

Amusement devices

Code of Practice

2023

WHSQ

Workplace Health and Safety Queensland
worksafe.qld.gov.au



This Queensland code of practice has been approved by the Minister for Education, Minister for Industrial Relations and Minister for Racing under section 274 of the *Work Health and Safety Act 2011*.

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Foreword

The *Amusement Devices Code of Practice 2023* is an approved code of practice under section 274 of the *Work Health and Safety Act 2011* (WHS Act).

An approved code of practice is a practical guide to achieving the standards of health, safety and welfare required under the WHS Act, and Work Health and Safety Regulation 2011 (WHS Regulation).

Under section 26A of the WHS Act, a person conducting a business or undertaking (PCBU) must:

- comply with an approved code of practice, or
- manage hazards and risks arising from the work carried out as part of the business or undertaking in a way that is different to the code but provides an equivalent or higher standard of work health and safety than the standard required in the code.

A code of practice applies to anyone who has a duty of care in the circumstances described in the code. In most cases, following an approved code of practice would achieve compliance with the health and safety duties in the WHS Act, in relation to the subject matter of the code. Like regulations, codes of practice deal with particular issues and do not cover all hazards or risks which may arise. The health and safety duties require duty holders to consider all risks associated with work, not only those for which regulations and codes exist.

Codes of practice are admissible in court proceedings under the WHS Act and WHS Regulation. Courts may regard a code of practice as evidence of what is known about a hazard, risk or control and may rely on the code in determining what is reasonably practicable in the circumstances to which the code relates.

An inspector may refer to an approved code of practice when issuing an improvement or prohibition notice. This may include issuing an improvement notice for failure to comply with a code of practice where equivalent or higher standards of work health and safety have not been demonstrated.

Code terminology

This code includes references to the legal requirements under the WHS Act and WHS Regulation. These references are not exhaustive and are included for convenience only. They should not be relied on in place of the full text of the WHS Act or the WHS Regulation.

The words **'must'**, **'requires'** or **'mandatory'** indicate that a legal requirement exists that must be complied with.

The word **'should'** is used in this code to identify the standard required in this code. PCBUs can only manage the identified hazard or risk in a different way if doing so provides an equivalent or higher standard of work health and safety than the standard required in this code.

The word **'may'** is used to identify an optional course of action.

Scope and application

This code provides practical guidance on how to manage health and safety risks associated with an amusement device at a workplace.

This code provides practical guidance to persons who conduct a business or undertaking and have management or control of plant in the workplace as well as other persons who have duties under the work health and safety legislation in relation to amusement devices. It should be read in conjunction with the WHS Act, WHS Regulation and other relevant codes of practice.

This code does not cover specific licensing and safety case requirements associated with major amusement parks under chapter 9A of the WHS Regulation. Separate guidance on these matters is available at WorkSafe.qld.gov.au.

References to other legislation

This code includes references to the *Electrical Safety Act 2002* (ES Act) and Electrical Safety Regulation 2013 (ES Regulation). These references are not exhaustive and are included for information only. They should not be relied on in place of the full text of the ES Act or the ES Regulation. While this code includes information about electrical safety, it is not an approved code under the ES Act.

This code includes references to the *Professional Engineers Act 2002* (PE Act), which regulates 'professional engineering services' provided by a registered professional engineer. These references are not exhaustive and should not be relied on in place of the full text of the PE Act. Both the WHS Regulation and this code refer to certain tasks being performed by a competent person, which in some circumstances must be a registered professional engineer under the PE Act. For further information about the PE Act and registered professional engineers, refer to bpeq.qld.gov.au.

1. Introduction

1.1 What is an amusement device?

An 'amusement device' is defined in the Work Health and Safety Regulation 2011 (WHS Regulation).

An amusement device is also 'plant' under work health and safety legislation. This means requirements in the WHS Act and WHS Regulation that apply to plant generally also apply to amusement devices. In addition, the *Managing the risks of plant in the workplace Code of Practice* provides guidance on managing health and safety risks associated with plant in the workplace and should be read in conjunction with this code.

WHS Regulation schedule 19 definition of 'amusement device'

'Amusement device' means plant operated for hire or reward that provides entertainment, sightseeing or amusement through movement of the equipment, or part of the equipment, or when passengers or other users travel or move on, around or along the equipment, but does not include:

- (a) a miniature train and railway system owned and operated by a model railway society, club or association, or
- (b) a ride or device that is used as a form of transport and that is, in relation to its use for that purpose, regulated under another Act or an Act of the Commonwealth; or
- (c) a boat or flotation device:
 - (i) that is solely propelled by a person who is in or on the boat or device, and
 - (ii) that is not attached to any mechanical elements or equipment outside the boat or device, and that does not rely on any artificial flow of water to move, or
- (d) any plant specifically designed for a sporting, professional stunt, theatrical or acrobatic purpose or activity, or
- (e) a coin-operated or token-operated device that:
 - (i) is intended to be ridden, at the one time, by not more than 4 children who must be below the age of 10 years, and
 - (ii) is usually located in a shopping centre or similar public location, and
 - (iii) does not necessarily have an operator.

1.2 Amusement devices referred to in this code

This code applies to amusement devices at a workplace and includes information about relevant requirements in the WHS legislation and ES legislation. Some requirements in the WHS legislation apply to plant generally, which includes 'amusement devices' as defined in schedule 19 of the WHS Regulation. As an example, an 'amusement device' includes an inflatable amusement device regardless of the platform height for the device.

While guidance in this code may be relevant to amusement devices generally, some requirements in the WHS legislation (i.e. Parts 5.2 and 5.3 of the WHS Regulation) apply only to registrable amusement devices at workplaces and amusement devices at licensed major amusement parks. Registrable amusement devices are a subset of 'amusement devices'. As an example, inflatable devices with a platform height of less than 3 metres are not registrable amusement devices.

Under Schedule 5 of the WHS Regulation, amusement devices classified by section 2.1 of AS 3533.1:2009 (*Amusement rides and devices—Design and construction*) require plant design registration and plant item registration, except the following:

- an amusement ride or device classified as class 1 under section 2.1 of AS 3533.1:2009 (*Amusement rides and devices—Design and construction*)
- playground structures
- water slides where water facilitates patrons to slide easily, predominantly under gravity, along a static structure

- wave generators where patrons do not come into contact with the parts of machinery used for generating water waves
- inflatable devices, other than inflatable devices (continuously blown) with a platform height of 3 metres or more:
 - *'inflatable device (continuously blown)'* means an amusement device that is an inflatable device that relies on a continuous supply of air pressure to maintain its shape
 - *'platform height'* means, in relation to an inflatable device (continuously blown), the height of the highest part of the device designed to support persons using it (the platform), as measured from the surface supporting the device to the top surface of the platform when the device is inflated but unloaded.

Examples of registrable amusement devices include:

- most powered mechanical amusement devices (e.g. rollercoasters)
- most non-powered (manually operated) mechanical amusement devices (e.g. bungy trampolines)
- inflatable devices (continuously blown) with a platform height of 3 metres or more
- mobile climbing walls
- bungy jumping devices.

Section 4 of the code provides further information on plant design registration and plant item registration of amusement devices.

Section 10 of the code provides further information on electrical safety and amusement devices. References to an 'amusement device', 'amusement ride' and 'amusement work' in the ES Regulation have a particular meaning as defined in that legislation. This is explained further in section 10 of the code.

1.3 Who has a health and safety duty in relation to amusement devices at the workplace?

Everyone in the workplace has a health and safety duty under the WHS Act. A person can have more than one duty, and more than one person can have the same duty at the same time. The main duties relating to amusement devices at the workplace are set out in Table 1.

While this code is not an approved code of practice under the ES Act, there are duties placed on persons under the ES Act that would also apply to electrical safety aspects relating to the installation, maintenance, use and repair of amusement devices.

Table 1 - Health and safety duties in relation to amusement devices at a workplace

Who	WHS duties
<p>A person conducting a business or undertaking (PCBU) – primary duty of care</p>	<p>A person conducting a business or undertaking (PCBU) must ensure, so far as is reasonably practicable, the health and safety of:</p> <ul style="list-style-type: none"> • workers engaged, or cause to be engaged by the PCBU • workers whose activities in carrying out work are influenced or directed by the PCBU <p>while the workers are at work in the business or undertaking.</p> <p>PCBUs must also ensure, so far as is reasonably practicable, that other persons (e.g. patrons, members of the public) are not put at risk from work carried out as part of the conduct of the business or undertaking.</p> <p>This duty requires the person to manage risks by eliminating health and safety risks so far as is reasonably practicable, and if it is not reasonably practicable</p>

Who	WHS duties
	<p>to eliminate the risks, by minimising those risks so far as is reasonably practicable. It also includes ensuring, so far as is reasonably practicable:</p> <ul style="list-style-type: none"> • the provision and maintenance of a work environment without risks to health and safety • the provision and maintenance of safe plant and structures, including amusement devices • the provision and maintenance of safe systems of work • the safe use, handling, storage and transport of plant and structures • the provision of adequate facilities • the provision of information, training, instruction or supervision • that the health of workers and the conditions at the workplace are monitored. <p>See section 19 of the WHS Act for the PCBU's primary duty of care.</p> <p>A PCBU also has a primary duty, under the ES Act to ensure their business or undertaking is conducted in a way that is electrically safe. This includes:</p> <ul style="list-style-type: none"> • ensuring that all electrical equipment used in the conduct of the business or undertaking is electrically safe • if the business or undertaking includes the performance of electrical work, ensuring the electrical safety of all people and property likely to be affected by the electrical work. <p>See section 30 of the ES Act for the PCBU's primary duty of care regarding electrical safety.</p>
<p>A PCBU with management or control of a workplace</p>	<p>A PCBU with management or control of a workplace must ensure, so far as is reasonably practicable, that the workplace, the means of entering or exiting the workplace, and anything arising from the workplace are without risks to the health and safety of any person. This duty holder is also referred to as a 'person with management or control of a workplace'.</p> <p>See section 20 of the WHS Act for the duty of a person with management or control of a workplace.</p>
<p>A PCBU with management or control of fixtures, fittings or plant at a workplace ('person with management or control of plant at a workplace')</p>	<p>A PCBU with management or control of fixtures, fittings or plant at a workplace must ensure, so far as is reasonably practicable, that the fixtures, fittings and plant are without risks to the health and safety of any person. This duty holder is also referred to as a 'person with management or control of plant at a workplace'.</p> <p>The WHS Regulation includes specific requirements for a person with management or control of plant at a workplace and specific requirements for a person with management or control of an amusement device at a workplace.</p> <p>Depending on circumstances or arrangements made, a PCBU who has hired or leased an amusement device may have management or control of it for the period the device has been hired or leased. Both the hiree PCBU and the PCBU from whom the device has been hired or leased will have duties to eliminate or minimise the risks associated with the device, so far as is reasonably practicable.</p> <p>See section 21 of the WHS Act for the duty of a person with management or control of fixtures, fittings or plant at workplaces.</p>
<p>Designers, manufacturers, suppliers and importers of plant</p>	<p>Designers, manufacturers, importers and suppliers of plant that is to be used, or could reasonably be expected to be used, at a workplace must ensure, so far as is reasonably practicable, the plant is without risks to health and safety. This duty includes carrying out analysis, testing or examinations and providing specific information about the plant. Information must, so far as is reasonably practicable, be passed on from the designer through to the manufacturer and supplier to the end user.</p>

Who	WHS duties
	<p>The WHS Regulation also includes specific requirements for designers, manufacturers, importers and suppliers of plant, including suppliers of second-hand plant.</p> <p>See sections 22–25 of the WHS Act for the duties of designers, manufacturers, suppliers and importers of plant.</p>
<p>PCBUs that install, construct or commission plant or structures</p>	<p>PCBUs must ensure, so far as is reasonably practicable, plant or structures they install, construct or commission for use at a workplace are without risks to the health and safety of persons.</p> <p>The WHS Regulation also includes specific requirements for PCBUs that install, construct or commission plant or structures at the workplace.</p> <p>See section 26 of the WHS Act for the duty of PCBUs that install, construct or commission plant or structures.</p>
<p>Officers of a PCBU</p>	<p>Officers of a PCBU, such as company directors or executives, must exercise due diligence to ensure the PCBU complies with the WHS Act and WHS Regulation. This includes taking reasonable steps to ensure the business or undertaking has and uses appropriate resources and processes to eliminate or minimise risks from plant.</p> <p>Further information on officers is provided in the Safe Work Australia guide: <i>The health and safety duty of an officer</i>.</p> <p>See section 27 of the WHS Act for the duty of officers.</p>
<p>Workers</p>	<p>While at work, workers must:</p> <ul style="list-style-type: none"> • take reasonable care for their own health and safety • take reasonable care their acts or omissions do not adversely affect the health and safety of other persons • comply, so far as the worker is reasonably able, with reasonable instructions given by a PCBU • co-operate with reasonable policies or procedures issued by a PCBU that have been notified to workers. <p>See section 28 of the WHS Act for the duty of workers.</p>
<p>Other persons at the workplace</p>	<p>Other persons at the workplace, such as members of the public and patrons using an amusement device, must:</p> <ul style="list-style-type: none"> • take reasonable care for their own health and safety • take reasonable care that their acts or omissions do not adversely affect other people's health and safety • comply, so far as the person is reasonably able, with reasonable instructions about health and safety given by the PCBU. <p>See section 29 of the WHS Act for the duty of other persons at the workplace.</p>

1.4 What is reasonably practicable?

WHS Act section 18

What is reasonably practicable in ensuring health and safety

'Reasonably practicable', in relation to a PCBU's duty to ensure health and safety, means that which is, or was at a particular time, reasonably able to be done to ensure health and safety, taking into account and weighing up all relevant matters including:

- the likelihood of the hazard or the risk concerned occurring
- the degree of harm that might result from the hazard or the risk

- the availability and suitability of ways to eliminate or minimise the risk
- what the person concerned knows, or ought reasonably to know, about the hazard or risk, and about the ways of eliminating or minimising the risk
- after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.

In practical terms, this means that all the relevant matters in relation to the hazard and its risk are taken into account and weighed up to achieve a balance that provides the highest level of protection that is possible and reasonable in the circumstances.

The question of what is reasonably practicable is determined objectively (that is, by what a reasonable person in the position of the PCBU would do in the circumstances), not by reference to a PCBU's capacity to pay or other individual circumstances. A PCBU cannot expose people to a lower level of protection simply because it is in a lesser financial position than another PCBU facing the same hazard or risk in similar circumstances.

Further information on what is 'reasonably practicable' is provided in the Safe Work Australia guide: *How to determine what is reasonably practicable to meet a health and safety duty*.

2. Risk management process

2.1 What is involved in managing risks associated with amusement devices at the workplace?

WHS Act section 17 Management of risks

A duty imposed on a person to ensure health and safety requires the person:

- to eliminate risks to health and safety, so far as is reasonably practicable, and
- if it is not reasonably practicable to eliminate risks to health and safety, to minimise those risks so far as is reasonably practicable.

WHS Regulation Part 3.1 Managing risks to health and safety sections 32–38

To manage risk, a PCBU must:

- identify reasonably foreseeable hazards that could give rise to risks to health and safety
- eliminate risks to health and safety so far as is reasonably practicable
- if it is not reasonably practicable to eliminate risks to health and safety—minimise those risks so far as is reasonably practicable by implementing risk control measures according to the hierarchy of control in the WHS Regulation
- maintain and implement control measures so they remain effective
- review and as necessary revise control measures implemented to maintain, so far as is reasonably practicable, a work environment that is without risks to health or safety.

WHS Regulation section 203 Management of risks to health and safety

A person with management or control of plant at a workplace must manage risks to health and safety.

The risk management process is used to:

- identify hazards—find out what could cause harm
- assess risks, if necessary—understand the nature of the harm that could be caused by the hazard, how serious the harm could be and the likelihood of it happening. This step may not be necessary if dealing with a known risk and known controls for that risk.
- eliminate risks so far as is reasonably practicable
- control risks—if it is not reasonably practicable to eliminate the risk, implement the most effective control measures that are reasonably practicable in the circumstances in accordance with the hierarchy of control measures, and ensure they remain effective over time
- review control measures—ensure control measures are working as planned.

Using methods and tools developed for hazard identification and risk assessment can streamline documentation requirements and improve the effectiveness of the risk management process.

Some examples of tools that a PCBU may consider using include:

- Hazard and Operability study (HAZOP). Further information about HAZOP can be found in AS IEC 61882 *Hazard and operability studies (HAZOP studies) – Application Guide*.
- ‘What if?’ analysis.
- Failure Mode and Effects Analysis (FMEA), and Failure Mode, Effects and Criticality Analysis (FMECA). Further information about FMEA and FMECA can be found in AS/NZS IEC 60812 *Failure modes and effects analysis (FMEA and FMECA)*.
- Fault tree analysis (FTA). Further information about FTA can be found in AS IEC 61025 *Fault tree analysis (FTA)*.

- A maintenance and operability study.
- Human factors and ergonomics analysis tools (e.g. National Aeronautics and Space Administration Task Load Index (NASA-TLX), Cognitive Work Analysis).

Risk management is an ongoing process. A person with management or control of an amusement device should use annual inspections, major inspections and any incidents that expose, or had the potential to expose, a person to a serious risk to their health or safety as occasions to carry out a comprehensive risk assessment and to:

- consider expert advice about any safety improvements that could be made to the device (e.g. when advice is provided by the competent person who has inspected the device)
- identify any new hazards associated with the device and enable development of new control measures to eliminate or minimise risk to people's health and safety
- review existing control measures to determine their effectiveness and if any improvements can be made to eliminate or minimise risk to people's health and safety.

Section 9 of this code provides further information about annual inspections and major inspections.

Further information on the risk management process is in the *How to manage work health and safety risks Code of Practice*.

Further information on managing the risks of plant is in the *Managing risks of plant in the workplace Code of Practice*.

2.2 Identifying hazards

WHS Regulation section 34 Duty to identify hazards

A duty holder, in managing risks to health and safety, must identify reasonably foreseeable hazards that could give rise to risks to health and safety.

Ways to identify potential hazards associated with an amusement device include:

- walking around the workplace and inspecting the amusement device to identify any problems. Consider how the device is operated, its design characteristics, how patrons use the device and local environmental factors like overhead and underground electrical services. Records of all inspections, including any inspections completed during the risk assessment process, must be kept for registrable amusement devices and amusement devices at licensed major amusement parks. Section 12 of this code provides further information about record keeping
- asking workers about any problems they encounter with the amusement device including during set-up, operation, inspection, maintenance, repair, dismantling, transport and storage, and any emergency conditions including evacuation of patrons from the device. This should include asking workers about how mentally or physically demanding it is to operate the device. Section 3 of this code provides further information on consultation with workers about work health and safety
- observing the amusement device in operation
- observing patrons to see if they encounter any problems when using the amusement device
- reviewing incident reports, including near misses, and observations of the device during a malfunction or emergency conditions
- reviewing design, inspection, testing and maintenance records for the device, including breakdown history, repairs and alterations. This may involve consulting people with specific areas of expertise (e.g. an electrical engineer or licensed electrical worker in relation to electrical installations and electrical equipment that is part of the amusement device or ancillary equipment)

- considering other incidents with similar amusement devices, within Australia and internationally, and seeking further information from designers, manufacturers, suppliers or owners of similar devices
- considering safety alerts, bulletins or notices published by regulators, within Australia and internationally, and amusement device manufacturers and suppliers
- for amusement devices with complex control systems or which rely on ancillary equipment, identifying risks associated with failure or malfunctioning of those systems or equipment. This may require a competent person considering specific factors relating to the device and ancillary equipment, such as:
 - conducting trials where elements of the system experience a simulated failure, such as a pump, and observing the impact of the failure on different flow rates
 - establishing failure mechanisms for block control systems which may allow ride carriages to collide or bottleneck.

2.3 Assessing risks

After identifying the hazards, assessing risks involves considering the likelihood of a person being harmed by the hazard and how serious the harm could be. Consider how incidents could happen and who might be harmed (e.g. device operators, maintenance workers, patrons on the device and members of the public in the vicinity of the device).

Assessing risk should include considering low probability failures that expose people to the risk of death or serious injury, that is, an incident that has a low likelihood of occurring but would have a high risk of death or serious injury if it did occur. For example, the failure of a sweep arm on a device may occur once in a 20–30 year period; however, if it did occur, there would be a high risk of death or serious injury. It is important that potential component failures or failures of existing control measures that may be low probability failures are included in any risk assessment and are reviewed regularly.

Consider using risk assessment tools which are best suited to the type of risk being assessed. For example, risk matrices which focus on consequences and likelihood are less suited to assessing risks associated with human factors, psychological health or manual tasks.

Workers who operate or work on an amusement device may readily identify hazards with the device and provide relevant information for assessing risk, implementing control measures and reviewing the effectiveness of control measures. However, familiarity associated with operating or working on an amusement device over a long period of time may also lead to overlooking or not fully assessing risks that have increased over time.

A risk assessment can help determine what action can be taken to control the risk and how urgently the action needs to be taken.

2.4 Controlling risks

WHS Act section 17

Management of risks

WHS Regulation section 35

Management of risk

WHS Regulation section 36

Hierarchy of control measures

The ways of controlling risks are ranked from the highest level of protection and reliability to the lowest. This is known as the hierarchy of control.

