Quad Bike Review

October 2013

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Executive summary

This review was initiated to examine the use of quad bikes within the organisation. The review was asked to ascertain whether quad bikes are 'fit for purpose' in relation to how we use them, and/or whether there are alternative vehicle options to undertake this work. If quad bikes are an appropriate vehicle, the review was asked to identify the hazards and the risks associated with that use and to put in place processes to minimise those hazards.

The review panel found that quad bikes are an appropriate vehicle to use for particular work activities, but our current use in some areas does not necessarily align with recommended practices. There are also inconsistent approaches across the organisation in relation to:

- induction, training and the assessment of competence
- carrying of loads, securing loads and liquids
- carrying of passengers
- modifications and attachments to quad bikes

The review panel recommends that an organisational Standard Operating Procedure be developed to cover all aspects of quad bike training and use. The most contentious use of quad bikes is in relation to carrying passengers. The review panel recommend that the carrying of passengers on quad bikes for staff and contractors be prohibited while the review panel conducts a comparison of different types of vehicles to determine whether any other mode of transport could be used to perform the same or better function than quad bikes for these particular purposes. If an alternative mode of transport is not appropriate, the Executive will need to determine whether the organisation is prepared to accept the carrying of passengers on quad bikes or whether changes need to be made to work programmes or any other options.

Introduction

Background – setting the scene

In late 2010, the Department of Labour, (now the Ministry of Business, Innovation and Employment ("MBIE")) launched a campaign to reduce harm resulting from the use of quad bikes in New Zealand. The Department released Guidelines for the safe use of quad bikes in February 2011. Those guidelines identified the following statistics:

"On average, five people are killed on New Zealand farms each year in work related quad bike incidents. In addition there are more than 845 work related injuries each year on New Zealand farms, with more than 160 serious enough to require time off work or on-going help."

Lesley Haines Acting Deputy Chief Executive, Labour Group

"Quad bike safety is one of four key campaigns the Labour Group is delivering to reduce New Zealand's unacceptable work fatality toll. We are committed to working to educate people on how to use quads safely, we will challenge dangerous behaviour, and we will consider prosecution following cases of serious injury or fatality if the basic safety steps have not been taken".

Lesley Haines - Spring 2012 Reminder for quad safety

The high incidence of quad bike incidents has been a catalyst for a range of investigations lead by MBIE, ACC and larger organisations such as Fonterra and Landcorp Farming Limited ("Landcorp"). Opus International Consultants Limited ("Opus") were commissioned and funded by ACC to establish methods to effectively retrospectively evaluate quad bike incidents and the impact of crush protection devices ("CPD") installed on quad bikes on preventing serious accidents and injuries.

Quad bikes

Quad bikes have proven to be very adaptive as a piece of work equipment, particularly in New Zealand, for a vehicle that was originally designed as recreational vehicle. A quad bike is probably the most routinely modified piece of equipment in the workplace and it has been described as the Swiss army knife of farming. Much of this broadening of the use of quad bikes has evolved because they can be used for a wide range of activities without actually stopping to review whether they should be/or are the most appropriate piece of equipment to be used.

Guideline statement - Quad bikes are invaluable farm tools when they are used for the right tasks, but pushing them beyond their limitations to do things or go places they were never designed for can have disastrous consequences.

Quad bikes are relatively unstable due to their high centre of gravity and the need for the rider to ride in a counter-intuitive manner by leaning away from the corner rather than leaning into it. The rider needs to shift and use their body weight to control the bike. This is called "active riding". Active riding is required to take the weight of the inner wheels as they do not slow down relative to the

outer ones as they do on a car going round a corner. The leaning "towards the danger" is counter–intuitive to people with experience of cycles and motorbikes.

Quad bikes are also more likely to roll, and roll more quickly than other vehicle types. Quad bikes have a wheel base about the size of a go-kart but whereas the karter's body weights acts just a few centimetres from the ground so that the machine skids around corners, the quad bike rider is sitting half a metre or so higher. As a result the quad bike will generally tip before it slides. The higher centre of gravity is due to the perceived need by the designers for the quad bike to have good clearance over rocks.

