Driving on rough or pot-holed surfaces. Poor driving posture.	Musculoskeletal injuries including but not limited to neck, shoulders and lower back. Fatigue.
Working environment.	Working in extreme weather conditions or temperatures. Working near water.	Sunburn, skin cancer. Heat stress. Strains and sprains from slips, trips and falls. Fatigue. Hypothermia. Drowning.
Working in confined spaces.	Working inside containers and ships' holds.	Exposure to toxic gases, vapours or oxygen-deficient atmosphere resulting in unconsciousness, serious illness or fatalities.

2.2 Assess the risks

A risk assessment involves identifying potential hazards and considering what could happen if someone was exposed to a hazard and the likelihood of this happening. A risk assessment can help PCBUs determine:

- if they need to take further action to control the risk, and
- how urgently the action needs to be taken.

Factors to consider when assessing the risks from loading or unloading cargo at a port or on a ship include:

- the type of work being performed
- how many people are exposed to the hazard
- communication methods and effectiveness
- suitability of vehicles and equipment for the activity, for example, ropes and lifting gear
- time of day and hours of work
- training, experience and competence of workers
- work environment
- fatigue management.

2.3 Control the risks

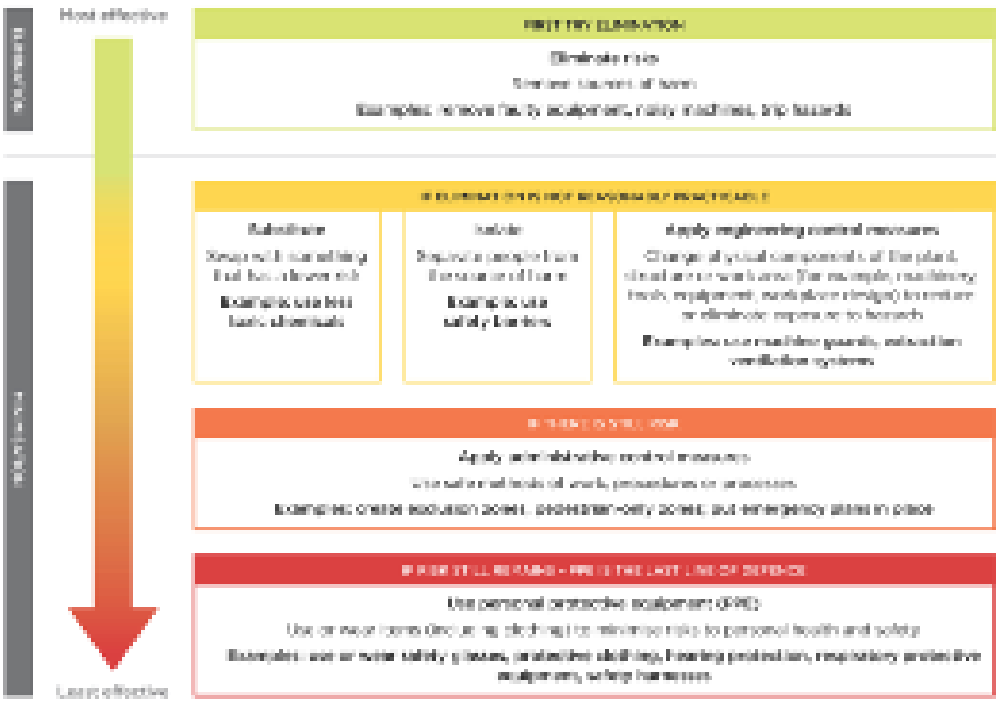
In the hierarchy of controls, the ways of controlling work health and safety risks are ranked from the highest level of protection and reliability to the lowest. The highest level and most effective control is elimination where the risk is completely removed. PCBUs should always aim to eliminate a risk. If this is not reasonably practicable, PCBUs must minimise the risk, so far as is reasonably practicable, by working through the other alternatives in the hierarchy.

Higher-level controls such as isolation and engineering controls give the highest level of protection and reliability. Lower-level controls such as administrative controls and PPE do not control the risk at the source.

Lower levels rely on human behaviour and should only be used:

- when there are no other practical control measures available
- as an interim measure until a more effective way of controlling the risk can be used, and
- in combination with, and as a backup to supplement, higher-level control measures.

Hierarchy of control measures



PCBUs should have controls in place that prevent an incident occurring. PCBUs also need to put in place controls that minimise the consequences and reduce the harm **should an incident occur**. For example, a PCBU puts in place controls to minimise, so far as is reasonably practicable, the risks of vehicles colliding with each other at a port. Unfortunately, in spite of these controls, later that day two vehicles collide. What controls did the PCBU have in place to minimise the consequences and reduce the harm in the event of this situation occurring? The higher-level engineering controls often feature here, with plant or equipment having design features such as speed restrictions built into them.

When selecting and implementing a combination of control measures, it is also important to consider whether new risks might be introduced as a result. If new risks are introduced, PCBUs must also control these.

2.4 Monitor the risk control measures

It is essential that risk controls are actively monitored to make sure that they are being used as intended and that they are effective in controlling the risks and preventing harm.

Where administrative controls are relied on to keep workers and others safe, a PCBU needs to consider how it will know that the SOPs are being followed.

Ways of monitoring risks controls may include a combination of the following:

- observations by supervisors
- using HSRs to gather feedback from workers to determine if the planned controls are realistic and achievable
- routinely seeking feedback from contractors or PCBUs with overlapping duties
- using technology to monitor exposure to risks
- encouraging workers to report any change to SOPs so that their effectiveness can be reviewed
- exposure monitoring for work-related health matters
- health monitoring for workers exposed to health-related risks
- periodic independent audits to determine whether controls and SOPs are being followed as intended.

Effective risk monitoring requires a positive safety culture in which workers are comfortable with identifying any challenges they have applying SOPs or risk controls as intended by the PCBU. If workers are concerned that they will be unfairly blamed for any observed change from procedure, then they will not raise concerns. The PCBU will also miss out on the opportunity to test that the controls they have designed are effective in practice.

2.5 Review the risks and the control measures

It is important to periodically carry out a more in-depth review of risks and risk controls. This is an opportunity to make sure that all of the risks that arise from the work have been identified, and that the control measures continue to be both appropriate and effective. For example, a review may identify new innovations in technology that could be implemented.

In addition to regular reviews, the following events may trigger the need for a detailed review of the risks and controls:

- routine monitoring has revealed that existing controls are ineffective
- an accident or near miss incident has occurred
- new or different plant and equipment has been purchased
- when there is a change to schedules or timelines for unloading
- when there is a change to related work processes
- if there are changes to the work environment or context, such as changes to the layout of the port, economic or environmental factors that may lead to additional pressures and risks.

A review should include a fresh assessment of the risk and controls to ensure that the risk has been correctly identified and quantified, and that the controls continue to be fit for purpose and achieve, so far as is reasonably practicable, the highest level of protection for workers and other people.

A review must include workers who undertake the work and should consider the following:

- have all of the potential risks been identified?
- are there changes to procedure, plant or work environment that impact on the risks?
- have there been changes to legislation requiring specific actions/controls?
- are there advances in technology that could be applied to better control the risk?
- are existing control measures effective (as demonstrated through monitoring)?
- has the communication of risk controls/ SOPs to workers been effective? Including addressing language and literacy challenges?
- has training for workers been effective?
- what accidents or incidents, have occurred while the existing controls were in place and what caused the events?

The outcome of a review could result in existing controls being confirmed, or new or additional controls being designed and implemented.

2.6 Managing risks that may arise during work

It is important to recognise at the outset that the work of loading and unloading cargo at ports and on ships is fast-moving, varied and complex. Workers may carry out their work outdoors at a port or on the deck of a ship, deep inside a ship's hold, or several metres in the air inside the cab of a large crane or on a raised platform or walkway. They may load or unload cargo to or from a ship, a rail wagon, a truck, an open storage area or a refrigerated warehouse at the port.

The control measures in place are unlikely to be the 'set and forget' type used by less dynamic industries. Changes in weather, temperature, tides, visibility levels, noise; whether it is day or night; the number of vehicles, plant and equipment onsite; the condition of a ship, its plant and equipment; the type and condition of cargo; the condition of a port or wharf; and the amount and type of labour available are all variables that can quickly change, causing new risks to emerge and requiring control measures to be reassessed at the same time as the work is being carried out.

Risks that arise from work, including those identified through a pre-work inspection, must be effectively managed. PCBUs should advise workers of what to do if risks emerge while they are carrying out their work and they reasonably believe conditions are unsafe.

For example, if:

- ship's crew carrying out work may interfere with the loading/unloading work area
- there is an incident or near miss
- there is an emergency
- plant or equipment breaks down or malfunctions
- a hazardous atmosphere occurs in the hold or on deck.

Information about what to do in these instances should form part of the content of a pre-work toolbox talk or site induction.

See also chapter 3 Pre-arrival Planning

2.7 Risk management – emergency planning

GRWM **r 14**

Duty to prepare, maintain and implement emergency plan

A PCBU must ensure that an emergency plan is prepared for the workplace that provides for:

- emergency procedures including:
- an effective response to an emergency, and
- evacuation procedures, and
- procedures for notifying emergency services organisations at the earliest opportunity, and
- medical treatment and assistance procedures, and
- effective communication between the person authorised by the PCBU to coordinate the emergency response and all other persons at the workplace
- testing of the emergency procedures, including how often they should be tested, and
- information, training, and instruction to be given to relevant workers in relation to implementing the emergency procedures.

The PCBU must maintain the emergency plan for the workplace so that it remains effective.

The PCBU must have regard to all relevant matters including:

- the nature of the work being carried out at the workplace
- the nature of the hazards at the workplace
- the size and location of the workplace
- the number and composition of the workforce at the workplace.

The PCBU must implement the emergency plan for the workplace in the event of an emergency.

Emergency plans should be site-specific, covered in induction training and made known to all workers and visitors.

Shore emergency plans should include:

- allocation of roles and responsibilities for specific actions in an emergency to people with appropriate skills, for example, appointment of area wardens
- access and exit for retrieval and escape including a contingency plan for alternative access and exit
- safe and timely evacuation procedures, for example, evacuation checklists and procedures for assisting injured people
- warning systems and what to do when they activate
- shutting down of equipment, for example, cranes
- planning for drills, for example, to make sure alarms are audible to everyone
- fire risks and provision of firefighting and rescue equipment at appropriate locations
- the establishment of a reliable means of communication between workers to ensure effective evacuation of danger areas including a backup communication system in case of a failure of the primary system
- a readily accessible communication system to contact emergency services
- the display of evacuation procedures in appropriate locations
- access for emergency services such as ambulances.

Regular refresher training in emergency procedures should be provided to workers and a process established and maintained to ensure there is effective communication and coordination between ship (the master) and shore (PCBU and workers carrying out the loading or unloading).

2.8 First aid

GRWM **r 13**

Duty to provide first aid

A PCBU must ensure that:

- adequate first aid equipment is provided for the workplace, and
- each worker at the workplace has access to the equipment, and
- workers have access to facilities for the administration of first aid, and
- an adequate number of workers are trained to administer first aid at the workplace, or workers have access to an adequate number of other person who have been trained to administer first aid.

The PCBU must have regard to all relevant matters including:

- the nature of the work being carried out at the workplace
- the nature of the hazards at the workplace
- the size and location of the workplace
- the number and composition of the workforce at the workplace.

First aid kits must be accessible at the workplace. On foreign ships, this may require that the New Zealand workers take first aid kits with them onto the ship.

2.9 Right to cease or refuse to carry out unsafe work

HSWA **s 83**

Right of worker to cease or refuse to carry out unsafe work

(1) A worker may cease, or refuse to carry out, work if the worker believes that carrying out the work would expose the worker, or any other person, to a serious risk to the worker's or other person's health or safety arising from an immediate or imminent exposure to a hazard.

(2) A worker may continue to refuse to carry out the work if –

(a) the worker attempts to resolve the matter with the PCBU as soon as practicable after first refusing to do the work, and

(b) the matter is not resolved, and

(c) the worker believes on reasonable grounds that carrying out the work would expose the worker or any other person to a serious risk to the worker's or other person's health or safety arising from an immediate or imminent exposure to a hazard.

(3) Without limiting subsection (2)(c), reasonable grounds exist if a health and safety representative has advised the worker that carrying out the work would expose the worker or any other person to a serious risk to the worker's or other person's health or safety arising from an immediate or imminent exposure to a hazard.

(4) A worker who ceases work under subsection (1) must, as soon as practicable, notify the PCBU that the worker has ceased work.

(5) Subsection (1) does not authorise a worker to refuse to do work that, because of its nature, inherently or usually carries an understood risk to the worker's health and safety, unless that risk has materially increased beyond the understood risk.

(6) To avoid doubt, nothing in this section limits or affects an employee's right to refuse to do work under any other enactment or the general law.

Under HSWA, a worker has the right to stop work or refuse to carry out work if they believe that doing the work would expose them, or anyone else, to a serious risk to health or safety from an immediate or upcoming hazard. If a worker has stopped work, they must let the PCBU know as soon as possible.

Once the worker has tried to resolve the issue with the PCBU, the worker does not have to start work again if they still reasonably believe that they or another person would be in danger.

2.10 Notifiable events

HSWA **s 56**

Duty to notify notifiable event

(1) A PCBU must, as soon as possible after becoming aware that a notifiable event arising out of the conduct of the business or undertaking has occurred, ensure that the regulator is notified of the event.

(2) A notification under subsection (1)–

(a) may be given by telephone or in writing (including by email, or other electronic means), and

(b) must be given by the fastest possible means in the circumstances.

(3) For the purposes of subsection (2), a person giving notice by telephone must–

(a) give the details of the incident requested by the regulator, and

(b) if required by the regulator, give a written notice of the incident within 48 hours of being informed of the requirement.

(4) Notice given in writing under subsection (2) or (3) must be in a form, or contain the details, approved by the regulator.

(5) If the regulator receives notice by telephone and a written notice is not required, the regulator must give the PCBU–

(a) details of the information received, or

(b) an acknowledgement of having received notice.

PCBUs must notify Maritime NZ or WorkSafe New Zealand of any notifiable event that arises from their work. Notifiable events include a death, a notifiable injury or illness or a notifiable incident.

LINKS TO MORE INFORMATION

WORKSAFE NEW ZEALAND

For details of what injuries, illnesses or incidents must be notified

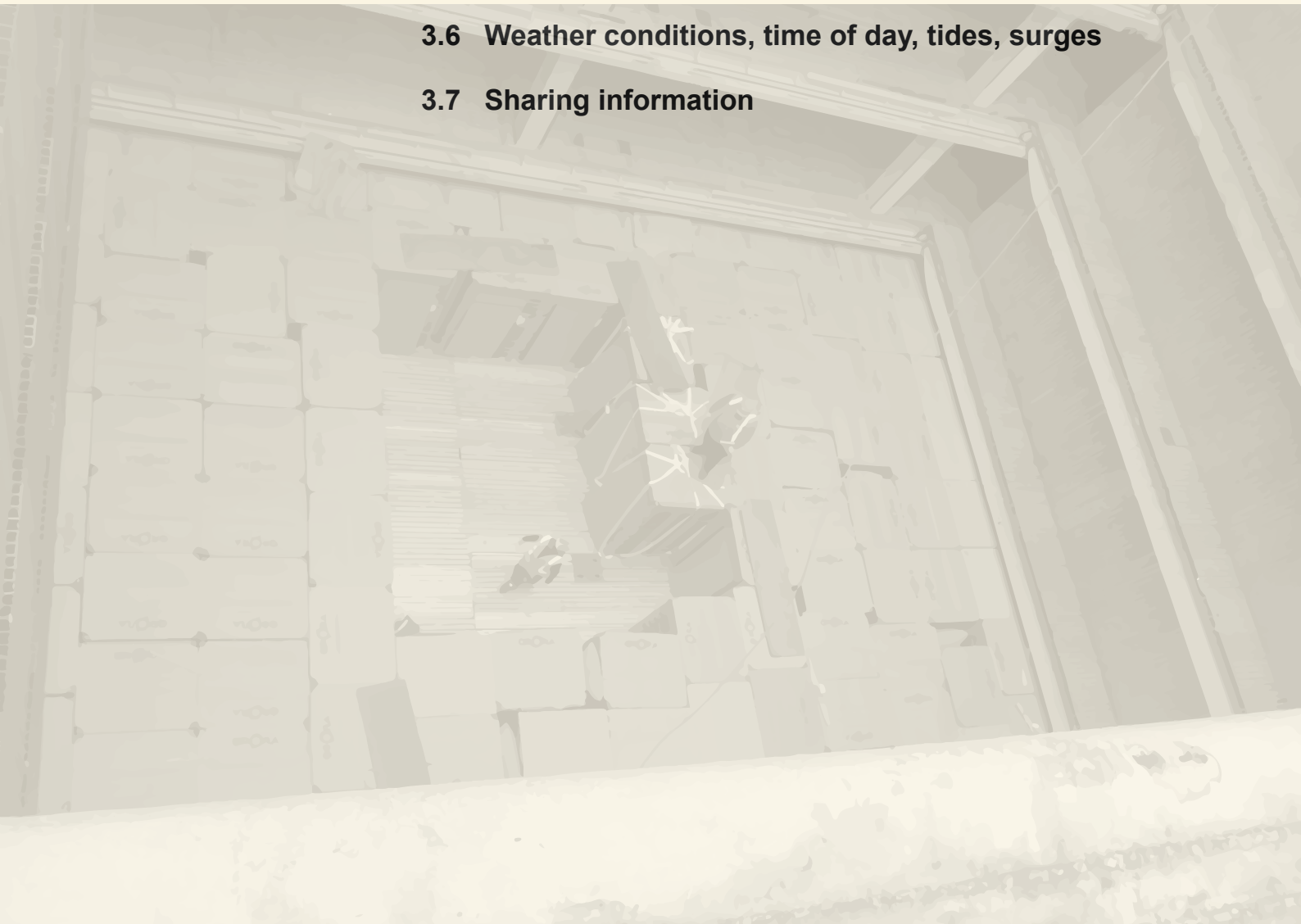
General Risk and Workplace Management Interpretative Guidelines parts 1 and 2

Quick Guide: First Aid at Work

SafePlus

3.0
Pre-arrival planning

IN THIS SECTION:



This section provides guidance for PCBUs on planning for the safe loading and unloading of cargo.

