

NTWorkSafe

QUAD BIKES

A handbook for workplaces



www.worksafe.nt.gov.au

 Northern Territory
Government

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INTRODUCTION

Quad bikes (four-wheeled motorbikes) are popular and useful machines that help Australian farmers tend to crops and livestock quickly and efficiently. However, quad bikes are also a significant cause of death and injury on Australian farms.

Approximately 10 people die in quad bike incidents on Australian farms every year and many more are injured. The emotional and financial cost of these deaths and injuries to families and communities is immense.

This handbook was originally developed by WorkSafe Victoria to encourage the safe use of quad bikes on farms. A reference group of industry experts led by Ballarat University's Victorian Farm Safety Centre, was convened to support the development of this handbook.

NT WorkSafe has adopted this handbook for use in the Northern Territory with permission from WorkSafe Victoria. The handbook outlines legal requirements and strategies to ensure the safe operation of quad bikes in the workplace.

NT WorkSafe encourages all operators of quad bikes to read this handbook and make quad bike accidents a thing of the past.

Note: Although the case studies in this handbook refers to farms the majority of the safety information is relevant to all workplaces that make use of quad bikes.

Important information - Quad bikes are not all-terrain vehicles or ATVs

In April 2009, the Victorian coroner in an inquest into eight fatalities involving quad bikes observed that: 'To describe a quad bike as an all-terrain vehicle is a serious overstatement of its capabilities.'

He went on to comment: 'Quad bikes are described, marketed and sold as all-terrain vehicles. They do not possess all-terrain capability. The description of a quad bike as an all-terrain vehicle creates an impression of invincibility. Manuals replete with warnings setting out the limitations of quad bikes have failed to negate the fallacy.'

'Despite warnings to the contrary, there exists the false perception that quad bikes are stable, robust machines with 'go-anywhere' capability. **Quad bikes are not all-terrain vehicles.**'

This handbook is not a substitute for the operator's manual for your specific quad bike. It should be read in conjunction with your operator's manual because quad bikes can be dangerous when used outside the manufacturer's guidelines.

Who should read this handbook?

While this handbook was originally written for farm owners, their family members and workers, including their contractors, the handbook will be useful to any person who operates or manages those who operate quad bikes in the workplace.

Why should you read this handbook?

The handbook will help users of quad bikes to identify hazards associated with their use and provides a range of simple solutions that may reduce the potential of both accident and/or injury.

What information does this handbook contain?

It explains the obligations a Person Conducting a Business or Undertaking (PCBU) and workers have under the Northern Territory *Work Health and Safety (National Uniform Legislation) Act* (WHS (NUL) Act). It also has information about risk factors, choosing the right vehicle for the job, safe operation and maintenance.

This handbook includes a number of checklists to assist people to identify and control risks associated with the use of quad bikes. Checklists may be altered to suit a particular property. The checklists are also available online at www.worksafe.nt.gov.au

Don't just read the handbook—Act on it

Quad bike operators need to understand the risks associated with the use of quad bikes so they can make informed choices that minimise risks and lead to safe use.

Case study

You are never too old or too experienced to wear a helmet

A 71-year-old farmer was killed when she was thrown from her quad bike into a barbed wire fence and hit her head on a rock. She had been checking stock and water. She was found by her son in an area that was deeply rutted, approximately 15 metres from the quad bike which was entangled in the fence. No helmet was worn.

Case study

Even the simplest job can be risky

A farmhand was killed traversing a slope along a makeshift road with long grass and a steep, uneven gradient. He had tied steel to the back of his quad bike which toppled over and landed on top of him as he was traversing the slope. He was 59 years old.

1. WHAT IS A QUAD BIKE?



For the purpose of this publication a quad bike is defined as:

Any motorised off-highway vehicle designed to travel on four low pressure tyres, having a seat designed to be straddled by the operator and handlebars for steering control, and intended use by a single operator and no passenger.

Quad bikes can be two-wheel drive or four-wheel drive and are sometimes referred to as 'four-wheel motorbikes'. They are only one of many vehicles that are useful for work on farms.

This handbook refers only to single-operator quad bikes as described in the definition above.

In many respects the quad bike is the modern equivalent of a horse. It carries a person and is reasonably manoeuvrable. Like a horse, a quad bike can pull implements and trailers, assist in mustering and help farmers check stock and fences. For many farmers, quad bikes are indispensable equipment and used almost every day.

But quad bikes have no innate sense of balance, they cannot compensate for poor skills or inexperience, they won't come when called and will never be able to take a severely injured operator home or raise the alarm.

Case study

Help needed

A farmer was riding a quad bike on his property when it rolled over on an embankment. The man walked approximately 40 metres and then collapsed and died. His body was not located until the following day.

A PCBU must make informed choices about the safest and most appropriate vehicles for particular tasks in their workplace. Knowledge of the source of risks relating to death and injury, plus an understanding of how to avoid or minimise risk can help you with the decision-making process.

2.1 Quad bike use

Studies of quad bike use show:

- Riders of all ages are at risk of death. The age range of those who have died broadly reflects the age distribution of farmers.
- The majority of those who have died were quad bike operators, however passengers and bystanders are also at risk.
- The majority of fatal quad bike incidents involve males, but females are also at risk.
- Quad bike-related deaths are associated with a wide range of work activities in agriculture and horticulture.
- A significant number of on-farm deaths are associated with recreational activities on farms.
- There is a propensity for quad bikes to roll over and cause serious injury or death to operators.
- Incorrect loading of the quad bike has been associated with rollover deaths. Terrain, slope and surface appear to play key roles in quad bike-related deaths.
- The head and chest are the most common body parts injured. Most of these injuries are caused by crushing between the quad bike and the ground or other surface, while others occur when operators are flung onto hard surfaces in a crash.
- Most injuries and deaths involve the head and cervical spine, crush injuries and asphyxia.¹

Farmers have been killed while:

- controlling weeds
- mustering/herding/drafting stock
- inspecting property/water/stock
- moving materials
- travelling
- hunting.

