

Submission to the Independent Taskforce on Workplace Health and Safety. 2012.

From Merv Rusk

ATTENTION: Mr Rob Jager. Chairman.

Dear Rob,

I read with interest your recent Opinion Column story in the Farmers Weekly. It was interesting and I agree you don't want to come up with any more recommendations that do not work. You are right about NZ having a fundamental disconnect. I have observed the disconnect developing since the 1970's.

Back in the 1960's NZ had 330 people of all ages killed on farms in 5 years. That is one death every six days. Young Farmers Clubs were involved in safety and I led the YFC farm safety campaign at the time we got safety frames onto farm tractors and cut tractor fatalities and farm accidents generally. I was on the National Safety Assn for three years and spoke on safety around the country. The YFC reached 13,000 farm people per year. Tractor roll-over fatalities that were running at thirty to forty a year in the 1960's have now fallen to one or two per year.

Now I'm a 70 plus dairy farmer and my observations span five decades. If you are interested in my experience then here is what I think and much of could apply to industry generally not just farming. What I'm sharing with you worked in the past. Please read this – it might help fix the 'disconnect' you talk about. There's also some practical stuff about Quad Bikes.

BACKGROUND:

1. The post war land development era caused many accidents as land was pioneered with inadequate equipment and no training – but that phase is now well past. There is less land being farmed now and these two factors should have seen accidents reduce.
2. On the negative side the small family farm is disappearing, where farm kids grew up with better skills before becoming farmers but now large scale and corporate farms employ workers from many other backgrounds.
3. There are more machines and more time pressure than in the past.
4. New Zealanders are not doing as well as many similar countries. Here we have the ingrained subconscious New Zealand Nanny State mentality where many people tend to see everything as the State's responsibility, or at least somebody other than themselves, so getting the message through successfully is important.
5. Add drug use in the workplace to the modern mix. Farming has this problem too. Drug use is more widespread and impacts badly on mental safety processes.
6. Recently we have seen a shift to more use of the Law and Regulation to make people change their behaviour. This is often assisted by television message and throwing dollars from a distance. I agree this may work somewhat – but it won't really get you to where want to be.
7. I have read the Taskforce's Consultation Document, Terms of Reference and Objectives.

THE POINTS I WISH TO CONTRIBUTE:

New Zealand must already be the most regulated top down society in the world and the trouble now is that many people are developing R.A.S. (Regulation Aversion Syndrome). The more regulation put on people the worse it gets. Aversion to our snowballing regulations is getting very common among NZ's farmers. This was not how we did it in the 1960's. The Young Farmer's campaign strived to get cooperation using commonsense, getting inside people's heads plus a bit of appropriate regulation, and that approach was very effective. Let me explain.

Generally speaking, using the Law to change a man's behavior does not work very well. It mostly fails because it requires only obedience (increasingly scarce) and does not change the internal thought processes from which our actions originate. We can change our behavior only by changing our internal knowledge and beliefs. Out of these beliefs come our feelings and from them our thoughts, and from these thoughts come our actions.

The critical thing is attaining the insight to recognize and interpret various risks (conditions) that stack up before an event occurs, equipping us to self monitor our behavior (actions) and this enables self control thus leading to accident prevention. It's pretty useful stuff when you get the hang of it. But when workers and farmers don't understand why they do silly things and how not to get caught out, then they simply get confused, negative and uncooperative when officialdom throws endless laws and paperwork in their faces. I've met plenty of people who have had a so called accident yet they still cannot figure out the factors even after the event let alone before it. Nobody gave them the tools. Sometimes a coroner will offer wise analysis after an event – but why can't we do this before the events? This is the problem - people just don't see injury or death lurking up on them. This is the solution- *see and recognize the signs BEFORE it occurs so you can then avoid it happening.*

Regrettably in recent decades the trend is to go the legal way in all things. Many of the old commonsense ways of doing things have been discarded. The Law however is very inefficient at achieving internal change and this is why the Law so often fails people, as Moses discovered ages ago. Repetitive failure under the Law is all too common because the Law, while helpful, has always been poor at instilling self regulation.