PCBUs should pre-plan cargo operations before the cargo arrives, whether this is by ship or land transport. Together with workers, PCBUs must identify the potential hazards, assess the risks and decide on the appropriate control measures. This may also include working with other duty holders such as the port authority, shipping agents or companies, and land transport companies.

See also 1.11, page 22

3.1 Pre-planning

This ACOP cannot list every step for every situation. As such, not all steps are included in this example of a checklist. There will be additional steps that a PCBU must consider, depending on the specifics of the work being carried out. The main point to take away is that PCBUs must carry out a risk assessment and ensure workers and other people are not at risk from the PCBU's work.

In their pre-planning, PCBUs should consider:

- Loading and unloading sequences - the order of work.
- Vessel type, cargo type. For example, heavy lifts and presentation.
- Lifting and rigging plans.
- Allocation of resources. For example, people, plant and skills.
- Weather conditions, time of day, tide levels and surge impact.
- Sharing information with other relevant PCBUs. For example, other ports.

3.2 Loading and unloading sequences: the order of work

These items should be considered before the ship or land transport arrives:

- Cargo manifest (for details such as the type of cargo, weight, number of items, any special conditions of the cargo).
- Stowage plans.
- Proposed loading/unloading plans.
- Lifting and rigging plans. See 3.4, page 45
- Location and condition of any hazardous substances or dangerous goods, including Safety Data Sheets (SDSs).
- Treatment or gas-free certificates for cargo which may have been fumigated on the way to New Zealand.

- Details of simultaneous operations planned nearby. For example, other PCBUs that may be planning to conduct cargo operations on the same ship or on an adjacent berth, or to perform work which may increase risk (such as hot works). See 1.11, page 22

3.3 Vessel type, cargo type (example: heavy lifts and presentation)

Adequate pre-planning requires PCBUs to consider the hazards and risks of the specific ship and cargo type they are working with. For example:

- Cargo holds and other shipboard spaces are considered to be confined spaces and must be managed as such.
- Certain cargoes may have an impact on worker health. For example, if a cargo was fumigated or if cargo in an adjacent hold has created a hazardous atmosphere. See 4.6, page 61
- Heavy-lift cargoes may require special consideration to maintain ship stability.
- Some cargoes may require specialty lifting equipment, such as custom spreaders, or the use of a union-purchase derrick.
- There may be addditional PPE requirements for dusty cargoes, such as grains or PKE.

See Chapter 5 for more details about loading and unloading different types of cargo

Pre-work communications

As mentioned, PCBUs should meet with a representative of the ship (this could be the ship's captain or chief mate) to discuss how hazards identified during the pre-work inspection will be managed. This is also a good time to talk through the ship's procedures in an emergency.

3.4 Lifting and rigging plans

Lift plans

Lift plans provide a systematic approach to preparing for a lift. A good lift plan is an appropriate resource that will help determine the complexity of the lift and in turn will help to ensure the lift is managed well, with all workers clear on their roles and responsibilities.

Lift plans may range from SOPs for lifts that are performed frequently, to a custom plan that is developed to account for factors that make the lift complex.

PCBUs should make sure that lift plans supplied:

- by the ship's owner or master are verified by a competent person from the PCBU as being fit for purpose
- by the PCBU are developed by a competent person, or similarly competent people, on the day.

Ideally, lift plans should be developed by the PCBU's foreman, crane operator and ship's chief officer working together. Simpler plans may be developed by the PCBU and verified by the ship's chief officer.

PCBUs should ensure lift plans:

- are discussed with and understood by all workers who will be involved with the lift, before work starts. This information could be shared with them at, for example, a pre-work meeting or toolbox talk
- include details of the control measures to be used
- are adjusted where necessary to manage new or emerging risks
- include a rigging plan for complex or irregular lifts
- are kept on-hand during the lift, and
- are kept as a record of the lift. **See 6.2, page 110**

RIGGING PLANS

A rigging plan is developed every time a heavy load is being lifted.

Rigging plans provide detail on:

- how the rigging of a load will work
- calculations, and
- checks taken for the rigging of a load.

PCBUs should ensure rigging plans supplied:

- by the ship's owner or master for use with ship-based cranes and equipment are sufficiently detailed and include relevant information necessary to permit the safe rigging of the crane and associated gear
- by the PCBU for use with shore-based cranes and equipment are developed on the day by a competent person, or similarly experienced or qualified people, such as the hatchperson or rigger.

PCBUs may choose to use their own equipment instead of the ship's equipment.

Regardless of who develops the rigging plan, PCBUs should ensure rigging plans:

- are discussed with and signed off as part of the lift plan by all members of the team
- specify the lifting or slinging methods to be used to manage the risk of a load slipping. For example, double-wrap or single-choke with sliding ring - and take into account the condition of plant and equipment, including age and wear
- include, where relevant, a rigging chart to ensure lifting techniques are appropriate. For example, the safest lift angles are used
- indicate the use of taglines where taglines are required.

It is helpful if PCBUs have plans that can be used repeatedly with little or no modification, and plans that need to be tailored for a specific complex lift. For example, a simpler plan or set of SOPs may be suitable where:

- a crane will be operating below or around 75% of its rated capacity
- the lifts are repetitive or of a similar nature, and
- the crane is in the same position.

When planning a lift, PCBUs should consider factors that may increase the complexity of the lift and, subsequently, the risks to the health and safety of workers and other people.

For example, if:

- the load weight is 75% or more of the crane's rated capacity
- the load's dimensions are oversized (for example, special project cargo, wind turbines, railcars)
- the load is unbalanced. That is, it has an unusual weight distribution (centre of gravity)
- the lift requires the transfer of ballast
- the leg spacing of slings is unequal
- more than one crane is to be used to lift a load (union-purchase or married falls)
- a work platform is to be used, in which case the crane should not operate at more than 75% of its rated capacity. **See 6.4, page 115**
- the load cannot be seen by the crane operator at any time during the lift (blind lift)
- hazardous substances are involved
- rigging arrangements are likely to be technically difficult
- a pre-engineered lifting configuration is required
- the lift gear to be used is unfamiliar, specialised or not ordinary, or
- the crane operator considers the lift to be complex.

A complex lift may require planning by an engineer or similarly competent person.

3.5 Allocation of resources (example: people, skills and plant)

Adequate pre-planning also requires consideration of the resources required to carry out the work and the resources available.

The specific factors to consider will vary on a case-by-case basis but examples of some factors to consider are:

- Number of workers required and for how many hours or shifts.
- Will work be carried out during the day, night, or both?
- Work start and finish times.
- Skills or experience workers need for specific jobs.
- Instructions and job-specific training to be provided.
- Supervision (such as who will supervise? What skills or experience will they need to make sure work is carried out safely?)
- Inductions (such as who will carry out inductions? how will inductions be delivered? what content will inductions cover? For example, the health and safety risks of the work and the control measures in place to minimise these, emergency plans, worker facilities such as toilets and drinking water supplies, what a worker should do if they reasonably believe the work is unsafe.

3.6 Weather conditions, time of day, tide levels and surge impact

Environmental factors which may affect cargo operations include weather, tides, time of day, and sea state. Operating instructions should include the actions to be taken by specified persons in the event of adverse weather or other environmental conditions.

Cargo operations should only be carried out in conditions that are suitable for the type of cargo and within the operating and manufacturers' limits of the equipment. Adverse weather conditions such as high winds, lightning, impaired visibility due to, for example, rain, snow, fog; adverse sea states or significant ship movement may affect certain cargo operations, including the use of lifting appliances.

Some factors to consider include:

- Weather forecasts should be monitored regularly so that appropriate steps can be taken well in advance of adverse weather.
- Tidal conditions, including times of high and low tides and any unusual tidal conditions, such as king tides, should be reviewed in advance.
- Seasonal impacts on daylight should be considered and arrangements for supplementary lighting made as needed.

When carrying out a risk assessment, PCBUs should consider how changes in weather may affect safe working practices. The following factors are some that may cause PCBUs to consider stopping work until conditions improve.

For example:

- stopping work if operating near refrigerated containers (reefers) in wet conditions (due to risk of electric shock or electrocution)
- if there is lightning
- operating cranes in high winds See 3.6, page 50
- vessel movements due to storms or unusual wave motions
- poor visibility, for example, in fog or heavy rain
- in periods of extreme low or high temperatures, and during periods of high solar UV radiation.

Control measures include:

- measuring wind speed (for example, anemometers on plant such as cranes) and stopping work when safe levels are exceeded
- checking the weather forecast when planning work
- moving vessels to another berth (or cancelling vessels altogether) if high seas and swells are forecast
- fitting equipment and infrastructure with devices to manage the risk of lightning strikes
- ensuring containers are stacked so they are stable in case of high winds
- providing drinking water, appropriate breaks and shelter in extreme heat, and suitable PPE such as wet weather gear and sun protection such as wide-brimmed hats, long-sleeved shirts, long pants, sunglasses and sunscreen.

Managing unplanned events

Plans may need to change owing to, for example, insufficient plant, the absence of a crew member, extreme weather, and productivity pressure. These changing circumstances may introduce new risks that PCBUs must also manage. Two examples of this type of situation, involving plant and equipment, are lightning and high winds.

LIGHTNING

Any crane struck by lightning must be thoroughly examined by a competent person before being returned to service. For ships' cranes, the definition of a competent person is defined in Maritime Rule Part 49. For shore-based cranes, the definition of a competent person is defined at 1.4, page 13

HIGH WINDS

What is a safe wind speed for cranes will depend on their type, configuation and the weight and type of the load being lifted. PCBUs should:

- understand the Original Equipment Manufacturer's (OEM) wind limits (or if unknown, have a competent person establish them) for the particular make and/or model of crane being operated. Such wind limits are generally gust limits, not mean wind speed limits. Operating manuals from the crane manufacturer may have this information. Design verification documentation or crane inspection certificates may also assist in establishing these limits
- implement ways of knowing what the wind is doing by installing local anemometers at crane height (on cranes not required to already have them). This will enable accurate and timely information and a system that tracks recent wind speeds, as well as 'live' wind speeds (in the moment) which shows forecast wind speeds to help understand if crane operations need to stop, and when they could be safely restarted
- establish procedures that clearly state what will happen if winds get close to, or exceed, safe thresholds
- maintain suitable levels of maintenance to ensure brakes are in a safe and serviceable condition and able to prevent unpredictable movement in high winds. For example, a crane's slewing brake should be capable of holding the job stationary, with the maximum WLL suspended at its maximum radius when a maximum in-service wind acts in the most adverse direction.

When high wind speeds (in excess of maximum rated wind speed) are expected, cranes should be secured in their appropriate out-of-service condition.

- If this requires the raising or lowering of a jib, PCBUs should have a planned procedure in place to ensure there is adequate time and space to do so.
- Cranes secured at picket points should be travelled against the wind to the nearest picket position and the storm anchor inserted.
- Rail-mounted cranes taken out of service in high winds should be secured using securing devices designed for the purpose. For example, storm pins or bolts that can be inserted into a socket in the wharf surface, rail clamps, wheel scotches and chains.

See also 2.6, page 37

3.7 Sharing information

PCBUs should keep a record for each ship visit including:

- the results of safety inspections of the ship, its plant and equipment
- the ship's stowage plan
- shoreside stowage arrangements for the ship's cargo. These may be relevant to the condition of the cargo. For example, organic cargos such as coal or grain can develop toxic gases or self-ignite if they are loaded with excessive moisture.
- plant and equipment required to load or unload the cargo (including shore-based equipment)
- any specific traffic management routes required, for example, exclusion zones required to be put in place
- any hazards or risks presented by working onboard the ship.

PCBUs should use the tools available for sharing information. This may include vessel safety databases or similar.

These are suggestions of some of the things that should be considered, not an exhaustive list.

This information should be shared with the supervisor/foreperson who should then pass it on to other managers and workers involved in loading/unloading of the cargo, including other New Zealand ports where the ship is due to call.

Over time, these records will help to show any patterns of particular ships arriving in New Zealand that continually present with the same hazards or risks which have not been attended to. PCBUs may in turn choose to forward these records to Maritime NZ for follow-up action.

LINKS TO MORE INFORMATION

ILO

For what to inspect on a ship, see chapters 4 and 7 of the
ILO's Code of Practice: Safety and Health in Ports

OTHER

Safe Crane (Crane Association of New Zealand)

4.0
Work environment

IN THIS SECTION:

This section offers guidance for PCBUs on how to manage common health and safety risks when loading and unloading cargo on ships and at ports.

As you read this chapter, please keep in mind the following:

Section 30 of HSWA provides that a PCBU is required to manage risks to the extent that it would reasonably be expected to have the ability to influence or control the matter to which the risks relate. In terms of a foreign ship, the port PCBU is not in control of the 'workplace' that is the ship and will have limited influence and control of the physical ship itself. To address risks, a PCBU may either need to provide facilities at the port (such as water, toilets, shade) or refuse to work on a ship where facilities are unsafe or unhealthy. It will also be necessary for a PCBU to ensure that there are adequate emergency procedures even where the ship does not have these – or workers should not be permitted on the ship.

GRWM **r 10**

Duty in relation to general workplace facilities

A PCBU must ensure, so far as is reasonably practicable, that:

- the layout of the workplace allows, and is maintained to allow, persons to enter and exit the workplace and move within it safely, both under normal working conditions and in an emergency
- work areas have sufficient space for work to be carried out safely
- floors and other surfaces are designed, installed, and maintained to allow work to be
- carried out safely
- lighting enables workers to carry out work safely, persons to move around safely, and safe evacuation in an emergency
- ventilation enables workers to carry out work safely, and
- workers exposed to extremes of heat or cold are able to carry out work safely.

GRWM **r 11**

Duty to provide certain workplace facilities

A PCBU must ensure, so far as is reasonably practicable, that adequate facilities are provided for

- toilets
- drinking water
- handwashing facilities
- facilities where workers can eat and take breaks
- if it is not reasonable for workers to leave the workplace if they become unwell, facilities where workers can rest.

In addition, a PCBU must ensure that the following facilities are provided for workers at a workplace if the work is of such a nature that the facilities are reasonably likely to be required:

- facilities for washing the body
- a place in which to change clothes that become contaminated or wet
- facilities for keeping clothes that will not be used at work clean and dry
- if it is reasonable for workers to perform work while seated, facilities for sitting
- if it is not reasonable for workers to perform work while seated, facilities for sitting that enable workers to take any reasonable opportunity for rest that may occur in the course of the work
- facilities that prevent workers from becoming wet from a wet floor, whether by way of drainage of the floor or otherwise
- facilities that enable any airborne contaminants to be controlled as closely as possible to their source and to be treated or carried off.

4.1 Ship inspections

Before work begins, PCBUs should:

- arrange for a visual safety inspection to be carried out on the ship and its lifting appliances and loose cargo gear to make sure they are safe to use.
- meet with a representative of the ship (for example, ship's captain or chief mate) to discuss how hazards identified during the inspection will be eliminated or, if this is not practicable, minimised so far as is reasonably practicable.

PCBUs should have a standardised approach to these inspections. PCBUs should make sure workers inspecting plant and equipment know who to report any unsatisfactory results to, and that work should not go ahead (in some cases, must not go ahead - see MR49.4 and 49.7) until any defects are fixed. PCBUs should notify the ship's master of any unsatisfactory inspection results so that these defects can be fixed before work begins. See also 6.2, page 109

The following areas of a ship should be inspected before work begins:

Ships' lifting applicances and loose cargo gear

HSWA does not apply to foreign ships. See 1.5, page 16 However, under Maritime Rule Part 49: Ships' Lifting Appliances, the ship’s master must make sure the ship is safe to work on and its lifting appliances and loose cargo gear are safe to use. This Rule implements the International Labour Organization's Occupational Safety and Health (Dock Safety) Convention 1979 and covers inspection, maintenance, testing and certification.

