



 **policy and practice**

By Tony Lower

Crush protection – raising the bar

Deploring the stubbornly high quad bike death rate in the agricultural sector, Director of the Australian Centre for Agricultural Health and Safety at University of Sydney, Tony Lower, gives his frank opinion on what needs to change.

In 2011 quad bikes were involved in 23 fatal incidents (18 on farm) and had the dubious distinction of being the leading cause of on-farm non-intentional injury death, exceeding tractor-related fatalities at a ratio of almost 2:1.

There is no doubt that quad bikes are highly valued by farmers, with approximately 220,000 in operation across Australia. Significantly, these vehicles were designed and marketed for recreational purposes but have gradually increased in popularity for a variety of work tasks.

Injury data

Australian coronial data (2001–2010) illustrates that there were 127 quad bike-related fatalities on farms, averaging 13 deaths per year. Of these incidents, approximately 50 per cent involve rollover events, with death often resulting from asphyxiation and crush injury/syndrome. Furthermore, almost nine out of every 10 rollover fatalities occurs on a farm.

A cursory examination of the international literature reveals numerous reports describing the burden they impose in terms of deaths and significant life-changing injuries. In the US alone there have been over 11,000 deaths associated



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with all quad bikes since 1982. Most of the deaths are recreationally based – however they are increasing in the agricultural sector (particularly among farmers aged 60+). For the most current year of complete data in the US (2007), there were over 800 deaths (132 being children) and 150,000 Emergency Department presentations.

Due predominantly to this burden (particularly relating to child deaths), manufacturers in the US entered a Consent Decree with the US Consumer Product Safety Commission for a 10-year period in 1988 as the vehicles were described by the Commission as “an imminently hazardous consumer product”. This included withdrawing three-wheeled bikes, limiting the size of bikes to be used for children and the development/implementation of training programs. Subsequent iterations of agreements after expiration of this decree have led to the signing of the American National Standard for Four Wheel All-Terrain Vehicles ANSI/SVIA 1-2010. One component of this Standard is a requirement for pitch (tip-up) stability. However, there are ongoing concerns about lateral stability, which is a more important factor in terms of overall vehicle stability. Further, there remains no

international standard for these vehicles or Australian Design Rules, effectively meaning they are unregulated in Australia.

Prevention by design

Adopting a first-principles approach by designing out or minimising a risk is second nature to those involved in health and safety. However, quad manufacturers and their representative agency in Australia, the Federal Chamber of Automotive Industries (FCAI), have continued to rely on helmet use and training. While data supporting the use of helmets exists, there is no data globally indicating training will make any difference. When you have a vehicle that is fundamentally unstable and “prone to rollover” any benefits derived from training are likely to be marginal at best. This is not to say that basic rider training is not important in developing some skills, and competency in a work setting is also a legal requirement. However its capacity to effectively manage risk is equivocal. Again this is supported by similar international findings in relation to two-wheel motorcycle rider training for on-road users.

Safety by design is not a new concept and will be well understood by the readership of this publication, but this appears to be something that the manufacturers are keen to side step.

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Trans-Tasman Quad Bike Strategy

The considerable debate regarding quad bikes has been fostered by the establishment of the Australian and New Zealand Work Health and Safety Authorities' Trans-Tasman Quad Bike Working Group and development of an accompanying strategy. This working group included several manufacturers and the FCAI, who tried to negate any discussion on crush protection. Manufacturers boycotted the final meeting and the FCAI for its part read a prepared statement and then exited the meeting as it did not want the integrity of the research conducted by manufacturers challenged. This in itself is a startling precedent, as examination and robust discussion on the quality of such evidence should be central to the development of best practice in terms of engineering design and policy. If we are not making our decisions on the best available evidence then we are in the wrong game.

In response to the release of the strategy, the FCAI launched an advertising campaign including a website. While this undoubtedly achieved its aim of further muddying the water by causing confusion amongst both its own retailers and potential purchasers, it was found

by the Australian Competition and Consumer Commission that the FCAI may have breached the misleading and deceptive conduct provisions of the Competition and Consumer Act 2010 by proclaiming that "without exception research has shown that such (crush protection) devices increase, rather than decrease, the risk of injury to operators". This website was subsequently closed by the FCAI. However, since then,

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the FCAI has opened a website which states, “Roll bars, crush protection devices and roll over protection systems when fitted to All Terrain Vehicles or quad bikes (ATVs) can cause more injuries than they prevent.”

The validity of industry-commissioned research on devices to prevent rollover deaths has also been questioned by several independent engineers as it inexplicably modifies the outcomes towards head injuries (helmet beneficial) and away from asphyxiation and crush syndrome, where a crush protection device would be beneficial. This bias notwithstanding, the industry commissioned data still indicates a net protective benefit of up to 29 per cent for the one commercially available crush protection device in Australia.

More recently, yet another independent engineers review of the arguments regarding crush protection devices has definitively stated that the FCAI’s “reasons for rejecting such (crush protection) devices cannot be supported given the major problems with the research methodologies identified”.

Yes, more research is needed but based on precautionary principles and the current state of evidence in this area, if people are going to use a quad bike, a suitably tested crush protection device should be fitted to the vehicle.

Definitive reasons why manufacturers continue to run a campaign against fitting these devices is difficult to gauge, but it is clearly not evidence-based. Speculation is rife that the stance is more about protecting the manufacturers from potential litigation worldwide (and especially in the USA). This is reinforced by the bias identified in their commissioned research and also the manner in which they have conducted themselves in this debate.

WHS legislation

Another issue that will likely be raised is whether these vehicles meet the requirements for use in a workplace (remembering they were developed as recreational vehicles). Quad bikes are defined as ‘plant’ and hence there are specific legal responsibilities to ensure protection from overturn when used in a work environment. Additionally, risk must be managed by designers, manufacturers, suppliers and users in accordance with the hierarchy of controls. However, designers and manufacturers that are operating upstream in the production process cannot simply pass on risk to retailers and users down the line. In short, the core responsibility for safer quad bikes rests with designers and manufacturers.

There is also the vexed issue of retro-fitment of devices and who should foot the bill if it proceeds. All up, this may well be one of the first serious tests of Australia’s new harmonised legislation. What is required from the manufacturers in the first instance is simply better design by improving stability and ensuring protection in the event of a rollover. It’s time to raise the bar on safe design. 