Quad bikes at GWRC

In our organisation, we currently run a mixed fleet of 22 4WD quad bikes including Honda, Suzuki and Can-Am quads, ranging in engine size from 350 – 800 cc. The majority are traditional single seat quads, with Parks recently replacing 3 single seat quad bikes with new 2 seat side-by-side Can-Am light utility vehicles ("LUV's").

Across the three departments who use quad bikes, namely Biosecurity, Parks and Land Management, there are approximately 40 staff who regularly used these bikes as part of their work. There are other staff (e.g. Wairarapa Environmental Regulation) who can face the issue of being offered rides as a passenger on a third party/ land owners/farmers quad to help them access sites when completing compliance inspections.

Raising the issue of quad bikes

The Health and Safety Advisory Group ("HSAG"), which is established as part of the organisation's Health & Safety Management System, raised concerns about the number of quad bike incidents occurring in the organisation, particularly as there had been four incidents within a period of three weeks during July.

At that time, there were no formal investigation reports to identify the causes of the incidents, the corrective actions taken and/or any learning's that could be passed onto other staff. Given the nature of the incidents and the potential for serious harm and/or a fatality, the HSAG considered the issue serious enough to put forward a recommendation to ELT to temporarily ban the use of quad bikes while an internal review was undertaken.

The Executive (ELT) discussed the issues raised by the HSAG and the use of quad bikes within the organisation. The Executive fully acknowledged the recommendations of the HSAG and the need to protect our staff from harm. The Executive considered that the following restrictions should be put in place pending an internal review on the use of quad bikes:

- a temporary ban should be placed upon the use of quad bikes in Water Supply, Parks and Biosecurity
- a temporary partial ban should be placed upon the use of quad bikes in the Land Management Department due to existing work programmes requiring the use of quad bikes to access property. Quad bikes should only be used as a means to transport to get from A to B, not as a means to undertake surveys or any other activity while driving

The temporary ban included the following:

- No passengers on quad bikes or riding tandem on third party quad bikes
- No loads on the quad bike apart from riders
- No towing
- Only trained and competent riders are to use quad bikes
- All incidents including near misses to be reported immediately to the Department Manager and entered into SafeTsmart within 24 hours

A review panel was formed and terms of reference were developed.

Managers spoke to the Departments who were directly affected by the ban to work through issues relating to finding alternative means of transport to carry out work programmes or where necessary, delays in work programmes.

A communication from the Chief Executive was emailed to the Departments directly affected by the ban to formally advise them of the ban, the reasons for the ban and an acknowledgement that the ban may impact work programmes and that the organisation would acknowledge this in our report to Council.

A communication from the Chief Executive was emailed to all staff advising them of the ban and the reasons for the ban. This email reiterated the organisation's approach to health and safety and the importance of the employee participation system.

The ban took effect as from Monday 23 September.

Examination of other vehicle options

Side-by-Side LUV's

Pro	Con
- Greater load capacity - Passengers (potential up to 4) - More comfortable - Weather protection - Towing capacity (weight & stability) - Ground clearance ?	- Width (needs to be transported by trailer – new purchases required) - Enclosed - Weight (if you get stuck, you're stuck) - Poorer vision - Inconvenient (in/out) - Multiple roll-over (bail out ability limited) - Maintenance every 500km (increased service costs and tyre wear) - Poor resale - Lack of experienced drivers - Unsuitable in all terrains / limited off formed tracks

Ute (4 X 4)

Pro	Con

- Greater load capacity (Hilux 2 tonne - tray)
- Passengers – up to 4
- More comfortable
- Weather protection
- Towing capacity (weight & stability)
- High ground clearance
- Less likely to be put in high risk situation
- RT
- Multi purpose
- Additional safety features:
  • ABS
  • Stability
  • Traction control
	- More expensive to purchase
	- Enclosed
	- Weight (if you get stuck, you're stuck)
	- Inconvenient (in/out)
	- Requires winch and chains
	- More training
	- Expensive to repair
	- Maintenance (greater running & service costs and tyre wear)
	- Unsuitable in winter conditions over all terrains