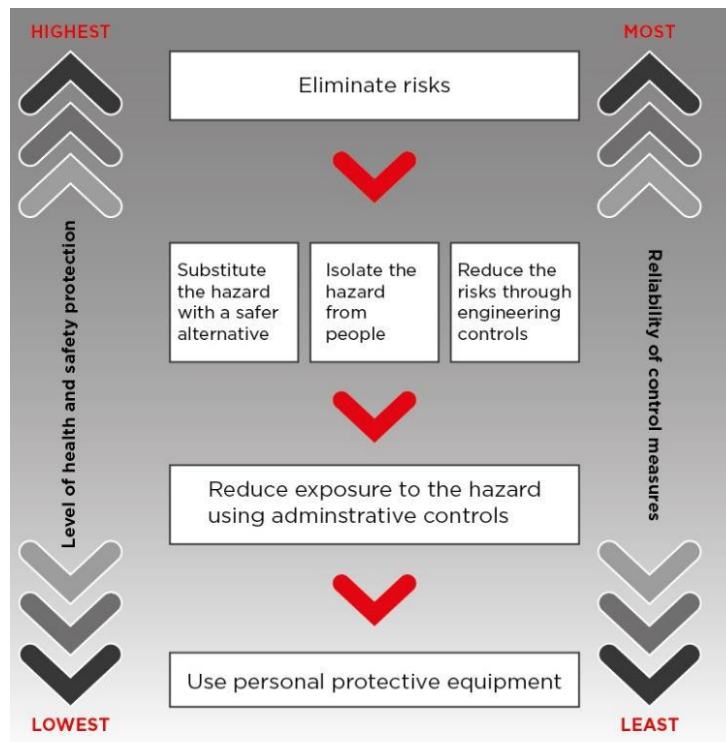


Figure 1: The hierarchy of controls

PCBUs must aim to **eliminate a hazard** and associated risk, so far as is reasonably practicable. Elimination is the most effective control measure and **must** always be considered before all other control measures. Consider whether the risks from an amusement device can be completely removed. If it is not reasonably practicable to eliminate the risk completely, the hierarchy of controls must be followed to minimise risks by using one or more of the following approaches:

- **substitution**—minimise the risk by substituting, wholly or partly, the hazard with something safer. For example, plan the set up of amusement devices away from overhead powerlines to reduce the risk of coming within an unsafe distance of the overhead electric line (e.g. a Ferris wheel has a high risk of breaching the exclusion zone) and substitute the use of the areas near overhead powerlines as dedicated pedestrian thoroughfares or with plant or vehicles that cannot breach the exclusion zone (e.g. a food van)
- **isolation**—minimise the risk by isolating or separating the hazard from any person exposed to it (e.g. providing a secure barrier around an amusement device to prevent unauthorised entry or access to the device)
- **engineering controls**—minimise the risk by using engineering controls (e.g. guarding, padding and more effective patron restraints).

If the risk remains, it must be minimised by implementing **administrative controls**, so far as is reasonably practicable (e.g. warning signs for patrons about safe use and size or height restrictions, and rotating shift times for operators to reduce fatigue).

Any further remaining risk must then be minimised, so far as is reasonably practicable, by using **personal protective equipment** (PPE) (e.g. personal hearing protectors for noise exposure, protective clothing and sunscreen to protect workers against sun exposure and helmets for patrons if required).

A combination of control measures may be appropriate to minimise risks. For example, controlling risks associated with different hazards in a 'ghost train' amusement device may include isolating hazardous special effects behind a see-through barrier, restraints to stop patrons being thrown from the carriage, and ride safety signs for patrons. A combination of control measures can also be used to minimise the same risk. For example, control

measures to minimise the risk of people being hit by a miniature train ride may include fencing, gate sensors, warning signals, operator training and signs.

Consider all possible control measures and choose the control measures that are reasonably practicable in the circumstances.

2.5 Maintaining and reviewing control measures

WHS Regulation section 37 Maintenance of control measures

Control measures must be maintained so they remain effective, including being:

- fit for purpose
- suitable for the nature and duration of the work
- installed, set up and used correctly.

WHS Regulation section 38 Review of control measures

Control measures must be reviewed and, as necessary, revised including:

- when the control measure is not effective in controlling the risk
- before a change at the workplace that is likely to give rise to a new or different health and safety risk that the control measure may not control effectively
- if a new hazard or risk is identified
- if the results of consultation indicate that a review is necessary
- if a health and safety representative requests a review.

Control measures must be reviewed, and if necessary, revised to ensure they continue to be effective. Questions to consider when reviewing control measures may include:

- Are there any key triggers that indicate when control measures are not operating as intended?
- Are the control measures working effectively in both their design and operation?
- Have the control measures introduced new hazards/problems?
- Have all hazards been identified?
- Are safety procedures being followed?
- Has the training provided to workers on how to work safely and operate the device safely been effective?
- Are workers openly raising health and safety concerns?
- Are workers reporting any problems promptly?
- Has the instruction provided to patrons on how to behave or use the amusement device been effective?
- If new legislation, standards or information becomes available, does it indicate current control measures may no longer be the most effective?

Control measures must be reviewed as necessary including:

- when the control measure is not effective in controlling the risk. For example, if a device operator identifies the locking mechanism for a restraint on a particular seat or carriage is no longer working properly, this would require action to address any immediate risk so a patron is not placed in that seat or carriage, and a review would need to be conducted to determine why the control measure failed and corrective measures implemented.
- before a change that is likely to give rise to a new or different health and safety risk that the control measure may not control effectively
- if a new hazard or risk is identified
- if the results of consultation indicate a review is necessary

- if a health and safety representative requests a review.

Control measures to minimise a high level of risk to health and safety may need to be reviewed more frequently. This may include control measures for risks with a serious consequence but a low frequency of occurring. In addition to the circumstances where control measures must be reviewed, the person with management or control of the amusement device should use the annual inspection of the device as an opportunity to review, and if necessary, revise control measures.

Section 9 of this code provides further information about annual inspections.

3. Consultation, cooperation and coordination

3.1 Consulting workers

WHS Act section 47(1) Duty to consult workers

A PCBU must, so far as is reasonably practicable, consult with workers who carry out work for the business or undertaking who are, or are likely to be, directly affected by a matter relating to work health or safety.

WHS Act section 48 Nature of consultation

Consultation requires:

- relevant information to be shared with workers
- that workers be given a reasonable opportunity to raise work health and safety issues and contribute to the decision-making process
- that the views of workers are taken into account by the PCBU
- the workers are advised of the outcome of the consultation in a timely way.

If the workers are represented by a health and safety representative, the consultation must involve that representative.

Consultation involves sharing information, giving workers a reasonable opportunity to express views, and taking those views into account before making decisions on health and safety matters. By drawing on the experience, knowledge and ideas of workers, a PCBU is more likely to identify all hazards and choose effective control measures.

PCBUs must consult with their workers, so far as reasonably practicable, when proposing any changes to work that may affect their health and safety. If the workers are represented by a health and safety representative, the PCBU must involve them in the consultation.

Examples of when consultation with workers would be required include:

- a change to procedures for loading and unloading passengers on an amusement device
- a proposed modification to the operating panel of an amusement device
- a change to the procedure for erecting or dismantling a mobile amusement device.

The PCBU should also have policies and procedures in place to make it easy for workers to quickly report any health and safety issues. The PCBU should make sure workers are familiar with these policies and understand them.

3.2 Consulting, cooperating and coordinating activities with other duty holders

WHS Act section 46 Duty to consult with other duty holders

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

Sometimes a PCBU may share responsibility for a health and safety matter with other businesses which are involved in the same activities or share the same workplace (e.g. where multiple PCBUs are setting up amusement devices at an agricultural show).

Multiple duty holders must, so far as is reasonably practicable, share information to find out who is doing what. They must work together in a cooperative and coordinated way so that all

risks are eliminated or minimised as far as reasonably practicable. For example, where an amusement device is to be operated at a festival or agricultural show, the person with management or control of the device and the event organiser would need to consult with each other about local factors which may affect the safety of amusement devices (e.g. ground conditions and underground or overhead services).

Section 11 of this code provides further information about event organisers and amusement devices.

Further information on consultation is in the *Work health and safety consultation, cooperation and coordination Code of Practice*.

4. Acquiring, registering and commissioning an amusement device

4.1 Acquiring an amusement device

WHS Act section 24

Duties of persons conducting businesses or undertakings that import plant, substances or structures

WHS Act section 25

Duties of persons conducting businesses or undertakings that supply plant, substances or structures

Before buying or hiring an amusement device, PCBUs should consider the purpose for using the device and discuss their needs with importers or suppliers to decide whether the amusement device is suitable for the intended use. Obtaining information about the amusement device may assist the PCBU in making a decision about buying or hiring the device. This includes asking the importer or supplier about:

- the technical standard to which the device has been designed and manufactured, the results of any tests, and conditions needed to use it safely
- what is required in relation to installing, commissioning, operating, storing, inspecting, maintaining, repairing, transporting and dismantling device.

A PCBU that directly imports an amusement device for use by the PCBU at a workplace must comply with the duties of importers of plant under the WHS Act to ensure, so far as is reasonably practicable, the device is without risks to health and safety. This duty includes carrying out, arranging, or ensuring testing and analysis is carried out, as well as providing specific information about the plant to other people. This may require specific testing, analysis and inspections to confirm the device has been manufactured to comply with the design.

Amusement devices must meet the level of safety required by the WHS Act and WHS Regulation. When an amusement device has been designed and manufactured to an overseas published technical standard, this should be checked to ensure it delivers a level of safety at least equivalent to that provided by the relevant clauses of Australian Standards relevant to the device (see Appendix 2 for a list of some of the relevant Australian Standards).

A PCBU buying an amusement device, either from overseas or from within Australia, should determine if the design and manufacture of the device provides an equivalent or higher level of safety than specified by relevant Australian Standards. The PCBU may obtain the assistance of a design verifier for this purpose. If a mobile amusement device is to be used in other states or territories, there may be additional legislative requirements in those states or territories. There may also be other legislative requirements about the transport and operation of the amusement device (e.g. road transport or electrical safety legislation).

In Queensland, the Professional Engineers Act applies to any 'professional engineering service' carried out as part of design verification of an amusement device. Only registered practising professional engineers or a person directly supervised by a registered practising professional engineer can carry out professional engineering services. Practising professional engineers are registered by the Board of Professional Engineers of Queensland.

Before committing to purchase an amusement device, a PCBU may find it beneficial to have a registered professional engineer with knowledge and experience in amusement devices to:

- advise on the design

- review and assess available information on the device, particularly whether there is adequate information in relation to installing, commissioning, operating, storing, inspecting, maintaining, repairing, transporting and dismantling the device
- assess the device, particularly a second-hand device
- identify any potential problems with the device.

A registered professional engineer who is experienced with the technical standards or engineering principles used for the amusement device may be able to provide advice on technical information provided by the manufacturer, importer or supplier. Section 4.3 of this code provides further information about engineers having expertise in different areas of engineering.

A registered professional engineer may also be able to assist with reviewing and updating operating procedures originally provided by the manufacturer to ensure the procedures are relevant for the local operating environment (e.g. maximum wind speed below which a Ferris wheel is allowed to continue operation).

Further information about acquiring plant and the duties of importers and suppliers of plant is in the *Managing risks of plant in the workplace Code of Practice*.

Further information is also provided in the Safe Work Australia *Guide for importing and supplying safe plant*.

4.2 Second-hand amusement devices

WHS Act section 25 Duties of persons conducting businesses or undertakings that supply plant, substances or structures

WHS Regulation section 198 Information to be obtained and provided by supplier

A supplier of plant must:

- take all reasonable steps to obtain the information required to be provided by the manufacturer under section 23(4)(a) and (c) of the WHS Act and under the WHS Regulation
- when the plant is supplied, ensure the person to whom the plant is supplied is given the information obtained by the supplier.

WHS Regulation section 199 Supply of second-hand plant – duties of supplier

A supplier of second-hand plant must ensure, so far as is reasonably practicable, that any faults in the plant are identified.

Before plant is supplied, the supplier of second-hand plant must ensure that the person to whom the plant is supplied is given written notice of:

- the conditions of the plant
- any faults identified
- if appropriate, that the plant should not be used until the faults are rectified.

WHS Regulation section 266 Application for registration

Requirements for registration application

Suppliers of second-hand amusement devices must take all reasonable steps to obtain information about the safe use of the device from the manufacturer or original supplier. Suppliers must give this information to the person being supplied with the device. Section 12 of this code provides further information about record keeping, including requirements about providing certain records when relinquishing control of plant.

Second-hand amusement devices (local and imported) are subject to the same requirements for plant design registration, plant item registration and inspections as a new amusement device. A second-hand amusement device is more likely to have outdated or inadequate safety features.

Before purchasing a second-hand amusement device, the PCBU should consider:

- whether there are records which state the technical standard to which the device has been designed
- the need for safety features of the device to be upgraded to meet current technical standards or bulletins issued by the manufacturer
- the operational history of the device, including:
 - any previous major breakdowns (e.g. where a device stopped mid-cycle due to the failure of the main gearbox or drive motor)
 - repairs that have been carried out
 - maintenance records
 - records of previous major inspection/s on the device (including details of the competent person who supervised the inspection, when the inspection was carried out, the type and results of testing carried out, and when the next major inspection is due)
 - design alterations which may have introduced or changed hazards
 - any previous major incidents or near misses
 - any statutory notices issued by inspectors under work health and safety or electrical safety legislation.

When purchasing a second-hand device, the PCBU should also ensure that all information and documentation required to register the device has been provided by the person selling the device (refer to sections 4.3 and 4.7 for further information about registration requirements). Before a person with management or control of plant applies to register a registrable second-hand amusement device, the person must ensure the device has been inspected by a competent person and assessed as being safe to operate.

A major inspection may also be necessary depending on the age of the device, if it is due for a major inspection, or lacks documented evidence or maintenance records. Section 9 of this code provides further information about major inspections.

Designs of individual amusement devices tend to be unique as manufacturers often produce amusement devices to particular specifications nominated by the buyer. The design of an amusement device may also be modified by the manufacturer or owner over time. Even though an amusement device may have the same name as another device operating in Australia or made by the same manufacturer, it should not be assumed that the designs are the same. It may be necessary to review the device and its records to confirm the device still complies with the registered design. It is recommended that a registered professional engineer assist with this review. Unless there is definitive evidence the designs are identical and no alterations have been made to the second-hand device, the design of individual registrable amusement devices will require separate design verification and registration.

Further information about the supply of second-hand plant is in the *Managing the risks of plant in the workplace Code of Practice*.

4.3 Plant design registration of an amusement device

WHS Act section 42 Requirements for authorisation of plant or substance

If plant design registration is required, the plant must not be used if the design has not been registered.

WHS Act section 45 Requirement to comply with conditions of authorisation

A person must comply with any conditions attached to the plant design registration.

WHS Regulation section 243 Plant design to be registered

The design of specific items of plant must be registered. Schedule 5, Part 1 of the WHS Regulation lists the specific items of plant requiring design registration, which includes certain amusement devices.

WHS Regulation section 245 Recognition of designs registered by corresponding regulator

A design of an item of plant is not required to be registered under the WHS Regulation if the design is registered under a corresponding WHS law.

WHS Regulation sections 248–263

Requirements for the plant design registration process.

It is a requirement under WHS legislation to register the design of specific amusement devices before they are used. Section 1.2 of this code provides information about the types of amusement devices which require plant design registration.

A person must not use an amusement device which requires plant design registration if the design has not been registered.

A PCBU must not direct or allow a worker to use an amusement device which requires plant design registration if the design has not been registered.

Either a PCBU that designs an item of plant or a person with management or control of an item of plant must apply to the WHS Regulator for registration of the plant design.

An application for plant design registration includes:

- a signed statement by the designer which states:
 - the designer has complied with obligations under section 22 of the WHS Act
 - the published technical standards and engineering principles used in the design
- a signed design verification statement which includes a statement by an eligible design verifier that the design was produced in accordance with published technical standards or engineering principles
- representational drawing(s) of the amusement device
- the relevant fee.

An eligible competent person for design verification is a person who has the skills, qualifications, competency and experience to design the plant or verify the design. In addition, the Professional Engineers Act applies to any 'professional engineering service' carried out as part of design verification of an amusement device. A person is not eligible to be a design verifier if:

- the person was involved in the production of the design, or
- the person was engaged by the PCBU that produced the design at the time the design was produced (unless the PCBU uses a quality system to undertake the design of plant that has been certified by a body accredited or approved by the Joint Accreditation System of Australia and New Zealand).

For some amusement devices, a single engineer may not have all the competencies to verify the design of all aspects of the device. While an engineer may be engaged to have overall responsibility for providing the design verification service, other specialists may need to be engaged to verify aspects of design of the amusement device that are outside that engineer's area of expertise.

For example, a structural engineer may only be able to verify the structural integrity of the device but not the mechanical, electrical or electronic control system of the device. A mechanical engineer may be required to verify the design of patron restraint locking systems, gear boxes and drive systems, and hydraulic and pneumatic systems. An electrical engineer with competency in control systems may need to be engaged to verify the design of the control system for the device.

Some mobile amusement devices may be excluded from plant design registration in other jurisdictions and still require design registration in Queensland. A person with management or control of a mobile amusement device from another jurisdiction should check

Queensland's plant design registration and plant item registration requirements before operating the device in Queensland.

Further information on plant design registration is in the *Managing the risks of plant in the workplace Code of Practice* and at WorkSafe.qld.gov.au.

4.4 Altering the design of a registrable amusement device

WHS Regulation section 244 Altered plant designs to be registered

If the design of an item of plant that is registrable is altered, the altered design must be registered if the alteration may affect health or safety.

WHS Regulation section 282 Changes to information

Registration holders must notify the WHS Regulator in writing of changes to information provided to the regulator in relation to a registered item of plant, including when plant is altered in a way that requires the plant to be subject to new control measures.

WHS Regulation section 237 Records of plant

Types of records to be kept and made available.

Before altering the design of a registrable amusement device, the person with management or control of the amusement device should consult with the designer or manufacturer to ensure the potential impact on safety of the device is considered. If the original designer or manufacturer cannot be contacted, alterations should be carried out by, or under the supervision of, a competent person based on relevant technical standards or engineering principles. The scope of this work is likely to be a professional engineering service which must be carried out or supervised by a registered professional engineer under the Professional Engineers Act.

The WHS Regulation requires that registrable plant design alterations which may affect health or safety must be registered.

Proposed alterations to the design of an amusement device should not be considered in isolation but assessed in relation to the whole device and how it operates to ensure the proposed alteration will continue to meet safety standards and not lead to adverse consequences. If the person with management or control of an amusement device is unsure if the proposed alterations would affect health or safety, the person may provide the WHS Regulator a brief outline of the proposed alteration to the design and inquire if there is a need to register the altered design. Information that will assist the WHS Regulator in considering the proposed alteration includes any relevant information provided by:

- the designer or manufacturer of the device
- a competent person with knowledge and experience in the design and operation of the device, which may include the competent person who has previously conducted an annual inspection or major inspection of the device.

Example of a design alteration which may affect health and safety and must be registered

The design of a 'Sizzler' type amusement device is registered. The patron restraint system on the 'Sizzler' is modified to have a permanent secondary locking mechanism to prevent the patron restraint system from opening during a cycle of the ride in the event that the primary lock fails. This is an additional measure to control risk. The design of the modification will need to be registered.

Where the alteration does not affect the health and safety of the device, the alteration will not need to be design registered. However, a change to information originally provided in the plant design registration application process must be given to the WHS Regulator in writing.

This ensures the WHS Regulator can include the updated information in the design registration file for the amusement device.

Example of an alteration which would not affect health or safety and would not require alteration to design registration

A dodgem car setup has been re-themed. Neither the design of the repainted cars nor the design of their 'track' area has been altered, although the appearance of the cars and backdrop look significantly different to the original set-up. Because this alteration does not affect health and safety, registration of the alteration is not required. However, if re-theming the amusement device includes changing the name of the device, the person with management or control of the amusement device must inform the WHS Regulator of the new name.

The person with management or control of the amusement device must keep a record of all alterations made to the device. To ensure this information is easily accessible to people inspecting, maintaining or testing the device, a record of alterations to the device should be included in the log book. The person with management or control the amusement device should also ensure the following are revised and updated where necessary to reflect any changes arising from alterations made to the device:

- operating and maintenance manuals for the device
- training or procedures for workers who carry out work associated with the device, including operators and attendants

Where an alteration to an amusement device requires plant design registration, before returning the altered device to service, the person with management or control of the amusement device must ensure:

- that, so far as is reasonably practicable, measures are in place to identify and eliminate or minimise any other risks created by the alterations. This should include ensuring the amusement device is inspected and tested in accordance with the modified design specifications, relevant technical standards or engineering principles, manufacturer's instructions, or the requirements of a competent person
- an application is made to the WHS Regulator for registration of the altered design and amendment of the plant item registration to include the new design registration number
- the device is not returned to service unless the WHS Regulator has granted the registration of the altered design.

4.5 Technical standards for the design of amusement devices

WHS Regulation section 229

Record of standards or engineering principles

WHS Regulation section 251

Design verification statement

WHS Regulation section 253

Duty of design verifier

Registrable amusement devices must be designed in accordance with relevant published technical standards or engineering principles and designed to ensure the device is without risk to health and safety, so far as is reasonably practicable. In general, amusement devices operating in Australia are designed to one of the following technical standards:

- Australian Standard AS 3533 *Part 1: Amusement rides and devices - Design and construction.*

- European Standard EN 13814-1 *Safety of amusement rides and amusement devices - Part 1: Design and manufacture.*
- International Standard ISO 17842-1: *Safety of amusement rides and amusement devices – Design and manufacture.*
- ASTM (American Society for Testing and Materials) Standard F2291 *Standard Practice for Design of Amusement Rides and Devices*
- Other relevant technical standards referred to in Appendix 2.

Technical requirements in these standards for the design of amusement devices may be the same or substantially similar. The technical standards or engineering principles used in the design of an amusement device should provide a level of safety at least equivalent to that provided by the Australian Standards relevant to the device.

Standards for the general design of amusement devices may also refer to other technical standards in specific areas for the design of amusement devices. For example, modern complex amusement devices often incorporate electronic safety control systems (e.g. systems governing locking the patron restraint and interlocking the restraint with the commencement of the ride operating cycle; electric speed-limiting devices; brakes and emergency stops).

The design, documentation, assessment and validation of safety related control systems should consider:

- specification of control system requirements
- a risk assessment of individual control functions to determine the required level of reliability, for example, the:
 - Category Level (CAT) under AS 4024.1501 *Safety of machinery, Part 1501: Design of safety related parts of control systems – General principles for design*
 - Safety Integrity Level (SIL) under AS 61508 *Functional safety of electrical/electronic/programmable electronic safety-related systems* and AS/NZS 62061 *Safety of machinery: Functional safety of safety-related electrical, electronic and programmable electronic control systems, or*
 - Performance Level (PL) under AS/NZS 4024.1503 *Safety of machinery, Part 1503: Safety-related parts of control systems – General principles for design.*
- a complete list of components that are critical to the reliability of the safety related control functions included in the control system ('critical safety components')
- justification of the suitability of selected critical safety components in relation to the level of reliability. Components used in safety related control functions should comply with appropriate technical standards for their intended use and have appropriate accredited certification provided by the component manufacturer. This should be confirmed in the supporting documentation supplied with the component
- issues arising from 'common cause failure' (CCF) of critical safety components including diversity of critical safety components to ensure reliability of the safety function
- potential environmental effects on the control system, including effects of temperature change, vibration (especially when mobile amusement devices are transported over long distances) and electro-magnetic interference.