¹ Source: Fragar, L. & Pollock, K. 2007, *All-terrain Vehicle (Quad bike) Safety on Australian Farms Briefing Paper*, prepared for the Farmsafe Australia Reference Group on Quad bike Safety

2.2 Rollover

Vehicle rollover is a common event in quad bike incidents. Quad bikes can roll over in any direction — to the front, side or rear. Rollover can occur suddenly, even at low speeds, putting the operator at risk of injury or death from being thrown from the vehicle, trapped, and/or crushed beneath it. The risk of rollover is increased if the quad bike:

- is traversing slopes
- is travelling at high speed
- is towing an implement
- is carrying a heavy or unstable load (like chemicals for spraying)
- has tyres that are under inflated or unevenly inflated.

Case study

Exercise caution when spraying

A 75-year-old man was killed while operating a quad bike equipped with a 50-litre spray tank full of chemical spray. He was working in a wet area on an incline of 20–30 degrees. The man's wife discovered him lying face down towards the rear of the quad bike which was on its side on top of the man.

The table below highlights conditions to be considered to ensure the safe operation of your quad bike. If any of the conditions exist you will need to take steps to control the risk.

Controlling the risk

Equipment and attachments	<ul style="list-style-type: none"> • Loading <ul style="list-style-type: none"> – overloading – liquid loads – unstable or unbalanced loads – over-sized trailers • Poor maintenance of both mechanical and safety items • Incorrect tyres for conditions • Incorrect tyre pressure • Inadequate guards to protect hands and feet
Operator characteristics	<ul style="list-style-type: none"> • Age of operator • Physical fitness of operator • Operator competency <ul style="list-style-type: none"> – type of activity to undertake eg mustering or spraying while operating a quad bike
Operator behaviours	<ul style="list-style-type: none"> • Failure to observe manufacturer's safety warnings or recommendations for use of vehicle • Failure to wear adequate personal protective equipment (PPE) such as helmets or hearing protection • Speeding • Single seat quad bikes used to carry passengers
Environment	<ul style="list-style-type: none"> • Bright sunlight that can affect the vision of the operator • Fences that are hard to see • Obstacles – overhead, ground level or hidden in long grass (eg stumps and animal burrows) • Terrain variations <ul style="list-style-type: none"> – mud – sand – uneven surface – frost, snow and floods • Unpredictable surface changes • Pavement or bitumen surfaces • Chemical exposure • Other vehicles

3. LEGAL REQUIREMENTS

3.1 Health and safety

The WHS (NUL) Act applies to all workplaces, including farms and as such, you have legal responsibilities under the WHS (NUL) Act.

These include ensuring, so far as is reasonably practicable, that:

- the workplace is a safe working environment without risk to the health of your workers
- all people (including family members, visitors and workers, which includes contractors) are not exposed to risks to their health and safety arising from workplace activities
- the means of entering and leaving the workplace are safe and without risk to health.

If you are a PCBU, you should:

- consult with your workers and any health and safety representatives (HSRs) on matters that might affect their health and safety
- report serious injuries and dangerous incidents to NT WorkSafe.

The reporting duty also applies if you are self-employed.

The Work Health and Safety (National Uniform Legislation) Regulations have more detailed requirements for the identification and control of hazards associated with the use of plant such as quad bikes.

If your workers use quad bikes, you must:

- identify any hazards associated with the quad bikes and their use, and ensure that any risks are eliminated or reduced
- provide and maintain quad bikes that are safe
- provide and maintain safe work practices relating to quad bike operation, and
- provide workers with sufficient training and supervision so that they can work safely with quad bikes.

Workers must:

- take reasonable care for their own health and safety
- comply with their PCBU in any actions taken to comply with the WHS (NUL) Act and Regulations.

3.2 Registration and licensing

Quad bikes are designed primarily for off-road recreation or agricultural purposes. These vehicles do not meet the necessary vehicle safety and environmental requirements for road vehicles in accordance with applicable Australian Design Rules for use in a public place, public street or a road related area. As a result, they cannot be granted open (unconditional) registration for normal on-road use.

The Registrar of Motor Vehicles may consider conditional registration of a quad bike where it can be demonstrated that a specific work related task cannot be performed in a complying vehicle that meets the necessary levels of vehicle safety. These specific tasks include utility works such as roadside litter collection and weed spraying.

Application for conditional registration of a quad bike must be made in writing to the Registrar of Motor Vehicles at the following address and will be considered on a case-by-case basis.

Registrar of Motor Vehicles
Motor Vehicle Registry
PO Box 530
DARWIN NT 0801

If conditional registration is offered, conditions may include, but not necessarily be limited to the following:

1. Restriction against transfer of ownership;
2. Area restricted;
3. Travel on or across public streets is to be kept at a minimum;
4. Operation of the quad bike is restricted to workers, which includes contractors of the organisation;
5. Safety limits of the vehicle are not to be exceeded;
6. The operator must wear an approved motor cycle helmet (conforming to Australian Standards AS 1698) at all times while operating the vehicle, unless wearing of necessary occupational health and safety equipment prevents this. If this is the case, the quad bikes operating speed must not exceed 10km/hr;
7. A rotating amber flashing light visible from all directions from a distance of at least 200 metres in fine daylight conditions must be operating while the vehicle is in use in public places or on public streets;
8. The quad bike is not to travel during darkness (sunset to sunrise) or conditions of poor visibility; and
9. The operator must hold a current Northern Territory "C" class or appropriate "R" class driver's licence.

For further information on conditional registration, contact the Motor Vehicle Registry on telephone **1300 654 628**.

4. VEHICLE SELECTION



The safest vehicle is the one best suited to the job

Quad bikes are practical for many tasks, however they have limitations. Small on-road vehicles, two-wheel motorbikes and light utility vehicles may be a better choice for many jobs in workplaces.