Tractor/smaller 4WD

Pro	Con

- Towing capacity (weight & stability)
- Greater load capacity (tray)
- Variety of use and implements / attachments
- Good for park type operations
- Similar cost to side-by-side
- Operator ergonomics
  • Foot throttle
  • Tractor accelerator
  • Steering wheel
	- Multiple trailers for transport
	- Training requirements
	- Dedicated tractor driver
	- Harder suspension
	- Limited terrain – track use only
	- Speed
	- No passengers

Helicopter

Pro	Con
- Greater load capacity - Can potentially carry passengers and material together - Cost effective with larger number of poles/farms - Contractor manages operation - Poles placed at exact locations	- Availability - Cost ($1450 per hour) - Weather limitations - Planning (logistics) • Poles still require distribution - Restricted public access to area while operation is occurring - Lambing season disruption – limited access - Potential catastrophic event

Motorbike

Pro	Con

- Manoeuvrable
- Light
- Cheap
- Rider focuses more when riding
- Dry weather, can access places
- Good for:
  • Surveying
  • Bait lines
  • Night shooting
	- Load limit
	- Less effective in winter
	- No passengers
	- No weather protection
	- No safety protection (wet long grass/unseen obstacles)
	- Speed
	- PPE doesn't work with tasks performed
	- Damage to terrain

Minimising hazards

Quad bikes are currently the most viable and pragmatic option for particular types of work in various terrains. There are a number of considerations to examine when considering controls to minimise the hazards and the risks associated with their use.

Our examination of the hazards and there risks and our recommended approach has considered the Guidelines on the safe use of quad bikes published by the Department of Labour (MBIE) and various research projects. Where we have arrived at a different conclusion to the Department of Labour (MBIE) Guidelines, we have explained the rationale for that departure and the safety reasons for our recommendation.

We recognise that the Department of Labour (MBIE) Guidelines, while not law, can be used by the courts to help decide whether or not an employer had failed to comply with any provisions of the Health and Safety in Employment Act 1992. There is an ability to put safety measures in place that differ from these guidelines, provided that they achieve the same level of safety (or better) for people. It is noted that the guidelines are silent on the use of Crush Protection Devices.

Operating a quad bike

Guideline statement: The hazard is riding the quad bike. Operating them can be dangerous if the rider does not know what he/she is doing. The rider needs to shift and use their body weight to control the bike. This is called "active riding". Quad bike riding is not intuitive and needs to be learned through riding experience and training. Riders who are unfamiliar with the particular quad bike or farm terrain and/or unskilled in the proper active riding techniques are at increased risk of injury.

Manage the hazard: Ensure quad bike riders have the knowledge, skills and training necessary to operate a quad bike safely, or are closely supervised until they are assessed as competent.

Discussion:

Currently the GWRC training, induction and competency processes are a mixture of NZQA and in-house training. The competency of the rider is initially assessed by either the team leader or an experienced GWRC employee. The riders come with a mixture of experience and abilities ranging from expert riders or natural riders who are "tuned into" the bike operations and can react instantly to changes, to less experienced riders who do not have the experience to react so quickly.

There is no specific training package for each employee to monitor skills development, riding abilities or experience in different terrains. Refresher training for Land Management staff is provided by in-house trainers on an annual basis. This is provided during the summer months

(during their quieter work period) and therefore does not test individual abilities in winter conditions, where environmental conditions are more difficult and challenging.