I have used cognitive insight teaching in accident prevention. Instruction is dull – but instruction plus insight works. While I never knew then what the technique was, I knew I was onto something that worked because it did. Revelation will always beat rules. People can actually get to where safety becomes almost instinctive.

Thirty and forty years after my YFC days farmers were meeting me in the street and saying something like this, "Hey Merv, remember that time you spoke to us at our local hall about farm safety? Well I never forgot what you said. It changed the way I thought and changed my life. Thanks." It had sunk in you see. They got tools they could understand and use. Have any of your people on the Taskforce ever had people remembering their safety talk and thanking the speaker three decades later for what they had learned?

I see very little at present that will actually get inside people's heads that will inform and tell them how not to have an accident. Taking pot shots at a handful of single issues, however useful, will never cover the field. The trouble with chasing a few single risk issues on safety is that *it is always going to be one of those you didn't swot up on that will get you.* What I'm talking about here works everywhere and can be widely adapted. Remember 'adapted.'

Analysis of most tractor or vehicle 'accidents' will demonstrate that a number of hazards have accrued until a certain situation is reached but the driver was not trained to recognize that build up. But a driver trained in *multiple risk recognition* will click on to it and back off, change to reduce the line-up of risk factors that he or she has recognized, and do it differently or call it off.

But drivers who simply believe that '*accidents just happen*' will simply keep on going until too many threats have built up and then something they do (an act) tips off the whole chain reaction. Nobody has taught them that 'accidents' are caused.

Here is an example using what took place concerning a local farmer on his quad bike:
All these things got lined up but he didn't see the dominoes stacking up. Can you?

1. He was in his sixties and a little bit less agile than he used to be.
2. He was still recovering from an operation. (appointment next day)
3. He had just finished a whole days work (tired and hungry from driving his bulldozer).
4. He was pressured by regulated months allowed for weed spraying. (only 3 days left)
5. He ignored warnings and went along to do the job alone on tea time.
6. The lack of an ROP device on the quad may have contributed.
7. It was late in the day so he was in a bit of a hurry to finish before dark.
8. The hillside was marginal and was a bit rutted with cow tracks.
9. It was sundown and facing west he had difficulty seeing into the sun.
10. The light was bad and he could not 'read' his path as he normally would have.
11. A spray outfit made the centre of gravity just a little bit higher.
12. The last straw was the cow track that lifted his topside wheels just a little bit.
13. Triggered by just one more 'little bit' - all the little bits suddenly added up.
14. It rolled and he died under his quad.

I was called over at the time and gave him CPR but couldn't bring him back and that is why I am writing this to you now....

Newspapers often report 'accidents' but miss the causes. Try this one:

1. A youth with little experience takes off in a car, (might be stolen).
2. It is dark.
3. It's late and he is already tired.
4. Has no driver's licence and no experience.
5. Had some alcohol. (drinking will get most of the blame later)
6. Driver starts speeding over the limit.
7. Police siren goes off behind him.
8. Brain freezes then driver decides to outrun professional police drivers.
9. Big increase in speed.
10. Police give chase. (sure to get criticized for this later)
11. A curve looms up ahead. (The dominoes have lined up now, ready to fall)
12. Driver cuts corner on wrong side of road, a bad act which is the last straw.
13. The car cannons into another car head on causing death and mayhem.

Question: Was this crash really an 'accident' or was it inevitable?

Why do we talk about accidents when they are not really accidents at all?

An accident is really an *unforeseen* preventable injury. Admittedly some unforeseeable accidents do occur, but mostly what society excuses as *accidental* are actually *inevitable*. It is time to explain it in a way people can understand. If people cannot understand this process they are unlikely to be part of the solution. Let's get real.

Understanding how accidents are caused should be part of our culture. Typically both examples above involve poor conditions to which are added unsafe acts. If we can see it afterward why can't we see it before it happens ?