The design verifier for the design of a registrable amusement device must document the design verification process they have carried out, and the results of that process. For an amusement device with a control system, this should include the review of the control system design and validation documentation considered necessary by the design verifier to confirm compliance with the technical standard nominated by the designer.

4.6 Commissioning an amusement device for the first time

WHS Regulation section 201 Duties of PCBUs that install, construct or commission plant or structures

A PCBU that installs, constructs or commissions plant at a workplace must have regard to the information provided by the designer, manufacturer, importer or supplier of the plant or health and safety instructions provided by a competent person.

WHS Regulation section 204 Control of risks arising from installation or commissioning

A person with management or control of plant at a workplace must:

- not commission the plant unless the person has established the plant is, so far as is reasonably practicable, without risks to the health and safety of any person
- ensure a competent person installs, assembles, constructs, commissions, decommissions or dismantles the plant
- ensure information on eliminating or minimising risks to health and safety is provided to persons installing, assembling, constructing, commissioning, decommissioning or dismantling the plant
- ensure the processes for installing, assembling, constructing, commissioning, decommissioning or dismantling the plant includes inspections that ensure, so far as is reasonably practicable, that risks associated with these activities are monitored.

WHS Regulation section 234 Duty of PCBUs that commission plant

A PCBU that commissions plant must not commission registrable plant unless the item of plant has been registered under the WHS Regulation. However, the person may perform any necessary adjustments, tests or inspections as part of the commissioning process before the plant is commissioned at the workplace.

Commissioning an amusement device involves carrying out the necessary adjustments, tests and inspections to ensure the device is in full working order before it is entered into service with patrons or passengers.

The PCBU commissioning plant that is an amusement device must have regard to information provided by the designer, manufacturer, importer or supplier of the device or instructions relating to health and safety provided by a competent person.

The PCBU commissioning the plant that is an amusement device should consider whether the information provided by the designer, manufacturer, importer or supplier is adequate for the circumstances in which the device is to be commissioned. If the information does not appear adequate, the PCBU should obtain additional health and safety instructions developed by a competent person to ensure the plant is without risk to health and safety when it is commissioned. Information or instructions for commissioning an amusement device should include:

- detailed instructions for all inspections, proof tests and site acceptance tests that are required by the manufacturer or a competent person to ensure the amusement device is safe to operate. This should include adequate checks by a competent person to confirm the device has been assembled or constructed in accordance with the instructions and complies with the registered design
- ensuring the amusement device is soundly constructed and free from obvious defects, (e.g. structural integrity of the device), non-destructive testing on welding (especially when welding of critical components is done on-site), verification of procedures used to tighten nuts and bolts. This should be based on the design documentation verified as part of the design registration to confirm the amusement device has been manufactured to the registered design

- for a fixed amusement device—ensuring the foundations and anchorage system are designed to comply with the manufacturer’s specifications to withstand all dynamic loads while the device is in operation
- for a mobile amusement device mounted on a vehicle or trailer—ensuring the device is set up in accordance with the manufacturer’s instructions for the ground conditions on site (e.g. jacks or outriggers correctly set up with adequate timbers or other dunnage under the unit so it cannot sink or become unstable)
- ensuring the amusement device can support the maximum design load for which it has been designed
- ensuring the amusement device can move safely at the speeds for which it is designed (e.g. testing the device loaded with appropriately weighted dummies in the carriages)
- ensuring out-of-balance testing is carried out on an amusement device that includes a degree of out-of-balance loading—checking there is no adverse vibration, harmonic oscillation or movement relative to footings and foundations
- ensuring safety control systems (e.g. systems governing locking the patron restraint and interlocking the restraint with the start of the ride cycle, load/unload gates, speed-limiting devices, brakes and emergency stops) are tested and validated in accordance with the technical standard/s to which the control systems have been designed
- ensuring the restraint system prevents uncontrolled release due to malfunction or accidental or deliberate release by a patron, especially where there is the presence of ejecting forces as a result of the motion of the device
- checking the patron containment and restraint systems are suitable for the allowable group of patrons for the device (e.g. based on restrictions relating to height, weight, girth etc as specified by the designer or manufacturer of the device)
- checking how the safety of patrons and workers will be maintained when there is an unexpected power failure on the amusement device
- checking how emergency evacuation procedures will provide for the safety of patrons and workers, including during a fire
- for an amusement device with an emergency braking system, ensuring it has been tested to prevent collisions (e.g. between carriages on multi-car roller coasters)
- ensuring any parts of the amusement device with which patrons may come in contact are smooth, free from sharp, rough or splintered edges and corners, and have no protruding parts (e.g. studs, bolts and screws, or pinch and nip points)
- for an amusement device operated on tracks—testing of the anti-rollback device, which should be automatically activated if the propelling mechanism fails
- for an inflatable amusement device—ensuring the device has enough anchor points to prevent the device from being blown away by strong wind, and that ground anchors are the correct size, length/weight and fit for purpose
- where applicable, ensuring there are systems or procedures to enable regular testing of the integrity of hydraulic and pneumatic systems and their components
- ensuring electrical testing has been performed with reference to relevant technical standards to ensure functionality, compliance and safety. This may include testing:
 - input current
 - safety contactor and residual current device functionality
 - leakage current
 - earth continuity
 - dielectric strength
 - insulation resistance
 - polarity and correct circuit connections
 - earth fault loop impedance

- whether the installation's prospective fault level is less than the fault withstand level of installed electrical components of the amusement device (particularly for fixed amusement devices)
- for a fixed amusement device that is hard wired, ensuring the electrical system has been designed to ensure the components are suitably rated for any prospective fault current. The advice of a competent person may be required to assess the prospective fault current level
- ensuring there is no obvious damage or defect in accessories, connectors, plugs, extension outlet sockets, flexible cords, cables and associated wiring (e.g. defects such as any exposed single insulation on any low voltage electrical equipment)
- ensuring covers and guards are secured in the manner intended by the designer, manufacturer or supplier
- ensuring the electrical equipment has a suitable Ingress Protection (IP) rating for the setup distance between the electrical equipment and any body of water (e.g. for air blowers near water pools) and in relation to wet weather (e.g. wind-blown rain) or nearby spraying water (e.g. wash-down hosing)
- ensuring electric cables, joints and junction boxes have been installed to prevent potential water ingress
- ensuring ventilation inlets and exhausts are unobstructed
- ensuring any specified site acceptance tests are passed, including foreseeable component failure, unexpected start-up, and potential hazards that may arise when power is being restored such as after an interruption or scheduled power shutdown
- ensuring potential sources of emission are safe (e.g. laser).

Other PCBUs carrying out inspections and tests as part of commissioning a registrable amusement device must provide records of the inspections and tests to the person with management or control of the device, who is required to keep a record of all testing, inspections and commissioning of the device. Section 12 of this code provides further information about record keeping requirements.

Section 10 of this code provides further information about electrical safety.

4.7 Plant item registration of an amusement device

WHS Act section 42 Requirements for authorisation of plant or substance

Registrable plant must not be used if it has not been registered.

WHS Act section 45 Requirement to comply with conditions of authorisation

A person must comply with any conditions attached to plant item registration.

WHS Regulation section 234 Duty of PCBUs that commission plant

A PCBU must not commission an item of registrable plant unless it has been registered. However, a person may perform any necessary adjustments, tests or inspections as part of the commissioning process before the plant is commissioned at the workplace.

WHS Regulation section 246 Requirements for registration of items of plant

Specific items of plant must be registered. Schedule 5, Part 2 of the WHS Regulation lists the specific items of plant requiring registration, which includes certain amusement devices.

WHS Regulation section 247 Recognition of plant registered by corresponding regulator

An item of plant is not required to be registered under the WHS Regulation if the plant is registered under a corresponding WHS law.

WHS Regulation sections 264–280

Plant registration process

WHS Regulation section 273 Plant registration number

The person with management or control of the plant at a workplace must ensure the plant registration number is marked on the item of plant.

In addition to plant design registration, it is a requirement under WHS legislation to hold individual plant registration for specific amusement devices. Section 1.2 of this code provides information about the types of amusement devices which require registration.

A person must not use a registrable amusement device if it has not been registered.

A PCBU must not direct or allow a worker to use a registrable amusement device if it has not been registered. However, a person may perform necessary adjustments, tests or inspections as part of the commissioning process before an amusement device is registered.

The person with management or control of the amusement device must apply to the WHS Regulator for registration of the device.

The application for a new plant item registration includes:

- the details of the item of plant
- the design registration number and issuing regulator
- a statement it has been inspected and assessed as being safe to operate by a competent person.

The process for renewal of plant registration is also considered to be an application; however, the information required is based on the renewal notice sent to the registration holder. The application for renewal will include:

- confirmation that the details in the renewal notice are correct and that the item of plant is still being operated
- a declaration the item of plant has been maintained, inspected and tested as required under the WHS Regulation.

When processing any plant item registration application, or during any audits by inspectors appointed under the WHS Act, the PCBU may be requested to provide copies of records necessary to confirm the details in the application for registration.

An item of plant is not required to be registered under the WHS Regulation if the plant is registered under a corresponding WHS law. However, some mobile amusement devices may be excluded from plant design registration or plant registration in other jurisdictions and still require design registration or plant registration in Queensland. A person with management or control of a mobile amusement device from another jurisdiction should check Queensland's plant design and plant item registration requirements before operating the device in Queensland.

Further information on plant item registration for amusement devices is available at [WorkSafe.qld.gov.au](https://www.worksafe.qld.gov.au).

5. Installing amusement devices

WHS Regulation section 201 Duties of PCBUs that install, construct or commission plant

A PCBU who installs, constructs or commissions plant to be used at a workplace must ensure the plant is installed, constructed or commissioned having regard to:

- the information provided by the designer, manufacturer, importer or supplier of the plant, or
- the health and safety related instructions provided by a competent person.

WHS Regulation section 204(3) Control of risks arising from installation or commissioning

A person with management or control of plant at a workplace must ensure that a person who installs, assembles, constructs, commissions or decommissions or dismantles the plant is a competent person.

WHS Regulation section 204(4) Control of risks arising from installation or commissioning

A person with management or control of plant at a workplace must ensure that a person who installs, assembles, constructs, commissions or decommissions or dismantles the plant is provided with the available information for eliminating or minimising risks to health or safety.

WHS Regulation section 204(5) Control of risks arising from installation or commissioning

A person with management or control of plant at a workplace must ensure that the processes for installation, construction, commissioning, decommissioning and dismantling of plant include inspections that ensure, so far as is reasonably practicable, that risks associated with these activities are monitored.

ES Regulation section 68 Duty of PCBU

A PCBU must ensure, so far as is reasonably practicable, no person, plant or thing at the workplace comes within an unsafe distance of an overhead or underground electric line. If it is not reasonably practicable to ensure there is a safe distance, the PCBU must ensure a risk assessment is conducted and control measures are implemented consistent with the risk assessment and any requirements of the electricity entity responsible for the electric line.

ES Regulation section 69 Meaning of unsafe distance for persons, operating plant and vehicles for overhead electric lines

Meaning of unsafe distance and exclusion zone for persons operating plant and vehicles near overhead electric lines.

5.1 Installation and set-up of amusement devices

Amusement devices must be set up or installed having regard to:

- information provided by the designer, manufacturer, importer or supplier of the device, or
- instructions relating to health and safety provided by a competent person. Health and safety information must be provided to anyone installing, assembling or constructing an amusement device. This includes information on eliminating or minimising the risks to health and safety from these activities.

The person with management or control of the amusement device should ensure there are clear procedures for setting up the device having regard to the information provided by the designer, manufacturer, importer or supplier of the device, or a competent person. For mobile devices, the person with management or control of the amusement device should

also ensure there are clear procedures for safely disassembling, packing up and transporting the device (e.g. securing the device so that parts of the device do not come loose during transport).

Procedures for setting up the amusement device should, where applicable, include:

- assessing ground conditions and ensuring conditions and supporting surfaces are suitable for the amusement device. This includes considering ground slope, bearing capacity and suitability for inserting ground stakes. If ground stakes are to be used, underground services need to be identified before installing the device
- ensuring the amusement device is set up clear from buildings, trees, overhead and underground electric lines, underground services, vehicle and pedestrian pathways and other amusement devices
- ensuring the ride envelope of the device does not intrude on the ride envelope of any adjacent amusement device
- ensuring parts of the device are properly aligned and not bent or distorted
- ensuring parts of the device that are corroded, worn or damaged beyond specified discard criteria or limits are not used
- ensuring any necessary fastening and locking devices are installed and properly secured
- ensuring parts of the device are lubricated where this is required
- ensuring any temporary supports or attachments are compatible with the amusement device and have an adequate capacity for the likely loads. Advice from a competent person may be needed to confirm the suitability of any temporary equipment used
- if it is identified during set up of the device that repairs are necessary, ensuring any repairs are carried out by a competent person and checked to ensure the device can be operated safely
- ensuring where split pins or taper pins are used in floating spindles, washers are fitted between the pins and adjacent rubbing surfaces
- ensuring the correct pins, bolts and other connectors are used as specified by the manufacturer or a competent person, and fully engaged with all retainers fitted
- ensuring self-locking nuts (e.g. nyloc nuts) are fitted in accordance with the manufacturer's instructions and are only reused where specifically allowed by the instructions. Some types of self-locking nuts can only be used once
- ensuring protective padding is placed over sharp edges
- ensuring lighting is installed where necessary
- ensuring metal parts of the device are correctly earthed or double insulated from electrically live parts
- ensuring electrical protection devices are adequate to protect against overcurrent:
 - maximum power rating of the device is known and the device is only connected to a power supply with an adequate power rating
 - the amusement device, or the power supply it is connected to, includes a protective device (circuit breaker or fuse) to protect from exceeding the current-carrying capacity/rating
- ensuring a residual current device (also known as a safety switch) is installed and tested as required
- where connected to a generator, ensuring:
 - the cables are connected correctly, including ensuring that the earth connection is made first and any live phase connectors cannot be incorrectly inserted. Further information on plugs and socket outlets is provided in *AS/NZS 3123 Approval and*

test specifications – Plugs, socket-outlets and couplers for general industrial applications.

- if connecting a generator requires electrical work to be performed, that this is carried out by the appropriate electrical licence holder, such as the holder of an electrical mechanic licence
- the generator is correctly sized for the load including undervoltage protection to ensure the generator will not be overloaded. NOTE: a generator is an electrical supply and electrical safety legislation requirements also apply.
- ensuring electrical accessories, connectors, plugs, light fittings, cables and associated wiring, extension outlet sockets and flexible cords:
 - do not have defects or damage
 - are compatible with each other.
- ensuring covers and guards are secured in the manner intended by the manufacturer or supplier to prevent contact with, or exposure to, energised parts
- ensuring ventilation inlets and exhausts are unobstructed
- ensuring engine exhausts are not placed indoors or anywhere that the air quality for people will be adversely affected
- ensuring any fuel is stored safely and securely
- ensuring health and safety equipment is kept in good working order and free from obvious defects.

Additional things to be carried out or checked when a mobile amusement device is being set up for use include:

- ground and supporting surfaces, such as:
 - firm ground that can support the weight of the loaded device and any plant used to erect or maintain it (e.g. forklifts or cranes)
 - temporary foundations or footings that can carry applied loads
 - slope of the ground that may affect the suitability (levelling) and stability of the device
 - site drainage and the potential impact from rain
 - for an inflatable device—ground that is suitable to hold anchors in place for the anchorage system that is suitable for the device (e.g. some local councils or property owners may not allow the use of stakes on sealed surfaces or other designated ground areas).
- weather conditions (e.g. high winds, rain, lightning)
- ensuring safe access for workers, patrons and emergency vehicles (e.g. access for an emergency vehicle if there is a need for emergency evacuation), particularly access to large amusement devices
- where timber is used under outrigger footplates or under props to level the amusement device, it should be sound, graded timber and arranged so that successive layers are laid at 90 degrees to each other. Where multiple layers of timber are used, and the motion of the device may transfer vibrations to the timber packing, it may be necessary to secure the timber layers to prevent movement
- where engineered mats manufactured of steel, synthetic or composite materials are used under outrigger footplates or under props, they are used in accordance with the manufacturer's or supplier's instructions (e.g. compliance with the load rating).

Section 10 of this code provides further information on electrical safety.

5.2 High risk work licences

WHS Regulation section 81 Licence required to carry out high risk work

A person must not carry out a class of high risk work unless the person holds the relevant high risk work licence. There are exceptions to this requirement, for example a person who is being trained to obtain a licence to carry out high risk work and is under supervision by a high risk work licence holder.

For further information about exceptions, see section 82, WHS Regulation.

A high risk work licence is required to operate certain types of plant that may be used to install or erect an amusement device, such as forklift trucks, boom type elevating work platforms and certain cranes. A high risk work licence is also required to carry out dogging, rigging or scaffolding work, including the erection and dismantling of scaffolding, where the distance a person or object could fall exceeds 4 metres.

Any person undertaking high risk work must hold the relevant high risk work licence.

Further information on high risk work licences is available at [WorkSafe.qld.gov.au](https://www.worksafe.qld.gov.au).

6. General workplace management

6.1 The work environment

WHS Regulation section 40 Duty in relation to general workplace facilities

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

- the layout of the workplace allows, and the workplace is maintained to allow, for persons to enter and exit and to move about without risk to health and safety, both under normal working conditions and in an emergency
- work areas have space for work to be carried out without risk to health and safety
- floors and other surfaces are designed, installed and maintained to allow work to be carried out without risk to health and safety
- lighting enables each worker to carry out work without risk to health and safety, persons to move within the workplace without risk to health and safety, and safe evacuation in an emergency.

Slips, trips and falls are a common hazard. They can happen anywhere at the workplace, including while amusement devices are being installed, operated and dismantled. Often work is being conducted outdoors and can be on rough or uneven ground. Rainy weather can make walking surfaces slippery or muddy, and create potholes and pools of water. Good housekeeping practices can reduce the risk of slip, trip or fall injuries (e.g. keeping all work areas clear of obstructions, removing any temporary obstacles such as electrical cords, ropes or boxes).

Other ways to reduce the risk of slips, trips and falls include:

- providing, and regularly maintaining, level accessways and work areas including on and around the amusement device
- managing risks of contaminants on the floor surface (e.g. rain, mud or condensation that may increase the risk of slips and falls)
- providing floor and standing surfaces on amusement devices with adequate grip for expected weather conditions.
- providing and maintaining adequate handrails and steps that are non-slip and have a contrasting front edge on each step. For more information, refer to *AS 1657 Fixed platforms, walkways, stairways and ladders – Design, construction and installation*
- providing adequate lighting to enable pathways and any hazards or changes in walking surface to be seen
- providing boot cleaning stations to reduce build up on soles of work boots
- early reporting of slip or trip hazards and taking action to eliminate or minimise the hazard
- having a system of regular cleaning and spot cleaning on and around the amusement device.

6.2 Hazardous manual tasks

WHS Regulation section 60 Managing risks to health and safety

A PCBU must manage risks to health and safety relating to a musculoskeletal disorder associated with a hazardous manual task. In determining control measures for hazardous manual tasks, a PCBU must consider all matters that might contribute to a musculoskeletal disorder including:

- postures, movements, forces and vibration relating to the hazardous manual task
- duration and frequency of the hazardous manual task

- workplace environmental conditions affecting the task or worker
- design of the work area
- layout of the workplace
- system of work used
- the nature, size, height or number of persons, animals or things involved in carrying out the hazardous manual task.

WHS Regulation schedule 19 definition of ‘hazardous manual task’

A ‘hazardous manual task’ means a task that requires a person to lift, lower, push, pull, carry or otherwise move, hold or restrain any person, animal or thing that involves one or more of the following:

- repetitive or sustained force
- high or sudden force
- repetitive movement
- sustained or awkward posture
- exposure to vibration.

During the installation and operation of amusement devices, workers may be exposed to hazardous manual tasks that can lead to musculoskeletal disorders. Work that may be a hazardous manual task includes:

- lifting and moving amusement device components during the installation of the device. This may have risk factors of repetitive or sustained force, high and sudden force, awkward posture and/or repetitive movements (e.g. moving and attaching the cars to the sweep arms of a ride, or handling or moving inflatable amusement devices).
- manually hammering in pins, pegs or stakes which may have risk factors of awkward and sustained postures, and/or repetitive movements
- securing patron restraints may include risk factors of high or sudden force (e.g. if restraints are jammed and hard to open/close) and/or repetitive movements
- high or sustained force when operating the amusement device (e.g. in hands and arms when operating controls), repetitive movements, awkward postures and vibration (e.g. standing on a vibrating surface of the device).

A task may involve more than one risk factor that can contribute to musculoskeletal disorders. Where several risk factors are present the risk of a musculoskeletal disorder increases significantly.

A PCBU should carry out a risk assessment, in consultation with workers, for any manual tasks identified as being hazardous, unless the risk is well known and the PCBU knows how to control it. PCBUs must consult workers when identifying hazards and assessing risks to health and safety. Workers can provide valuable information about work that results in discomfort and muscular aches and pains. Section 3 of this code provides further information on consultation with workers.

When conducting a manual task risk assessment, consider sources that may cause risk factors such as:

- the systems of work and the way the work is organised can contribute to fatigue
- shift arrangements
- duration of the task or deadlines (e.g. for site set up)
- environmental factors such as gusty winds, or rough ground conditions
- the design and layout of the work area (e.g. layout of the site when the amusement devices are being set up, and access to it)
- the nature, size, weight or number of things to be handled (e.g. parts of the amusement device that are regularly assembled and disassembled).

Examples of control measures for hazardous manual tasks include:

- designing the work in a manner that minimises exposure to hazardous manual tasks
- having materials, tools and items delivered and suitably located to minimise the amount of carrying required over long distances
- using mechanical equipment to eliminate or reduce the need for workers to lift, carry or support materials and equipment. Wherever practical use forklifts, vehicle loading cranes, lifting hoists and trolleys, but ensure that an additional risk is not introduced when working with these aids in the same workspace as other workers.
- selecting tools that are suitable for the task and are well maintained.

Further information on managing the risk of hazardous manual tasks is in the *Hazardous manual tasks Code of Practice*.

6.3 Noise levels

WHS Regulation section 57 Managing risk of hearing loss from noise

A PCBU at a workplace must manage risks to health and safety relating to hearing loss associated with noise. A PCBU must ensure the noise to which a worker is exposed at the workplace does not exceed the exposure standard for noise.