Before work begins, PCBUs should make sure a visual safety inspection of cranes (and other lifting appliances as appropriate) and loose cargo gear is carried out by a suitably qualified person. Ideally this person would be an independent marine surveyor at first port of call. When this is not possible, a worker delegated by the PCBU may conduct the inspections, provided they have been adequately trained and have the skills and experience to carry out such an inspection.

It may be useful for PCBUs to have at hand the following requirements that all ships' masters and owners have regarding maintenance, testing and certification of ships' lifting appliances and loose cargo gear:

Ship's responsibilities under Maritime Rule Part 49: Ships' Lifting Appliances

- The owner and master of a ship must ensure that a certificate of test is obtained for every lifting appliance and every item of loose gear carried on the ship and that the validity of the certificate of test is maintained.
- The owner and the master of a ship must ensure that every lifting appliance and every item of loose cargo gear carried on the ship is maintained in good repair and working order.
- Each item of loose cargo gear must have been proof load tested by a competent person before being brought into use, and in response to any repairs to an item of loose cargo gear.
- Under this Rule, the results of tests, examinations, and certificates of tests on the ship's lifting appliances and loose cargo gear must be recorded in the ship's Register of Equipment.
- The tests, examinations, and certificates of tests must be carried out at the following times:
  - at least once in every five-year period, every lifting appliance on the ship is retested by a competent person (in this instance, a class surveyor)
  - at least once in every 12 months, the owner or master of a ship must ensure that every lifting appliance on the ship and every item of loose cargo gear carried by the ship is thoroughly examined by a competent person (in this instance, a class surveyor).
- Before it is used, the master of a ship must ensure that every item of loose cargo gear is inspected by a responsible person.
- The control guards, locks, gates, limit switches and other safeguards have been tested and can be used according to the manufacturer's instructions.

The PCBU should not work the ship or use the ship's plant or equipment until it has sighted the following documents. Where practicable, these documents can be requested from the ship before it arrives at the port:

- excerpts from the Ship's Register of Lifting Appliances:
  - Part 1 – Dates of last annual examination and five-yearly testing by a competent person (in this instance, 'competent person' is as defined in Maritime Rule Part 49)
  - Part 2 – Dates of last visual inspection prior to use by a responsible person (typically the chief mate). 'Responsible person' is as defined in Maritime Rule Part 49

- certificate of test and thorough examination of lifting appliances
- certificate of test and thorough examination of loose gear
- certificate of test and thorough examination of wire rope
- dates that the wire rope was put into service on each crane
- records of any cargo inspections from previous ports.

The crane manufacturer's instructions should be located in the rigging plan or accompanying booklets, and be available onboard the ship.

Access on, off and around the ship

GANGWAYS, WALKWAYS AND SAFETY NETS

Means of access to and from a ship and into or onto shipboard spaces (for example, the cargo hold, a deck) may be by way of a gangway, walkway, ladder, or stairs provided by the ship or the PCBU. Regardless of who owns the means of access, before work begins, PCBUs should check that all means of access that workers will use are safe (for example, correctly positioned and in good working order).

On gangways, check that a safety net is rigged wherever a person may possibly fall between the ship and the shore from a means of access to the ship. So far as is reasonably practicable, the net should protect the entire length of the means of access and be fastened top rail to top rail. Gangway safety nets should remain rigged while cargo is loaded or unloaded. If this is not practicable, the means of access should be supervised while workers are using it.

Check that gangway safety nets are placed:

- so no loads pass over them
- where access to them will not be obstructed
- where they cannot be struck by moving traffic on a crane track, rail track, or other route.

Gangways, walkways and handrails should be in good condition, free from obstructions and build-up of residue, and clearly marked.

- On Ro-Ro ships, safe pedestrian access, separate from vehicle access ramps, should be provided. If this is not practicable, the ramp should be controlled at all times to prevent pedestrians from using the ramp while it is being used by vehicles.
- Hatchway ladders/stairs and their handrails are safe and in serviceable condition.
- All walkways are safe, accessible, and in serviceable condition.
- Safe access to cargo is provided as required. For example, on-deck logs, breakbulk in holds.

MOVING AROUND THE SHIP

- There should be proper guarding/marking of danger areas. For example, handrails near edges, around deck openings, and portable fencing around -deck openings and under loads.
- Decks should be clear of obstructions.
- Decks should be in reasonably good condition. For example, there are adequate non-skid coatings; there are no holes or excessive rust.
- There should be adequate lighting and ventilation on decks and in holds. See also 4.6, page 61
- Locking devices on hatch covers should be in serviceable condition.

GETTING IN AND OUT OF SHIPS' HOLDS

There must be safe access and egress for workers to get in and out of the hold. Entry and exit points should be kept clear of cargo or other obstructions. When cargo is being loaded or unloaded to/ from the hold, the entry and exit to the hold should be monitored (by, for example, the hatchperson or supervisor) to ensure they remain clear throughout the operation.

PCBUs should check hatches and openings to holds to ensure:

- they are protected by coamings
- there is adequate clear space around the coamings to allow easy access
- hinged and pontoon hatch covers are secured open, or removed if not adequately secured, to prevent them from accidentally closing while being accessed
- hatch covers are closed when the hatch is not in use.

If a crane-lifted work platform is used to place workers in the hold, PCBUs should check the platform is of suitable design, well maintained and inspected before use. The platform should remain attached to the lifting appliance as a means of escape or until an alternative means of escape/egress can be arranged. See also 6.4, page 115

ACCESS IN AN EMERGENCY

Workers must be able to get out of the hold safely, including in an emergency. If they are unable to get out, they must be able to alert other people that they need help. Other workers or people (such as emergency services) must be able to safely access the worker. See also 2.7, page 38 and 4.2, page 59

Ships' cargo

- Ships may encounter rough weather at sea, causing cargo to move. Cargo areas to be worked should be inspected to ensure the cargo has not shifted during the voyage and that all adjacent cargo remains adequately secured.
- Where changes in the condition of cargo are identified, such as damaged or unsecured cargo, these should be notified to the ship and suitably rectified whenever possible. When correcting unsecured or damaged cargo is not practicable, these conditions should be communicated to the relevant people in subsequent ports.
- Slings around pre-slung cargo should be certified in line with AS1353.1 'Flat synthetic webbing slings' and safe to unload cargo.
- Lashing gear should be suitable for the type of cargo being lashed, in a safe condition, and properly maintained.
- Baling wire should be suitable for lifting. If it is not, slings or equipment appropriate to the task should be used instead.

4.2 Ships' emergency plans

PCBUs must understand what the ship's procedures are in an emergency and share this information with workers. The ship’s emergency plans should be sought out during the ship inspection, advised to workers, and followed in an emergency. Consider: you have workers working onboard a ship and a fire breaks out in their vicinity. Where are the ship's assembly points in an emergency, what should workers do? What do the different ship's alarms mean (if applicable)?

PCBUs should not depend solely on the ship’s emergency plans, however. PCBUs should have some form of backup or plan for a coordinated response if emergency assistance is needed.
See also 2.7, page 38

4.3 Working with ladders

Workers using a ladder should:

- have both hands free for climbing up and down
- ensure any bulk cargo is cleared away so the ladder rungs are exposed
- face the ladder when climbing up and down
- wear suitable non-slip footwear, and
- use a belt or other suitable means to carry any necessary items.

Ships' ladders

Where a ship's ladder is used to access a ship or the spaces within a ship (for example, the hold), PCBUs should undertake a risk assessment to ensure the ladder is free from defects (for example, brittle or rusty welds) and it is adequately secured.

If the ladder is defective or not properly secured, PCBUs should report this to the ship's master or the chief mate and ensure that before workers use the ladder, the defect has been repaired or safe, alternative access for workers has been provided.

Shore-based ladders

Fixed ladders used on the shore (for example, on the inside or outside of port or wharf structures) should meet or exceed the requirements of industrial rating of the relevant AS/NZS 1657 Standard.

Portable ladders

If all permanent accessways are unable to be used to access a ship's hold, a portable ladder may be used. Portable ladders should meet or exceed the requirements of industrial rating (that is, a minimum load rating of not less than 120kg) of the relevant AS/NZS 1892 Standard.

When used, portable ladders should be:

- not more than six metres long
- in good condition
- placed on a firm and secure surface at an angle of between 70 and 80 degrees to the horizontal, and
- secured at their upper resting position, which must be at least one metre below the top of the ladder.

Where a portable ladder is used in a hatchway, cargo should not be loaded or unloaded through that hatchway.

4.4 Housekeeping

Good housekeeping practices should be put in place to control the risks of trips, slips and falls on shore and on ships. Designated storage areas should be provided for loose items, for example, twistlock bins, to ensure these are correctly stored. Goods and materials not in containers or vehicles should be kept in stable and orderly stacks or piles on firm and level surfaces. Stacks may need to be secured.

4.5 Lighting

Lighting may include external lighting towers, portable lights and crane lights. Adequate lighting must be provided and maintained to make sure cargo loading and unloading can be carried out without risks to health and safety.

There should be suitable deck and under-deck lighting on ships, particularly for:

- access routes, including access to lifting equipment
- ladders providing access to the ship
- working areas onboard and adjacent to the ship
- lashing operations.

Lighting should be sufficient for work carried out at night as well as enabling good visibility in ships' holds, taking into account glare, reflections or shadows. If portable lighting is used on ships, electrical cables should be protected from accidental damage and positioned to prevent trip hazards.

4.6 Air quality

Ship holds, stairwells and accessways

The ship's master is responsible for ensuring that all accessways and ship's working spaces are safe to enter. However, it is good practice for a PCBU to conduct their own checks before letting their workers on board the ship, and to ensure any defects have been repaired before work begins in that area.

Shipboard spaces are an example of confined spaces in AS 2865 'Safe working in a confined space', which is the accepted standard. Everyone who carries out confined space work needs to be familiar with this standard.

For the record, a confined space is:

- an enclosed or partially enclosed space
- is not intended or designed primarily for human occupancy and
- may present a risk from one or more of the following at any time:
    - unsafe concentration of harmful airborne contaminants
    - unsafe concentration of flammable substances
    - unsafe levels of oxygen
    - substances that can cause engulfment.

Other examples of confined spaces - apart from shipboard spaces - include storage tanks, tank cars, process vessels, boilers, silos, pits, pipes, sewers, shafts, and ducts.

Cleaning, purging and testing

The atmosphere within ships' holds, stairwells and accessways can become hazardous in several ways including having:

- dangerously low levels of oxygen
- a build-up of flammable and/or explosive atmospheres, or
- a build-up of toxic or corrosive gases and/or substances.

Before undertaking any work which requires entry into a confined space, PCBUs must carry out a risk assessment. The confined space may need to be cleaned and purged before it is safe for workers to enter.

Where practicable, PCBUs should signpost and secure the confined space so that no person can enter it while it is being cleaned and purged.

PCBUs should seek expert assistance before cleaning, purging and testing the atmosphere. Cleaning and purging does not replace the need to test and monitor the atmosphere.

Warning: **Never** use oxygen to purge a confined space: this can create a fire and explosion hazard.

More extensive guidance on cleaning, purging, ventilating, and testing the atmosphere in confined spaces is available from the WorkSafe New Zealand website. (See the end of this chapter for links.)

Control measures for working in confined spaces include:

- providing natural or mechanical ventilation to extract and prevent the accumulation of harmful concentrations of gases, fume, vapours and fumigants
- substituting combustion-powered plant or equipment (for example, forklifts) for options that do not produce exhaust emissions
- switching off engines when plant is not in use
- limiting the amount of plant operating in the space at the same time
- providing appropriate PPE such as respiratory protective equipment (RPE), making sure it has been fit-tested to individual workers, and making sure that workers know how to wear or use it correctly.

Reading the SDSs for hazardous chemicals can help identify a hazard or risk; SDSs will usually provide information on possible control measures.

WORKER TRAINING OR INSTRUCTION

Workers must be trained or instructed in the nature of the hazards and the control measures to be followed.

Workers should be trained in how to respond to emergencies involving confined spaces (for example, rescue drills and safety equipment), at least until emergency services arrive.

Substances hazardous to health

Substances hazardous to health include airborne substances and substances on surfaces. Some of these substances may include carcinogens. Common carcinogens at ports and on ships include asbestos and fumes from vehicle engines, ships' exhaust, and welding. Workers may also be exposed to carcinogens from damaged cargo.

Airborne substances that are hazardous to health include dust, mists, vapours, gases and fume. Many of these are invisible. Workers exposed to airborne risks, including hazardous substances and substances hazardous to health, may develop cancer, respiratory diseases and other illnesses.

As part of the primary duty of care in HSWA section 36, PCBUs have a duty to manage work-related health risks and to monitor the health of workers and workplace conditions to make sure workers are not injured or made ill by their work, so far as is reasonably practicable.

FUME, VAPOURS, LIQUIDS AND SOLID PARTICLES

Exhaust emissions can contain vapours such as polycyclic aromatic hydrocarbons (PAH), oxides of nitrogen, sulphur oxides, aldehydes, and solid particulate matters, for example, diesel particulate matter (DPM). Paint vapours may contain solvents including acetone, toluene, turpentine, styrene, ethanol, and benzene. Welding fume contains a complex mixture of metallic oxides, silicates and fluorides as well as gases and other products of combustion arising from surface coatings.

Control measures for substances hazardous to health include:

- providing workers with appropriate RPE for the task, making sure the RPE is fit-tested and workers know how to correctly use and maintain it.
- ensuring plant cabs are adequately sealed and replacing damaged or ineffective seals
- regularly cleaning plant and equipment
- making sure all requirements of the SDS (as applicable) have been put in place.

DUST

Workers loading or unloading cargo may be exposed to many sources of dust including but not limited to:

- dust from logs and PKE
- coal dust
- cement dust
- flour dust
- grain dust
- fertiliser dust
- dust released through air vents inside RoRo cargo (such as vehicles) when air-conditioning is turned on
- dust from rubber tyres on forklifts.

Control measures specifically for dust include:

- spraying or misting water over the cargo where safe and appropriate. This should be done well in advance so there is enough time for cargo to dry before being loaded or unloaded
- using an industrial vacuum cleaner to vacuum up dust once it has settled, to prevent dust build-up
- using power tools connected to a portable dust extractor or to a fixed local exhaust ventilation (LEV) system. This is an effective way to capture and remove dust from the point of generation as it is generated
- using loading systems with integrated LEV fitted to remove fugitive dust
- regularly changing the filters in cabs of plant
- regularly inspecting and maintaining cab door and window seals
- where practicable, fitting cabs with positive pressure systems to eliminate dust ingress, or providing high-efficiency filtered air to minimise dust ingress
- designing tasks to reduce the amount of dust generated, including reducing drop heights
- restricting workers' entry to dusty areas.

Never dry sweep or use compressed air to remove dust. These methods cause dust to become airborne and spread, and in some cases create a potentially explosive atmosphere.

4.7 Traffic management

There is a risk of death or serious injury in workplaces where vehicles, trains, mobile plant and people share the same work areas. Where reasonably practicable, the work environment should be designed to allow for the types of transport used at the port to be separated from pedestrians.

When managing traffic risks, PCBUs should consider:

- the types of transport and pedestrian movements:
    - on the wharf
    - on and off ships
    - on decks and in cargo storage, receival and delivery areas at the port
- when trucks are arriving and departing, being loaded and unloaded, reversing, queuing and parking
- when trains are arriving and departing, being loaded and unloaded, and shunting
- work being carried out, or planned to be carried out, nearby by other PCBUs
- controlling workers' (including contractors') and visitors' movements onsite, and
- the condition of road and wharf surfaces (for example, if there are potholes) and rail tracks.

Traffic management plans

A traffic management plan (TMP) can assist with managing the risks of a busy port environment and communicating how these risks will be managed.

The common-user operator (in this case, the port operator) should develop a TMP in consultation with the relevant PCBUs working onsite. PCBUs that load or unload cargo should develop their own TMP that is specific for their work and traffic movements (rather than relying only on one TMP produced for the entire port).

PCBUs should engage with workers when developing a TMP, whether it is a general TMP or a TMP that is specific to a vessel or a task. Inductions should provide workers with information, instruction and training on how to apply the TMP when they are working.

A TMP should provide details about:

- the desired flow of types of transport and pedestrian movements including stop and give way rules. For example, setting up one-way traffic areas for times when visibility may be restricted, such as when operating empty container handlers or reach stackers
- how often and when types of transport and pedestrians are expected to interact

- traffic controls for each expected interaction including:
    - illustrations of the layout of barriers, walkways, signs, and
    - general arrangements to warn and guide traffic around, past, or through a worksite or temporary hazard
- exclusion zones. Signs, markings and delineations should be consistent with public road markings to reduce the risk of confusion for operators or drivers
- driver safety zones for vehicles while waiting for cargo to loaded or unloaded
- whether there are any shared roadways, main haul roads and potential high-risk areas where congestion is more likely
- roles and responsibilities of workers managing traffic, including in an emergency

When there are changes in traffic movements, TMPs should be updated and these changes communicated to workers.