At GWRC, like other rural based workplaces, we are operating quad bikes in a very dynamic environment where the risk factors are continuously changing and interaction with this environment can never be fully anticipated. We need to ensure that we take a full systems look at quad bike operations by:

- choosing the best equipment for the job looking for the technical advancements as they occur
- taking safety into consideration in the way work is organised and planned
- responding to changes in the environment
- train and supervise staff well

***Our recommendation**: Standardise quad bike induction, training, supervision and competency assessments and processes across GWRC. Provide tailored training which tests individuals in conditions that are more applicable to the work place and include training on loading, slide arrest, towing and the danger of secondary visual tasks. Utilise our internal expertise to assess skills and competency against a standard framework. Supplement internal training with external training where appropriate.*

Identify current employees that we want to use for internal training and competency assessment and put them through baseline external refresher training to confirm their suitability.

Ensure that all training and competency assessments are documented and signed by the assessor/employee. Put in place a formal refresher training programme to ensure individual employees are trained on any new quad bikes and/or where any factors, including environmental factors, change.

When any quad bikes come up for replacement there is robust process put in place to determine the best option for its replacement, including considering better options other than quads bikes for performing the intended work.

Quad bike loss of control

Guideline statement: The hazard is where and how a quad bike can be used. Quad bikes are used in areas with difficult terrain. Manufacturers advise caution as the quad bike may become unstable due to sudden and dramatic shifts in the bike's centre of gravity. Riders can easily lose control of quad bikes following a collision with an object, encountering unfavourable ground conditions, or as a result of towing trailers. In these incidents the rider can come off the quad bike and hit the ground, another object or the quad bike itself. Quad bike rollovers can result in the rider being pinned or trapped underneath the vehicle, causing severe crushing injuries which are sometimes fatal.

Manage the hazard: Wear a helmet at all times the vehicle is being ridden. The helmet needs to be well-fitting, securely fastened, and maintained in good condition. The All-Terrain Vehicle helmet standard is appropriate for off-road use at low speeds (less than 30kph).

Manage the hazard: recognise dangerous areas by establishing 'no-go zones' in property health and safety plans.

Discussion:

Currently all SOPs require employees to wear a helmet when riding a quad bike. Some SOPs provide further guidance in terms of how to wear the helmet, which should be standardised across the organisation. The SOPs do not provide a standard process for checking, renewal and selection of helmets.

Land Management staff use quad bikes in numerous farms and in many cases, environmental changes can take place from time to time which change the risk factors associated with hazards on the property. The job specifications contain details of hazards that are known, however there are no detailed specific site routes or 'no go' areas and the hazards e.g. slips, wet ground, can change from day to day. The land owner also has responsibilities under the HSE Act and should be consulted to confirm whether there are any new hazards and any 'no-go' areas.

Biosecurity staff use quad bikes predominantly to service pest animal control programmes and spraying on GWRC owned land e.g Regional Parks or GWRC managed land e.g. Key Native Ecosystems ("KNE") sites. When servicing bait stations, staff are repetitively travelling pre-defined routes over flat to rolling terrain, usually on formed tracks. General location hazards are identified for these routes as part of the Park/KNE specific hazard register. There is still the need for GWRC staff going onto land managed by another part of the organisation to check whether there are any changes in hazards.

Parks staff use quad bikes on narrow tracks or muddy roads within the parks network. Hazards are identified for these areas.

Our recommendation*: An AS/NZS approved quad or motorcycle helmet must be worn by the operator at all times. Quads must not be operated at speed over 30 km/h. Details of standards and helmet renewal will be detailed in the SOP.*

Review the recording of hazards details for specific sites and determine how these hazards can be regularly reviewed/updated and captured in Farm Plans, toolbox meetings etc. For Land Management, examine alternative ways of recording hazards such as verbal reports on Iphones. Review the use of GIS/ GPS to manage information.

Carrying passengers

Guideline statement: The added weight and movement on a quad bike designed only for one person. Carrying passengers increases the bike's instability by raising the centre of gravity, and can restrict the rider from using active riding techniques. For these reasons, manufacturers prohibit the carriage of passengers on bikes that are designed for one person and this is clearly marked on the bike itself with stickers.

Manage the hazard: do not carry passengers on quad bikes designed for one person.