WHS Regulation section 56 Meaning of exposure standard for noise

The exposure standard for noise, in relation to a person, means –

- $L_{Aeq,8h}$ of 85 dB(A), or
- LC_{peak} of 140 dB©.

Exposure to high noise levels can cause permanent hearing loss.

The operation of amusement devices or localised, loud music or entertainment accompanying operation of the amusement device could expose workers and patrons to hazardous noise levels. The PCBU with management or control of an amusement device should also consider potential noise exposure for other PCBUs and workers in close proximity (e.g. an adjacent device or stall) and consult, cooperate and coordinate with other PCBUs to manage the risk associated with exposure to noise.

Noise to which a worker is exposed must not exceed the exposure standard for noise under the WHS Regulation. The exposure standard for noise in the WHS Regulation is:

- an 8-hour equivalent continuous exposure of 85 dB (A-weighted sound pressure level), or
- a peak exposure level of 140 dB (C-weighted sound pressure level).

There are two parts to the exposure standard because noise can cause gradual hearing loss over time or be so loud that it causes immediate hearing loss. As a guide, if a person needs to raise their voice to communicate with someone about one metre away, the noise is likely to be hazardous to hearing.

Noise affects more than hearing, even at levels where hearing loss is unlikely to occur. Noise can interfere with concentration, communication, and can increase the risk of fatigue and cardiovascular disorders.

In addition to minimising the health risks associated with noise exposure, reducing noise levels can assist in enabling more effective communication if responding to emergencies, or when communicating with patrons in general, such as during ride safety briefings.

Further information about managing risks from noise exposure is in the *Managing noise and preventing hearing loss at work Code of Practice*, which also provides guidance about keeping noise levels:

- below 50 dB(A) where work is being carried out that requires high concentration or effortless conversation
- below 70 dB(A) where more routine work is being carried out that requires speed, attentiveness or where it is important to carry on conversations.

6.4 Emergency plans and first aid

WHS Regulation section 43 Duty to prepare, maintain and implement emergency plan

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

- emergency procedures
- testing of emergency procedures, including the frequency of testing
- information, training and instruction to relevant workers in relation to implementing emergency procedures.

A PCBU at a workplace must maintain the emergency plan for the workplace so that it remains effective.

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

An emergency plan must be prepared and maintained so that it remains effective for the workplace. The plan's emergency procedures must include:

- an effective response to an emergency
- evacuation procedures
- notifying emergency service organisations at the earliest opportunity
- medical treatment and assistance
- effective communication between the person authorised by the PCBU to coordinate the emergency response and all people at the workplace.

A person with management or control of an amusement device should consider the following as part of an emergency plan, where applicable:

- warning systems and evacuation procedures that use simple language and/or simple diagrams
- displaying emergency contact numbers where they can be read easily
- outlining the responsibilities of different workers (e.g. operators, attendants and maintenance workers)
- how workers will communicate with each other and emergency services
- the availability of firefighting and rescue equipment on the site
- emergency stop systems and safe shut-down procedures for the device, including what part or parts of the device are controlled by emergency stops
- using emergency or specialist equipment to release patrons from the device in an emergency
- training workers to respond to injured people and unpredictable patron behaviour in an emergency
- space required for access by emergency services to respond to an emergency, including evacuation of patrons from the device
- the impact of stress on performance in emergencies (e.g. focussing on speed and inadvertently ignoring other important information relevant to the situation)
- how the emergency plan may be affected during night operation or adverse weather

- how often emergency drills will be conducted as part of testing the emergency plan (e.g. more regular testing of evacuation procedures for amusement devices where patrons can become stuck at height)
- conducting debriefs after emergencies or testing the emergency plan to identify areas where improvement may be required.

The person with management or control of the amusement device should ensure emergency procedures take into account the potential impact of a power failure, malfunction, unplanned stoppage or fire in relation to evacuation of patrons from the device. Where applicable for the amusement device, this may include:

- functions or equipment to bring the device to a position where patrons can disembark
- fixed walkways, stairs, platforms or hatchways that are readily accessible
- the capacity for remote release of patron restraints.

Clearly marked exits should be established including those used for emergency evacuation. Where ambient light is low, exit signs and pathways should be illuminated.

Amusement devices in enclosed spaces (e.g. a ghost train), should have torches at designated locations so they are readily accessible to operators and attendants. Consideration should also be given to operators and attendants carrying a torch or headlamp to provide additional lighting in an emergency evacuation.

Exit points should be fitted with a gate or door to secure against entry from outside while providing an obvious means of egress from the amusement device operating area.

For mobile amusement devices which are used at various workplaces, a person with management or control of the amusement device must, so far as is reasonably practicable, consult, cooperate and coordinate with other duty holders in relation to their emergency plans for the workplace (e.g. the PCBU organising the event or person with management or control of the workplace).

Further information about emergency planning is in the *Managing the work environment and facilities Code of Practice*.

There are more comprehensive regulatory requirements regarding emergency plans at major amusement parks. For further information on these requirements, see chapter 9A of the WHS Regulation.

WHS Regulation section 42 Duty to provide first aid

A PCBU must ensure the provision of first aid equipment for the workplace, that each worker has access to the equipment, and access to facilities for the administration of first aid.

An adequate number of workers must also be trained to administer first aid at the workplace or workers must have access to an adequate number of other persons who have been trained to administer first aid.

For mobile amusement devices which are used at various workplaces, the person with management or control of an amusement device must, so far as is reasonably practicable, consult, cooperate and coordinate with other duty holders in relation to first aid equipment and facilities for the workplace (e.g. the PCBU organising the event or person with management or control of the workplace).

Further information about providing first aid is in the *First aid in the workplace Code of Practice*.

7. Operation of amusement devices

7.1 Information, training, instruction and supervision for operators and other persons working with an amusement device

WHS Act section 19(3)(f) Primary duty of care

A PCBU must ensure, so far as is reasonably practicable, the provision of any information, training, instruction or supervision that is necessary to protect all persons from risks to their health and safety arising from work.

WHS Regulation section 39 Provision of information, training and instruction

A PCBU must ensure information, training and instruction provided to a worker is suitable and adequate having regard to:

- the nature of the work carried out by the worker
- the nature of the risks associated with the work
- the control measures implemented.

The information, training and instruction must, so far as is reasonably practicable, be provided in a way that is readily understandable by any person to whom it is provided.

WHS Regulation section 238 Operation of amusement devices

A person with management or control of an amusement device at a workplace must ensure the device is operated only by a competent person who has been provided with instruction and training in the proper operation of the device.

Instruction and training must include:

- procedures for checking the device before it is operated with passengers
- starting, operating and stopping the device under normal conditions
- stopping the device in an emergency
- providing for the safe access of passengers onto or into the device, including how to place, manage and secure passengers
- giving safety instructions about the device to passengers
- providing for the safe exit of passengers off or out of the device, including how to exit the device in an emergency or because of a power failure or malfunction of the device.

WHS Regulation section 204(3) Control of risks arising from installation or commissioning

A person with management or control of plant at a workplace must ensure that a person who installs, assembles, constructs, commissions or decommissions or dismantles the plant is a competent person.

Before an amusement device is used, the person with management or control of the amusement device must ensure workers who are to operate the device are provided with instruction and training necessary to operate the device properly. The person with management or control of the amusement device should ensure the instruction and training about operating the device is provided by a competent person.

The person with management or control of the amusement device must also ensure workers performing duties connected with operating the amusement device (e.g. attendants who assist and guide patrons on to the device) are also provided with information, training and instruction for the work to be carried out.

Instruction and training for operators of an amusement device must include:

- procedures for checking the device before it is operated with passengers
- starting, operating and stopping the device under normal conditions
- stopping the device in an emergency

- providing for the safe access of passengers onto or into the device, including how to place, manage and secure passengers
- giving safety instructions about the device to passengers
- providing for the safe exit of passengers off or out of the device, including how to exit the device in an emergency or because of a power failure or malfunction of the device.

Instruction and training should cover:

- a clear explanation of roles and responsibilities for people operating the device
- a clear explanation of roles and responsibilities for people who are attendants for the device (e.g. when patrons can be assisted to enter and exit the device or where the designated safe zone is for attendants during different stages of the device being operated).
- for mobile amusement devices, there should also be a clear explanation of roles and responsibilities for people who install, assemble, construct or dismantle the device. This should include instructions on safely disassembling, packing up and transporting the device for workers involved in those activities.
- the manufacturer's operating instructions or other written operating instructions prepared by a competent person
- if applicable for the device—speed limits, balancing loads (including number, distribution and placement of patrons on the device), ride times and frequency (e.g. a loading plan for the placement of patrons on the device which takes into account forces affecting patrons during operation of the device to minimise the risk of a large patron colliding with or squashing a child).
- methods of communicating with other device operators/attendants (e.g. if headsets or other devices are used)
- limiting operator/attendant distractions (e.g. not using a personal mobile phone or other personal electronic device while operating the device)
- patron restrictions and methods for screening patrons, including the PCBU's process for assessing disabilities in relation to restrictions for the device. Examples of restrictions may include the height, weight and girth of patrons or circumstances where an adult is required to accompany a child on a device. Patron restrictions should include all necessary information, based on anthropometric data, for the physical characteristics of the allowable group of riders for the device. Training on patron restrictions should also cover common things to be checked to ensure patron restrictions are being applied accurately (e.g. removing shoes with thick soles or high heels, hair styles that make it difficult to confirm the patron's height at the top of their head)
- how to manage patrons who should not be allowed on the device (e.g. people who do not meet allowable riding requirements specified by the manufacturer or a competent person, people who appear to be under the influence of alcohol or drugs)
- how to manage patrons who are not following safety instructions (e.g. a patron smoking when on or near the amusement device)
- how to manage aggressive or unexpected patron behaviour towards operators and other patrons
- how to manage patron requests which could distract the operator from operating the amusement device (e.g. minding a young child while other family members are on the device)
- safe waiting and viewing places for spectators
- use and maintenance of safety equipment (e.g. fire extinguisher)
- local environmental conditions (e.g. when the amusement device is not to be used due to weather conditions such as high winds, heavy rain or unsuitable ground conditions)

- how to report faults, malfunctions or other incidents associated with operation of the amusement device. This should also include encouraging reporting of operator errors or concerns so the PCBU can identify issues in systems that need to be addressed (e.g. the design of the controls or changing the operator's work demands).
- how operators/attendants will be advised of any changes in procedures associated with operating the amusement device (e.g. where a seat is required to be taken out of service due to a fault identified with the security of the restraint locking mechanism)
- emergency and evacuation procedures during amusement device failure or an incident, including practical training or drills on how to stop the device in an emergency and evacuate patrons from the device. Training in dealing with emergencies should deal with a variety of scenarios including device malfunctions, medical emergencies, and stranded patrons.
- how to provide, or obtain, first aid assistance
- using, testing and storing PPE, including PPE required for emergencies
- the PCBU's policy regarding alcohol and drugs, including medication that has warnings about operating machinery
- the PCBU's policy regarding job rotation and breaks
- reporting procedures for operators/attendants where they are concerned about other factors that may affect their ability to operate the amusement device safely (e.g. patron-related violence, work-related stress, bullying, harassment, fatigue, medical issues or the effect of secondary employment commitments).

The person with management or control of the amusement device must ensure:

- workers who have completed instruction and training are assessed as competent to ensure they have acquired the necessary knowledge and skills to operate the amusement device
- names of trained and competent operators are recorded in the log book for the device. Section 12 of this code provides further information about log books and record keeping requirements.

The person with management or control of the amusement device should ensure operators and attendants are supervised by a competent person until they can carry out their role competently and safely.

Instruction and training should include practical training and instruction that is appropriate for the needs of workers (e.g. it should be appropriate for their literacy levels, experience and the specific skills required for the safe use of the amusement device).

The person with management or control of an amusement device should have a system in place to ensure operator and attendant competency is maintained, for example, through:

- supervision of operators and attendants
- pre-start briefings and toolbox talks
- routine assessment of proficiency in performing assigned tasks for operation of the device/performing tasks as an attendant for the device
- participation in emergency drills
- reviewing incidents to determine if other action is needed (e.g. to update training or provide refresher training)
- making operators and attendants aware of new or amended procedures, and the process for amending procedures.

Factors to consider in maintaining competency for amusement device operators and attendants include:

- changes to functions or performance of tasks for operation of the device or being an attendant for the device
- changes to procedures for operation of the device or being an attendant for the device
- the period of time since a person last operated the device or was an attendant for the device
- the risk of complacency associated with ongoing operation of the device or performing work as an attendant for the device.

Where the person with management or control of an amusement device considers a worker may not be competent to operate the device or perform tasks related to operation of the device, the person should:

- determine whether the worker should cease operating the device or performing related tasks until a full assessment of competency can be carried out
- identify any gaps in the worker's competency
- develop and implement a training plan to enable the worker to be assessed for competency
- determine when a worker is competent and can return to operating the device or performing tasks related to operation of the device.

7.2 Operating an amusement device

WHS Regulation section 206 Proper use of plant and controls

Proper use of plant and controls

WHS Regulation section 238(1A) Operation of amusement device

A person with management or control of an amusement device must ensure the device is only operated by a person who is competent to operate the device.

WHS Regulation section 238(2)(d) Operation of amusement device

A person with management or control of an amusement device must ensure the device is operated by a person who is clearly identifiable as the operator of the device.

A person with management or control of plant that is an amusement device must take all reasonable steps to ensure the device is used only for the purpose for which it was designed, unless the person has determined the proposed use does not increase the risk to health or safety. In determining whether or not a proposed use increases the risk to health or safety, the person with management or control of the plant must ensure the risk is assessed by a competent person.

A person with management or control of an amusement device must ensure the device is only operated by a competent person. Operators must also be clearly identifiable as the operator of the device (e.g. through an identification card, badge or clothing visible to patrons).

The risk management process carried out for operating the amusement device should consider the following:

- how operators interact with the amusement devices they are operating (e.g. the design, layout and placement of controls should be easy for operators to understand and allow for appropriate controls to be identified quickly and accurately). Further information can be found in AS 4024.1901 *Displays, controls actuators and signals – Ergonomic requirements for the design of displays and control actuators – General principles for human interactions with displays and control actuators*
- that the job demands for operators are not excessive, with consideration given to the number, type and complexity of tasks required to be performed, the time available to perform them, and busy times with increased patronage

- that the number of operators allocated for operation of the device is adequate having regard to the number, type and complexity of tasks involved in operating the device safely and peak periods with increased patronage
- rosters and length of shifts take into account the physical and mental demands associated with operating the device. Job rotation and breaks can assist with managing fatigue, loss of concentration and stress associated with patron management.

The person with management or control of the amusement device should ensure:

- operators/attendants provide a handover at shift changeover to communicate information about any issues that have arisen (e.g. maintenance requests, faults observed and reported). This may include checking the log book for details of the daily inspection for the device as well as other documented maintenance requests
- where there is more than one person involved in operation of the device, the operators/attendants are able to communicate clearly. This includes considering the operating environment (e.g. distance between operators/attendants, type of communication devices used, potential obstructions, and noise levels)
- if operators/attendants are in a location away from other workers, there is a method of communication for them to contact other workers (e.g. in the event of an emergency or if they require assistance)
- operators/attendants are provided with equipment necessary to check any patron restrictions for the device (e.g. height sticks or frames for measuring patron dimensions such as height, weight and girth)
- operators/attendants check patrons before they enter the amusement device to ensure compliance with any health and safety instructions for patrons (e.g. patron dimension restrictions, the need to remove or secure loose items of clothing or personal devices)
- operators take appropriate action if patrons are not complying with health and safety instructions (e.g. ranging from giving friendly reminders to stopping the amusement device depending on the potential consequence). Section 7.12 of this code provides further information about patron responsibilities.

7.3 Amusement device access and storage

WHS Regulation section 207 Plant not in use

A person with management or control of plant at a workplace must ensure, so far as is reasonably practicable, that plant not in use is left in a state that does not create a risk to the health or safety of any person.

WHS Regulation section 239 Storage of amusement devices

A person with management or control of an amusement device at a workplace must ensure the device is stored so as to be without risk to health and safety.

The person who stores the device must be a competent person or under the supervision of a competent person.

WHS Regulation section 205 Preventing unauthorised alterations to, or interference with, plant

A person with management or control of plant at a workplace must, so far as is reasonably practicable, prevent alterations to the plant or interference with the plant that are not authorised by the person.

7.3.1 Access to an amusement device

A person with management or control of an amusement device should work closely with event organisers to ensure public safety when the amusement device is used during an event. This includes while the device is being operated at the event and storage of the

amusement device at the site before or after the event (e.g. where amusement devices are set up the night before a school fete).

Examples of when unauthorised access to an amusement device may occur include:

- a person accidentally entering the area of an amusement device while it is being set up or operated (e.g. a small child entering a dodgem car zone while cars are being operated)
- a patron entering the amusement device area to retrieve personal property (e.g. an item of clothing or mobile phone)
- an unauthorised person attempting to climb or gain access to the device while it is being stored at a site before or after the event
- an unauthorised person tampering with the device.

Control measures to minimise the risk of unauthorised access include perimeter fencing, gates, barriers, locks, security personnel and supervision by the device operator or attendant.

Perimeter fencing, gates, barriers and locks should be checked regularly and maintained in good condition to prevent unauthorised access to the device. Gates providing access to the amusement device for maintenance, assembly or inspection should be secured to prevent access while the amusement device is in operation.

In circumstances where an amusement device is being stored at a site temporarily and it is not reasonably practicable to install fencing, gates, barriers or locks to prevent unauthorised access to the device, the person with management or control of the amusement device should consult with the event organiser about security arrangements for the event site to minimise the risk of unauthorised access.

Preventing unauthorised access to an amusement device should not limit emergency access or the ability to evacuate people if necessary.

Table 2 - Permanent and temporary barriers

Permanent barriers	Temporary barriers
<p>Should:</p> <ul style="list-style-type: none"> • be at least 1 metre higher than adjacent surfaces • define the zone • be constructed from suitable materials • prevent people from climbing or moving through or under them • be stable and able to withstand anticipated loads and weather conditions • be secured by installing gates and joints so there is no weak point for entry. 	<p>Should:</p> <ul style="list-style-type: none"> • be at least 900 mm high • be easily identifiable e.g. a distinctive colour • have signs marked "NO ACCESS" in lettering 75 mm or bigger • prevent people from climbing or moving through or under them • be stable and able to withstand anticipated loads and weather conditions • be secured by installing gates and joints so there is no weak point for entry.

A person with management or control of an amusement device should ensure there are crowd control fences, barriers or other physical measures to:

- enable safe and orderly queuing for patrons
- define the safe loading and unloading area
- provide safe passage for operating staff and patrons

- prevent access to areas that are exclusion zones during operation of the device (e.g. prevent access to the ride envelope and ensure patrons remain in designated access areas)
- protect the health and safety of spectators and other people in the vicinity.

Access for patrons entering or exiting the amusement device should be:

- defined clearly
- illuminated where necessary
- free of slip, trip and fall hazards (e.g. provide even surfaces kept clear of debris, litter or obstructions).

For an amusement device which is in motion during operation, barriers should be located to prevent:

- a person outside the barrier from touching or coming into contact with the device or a patron on the device while the device is in motion, where contact would be likely to cause an injury
- a patron on the device from being able to touch or come into contact with the barrier or a person outside the barrier while the device is in motion, where contact would be likely to cause an injury.

People entering operating areas of the amusement device could be exposed to risk when the device is in operation (e.g. the risk of an impact from moving carriages). This includes patrons entering and exiting the device as well as operators and attendants. Entry through a gate should be supervised by an operator or attendant or locked if the gate is unattended. Some gates at the entrance to an amusement device may be directly controlled by the device operator (i.e. controls on the operator's panel can be used to unlock and/or open the gates). Where gates are unlocked or opened remotely by the operator, the gates should be interlocked with the start of the ride cycle. The control system for the device should prevent the start of a ride cycle if the gates are not closed and locked.

The security of unattended amusement devices should also be managed, for example, by:

- ensuring unauthorised people cannot gain access to control panels or electrical switchboards
- ensuring keys for locking parts of the device are stored safely
- ensuring any fuel or hazardous chemicals associated with the device are stored properly and securely
- keeping other plant and equipment associated with the device stored safely.

7.3.2 Storing an amusement device when not in use

A person with management or control of an amusement device must ensure:

- the device is stored so it is without risk to health and safety, such as taking steps to prevent damage during storage e.g. from corrosion, vermin or weather exposure.
- the available information about eliminating or minimising risks to health and safety is provided to the competent person who is dismantling the amusement device. This should include any information on storing the device safely.

After a prolonged period of storage, the person with management or control of an amusement device should determine if:

- any maintenance work or repairs are required before erecting, using, operating or commissioning the amusement device
- a competent person should inspect the condition of the device and assess if it is safe to operate.

In making this determination, factors that should be taken into account include:

- if the device has been stored for longer than the inspection and maintenance intervals specified by the designer, manufacturer or supplier of the device
- any recommendations made by a competent person about storing the device
- environmental conditions that may have affected storage of the device.

If the amusement device requires plant registration prior to re-commissioning, the device must be inspected by a competent person and assessed as safe to operate.

7.4 Patron restraint and containment

Where there is a risk that patrons could fall or be ejected from an amusement device, including as a result of unexpected behaviour like panicking, the risk must be eliminated or minimised so far as is reasonably practicable.

The design of patron containment and restraint systems will require consideration of the physical characteristics of the group of patrons reasonably expected to ride on the device. It is important that the containment and restraint systems are effective for the range of patrons allowed to ride.

The person with management or control of the amusement device should refer to the manufacturer's specifications and instructions for information on the operation of any restraint systems fitted to the device, and this information should be used to develop procedures for operating the device. If adequate information is not readily available, a competent person should assess the seating and restraint system to determine any patron restrictions that should be applied to the device. It may be necessary to determine the critical dimensions of the restraint system and ensure that all the upper and lower limits of patron restrictions are included in the operating procedures for the device.

Information on the checks required for loading of patrons and locking of restraints should be readily available to workers who operate the device or load patrons on to the device. Where the restraint system includes variable locking positions, the information should include checks required to ensure the correct adjustment of the restraint for patrons.