Truck movements at a port

Under HSWA, truck drivers that visit a port to drop off or pick up cargo are either workers or 'other persons at a workplace'. As such, they have a duty to take reasonable care for their own health and safety, and they must take reasonable care that their own acts or omissions do not adversely affect the health and safety of other persons. They must also comply with, as far as reasonably able, any reasonable instruction given by relevant PCBUs with regards to health and safety.

At any point where the port has instructed that a load can be transported unsecured, controls must be in place (for example, low speed, no turns, no pedestrians and other people). Distances travelled with unsecured loads must be minimised so far as is reasonably practicable. An example of when the load can be transported unsecured is where a driver does not get out of their truck to tighten twistlocks in an operational area because to do so would increase the risk of harm to the driver (for example, by being run over by a different plant/vehicle). For this example and on this occasion, provided that appropriate safeguards are implemented, it may be preferred for the driver to drive with the unsecured load to a designated Driver Safety Zone (DSZ) to secure the container using twistlocks.

Driver Safety Zones and loading/unloading zones

Whether a truck driver stays in the truck while their cargo is being loaded or unloaded will depend on the type of cargo and which option (staying or leaving) provides the highest level of safety.

If the truck driver is required to leave the cab of their truck, they should be directed to a clearly marked DSZ. PCBUs should ensure that truck routes and loading and unloading points are clearly marked or otherwise indicated using physical barriers and signs. Markings, signs and delineations for the DSZ should be consistent with road markings.

The DSZ should be located forward of the truck's cab and a safe distance from the truck, and be visible to the operator of plant (for example, a straddle carrier) as they approach.

The driver should stay in the DSZ throughout the loading or unloading of the cargo. **They should not return to the cab of their truck until loading or unloading has been completed.**

If, due to the complexity of the SOPs this is not possible, then there must be a risk assessment completed by a competent person to determine the safe options. This may involve someone other than the fortklift operator and the truck driver. However both of these people can contribute to the risk assessment.

Loading and unloading areas should be kept clear of all other traffic (vehicles, trains, mobile plant, pedestrians) not involved in the activity. Trucks should not be loaded or unloaded in any other area without the permission of the supervisor or foreperson (or delegated operator).

Reversing vehicles

Where it is necessary to reverse, it is good practice for PCBUs to:

- create a dedicated reversing area where other vehicles and people cannot enter
- improve visibility and awareness by using devices such as proximity detectors, reversing sensors, reversing cameras, lights, and mirrors
- use a spotter (if it is safe to do so) to help guide the driver, and
- provide an effective communication system. For example, between spotters and drivers, and between plant operators and truck drivers.

Heavy plant (such as straddle carriers)

Heavy plant, such as straddle carriers, often operate in proximity to other vehicles, mobile plant and pedestrians. PCBUs must ensure, so far as is reasonably practicable:

- workers have adequate knowledge and experience to ensure they can safely operate the straddle carrier, or that they are supervised by a person with that knowledge and experience.

PCBUs should ensure plant is certified and regularly maintained in line with the PECPR Regulations.

GRIDS AND STRADDLE CARRIERS

Loading and unloading containers from road vehicles should be carried out on identified straddle carrier exchange grids. Grids should be clearly marked and not used as general waiting areas for road vehicles.

Where practicable, a straddle carrier should:

- approach a road vehicle from the rear during loading or unloading and then leave the vehicle by moving away from the vehicle’s rear, and
- approach a grid slot in the opposite direction to road vehicles.

PCBUs should ensure safe areas are designated within the grid to allow safe movement of straddle carriers, other vehicles, mobile plant and pedestrians.

Ample space should be provided for road vehicles to reverse into a slot on a grid safely if this manoeuvre is necessary. Oversized containers or problem containers that cannot be handled safely at the grid should be moved to a suitable designated area where they can be handled safely.

Where a truck is delivering or picking up cargo, the straddle carrier operator should not approach the grid if they cannot see the truck driver.

4.8 Rail operations

Loading and unloading rail wagons at ports

All workers working on or near rail lines should wear high-visibility clothing.

PCBUs should ensure workers know that locomotives passing through a port area may move at speeds from 5km/h ('walking pace') to 15km/h (if there is no speed limit posted). Locomotives can also be remotely operated and move without warning.

No goods or other obstruction should be placed within two metres of the nearest rail of a track. Wagons and other vehicles should not be parked close to road or pedestrian crossings or other

places where they may cause an obstruction or obscure the view of road or locomotive drivers. No person should pass under, over, through or between rail vehicles, unless required as part of a controlled operation.

When opening wagon doors, workers should check the door fastenings are in good order and stay clear of the door and any cargo that may fall as the door is opened.

Workers should not be inside open wagons (gondola cars) when bulk material is handled by grabs or magnetic lifting devices.

Danger signs should be placed at either end of sections of passageways or walkways near which open wagons with swinging side doors are being emptied.

Control measures to prevent workers' fingers from being crushed should be in place when drop doors on hopper wagons or open wagons with hopper bottoms are opened.

Before wagons are moved, all hinged doors should be properly fastened, and insecure and overhanging stanchions or metal straps should be removed and placed at least two metres clear of the rails.

Suitable tools should be provided and used for unfastening metal straps.

Lift trucks should not be used inside rail wagons unless the floors of the wagons are in a safe condition and the wagon is designed to take the load imposed on it.

Double-deck wagons to be loaded or discharged should have handrails at the sides of the top deck. Walkways adjacent to the handrails should have a non-slip surface.

Adequate clear space should be allowed between rail tracks and structures, piles of cargo or material traffic routes and walkways. This should allow for the width of rail wagons and should not be less than two metres.

Prohibited actions

Unauthorised persons should never ride on locomotives or rail wagons.

Workers should never climb above a footplate or floor level on any locomotive or wagon while under overhead electrified lines.

Cranes, ships' winches, and derricks should not be used to move rail wagons. Locomotives or wagons should not be used as a ram to adjust a load on a wagon.

Crossing a rail line

No person should cross rail lines within 10 metres of a stationary rail vehicle, unless it has been positively established that it will not move.

Particular care should be taken when crossing behind a train that has just stopped. Braking may have taken up slack between vehicles and compressed couplings and buffers. Wagons may then roll back several metres after the train stops.

Rollbacks are fundamentally an uncontrolled movement of heavy plant and there should be controls in place that are comparable for other hazards of that type, such as setting an exclusion zone. Rail crew should ensure handbrakes have been applied on the wagons.

Other controls include the rail crew applying lockout procedures to the train, putting chocks in place at each end of the wagon/train, and communicating (by radio or signals) to workers that the train is safe or ready to be worked. Once work has been completed, workers radio or signal this to the rail crew who then remove the chocks and prepare the train for departure.

Where buildings have exits opening directly onto port rail tracks, at blind corners and at other places where the field of vision is particularly restricted, there should be suitable barriers and warning signs to protect workers from stepping onto the rail tracks in front of moving trains.

Trains moving off

Locomotive whistles should be sounded or other appropriate warning devices activated before locomotives or trains move off, and on approaches to level crossings and other hazardous places.

Procedures should also be in place to signal the imminent movement of a train to workers, for example, a call over the radio or physical signage/cones/barriers.

Shunting

Level crossings and unprotected openings near the track should be controlled during shunting operations.

All trains should be brought to a full stop before any wagons are uncoupled. Positive confirmation should be given by the person in charge of the rail unit (for example, the remote control operator or the locomotive engineer) that the train is braked and safe to be worked on before decoupling or any cargo work commences

4.9 Working at height

HSE **r 21**

Heights of more than three metres

Every employer must, so far as is reasonably practicable, ensure, in relation to every workplace under the control of that employer, that, where any employee may fall more than three metres:

- means are provided to prevent the employee from falling, and
- any means so provided are suitable for the purpose for which they are to be used.

Working at height means working in a place where a person could be injured if they fell from one level to another. For example, when accessing the hold of a ship or working on top of a container. Rather than thinking about how high the fall will be, PCBUs should also consider how someone could fall and what they might land on.

PCBUs must ensure, so far as is reasonably practicable, the health and safety of workers who work at height. This includes ensuring that the plant and structures are safe, and that workers have adequate PPE and have been trained in how to carry out the work safely.

Discussions with customers and ships' agents at the early planning stage can often provide PCBUs with the opportunity to reduce or eliminate the risks from working at height. Consider the type, shape and size of ship, and the configuration of cargo stows at point of loading, and splicing cargo to eliminate gaps at the end of stows.

In an emergency, PCBUs must have an onsite rescue plan with details of what workers should do in an emergency to ensure a prompt response to an incident. The plan should not solely rely on the emergency services which may, due to traffic or other factors, take some time to get to the incident site. Workers should be trained in any relevant procedures required to carry out the plan safely and the procedures regularly practised through drills or refresher training. PCBU's must ensure that workers carrying out the plan are not put at risk.

See also 2.7, page 38

A NOTE ABOUT REGULATION 21

Regulation 21 of the HSE Regulations is the source of the often-quoted 'three-metre rule'. It is mistakenly believed that no controls are needed where a person faces a fall of less than three metres. **That belief is wrong and ignores the overarching duties in HSWA.**

HSWA requires that if there is potential for a person at work to fall from any height, reasonable and practicable steps must be taken to prevent harm from resulting. Doing nothing is not an option.

Managing the risk of falls

A ship should be loaded or unloaded in a way that eliminates the risks of falls or, where this is not reasonably practicable, minimises the risk of falls so far as is reasonably practicable.

If new risks emerge while the work is being carried out, PCBUs must manage these risks, so far as is reasonably practicable. PCBUs may need to revise their control measures to make them more effective or implement new control measures. **See also chapter 2 Risk management**

Work areas where control measures for preventing falls are required include:

- gangways, walkways and accessways to a ship's decks, hatchways and holds wherever ladders are used
- when work is carried out in the vicinity of holes or cavities onboard ship. For example, near hatchways or on top of cargo where voids are created during loading and discharge
- working on top of containers or other cargo
- working on raised work platforms, and
- accessing the cabs of cranes.

TOTAL RESTRAINT SYSTEMS

PCBUs must ensure workers required to work on top of a container have safe means of access such as a crane-lifted work platform with suitable, well-maintained guard railings or protective barriers. If a crane-lifted work platform is not available, a total restraint system (TRS) should be used.

See also 6.4, page 115

A TRS is a full-body harness that is connected by an energy absorbing lanyard to a suitable anchorage point or horizontal lifeline. A TRS is set up to keep the worker from reaching the edge.

Edge protection is the preferred control for preventing falls from heights such as containers. **See also 4.9, page 73** A TRS may be used when edge protection is not practicable.

A TRS is different from a fall arrest system. A fall arrest system protects only one worker at a time and reduces the impact of a fall rather than prevents it. Fall arrest is a minimisation measure as it does not prevent the fall from occurring. Only when a TRS is not practicable should PCBUs consider using a fall arrest system.

Working near water

PCBUS must ensure, so far as is reasonably practicable, that workers who work within one metre of the edge of a wharf – for example, when recovering a fallen log from open water or handling ship mooring lines – wear a personal flotation device (PFD).

PCBUs must ensure PFDs and other lifesaving equipment are regularly maintained, fit for purpose and safe to use.

There are different standards for PFDs depending on whether it is to be used for inshore waters or open waters. Whichever option is chosen, PCBUs must ensure that workers have been trained and are competent in using PFDs. This means the worker knows when and how to wear it correctly, when and how to inflate it and, if applicable, how to maintain and store it.

Where workers are raised above the water (using, for example, a work platform lifted by crane or forklift), workers may wear a PFD instead of a safety harness and lanyard. However, PCBUs must carry out a risk assessment taking into account the hazards presented by the work and the work environment, for example, structures, changing water levels, currents and wind.

PCBUs should make sure workers know where lifesaving equipment such as lifebuoy rings and wharfside ladders are installed or stored, and that these are easily accessed if a person falls into the water.

Edge protection

Edge protection helps prevent people, tools, and materials from falling:

- around the perimeters of a work area
- around openings (such as hatchways or holds)
- when brittle material cannot safely support the weight of a person (depending on their age and condition, this could include some wharves in New Zealand and the deck edges of some ships).

Kerbing

Where vehicles or mobile plant are within one metre of the edge of a wharf, so far as is reasonably practicable, there should be a continuous coping wall or robust rigid barrier of sufficient strength to prevent vehicles and mobile plant from falling into the water. The height of the wall or barrier should be as high as practicable but not less than 300 mm.

4.10 Falling objects

GRWM **r 25**

Managing risks associated with falling objects

A PCBU must manage, in accordance with regulations 5 to 8, risks to health and safety associated with a falling object if the object is reasonably likely to fall on and injure a person.

If it is not reasonably practicable to eliminate this risk, the PCBU must minimise the risk by providing and maintaining a safe system of work that includes:

- measures for preventing an object from falling freely, so far as is reasonably practicable, or
- if it is not reasonably practicable to prevent the object from falling freely, a system to arrest the fall, or
- if it is not reasonably practicable to comply with either of these measures, providing an exclusion zone that persons are prohibited from entering.

Falling objects pose a significant risk when loading or unloading cargo at a port or on a ship. For example, during lifting operations and working at height.

Control measures may include:

- ensuring loads and equipment are not lifted over the heads of any person
- using the appropriate equipment to raise and lower cargo including ensuring that the working load limit is not exceeded
- providing overhead protective structures to operators of self-propelled mobile plant
- stacking containers and other cargo so they are stable
- establishing exclusion zones where loads are being lifted overhead
- setting up safe zones for workers to work or wait while loads are being lifted, and
- instructing workers to stand clear of loads.

4.11 Noise

HSE Regs **r 11**

Noise

Every employer must, so far as is reasonably practicable, ensure, in relation to every workplace under the control of that employer, that no employee is exposed to noise above the following levels:

(a) a noise exposure level, LAeq,8h, of 85 dB(A), and

(b) a peak noise level, Lpeak, of 140 dB

whether or not the employee is wearing a personal hearing protection device.

Where an employer has [...] not eliminated the risk that any employee may be exposed to noise above those levels, the employer shall communicate clearly, by way of signs, labelling of machinery, or other appropriate means —

(a) the fact that noise levels at the workplace are or are likely to be hazardous, and

(b) the sort of personal hearing protection device that is suitable to protect against the noise levels, and

(c) where such a device may be obtained.

At port or on a ship there may be excessive noise levels in such places as car decks, wharves, and in holds due to mobile plant, engines and transmission equipment, conveyor systems, container handlers, and banging and clanging of cargo. Noise monitoring provides a means of assessing noise levels and length of exposure. PCBUs can use the data obtained to determine suitable control measures to minimise the risk of hearing loss in workers.

Where personal hearing protection is used, PCBUs must ensure workers are still able to hear communications and warning signals such as whistles and vehicle horns.

4.12 Vibration (whole body)

Whole-body vibration (WBV) occurs when vibration (including bumps, shocks and jolts) pass through someone's body from the surface they are sitting or standing on.

For example, workers can be exposed to WBV if they regularly drive, ride in, or operate plant (for example, reach stackers, straddle carriers, mobile plant, forklifts) that travel over rough surfaces (such as a wharf with potholes, or over cargo such as logs) or have a vibrating function.

Long-term exposure to excessive WBV could harm workers. Lower back, neck or shoulder pain or other discomfort could be signs that workers are being exposed to excessive WBV. However, there can be other work and non-work factors that could contribute to these symptoms.

There are many factors that can influence the effects of exposure to WBV. These include:

- the condition and age of the machine
- intensity of vibrations
- the duration of exposure (time/day, frequency)
- the skill of the worker operating the plant
- the workers' health and medical history
- the design of the cab and seat, or the standing surface
- the type of tyres or tyre pressure.

To work out whether their workers are at risk, PCBUs should think about:

- type of plant and its condition
- condition of the surface the plant will be operated on
- the work itself (for example, the length of time the worker will spend operating the plant, whether the worker will have sufficient breaks).

4.13 Fatigue

See the Fatigue Risk Management System guidelines on Maritime NZ's website

4.14 Exposure and health monitoring

PCBUs must eliminate the health risks to workers and others that arise from being exposed to the work carried out by their business. If this is not reasonably practicable, these risks must be minimised so far as is reasonably practicable. In some circumstances, this could mean monitoring worker exposure (exposure monitoring) and monitoring the health of workers (health monitoring).

Exposure monitoring

Exposure monitoring measures and evaluates what workers are being exposed to at work. Exposure monitoring can:

- identify, assess and confirm health risks
- identify where new control measures are needed
- monitor how well current control measures are performing, and
- identify when control measures need to be reviewed, updated or removed.

Examples of exposure monitoring are measuring the level of noise or the amount of a substance hazardous to health that workers are being exposed to.

Biological monitoring (which requires worker consent) which measures the concentration of a substance or its metabolites in a worker's blood, urine, exhaled air or even in hair, is also an example of exposure monitoring.

Health monitoring

Health monitoring looks at whether a worker's health is being harmed because of what they are being exposed to at work. Health monitoring can tell a PCBU if its workers are experiencing health effects from potential exposures. Health monitoring can also confirm that control measures are preventing harm.

Workers must give their written informed consent for health monitoring.