Discussion:

Biosecurity and Parks either do not carry passengers or carry them occasionally on quad bikes. Parks have purchased three side-by-sides for the purposes of carrying passengers. A prohibition on carrying passengers would not affect these departments.

Land Management use quad bikes to transport contractors to sites for their pole planting and farm forestry programmes. Quads are also used to transport landowners during surveys of their properties in the drier months. These surveys inform the winter planting / fencing programmes.

Pole and farm forestry planting is carried out in remote locations and the quad is the preferred form of transport due to the difficulty of access to varying terrain (motor bikes and 4WD vehicles are limited as they cannot safely access all sites). Normal practice is for quad bikes to carry up to 2 passengers per quad. In an ascent the passengers' weight can act behind the rear axle, making a backward tip of the machine more likely, especially when the rider blips the throttle. A sudden acceleration of the quad bike means that the passenger is forced back towards the rear rack of the quad bike.

Alternatives for the quad bike need to be considered, but it is likely that it will add cost to the pole planting programme and the potential for some work not to be programmed due to access restrictions.

***Our recommendation**:*

Prohibit carrying passengers on quad bikes designed for one person pending a review of alternative transport options (including the Tom Car), taking into account costs and viability. Apply the same restrictions to contractors using quad bikes

Towing and carrying loads

Guideline statement: Carrying loads on the front and/or rear 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 more difficult to control. Brakes are only designed to operate effectively when carrying loads up to the weight limits specified. Liquid loads are unstable because the contents can shift when cornering or traversing slopes. Carrying liquid loads may decrease quad bike stability and therefore increase the likelihood of rollover.

Manage the hazard: keep within the load limits stated by manufacturers – never overload a quad bike or trailer. Operate only with stable and balanced loads that are well secured to the racks with straps, and keep the load low. High loads raise the centre of gravity. Internal baffles in tanks for liquids will help to reduce the movement of liquid and stabilise the load.

Discussion: Load carrying (excluding passengers, as detailed above) ranges from materials, tools and liquids. Loads can become unstable due to the shifting of weight, shape and length of load, distribution across the quad and the manner in which it is secured. There is inconsistency across the organisation on weight of the permitted load and some SOPs are inconsistent with the load limits set out in the manufacturer's specifications.

There was discussion about the experience of a quad bike industry representative saying that he has very really had to repair a quad bikes suspension due to carrying heavy loads. When considering the loading of the quad bike staff need to take into account the adverse effect that this will have on the braking and turning performance of the quad bike.

It is important that all attachments fitted to the quad bike are taken into consideration when working out the load capacity as they essentially form part of the load weight.

There is an increased risk of slides when towing on slopes greater than 15 degrees.

Our recommendation: *Total load must not exceed the manufacturer's specification and must take into account specifications in relation to maximum weights for front and rear carriers. All loads must be balanced and properly secured. Liquid loads must be carried as full containers or specifically designed tanks with baffling features.*

No towing apart from approved quad specific implements (eg. Parks' quad mower) in compliance with manufacturer's specifications for the quad and implement.

Ensure that the training and on-going supervision/coaching of staff incorporates carrying loads, positioning and securing these loads, as well as experiencing the impact that the load has upon the handling of the quad bike. Ask the manufacturers or dealers to explain how the load specifications are set to understand loading requirements.

Attachments and modifications

Guideline statement: Modifying a quad bike or adding attachments that do not match the manufacturer's specifications. Carriers and bull bars are a type of modification and can create a hazard if the quad bike rolls.

Manage the hazard: when purchasing attachments check with suppliers and/or ask for verification that the type of quad bike and any attachments are compatible and suitable for the intended use of the vehicle.

Discussion:

All Departments have attachments and modifications to quad bikes. Some of these modifications are manufacturer approved, other modifications are not. The most contentious modifications are bull bars and crush protection devices (CPD).