The restraint locking system, when locked and correctly adjusted for the patron, should effectively restrain the patron who has been loaded on to the device. An example of an effective restraint for a device where there are high ejection forces is a type 5 restraint (class 5 in some international standards) as defined in the applicable technical standard such as *AS 3533.1 Amusement Devices – Design and Construction*. An appropriately designed type 5 restraint is designed to prevent ejection of all patrons, within the allowable group of riders, in the event of any single failure of structural members, mechanical components, or the locking system of the restraint.

If there is a risk that a patron's dimensions e.g. height, weight, girth or other body dimensions, may not be suited to the containment and restraint system design, and could result in them falling or being ejected, suitable screening techniques which are relevant to the seat and restraint design should be implemented. It should be noted that height or weight factors on their own may not be adequate depending on the seat and restraint system design.

Control measures include:

- enclosing patrons in a carriage or providing a restraint system to ensure they remain secured
- containing and keeping patrons separated from moving parts of the device
- where ejection of a patron could result in serious injuries:
 - using unlocking mechanisms that cannot be accessed by the patron (e.g. by having a centrally controlled interlock mechanism for the operator to disengage the restraint system). The control system should only allow the operator to unlock the restraint when the device is stopped in the load/unload position.

- fitting redundant locking mechanisms to ensure the restraint system would continue to be effective even if one of the locks failed.
- screening procedures for patrons to ensure only those who can be restrained effectively are allowed on the device (e.g. screening out children who are too small or patrons who are too large or whose body dimensions do not allow them to be restrained effectively or to meet the load limits for the device)
- checking patrons are effectively restrained and restraints are locked before the amusement device starts.

7.5 Upgrading the patron restraint on older amusement devices

Serious injuries and fatalities can occur if a patron restraint on an amusement device fails to secure patrons while they are subjected to ejection forces. This may be more likely to occur on older amusement devices where patron restraints were designed in accordance with superseded technical standards. Such a restraint system may rely on a patron's ability to hold on to the restraining mechanism (e.g. a lap bar) and remain in the intended riding position to avoid being thrown from the carriage during the ride.

A person with management or control of an amusement device that has a patron restraint designed to a superseded technical standard should:

- engage a competent person to assess the effectiveness of the patron restraint system in accordance with AS 3533.1 *Amusement Devices – Design and Construction*
- implement additional engineering control measures to eliminate or minimise, so far as reasonably practicable, the risk to patron safety. This may require determining the upper and lower limits for the range of allowable patrons and ensuring the seat and restraint system is effective for all patrons within that range.

Where acceleration due to device motion results in ejection forces on the patron, the assessment of any upgrade to the restraint system should consider the following:

- patrons being able to move from the designated riding position
- patrons being able to move to positions where they are exposed to a risk of hitting or being hit by parts of the device
- patrons being ejected from the device – the design of the various components that make up the containment and restraint system will need to consider the physical characteristics of the targeted range of patrons who will be able to ride the device. This may include seeking specialist advice from one or more competent persons. For example, an ergonomist who has relevant knowledge and skills in interpreting and applying anthropometric data may be required to look at the size and shape of the seat and any restraint to ensure the combination will be effective to restrain the allowable range of patrons. This may require additional information to be included about patron restrictions in the procedures for the amusement device.

Examples of control measures include:

- installing a secondary locking mechanism if the original locking mechanism can be unlocked by patrons. The design of any secondary locking mechanism should be capable of keeping the restraint locked independently of the original locking mechanism.
- adding profiled seats or dividers on lap bars that are collective restraints (i.e. restraints shared by two or more patrons) to reduce the risk of patrons moving from the intended riding position
- adding extra locking positions to make a fixed restraint adjustable.

An alteration that prevents or minimises the risk of a patron from being ejected is considered a design change that affects health and safety and requires plant design registration. Section 4 of this code provides further information about plant design registration.

7.6 Guarding

WHS Regulation section 206 Proper use of plant and controls

Proper use of plant and controls (including guarding)

WHS Regulation section 208 Guarding

Requirements for guarding used as a measure to control risk associated with plant at a workplace

A guard is a barrier that can perform several functions including:

- preventing contact with moving parts or controlling access to dangerous areas of an amusement device (e.g. prevent a person's clothing or part of their body from being caught or trapped)
- minimising noise through applying sound-absorbing materials.

Where guarding is installed on an amusement device or ancillary equipment, the person with management or control of the amusement device must ensure the guarding:

- is of solid construction and securely mounted so as to resist impact or shock, e.g. the guarding is made of material with adequate strength and is securely mounted
- makes by-passing or disabling of the guarding, whether deliberately or by accident, as difficult as is reasonably practicable
- does not create a risk in itself (e.g. through creating pinch points, or rough or sharp edges)
- is properly maintained.

A person with management or control of an inflatable amusement device should ensure the blower used to maintain the air pressure for the device is guarded to prevent contact with the hazardous parts of the blower.

Further information on guarding is in the *Managing the risks of plant in the workplace Code of Practice*.

7.7 Operator controls

WHS Regulation section 206 Proper use of plant and controls

Proper use of plant and controls (including operational controls)

WHS Regulation section 210 Operational controls

Requirements for operator controls on plant at a workplace

WHS Regulation section 205 Preventing unauthorised alterations to, or interference with, plant

Preventing plant alterations or interference that are not authorised

A person with management or control of plant that is an amusement device must take all reasonable steps to ensure that all health and safety features and warning devices (including operational controls) are used in accordance with instructions and information required to be provided to workers operating the device.

A person with management or control of plant that is an amusement device must ensure that any operator controls are:

- identified on the plant to indicate their nature and function and direction of operation
- located so that they can be readily and conveniently operated by each person operating the device

- located or guarded to prevent unintentional activation
- able to be locked into the 'off' position to enable disconnection from all motive power.

If the need to operate plant that is an amusement device during maintenance or cleaning cannot be eliminated, the person with management or control of the plant must ensure the operator's controls:

- permit operation of the plant while a person is undertaking the maintenance or cleaning, and
- cannot be operated by anyone else other than the person who is carrying out the maintenance or cleaning of the device, or
- if the plant must be operated by another person, the other person is authorised to do so; and
- will allow operation of the plant in a way that risks to any person maintaining or cleaning the plant are eliminated or minimised so far as is reasonably practicable.

The person with management or control of plant that is an amusement device must, so far as is reasonably practicable, prevent unauthorised interference with the device (e.g. patron interference with operator controls for the device).

The person with management or control of an amusement device should, so far as is reasonably practicable, ensure the device's operator control panels minimise complexity for the operator.

Instructions and diagrams on operator controls should be clear and accurately reflect the controls for operating the device.

Where controls move in a particular direction which results in the device moving, there should be consistency between the direction/action of the control and the resulting movement of the device, so far as is reasonably practicable.

Visual indicators should be available to show the operational state of the device (e.g. lights to show that restraints are open or closed/locked, lights to show whether gates are open or closed/locked, warning lights to indicate a fault has been detected).

The person with management or control of the amusement device should ensure:

- device operators are able to read and interpret controls easily from their normal operating position
- device operators are able to reach and operate controls easily (e.g. without awkward body postures)
- other factors that may affect an operator's ability to use controls properly are considered and addressed including:
 - sunlight or glare on controls and screens
 - exposure to heat which could affect the operator's thinking processes (e.g. decision making) and concentration
 - the degree of physical effort required to use controls for the device
 - the operator's position has a clear view of the device or relevant zone of the device.

Further information on operator controls is provided in:

- the *Managing the risks of plant in the workplace Code of Practice*
- AS 4024.1901 *Displays, controls, actuators and signals—Ergonomic requirements for the design of displays and control actuators—General principles for human interactions with displays and control actuators*
- AS 3533.1 *Amusement rides and devices – Part 1: Design and construction.*

7.8 Emergency stops

WHS Regulation section 206 Proper use of plant and controls

Proper use of plant and controls (including emergency stops)

WHS Regulation section 211(2) Emergency stops

If the design of plant at a workplace includes an emergency stop control, the person with management or control of the plant at the workplace must ensure that:

- the stop control is prominent, clearly and durably marked and immediately accessible to each operator of the plant
- any handle, bar or push button associated with the stop control is coloured red
- the stop control cannot be adversely affected by electrical or electronic circuit malfunction.

Emergency stop controls must be clearly marked and should convey what function is stopped by the control (e.g. whether the emergency stop is for all power sources for the device, or part of the device only). AS/NZS 4024.1604 *Safety of Machinery: Design of controls, interlocks and guarding - Emergency stop – Principles for design* specifies functional requirements and design principles for emergency stops. AS/NZS4024.1604 includes a requirement for the actuator of the emergency stop to be red, and as far as practicable, on a yellow background.

The emergency stop should:

- not be the only method of bringing an amusement device to a stop
- be designed as an emergency backup to other controls to stop the device
- be able to stop the device safely, for example, by keeping accelerations below harmful levels to avoid injuries to patrons and to avoid damage to plant from sudden stops.

The person with management or control of the amusement device must ensure workers have been provided with information, instruction and training about using the emergency stop controls. This should include information about:

- what parts of the device are affected by the emergency stop control
- the circumstances in which the emergency stop control is to be used.

The person with management or control of the amusement device should ensure operators are provided with clear decision-making aids to assist with emergencies (e.g. diagrams which show the correct sequence to shut down the device and that accurately reflect the current layout of the controls for operating the device).

Section 6.4 of this code provides further information on emergency plans, including testing emergency procedures.

Section 7.1 of this code provides further information on emergency drills in training for workers.

Uncontrolled start-up of an amusement device can result in serious injuries, particularly to patrons who may be getting on or off the device. Where there is a risk of an uncontrolled start-up of an amusement device, the person with management or control of the amusement device should, so far as reasonably practicable, upgrade the control system for the device to prevent an uncontrolled start-up from occurring.

Further information on emergency stops is in the *Managing the risks of plant in the workplace Code of Practice*.

7.9 Warning devices

WHS Regulation section 206 Proper use of plant and controls

Warning devices must be used in accordance with instructions and information provided.

WHS Regulation section 212 Warning devices

If the design of plant includes an emergency warning device or it is necessary to include an emergency warning device to minimise risk, the person with management or control of the plant must ensure that the warning device is positioned on the plant to ensure the device will work to best effect.

Warning devices should be used in addition to other control measures. Warning devices can indicate that the amusement device is starting or stopping and for patrons to stand clear.

Further information on warning devices is in the *Managing the risks of plant in the workplace Code of Practice*.

7.10 Internal combustion generators

If an internal combustion generator is used, risk controls should include:

- ensuring the generator is connected by a competent person and is inspected and tested to be electrically safe. Where this requires electrical work to be performed, this must be carried out by an appropriate electrical licence holder. Further information is available in AS/NZS 3010 *Electrical installations – Generating sets*
- locating the generator in an area with sufficient fresh air and/or venting exhaust gas to an open area that is away from people
- providing a fire extinguisher (i.e. dry powder chemical) near the generator
- preventing unauthorised access to the generator
- using measures to minimise noise levels (e.g. solid walls enclosing the generator)
- processes to ensure safe refuelling of the generator.

7.11 Signs

A person with management or control of an amusement device should display information about operating restrictions for the device relating to patrons and any possible effects that use of the device may have on patrons. This should be based on information provided by the manufacturer of the amusement device, or where information from the manufacturer is not available, by a competent person. Examples include:

- the minimum or maximum allowable dimensions of patrons
- if it is not advisable or permitted for patrons who are pregnant or have particular medical conditions (e.g. a neck or back injury) to go on a certain type of amusement device
- if there are any physical capabilities needed to go on the device safely (e.g. forces generated by the device may require the patron to control movement of parts of their body)
- advice for patrons about not going on the device if under the influence of alcohol or drugs, including prescription medication advising against use of machinery
- any instructions on what patrons cannot take or use while on the device (e.g. loose items of clothing, and/or mobile phones).

Signs should outline a patron's responsibilities, including:

- not to behave in a way that could adversely affect their own health and safety or the health and safety of other people
- not to behave in a way that may damage the amusement device

- to comply with reasonable verbal and written instructions and warnings given by the person with management or control of the amusement device, or by device operators or attendants (e.g. patrons should secure or store loose items as instructed)
- to use any safety equipment provided.

Signs should include appropriate images, pictures or symbols to ensure they can be readily understood by patrons including by patrons who may not read English.

Signs should be displayed where they are visible to patrons before using, riding or going on the amusement device. At workplaces where there is more than one amusement device operating, the person with management or control of the amusement device should consider the following in relation to location of signs:

- where general signs applicable to multiple amusement devices can be displayed (e.g. at the entrance to the workplace or at booths for purchasing ride tickets)
- where it is necessary to display signs with information specifically relating to a particular amusement device, the sign should be located where it is visible to patrons in the immediate vicinity of the device.

7.12 Patron responsibilities

WHS Act section 29 Duties of other persons at the workplace

A person at a workplace, whether or not the person has another duty under the WHS Act, must:

- take reasonable care for his or her own health and safety
- take reasonable care that his or her acts of omission do not adversely affect the health and safety of other persons
- comply, so far as the person is reasonably able, with any reasonable instruction that is given by the person conducting the business or undertaking.

Unsafe behaviour by patrons on an amusement device can create a risk to their own health and safety and as well as the health and safety of other people.

The person with management or control of an amusement device should ensure:

- patrons are provided with health and safety information and instructions relevant to the device so that patrons understand the standard of behaviour required while on, or using, the device (see examples of hazardous behaviour in Table 3)
- patrons are aware of their responsibility to comply with reasonable instructions affecting health and safety.

Table 3 - Examples of hazardous patron behaviour

Hazardous patron behaviour	
All patrons	<ul style="list-style-type: none"> • ignoring signposted health and safety restrictions e.g. height and weight limitations or pre-existing medical conditions • reaching with hands or feet outside the amusement device where this is not permitted • standing up while on an amusement device where this is not permitted • not using seat belts, patron restraints or other safety equipment as instructed • rough or boisterous action that may overload an amusement device • rough or boisterous interaction with other patrons on the device • not paying attention • turning or twisting the head or body on a high acceleration amusement device • using a mobile phone on a high velocity amusement device • riding while under the influence of alcohol or drugs.
Young children	<ul style="list-style-type: none"> • getting off an amusement device prematurely due to confusion, excitement or fear • putting parts of the body (e.g. hands, feet or head) into gaps, openings or parts of the amusement device where they are not intended to be during the operation of the device • running or jumping while getting on or off an amusement device.

Section 7.2 of the code provides further information about operators and attendants assessing patrons in relation to restrictions (e.g. height, weight and dimension limitations) and monitoring patron behaviour.

8. Inflatable devices

Inflatable amusement devices are used on land (a land-borne inflatable amusement device) or on water (a water-borne inflatable amusement device).

Health and safety risks associated with inflatable amusement devices include:

- the device becoming airborne during strong wind gusts or whirlwinds
- the device becoming unstable and collapsing
- unsafe patron behaviour while on the device.

Requirements in the WHS Act and WHS Regulation regarding plant apply to all inflatable amusement devices.

Requirements in the WHS Act and WHS Regulation which apply to registrable amusement devices apply to continuously blown inflatable amusement devices with a platform height of 3 metres or more.

8.1 Installing an inflatable amusement device

WHS Regulation section 40

Duty in relation to general work facilities

WHS Regulation section 201

Duties of persons conducting businesses or undertakings that install, construct or commission plant

ES Regulation section 68

Duty of person conducting a business or undertaking (overhead or underground electric line)

ES Regulation section 117

Amusement devices and amusement rides

A PCBU that installs plant that is an inflatable amusement device must ensure all anchor points on the device are secured or anchored to the ground having regard to:

- the information provided by the designer, manufacturer, importer or supplier of the device, or
- the health and safety instructions provided by a competent person.

Where a land-borne inflatable cannot be secured with ground stakes (such as on hard surfaces, paving or asphalt), the anchorage system should be able to withstand the same forces as though it were secured with ground anchor stakes. If there are no manufacturer's instructions on securing the inflatable amusement device on surfaces where ground anchor stakes cannot be used, an anchorage system designed to comply with relevant technical standards or engineering principles should be used. Where design of an anchorage system requires the provision of a 'professional engineering service' under the Professional Engineers Act, this must be carried out by or under the supervision of a registered professional engineer under the Professional Engineers Act.

If an inflatable amusement device is regularly set-up at a location where ground stakes cannot be used (e.g. an inflatable device set up outside a retail outlet each weekend), consideration should be given to installing permanent ground anchors.

If an inflatable amusement device is erected and used indoors, it should be secured to:

- maintain stability
- maintain the shape of the device

- prevent the device from moving.

A site-specific risk assessment for the inflatable device should consider all relevant operational and environmental factors. For example, where an inflatable device is set up in a building with large roller doors which are opened while the device is being used, the person with management or control of the inflatable device should ensure control measures are in place to manage the risk of injury arising from strong wind.

A PCBU at a workplace must ensure, so far as is reasonably practicable, the layout of the workplace allows for people to enter and exit and move about without risk to health and safety. For a person with management or control of an inflatable amusement device, this includes ensuring, so far as is reasonably practicable, that the ground stakes or anchoring system used to secure an inflatable device do not create a trip or fall hazard for patrons or workers.

A PCBU at a workplace must manage the risk of a person, plant or thing coming within an unsafe distance of an underground electric line. For a person with management or control of an inflatable amusement device, this includes managing the risk of anchoring stakes contacting an underground electric line. Other underground services such as water or gas infrastructure should also be considered. This includes seeking information about the location of, and safe clearances from, existing underground services, e.g. from Before You Dig Australia and electricity entities.

The person with management or control of an inflatable device must ensure blowers and electrical equipment used for inflatable amusement devices are electrically safe to operate and, where required, connected to a residual current device (safety switch). Blowers should have the correct ingress protection rating for the environmental conditions and be designed to operate in or around water.

When positioning a blower, it should be located in a position where:

- it is not accessible by patrons or members of the public
- contact with water is prevented, including exposure to rain, splashing water and overground water flow
- it is prevented from falling into or being pulled into water.

Backflow devices should be installed between the blower and the inflatable amusement device to prevent sudden deflation if the blower stops working.

For inflatable amusement devices that completely encase patrons (e.g. walk-through inflatable tubes), there should be provision for fresh air circulation with an airflow rate of at least six air changes per hour. Fumes from adjacent internal combustion engines should be prevented from entering any enclosed space where patrons or workers are or are likely to be.

In addition to guidance provided in this code about installation and set-up inspections for amusement devices generally, the person with management or control an inflatable amusement device should ensure:

- the device is checked for holes or rips
- the device is properly inflated before use by patrons
- impact-attenuating material or appropriate surfacing as recommended by the manufacturer or a competent person is correctly placed to minimise the risk of injury to patrons where they could fall from the device.

8.2 Operating an inflatable amusement device

WHS Regulation section 206

Proper use of plant and controls

A person with management or control of an inflatable amusement device must take all reasonable steps to ensure the device is only used for the purpose for which it is designed, unless they have determined that the proposed use does not increase the risk to health and safety. Proper use of an inflatable amusement device includes taking all reasonable steps to ensure:

- the device is not used by more than the maximum number of patrons specified by the designer, manufacturer, importer or supplier of the device or specified by a competent person
- the device is not used when there are wind speeds above the maximum permissible wind speed specified by the designer or manufacturer of the device, or if this is not available, as specified by a competent person
- patrons are evacuated from the device immediately if monitoring indicates the maximum permissible wind speed is likely to be exceeded, and the device is deflated.

In addition to ensuring the anchorage system for an inflatable amusement device remains secure while it is being operated, being aware of forecast weather conditions and monitoring conditions on-site is also necessary.

A person with management or control of an inflatable amusement device should check the weather forecast (e.g. on the Bureau of Meteorology website) for expected weather conditions, including wind speeds, on days when the device is to be installed or operated. Wind speed should be monitored on-site to ensure there is sufficient detection and warning of the maximum permissible wind speed for the inflatable amusement device. An on-site wind speed meter (anemometer) should be used. Weather conditions should be monitored on-site to identify the risk of dust devils forming. A dust devil, also referred to as a whirlwind, is a localised dust filled vortex which typically forms in clear, dry conditions.

If monitoring indicates dust devils are forming in the area or the wind speed is approaching the maximum permissible wind speed specified for the device, all patrons must be evacuated from the inflatable amusement device immediately, and the device deflated. The person with management or control of the inflatable amusement device must ensure the device is deflated or re-inflated by a competent person who has been provided with information about relevant risks to health or safety.

In addition to guidance provided in this code about operating amusement devices generally, the person with management or control of an inflatable amusement device should:

- ensure device operators/attendants understand and follow procedures to stop patrons from engaging in unsafe activities (e.g. rough play, somersaults or flips)
- consider how the risk of injury to smaller patrons can be minimised. This may include:
 - only allowing patrons of similar size, weight and age on the inflatable device at the same time
 - allowing larger patrons on the device if they are specifically accompanying a smaller patron to assist them with being on the device in a safe manner.

During the period in which the device is operated, the person with management or control of the inflatable amusement device should ensure both the device and ancillary equipment are monitored, including:

- checking the anchorage system remains secure
- the blower is operating properly
- there are no holes or rips in the device

- removing any loose objects on the device
- impact attenuating mats remain in the correct position and free of obstruction.

8.3 Additional guidance for water-borne inflatable amusement devices

Water-borne inflatable amusement devices are typically used on controlled water, such as swimming pools, artificial waterways and cordoned off areas of natural bodies of water. Water-borne inflatable amusement devices tend to be more unstable and more difficult to secure in position than land-borne inflatable amusement devices. Closer supervision is needed for patrons using a water-borne inflatable amusement device.

In addition to guidance provided in this code about operating amusement devices and inflatable devices, the person with management or control of water-borne inflatable amusement device should implement control measures to manage the following:

- the risk of patrons drowning if they were to become stuck under a water-borne inflatable device or entangled in anchor lines
- the risk of patrons drowning if they have limited swimming ability
- the risk of patrons being injured due to the depth of water surrounding the device (e.g. diving from the device into shallow water)
- the risk of the device becoming detached from anchor lines and drifting into a hazardous area (e.g. shallow water or an area of water used by vessels)
- the risk of patrons falling off the device and hitting an adjacent hard object (floating or stationary).

The person with management or control of a water-borne inflatable amusement device must ensure a competent person operates the device. This includes supervision of the device when it is being operated. The competent person should hold a current industry recognised qualification in life guarding/water rescue and resuscitation.

Proper use of a water-borne inflatable amusement device includes taking all reasonable steps to ensure patrons are supervised by at least the minimum number of operators and attendants as specified by the designer, manufacturer, importer or supplier of the device or by a competent person, including the required number of qualified lifeguards.