It concerns me to see so much 'safety-message stuff' on TV and elsewhere but nowhere are people taught how to recognize and avert an 'accident' **before** it is triggered off. It just makes me extremely sad that nobody out there is teaching people what an accident really is - failing to see when the risk factors are lining up against them and failing to take corrective action right then. We are not giving people the simple insight to understand. It's all being made far too complicated in masses of red tape, regulations and laws. And political correctness has had a huge price and we are now paying for it dearly.

The difficulty of taking training into the workplace is acknowledged on pages 146 and 147 of the Discussion Document. "*The inability to take training into the workplace and make it work.*" This is exactly what I identify with here.

In 1964 I attended a farm safety training course at Canterbury University where a lecture by a safety expert made more sense in 45 minutes than all the safety publicity I ever saw. He used little boxes that knocked each other over illustrating causes and effects. Our farm safety officers took this away and used it. I was so taken with the effectiveness of this method that I further modified it into NZ farm scene Kiwi-Speak, making it even more helpful to farmers. I renamed some dominoes and explained how various causative combinations work. These demonstrations and discussions stuck in people's minds. Click! This working insight enabled them to change both their working conditions and their behavior. Individual farmers told me so years later. Decades later.

But that university speaker never mentioned he was using a modified version of a system first developed back in 1929 when a USA insurance worker Bill Heinrich studied 70,000 accident reports and came up with the beginnings of industrial accident prevention: *Heinrich's Domino Theory*. Our NZ National Safety Association obtained this theory after its profound success in WW2 shipbuilding yards in the USA. Our safety officers were trained to use the fundamental elements of the method and no doubt we all adapted it to suit our needs. If you can take theory through the brain-barrier you can turn it into results. Interested?

With surprise I learned 45 years later that the Kiwi Farm Safety Demo that I developed and used so successfully in the 1960's originated from *Heinrich's Domino Theory* which I had never heard of back then. Heinrich's theory was used worldwide for 70 years based on unsafe conditions and unsafe acts. Unfortunately since 1994 modern methods seem to have abandoned that simple, teachable, understandable, workplace logic. Now workplace safety is wordy, complex, and the legalistic pseudo science of politically correct verbiage has buried many of us in more ways than one.

Why have we moved away from Heinrich's Domino Theory in the last two decades ? During this time the Dominos **were re-named to suit the experts and accident investigators not the target worker audience!** Today the Domino teaching seems to be so watered down the target audience cannot even grasp the truth of it. Connect has turned into dis-connect.

Some suggest we should not have a method of accident prevention that may pinpoint what a worker did wrong. Really? Well I believe the wheel is soon going to turn full circle. So what might be the outcome, for example, of introducing Guidelines for Quadbike Use? Further down the track it will turn into more regulations and then into Law and then inspections to force employers into “making workers safe”. The courts will be able to read the riot act to bewildered farmers who probably won’t even understand how accidents are caused in the first place. They won’t learn much and it will turn people off in droves. If the legal beagles are so wise following these events as they often are, why aren’t they teaching people how to avoid getting injured or killed before it occurs?

If pressure on employers is the way it’s going to be done then so be it. But sooner or later a method will need to be introduced or re-introduced, that turns the lights on in the brains of those in the workplace who need to get a handle on accident avoidance. That includes workers and the self employed alike. Have you ever been taught how not to have an accident?

Will our society with all its universities and communication resources ever get out of the dark ages and teach its workers and drivers how to understand why they are getting hurt and killed? Imagine high school kids learning how to avoid any sort of accident in life. Learning is helped by carrots and less so by sticks.

Can New Zealand once again adapt Heinrich’s Domino Theory and make it work again Kiwi Style? Not as an aid for accident investigators but as training for those at work who are at risk of getting injured and killed? Perhaps as a second tier of training and publicity at grassroots level, below all the legal stuff. For the people who need it?

You will note in the Appendix that the plot started getting lost from the 1970’s as far as the guys in the workplace and on the farms were concerned and over time the disconnect has escalated. I find it all so disappointing after the great success we had before. I expect the senior Labour Department will most likely just pour cold water on this paper but somebody has got to say it. We were able to make it work in the farms and factories before. It worked. I believe it can be done again. It is long overdue.