4.1 Is a quad bike the best option for your workplace?

When purchasing a vehicle, a bit of research goes a long way toward helping you get the vehicle that's best for you. There are three easy steps to help you select the right vehicle for your workplace.

- 1 Identify your needs and relevant operator safety issues.
- 2 Compare vehicle options to your needs.
- 3 Question dealers and others with relevant knowledge.





4.1.1 Identify your needs and relevant operator safety issues

Before you visit dealer showrooms, make a list of your needs. Some questions to ask include:

- Tasks – What tasks will it be used for? What do you need it to do?
- Conditions – What are the most common conditions you will be using it in? Rocky or hilly country? Mud? Sand?
- Safety – Which vehicle provides the operator with the greatest level of safety for each task?
- Operator – Who will be operating the vehicle? What training do they have, or require? What size and age are they? Do I have the necessary skills and expertise to train the operator(s) or would I need to seek outside trainers?
- Protective equipment – What protective gear is required?
- Potential road use – Will there be times when the vehicle is operating on the road?
- Loads – What will be carried and how much will it weigh?
- Towing – Will the vehicle be used to tow trailers or other attachments? If it will, what will be the maximum weight and height the vehicle will be required to tow?

4.1.2 Compare vehicle options to your needs

Quad bikes have a light footprint and are an economical single person vehicle for off-road use. However, a quad bike may not be the most suitable choice when work requires more power.

Larger and more powerful quad bikes have become available in recent years. A key safety consideration on larger quad bikes, especially for inexperienced operators, is the aggressiveness of the throttle action when starting off and changing gears while on the move. Therefore larger quad bikes may not be as safe as smaller ones for many tasks, for example, droving.

4. VEHICLE SELECTION

The information in this table may assist you in selecting the safest vehicle for jobs in your workplace.

Workplace vehicle selection options

Task	Risks	Alternatives to consider that may reduce risks
<p>Checking parts of the workplace</p> <p>Quad bikes, when used without attachments and on level surfaces are an invaluable tool for inspecting and accessing remote parts of the workplace.</p>	<p>Rollover</p> <p>Collision</p> <p>Unpredictable surface changes</p>	<ul style="list-style-type: none"> • Ute, 4WD • Two-wheel agricultural motorbike • Horse • Light utility vehicle (sometimes known as multi-purpose vehicle)
<p>Transporting</p> <p>Quad bikes are often used for transporting the operator and small loads around the workplace.</p>	<p>Rollover</p> <p>Collision</p>	<ul style="list-style-type: none"> • Ute, 4WD • Light utility vehicle • Small tractors (that also function well in wet conditions) • Two-wheel agricultural motorbike
<p>Moving produce on the workplace</p> <p>When used within their load and towing capacities, quad bikes are useful for carting boxes of fruit, vegetables, hay and small animals.</p>	<p>Rollover</p> <p>Collision</p> <p>Loss of traction on downhill slopes</p> <p>Overload</p>	<ul style="list-style-type: none"> • Light utility vehicle with trailer • Ute, 4WD • Tractor with trailer
<p>Spraying of weeds</p> <p>Quad bikes may have fitted or towable spray tanks.</p>	<p>Unstable load may change centre of gravity and make vehicle less stable</p> <p>Loss of traction on downhill slopes</p> <p>Rollover</p> <p>Collision</p> <p>Overload</p> <p>Chemical exposure</p>	<ul style="list-style-type: none"> • Light utility vehicle with fitted or towed tank • Ute, 4WD • Small tractor • Knapsack spray
<p>Mustering</p> <p>Quad bikes have proved very useful for mustering and moving sheep and cattle.</p>	<p>Rollover</p> <p>Collision</p> <p>Hidden obstacles</p>	<ul style="list-style-type: none"> • Two-wheel agricultural motorbike • Ute, 4WD • Horse • Helicopter

Adapted from Farmsafe Australia Inc, *Safe operation of All-terrain Vehicles and All-terrain Utilities on Australian Farms – An Industry Strategy 2004–2009*

4.2 Quad bike selection criteria

If you have decided that a quad bike is best for your operation, there are still many options and combinations to consider:

- size range from small and lightweight, to large and heavy
- high or low engine capacity size (cc)
- two-wheel drive and/or four-wheel drive
- front and/or rear brakes - some may have linked hand and/or foot brakes
- electric start, kick-start and/or pull-start
- liquid-cooled and/or air-cooled engines
- automatic or hand-operated clutches
- ability to drive in reverse or reverse gear provided
- solid drive axles, differentials
- chain drives, shaft drives
- thumb lever throttles, twisting handgrip throttles
- controls and their locations differ from one quad bike to another.

4.2.1 Loads and attachments

It is also important to consider the load specifications of particular quad bikes and what attachments are available. The manufacturer's specified load limit includes the operator, the load being carried, plus any attachment used. These should be factored into the total weight of any load and will impact upon the safe choice you make about a particular quad bike.

Ask suppliers about the suitability of their range of quad bikes and attachments for the tasks you want to do in your workplace. In the final analysis, safety must be the paramount consideration.



5. WORKPLACE SAFETY SYSTEMS

As stated in section 3, PCBUs are responsible for ensuring, so far as reasonably practicable, that the workplace they control or manage is safe and without risks to health and safety for any person. Workplace safety systems help you meet your legal work health and safety requirements, and are specific to your workplace environment. Some key safety systems include:

- quad bike operating rules
- emergency communication systems, and
- training and supervision.