Operators and attendants should be positioned to ensure:

- there is constant supervision of all activities on and around the water-borne inflatable amusement device
- they are able to respond rapidly if any person using the device needs assistance.

Patrons should be provided with information about the swimming ability recommended for using the device safely.

The person with management or control of the water-borne inflatable amusement device should ensure the device operators and lifeguards have adequate methods of communication to instruct patrons to evacuate from the device in the event of an emergency.

For water-borne inflatable amusement devices used in pools, non-slip impact-attenuating matting should be used on pool edges used for access or egress to minimise the risk of injury in the event of a fall. The matting should include a turn down into the pool to protect patrons from hitting the pool edge. Matting may also be required in other areas of the pool edge if there is a risk of a patron falling and hitting the pool edge. The proximity of the waterborne inflatable device to the pool edge should be assessed during set-up of the device.

In addition to duties and requirements under WHS legislation that apply to waterborne inflatable amusement devices at a workplace, the *Safety in Recreational Water Activities Act 2011* may also apply. The *Safety in Recreational Water Activities Act 2011* places a primary duty of care on a PCBU that provides recreational water activities.

9. Inspection, maintenance, testing and repair of amusement devices

9.1 General inspection, maintenance and testing

WHS Regulation section 213 Maintenance and inspection of plant

A person with management or control of plant at a workplace must ensure that the maintenance, inspection and, if necessary, testing of the plant is carried out by a competent person.

Maintenance, inspection and testing must be carried out:

- (a) in accordance with the manufacturer's recommendations, if any, or
- (b) if there are no manufacturer's recommendations, in accordance with the recommendations of a competent person, or
- (c) in relation to inspection, if it is not reasonably practicable to comply with (a) or (b), annually.

WHS Regulation section 240 Maintenance, inspection and testing of amusement device

A person with management or control of an amusement device at a workplace must ensure the maintenance, inspection and, if necessary, testing of the amusement device is carried out:

- by a competent person, and
- in accordance with the recommendations of the designer and/or manufacturer, or the requirements of a maintenance manual prepared by a competent person.

A person is not a competent person to carry out a detailed inspection of an amusement device that includes an electrical installation unless the person is qualified, or is assisted by a person who is qualified, to inspect electrical installations.

An amusement device must be maintained, inspected and tested according to the designer or manufacturer's recommendations, or recommendations in a maintenance manual prepared by a competent person.

Inspections should include checks of the operating systems and components of the amusement device to confirm it is operating in accordance with the designer's or manufacturer's specifications. The checks should also confirm that any existing risk control measures are in place and functioning as designed. Examples of items that may need to be checked include the device's operating sequence, mechanical systems, speed limiting devices, brakes, electrical systems, pressure vessels, fastenings and other safety equipment including barriers.

To protect the health and safety of people conducting inspections and any maintenance required, the person with management or control of the amusement device should ensure that:

- hazardous energy sources are identified and effectively isolated (e.g. the electrical supply to the amusement device is isolated or disconnected prior to the inspection). Some manually powered amusement devices may not need to be isolated during maintenance and inspection, however, it may still be necessary to restrict access when work is undertaken. In this case, appropriate fences or barriers should be used to prevent unauthorised access to the device.
- a lockout device is fixed to the isolation point for the amusement device (in some instances this may be a plug assembly). A tag should be placed on the lockout device advising other people of the inspection or maintenance activities, and warning against reconnection of supply.
- uncontrolled release of stored energy is prevented (e.g. before inspection, releasing energy through an open valve on an accumulator to release pressure, or by positively

restraining stored hydraulic energy by installing a mechanical prop to stop the amusement device moving or collapsing unexpectedly).

- guards removed for inspections and maintenance are correctly replaced before the amusement device or part of the amusement device is operated.

Depending on the type of inspection or testing required, specific procedures may need to be considered to ensure the risk of unintended operation of the device or parts of the device is controlled. The design of the device being inspected may also require the development of specific inspection or testing procedures that include the necessary controls to ensure the inspection or testing can be completed safely.

Section 10 of this code provides information on particular inspection requirements for amusement devices under the ES Regulation.

9.2 Set-up inspections for mobile amusement devices

A set-up inspection for a mobile amusement device involves a competent person examining the site-specific conditions and factors that need to be considered at a location where the device is to be installed or set up. If the inspection requires the provision of a 'professional engineering service' under the Professional Engineers Act, the inspection must be conducted by, or under the supervision of, a registered professional engineer.

9.3 Daily inspections

WHS Regulation section 238(2) Operation of amusement devices

A person with management or control of an amusement device at a workplace must ensure that:

- the device is checked before it is operated on each day it is intended to be operated
- the device is first operated without passengers on each day it is intended to be operated
- daily checks and operation of the device without passengers are recorded in the log book for the device.

WHS Regulation section 240

Maintenance, inspection and testing of amusement device

A person with management or control of an amusement device must ensure a competent person carries out a daily check before operating the amusement device and carries out another check with the amusement device running under power before it is loaded with patrons. The daily check must be carried out in accordance with the recommendations of the designer and/or manufacturer or a maintenance manual prepared by a competent person. If there are no designer or manufacturer instructions, for example, because of the age of the device, daily checks must be carried out in accordance with a maintenance manual for the device that has been prepared by a competent person.

These daily checks must be entered into the log book and should include:

- the date and time of the inspection and operation without passengers
- the name of the person who performed the check
- information about any defects or problems identified in the daily check and steps taken to fix them and/or whether the device should be taken out of service
- an indication the amusement device has satisfied the daily check and is ready to operate.

9.4 Annual inspections

WHS Regulation section 241 Annual inspection of amusement device

A person with management or control of an amusement device at a workplace must ensure that a detailed inspection of the device is carried out at least once every 12 months by a competent person.

An inspection must include:

- a check of information about the operational history of the device since the last detailed inspection
- a check of the log book for the device
- a check that maintenance and inspections have been undertaken
- a check that any required tests have been carried out and that appropriate records have been maintained
- a detailed inspection of the device to ensure compliance with the WHS legislation, including a specific inspection of the critical components of the device.

For annual inspections, a competent person means a person who:

- for inflatable devices (continuously blown) with a platform height less than 9 m—has acquired through training, qualification or experience the knowledge and skills to inspect the plant, or
- for other amusement devices—a person who has the skills, qualifications, competency and experience to inspect the device and is registered under a law that provides for the registration of professional engineers (i.e. registered engineer with the Board of Professional Engineers of Queensland).

WHS Regulation section 242A

Requirements of log book

WHS Regulation section 237

Records of plant

In addition to what must be included in the annual inspection for an amusement device, the person with management or control of an amusement device should ensure the competent person carrying out the inspection includes the following in the inspection, where relevant, for the device:

- items specified for an annual inspection by the amusement device manufacturer or recommended by a competent person
- checking the condition of structural and mechanical components (e.g. seating, brake systems, frames and motors)
- checking the condition and effectiveness of patron restraint devices. This should include checking information on the patron restrictions for the allowable group of riders to confirm the restraints remain effective for the range of allowable riders. Patron restrictions should include all necessary information, based on anthropometric data, for the physical characteristics of the allowable group of riders.
- checking the condition of electrical and electronic systems and components (e.g. cabling and connections, limit switches and sensors that provide for safety-related functions)
- tolerance checks (or measurements, if required) of critical components
- where required by the manufacturer or competent person, non-destructive testing (NDT) of critical areas for evidence of cracking, fatigue, corrosion or excessive stress and that any defects identified by the NDT have been rectified satisfactorily
- a review of the maintenance and inspection criteria to ensure they remain relevant and effective for the device.

The person with management or control of the amusement device should ensure the competent person carrying out the inspection observes the amusement device in its various configurations and modes of operation including (where applicable) packed for transport, partly erected, fully assembled, and when operating. This may mean the inspection takes place over a period of time and is not finalised until all aspects of the inspection are completed.

The annual inspection provides the person with management or control of the device an opportunity to conduct a review of the risk management process outlined in section 2 of this code, including:

- identification of any new hazards, and any existing but previously unidentified hazards
- assessing risks for existing and new hazards
- determining any new control measures for newly identified hazards
- reviewing the effectiveness of control measures for existing hazards.

Records relating to the risk management process including any inspections completed during the hazard identification for the device should be readily available to the competent person carrying out the annual inspection.

If an amusement device requires an electrical installation inspection, or any inspection identifies electrical work is required to be performed for maintenance or repair, the person who inspects the electrical installation or performs the electrical work must be licensed or authorised under the ES Act. The electrical licence holder should provide a record indicating the electrical work undertaken, results of tests performed and a statement that the electrical installation is electrically safe to use and operate. If the electrical licence holder performing the electrical work is not an employee of the person with management or control of the amusement device, the work must be performed under an electrical contractor licence. Section 10 of this code provides further information about electrical safety.

Depending on the type of amusement device being inspected, one individual may not have all the competencies required for all aspects of the inspection. In these circumstances, other specialists must be engaged as required for these aspects of the inspection.

The person with management or control of the amusement device should ensure the competent person carrying out the inspection prepares an annual inspection report which provides a record of what was checked in the inspection. The report should include the methodology, assumptions and results of the annual inspection. It should be clear when and where inspections occurred, and third-party results or reports related to the inspection should be provided with the annual inspection report.

The following details of the most recent annual inspection must be kept in the log book:

- the name of the competent person who carried out the inspection
- date of the inspection
- results of the inspection and any recommendations of the competent person
- any components repaired or replaced during, or as a result of, the inspection.

The person with management or control of the amusement device must keep all earlier records of annual inspections of the device.

9.5 Ancillary equipment inspections

WHS Regulation section 213 Maintenance and inspection of plant

The person with management or control of an amusement device must ensure any ancillary equipment associated with the device is maintained in accordance with the manufacturer's recommendations. If there are no recommendations from the manufacturer, maintenance must be carried out in accordance with the recommendations of a competent person.

Technical standards relevant to particular ancillary equipment may also provide recommendations on maintenance.

Examples of common ancillary equipment include:

- pneumatic systems such as air receivers, compressors, filter dryers, piping, valves, actuators, fittings and hoses
- hydraulic systems such as oil reservoirs, pumps, valves, hydraulic cylinders (rams), motors and actuators, piping, fittings and hoses
- fire extinguishers and fire detecting and fire-fighting systems
- blowers
- lifting and rigging gear
- electrical cabling and flexible cords
- water treatment plant such as filters, pumps, sampling and chemical dosing systems.

The inspections of ancillary equipment should include checks of the integrity of the ancillary equipment to ensure they can reliably and safely perform their intended function. The inspection of ancillary equipment should include checks for:

- degradation such as corrosion, wear, fatigue, cracks and deformation
- leaks
- security and protection of the piping, hoses and cabling
- structural and/or electrical connections for motors, switches, sensors, cylinders and actuators
- wear and clearances in pins, bushes and bearings
- security and protection of the piping, hoses and cabling
- tightness of fasteners.

As part of inspections, ancillary equipment should undergo any necessary function testing to ensure the systems are safe and functioning as designed. If these inspections are included as part of the annual inspection or major inspection for an amusement device, this should be included with the re-commissioning of the device.

Where required, some ancillary equipment must be inspected by a specialist (e.g. pressure vessel inspectors) in accordance with the manufacturer's specifications or, in the case of electrical installations, by a person holding a relevant licence or registration for the work performed (e.g. an electrical work licence, a Queensland electrical contractor licence, or Queensland registration as a registered professional electrical engineer).

Section 10 of this code provides further information about electrical safety.

9.6 Non-routine inspections

A person with management or control of an amusement device should ensure a non-routine inspection is carried out by a competent person in the following circumstances:

- an incident or near-miss relating to the amusement device or ancillary equipment associated with the device. At a minimum, an inspection should be completed to confirm the effectiveness of any control measures that may not have operated as designed.
- the person with management or control of the amusement device receives information regarding a safety issue about the device or type of device from:
 - a worker
 - the designer or manufacturer (e.g. manufacturer's bulletins)
 - industry sources
 - an engineer competent to provide advice
 - any incident reports

- a regulatory authority.

In addition, licensed major amusement parks have specific requirements in chapter 9A (Major amusement parks) of the WHS Regulation in relation to reviewing safety assessments and the safety management system for amusement devices at the park when new amusement device hazards are identified or a control measure has not controlled the risk of an amusement device incident occurring.

9.7 Major inspections

WHS Regulation section 241A Major inspection of amusement device

A person with management or control of an amusement device at a workplace must ensure that a major inspection of the device is carried out by, or under the supervision of, a competent person:

- (a) at the end of any period for a major inspection recommended by the manufacturer of the device, or
- (b) if, following an inspection under section 241 or an earlier major inspection under this section, a competent person recommends a shorter period than the period mentioned in paragraph (a) – as recommended by the competent person, or
- (c) if there is no recommendation for the device under paragraph (a) or (b):
 - (i) if the device has not had an earlier inspection under this section – no later than 10 years after the day the device was first commissioned or first registered, whichever is earlier, or
 - (ii) if the device has had an earlier inspection under this section – no later than 10 years after the day the earlier inspection was completed.

A major inspection carried out under an equivalent provision of a corresponding WHS law is taken to be a major inspection.

For a 'major inspection' of an amusement device, a 'competent person' means a person who:

- (a) for an inflatable device (continuously blown) with a platform height less than 9m – has the knowledge and skills to carry out a major inspection of the device, or
- (b) for any other amusement device:
 - (i) has the knowledge and skills to carry out a major inspection of an amusement device, and
 - (ii) is registered under a law that provides for the registration of professional engineers.

A 'major inspection' of an amusement device means:

- (a) a thorough examination of all critical components of the device, including, if necessary, stripping down the device and removing paint, grease and corrosion; and
- (b) a check of the effective and safe operation of the device.

A person with management or control of an amusement device must ensure a major inspection of the device is carried out by, or under the supervision of, a competent person at the intervals specified in section 241A of the WHS Regulation.

A competent person to supervise or carry out a major inspection of an amusement device is a registered professional engineer who has acquired through training, qualification or experience the knowledge and skills to inspect this type of plant. For inflatable amusement devices with platform heights under 9 metres, the person is not required to be a registered professional engineer but is competent if they have acquired through training, qualification or experience the knowledge and skills to inspect this type of inflatable amusement device.

Depending on the type of amusement device being inspected, one individual may not have all the competencies required for all aspects of the inspection. In these circumstances, other specialists must be engaged as required for these aspects of the inspection. For example, a competent person may be a qualified mechanical engineer but may need to refer the inspection of electronic control systems to specialist engineers who are qualified and

experienced in the field. In forming their opinion, a competent person may use the advice of other competent persons involved in inspecting the device who are not engineers (e.g. a non-destructive testing specialist).

Any electrical installation in the device must be inspected and tested by a person who is licensed or authorised under the ES Act to perform this work. If the electrical licence holder performing the electrical work is not an employee of the person with management or control of the amusement device, the work must be performed under an electrical contractor licence.

The major inspection provides the person with management or control of the amusement device an opportunity to ensure the risk assessment and associated records of any inspections completed during the hazard identification for the device are reviewed as outlined in section 2 of this code.

Where a competent person carrying out the major inspection identifies the viability of upgrading parts of the amusement device to comply with current technical standards, the person with management or control of the device should, so far as reasonably practicable, implement upgrades to improve safety. Where strict compliance with current technical standards is not reasonably practicable, the person with management or control of the amusement device should determine if it is possible to develop an alternative way that achieves the desired safety outcome. Design alterations that affect health and safety must be registered with the WHS Regulator. Section 4 of this code provides further information about plant design registration.

9.7.1 Timing of major inspections

The WHS Regulation requires a major inspection of an amusement device:

- before the end of any period for a major inspection recommended by the manufacturer of the device, or
- if a competent person who has previously completed an annual inspection or major inspection of the device recommends a shorter period than recommended by the manufacturer, the next major inspection is due by the period recommended by that competent person, or
- if there is no recommendation from the manufacturer or a competent person, the device is due for the next major inspection no later than 10 years after it was first commissioned or registered, whichever is earlier; and then no later than 10 years after its last major inspection.

In some circumstances, an amusement device manufacturer may not recommend a period for a major inspection on the basis that compliance with the manufacturer's instructions for detailed inspections, maintenance and replacement of components is equivalent to the outcome achieved by a major inspection. In this situation, the person with management or control of the amusement device should obtain an assessment by a competent person of the manufacturer's instructions to determine if they are appropriate for local conditions and that the detailed inspection, maintenance and component replacement schedule is equivalent to a 'major inspection' under section 241A of the WHS Regulation (i.e. is considered 'an equivalent method').

A person with management or control of the amusement device must keep accurate records detailing all the inspections, testing, maintenance and component replacements as specified in the manufacturer's instructions. When following the equivalent method for a major inspection, the entire set of records from the date the device was first commissioned needs to be available to demonstrate compliance with the major inspection requirement under section 241A of the WHS Regulation. The ability to rely on the equivalent method for a major inspection may be affected by records that are incomplete or lack sufficient detail to demonstrate the manufacturer's requirements for inspections, testing, maintenance and component replacements have been completed satisfactorily.

Where the person with management or control of the amusement device is following the equivalent method, the competent person carrying out annual inspections of the device

should be advised so records can be reviewed properly. If the manufacturer's instructions for inspections, testing, maintenance and replacement of components equivalent to a major inspection are not followed, the person with management or control of the amusement device must comply with the major inspection interval specified in section 241A.

The person with management or control of an amusement device should also consider other circumstances which may trigger the need for a major inspection of the device, or part of the device. For example, AS 3533.2 *Amusement rides and devices Part 2: Operation and maintenance* also specifies a major inspection:

- after a device has suffered a major departure from normal operation or a failure of any major structural or mechanical component
- when a device is to be recommissioned and adequate records are unavailable or the device was designed and built to unknown standards (e.g. importing a second-hand device with incomplete records for the operational history and maintenance of the device).

9.7.2 Major inspection requirements

Under the WHS Regulation, a major inspection of an amusement device involves:

- a thorough examination of all critical components of the device, including if necessary, stripping down the device and removing paint, grease and corrosion, and
- a check of the effective and safe operation of the device.

A major inspection ensures all the high stress areas and critical parts of the device are inspected in detail, including those that are normally hidden or inaccessible during other inspections.

Even if an amusement device has not been in frequent or regular operation, it may have deteriorated due to the way it has been stored or the environment in which it has operated.

The extent to which the amusement device will need to be stripped down for the major inspection is a matter for the competent person supervising or carrying out the major inspection to determine based on their professional judgement and experience and taking all the relevant information about the device into account. The competent person should record relevant information (e.g. non-destructive testing reports, photos of partially stripped components etc.) to support any decision not to strip down a critical component of the device.

As the extent to which the device needs to be stripped down will affect the length of time the device is out of service, it is recommended the person with management or control of the device consult with the competent person about the scope of the major inspection before it commences to allow for adequate scheduling of time for the inspection. See section 9.7.6 of this code for circumstances to consider when determining the extent to which a device should be stripped down.

9.7.3 Critical components

Under the WHS Regulation, a critical component of an amusement device means a component of the device that would, if the component failed to function properly, be likely to cause a risk to the health or safety of a person.

Critical components of an amusement device need to be documented so that details of specifications, applicable standards to which they comply and a source of evidence that demonstrates compliance (i.e. test report, third party certificate/listing document) are readily available.

For maintenance and repairs, including those undertaken during a major inspection, critical components should only be replaced by components that provide an equivalent or a higher level of safety (also certified for the safety application) and a record must be kept of the replacement components. Components should preferably be replaced with those approved by the manufacturer. Critical components can be electrical, electronic, hydraulic, pneumatic, mechanical and structural in type.

Appendix D in AS 3533.3 *Amusement rides and devices Part 3: In-service inspection* provides further information on non-destructive testing of critical components.

Safety related control functions (including electrical, electronic, hydraulic, pneumatic and mechanical components) may be critical functions for the safe operation of the device. The subsystem elements, low or high complexity components, such as sensors, that make up the various circuits for a specific safety function should be inspected or tested as part of any major inspection. It may be necessary to refer to the manufacturer's information or obtain specific advice from a competent person on the inspection or proof testing requirements for the safety related control system components. Where these components are identified as a critical component (i.e. if the component failed to function properly it would be likely to cause a risk to the health or safety of a person) these must be included in the major inspection of the device.

9.7.4 Inspection criteria

Potential damage and wear to an amusement device can be caused over time by many factors, including:

- normal operation of the amusement device, even when operated in accordance with the manufacturer's instructions
- environmental factors such as corrosion or degradation of electrical or electronic components from water ingress or storage outdoors, particularly in coastal environments, or storage over extended periods
- humidity and extreme temperatures causing degradation of electrical or electronic components
- movement and vibration of mobile amusement devices while being transported by road. This can be exacerbated by travel on uneven roads and where the device is not restrained correctly for road travel.

The inspection criteria for an amusement device should consider factors specific to the device being inspected including:

- the operational history
- maintenance records
- environmental factors
- modes of operation
- any other factor that has potentially serious consequences for safety.

Inspection criteria, including for non-destructive testing, should be reviewed, and where necessary, revised so that it remains relevant and effective for the device.

The inspection criteria for a major inspection are aimed at reducing the risk of incidents caused by an unexpected failure of an amusement's device's critical components. The criteria relate to the amusement device itself and not to roadworthiness issues for vehicle-related components of mobile amusement devices. Additional inspections may be required to ensure the transport-related components comply with requirements set out in transport or road safety legislation. This may include items such as brake/tail and indicator lights, wheels and brakes, suspension, tow connections and load restraint for securing the amusement device during transport.

Before dismantling the amusement device, it is advisable to carry out full function tests on the device to determine if any function requires specific detailed checks and repairs, for example, tests to identify if the safety control system or rider restraint locking mechanisms are functioning correctly.

Amusement devices can be subjected to cyclic loading during normal operation and transport (vibration effects in the case of mobile devices). The cumulative effect of cyclic loading can lead to the development of cracks on various supporting structures. If

undetected, the cracks may continue to worsen and increase the risk of a catastrophic failure of the device. For mobile devices, the competent person should not estimate the device's fatigue life based on loading cycles due to hours of operation alone, but also consider the effect of transport on the device.

The person with management or control of the amusement device should ensure the competent person supervising or carrying out the major inspection:

- is provided with any recommendations or instructions for the major inspection supplied by the manufacturer of the device
- follows the manufacturer's recommendations or instructions in supervising or carrying out the major inspection. Where a competent person determines there are reasonable grounds to depart from the manufacturer's recommendations or instructions (e.g. to provide for a higher level of safety or replace a part sooner or later than scheduled), the reason should be recorded in the major inspection report.