Merv Rusk.

Footnote:

I joined The Young Farmers Club in 1958 graduating eventually to the Dominion Executive in Wellington and also represented the Federation on the National Safety Association for some years. Being the Safety rep I provided some enthusiasm and pushed hard for safety frames to be made compulsory on new tractors. By then the Young Farmers Clubs had over 200 active farm safety officers in 370 clubs in NZ with over two hundred having been trained at substantial training courses at places like Christchurch University. When I retired in 1967 the National Safety Association unanimously awarded their Merit Award to the YFC citing its “meritorious performance in industrial accident prevention.” Working together we changed mindsets, helped farmers and workers understand how to avoid mishaps, and got frames on tractors.

As a result both injuries and fatalities dropped. Tractor rollover fatalities that were previously running at thirty to forty a year have fallen to one or two per year.

THE QUAD BIKE PROBLEM

- **The historical views and debates held by farmers:**

My life experience in dealing with issues among farmers has taught me that, initially, thirty thousand farmers will always come up with thirty thousand different ideas on how to fix a problem. Among other things, this individualism comes from their relative isolation, their adaptation to survival, economic necessities and differing situations and ages. Also there is a very wide variety of farm terrain in NZ. But, while frustrating there are some good points. Farmers don't get sucked in easily and go down the wrong track too often. They will expose weaknesses in proposals as quick as a flash. They are practical people with real hands on survival experience. However, when taken on board they will prove to be most helpful. At the end of the consultation process, which will take a little longer, the farmers' contributions will have improved the solution considerably at little extra cost. Regarding quad safety, this stage has probably not yet been worked through enough yet.

- **Whether farmers will ever really agree:**

At first one is tempted to say "no they won't". But there's more. A good example is the way that dairy farmers have used their company Fonterra over the last decade. After some smoke, and rubber marks on the road, Fonterra now has a good process where company intentions are proposed, the proposals are put out for ideas and comment, the proposal is revised (sometimes even thrown out), it goes around the grassroots meetings again and back to the board. This process is repeated until it is reasonably clear what can be agreed and implemented in a way that will be accepted, 'owned' and put into practice. Usually the vote of acceptance is around 80 to 90 percent and after that they all get on with it.

While Federated Farmers also do a good job they do have limited membership, nevertheless their publications do go out to all farmers. There is however a difference between reading something on paper and attending a group discussion, contributing, and or voting on something. The Fonterra approach that has worked well, involved some fairly open and 'every farmer' opinion gathering at times and that approach is always appreciated. It also works. Farmers can make a huge cooperative contribution if you harness it correctly.

- **The technical deficiencies of these machines:**

I believe there are technical deficiencies in Quad Bikes. As an example take quad tyres. They used to be square cross section with a wide flat grip but because of the recreation market tyres over the last ten years have been changed to round cross section. This narrowing of the track width of an already narrow vehicle has gone virtually unnoticed.

The ever increasing power of engines has attracted buyers but at what cost to young farm workers who are new to these machines and the farm workplace? As with other motor vehicles youth plus inexperience plus more power is a risky mix.

I think that technically, regarding the actual nuts and bolts and actual construction of the machines, they are OK, they even hang together in New Zealand under abuse they were never designed for. What may be a different story are design parameters. Some examples:

Height of vehicle centre of gravity.

Width of effective wheel track. For NZ hill country I view quads as dangerously narrow.

Quads have suspensions, some utility types don't.

Power.

Some vehicles have rollover protection at purchase - some don't. (More on this below)

An important aspect is that most of the machines are not produced for the New Zealand farming market and farmers here are simply making do with the product because for the most part it is very useful. The big market driver around the world is recreational use and the specifications for this can be very different from the needs of our farmers. Hence the good old Kiwi attribute for adaptation takes over. FF policy adviser Matt Scott put it well when he wrote, "Quad bikes have become the farmer's Swiss Army Knife, being horse, trail bike, and light tractor all in one. This multi-use nature can see them pushed beyond their design limits." Most would agree that he was understating it!