Examples of health monitoring are carrying out hearing tests to check for hearing loss from being exposed to noise or checking for nerve, muscle or circulation damage from being exposed to vibration.

MONITORING IS NOT A CONTROL MEASURE

Monitoring is not a control measure — no monitoring, whether it is exposure or health monitoring, will control risk. Monitoring does not replace the need for control measures to eliminate or minimise worker exposure to harm.

WHEN MONITORING MUST BE CARRIED OUT

Under the GRWM Regulations, there are specific circumstances when monitoring must be carried out:

- if the work involves substances hazardous to health and the PCBU is not certain whether the concentration of the substance exceeds its prescribed exposure standard, and
- if the work involves a substance hazardous to health that is specified in a Safe Work Instrument (SWI) as requiring health monitoring, and there is a serious risk to worker health from exposure to that substance.

SEEK SPECIALIST ADVICE FIRST

PCBUs should seek specialist advice before implementing a monitoring programme or exposure control to inform their decisions relating to levels of exposure to chemical and physical agents in the workplace.

Prescribed exposure standards and workplace exposure standards – what's the difference?

A prescribed exposure standard is a workplace exposure standard that has the purpose of protecting persons in a workplace from harm to health and that is prescribed in:

(a) regulations

(b) a safe work instrument.

A workplace exposure standard, unless it is also a prescribed exposure standard, is a guidance value intended to be used as risk criteria for health risk assessment and risk management purposes, and applied or interpreted only by people with appropriate training and experience, such as those qualified in occupational health practice.

Sharing monitoring duties with other PCBUs

At times, more than one PCBU may share a duty to monitor the same worker's exposure or health. PCBUs should talk with each other and decide who will organise the monitoring, how information will be shared, and how costs will be split. See also 1.11, page 22

Example 3

A labour hire PCBU supplies workers to two PCBUs working at the local port – the port operator and a cargo-handling company. All three PCBUs meet to discuss the shared risk of workers being exposed to noise at the port, whether the risk can be eliminated or, if not, what control measures to put in place to minimise the risk so far as is reasonably practicable, who should organise exposure monitoring, and agreement is reached over the distribution of costs.

The PCBUs come to an agreement that, as the labour hire PCBU has an ongoing relationship with the workers, it would coordinate audiometry testing and share the results with port-based PCBUs.

The port-based PCBUs are best placed to implement the appropriate controls and must monitor to understand the level of control that is appropriate and to check that the controls are effective.

The labour hire company has an active duty to ensure that their workers are safe including checking controls are in place, are being implemented and that monitoring is occurring. They also need to make sure that when monitoring reveals either excessive exposure (exceeding WES) or harm resulting from exposure that they are taking the appropriate steps.

LINKS TO MORE INFORMATION

KIWIRAIL

Kiwirail's freight handling code

MARITIME NZ

Fatigue risk management system

WORKSAFE NEW ZEALAND

Carcinogens and airborne substances hazardous to health

Confined spaces (including cleaning, purging, ventilating and testing the atmosphere)

Exposure monitoring and health monitoring

Extracting hazardous dust

Hazardous substances

Ladders

Noise

Respiratory protective equipment

Safe use of containers at worksites

Safety nets

Vibration

Work site traffic

Working at height

Working near the rail corridor

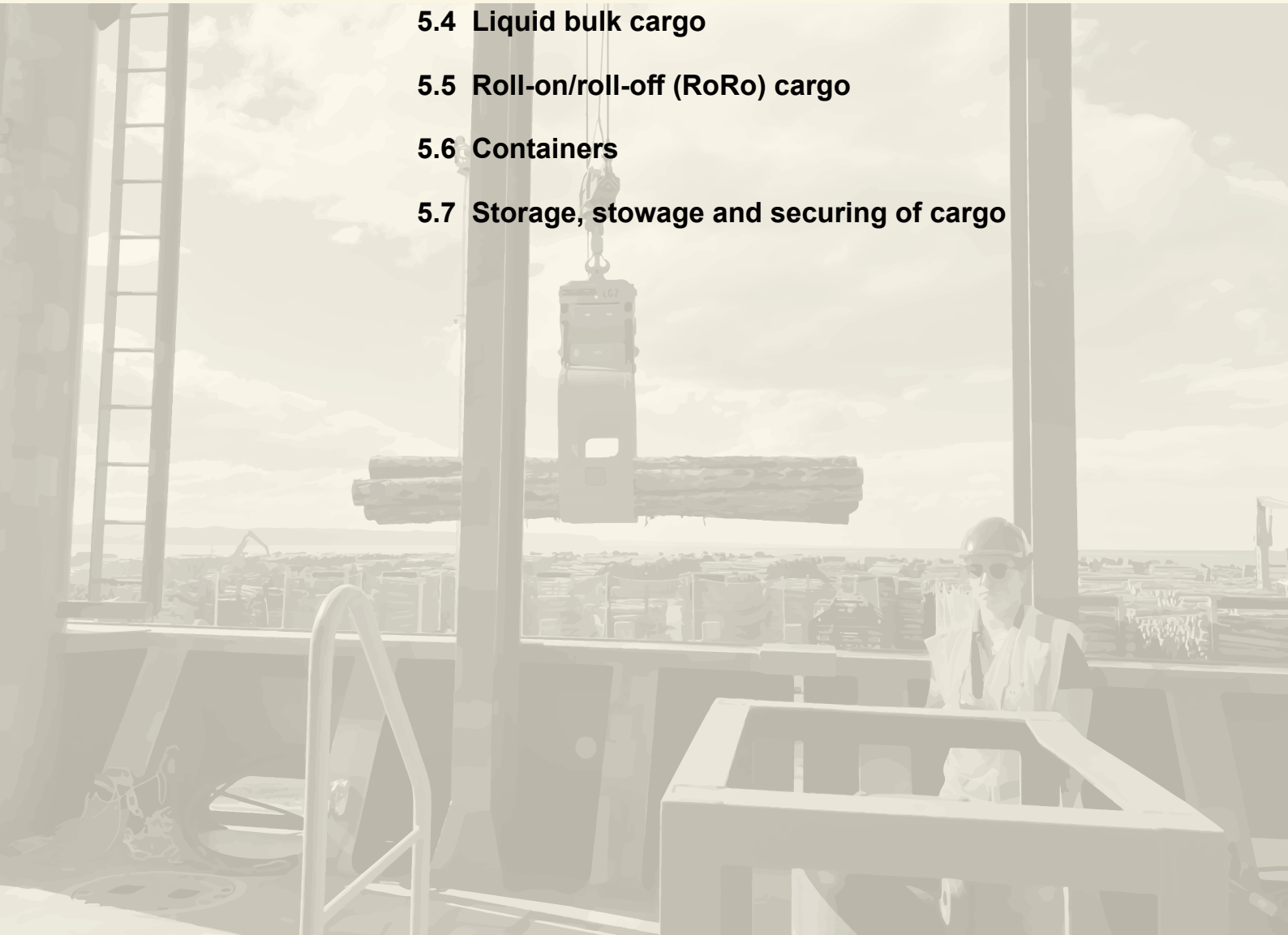
Working safely in extreme temperatures

Workplace exposure standards (the WES Book)

5.0

Loading and unloading cargo

IN THIS SECTION:



This section offers guidance for PCBUs on managing some of the most common hazards to health and safety of working with specific types of cargo.

As you read this chapter, please keep in mind the following:

Section 30 of HSWA provides that a PCBU is required to manage risks to the extent that it would reasonably be expected to have the ability to influence or control the matter to which the risks relate. In terms of a foreign ship, the port PCBU is not in control of the 'workplace' that is the ship and will have limited influence and control of the physical ship itself. To address risks, a PCBU may either need to provide facilities at the port (such as water, toilets, shade) or refuse to work on a ship where facilities are unsafe or unhealthy. It will also be necessary for a PCBU to ensure that there are adequate emergency procedures even where the ship does not have these – or workers should not be permitted on the ship.

5.1 Managing the risks of loading and unloading cargo

PCBUs must eliminate risks to health and safety (in this case, from loading and unloading cargo) so far as is reasonably practicable. If it is not reasonably practicable to eliminate these risks, PCBUs must minimise the risks so far as is reasonably practicable.

A risk assessment should include consideration of the type of cargo being loaded or unloaded, the method of loading or unloading, the number of workers required to carry out the work safely, and where an exclusion zone needs to be in place.

5.2 Dry bulk cargo

GRWM **r 22**

Managing risks associated with atmospheres with potential for fire or explosion

A PCBU with management or control of a workplace must manage, in accordance with regulations 5 to 8, risks to health and safety associated with an atmosphere with potential for fire or explosion.

GRWM **r 23**

Managing risks associated with ignition sources

A PCBU with management or control of a workplace must manage, in accordance with regulations 5 to 8, risks to health and safety associated with an ignition source in an atmosphere with potential for fire or explosion.

Maritime Rule Part 24C Carriage of Cargoes: Specific Cargoes sets out the requirements which ships carrying dry bulk (solid bulk) must comply with.

Hazards and risks of dry bulk cargo

Dry bulk is cargo shipped in large unpackaged amounts. Examples are fertiliser, grain, gravel, sand, salt, concentrates, wood chips, coal, mineral ores, PKE.

Dry bulk cargo often has characteristics that make it dangerous to handle. For example, dry bulk cargo can spontaneously combust or explode, develop hot spots, emit dangerous gases, liquefy, develop biological hazards, and become unstable, causing multiple injuries and fatalities. A stockpile of coal, for example, even if it is wet, generates its own heat. Once the coal reaches its ignition point, it is at risk of self-combusting.

Dry bulk cargo can also generate significant amounts of dust which may present a risk of combustion, explosion or harm to health.

Dry bulk cargo will move/flow until it reaches its ‘angle of repose’. This is the steepest angle at which a sloping surface formed of loose material becomes stable.

The cargo may become unstable due to factors including but not limited to ship movement, the design of the hold, and grabbing and loading/unloading operations. This may create a risk of workers in the hold being buried or crushed.

Control measures for dry bulk cargo include:

- storage and stack management
- temperature monitoring and thermal imaging in the hold to detect hot spots in the cargo
- control of ignition sources
- ventilation of explosive/flammable gases
- regular cleaning of work surfaces, plant and equipment to eliminate build-up of dust and other substances such as grease and oil
- no dry sweeping or use of air tools
- PPE such as hard hats with chin straps
- -suitable fire-fighting equipment should be readily available at work and workers trained in when and how to use it correctly.

5.3 Breakbulk cargo

Hazards and risks of breakbulk cargo

Breakbulk cargo includes logs, construction steel, steel sections, pipes, coiled steel products, drums, cases, pallets and bundles of manufactured goods or raw materials, project cargo (or 'special cargo'). Hazards associated with the loading and unloading of breakbulk cargo include:

- being struck by work equipment such as lifting equipment, moving cargo, vehicles and mobile plant
- being crushed against a fixed object such as a ship's bulkhead, a deck support pillar, or the cargo stow itself by shifting/falling cargo or moving vehicles
- slips, trips or falls while working on surfaces which may be uneven, unstable or slippery due to the presence of substances such as cargo residue, oils, ice, water, or protective wrapping
- falls from heights:
    - during ship or cargo access/egress
    - through gaps between adjacent cargo stows
    - from cargo stows at varying heights
    - when working near the edge of cargo stows
    - when working on top of platforms to inspect, audit or ticket breakbulk cargo during marshalling
- falls on the same level into voids between cargo and bulkheads or wells formed in the cargo stowage
- collapse or shifting of the cargo stow, either before or during handling or while the stow is on the wharf
- a potential explosive or hazardous atmosphere caused by, for example, carbon monoxide, oxygen deficiency, dust, fume from machinery or cargo
- contact, including contact through inhalation or skin, with hazardous substances such as chemicals, or substances hazardous to health such as wood dust
- being struck by falling or moving objects such as dunnage or the cargo itself
- lifting, carrying, handling
- extreme temperatures (high or low)
- excessive noise
- vibration from operating machinery over uneven surfaces (for example, potholes on the wharf)
- fatigue.

WALKING ACROSS CARGO

Walking across cargo may present a risk of slips, trips, or falls.

For example:

- cargo – for example, logs – that has been exposed to snow, ice, sea spray and rain
- cargo wrapped in plastic sheets that become slippery when wet.

PPE for workers required to walk across cargo should include footwear appropriate for the task (this may include shoes or boots with studs, or boots with ankle support).

When working on breakbulk cargo with a curved or uneven surface such as pipes, rails or constructional steel, PCBUs should use wooden staging boards, aluminium walkways or other suitable measures that provide workers with a firm, level surface to walk on.

Workers should **never** step into or jump over gaps in cargo.

Slinging and lifting loads

PCBUs should ensure lifting operations are planned by a competent person with adequate practical and theoretical knowledge and experience.

Lifting equipment and gear should be suitable for the task.

Before work begins, a competent person should carry out a visual check of all lifting equipment and gear to be used. Equipment and gear that show signs of damage should not be used. It should be reported to the ship's master or chief mate (if it belongs to the ship) or the supervisor/foreperson.

Work should not proceed until replacement fit-for-purpose gear is provided.

The person guiding the crane should be competent in the selection and use of equipment and safe slinging methods appropriate to the cargo. PCBUs should instruct this person that if there is any doubt about the integrity of any sling, it should not be used and they should report this to their supervisor/foreperson.

Supervisors/forepersons should be trained, competent and experienced in the safe lifting and slinging of loads or have access to relevant competent advice and assistance.

A suitable landing site for the load should be prepared as part of the pre-planning stage of any lifting operation. The site should be kept free of debris to minimise the risks of slips, trips and falls during loading/unloading.

Workers involved in slinging should be positioned safely away from the load when it is being lifted.

A person must **never** ride, or stand under, the load at any time. See also 5.6, page 100

If the crane operator or hatchperson is not sure where workers are positioned, the lift should be stopped and not restarted until workers are confirmed to be a safe distance from the load.

Loads should never be suspended over personnel within an occupied area.

Taglines should be considered where appropriate to help control a suspended load from a safe distance.

PRE-SLUNG LOADS

When choosing control measures to manage the risks of pre-slung loads, it is important to consider that the condition of the load and equipment may be uncertain. For example, lifting gear such as slings may have been certified but damage may have occurred and be concealed under the load.

If a ship cannot produce the required certificate for its lifting gear or its lifting gear is damaged, PCBUs should not use the gear.

Control measures for pre-slung loads include:

- maintaining and documenting a system of inspection of gear to be used. Inspections should be done by a competent person and completed before any gear is used
- removing and appropriately tagging out-of-service or damaged gear. If the damaged gear belongs to the ship, PCBUs should bring this to the attention of the ship's master or chief mate. Work should not proceed until replacement fit-for-purpose gear is provided.
- putting in place exclusion zones in the vicinity of the lift
- providing workers with information, training and instruction to select the right gear
- supplying information before a ship's arrival and including pre-work inspections and checks as part of the inspection regime
- putting in place an auditable system of certification of the working load limit of the gear used, and
- using gear only with reference to actual marked working load limit and not basing selection on colour-coding.

It is good practice to consider how the cargo will be discharged in the receiving port. It may be necessary to provide a 'key' so that cargo handlers at the next port of discharge can break into the stow to allow efficient and safe unloading. This is often a section of cargo that has been pre-slung to enable safe 'breaking in'.

Communication when lifting loads

There should be clear lines of communication between all workers involved in the lifting operation. Visual and/or voice communications (via radio) from the person directing the lift to the crane driver should be clear, agreed and understood.

Where radio communications cannot be established, an agreed system of hand signals should be followed. The hand signals on pages 88 to 92 provide one example of signals.

A note about the hand signals in this ACOP

The hand signals in this ACOP have been adapted from the Approved Code of Practice for Cranes. PCBUs can choose to use different hand signals. The most important thing is that whichever hand signals are used, that the PCBU ensures workers have a clear understanding of what they mean and when and how to use them.

THE PERSON GUIDING THE CRANE

The person who guides a crane to make sure the crane operator safely places the load in the right spot may also, at some ports, be actively involved in slinging or unslinging cargo. However during the actual lift, it is important that **this person focuses solely on the lifting operation**.

COMMUNICATION BETWEEN THE CRANE OPERATOR AND THE PERSON GUIDING THE CRANE

The person guiding the crane should stand in a secure position where they can see the path of the load and, wherever possible, they can be seen by the crane operator. This is especially important where the lifting operation requires the use of hand signals.

Where the crane operator cannot see the person guiding the crane, radio communications should be used.

In some circumstance, it may be necessary to have two people guiding the crane – if this is the case, it is important that only one of them gives instructions to the crane operator and that the crane operator knows which person this is.

ROLE OF THE HATCHPERSON

On board ships, a hatchperson has various functions including guiding the crane driver or assisting the crane driver to position the hook or land the load safely if the crane driver's visibility is obscured. When carrying out this task, the hatchperson should not be engaged in any other activity during any part of the lifting operation.

The hatchperson is also a pair of eyes looking out for workers when they are working under the hook on the wharf.