5.1 Quad bike operating rules

Quad bike operating rules are the basic rules for operating quad bikes in the workplace. When developing these rules, be guided by the manufacturer's specifications and the safety warnings on the vehicle. At a minimum, quad bike operating rules should cover:

- information about the make and models of quad bikes in your workplace
- who is authorised to operate each quad bike
- what training and induction is required
- information that passengers are not to be carried on quad bikes
- what protective gear must be worn, how to care for it and how to store it
- what each quad bike can be used for, and what it can't be used for
- where it can be ridden. Are parts of the workplace quad bike no-go zones? Are there designated tracks?
- what conditions each quad bike can be used in, and what conditions it cannot be used
- what speed the quad bike is to be ridden on various terrain and around buildings
- how to safely load and unload each quad bike and how much it can carry
- how the quad bike will be loaded for transport
- how the quad bike will be stored
- what attachments are to be used with the quad bike
- when and how the quad bike is to be maintained or defects rectified
- what communication systems are to be used by quad bike operators in your workplace.

5.2 Communication systems

In many quad bike-related fatalities, the victim was not noticed as missing for at least 24 hours, sometimes considerably longer. Some of these lives could have been saved if the victim communicated they were injured and received help promptly.

If workers are working alone, it is important someone else knows their planned movements. If they are late returning, a phone or two-way radio call will keep concerned parties informed. If there is no answer, the other person can arrange for someone to search for the person.

Developing a communication plan is a good safety strategy. Once established, it will soon become automatic.

5.2.1 Sample communication protocol

If you will be working alone and out and about on a quad bike:

- Identify someone in the workplace or close by who agrees to check for your planned return and monitor a phone and/or two-way radio while you are working.
- Leave a note for the person advising them:
 - what you will be doing
 - where you will be
 - when you expect to return.
- Discuss emergency plans with the person:
 - if you are late, how much leeway until the alarm is raised?
 - will they come looking or call emergency services first?
- Wear a high visibility vest and/or put a high flag on the quad bike to improve your visibility.
- Carry adequately powered and charged two-way radio and/or mobile phone.

5.2.2 Some ways to raise help are:

- In an emergency call 000 from fixed or mobile phones.
Call 112 from GSM mobile phones only – when dialling '112' on GSM mobile phones, access is provided regardless of the presence or validity of a SIM card within the phone or whether the keypad is locked. A signal is still necessary. The call automatically directs to 000.
- Carry a Personal Locator Beacon for use in area's outside of mobile phone coverage.

The PCBU must provide a safe system of work that includes effective communication with the worker who carries out remote or isolated work..

5.3 Training and supervision

No operator should use a quad bike for work without first receiving training.

Training is essential to help reduce the risk of serious injury and death associated with quad bike use. Training and supervision ensure the workplace safety systems are communicated to workers and that workers understand and follow the systems.

The manufacturer, supplier, an external training provider or yourself (if you have the necessary skills and expertise), can provide training. Some suppliers provide training options at the time of purchase.

5.3.1 Training requirements

- Induction

A PCBU must ensure new workers are trained before they use equipment. The induction should outline the workplace operating rules and familiarise the worker with the safety instructions in the operator's manual as well as the location of the operator's manual. Any quad bike no-go zones in the workplace should also be explained.

- Upgrading and training for existing workers

A PCBU must ensure experienced operators and long-term workers receive training when there is a change in vehicle or attachments.

5.3.2 Supervision

Supervision ensures workers operate quad bikes safely. Supervision may need to be more frequent at first to support new and young workers or other workers who are not familiar with quad bikes.

After providing training or an induction, it is advisable to carry out (and document) a practical skills assessment of each person who is to operate existing and/or new quad bikes in your workplace. The purpose of this is to help you gauge the skills of workers before they operate a quad bike in your workplace. This skills assessment involves the operator demonstrating knowledge about the quad bike, its operation, your workplace rules and showing you their riding skills.

5.3.3 Maintaining records of training and supervision

Keep records of training and induction that is undertaken, noting the names of the trainer and the operator, the date, location of training and the skills assessment results of training. Also, when problems are reported, record the problem as well as the actions undertaken to remedy it.

The following 'Sample quad bike operator skills assessment' checklist can be adapted for use in your workplace.

Sample quad bike operator skills assessment

Add to or alter this form to suit your quad bike and workplace rules.

- Maintain completed forms to provide a record of completed inspection and/or training.
- The operator's manual provides information about minimum maintenance activity.
- Additional copies of checklists are available at www.worksafe.nt.gov.au

Quad bike skills assessment for (operator name):

Test undertaken at (location):

Pre-start-up	Operator should:	Demonstrated	
		Yes	No
	Be dressed in suitable work clothing and footwear for operation.	<input type="checkbox"/>	<input type="checkbox"/>
	Describe the purpose and correct use of machine controls.	<input type="checkbox"/>	<input type="checkbox"/>
	State why passengers are not to be carried on quad bike.	<input type="checkbox"/>	<input type="checkbox"/>
	Know how to do a pre-operational check.	<input type="checkbox"/>	<input type="checkbox"/>
	Check operation and adjustment of brakes.	<input type="checkbox"/>	<input type="checkbox"/>
	Other	<input type="checkbox"/>	<input type="checkbox"/>
Operation	Operator should:	<input type="checkbox"/>	<input type="checkbox"/>
	Wear a helmet that complies with AS 1698-2006.	<input type="checkbox"/>	<input type="checkbox"/>
	Wear appropriate PPE and specify different PPE for different work tasks.	<input type="checkbox"/>	<input type="checkbox"/>
	Follow the manufacturer's starting procedure.	<input type="checkbox"/>	<input type="checkbox"/>
	Ride in forward direction around a defined course – figure-8 around soft obstacles.	<input type="checkbox"/>	<input type="checkbox"/>
	Brake at corner of defined course.	<input type="checkbox"/>	<input type="checkbox"/>

5. WORKPLACE SAFETY SYSTEMS

Sample quad bike operator skills assessment (continued)

Operation	Operator should:	Demonstrated	
		Yes	No
	Demonstrate how to reverse, if appropriate.	<input type="checkbox"/>	<input type="checkbox"/>
	Ride the quad bike, demonstrating control over more difficult terrain such as slope, gully, and channel bank.	<input type="checkbox"/>	<input type="checkbox"/>
	Know about safe loads and attachments and where to get this information for each quad bike in the workplace.	<input type="checkbox"/>	<input type="checkbox"/>
	Know about workplace safety rules, including speed limits and quad bike no-go zones.	<input type="checkbox"/>	<input type="checkbox"/>
	Know what jobs the quad bike is to be used for (and what it should not be used for.)	<input type="checkbox"/>	<input type="checkbox"/>
	Know how to safely load, transport, unload and store a quad bike.	<input type="checkbox"/>	<input type="checkbox"/>
	Other	<input type="checkbox"/>	<input type="checkbox"/>
Name of operator:		Date of assesment	
Person conducting assessment:		For quad bike No.	