New Zealand could well cooperate more with Australia on Quad Safety matters. An Australian researcher Mr John Lambert, believes extensive modifications need to be made to (some) machines to improve their safety. He makes some interesting observations reported in the NZ Farmers Weekly page 19 of December 20th 2010. The five effects of low tyre pressures, soft suspensions, high centre of mass, and speed are discussed. Dynamics are contrasted to other 4WD vehicles and cars and tractors and while some of his final recommendations proved controversial he raises some very interesting technical points. These matters could well be examined by a testing facility set up in New Zealand or better still, a joint testing facility with Australia, possibly attached to a university. Why not?

- **Suggested safety features:**

Roll cages:

My history with the introduction of tractor roll over protection means I give firm support to this. Roll over protection is a no brainer to me.

My previous experience suggests there needs to be some official testing done where issues can be examined properly and both devices and machines rated. In the 1960's I think the Engineering Dpt at Lincoln University may have done this back then. Let's do the same for quads somewhere and get on with it.

I'm not pushing a particular product here but the 'Quadbar', a new (Australian) product, is already the most tested ROP ever and already has university assessment. Apart from farming use in Australia and NZ the Quadbar is used in organizations with strong OH&S ethics including government, mining and tourism in North America, Europe, Africa and South America. No doubt there will be other products.

My present thinking (at this stage anyway), is that suppliers of new quad bikes should be required to sell machines with an approved roll over protection fitted. If the farmer chooses to remove it for his situation he may or may not be held liable for any consequences following injury, disability or death.

I noted in 2011 that Federated Farmers maintained neutrality on roll over protection (ROPS) citing insufficient evidence to say they improve operator safety. This is exactly the same argument they used against us forty five years ago when we were battling to get them to agree to roll over protection on farm tractors! There's a message there. Would Federated Farmers oppose safety frames on farm tractors now?

Wider wheel base

This is already present on many machines. These tend to be machines that are designed for industry and not for recreational use. There is a shift away from the traditional "Quad Bike" design and machines are becoming more like small trucks or utility vehicles. I am considering buying one of these. They are known as Side By Side or Utility Vehicle. (UTV)

I sat on a new UTV import 4 days ago and things are changing. Twin bucket seats, roll cage, seat belts fitted, and new control systems. The old bike handlebar that can be a problem on full lock on hillsides seems like it's being replaced by either a steering wheel or semi wheel.

Remember farmbikes all started with farmers using old motorbikes. This led to the introduction of the 2 wheeler farm bike and that evolved into the Three Wheeler Trike which was a menace and quickly died out. It's successor then got four wheels and is today's traditional Quad Bike. But it's still a Bike! A motorbike with four wheels albeit very mobile and extremely useful. But they are still too narrow. Will purpose designed industrial UTV machines take over one day? It looks that way to me. What is needed is some encouragement.

Lap belts and helmets

Both give me mixed thoughts. (This is from a guy who often went to Wellington so he wore a helmet and double shoulder safety belt in his car way back in 1964) I believe applying the motor car policy across to the farm bike industrial scene is a leap that may not be as successful. Policing or self policing aside, the practical issues of putting these things on and off a zillion times a day in the dark, mud, heat, rain or snow, while wearing cumbersome wet weather gear and coping with stock and other staff might be expecting too much. Helmets and rain hoods do not mix.

I would not wear a lap belt on a quad on a hillside without ROP. Even then if it gets tricky there's a time to bail off and I think few riders would want to be locked in. That's a bad feeling. Another place where the policy transfer from car on the road to quad on the hillside does not fit well. The rider must also move about to balance the machine if it's a quad.

Personally I'd let belts and helmets be optional until the actual machines have evolved into something better. At this stage I'd concentrate on getting testing instituted, introduce roll over protection, and teach users the process of how to recognize danger and be accident avoidant.