All quad bikes have been fitted with bull bars, which are manufactured by engineers rather than by the manufacturer. Although they are not manufacturer specified for quad bike use as a recreational vehicle, they are important modifications for using the quad bike as a farm/working

vehicle. Staff identified that bull bars are important to protect the rider and bike when going through bush, farm yards with gates etc.

Most of the quad bike attachments were fitted by the supplier at the time the quad bike was purchased, which provides a level of confidence that they are suitable for their intended use. There are however, other attachments purchased or fashioned in-house that have been fitted to some of the quad bikes.

In terms of the CPD, only Land Management use these devices. There has been a range of research into the use of CPD's devices on quads; however the research has not reached a point where industry, OSH regulators and the manufacturers have agreed upon the design and standards for the device to allow retro fitting. Detailed below are extracts from recent ACC commissioned studies carried out by Opus.

Land Management Department have fitted CPD's to all of their quads but other departments have considered the CPD as a potential hazard when travelling through bush with low overhanging branches as there could be snagging on either the rider or a CPD. However, Land Management has experienced 3 tip over incidents in recent times and on all occasions the riders were not harmed and the quad bike was prevented from rolling further after tipping onto their side. They are convinced the CPD prevented injury.

Our recommendation: *GWRC need to consider the strategy for the fitting of CPD's to quads to ensure a robust risk assessment is undertaken based on task and terrain. It is considered that there are safety benefits to fitting CPD's on quad bikes but it is important to understand the issues with snagging on overhead trees and whether there are safety benefits for all tasks/in all terrains.*

Undertake more research into snagging hazards and review the design of CPD to allow adjustment to height to allow access when height is restricted. Confirm standards on CPD's, design and monitoring of performance.

Continue to discuss CPD's with specialist/regulators. This should include continued participation in the external research projects looking at the efficacy of the CPD's.

Multi-tasking

Guideline statement: The risk is performing another task at the same time as riding can increase the risk of losing control of the bike as the rider's attention is diverted.

Manage the hazard: keep both hands on the handlebars and both feet on the foot pegs while riding the quad bike. Wherever possible, stop the quad bike before performing another task. Use the right vehicle for the job. Maintain a slow speed and seek a path over the terrain that provides the best visibility of any potential hazard or obstruction.

Discussion:

In some situations, employees use quad bikes to undertake another task eg. surveying. Quad bikes are often considered to be the means to get to a destination rather than attention being paid to the

task of riding the quad bike. There have been incidents where multi-tasking has been a contributing factor to loss of control.

Our recommendation: *Training, education and work observations to ensure that staff do not multi-task while riding the quad bike. Tool box meetings (JSR reminders) will provide timely reminders to staff. Further research using instrumentation such as GPS, gyro angle and video can provide information on driving behaviour to identify where further work needs to happen to ensure staff do not multi-task.*

Working alone and in isolation

Guideline statement: Using quad bikes has greatly increased the mobility of people to get to remote areas while working alone.

Manage the hazard: tell someone where you are working and when you plan to return, and have regular 'check-in' times.

Discussion:

At times employees work alone in remote locations as it is the nature of the business and necessary for the service GWRC provides to the community. There are a number of systems and process in the Departments for managing working alone - notifications, call backs and responses are in place. In addition employees working alone carry Personal Locator Beacons ("PLB").

There is a current proposal to fit GPS to all GWRC vehicles and this could be extended through to the quad bike fleet as well. There are also developments happening with potential alert functionality that can be included with GPS equipment that could activate an alarm if a tip-over or similar event has occurred.

Our recommendation: *Review lone working SOPs/ PLB use across GWRC. Work with the organisation to develop a single SOP on working alone. Provide training on the use of PLBs and test emergency responses scenarios to confirm effectiveness of the systems.*

Ensure that the organisation remains aware of developments in GPS technology that could be beneficial to lone worker situations.

Personal factors

Guideline statement: The rider being impaired due to fatigue, stress, attitude (eg. Over-confidence, recklessness) or being under the influence of drugs and alcohol. This can result in poor judgement, and reduced balance, coordination or reaction times, and will increase the risk of serious injury or fatality.