Adapted from Farmsafe Australia Inc, 2006, *Safety of All-terrain Vehicles (Quad bikes) and other small Utility Vehicles on Australian Farms, A practical management handbook*, Australian Centre for Agricultural Health and Safety.

6. USING A QUAD BIKE

For many property owners/farmers it is second nature to use a quad bike, but many injuries and fatalities happen on properties/farms from using quad bikes inappropriately. When you own a quad bike, it can become a habit to use the quad bike, but quad bikes are not suited to all operators, conditions or tasks.

The following sections include useful advice for operating your quad bike safely.

6.1 Operators

The operator must be able to safely operate the quad bike. Some aspects to consider when matching a quad bike to an operator include:

- Size of operator: Large or heavy framed people require a larger vehicle, smaller people require a smaller vehicle – match the quad bike to the size of the person.
- Operator competence: Some quad bikes are more difficult to operate than others based on their speed, agility and other performance characteristics. Ensure the operator has the skill and experience to operate the quad bike safely.
- Operator age: Use of adult-sized quad bikes by persons under the age of 16 is not recommended by manufacturers.



6. USING A QUAD BIKE



6.2 Conditions and tasks

The conditions in your workplace and the tasks that will be done are also key considerations when thinking about using a quad bike. When riding in sand and mud, specific riding skills are required, particularly in maintaining vehicle momentum and stability. Other factors that can affect quad bike operation are seasonal conditions like frost, snow or flooding. Attachments, liquid loads and multi-tasking are risks that can be managed. Some techniques for managing these risks are outlined below.

6.3 Challenging terrain

Operators must take precautions while riding on challenging terrain.



Recommended precautions

Ride on familiar tracks and be aware of what obstacles are in your path (like drains or rough surfaces).

Assess the terrain before you choose to ride over it. If you are not confident about riding over a particular patch of terrain, go another way or turnaround and use a more appropriate vehicle to complete your task.

Watch the ground ahead for potential hazards such as tree stumps, rabbit burrows, rocks or branches, especially in long grass.

Terrain can change in wet weather and require different skills and greater vigilance to operate a quad bike.

Quad bikes may become unstable where the terrain is rocky, rough or steep because the centre of gravity can shift quickly and dramatically in these conditions.

Be aware that liquid loads can cause sudden shifts to your quad bikes centre of gravity when riding over uneven terrain.

Remember that steep slopes put you at risk of rollover. The steeper the slope the higher the risk of rollover.

Keep speed down on slopes and in long grass.

Select low ratio gear when going up or coming down a slope. This also allows for engine braking to control speed when coming down hills.

It is safer to ride up or down slopes rather than across them.

When operating on slopes, operators must be trained in active riding techniques so that they know when to change their riding position to safely cross slopes and make turns.

Case study

Choose your riding path carefully

A young man, who owned his quad bike for two weeks, was carrying a passenger when his vehicle hit a low-lying outcrop of rock. Both the rider and passenger were thrown off the vehicle and the rider died from multiple injuries.

6.4 Attachments, loads and towing

Carrying loads on the front and/or rear racks of quad bikes is convenient, but can be risky because the extra weight can affect braking, alter the centre of gravity and make the vehicle difficult to control.

Manufacturers specify load and towing limits in the operator's manual and on the quad bike itself. These limits should not be exceeded. Manufacturer's load and towing limitations include:

- weight of the load
- location of the load
- attachment weight
- operator weight.

If an after-market attachment is used, the combined total weight should not exceed the manufacturer's weight or towing specifications.

Some workplaces may use more than one type of quad bike and the weight specifications may be different for each of them. Where necessary, check with your supplier.

Never operate an overloaded quad bike.

Never overload trailers.

Case study

Be cautious when spraying

A farmer was spraying using a quad bike fitted with a spray tank. The terrain was very steep and uneven. When he did not return by nightfall, a search was undertaken and he was found with the quad bike on its side, across his head and chest. He could not be revived.

Tips for loads and towing with your quad bike

Decide if there is a better alternative than your quad bike for towing.

Always obey the manufacturer's load limitations and recommendations. The brakes on a quad bike are designed to operate effectively within the limits specified, over relatively smooth and level terrain.

Keep the load low. High loads raise the centre of gravity and should be avoided.

Reduce speed and allow longer braking distance when carrying a load. Use low gear. The more weight you carry, the slower you should go.

Avoid hills and rough terrain. The weight of cargo carried should be reduced in rough terrain or as the slope increases. If operating on steep slopes, little or no load should be carried. Speed of operation should also be modified.

Secure loads to racks with straps provided.

Connect to the towing point of the vehicle only.

Operate only with stable and safe loads.

Do not travel faster than the speed recommended in the operator's manual or in your workplace rules.

Tanks for liquids should have baffles to reduce the movement of the liquid.



6.4.1 Liquid loads and tanks

Liquid loads, either carried on the quad bike or towed, are unstable because the contents can shift when cornering or traversing slopes. This decreases quad bike stability and increases the likelihood of rollover. Tanks fitted with baffles are a better option, but they do not completely reduce the risks associated with liquid loads.

When carrying liquid loads, include the weight of the contents of the tank in your load calculations. One litre of water weighs 1kg.