History of discussion with manufacturers:

I attended Dargaville field Days where the Quad Bar was being demonstrated using a small model. (like we did with tractors in 1964) It was impressive even on a very long steep gradient. I then walked across to a well known Quad manufacturer and chatted about safety issues. The man was a NZ executive. Immediately I was informed that, "All accidents are simply the driver's fault not the machine's." When I inquired if their quads could be sold with something like Quadbars already fitted I was quickly told "Quadbars only work on flat ground and don't work on hills". I was rather taken aback. Assertions like that from manufacturers are not constructive or helpful. In the 1960's we had early resistance from tractor suppliers. Now it's quad suppliers doing the same. If it is not already being done, I would like to suggest that accident and fatality reports collect information on:

1. The terrain and angle.
2. The speed if known.
3. The make and model of machine.

Whether farming or recreational use, etc. The manufacturer's make and model figures for the last ten years of fatalities could be an interesting read. I believe that when full information is made public along with safety rating then market pressure will cause manufacturers and

suppliers to change. This has worked in the motor car industry. Manufacturers are happy to pay staff to talk defensive practices forever - but it is market pressure that will force change. Helped by a regulation or two.

- What farmers have done by way of education around these machines:

I note that the Federated Farmers organization holds the view that education and regulation is “the best tool in the box to prevent quad bike accidents before they occur”. I agree it is the **best** tool but it is not the **only** tool. In fact with the successful tractor safety frame campaign we used in the sixties we had education (translate understanding), legislation, publicity, and cooperation from manufacturers and suppliers. I think a multi faceted approach is needed, one that is achievable, and one that keeps farmers onside and able to continue their operations without useless interference.

I have not seen much done by farmers themselves in the way of education around these machines. Most farmers are self taught, they teach their families, and mostly they will teach their staff. In Young Farmers Club days back in the 1960's we had 330 voluntary Farm Safety Officers out in the communities working. I have attended a “Farmsafe” workshop as have many farmers and staff, however, because it majored on the costs to ACC of injuries and a lot of statistics it never made an impact on me at all, although through my experience I well understood what was being talking about. Co-attendees were bored stiff, very ho-hum and I felt they only attended because they had to. That sort of training is just not effective. Going through the motions to get a bit of paper makes nobody any safer.

- Views on how we can reduce the number of quad bike deaths – short or long term.
(In no particular order)
- My major thrust would be as explained above in my submission. Essentially it is training people on how to recognise when a number of risks and conditions are lining up like dominoes in a way that could result in injury or death and showing how to take preventative action right there and then. (This applies to road safety as much as farm safety.) There is no reason why this learnable skill could not be taught at Farmsafe workshops and elsewhere by good presenters. It is a skill that is **NOT** being taught.
- I would explore the introduction of safety ratings for Quad Bikes and similar machines used on farms. This could work like safety ratings for motor cars. Machines from manufacturers would be submitted for testing in controlled conditions by qualified personnel at a dedicated Australia/NZ facility using a standard set of testing criteria and parameters. Ratings and data would be made public and farmers would make up their own minds about which vehicle they preferred for their application. More and more different machines are coming onto the market and evaluating the whole range used for farming would be useful as well as comparisons of injury and deaths by machine. It would all promote change.
- I would provide to coroners, if they asked for it, access to technical support and expertise from the industry which coroners could use when investigating and making their reports.
- Kiwis are an inventive bunch but getting a new thing accepted is not easy. The Labour Department is not permitted to test or recommend a product in any way. There is a big vacuum here (or is it in politicians heads?) and this needs to be addressed. Here is a

country with a unique problem in a key export industry, laws aplenty, but nobody will test products or recommend a solution. Nothing will improve if this silly situation continues. This needs changing. We need testing, evaluation and safety rating, with information made public.