Manage the hazard: make riders aware of the hazards associated with operating a quad bike and the impact of their own behaviour and attitudes on these hazards.

Discussion:

It is recognised that there are periods where the work programmes are full on and staff are managing the resources and their time to meet the levels of service. Land Management provide a high level of service where poles are sourced , delivered and planted to a large number of farms in areas that are difficult to access. This review has noted these issues and staff are considering the options for delivering poles, transporting staff and contractors to planting locations. Detailed in the rider training, JSR's and SOP are the factors detailed above regarding fatigue.

In other departments, e.g. Parks, riders can be required to perform physical tasks for long periods of time. Given the physical nature of this work, any potential fatiguing effect on the quad bike rider needs to be taken into consideration when planning work.

Our recommendation: *Review levels of service and work programmes that align with the recommendations of this review.*

Make sure the journeys to and from worksites using quad bikes are taken into consideration when planning and completing work.

Mechanical Failure

Guideline statement: The hazard is mechanical failure of the quad bike during operation and this puts the safety of the rider at risk. As most quad bikes are not required to be registered/licensed the majority of these vehicles are not subject to a formal warrant of fitness scheme.

Manage the hazard: conduct a pre-operation check before riding. Ensure the bike is in reliable working condition by undertaking regular maintenance checks and take immediate remedial action where shortcomings are found.

Discussion:

The research has identified that incorrect tyre pressures, tyre specifications can contribute to loss of control. Remedial action for any faults found on the quad bikes is taken by all departments.

Regular bike checks are completed by the rider to ensure there are no faults that may impede operation and all bikes are regularly serviced by approved mechanics.

In general all quad bikes are well maintained through staff regularly cleaning and completing basic operational checks. More significant routine maintenance and other repairs are either carried out by GWRC's in-house mechanic or by a recognised dealer. However there is no consistent recording of this activity across the fleet.

Our recommendation: *Specify maintenance requirements in the SOP to ensure that quad bikes are maintained in accordance with manufacturer's specifications. Utilise internal knowledge on tyre suitability and pressure.*

Recommendations

The review panel make the following recommendations for the Executive Leadership Team to consider and approve.

Fit for Purpose

Quad bikes are 'fit for purpose' for specific tasks and functions. However, there needs to be greater awareness of the specifications for any particular quad bike and greater consideration given as to whether the quad bike is the only vehicle appropriate for that use, or whether alternatives modes of transport should be considered.

Standard Operating Procedure

A Standard Operating Procedure (SOP) to be developed for quad bike use in the organisation. This SOP should specify the following:

1. NZS approved quad or motorcycle helmet must be worn by the operator at all times. If passengers are carried (in accordance with manufacturer's specifications), passengers to also wear approved helmets at all times.

2. All employees must be trained (NZQA Unit standards) –

    a. Tier 1 – external training provider (training tailored to meet GWRC specific needs if possible)

    b. Tier 2 – internal/external training provider to work on specific personal training needs with individuals to bring them to the level required of their role. Coaching by internal "experts"

    c. Refresher – annual, seasonal refresher training (if possible in winter conditions)

    d. Competency assessment – scaled, signed off by staff member and assessor. Including operational use – e.g. loading balance and security. Employees only able to operate within the limits of their competency assessment

3. Passengers to be carried in accordance with manufacturer's specification only. Further research required (discussed below).

4. Quads must not be operated at speeds over 30 km/h.

5. Where possible public road transits must be avoided. If necessary then the 30 km/h maximum speed applies.

6. Slopes, across, up and down. Further research required (discussed below).

7. Total load must not exceed the manufacturer's specifications – including front and rear carrier weight limits.

8. All loads must be balanced and properly secured.

9. Liquid loads must be carried as full containers or specifically designed tanks with baffling features.

10. No towing apart from approved quad specific implements (e.g. Park's quad mower) in compliance with manufacturers' specifications for the quad and implement.