The hatchperson on container ships carries a cargo plan and is also responsible for ensuring the correct containers are unloaded and the containers being loaded are placed in the correct position. They are also responsible for ensuring safety zones are adhered to while workers are on deck lashing containers.

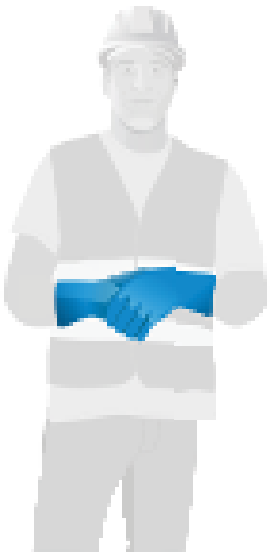
On log or general cargo ships, the hatchperson is typically a qualified crane driver and the two workers may alternate roles for fatigue management purposes.

Hand signals

Stop
Extend one arm and hold palm of hand vertical.

Emergency stop
Extend both arms and hold palms of hands vertical.

Stop (B)
Arm extended, palm down, move hand right and left. Usually for different level operations.



Hold everything
Clasp hands in front of body.

Move slowly
Place one arm motionless across chest in conjunction with or before giving any other directional signal. ('Hoist slowly' shown as example.)

Hoist
With forearm vertical, forefinger pointing up, move hand in horizontal circles.

Lower
With arm extended downward, forefinger pointing down, move arm in horizontal circles.

Use main hoist
Tap fist on head, then use regular signals.

Use flyline (auxiliary hoist)
Tap elbow with one hand, then use regular signals.

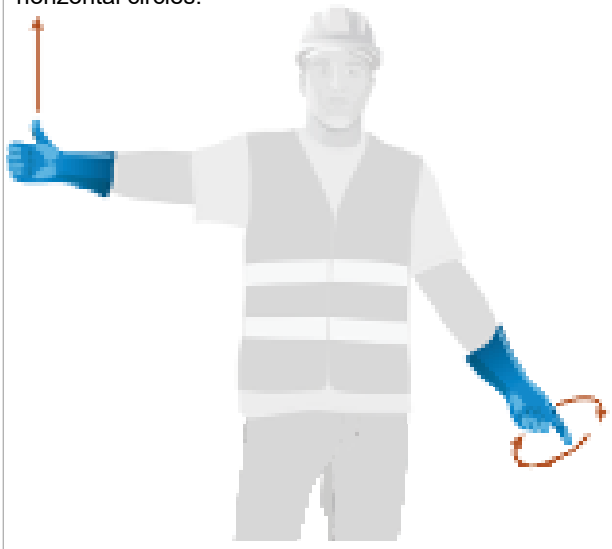
Raise boom (luff up)
Arm extended, fingers closed, thumb pointing upward.

Lower boom (luff down)
Arm extended, fingers closed, thumb pointing downward.

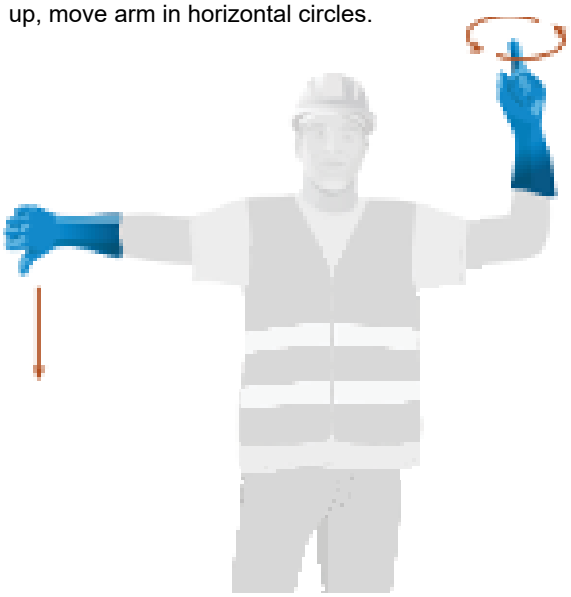
Slew
Arm extended, point with finger in direction of swing of boom.

Overhead gantry crane
Arm extended, point with finger in the long-travel or cross-travel direction.

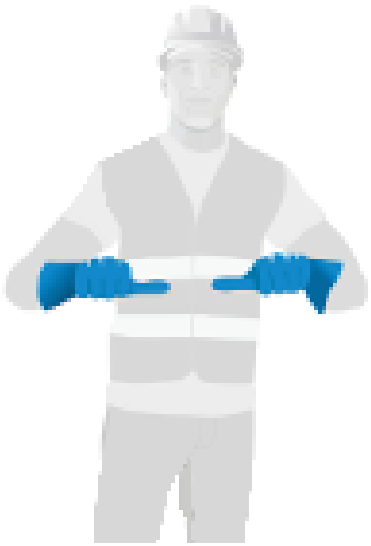
Raise the boom and lower the load
One arm extended, fingers closed, thumb pointing upward. Other arm extended downward with forefinger pointing down, move arm in horizontal circles.



Lower the boom and raise the load
One arm extended, fingers closed, thumb pointing downward. Other arm vertical with forefinger pointing up, move arm in horizontal circles.

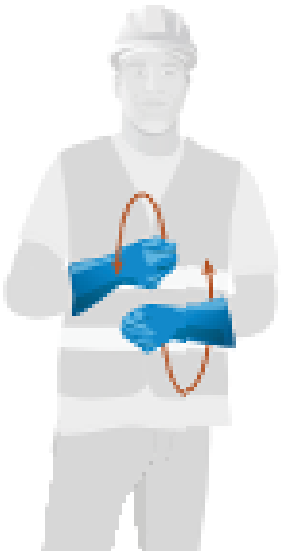


Extend hydraulic boom or trolley out (tower crane)
Both fists in front of body with thumbs pointing outward.

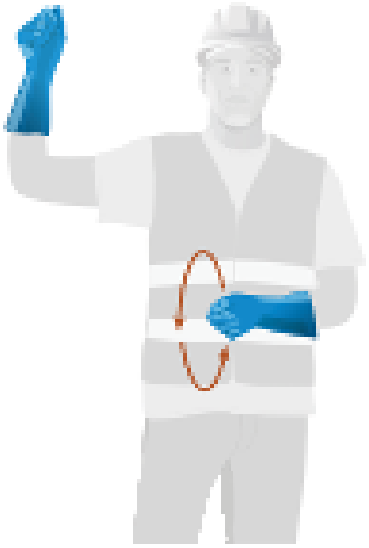


Retract hydraulic boom or trolley in (tower crane)
Both fists in front of body with thumbs pointing towards each other.

Travel
Arms bent at the elbows, fists clenched, rotate both forearms around each other, then point in the direction of travel.



Travel (one-track crawler cranes only)
Lock the track on the side indicated by the closed fist. Travel opposite track in the direction indicated by the circular motion of other fist rotated vertically in front of body.



Finished with crane
Place arms above head and cross hands.

5.4 Liquid bulk cargo

GRWM **r 26**

Containers of liquids

A PCBU must ensure, so far as is reasonably practicable, where any container that contains liquids at the workplace presents a risk of drowning:

- the container is securely covered, or
- the container is enclosed by a secure fence that:
  - extends at least one metre above the adjoining floor, ground, or platform, and
  - is in a position that will provide adequate protection for any person who is near the container.

Container:

- means any enclosure, fixed vessel, pit, structure, sump, vat, or other container of a similar kind:
  - that contains any liquid, and
  - the edge of which is less than one metre above the adjoining floor, ground, or platform, but
  - does not include any drinking troughs for animals or any system of water collection, disposal, distribution, or storage.

Liquid bulk is cargo shipped in large unpackaged amounts on specially designed ships. For example, vegetable oils, tallow, molasses. Liquid bulk includes fuel (such as petroleum and oil) however, due to their highly specialised nature, petroleum and oils are out of scope of this ACOP.

Maritime Rule Part 24A Carriage of Cargoes: Dangerous Goods sets out the requirements for the carriage by sea of dangerous goods in bulk including liquid chemicals and liquefied gases. What follows below is general guidance. PCBUs should consult a competent person if they require assistance to manage the risks of liquid bulk cargoes.

Hazards associated with the storage of hazardous substances

The incorrect storage of hazardous substances can result in the following adverse effects:

- Fire, from welding, ignition after a spill or release.
- Explosions, from ignition after a spill or release.
- Severe impacts on health from the release of a toxic substance.
- Slips, trips and falls.

Hose management

Portable hoses, fixed-loading arms, and any other device connecting to ships manifolds should be fit for purpose, inspected at appropriate intervals and safe for use in an environment where liquid bulk cargoes are handled.

PCBUs should ensure that flexible hoses are not left lying around where they may become a trip hazard to workers and other people.

Transfer equipment and operations

Equipment such as pumps and vapour return units should be fit for purpose and suitable for use in an environment where liquid bulk cargoes are handled.

Safety data sheets

For information about the properties of specific liquid bulk cargo, PCBUs should ensure they read the SDS that accompanies the cargo and make them available to their workers. If there is no safety data sheet with the cargo, PCBUs should contact the sender or manufacturer of the cargo.

The SDS provides comprehensive information about the properties of the cargo, how it may affect health and safety, and how to manage these risks. It also provides information about first aid treatment and what to do in an emergency, such as a spill or a fire.

5.5 Roll-on/roll-off (RoRo) cargo

Maritime Rule Part 24B Carriage of Cargoes: Stowage and Securing sets out requirements for ships' masters to ensure RoRo cargo is adequately stowed and secured.

Maritime Rule Part 49: Ships' Lifting Appliances sets out requirements for the maintenance, testing, and certification of cargo or vehicle lifts and ramps on New Zealand-owned ships (at 49.13).

RoRo cargo is cargo with wheels or tracks. For example, cars, trucks, farm vehicles, heavy machinery, trailers. Workers must hold the appropriate licence endorsements to drive particular RoRo cargo. If workers have to climb on heavy plant or machinery to access the cab or driver's seat, PCBUs must ensure, so far as is reasonably practicable, that safe means of access is provided.

Hazards and risks of RoRo cargo include:

- being struck by moving vehicles and plant, or lashings that may spring back when being applied, tightened, released or loosened
- being crushed against a fixed object such as the ship's structure or between moving vehicles
- slips, trips or falls while working on surfaces which may be:

    - uneven (for example, due to deck lashing points, frames or deck gratings)
    - unstable or slippery (for example, due to the presence of substances such as cargo residue, spilt oil and loose lashing gear)
- falls from height:
    - when working or passing near openings or edges such as lift shafts, voids, deck openings and ships' internal access ladders
    - due to a failure to provide and maintain a safe means of access/egress to/from and onboard the ship
- exhaust emissions from the ship or RoRo cargo
- noise
- electric vehicles left running undetected
- handling and storage of fuel
- leakage of hazardous cargo
- hazards associated with breakdowns and jumpstarts
- electrical hazards related to plug-in units
- lithium batteries in electric vehicles
- extreme temperatures
- fatigue
- manual handling injuries from handling trestles and lashing gear
- reduced levels of lighting.

Vehicle movements on ships

Factors to take into consideration when assessing the risks of RoRo cargo include:

- vehicle speed
    - the driver's restricted visibility
    - lighting
    - noise
    - availability of visual aids and warning devices
    - safe stowage and positioning
    - any other work activities being carried out at the same time.

GUIDING DRIVERS AND USING SIGNALS

Only authorised people should be on deck while RoRo cargo is loaded or discharged.

All workers involved in loading or unloading RoRo cargo should wear high-visibility clothing.

Before work starts, workers should agree on and make sure they understand the signals to be used for guiding drivers.

A competent person such as a signaller should direct all vehicles being reversed or manoeuvred into stowage positions on deck. This person should be identified to drivers.

The signaller should stand a safe distance from moving vehicles and be visible to drivers at all times either directly or via vehicle mirrors. Where this is not possible, the signaller should position themselves clear of the vehicle movement (and trailer, if applicable) and away from the risk of being trapped or crushed.

Before signalling a driver to proceed, the signaller should ensure it is safe to do so. Generally a loud, long blast on a whistle or the hand signal below indicates emergency stop.

TRAFFIC MANAGEMENT

When preparing a traffic management plan for RoRo cargo, PCBUs should consider:

- speed limits
- coordinating RoRo activities across multiple decks
- separating pedestrians from vehicles on ramps by using separate walkways or separate access times
- drivers' restricted visibility
- safe stowage or positioning, and
- what other activities may be being carried out at the same time in the same work area.

PCBUs should keep workers handling RoRo cargo informed of the TMP and any changes to it.

KEEP PEDESTRIANS AND VEHICLES SEPARATE

PCBUs should put in place a traffic management plan to control vehicle and pedestrian movements for each entrance and exit ramp, and for ramps within the ship.

IDENTIFY, MARK AND EXCLUDE HAZARDOUS ROUTES

Before work to load or discharge RoRo cargo begins, hazardous routes or areas that workers or other people (such as ship's crew) could mistake for normal drive-on or drive-off routes should be identified, clearly marked and barricaded.

Suitable warning notices should be posted on the ramps.

Ramps, linkspans and gradients

Only workers specifically engaged in the manoeuvring of plant or vehicles should be on the linkspan or ramp during RoRo cargo movements.

Ramps used by vehicles should not be used for pedestrian access unless there is suitable segregation of vehicles and pedestrians. For example, by providing a suitable protected walkway or ensuring pedestrians and vehicles do not use the ramp at the same time.

The risk assessment should take into account the safe movement of vehicles on gradients, paying special attention to unbraked units and considering slope, angle, speed, load configuration, and trailer weight based on tractor and equipment specifications.

Where Mafi and gooseneck trailer attachments do not offer an interlock, they should never be used on gradients.

Lashing/unlashing

Workers carrying out lashing/unlashing cargo onboard ships, including Ro-Ro, should:

- always work in pairs
- stand clear of trailers being coupled, uncoupled or moved that could put them at risk of being struck, crushed or trapped
- be able to signal a vehicle to stop in an emergency or attract attention if they see a potential incident emerging. For example, using a whistle or vehicle horn.

Ventilation

Before work begins on an enclosed car deck, PCBUs should ensure the ship's ventilation system is operating, including ventilation fans used to control the build-up of exhaust emissions.

Loading/unloading work should be organised to minimise the number of vehicles with engines running at any one time.

Engines should not be started or left running on car decks until the vehicle is ready for discharge.

Dust

Dust on RoRo decks generally consists of soil dust from vehicles, rust from the ship's deck, or dusty cargos. Control measures include but are not limited to decks being damped down and vehicles being washed. Dry sweeping and compressed air should **never** be used to control dust – these methods serve only to move the dust into the air and spread it throughout the workplace.

Non-starters and breakdowns

A safe procedure for dealing with vehicles that will not start or which have broken down should be in place and agreed with the ship's master.

The procedure should include but is not limited to:

- safe arrangements for refuelling vehicles, particularly on RoRo decks or in ships' holds. For example, LPG-powered vehicles should be refuelled in a safe, well-ventilated area not in a confined space
- towing operations
- punctures and wheel changes
- jumpstarting/safe use of batteries
- seeking expert mechanical assistance when required.

Where multiple work gangs are working in the same area or at the same time, for example, one gang carrying out lashing and one gang driving vehicles off the ship, control measures should be in place so that one gang does not adversely impact the safety of the other.

5.6 Containers

GRWM **r 24**

Managing risks associated with working under raised objects

(1) A PCBU must manage, in accordance with regulations 5 to 8, risks to health and safety associated with work being done under any object that has been raised or lifted by any means.

(2) If it is not reasonably practicable to eliminate the risk referred to in subclause (1), the PCBU must minimise the risk by, so far as is reasonably practicable, providing supports or other devices to be placed or used under the raised object so that the object cannot fall or be lowered while a worker or other person is under it.

Maritime Rule Part 24D Carriage of Cargoes: Convention Containers sets out requirements for any container that is to be loaded/discharged to/from a ship at a port in New Zealand.

Lashing containers to the ship

To ensure stability during the ship's voyage, containers must be stowed and secured to the ship's structure according to the ship's cargo securing manual.

Hazards and risks that workers may be exposed to when lashing and unlashing include:

- manual handling injuries and falls from height due to lifting and manipulating heavy and long lashing bars, often in awkward positions. Lashing bars are generally between 2.5 metres and 4.5 metres long and about 13 kilograms to 20 kilograms in weight
- falls from height when working or passing near openings or edges (for example, off the wharf o through an open hatch/hold; when working on top of a container)
- falls from height when unlocking twistlocks from above (such as on top of a container)
- being struck by falling lashing bars or other lashing gear (such as twistlocks)
- being struck by moving containers or other loads if a crane is operating on a ship at the same time as lashing work is taking place, or if the lashers are working on containers shoreside
- slips, trips and falls. For example, when working on unlevel and/or slippery surfaces due to leaking cargo residues, oils, ice or water; tripping over lashing gear not safely stowed out of the way
- electrical hazards from damaged power cables to reefers
- pinches, cuts, skin abrasions and bruising when assembling multi-part lashing bars.