At a minimum, tanks for liquids should:

- have internal baffles that restrict the movement of liquid as the tank is moved
- have smooth external surfaces with no sharp edges and be as low as possible to keep the centre of gravity low
- allow the operator to move freely when operating the quad bike without obscuring their vision or interfering with operator controls
- not touch the operator or restrict their ability to separate from the machine in the event of a rollover
- be properly sealed to avoid splashing of chemicals onto the machine, the operator or surroundings
- must not exceed the manufacturer's load limits for each quad bike.



6.5 Multi-tasking

Where a quad bike operator undertakes a task (such as spraying or mustering) while operating a quad bike, their skill level needs to be higher than that required for simple riding. Multi-tasking increases risk because the operator may focus on the task rather than operating the vehicle.

Mustering provides a good example of this. Quad bike operators focus on the livestock rather than the ground they are riding over and may not be aware of unexpected surface changes or obstacles.

To increase your safety when mustering or performing other multi-tasking activities, maintain slow speed and seek a path over the terrain that provides the best visibility of any potential obstruction or hazard.

Case study

Mustering without a helmet

A 38-year-old man was killed when mustering cattle on a quad bike. While pursuing an animal in the area adjacent to the road he came off the quad bike and landed awkwardly approximately two metres from the quad bike. He was not wearing a helmet.



6.6 Wear the right PPE for the task

Quad bike operators should wear appropriate personal protective equipment (PPE) when operating a quad bike.

Case study

A young man without a helmet

A 21-year-old man was killed while accelerating up a steep embankment. The front wheels of his quad bike left the ground, causing it to roll over onto him. He was not wearing a helmet.

PPE Information

Helmet

- A helmet is the most important piece of protective equipment and should be worn at all times the vehicle is being ridden.
 - Select a helmet that complies with Australian Standard 1698:2006 Protective helmets for vehicle users. These helmets meet the requirements for on-road and off-road use.
 - Ensure the helmet fits the operator snugly, is securely fastened and provides good, all-round visibility. A poorly-fitting or loose helmet can become dislodged in an incident and then offer no protection at all.
 - Operators should not share helmets but instead use personal helmets for size and hygiene reasons.

Eye protection

- Eye protection is recommended to prevent eye injuries and prevent branches, bugs, dust or sand hitting your face and distracting you. Sunglasses are unlikely to provide adequate physical protection. Suitable types of eye protection include:
 - helmets fitted with visors (check visibility of tinted visors in low light conditions), or
 - a pair of riding goggles. If goggles are worn, ensure they are good safety goggles, are well-ventilated, and able to be securely fastened.

Gloves

- Gloves are recommended to provide protection from abrasions and help to keep your hands from getting sore, tired or cold. Note that rigger's gloves may become slippery when wet and are not advisable for use with quad bikes.



PPE	Information (cont.)
Footwear	<ul style="list-style-type: none"> Sturdy footwear is recommended (preferably boots that come up past your ankle with strong uppers for gear changes.) Heels will prevent your feet from slipping off the foot decks.
Clothing	<ul style="list-style-type: none"> Arms and legs should be covered to reduce abrasions to the body, even in hot weather. Trousers should be close-fitting and in good condition.
Hearing protection	<ul style="list-style-type: none"> If the vehicle operation is rated above 85 decibels, hearing protection such as earplugs should be used.
UV protection	<ul style="list-style-type: none"> UV protection is recommended as helmets may not protect your face or back of neck from UV rays. UV protection includes: <ul style="list-style-type: none"> sun block (be guided by the Cancer Council recommendations).
PPE for chemical application	<ul style="list-style-type: none"> Employers must ensure employees follow the chemical manufacturer's directions when working with chemicals. Refer to the relevant chemical safety data sheet (SDS) and product label for the correct type of PPE required. If the recommended PPE interferes with the operator's helmet or the operation of the quad bike, then an alternative vehicle should be used. Equip the quad bike with a first aid kit and ensure items recommended in the SDS are included.
High-visibility vest	<ul style="list-style-type: none"> High-visibility vests are recommended for use, particularly when quad bikes are driven on roads.

Case study

Obey all quad bike warning decals

Three people on a quad bike were not wearing helmets when the vehicle crashed into a fence post and overturned. The two adults were thrown clear but the quad bike overturned onto the child passenger.

The quad bike had two safety decals displaying warnings about wearing helmets and never carrying passengers.

6.7 Quad bike safety essentials

While it's essential to plan for safety, it's equally important to operate the quad bike according to the plan. The best quad bike safety plan is only as safe as the operator driving the quad bike. At a minimum, operators must:

- wear a helmet that meets *Australian Standard 1698:2006 - Protective helmets for vehicle users*
- wear the appropriate PPE
- undertake pre-operation checks
- only operate equipment that is correctly maintained
- operate the quad bike in accordance with the operator's manual and workplace operating rules
- work in pairs where possible.

7. TRANSPORTING AND STORING YOUR QUAD BIKE



7.1 Loading (and unloading) quad bikes for transport

The following steps should be taken to load your quad bike.

1. Read the operator's manual to identify the maximum safe slope for loading. Ramps will need to be longer the higher the tray on the transport vehicle.
2. Select a suitable site to load and unload the quad bike. Use a loading bank or platform whenever possible.
3. Box-type trailers may be lower than other options and therefore safer to use.
4. Remove loads from the quad bike. Empty spray tanks before loading.
5. If using ramps, centre the quad bike over the ramps. Select 4WD if available.
6. Check ramp carrying capacity. The weight should be marked on each ramp.
Example: if the safe working load (SWL) for each ramp is 175kg, that's a total load capacity of 350kg.
7. Once loaded, position the quad bike in the centre of the trailer.
8. Put the park brake on.
9. Secure the quad bike front and back with straps and harnesses in good condition.
10. Use crossover ties if you are travelling a long distance or over uneven terrain.
11. Secure other objects the quad bike is not damaged by shifting loads.