Where a manufacturer's recommendations or instructions for a major inspection do not exist or do not include enough details (e.g. do not take local environmental issues into account), the person with management or control of the amusement device should ensure a competent person develops inspection criteria. The criteria should be based on sound and proven analytical practice and include inspection methods with pass/fail criteria. In every case, whether manufacturer's instructions or a competent person's instructions have been followed, the competent person needs to be satisfied that, in their professional judgement, the purpose of the major inspection has been achieved.

An amusement device has a design life and as the end of the design life approaches, defects are more likely to appear. For this reason, completion of the major inspection does not mean the device will be safe to operate for another 10 years, especially with older devices. The competent person supervising or carrying out the major inspection may specify a shorter period when the next major inspection is due or when the device has reached the end of its life.

Where there are signs of cracks, corrosion or excessive wear, the competent person supervising or carrying out the major inspection should identify the affected component and recommend if it is to be replaced with a new part or repaired. Where the component is repaired, it is recommended that the competent person prepares a procedure that specifies the repair work to be carried out (e.g. welding details, material types and dimensions of the repair). Where the competent person has indicated they want to inspect the repairs after they have been completed, the person with management or control of the device should ensure arrangements are made to allow the competent person to inspect the completed repairs.

Where no visual faults are observed, hydraulic or pneumatic cylinders that provide movement of parts of the amusement device may not require stripping down unless they fail any testing. Testing and inspection of restraint locking cylinders must take into account the instructions issued by the restraint locking cylinder manufacturer and the records for any previous testing or inspections. In some cases, the manufacturer may require replacement of restraint locking cylinders or return of the locking cylinders to the manufacturer, or their nominated agent, for service.

For amusement devices that include a safety control system designed to a relevant safety control system standard (e.g. AS 4024 *Safety of Machinery* series), the components critical to the reliability of the system should be:

- identified and compiled to form a list of critical safety components for the safety control system
- checked (e.g. through manufacturer's certification) to confirm compliance with the safety level to which the control system has been designed (e.g. Safety Integrity Level (SIL), Category or Performance Level (PL))
- assessed for replacement where they may be nearing the end of their 'design life'
- proof-tested (where specified by the manufacturer or competent person) to ensure that the components continue to function effectively. The functions on the control system, when re-

assembled, should be proof-tested to ensure all safety functions operate as designed (e.g. introduce single faults to ensure the safety function responds as designed).

9.7.5 Non-destructive testing for the major inspection

Non-destructive testing (NDT), also known as non-destructive examination (NDE), means using technical methods to examine materials or components in ways that do not impair their future usefulness and serviceability. This is done to find, measure and evaluate flaws, to assess integrity, properties and composition and to measure geometrical characteristics. The most frequently used NDT methods are eddy-current, magnetic-particle, liquid penetrant, radiographic, and ultrasonic.

All NDT on the amusement device and associated parts must be based on the manufacturer's specified NDT schedule or an NDT schedule in a maintenance manual prepared by a competent person. These should be considered in conjunction with any recommendation made by the competent person supervising or carrying out the major inspection.

NDT should be:

- carried out by a person who has been accredited by an acceptable testing authority (e.g. the National Association of Testing Authorities, Australia (NATA))
- carried out in accordance with a testing procedure specified in relevant technical standard/s, unless otherwise specified by the competent person
- verifiable through a signed report that complies with reporting requirements for the testing authority. This will include conditions of the test and a record of discontinuities found.

It is generally advisable to remove paint from parts before carrying out NDT, particularly in high stress areas. Some amusement devices have multiple layers of paint which may interfere with the effectiveness of the NDT method.

If the NDT specialist recommends carrying out NDT through paint, the test method is to comply with the relevant conditions for testing through paint (one of the conditions of such testing will be that the paint does not contain metal elements or exceed a maximum thickness) and the recommendation approved by the competent person.

9.7.6 Circumstances under which stripping down of the device or its components may not be required for the major inspection

While periodic inspection, including the annual inspection, can highlight faults on the amusement device, certain critical components can only be thoroughly inspected when the device is dismantled.

The major inspection is a comprehensive inspection process that should include dismantling (stripping down) all structural areas and mechanical components that are subject to high stress, and critical components and components that are subject to wear or degradation over time, unless considered unnecessary by the competent person.

Where there is documented evidence that the appropriate inspecting and testing has been carried out on a component within the previous two years, the competent person may determine that this component does not have to be dismantled during the major inspection. However, the component must still be inspected to determine that it is operating effectively and safely.

The competent person may also make a recommendation about future inspection requirements on a component that has not been dismantled as part of the major inspection.

Example

The pins and bosses on one linkage may have been replaced with new parts 18 months ago. The competent person, or a specialist under the supervision of the competent person, carries out a function test, ascertains that the linkage is operating correctly and

that tolerances are within the manufacturer's specifications. The competent person may note that this component is to be periodically inspected and that it may require removal and checking within the next four years.

Under limited circumstances, the competent person supervising or carrying out the major inspection may decide not to dismantle some parts of the device. When making this decision, the competent person should consider all the following:

- if the amusement device has had minimal use and has not been adversely affected from its storage (e.g. has been stored indoors and not exposed to the weather and there are no signs of corrosion due to collection of moisture).
- the design life of the amusement device, where this is available from the manufacturer
- a function test and load test to verify the amusement device is operating in accordance with the manufacturer's specifications
- if the competent person has a comprehensive knowledge of amusement devices made by the manufacturer or the type of amusement device being inspected
- documentation on the working history of the amusement device that details the operating frequency and duration. This information should be available in detailed log books and maintenance records kept for the life of the device and should not be based on statements from the owner that the device has had minimal use. Some devices may be fitted with data loggers that can supply some information about usage. However, it can be difficult to verify the data from some data loggers and it is recommended that competent persons do not rely solely on data loggers for the working history of the device.
- there may be documented evidence that carriages of the amusement device (such as carriages of a roller coaster) have been overhauled or refurbished in recent years on a rotational basis. The competent person may determine a visual inspection is satisfactory and there is no need to dismantle or strip down the overhauled carriages during the major inspection.
- tolerance checking of critical components to ensure they are within the manufacturer's specifications. Where the manufacturer specifies quantitative tolerances, the tolerances should be measured quantitatively and recorded within the inspection report.
- visual verification and/or testing, by the competent person, that the amusement device is in good condition, after the device has been cleaned and where applicable, outriggers deployed. This visual inspection should identify the absence of cracks, corrosion and damage to the device. Where cracks and corrosion (other than surface corrosion) exist, the affected components of the device must be dismantled for a thorough examination. Undetected internal corrosion can result in sudden catastrophic failure of the amusement device. The competent person should not rely solely on a visual verification of critical components of the amusement device but engage a competent person to perform NDT to verify there is no excessive internal corrosion within structural members of the amusement device.
- in the case of mobile amusement devices, the potential for damage or metal fatigue on the device from road travel. Even though limited set-ups and operation of the device may have occurred, the device may be showing signs of wear and damage from road travel.
- verifiable documented evidence that a part of the amusement device has been dismantled and re-assembled to an acceptable standard recently
- documented history of major repairs or modifications that have been carried out recently on the amusement device or support structure (photographic evidence and repair method statements should remain with the device for future reference)
- information from the amusement device manufacturer that requires the device or a component of the device to be dismantled and inspected (e.g. a safety recall or bulletin on the device that highlights failure and/or increased wear of critical components). In this case,

the components must be dismantled and inspected in accordance with the manufacturer's instructions.

Where the competent person has determined that dismantling specific parts of the device is unnecessary, the inspection criteria should be developed by the competent person and include any conditions associated with the ongoing safe use of the device. For example, the competent person may specify more frequent inspection intervals or may state that the device or particular components require dismantling within a period of less than 10 years.

9.7.7 Major inspection report

The person with management or control of the amusement device should ensure the competent person carrying out the major inspection provides a comprehensive report on the major inspection of the device. Under the WHS Regulation, the person with management or control of the device must keep records of all tests, inspections, and maintenance on the device, and make the records available to the next owner when relinquishing control of the device. This includes major inspection reports for the amusement device in addition to annual inspection reports. A major inspection report should include:

- a summary of the history of the amusement device prior to the major inspection being carried out including modifications made to the device since the previous major inspection or the manufacture of the device. If a history of the device is unavailable, it is likely the major inspection and report will need to be more comprehensive.
- where provided, a copy of the major inspection criteria specified by the manufacturer and by the competent person
- extracts of the manufacturer's maintenance manual detailing wear tolerances, disassembly, inspection and assembly instructions or other relevant instructions to be followed during the inspection process (e.g. bolt torque specifications and tightening sequences)
- a complete list of work carried out on the amusement device during the major inspection process including:
 - any faults found and remedial action taken
 - any components replaced
 - any modifications made to the device
 - where applicable, a record that hydraulic cylinders have been creep tested and are satisfactory
 - where applicable, a record of functional proof-test or validation on safety control systems
- photographs of the device during the inspection process, including photos of damage, wear, corrosion or cracks and completed repairs
- if the decision has been made not to dismantle components of the amusement device, specify reasons (based on sound engineering justifications) why this decision has been made, supported by documented evidence
- a list of any specialists engaged to assist with specific work on the device as part of the major inspection
- a summary of components replaced with copies of receipts or other evidence of purchase or installation
- where aspects of the work have been contracted to third parties, a report of the work done, including full description of the work (scope and nature of work done), copies of test results, any recommendations of follow-up repairs required and copies of invoices
- signed statements from people involved in the assembly process (where applicable) in relation to:
 - structural bolts being installed correctly (taking into consideration bolt type, lubricant if used, bolt tightening torque and bolting sequence)

- details of any marking used to confirm final torquing has been completed (e.g. torque striping)
- pin and pin retainers being installed correctly
- hydraulic and/or pneumatic components being installed correctly including a statement that replaced components meet the manufacturer's specifications and fittings have all been tightened to the correct torque
- a summary of commissioning testing completed to return the amusement device to service
- a statement by the competent person about the remaining life of the amusement device and when the next major inspection is due— either in 10 years or a shorter period if recommended by the competent person
- a summary of any assessments completed and a statement about the viability of upgrading the amusement device to meet requirements of relevant current technical standards
- the competent person's opinion on the safety of the amusement device.

Further information on conducting major inspections is in AS 3533.3 *Amusement rides and devices Part 3: In-service inspection*.

10. Electrical safety

10.1 Managing electrical risks at the workplace

The ES Act and ES Regulation set out requirements to prevent people being killed or injured, or property being destroyed or damaged by electricity.

Further information about managing electrical safety risk is in the *Managing electrical risks in the workplace Code of Practice* and *Working near overhead and underground electric lines Code of Practice*.

ES Act section 30 Primary duty of care

A PCBU must ensure the person's business or undertaking is conducted in a way that is electrically safe.

This includes:

- ensuring that all electrical equipment used in the conduct of the person's business or undertaking is electrically safe
- if the person's business or undertaking includes the performance of electrical work, ensuring the electrical safety of all persons and property likely to be affected by the electrical work
- if the person's business or undertaking includes the performance of work, whether or not electrical work, involving contact with, or being near to, exposed parts, ensuring persons performing the work are electrically safe.

A PCBU has the primary duty under the ES Act to ensure their business or undertaking is conducted in a way that is electrically safe. This duty includes ensuring that all equipment used in the conduct of the person's business or undertaking is electrically safe.

A PCBU has specific duties under the ES Regulation in relation to overhead and underground electric lines. Section 5 of this code provides further information on installation and setup of amusement devices.

ES Act section 36 Duty of installer of electrical equipment or electrical installation

Duty of installer of electrical equipment or electrical installation to ensure:

- the way it is installed is electrically safe
- the processes followed for installing it ensure that, when installed, it will be electrically safe
- after installation, the electrical equipment or installation is tested and examined to ensure it is electrically safe.

ES Act section 37 Duty of repairer of electrical equipment or electrical installation

Duty of repairer of electrical equipment or electrical installation to ensure:

- the way it is repaired is electrically safe
- the processes followed for repairing it ensure that, when repaired, it will be electrically safe
- after repair, the electrical equipment or installation is tested and examined to ensure it is electrically safe.

ES Act section 38 Duty of person in control of electrical equipment

Duty of person in control of electrical equipment to ensure the equipment is electrically safe.

Installers of electrical equipment and electrical installations must ensure the way in which the electrical equipment or electrical installation is installed is electrically safe. The duty includes

ensuring the electrical equipment or electrical installation is electrically safe following installation, which requires testing and examination.

Repairers of electrical equipment and electrical installations (e.g. power and lighting circuits) must ensure the way in which electrical equipment and electrical installations are repaired is electrically safe. The duty includes ensuring the electrical equipment or installation, when repaired, is tested and examined to ensure it is electrically safe.

The person in control of electrical equipment must ensure electrical equipment is electrically safe. This duty includes ensuring electrical equipment is maintained and also includes having processes to remove from service electrical equipment deemed not electrically safe.

10.2 Performing electrical work

ES Act section 18 Meaning of 'electrical work'

Electrical work means:

- connecting electricity supply wiring to electrical equipment or disconnecting electricity supply wiring from electrical equipment, or
- manufacturing, constructing, installing, removing, adding, testing, replacing, repairing, altering or maintaining electrical equipment or an electrical installation.

Electrical work does not include a number of specific items listed in section 18.

ES Act section 55 Requirement for electrical work licence

Electrical work may only be performed by a person who is:

- the holder of an electrical work licence authorising the electrical work, or
- otherwise authorised to perform the electrical work under the Act.

ES Act section 56 Requirement for electrical contractor licence

A person must not conduct a business or undertaking that includes performing electrical work unless the person is the holder of an electrical contractor licence.

ES Regulation Schedule 9 definition of 'competent person'

Competent person, in relation to a task, means a person who has acquired, through training, qualifications, experience or a combination of these, the knowledge and skill to carry out the task.

An appropriate electrical licence or authorisation to perform electrical work under the ES Act is required to carry out electrical work. Permitted exclusions allow for activities such as connecting electrical equipment by means of a socket outlet and flexible cord plug, replacing fuses and light bulbs if that can be safely performed, replacing a drive belt on an electric machine if there is no exposure to an electrical hazard, and affixing electrical equipment (e.g. a fan) in place but not connecting it to power nor installing its supply conductors.

Some electrical testing and inspection, such as 'testing and tagging' under Part 6, Division 6 of the ES Regulation, can be undertaken by a competent person who does not necessarily hold an electrical work licence. If a competent person performing electrical work is not an employee of the person with management or control of the amusement device, the work must be performed under an electrical contractor licence. Further information on the electrical knowledge of a competent person for testing electrical equipment is available in AS/NZS 3760 *In-service safety inspection and testing of electrical equipment and RCDs*.

10.3 Common electrical safety issues with amusement devices

Some common electrical safety issues associated with the operation of amusement devices include:

- safety interlocks and emergency stops not operating correctly or bypassed

- exposed energised electrical parts (e.g. where there are covers missing from junction boxes, motor terminal blocks, or switchboards, broken or damaged electrical equipment, exposed electrical slip rings designed to provide power to moving parts of a ride)
- damage to flexible leads and cables (poor or damaged insulation or broken internal conductors)
- broken or missing low voltage bulbs on low hanging festoon lights
- testing and tagging out of date
- use of non-approved plugs or incorrectly mated plugs and sockets
- inadequate protection provided against harmful effects of ingress of water or dust (i.e. Ingress Protection (IP) rating is inappropriate), including:
 - equipment not being rated for outdoor use
 - IP rated equipment is not adequately maintained
 - damaged switchboards and electrical cabinets allowing access to live parts
 - use of electrical equipment in or near water when the electrical equipment is not rated for water splashes or immersion (e.g. use of a corded electrical blower to blow up 'Zorb balls' near water)
- electrical injuries from dodgem cars, including electric shocks and sparks causing burns
- loose electrical connections causing hot joints, overheating, open-circuit or high resistance earth connections
- broken earth connections.

ES Regulation section 115 Double adaptors and piggyback plugs prohibited

A PCBU must not use a double adaptor or piggyback plug for amusement work.

A PCBU must ensure workers carrying out work for the person do not use a double adaptor or piggyback plug.

ES Regulation section 97 Definitions for Part 6 Division 6

amusement work means work, other than work performed by a non-profit organisation, to assemble, operate or disassemble any of the following on the site on which it is used, intended to be used or has been used:

- (a) an amusement device or amusement ride
- (b) a thing used to provide amusement activities, including side show activities, associated with:

- (i) carnivals, fairs or shows, or
- (ii) amusement arcades or similar places

Example of side show activities —

providing hamburgers, fairy floss or massages in a side show

- (c) a thing used to provide entertainment or advertising activities, in temporary sites, associated with shows, fairs or carnivals.

Double adaptors and piggyback plugs for amusement work as defined in the ES Regulation must not be used.

10.4 Amusement devices connected to an electricity supply by a plug

ES Regulation section 117 Amusement devices and amusement rides

A PCBU at a workplace must ensure that all or part of an amusement device or amusement ride at the workplace, that is electrical equipment connected to the electricity supply by a plug, is not used to perform work unless:

- (a) it is inspected and tested by a competent person:
 - (i) each time it is assembled on the site where it is intended to be used, and

- (ii) in any event at least once every six months, and
- (b) for a device or ride with a current rating of not more than 20 Amps—it is connected to a type 1 safety switch or type 2 safety switch.

An inspection and test must include the competent person:

- (a) deciding the safety of earthing, insulation and connections, and
- (b) deciding whether any safety switch complies with AS/NZS 3760 when tested, and
- (c) making a visual examination to decide the safety of the items of electrical equipment of the device or ride, including cabling, plugs, sockets, light fittings, enclosures and motors.

If after inspecting and testing the electrical equipment, a competent person decides the equipment is safe to use, the PCBU must ensure the competent person immediately makes a written record of:

- (a) details of the test, and
- (b) the prescribed details for the equipment.

If after inspecting and testing the electrical equipment, a competent person decides the equipment is not safe to use, the PCBU must ensure:

- (a) the competent person immediately:
 - (i) attaches a durable, conspicuous sign to the equipment that warns people not to use the equipment, and
 - (ii) makes a written record of details of the test, and
- (b) the equipment is immediately withdrawn from use.

The PCBU must ensure that a written record of the day by which the equipment must be reinspected and retested is not made with the authority of the person unless the equipment has been inspected and tested by a competent person.

ES Regulation section 97 Definitions for Part 6, Division 6

'*amusement device*' means an amusement device as defined in AS 3533.3

'*amusement ride*' means an amusement ride as defined in AS 3533.3

All or part of an amusement device that is electrical equipment connected to the electricity supply by a plug must not be used to perform work unless it is inspected and tested by a competent person:

- each time it is assembled on the site where it is to be used, and
- in any event at least once every six months, and
- for a device with a current rating of not more than 20 Amps, it is connected to a type 1 or type 2 safety switch.

A competent person must inspect and test to decide the safety of earthing, insulation and connectors and whether any safety switch complies with the requirements of AS/NZS 3760 – *In-service safety inspection and testing of electrical equipment and RCDs*. Examples of tests include:

- earthing continuity (continuity of the protective earthing conductor from the plug earth pin to accessible earthed parts to ensure that the resistance of the protective earth circuit is sufficiently low to ensure correct operation of the circuit protection device)
- testing of insulation (a leakage current test or an insulation resistance test between all conductors that are to be live and earth)
- polarity testing (to ensure no shock hazard arises from incorrect connection of active, neutral and earthing conductors and to ensure electric machines rotate in the expected direction)
- operation of residual current devices (also known as safety switches) by verifying functionality either by the operation of the integral test button or by the use of test equipment.

A competent person must inspect any electrical equipment attached to the amusement device. This inspection should be made to check for overall electrical safety of the amusement device and should be aimed at identifying any damage or defects that may pose a risk to workers, patrons or members of the public. Examples include identifying:

- any exposed parts
- earthing is installed and continuous
- any damage to cable insulation
- adequacy of equipment
- integrity of IP ratings
- condition of plugs
- any discolouration that may indicate overheating
- mechanical restraint of cables is adequate to avoid failure
- condition of the operating panel to confirm controls are secure, aligned and appropriately labelled.

Further information on equipment testing and on the electrical knowledge of a competent person for testing is available in *AS/NZS 3760 In-service safety inspection and testing of electrical equipment and RCDs*.

If, after inspecting and testing the electrical equipment, the competent person decides that the electrical equipment is:

- safe to use, the PCBU must ensure that the competent person immediately makes a record of the details of the test and the prescribed details of the equipment.
- not safe to use, the PCBU must ensure the competent person immediately attaches a durable, conspicuous sign to the equipment that warns people not to use the equipment, makes a written record of details of the test, and the equipment is immediately withdrawn from use.

The PCBU must ensure that, if the electrical equipment requires testing, maintenance or repairs that involves electrical work, the work is performed by a person authorised to perform electrical work under the ES Act, such as an appropriately licensed electrical worker.

A competent person who performs the initial inspection and testing under section 117 of the ES Regulation is not permitted to perform electrical work unless they are the holder of an appropriate electrical work licence. For example, a competent person may have identified a damaged plug top or electrical lead. Repairs to that plug top or lead are electrical work and can only be performed by a licensed electrical worker. If the licensed electrical worker is not an employee of the person with management or control of the amusement device, the electrical work must be performed under an electrical contractor licence.

10.5 Electrical safety inspections for hiring amusement devices

ES Regulation section 194 Hiring electrical equipment

This section applies to a person (the *hirer*) conducting a business or undertaking of hiring out electrical equipment (including amusement devices) to other persons.

The hirer must ensure each item of electrical equipment hired out by the hirer to another person:

- (a) either:
 - (i) is inspected and tested by a competent person before each hiring, or
 - (ii) has a safety switch that cannot be disconnected, deactivated or removed during the item's operation
- (b) is inspected, tested and tagged by a competent person at least once every six months
- (c) if the item has a safety switch under paragraph (a)(ii), the safety switch:
 - (i) is inspected, tested and tagged by a competent person at least once every six months, and
 - (ii) complies with AS/NZS 3760 (In-service safety inspection and testing of electrical equipment) when tested.

The hirer must keep records of the tests performed for at least five years.

WHS Regulation section 237

Records of plant

A person (hirer) conducting a business or undertaking of hiring electrical equipment to other people (e.g. blowers for inflatable amusement devices) must ensure that the equipment is inspected and tested by a competent person.