CONTROL MEASURES

Control measures for lashing/unlashing include:

- working from a stable level base or surface
- visual safety inspections by a competent person of lashing equipment and containers before work begins
- maintaining awareness of other work being carried out in the area including crane movements and exclusion zones
- ensuring at least one worker maintains control over the lashing equipment when it is elevated
- ensuring lashing bars are not left partially attached and hanging
- eliminating, where practicable, the practice of learning lashing bars against containers during lashing
- eliminating, or if not reasonably practicable, minimising double-handling of lashing bars and other lashing equipment to minimise manual handling risks.

PCBUs should also consider:

- how many workers are required to carry out lashing/unlashing work safely. Generally, lashing activities require a minimum of two workers – one to handle the lashing bar and one to operate the turnbuckle
- the size of the work area and the layout of the ship.

Where lashing equipment is to be reused in the same work area, PCBUs should ensure it is stored safely on the side of a walkway to minimise the risk of workers tripping over it.

Position of workers in relation to suspended loads

When unloading containers, they should be unlashed from the wharfside of the ship first, working to seaward. This ensures that suspended loads do not pass over or in proximity to workers carrying out lashing. The opposite should be applied for lashing when containers are being loaded. Exclusion zones should be created that take account of the possibility that an adjacent container could be knocked or destabilised by the crane. Exclusion zones should be defined and clearly signposted to prevent workers accidentally working in the vicinity of a suspended load.

See also 4.10, page 74

Effective communication

Workers carrying out lashing/unlashing should not work alone. If there are teams working near each other, such as one lashing and one loading, PCBUs should ensure effective communication (for example, radio or hand signals) is maintained between them, managers, supervisors/forepersons, and ship's crew. This ensures each team is aware of what the other is doing and safe areas of work are identified and made known to workers.

Toolbox talks can be used to inform workers at the change of shift about health and safety issues related to the work and to remind workers of relevant safe work procedures.

Ship's responsibilities when containers are being lashed

Before loading containers, the ship's master should ensure that container weights are declared as per SOLAS requirements and the maximum stack weight and height limits are not exceeded. See Containers need a verified weight on Maritime NZ's website for more information.

The ship should provide a lashing plan. Instructions for lashing the containers correctly should be provided in each bay of the ship.

Faulty lashing equipment

Lashing equipment is generally supplied by the ship. All lashing equipment should be suitable, in a safe condition and compatible with the cargo to be lashed. If equipment is faulty or its condition has clearly deteriorated (for example, there are fractures or signs of excessive corrosion), workers should not use it.

The supervisor/foreperson should report faulty equipment to the ship's master or chief mate and this equipment should be taken out of service. The ship should supply replacement equipment according to the specifications in the ship's cargo securing manual.

The ship should also provide a receptacle (such as a separate gear bin) for damaged equipment. This will make sure it does not get put back for use by workers.

Twistlocks

There are three types of twistlocks commonly used when lashing containers:

1. **Manual twistlocks.** These are often used to secure containers to the deck of the ship. When used above the first tier, manual twist locks are fitted on the wharf into the bottom corner castings before the container is loaded into the hold. The container should be held at a height above the wharf which allows workers to easily insert the twistlock into the corner castings, while eliminating the possibility

that someone can pass under the lifted container. They are then unlocked and removed before unloading the next container from the ship. The twistlock is locked/unlocked by pushing a lever from one side to the other. The twistlock may be either left or right-handed in its operation. Manual twistlocks of the newer style can be used in the same way as semi-automatic twistlocks. That is, inserted into the bottom corner casting of the container, on the wharf.

2. **Semi-automatic twistlocks.** These are unlocked by operating wire toggles or a handle on the unit. They lock automatically when a container is landed onto it or the container in which it is inserted is landed onto a container stow. Semi-automatic twistlocks should not be used inserted unless specifically designed to be used in that manner safely.

3. **Fully automatic twistlocks.** These twistlocks remain in the bottom corner castings of a container being unloaded and do not require unlocking before the container is unloaded. Both fully automatic and semi-automatic twistlocks are fitted before loading and removed before the container is landed. This may take place onboard the ship but more typically occurs on the wharf, either at the crane or at a ‘station’ remote from the crane. PCBUs should not use a combination of manual, semi- automatic and fully-automatic twistlocks in the same stowage unless this is approved in the ship’s cargo securing manual.

SAFE SYSTEM OF WORK WHEN USING TWISTLOCKS

Factors to consider when developing a safe system of work for using twistlocks operations on the wharf include:

- safe positioning of workers handling twistlocks on the wharf from vehicular traffic flows
- position of workers in relation to suspended loads
- interaction between mobile plant and equipment when removing/replacing gear bins
- techniques for safe handling/fitting/removal of twistlocks, including procedures for removing defective twistlocks and isolating them from further use
- PPE requirements
- safe access to storage of twistlocks within gear boxes/bins.

JAMMED TWISTLOCKS AND STORED ENERGY

Defective twistlocks or twistlocks that have not been fitted correctly may jam and not release correctly. Any system of work for freeing jammed container fittings such as twistlocks should take into account the additional hazards of tension being built up in the crane hoist system due to ship or tidal movements, and the potential for the jammed fitting to free itself without warning.

A note about stored energy

Stored energy can be mechanical, gravitational, hydraulic, chemical or pneumatic and refers to the energy stored under tension in machines and equipment. Stored energy hazards exist because stored energy can be released accidentally and without warning, and potentially cause serious injury. The US Department of Labour estimates that almost 10% of that country's serious accidents at work are associated with a failure to control stored energy.

In the port and ship environments in New Zealand, examples of where stored energy could be a hazard are winches and coiled steel cables or mooring ropes — if the stored energy is suddenly released, it can cause the winch, cable or rope to 'snap back' and hit a person, resulting in serious or fatal injuries.

The most common types of injuries associated with stored energy hazards are:

- electrocution
- burns
- crushing
- cutting
- lacerations
- amputations
- fractures.

FREEING JAMMED TWISTLOCKS

Factors to consider when freeing jammed twistlocks include:

- communication between all workers carrying out the process
- access to assess the situation
- removal of all tension in the crane system
- means to free the jammed fitting, for example, by use of limited crane power or hand tools.

Some ships may supply twistlock clamps, which are attached between each of the bottom corner castings of the container to be discharged and the top corner castings of the container to which it is jammed. These clamps should only be used if they are marked with a working load limit and accompanied by an 'in date' certification.

Accessing the top of containers

Accessing the top of containers can create a risk of falls from heights. When accessing the top of containers cannot be avoided, PCBUs should ensure workers have safe means of access. Wherever possible, this access should be part of the ship's permanent superstructure, such as lashing platforms. When such access is not possible, safe access should be provided by the use of a crane-lifted work platform. **See also 3.6, page 48** and **4.9, page 71**

HOUSEKEEPING BEFORE THE SHIP DEPARTS

After the completion of lashing and unlashing, excess lashing gear should be safely secured in designated stowage compartments, where available, in accordance with the ship's master's requirements.

5.7 Storage, stowage and securing of cargo

Maritime Rule Part 24B Carriage of Cargoes: Stowage and Securing sets out requirements for ships' masters to ensure RoRo cargo is adequately stowed and secured.

Cargo not in containers, for example, coils, pipes and beams, should be stored or stowed in stable stacks. This cargo may be moved repeatedly during loading, unloading and storage which may create new risks or change already identified risks. Ongoing risk management is required to ensure these risks are eliminated or minimised.

Storage of cargo at a port

Any plan for storing cargo at a port should take into account the:

- wharf load capacity of the storage area
- stability and ability of, the ground to support the cargo (and any mechanical equipment if required)
- type, dimensions and weight of cargo and the methods of storage
- potential for stored energy due to stacking arrangements
- safe access and egress for workers
- mechanical handling equipment and ability to operate it safely
- exclusion zones to separate mobile plant and workers
- storage or separation requirements of hazardous substances or dangerous goods
- environmental conditions, such as wind, rain
- length of time the cargo will be stored, and
- stability and securing devices for different types of cargo.

Control measures for safe storage include:

- ensuring cargo stacks remain stable (the maximum height of the stack is determined by the need to ensure stability), ensuring coils are:
    - used with end stops where there are pedestrian walkways nearby
    - supported by coil collapse arrest systems when near to amenities or offices
- using racking systems where appropriate
- using jersey curbs
- using dunnage correctly, including:
- using means other than hands to place dunnage under loads
- avoiding placing hands or limbs under loads during glutting using correct chocking measures such as:
    - fixed chocks at the end of walkways
    - ensuring materials used for chocking and dunnage are fit for purpose and adequately withstand the weight of the load
- using bolsters, where required, at the end of walkways. Bolsters should be designed by an engineer, inspected regularly and maintained as required
- identifying and communicating the load-bearing capacity of floors, and
- maintaining exclusion zones where identified.

LINKS TO MORE INFORMATION

WORKSAFE NEW ZEALAND

Maintaining air quality in enclosed cabins

Safe use of containers at worksites

Workplace exposure standards

6.0 Plant and equipment management

IN THIS SECTION:

This section provides guidance for PCBUs on ways they can apply good health and safety practices when working with plant and equipment on ships and on shore. Plant and equipment includes machinery such as cranes, other lifting appliances, self-propelled mobile plant, and loose cargo gear.

As you read this section, please keep in mind the following:

Section 30 of HSWA provides that a PCBU is required to manage risks to the extent that it would reasonably be expected to have the ability to influence or control the matter to which the risks relate. In terms of a foreign ship, the port PCBU is not in control of the 'workplace' that is the ship and will have limited influence and control of the physical ship itself. To address risks, it may either need to provide facilities at the port (such as water, toilets, shade) or refuse to work on a ship where facilities are unsafe or unhealthy. It will also be necessary to ensure that there are adequate emergency procedures even where the ship does not have these – or workers should not be permitted on the ship.

6.1 Managing the risks of plant and equipment

HSE **s 38**

Duty of PCBU who manages or controls fixtures, fittings, or plant at workplace

(1) A PCBU who manages or controls fixtures, fittings, or plant at a workplace must, so far as is reasonably practicable, ensure that the fixtures, fittings, or plant are without risks to the health and safety of any person.

A risk management process is outlined in detail at Chapter 2. See also section 1.7, page 17

Working with suppliers

PCBUs operating plant and equipment must, so far as is reasonably practicable, ensure the plant and equipment is without risks to health and safety. Where the PCBU is intending to use plant or equipment that it does not own, the PCBU must confirm with the supplier of the plant or equipment that it is safe to use, fit for purpose, in good condition, and of adequate capacity to do the work.

PCBUs should be aware that under HSWA, suppliers of plant and equipment must:

- ensure any calculation, analysis, testing, or examination required for use, storage, inspection, maintenance or repair, is carried out

- give to each person to whom the plant is supplied, adequate information concerning:
    - each purpose for which the plant was designed or manufactured
    - the results of any calculations, analysis, testing, or examination
    - any conditions necessary to ensure the plant is without risk to health and safety when used as intended, stored, inspected, cleaned, maintained or repaired
- on receiving a request from a person who uses, stores, inspects, cleans, maintains or repairs the plant, make reasonable efforts to reply with current relevant information.

6.2 Plant and equipment management plan

For all PCBUs that own or lease shore-based plant or equipment, a management plan is the recommended practice.

An effective plan forms part of the risk management process by helping to ensure:

- the right plant and equipment for a particular task is used every time
- sufficient plant to undertake the tasks in hand
- the PCBU always has suitable plant and equipment available even if an item cannot be used (due to breakdown or other reason)
- regular maintenance is scheduled for each item of plant and equipment.

Implementing such a plan increases the likelihood that, at all times, plant and equipment is:

- without risk to workers operating or using it
- fit for purpose
- clearly marked with the item's working load limit
- certified if required, and
- there are no shortcuts taken (that is, PCBUs are not forced to use unsuitable plant and equipment for a task because that is all that is available).

For shore-based plant and equipment, an effective management plan should include a schedule of regular inspections, maintenance and testing.

Inspections

PCBUs should make sure a pre-work inspection is carried out of all plant and equipment that will be used to ensure it is safe for workers to operate or use. This applies to plant and equipment that is shore-based or owned by a ship. For plant and equipment owned by a ship, see 4.1, page 56

SHORE-BASED PLANT AND EQUIPMENT

Before work begins, PCBUs should ensure that;

- shore-based plant and equipment, where required, have valid certificates of inspection issued by an inspection body recognised by WorkSafe New Zealand. An exception to this is when an item of plant has been granted an exemption from requiring a certificate of inspection by WorkSafe New Zealand
- a visual safety inspection of shore-based cranes (and other lifting appliances as appropriate) and loose cargo gear is carried out by a suitably qualified person.

PCBUs should also refer to the Health and Safety in Employment (Pressure Equipment, Cranes, and Passenger Ropeways) Regulations 1999 (PECPR) for more information on the issuing of certificates of inspection for shore-based cranes.

Shore-based cranes should also be well maintained and fit for purpose, in accordance with PECPR and the Approved Code of Practice for Cranes.

Shore-based plant and equipment, inspection, maintenance and testing should be in accordance with the Approved Code of Practice for Cranes, and the Approved Code of Practice for Load-Lifting Rigging.

WHAT TO INSPECT

Examples of what to include in a pre-work inspection of shore-based plant and equipment are below. This is not an exhaustive list.

Check:

- the engine's fluid levels and filters show no loss of fluids, for example, lubricating oil or coolant
- controls are clearly labelled for function, operation, function properly and mechanical parts are moving smoothly, for example, the ignition, lights, fuel gauge, headlamps, wipers and horn.
- safety systems, such as limits or load cut-outs are functioning correctly
- faults, defects, wear or damage (such as worn tyres, for example), any visible dents, rust or deformations, leaks

- the condition of the operator's seating and confirm unobstructed access to all relevant controls
- there is safe access/egress to plant and equipment – for example, ladders or stairs, surfaces – and adequate lighting
- there is suitable emergency access/egress
- there is appropriate and readily accessible fire-extinguishing equipment with up-to-date inspection tags
- items such as lights, windscreen wipers, washers and other attachments are properly secured and operating correctly
- there are no obstructions impairing safe operation, for example, oil, debris or structures like a cable trench, rollers and rail tracks
- there are no internal access hazards. For example, there are guards on moving equipment such as fans in the crane's cab
- the cab has adequate weather protection, emergency egress, a fire extinguisher, adequate visibility, adequate ergonomics, and all controls work as they are supposed to
- electrical equipment is not contaminated by oil, grease, water or dirt
- all ropes are correctly positioned on their sheaves and drums, and are not displaced
- the working load limiter is correctly set and the manufacturer's daily test is carried out
- the radius is varied without load to check the correct movement of the radius indicator and working load limiter
- if separate from the working load limiter, the radius indicator is appropriate to the jib configuration fitted.

Loose cargo gear should be in good condition, certified and tagged. For example, wires, sheaves, blocks, hooks, swivels. Each item of loose cargo gear should be clearly marked with its working load limit.

RECORDS

PCBUs should ensure workers have a way of recording inspections, raising faults and requesting repairs. For example, a machine log book or a book of pre-work inspection forms.

For each item of plant and equipment, the following details should be recorded:

- each item's unique identification number
- the type of plant or lifting equipment
- for each item's certificate, the date of expiry

- risk assessment results
- faults and damage to plant and equipment as they occur
- repairs and modifications to plant or equipment. PCBUs should ensure any modifications to plant are planned so that new risks are not introduced. If new risks are introduced, PCBUs must eliminate them or if this is not reasonably practicable, minimise them so far as is reasonably practicable
- variations from normal operation and any trends that may emerge
- control measures that have been put in place to eliminate or minimise harm so far as is reasonably practicable
- near misses and incidents involving plant or equipment
- the names of the operator and any other people involved in a near miss or incident
- the name of the inspector and inspection body
- standards against which plant or equipment should be inspected
- frequency of inspections
- procedures for performing inspections
- critical safety instructions to be followed during inspection, for example, the energy isolation procedure, and
- tests specific to the plant or equipment being inspected.

Maintenance for shore-based plant and equipment

PREVENTATIVE MAINTENANCE

The aim of carrying out preventative maintenance is to minimise the risk of incidents due to faulty or defective plant or equipment and to ensure it remains fit for purpose and reliable for as long as possible.

The frequency at which preventative maintenance is scheduled should be guided by:

- manufacturer's instructions
- a competent person’s recommendations based on technical standards and engineering principles
- the PCBU's risk assessments, incidents, and breakdown/failure rates.

Regularly monitoring the performance of plant and equipment can help PCBUs know when to schedule preventative maintenance. For example, by comparing at regular intervals:

- the condition of the item
- the cost of breakdowns or damage to the item

- the number of near misses and incidents involving the item
- damage and incidents of harm associated with the item.

Adequate contracts, service-level agreements, and procedures should be in place to enable PCBUs to have parts repaired or replaced as soon as practicable after they are discovered to be faulty or defective.

REACTIVE MAINTENANCE

Reactive maintenance means repairing or replacing plant and equipment when it fails.

6.3 Safety while servicing machinery

If maintenance or repair work is required during cargo loading or unloading operations, PCBUs must ensure the risks have been assessed and control measures are in place to eliminate the risks. If the risks cannot be eliminated, control measures must be put in place to minimise the risks so far as is reasonably practicable.