For unloading, follow the steps above, but in reverse.

7.2 Storing a quad bike

Store under cover if possible.

1. Before putting the quad bike away report any maintenance issues so they can be attended to before it is next used. Consider disabling the quad bike until repairs are completed.
2. Store any associated quad bike equipment (such as spray tanks) securely.
3. Refer to the operator's manual if the quad bike is to be stored for a long period.
4. Remove keys to prevent unauthorised use.

8. QUAD BIKE MAINTENANCE



A properly maintained quad bike is a safer vehicle. Regular, careful pre-operation checks and routine maintenance will keep your quad bike in reliable working condition. If you are uncertain about carrying out a maintenance task correctly, take it to a suitably qualified repairer.

Case study

Maintenance – your life may depend on it

A 56-year-old farmer and a small child were killed when a quad bike reversed and crushed them between the vehicle and a trailer. An inspection of the quad bike by a qualified technician showed that it was in a chronic state of disrepair. Only 10 per cent of the brake shoe material remained. The vehicle was judged incapable of stopping within the required distance, even at 8kph.

Like many quad bikes, this quad bike had a safety 'lockout' that prevents the engine being started in gear unless the footbrake is engaged, but on this one the reverse lock release cable was so rusted it had seized.

8.1 Pre-operation checks

Case study

Don't forget the pre-operation check

A farmer was checking the fuel level of his quad bike while it was in motion when he lost control of the vehicle and it rolled. He was found deceased one hour later with the bike on his chest. He was not wearing a helmet, despite one being available.

Ensure your quad bike is in proper working order before use to minimise the risk of personal injury and damage to the vehicle. It is particularly important to do a pre-operational check if you are not the person who last used the quad bike or if you have not used it for some time. This also helps avoid the possibility of getting stranded because of breakdown or lack of fuel.

The operator's manual lists specific items to be checked before a quad bike is started up for work and is the starting point for safe operation of a quad bike. Always follow the procedures and specifications laid out in the manual.

The following sample pre-operation checklist can be adapted for use in your workplace.

Sample pre-operation checklist

Add to or adapt this checklist to suit your quad bike and place photocopies in a sturdy folder where vehicle keys and operator PPE are stored.

- Maintain completed forms to provide a record of completed inspection and/or training.
- The operator's manual provides information about minimum maintenance activity.
- Additional copies of checklists are available at worksafe.nt.gov.au

Pre-operation checklist:

For quad bike No:

Check the fuel, oil and coolant every time before use with the engine off.

Visually inspect

Check for damaged or loose parts. Check for fuel or oil leaks.

Wheels and Tyres

Check tyres for damage. Ensure tyre pressure is correct and even in each tyre. Check wheel nuts.

Throttle

Check the throttle operates smoothly across its range. Accumulated mud and dirt can restrict cable movement and prevent the throttle from closing.

Brakes

Check brakes operate properly before reaching full speed.

Air filter

Check it is not choked with dirt. Clean and replace regularly.

Lights and switches

Check lights and switches work.

Drive chain and chassis

Inspect chain for proper adjustment, wear and lubrication. Check drive shaft for oil leakage.
 Look and feel for loose parts with the engine off. Rough terrain will loosen chassis parts.

Steering

Check the steering moves freely, but without undue looseness.

Other checks required

Maintenance actions required

For safe operation, any defects identified in a check of the quad bike must be fixed before it is put into operation. This may mean you need a suitably qualified repairer.

Done

Checked by:

Date

8. QUAD BIKE MAINTENANCE



8.2 Routine maintenance

Routine maintenance involves:

- cleaning
- inspecting
- lubricating
- adjusting
- replacing parts.

A toolkit is provided at the time of purchase and is usually stored under the seat or in a compartment on the quad bike itself.

Maintenance tips

Maintain your quad bike according to the maintenance schedule in the operator's manual at a minimum. Quad bike manufacturers recommend how and when routine maintenance should be conducted. The frequency of routine maintenance of your quad bike should take account of the environment in which the quad bike operates.

Ensure that a competent person carries out any maintenance tasks and a suitably qualified repairer carries out repairs.

After any significant incident or accident, have a suitably qualified service person check the vehicle and list all defects.

Wash the quad bike routinely to remove mud, manure, debris or chemical residue build up that can cause corrosion and affect operation and/or prevent controls from functioning.

Any modifications must be within the manufacturer's specifications. Changing the type of tyres or puncture-proofing tyres may adversely affect the quad bikes performance. Refer to your operator's manual and/or speak to your supplier for more details.

8.3 Sample routine maintenance checklist

The sample routine maintenance checklist below can be adapted for use in your workplace.

- Maintain completed forms to provide a record of completed inspection and/or training.
- The operator's manual provides information about minimum maintenance activity.
- The frequency of routine maintenance of your quad bike should take account of the environment in which the quad bike operates.