The hirer must ensure that, if the electrical equipment requires testing, maintenance or repairs that involves electrical work, the work is performed by a licensed electrical worker with a licence appropriate for the electrical work to be performed. If the licensed electrical worker is not an employee of the person with management or control of the amusement device, the electrical work must be performed under an electrical contractor licence.

The hirer must also keep records of the tests performed for at least five years. However, if the equipment is also plant that is design or item registered, the hirer must keep records of the tests performed on plant that is design or item registered (including amusement devices) for the period that the plant is used or until the hirer relinquishes control of the plant.

11. Event organisers and amusement devices

WHS Regulation section 242 Log book and manuals for amusement device

If requested, the person with management or control of an amusement device must give an event organiser the following information before the device is operated at the event (e.g. a show or school fete):

- details about the most recent annual inspection of the device
- details about any person at the event who will be operating the device and whether they have completed required instruction and training and been determined as competent to operate the device.

Organisers of events (e.g. festivals, school fetes, fundraisers or agricultural shows) may be PCBUs under the WHS Act and have duties to ensure, so far as is reasonably practicable, the health and safety of workers (including volunteers) and members of the public attending their events.

Event organisers may also be the person with management or control of the workplace, that is, the site where the event is to be held. In these circumstances, the event organiser must ensure, so far as is reasonably practicable, 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.

To effectively manage safety for the event, PCBU event organisers must consult, cooperate and coordinate with all relevant duty holders on health and safety matters at all stages of the event.

Although the person with management or control of the amusement device is primarily responsible for ensuring the device is not a risk to health and safety, PCBU event organisers should:

- provide relevant information to the person with management or control of the amusement device about the event site (e.g. a site plan, entry and exit points, ground conditions, location of overhead and underground services, site emergency plan)
- provide adequate facilities for the person with management or control of an amusement device (e.g. adequate space to set-up the device). If the event organiser provides an electricity supply for the amusement device to use (e.g. power outlet), the electricity supply must be electrically safe. Considerations in making it safe include ensuring:
 - the electrical circuit is electrically protected with an appropriately rated device (e.g. fuse or circuit breaker) that is in good working order
 - any outlet is appropriate for the environmental conditions where it is installed (e.g. protected from rain if installed outdoors)
- monitor work activities at the bump-in phase, during the event and bump-out phase
- implement control measures to ensure, so far as is reasonably practicable, a safe event.

Event organisers, regardless of whether they are a PCBU, can request the following information from amusement device owners before the device is operated at the event:

- details about the most recent annual inspection of the device
- details about whether each person who will be operating the device at the event has completed proper instruction and training and is a competent person to operate the device.

The person with management or control of the amusement device must provide the event organiser with this information if requested.

12. Record keeping

12.1 Log books and manuals

WHS Regulation section 242 Log book and manuals for amusement device**WHS Regulation section 242A Requirements of log book****WHS Regulation section 238(2)(c) Operation of amusement device**

Daily checks and operation of the amusement device without passengers must be properly and accurately recorded in a log book for the amusement device.

A log book is used to keep permanent records about repairing, maintaining and operating the amusement device, as well as records of tests, inspections, erection, commissioning, decommissioning, dismantling, storage and alterations.

One function of the log book is to capture all the information that is relevant to the safety of an amusement device for the purpose of making the information accessible to everyone who has a reasonable interest in it. Examining the log book is one way to obtain insight about the ongoing adequacy of responses to previous incidents and the effectiveness of current control measures.

The log book and operating and maintenance manuals must be kept with the amusement device. A log book may be kept in any accessible form (e.g. paper or electronic), however, it must be readily available to workers and other people authorised to use or view the log book. The log book and operating and maintenance manuals for the amusement device must be available for inspection by:

- a competent person carrying out an annual inspection or major inspection of the device
- people involved in commissioning, installing, using, storing, testing, decommissioning, dismantling or disposing of the amusement device.

Where the log book is in electronic format, back-up copies should be kept so that the information is not lost. Electronic signatures or another effective method to confirm the actions and responsibilities for tasks carried out by various persons should also be provided.

The log book must include certain information and it is recommended additional information also be kept in the logbook as follows:

Operation of the device

- must have a record of the daily check and operation of the device without passengers on each day before the device is to be operated.
- it is recommended the following be recorded in the logbook:
 - on days when the device is operated, the number of hours for which it is in operation or a ride cycle count for the day
 - the total number of hours for which the device has ever been operated or total number of ride cycle counts. The person with management or control of the amusement device is not expected to account for this information about operation of the device when it was under the management or control of another person and the information was not provided when the device was transferred (e.g. from the previous owner).
 - details of any faults or other matters relevant to the safety of the device identified during its operation. (e.g. breakdowns that interrupt the operation of the device or issues identified during routine inspections that require repairs before the device is able to be returned to operation).

Competency of persons

- must have details of operators who have completed proper instruction and training and been determined as competent to operate the device. Where there are multiple roles for

operators and attendants for a device it should be clear which role(s) a person has been determined as competent to perform.

- this should include the date on which training was completed and a brief description or summary of the instruction or training provided. A record of the name and qualifications of the person who provided instruction and training should be kept. This may be kept in the log book or maintained as a separate record.
- must have details of the competent persons who install, assemble, construct, commission, decommission, dismantle or store the device.

Annual and major inspections

- must have the following information about the most recent annual inspection and any major inspection:
 - the name of the competent person who carried out the inspection
 - the date of the inspection
 - the results of the inspection and any recommendations made by the competent person carrying out the inspection
 - any components repaired or replaced during, or as a result of, the inspection.

Erection and storage

- must have details of each time the device is erected or stored.
- it is recommended that it be noted whether the device is stored under cover.

Maintenance

- must have details of the maintenance of the device.
- it is recommended this include information about:
 - what maintenance was carried out. This should include routine service and maintenance tasks and repairs that need to be carried out (e.g. due to a breakdown). Maintenance related to the device being operational should be recorded; however, maintenance carried out for purely aesthetic purposes need not be recorded (e.g. replacing a light globe for the control panel should be recorded while replacing a light globe used for theming need not be recorded)
 - the date the maintenance was carried out
 - the name of the person who performed the maintenance.

Enforcement information

- must have the following information about any improvement notice, prohibition notice, electrical safety notice or infringement notice issued by an inspector:
 - the date and reasons why the notice was given
 - any action taken by the person for the notice
 - if the notice was given under a work health and safety law from another jurisdiction, the location of the device when the notice was given
 - details, including the date/s when the device was erected or stored
 - the date of the inspection

If the person with management or control of the amusement device relinquishes control of the device (e.g. sells the device), the PCBU must ensure the log book is made available to the person to whom the device is relinquished (e.g. the new owner). The operating and maintenance manuals for the device should be provided to the new owner along with other records for the device which must be provided.

Log books, like other records for registrable plant, must be available for inspection by inspectors appointed under the WHS Act.

12.2 Other records for the amusement device

WHS Regulation section 237 Records of plant

Keeping a record of all tests, inspections, maintenance, commissioning, decommissioning, dismantling and alterations of the plant for the period the device is used or until control of the plant is relinquished.

WHS Regulation section 260 Plant design registration number

Design registration number to be kept readily accessible in vicinity of the plant

WHS Regulation section 273 Plant registration number

Plant registration number marked on item of plant

A person with management or control of a registrable amusement device or amusement device at a licensed major amusement park must also keep a record of all tests, inspections, maintenance, commissioning, decommissioning, dismantling and alterations of plant for the period the device is used or until they relinquish control of the plant.

A person with management or control of a registrable amusement device must ensure the plant design registration number for the device is readily accessible in the vicinity of the plant at all times. Where an amusement device is required to have plant item registration, the person with management or control of the device must ensure the plant registration number is marked on the item of plant. It is recommended both the plant design registration number and plant registration number be kept in or with the log book so it is readily accessible.

The following records should be readily available and may also be kept in or with the log book:

- the type of amusement device and its classification under AS 3533.1 *Amusement rides and devices - Design and construction*
- if final and approved design drawings and calculations are available, keeping them with the log book will assist with testing and inspection
- records of inspections conducted during the various steps of the risk management process and the results of hazard identification and risk assessments carried out on the device
- relevant information and data from commissioning of the device
- manufacturer's specifications
- a copy of set-up and dismantling procedures (where applicable)
- details of incidents or near misses associated with the device
- a copy of the emergency plan or procedures related to the device.

Records of testing, inspection and maintenance need to be kept for the life of the amusement device and must be passed on to the new owner when the amusement device is sold. These records provide insight into the history of the device and provide valuable information on features of the device that need special attention, areas where increased maintenance may be required, and a realistic idea of the life of the device before it needs to be permanently decommissioned.

There is a wide range of testing, inspection and maintenance of an amusement device that takes place during its life including:

- daily, set-up, routine, annual and major inspections
- other inspections specified by the manufacturer (i.e. based on time, hours of operation or ride cycles)
- load testing
- non-destructive testing of welds, pins, bolts and other high stress areas

- tightening bolts to the torque specified by the amusement device manufacturer
- thickness testing of members that may be exposed to corrosion or wear
- replacement of components at pre-determined intervals specified by the manufacturer
- periodical greasing of components
- tolerance checking of parts that are subjected to wear
- repairs
- inspections conducted during the risk management process (e.g. hazard identification, checks on the effectiveness of existing control measures).

Where the manufacturer completes factory proof testing and examinations on the device, copies of the results of any tests, inspections or examinations must be made available when the device is supplied and should be kept with the device.

All records of tests, inspections, maintenance, commissioning, decommissioning, dismantling and alterations must be available for inspection by inspectors appointed under the WHS Act. Records required to be kept under the ES Act must be available for inspection by inspectors appointed under that Act.

13. Decommissioning and dismantling an amusement device

WHS Regulation section 204 Control of risks arising from installation or commissioning

A person with management or control of plant at a workplace must:

- not decommission or dismantle the plant unless the decommissioning or dismantling can be carried out, so far as is reasonably practicable, without risks to the health and safety of any person
- ensure that a person who installs, assembles, constructs, commissions or decommissions or dismantles the plant is a competent person
- ensure that a person who installs, assembles, constructs, commissions or decommissions or dismantles the plant is provided with the available information for eliminating or minimising risks to health or safety
- ensure that the processes for the installation, construction, commissioning, decommissioning and dismantling of plant include inspections that ensure, so far as is reasonably practicable, that risks associated with these activities are monitored.

WHS Regulation section 200 Second-hand plant to be used for scrap or spare parts

A supplier of plant to be used for scrap or spare parts must, before the plant is supplied, inform the person to whom the plant is supplied that it is being supplied for scrap or spare parts and in its current form is not to be used as plant.

ES Regulation section 68 Duty of PCBU

A PCBU must ensure, so far as is reasonably practicable, no person, plant or thing at the workplace comes within an unsafe distance of an overhead or underground electric line. If it is not reasonably practicable to ensure there is a safe distance, the PCBU must ensure a risk assessment is conducted and control measures are implemented consistent with the risk assessment and any requirements of the electricity entity responsible for the electric line.

ES Regulation section 69 Meaning of unsafe distance for persons, operating plant and vehicles for overhead electric lines

Meaning of unsafe distance and exclusion zone for persons operating plant and vehicles near overhead electric lines.

As an amusement device ages, the levels of inspection and maintenance required to ensure the amusement device continues to operate in a safe manner will usually increase.

Signs that an amusement device is approaching the end of its design life include cracking of high stress parts, increased wear, loosening of connections and increasing noise in drive lines. While a major inspection can help to address any safety concerns, the major inspection does not guarantee that the amusement device will continue to operate as well as a new device.

Increased levels of inspection and maintenance may eventually mean it is not feasible for an amusement device to continue in service. In this case, the amusement device should be permanently decommissioned and scrapped. If the amusement device is to be decommissioned and scrapped, it should not be sold or disposed of in a way where it could be reused as an amusement device.

Dismantling plant that is an amusement device must be performed by competent persons. The designer's or manufacturer's instructions may assist with providing information on safely decommissioning and dismantling the device.

For mobile amusement devices where the site of decommissioning and dismantling a device can be chosen, the work should be carried out at a suitable distance from things which could interfere with safely carrying out dismantling of the device, (e.g. buildings and other

structures, trees, and other amusement devices). Where a fixed amusement device is being decommissioned and dismantled, the PCBU should consider how dismantling the device can be done in a way to minimise the risk associated with any nearby structures, trees or other amusement devices.

Where there is vehicle or pedestrian access at the site, traffic management and restricted access should be put in place to ensure unauthorised people do not enter the site while the amusement device is being dismantled.

The PCBU must ensure dismantling the amusement device is carried out in a way which complies with exclusion zone requirements for overhead electric lines.

Any electrical installation must be de-energised and disconnected by a person with an electrical mechanic licence. If the licensed electrical mechanic is not an employee of the person with management or control of the amusement device, the electrical work must be performed under a Queensland electrical contractor licence.

Appendix 1: Glossary

Note: Where the terms included below are defined in legislation, the definition is based on the legislation in force at the time this code was approved. Please refer to the legislation to check the definition has not been amended after approval of the code.

Term	Description
AS or AS/NZ	Australian Standard or Australian/New Zealand Standard
Competent person (Schedule 19, WHS Regulation 2011) Schedule 9, Electrical Safety Regulation 2013	<p>A person who has acquired through training, qualification or experience the knowledge and skills to carry out the task.</p> <p>A competent person has a more specific meaning in the following circumstances:</p> <p>For the purpose of conducting an annual inspection or major inspection, means a person who—</p> <p>(a) in the case of an inflatable device (continuously blown) with a platform height less than 9m—has acquired through training, qualification or experience the knowledge and skills to inspect the plant; or</p> <p>(b) in the case of any other amusement device—</p> <ul style="list-style-type: none"> (i) has the skills, qualifications, competence and experience to inspect the amusement device; and (ii) is registered under a law that provides for the registration of professional engineers; or <p>(c) is determined by the regulator to be a competent person.</p> <p>Note: A person is not a competent person to carry out a detailed inspection of an amusement device that includes an electrical installation unless the person is qualified, or is assisted by a person who is qualified, to inspect electrical installations.</p> <p>For inspecting plant for registration purposes, the person must have:</p> <ul style="list-style-type: none"> - educational or vocational qualifications in an engineering discipline relevant to the plant being inspected - knowledge of the technical standards relevant to the plant being inspected. <p>For the purpose of conducting electrical safety inspections required under section 117 of the ES Regulation, means a person who has acquired, through training, qualifications, experience or a combination of these, the knowledge and skill to carry out the task.</p> <p>NOTE: a competent person is not authorised to perform electrical work without the appropriate electrical licence.</p>
Critical component Sections 241 and 241A, WHS Regulation 2011	A component of the amusement device that would, if the component failed to function properly, be likely to cause a risk to the health or safety of a person.
Design verification statement Section 251, WHS Regulation 2011	A statement that: <ul style="list-style-type: none"> • is written and signed by a person who is eligible to be a design verifier for the design • states that the design was produced in accordance with published technical standards or engineering principles specified in the statement, and • includes—

Term	Description
	<ul style="list-style-type: none"> - the name, business address and qualifications (if applicable) of the design verifier; and - if applicable, the name and business address of the organisation for which the design verifier works.
Design verifier Section 252 and Schedule 19, WHS Regulation 2011	<p>For the design of plant, means a person who has the skills, qualifications, competence and experience to design the plant or verify the design.</p> <p>A person is not eligible to be the design verifier for the design of an item of plant if:</p> <ul style="list-style-type: none"> (a) The person was involved in the production of the design; or (b) At the time the design was produced, the person was engaged by the PCBU that produced the design. However, this does not apply if the PCBU uses a quality system to undertake the design of plant that has been certified by a body accredited or approved by the Joint Accreditation System of Australia and New Zealand.
Duty holder Part 2, WHS Act 2011	<p>Any person who owes a work health and safety duty under the WHS Act including:</p> <ul style="list-style-type: none"> • a person conducting a business or undertaking (PCBU) • a person with management or control of plant at a workplace • a designer, manufacturer, importer, supplier, or installer of plant used at a workplace • an officer • a worker • other persons at a workplace. <p>Note: there are duty holders under the ES Act.</p>
Engineer or professional engineer	<p>Means a person who is a registered professional engineer under the <i>Professional Engineers Act 2002</i></p> <p>A person must not carry out professional engineering services in or for Queensland unless they are a registered professional engineer and registered with the Board of Professional Engineers of Queensland or supervised by a registered professional engineer.</p> <p>For more information, refer to the Board of Professional Engineers of Queensland. www.bpeq.qld.gov.au</p>
Engineering principles	<p>Principles stated or outlined in an engineering, mathematical or scientific text, relevant to safe plant design, commonly used in professional engineering practice.</p>
Health and safety representative Schedule 5 and part 5 of the WHS Act	<p>Means the health and safety representative elected under the WHS Act for the work group of which the worker is a member</p>
Officer Schedule 5, WHS Act	<p>An officer under the WHS Act includes:</p> <ul style="list-style-type: none"> • an officer under section 9 of the <i>Corporations Act 2001</i> (Cth) • an officer of the Crown within the meaning of section 247 of the WHS Act

Term	Description
	<ul style="list-style-type: none"> an officer of a public authority within the meaning of section 252 of the WHS Act. <p>A partner in a partnership or an elected member of a local authority is not an officer while acting in that capacity.</p>
<p>Person conducting a business or undertaking (PCBU)</p> <p>Section 5, WHS Act 2011</p>	<p>A person conducting a business or undertaking (PCBU) alone or with others, whether or not for profit or gain.</p> <p>A PCBU includes a:</p> <ul style="list-style-type: none"> company unincorporated body or association sole trader or self-employed person. <p>Individuals who are in a partnership that is conducting a business will individually and collectively be a PCBU.</p> <p>A volunteer association (defined under the WHS Act, see below) or elected members of a local authority will not be a PCBU.</p>
<p>Person with management or control of plant at a workplace</p> <p>Section 21, WHS Act</p>	<p>A person conducting a business or undertaking to the extent that the business or undertaking involves the management or control of fixtures, fittings or plant, in whole or in part, at a workplace, but does not include the occupier of a residence unless the residence is occupied for the purpose of conducting a business or undertaking.</p>
<p>Person with management or control of an amusement device at a workplace</p>	<p>A person with management or control of an amusement device at a workplace is a subset of the term 'person with management or control of plant at a workplace'.</p>
<p>Plant</p> <p>Schedule 5, WHS Act</p>	<p>Plant includes—</p> <ul style="list-style-type: none"> any machinery, equipment, appliance, container, implement and tool; and any component of any of those things; and anything fitted or connected to any of those things.
<p>Reasonably practicable</p> <p>Section 18, WHS Act</p>	<p>In relation to a duty to ensure health and safety, reasonably practicable means what is reasonably able to be done in relation to ensuring health and safety, taking into account and weighing up all relevant matters including:</p> <ul style="list-style-type: none"> the likelihood of the hazard or the risk concerned occurring the degree of harm that might result from the hazard or the risk what the person concerned knows, or ought reasonably to know, about: <ul style="list-style-type: none"> the hazard or the risk ways of eliminating or minimising the risk; and the availability and suitability of ways to eliminate or minimise the risk; and after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.

Term	Description
Technical standard	<p>For the design of plant, means a standard published by either:</p> <ul style="list-style-type: none"> • Standards Australia • another organisation that publishes standard(s) about the design of plant, for example: <ul style="list-style-type: none"> - the publisher of British Standards - International Electrotechnical Commission - American National Standards Institute - American Society of Mechanical Engineers - Canadian Standards Association - International Standards Organisation - Europäische Norm (European Standard)
Volunteer association Section 5, WHS Act 2011	A group of volunteers working together for one or more community purposes where none of the volunteers, whether alone or jointly with any other volunteers, employs any person to carry out work for the volunteer association.
WHS Regulator Schedule 5 and Schedule 2, WHS Act	The regulator for the <i>Work Health and Safety Act 2011</i>
Worker Section 7, WHS Act 2011	Any person who carries out work for a person conducting a business or undertaking, including work as an employee, contractor or subcontractor (or their employee), self-employed person, outworker, apprentice or trainee, work experience student, employee of a labour hire company placed with a 'host employer' or a volunteer.
Workplace Section 8, WHS Act 2011	Any place where work is carried out for a business or undertaking and includes any place where a worker goes, or is likely to be, while at work. This may include offices, factories, shops, construction sites, vehicles, ships, aircraft or other mobile structures on land or water.

Appendix 2: Relevant technical standards

The following list of published Australian Standards and Australian/New Zealand Standards provides guidance only, with the exception of AS/NZS 3000 Wiring Rules, and compliance with them does not guarantee compliance with the WHS Act and Regulations. This list is not exhaustive.

Note: AS/NZS 3000 Wiring Rules is mandatory for electrical installations.

Australian Standards:

- AS 3533 series: Amusement rides and devices
- AS/NZS 3123 Approval and test specifications – Plugs, socket-outlets and couplers for general industrial application
- AS 2316.2.1 Artificial climbing structures and challenge courses - Flying foxes and challenge rope courses – Construction and Safety Requirements (EN 15567 -2:2007, MOD)
- AS/NZS 3000 Electrical installations (known as the Australian/New Zealand Wiring Rules)
- AS/NZS 3010 Electrical installations – Generating sets
- AS/NZS 3002 Electrical installations – Shows, carnivals and events
- AS 1657 Fixed platforms, walkways, stairways and ladders - Design, construction and installation
- AS 61508 series: Functional safety of electrical/electronic/programmable electronic safety-related systems
- AS/NZS 3760 In-service safety inspection and testing of electrical equipment and RCDs
- AS/NZS 1269 series: Occupational noise management
- AS 1210 Pressure Vessels
- AS 4024 series: Safety of machinery

Appendix 3: References

This code of practice includes content adopted or adapted from the following publications:

Amusement Devices Checklist for Owners and Operators, Safe Work Australia, September 2022.

Amusement Devices Information Sheet for Annual Inspection and Records, Safe Work Australia, September 2022.

Amusement Devices Information Sheet for Inflatable Devices, Safe Work Australia, July 2014.

Amusement Devices Information Sheet for Operators, Safe Work Australia, September 2022

Guide for Amusement Devices, Safe Work Australia, September 2022.

How to determine what is reasonably practicable to meet a health and safety duty, Safe Work Australia, May 2013.

The State of Queensland acknowledges the above as author of these publications.