11. Modifications/ after-market features –

    a. Specific need for the modification to be specified

    b. where possible the modification is manufacturer approved

    c. or purchased from a recognised dealer

    d. Tested/manufactured to recognised standards by qualified engineers.

12. Active riding/fatigue/hydration effects on riding ability. Further research required (discussed below).

13. Monthly checks/maintenance/pre-operation checks/tag out/release once repaired.

14. PLB's to carried by all riders.

15. PPE – helmets, boots, not loose clothing/gear.

16. Further training required on cartage, tying down, loading and unloading, ramps

Further Research

There are several recommendations which require further research.

a) Passengers – the Land Management department use quad bikes to carry passengers to locations which are difficult for other vehicles to access. These passengers are commonly contractors engaged to plant poles. In addition, contractors to Land Management carry passengers on their quad bikes to these locations for the same purposes.

   The quad bikes are designed for one person and the manufacturer's specifications prohibit the carrying of passengers. In addition, the additional weight of one/two passengers together with materials and equipment often exceeds the manufacturer's specifications in relation to loads.

   Staff who use these quad bikes advocate that carrying passengers on the sides of the quad bike is safer than carrying a pillion passenger on a double quad bike or using a Light Utility Vehicle (LUV), as the passenger can simply step off the quad bike if the bike gets into difficulty. Unfortunately there is no research or evidence to support this view or to suggest that it is safe to carry passengers in this manner.

The inability for Land Management staff and/or contractors to carry passengers will have a dramatic impact upon the pole planting programme unless alternative modes of transport are found or utilised and/or modifications are made to the programme which has either cost or customer satisfaction implications.

The review panel together with staff from the Land Management Department will be trialling another vehicle called the Tom Car, which is an All-Terrain Vehicle modelled on the Israeli military vehicles. A comparison will be conducted between quad bikes, side-by-sides and the Tom Car to determine whether any of these modes of transport perform the same or better function as the quad bike. While this analysis is undertaken, the review panel have recommended that the carrying of passengers on quad bikes for staff and contractors be prohibited.

b) Slopes – the research completed to date has only tested the performance of quad bikes on differing degree slopes in a simulated environment. The quad bike performance has not been tested in the natural environment to determine whether there is a maximum degree of slope that quad bikes should not be used upon.

   The review panel have decided not to specify a maximum degree of slope that quad bikes should not be ridden (as compared with Landcorp who have specified maximum degree slopes).

   Staff consider that the riders ability to ride any degree of slope in any given environmental conditions should be a fundamental part of the rider's training and that the rider should be given the authority to refuse to ride if they do not feel safe.

   We understand that further research is currently being conducted in Australia on quad bike use and that they have trialled quad bikes in the natural environment. The panel consider that any conclusive findings from that research should be reviewed as ongoing monitoring and development of our quad bike SOP.

c) Fatigue – there is limited research on the effects of fatigue particularly in relation to the rider's ability to actively ride the quad bike. We will discuss the possibility of further research with ACC/Opus in relation to this factor.

d) GPS – continue to track GPS tracking technology.

Next steps

Following the Executive's decision on this report, a specific project plan will be developed to manage the implementation of the various agreed recommendations.

This project will be led by a Senior Health and Safety Adviser with sponsorship and oversight of an appropriate General Manager. Progress against the plan will be reported as part of the monthly ELT H&S Report or more frequently if required.

The project plan will also identify key staff members from across organisation to advise and support the completion and implementation of specific actions where necessary.

The key activities already identified and underway that will be incorporated into this project include:

- The formal review of and report back on the various alternative modes of transport currently being tested.
- The consolidation of all existing quad bike related SOPs into a single organisational SOP.
- Clarifying the training, competency supervision framework for quad bikes, including co-ordinating the internal and external training programmes.
- Managing GWRC's participation in further research with external agencies.
- Clarifying GWRC's position on outstanding issues e.g. the suitability of fitting crush protection devices across the full GWRC quad bike fleet.

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