HSE **r 17**

Cleaning, maintenance, or repair of machinery

(1) Subject to subclause (2), every employer must, so far as is reasonably practicable, ensure, in relation to every workplace under the control of that employer, that, where the cleaning, maintenance, or repair of any machinery while the whole or a part of the machinery is moving may cause harm to any employee, the machinery is not cleaned, maintained, or repaired—

(a) until every part of the machinery, including any extension or attachment, has been secured against movement, including inadvertent movement; and

(b) until every control device has been secured in the inoperative position by the use of locks or lock-out procedures or other equally effective means.

2) Every employer must, so far as is reasonably practicable, ensure, in relation to any machinery to which subclause (1) applies, that, where it is essential to the process that the machinery performs, or to the procedure for cleaning, maintaining, or repairing the machinery, that the whole or a part of the machinery remains in motion during cleaning, maintenance, or repair,—

(a) a procedure is established for the carrying out of the cleaning, maintenance, or repair in a safe manner; and

(b) the procedure contains at least the following features:

(i) no employee who has not been adequately trained for the purpose shall carry out the cleaning, maintenance, or repair;

(ii) where it is essential that a part of the machinery remains moving, only that part shall be set in motion; and

(c) the procedure is followed on every occasion to which it applies.

Lockout/tagout procedures for plant and equipment

PCBUs must, so far as is reasonably practicable, have a safe and effective lockout procedure to isolate and de-energise parts of any plant and equipment that could cause harm to workers. Lockout is the use of a lock to:

- render plant or equipment inoperable, or
- isolate an energy source so as to establish a state of ‘zero energy’.

Zero energy is the state where all sources of energy including electrical, pneumatic, hydraulic, mechanical and stored energy are isolated to prevent activation of moving parts on plant or equipment that could otherwise cause harm when the parts are in motion.

Plant or equipment that is locked out should also be tagged out. Tagging out involves attaching a tag to the plant or equipment warning other workers that it is locked out and is not safe to use.

PCBUs must ensure, so far as is reasonably practicable, that workers:

- have adequate knowledge and experience or training in the procedure, or
- are adequately supervised by a person who has that knowledge and experience.

Lockable isolation switches should be fitted to all plant that will be used within a crane’s operating area. The isolation system should include lock-off facilities if the plant can be started remotely.

ISOLATING AND LOCKING OUT/TAGGING OUT BRIDGE AND GANTRY CRANES

PCBUs must ensure bridge and gantry cranes can be isolated or locked out when, for example:

- workers are carrying out maintenance on the crane
- the crane is not being used, that is, to prevent unauthorised use, and
- the crane is deemed unfit for use either:
    - before commissioning, or
    - after an incident or inspection.

Emergency stops for plant and equipment

An emergency stop is a manual control device used to immediately stop machinery when there is a risk of harm to one or more persons or a risk of damage to machinery or product (cargo).

Emergency stops should not be used to routinely stop machinery or relied on as a method of lockout.

They should be tested and proved functional on a regular basis.

Self-propelled mobile plant: roll-over protective structures

PROTECTION FROM OVERTURNING

Self-propelled mobile plant must be fitted with a roll-over protective structure, however there are some exemptions.

EXEMPTIONS

A roll-over protective structure is not required where:

- Worksafe New Zealand has issued a certificate in writing that, subject to conditions, the certificate exempts self-propelled mobile plant from requiring a roll-over protective structure
- the self-propelled mobile plant’s mass is 700 kilograms or less, or
- the self-propelled mobile plant:
    - is a forklift with a telescopic boom
    - is a crane
    - is a power-operated elevated work platform
    - is a car, bus, truck or van, or
    - was designed for and operates on level ground.

The following are not considered level ground:

- wharves, owing to different road surfaces and the presence of railway tracks
- ships or ships' cargo, for example, layers of logs.

IF A ROLL-OVER PROTECTIVE STRUCTURE IS DAMAGED

Roll-over protective structures can be damaged if the plant tips over, rolls over, or is hit by a falling object.

Where there is damage to the plant's roll-over protective structure, the plant must not be used until the roll-over protective structure is:

- replaced, or
- restored to a strength and effectiveness that is equal to the original structure.

A restored roll-over protective structure must be approved (recertified) by the manufacturer, manufacturer’s principal agent, or a chartered professional engineer before the plant can be used.

SEAT BELTS

Self-propelled mobile plant must be fitted with a seat belt that is fit for purpose.

Carrying passengers

If carrying a passenger, the passenger should have, as a minimum, the same protections as the operator of the plant. To carry a passenger, a manufacturer approved passenger seat and seat belt should be fitted. PCBUs should set policies around who may ride as a passenger, including workers (employees, contractors, trainees 15 years of age and older) and other people (such as visitors).
See also 4.10, page 74

6.4 Work platforms

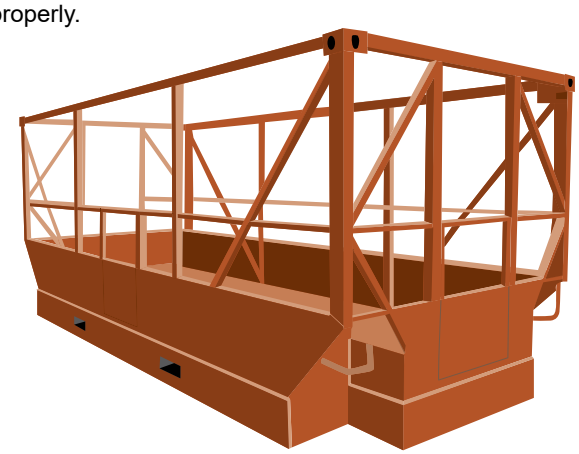
A crane-lifted work platform is a piece of equipment from which one or more workers can carry out their work. The work platform is either attached to the crane's hook or the head of the crane's boom and is lifted or suspended to allow one or more workers to work from the safety of the platform.

Workers working on or from the platform must be able to communicate clearly with the crane operator at all times.

PCBUs must provide PPE to workers working from a crane-lifted work platform, and ensure they know how to wear or use it and maintain it properly.

When the platform is used above water, PPE should include:

- a safety harness that is suitably attached via an approved lanyard, and
- if required by a risk assessment, a personal flotation device.



INSPECTIONS

PCBUs should confirm the:

- work platform has been inspected and tested annually by a competent person with records kept of the inspections
- (before work begins) platform, lifting attachments and records are inspected by a competent person and confirmed as safe to use.

An inspection before work begins should include checking the work platform:

- is specifically designed to lift or suspend people

- is securely attached to the plant
- has slip-resistant access
- has been designed, manufactured and tested in accordance with approved standards using a minimum impact factor of 1.5, and certified by a Chartered Professional Engineer (CPEng)
- has inwardly opening or sliding self-closing gates that can be secured in position to prevent unintentional opening
- is fitted with sidewalls, and guardrails or barriers no less than 900 mm and no greater than 1100 mm above the platform's floor, and
- has fall-arrest anchorage points fixed to the platform.

The following information should be clearly visible on the platform:

- the working load limit, and
- the CPEng design certificate. This certificate should be issued and fixed to the platform by the Chartered Professional Engineer with the certificate stating the:
    - design code
    - impact factor
    - class of utilisation, and
    - state of loading.

OPERATING THE WORK PLATFORM

During operation, PCBUs should ensure the work platform:

- if moved, is only moved at slow speeds with minimal acceleration and deceleration
- if electrically insulated, is dried before use
- is not used in high winds or weather events such as electrical storms.

When a crane is used to lift a work platform, PCBUs should ensure:

- the crane has power-lowering capability
- if the crane is fitted with a free-fall facility, this is locked out to prevent inadvertent activation
- where a crane has multiple work drums and a hoist system that allows either hook block to fall free, the hook block that is not in use is removed and the wire rope is stowed
- where a crane operates suspended or fixed/pendulum platforms, the crane is operated at no more than 75% of its working load limit

- where a crane is used with suspended platforms, the crane has anti-two-block devices fitted, unless they have a fixed hook
- when operating suspended work platforms from a hook, all hook safety latches are fully operational
- the braking efficiency of the hoisting drive train is tested each day before using the lifted work platform. This should be done by hoisting and holding a load not less than twice the maximum hoisted load of the loaded working platform
- the crane has levers and foot pedals fitted with a constant pressure system that stops the crane's motions when the operator removes pressure from the controls.

Where a crane has automatically-applied brakes to the hoist or is twin-lever operated, the crane may operate with two hooks.

CRANE OPERATORS

PCBUs should ensure the crane operator:

- remains in attendance while the work platform is in use
- operates the crane and platform within the manufacturer's recommendations
- does not suspend the work platform over people
- does not use the crane to simultaneously raise, lower or suspend another load while the work platform is suspended from it.

Where the crane operator lands the work platform on the edge of a structure, where practicable PCBUs should ensure:

- the maximum gap between the work platform and landing does not exceed 100 mm
- the work platform is secured to a suitable point on the landing
- fall arrest harnesses are properly worn and attached to suitable anchorage on the structure.

FIRE PREPAREDNESS

PCBUs should ensure the work platform:

- carries a fire extinguisher suitable for extinguishing fires caused or spread by flammable substances associated with the work to be carried out
- where used to carry flammable liquids, oxygen and acetylene cylinders, that these substances will be carried only:
    - where they are needed to carry out work
    - in quantities adequate to carry out the work, and
    - when they are correctly secured to the work platform.

WORK PLATFORMS LIFTED BY FORKLIFT

PCBUs must assess the risks associated with operating a forklift and the tasks carried out by workers who will be working from the fork-lifted work platform, and put in place effective control measures.

Work platforms lifted by forklift should:

- be designed and manufactured in accordance with an industry standard or practice. For example:
    - ANSI B56 Safety standard for low, high lift trucks
    - AS 2359.1 Powered industrial trucks
    - NZS 3404 Steel structures: Materials, fabrication and construction
- be fitted with guardrails, mid-rails, kickboards and harness anchor points
- only have self-closing gates that open inwards and that are installed with a spring-loaded latch
- have a two-metre-high guard that is adequately wide to prevent any contact with the lifting
- mechanism fitted to the back of the platform
- be operated with the tilt lever on the forklift controls locked out or made inoperable (for example, with chains)
- have operating instructions available
- have the working load limit and maximum number of persons displayed in a prominent position
- have the platform secured to the forks in such a way that it cannot tilt, slide or be displaced. For example, with chains
- have the park/hand brake applied when elevating persons
- not be used to move people around the port
- only be used by a competent forklift operator
- only be used while an operator is at the controls of the forklift or there is an independent means of access to and egress from the platform
- maintain a safe distance from the edge of the wharf, ramps, platforms and other similar working surfaces.

ENTERING AND EXITING A CRANE-LIFTED WORK PLATFORM IN AN EMERGENCY

PCBUs must ensure that an emergency plan is prepared for the workplace.

When considering how workers will enter and exit a crane-lifted work platform in an emergency, the PCBU should carry out a risk assessment to ensure:

- an alternative safe means of access and exit is available if workers need to immediately evacuate the platform, and
- the landing area is structurally adequate and clear.

Emergency procedures should be written down (digital versions are fine).

LINKS TO MORE INFORMATION

ILO

ILO Code: Safety and health in ports - section 5.1.4.2 Daily checks

WORKSAFE NEW ZEALAND

Approved code of practice for Cranes

Approved code of practice for Load-Lifting Rigging

Keeping workers safe with machine lockouts

For seatbelt specifications, see the Approved Code of Practice for Operator Protective Structures on Self-Propelled Mobile Mechanical Plant

Retrofitting seat belts to mobile plant

OTHER

For a comprehensive list of what must be included in certificates of inspection for shore-based cranes and self- propelled mobile mechanical plant, see the Health and Safety in Employment (Pressure Equipment, Cranes, and Passenger Ropeways) Regulations 1999, Regulation 33 (4)

The Australian Standard for (shore-based) Cranes, Hoists and Winches is AS 1418.1:2021.

Appendix 1

Example checklist for vessel inspection: container operations

Vessel: _____

Date and time: _____

Inspection conducted by: _____

Vessel representative: _____

Terminal representative: _____

Inspection areas	Y	N	N/A	Comments
1. Access and egress				
Gangway in a suitable position, secured and netted				
Gangway kept clear of quay cranes and not impede crane travel				
Gangway signage in place and secure at the wharf side access point				
Gangway kept fully lowered				
Hatchway covers above ladders in place & can be secured				
Handgrips present at top of ladder				
Access hatches are of suitable size to access freely				
Working space is clear of obstructions				
Walkways are in good condition and free of obstructions, with excess lashing gear suitably stacked to remove slip and trip hazards				
Lashing points accessible				
Vertical ladders >3 m have safety hoops—bottom hoop is at least 2 m from the base of the ladder				
Provision of safe access and egress to under deck stows				
2. Edge protection				
Outboard cells are provided with safety rails sufficient to prevent a person falling overboard				

Provision of 2 parallel railings—top and mid-rail—around open hatches and outboard cells including safety chains				
Continuous rails—rope or wire—are taut and in good condition				
Metal stanchions are 1 m in height and no more than 2.5 m apart and secured in position				
3. Housekeeping				
Lifebuoy accessible and visible				
Hazardous substance containers checked for leaks				
Fire and emergency equipment including warning alarms functional and in suitable positions				
4. Lashing and twistlocks				
Lashing gear, unlashing poles, bars, spanners etc are accessible and appear to be in serviceable condition				
High lashing bars can be handled using appropriate manual handling technique				
Are lashings and twistlocks of a consistent type and style?				
Are twistlocks compatible with plant and equipment?				
Bins and racks for stowage of lashing gear are provided and accessible at point of work				
Walkways are clear of excess lashings, loose gear and other trip hazards				
Cell guides in good condition				
Do the 20’ containers loaded on deck need to be lashed in the centres?				
Does the vessel’s container stowage and configuration—20’/40’—cause a change in the lashing and fall protection on the outboard cells regarding protective fencing?				
5. Lighting				
Adequate lighting is provided at points of work for lashing and unlashing and cargo operations				

6. Ship's gear and cranes				
Inspection and maintenance logs kept and available for wires and lifting gear, only where applicable e.g. chains, slings				
Ship's crane stowed to waterside and boom below the top of crane pedestal—only where required				
Slings for pre slung cargo are accessible with WLL displayed				
7. Reefers				
Cables are stowed away clear of walkways and work areas				
Power can be isolated at the board in vicinity to lashing activities				
Reefer cables of import boxes are unplugged & rolled up by crew and placed in storage compartment of container before discharge				
8. Deficiencies or non-conformities				
Outstanding deficiencies or non-conformities from the previous pre-work inspection.				

Appendix 2

Example checklist for vessel inspection: bulk and general operations

Facility name: _____

Vessel: _____

Date and time: _____

Person responsible for inspection: _____

Signature: _____

Item		Y	N	Comments
1	Safe access from wharf to vessel			
2	Safe onboard access, clear alleyways to and from work areas			
3	Safe access to cargo gear operating areas			
4	Safety rails rigged in work areas and lashing platforms			
5	Confirmation ship's gear conforms with Maritime Rules			a) Date of last four or five-yearly: (indicate four or five as applicable) Surveying authority: b) Date last annual: c) Random gear item check: Item ID Sited endorsement i) YES NO ii) YES NO

6	Are fire hoses and firefighting equipment on board and ready with international shore connection			
7	Work spaces are adequately ventilated and atmosphere is safe			
8	Information has been provided on hazardous or dangerous goods cargos and confirmation this cargo is intact with no flammable or toxic spillage			
9	Confirmation an adequate mooring watch will be maintained			
10	Confirmation of emergency procedures			
11	Vessel and wharf operational areas adequately lit			
12	Agreement regarding order of load, discharge and cargo placement			
13	Specific advice regarding abnormal stow conditions or special requirements e.g. lashing, tomming off, dunnaging, glutting, securing requirements			
14	Vessel advised of person responsible for stevedoring operations, contact numbers, structure and allocation of workforce			
15	Start with and maintain a clear and uncluttered wharf face operational area			
16	Confirm machinery to be used onboard and on wharf for practicality and suitability			
17	Stevedoring equipment to be used, with specific consideration given to suitability, condition and WLL of slings and rigs. This includes consideration of ship and shore gear WLL in regard of lifts to be taken			
18	Establish traffic flow patterns to deliver cargo, or remove cargo from the wharf landing area— under hook. Crossing of machinery paths shall be minimised and controlled. Ensure traffics way are clear and unobstructed			
19	Wharf landing area—under hook—prepared with appropriate gluts, landing platforms or safe means by which cargo			

20	Workers equipped with the skills necessary to carry out the intended operation and fitted out with the appropriate PPE			
21	Workers have a clear understanding of gear and rigs to be used and how cargo is slung or unslung			
22	In the case of bulk cargoes, wharf face personnel will have clear instructions regarding cargo receival e.g. backing trucks loaded with coal into dump bins before lifting on board or delivery e.g. operating a hopper to load product into a truck			
23	Have wharf face operations been assessed and barricades established separating operational aspects to maintain safe work areas?			