Sample routine maintenance checklist

Quad bike No:	Odometer/hours reading:
Brakes <ul style="list-style-type: none"> <input type="checkbox"/> Check adjustment, pads, cables and fluid levels <input type="checkbox"/> Auxiliary brake <input type="checkbox"/> Foot and hand levers adjusted – as per the operator's manual <input type="checkbox"/> Check disc wear 	Wheels <ul style="list-style-type: none"> <input type="checkbox"/> Axle bearings and wheel nuts are tight <input type="checkbox"/> Rims not dented or buckled <input type="checkbox"/> Tyres are roadworthy, with adequate tread depth <input type="checkbox"/> Tyre type and pressure as per the operator's manual <input type="checkbox"/> Use low-pressure tyre gauge. High-pressure gauges are not accurate for quad bike tyres
Chassis and suspension <ul style="list-style-type: none"> <input type="checkbox"/> Shock absorbers – for leaks and wear <input type="checkbox"/> Suspension operation <input type="checkbox"/> Safety guards – for looseness <input type="checkbox"/> Handlebars, foot decks and major fasteners – use tension wrench 	Steering <ul style="list-style-type: none"> <input type="checkbox"/> Smooth movement from lock to lock <input type="checkbox"/> Linkages – for wear
Throttle operation <ul style="list-style-type: none"> <input type="checkbox"/> Test while moving handlebars fully to the left and fully to the right 	Gear selectors <ul style="list-style-type: none"> <input type="checkbox"/> Gear levers – for damage and excessive slack <input type="checkbox"/> Splines on gear shaft
Fluid levels <ul style="list-style-type: none"> <input type="checkbox"/> Fluid levels as recommended in the operator's manual <input type="checkbox"/> Transmission fluid <input type="checkbox"/> Engine oil <input type="checkbox"/> Battery fluid <input type="checkbox"/> Brake fluid <input type="checkbox"/> Fuel tank filled 	Cooling systems <ul style="list-style-type: none"> <input type="checkbox"/> Fluid levels (if liquid cooled) <input type="checkbox"/> Thermostatic fan <input type="checkbox"/> Leaks and damage

8. QUAD BIKE MAINTENANCE

Sample routine maintenance checklist (cont.)

4WD system

- Constant velocity joints
- Drive line and shafts
- Check for split boots on drive shafts

Signals

- Lights
- Horn
- Indicators

For quad bikes with chain drive

- Chain adjustment as per the operator's manual
- Sprockets not worn

Lever controls

- Check smoothness of operation
- Check for broken, sharp or bent levers

Air filter

- Check, clean and regularly replace

Exhaust

- Holes and corrosion
- Excessive noise
- Looseness
- Spark arrestor fitted

Battery

- Battery terminals – for corrosion and tightness
- Electrolyte levels
- Damaged casing

Other

- Check for attachment and condition of:
- Load carriers
 - Foot decks
 - Seat

Additional routine maintenance checks required for your quad bike:

On the back of this sheet list:

1. Maintenance actions required
2. Items that require attention from an authorised repair person

Maintenance check performed by:

Date:

Next service at:

9. QUAD BIKE OPERATION CHECKLIST

This checklist is a simple summary of the safety features discussed in the Quad Bikes handbook.

If you can tick the 'Yes' column for the items listed you are well on the way to productive utilisation of quad bikes in your workplace. If you tick 'No' you need to address those issues.

Sample quad bike operation checklist

	Yes	No	Notes
Vehicle choice			
• Has the best vehicle for the task and conditions been selected?	<input type="checkbox"/>	<input type="checkbox"/>	
• Is the quad bike the safest vehicle for the job?	<input type="checkbox"/>	<input type="checkbox"/>	
• Is the quad bike matched to the operator?	<input type="checkbox"/>	<input type="checkbox"/>	
• Are any special permits and conditions relating to quad bike use complied with (eg registration for on-road use)?	<input type="checkbox"/>	<input type="checkbox"/>	
The operator			
• Workplace induction completed?	<input type="checkbox"/>	<input type="checkbox"/>	
• Quad bike operators are trained and competent?	<input type="checkbox"/>	<input type="checkbox"/>	
• Are records of training kept?	<input type="checkbox"/>	<input type="checkbox"/>	
• Are only authorised operators permitted to use quad bikes in your workplace?	<input type="checkbox"/>	<input type="checkbox"/>	
List their names:			

9. QUAD BIKE OPERATION CHECKLIST

Sample quad bike operation checklist (cont.)

	Yes	No	Notes
<p>Workplace</p> <ul style="list-style-type: none"> • Are safe work practices relating to quad bike operation established and communicated (ie workplace operating rules)? • Do workers know the workplace operating rules and are records kept? • Are workplace jobs for which the quad bike can be used (and not used) specified? • Are speed limits set for the workplace? • Do operators know about no-go zones for quad bikes in the workplace? 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<p>Maintenance</p> <ul style="list-style-type: none"> • Are quad bikes kept in safe condition? • Quad bike has start-up check before use every time? • Quad bike has routine maintenance? • Are faults reported and fixed as they occur? 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<p>PPE</p> <ul style="list-style-type: none"> • Does each operator have their own helmet that conforms to Australian Standards? • Does each operator wear their helmet and fasten their chinstrap? • Does each operator wear eye protection, sturdy boots, gloves, long sleeves and trousers? • Is other PPE required for specified jobs (eg spraying) available and worn? 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<p>Attachments, loads and towing</p> <ul style="list-style-type: none"> • Do fitted attachments comply with weight and towing specifications set by the manufacturer? • Are manufacturers' recommendations followed when using an attachment? • Do workers know what attachments to use and when? • Are tanks for carrying liquid loads fitted with baffles (eg spray tanks)? 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

Sample quad bike operation checklist (cont.)

	Yes	No	Notes
Transporting quad bikes <ul style="list-style-type: none"> Do workers know how to safely load, unload, tie down and transport the quad bike? 	<input type="checkbox"/>	<input type="checkbox"/>	
Communication <ul style="list-style-type: none"> Does your workplace have an established communication plan and is it followed? 	<input type="checkbox"/>	<input type="checkbox"/>	
Additional safety <ul style="list-style-type: none"> Passengers are not permitted on quad bikes. Children are not allowed to operate adult quad bikes. Are safety warnings on quad bikes obeyed? Is an appropriate first aid kit carried and maintained? Is unauthorised use of the quad bike controlled by the removal of keys? 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Additional requirements for workplace:			

Sample checklists

The sample checklists for quad bikes that appear in this handbook are available online for adaptation to particular properties and particular quad bike models. PCBUs can add to or alter each form to suit their property and copy the customised form as needed.

Completed forms can provide a record of completed inspection and/or training.

The sample checklists available at worksafe.nt.gov.au are:

- Quad bike operator skills assessment
- Pre-operation checklist
- Routine maintenance checklist
- Safe quad bike operation.

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