- It used to be standard procedure on farms to extend the track width of our tractors' rear wheels when doing hill work and we'd put them back in for mowing jobs etc. (You may note that tractors, mostly designed in the northern hemisphere, are getting higher, more powerful, and many have relatively narrower wheelbases than NZ tractors used to have.
- The same methodology as we use for tractors could be used on Quad bikes by having or making available, adjustable wheel hubs and rims. Just a small increase in track width makes a huge difference in hillside safety. It's well proven with tractors – why not for Quads? A testing facility, as mentioned above, could soon sort out the facts from the assertions on this matter. Hikurangi farmer _____ has been successfully using his farm built wider wheel hubs on quads for years and is happy to demonstrate and provide a trial of a very successful modification.
- In addressing quad safety we also need to produce an annual estimated total of man and woman hours these machines are used for on NZ farms and compare the injury and death rate totals against that figure for other industries. We need to keep perspective.
- Like many farmers I use dual wheels on my tractor. I had intended to put them on sometimes when doing the hills but they have been on now for twenty five years straight and I never have them off the tractor. For some years *Clic Wheels Systems Ltd* have imported click-on dual wheels for Quads and while individual users around New Zealand swear by them, neither the government nor manufacturers will have a bar of them. The manufacturers actually agree they are a good product and would improve safety but they will not even consider them. Manufacturers could simply beef up their axle bearings a little. As mentioned above, an independent testing facility could sort this out.
- As mentioned, roll over protection is to me a no brainer. We had doubters coming up with the same arguments against tractor frames in the 1960's. Where are those doubters now? Who would stand up and argue against roll over protection for farm tractors now?
- Law and compulsion: as mentioned before I do not see over-use of compulsion working well on everything. The law is not that successful, even with our roads saturated with Police, so it's unlikely to be any better when a worker is up a back gully without supervision and a bunch of factors line up threatening the rider who is not trained to recognize and avert the situation.
- It seems that manufacturers are reluctant to change and that is understandable given NZ is small market segment, but they will probably need to front up or competitors will move in. Testing and rating machines would help promote change.
- The name ATV is out and the name Quad Bike may also need to change in time. Already there are machines that really do not fit the description of 'Quad bike'. Some are simply known as 'Utility Vehicles' because their design has moved away from the 'bike' design.

I will stick my neck out here and predict that the new Utility Vehicles will prove to have a far better safety record than the traditional existing Quad Bikes. Not perfect - far better.

- I believe that in the long term the present Quad Bike that thankfully superseded the Trike will itself be modified and also largely superseded. The standard style of Quad now has many UTV competitors already and more are coming on the scene all the time. The culture is changing to suit the industry. It could change a little faster with some strategic help.

- **SALES TRENDS CHANGING ALREADY :**

Last year I checked with _____ of Hikurangi who has a leading business selling new and used machines to farmers in Northland and services them as well. He sells both Quads and side by side SUV's and has a wealth of experience and wisdom.

_____ had a large stand at the Dargaville field Days and told me that he sold quite a number of machines. Only one was a Quad Bike – the rest were SUV's or side by side machines complete with roll over protection etc etc.

I asked him, "Do you think traditional Quads will lose sales in favour of SUV's ?" "Definitely," he replied. "It's been going on for a while. At the field days I sold a number of SUV's but only one single Quad. All the interest was in the 'side by side' SUV's."

So there you are! The culture is already changing away from traditional Quad Bikes. A range of different SUV machines are on the market with more arriving.

I believe the timing is right for:

1. Machines to be tested at a purpose built facility. Aust.NZ.
 2. Safety ratings and reports to become available to consumers as for motor vehicles.
 3. A well informed market that can move causing manufacturers to respond.
 4. ROP's such as 'Quadbar' to be retro fitted to existing machines with perhaps using some kind of incentive.
 5. New Quads to be fitted with an ROP device before sale on a 'remove it at your own legal risk' basis. (one single regulation)
 6. Testing and evaluation of Quads and SUV's should proceed as soon as possible to give consumers the information they need, and to provide direction to the market.
 7. *LATE NEWS: Another young tourist has been killed on a quadbike having also been a first time rider as they often are. I recommend that all tourism ventures offering rides in NZ be required to use only side by side machines equipped with rollover protection. Please see the newly developed Australian Vmoto Scart 500 4WD.*
- Regarding the target of a 25% reduction in injuries etc: I believe the quadbike problem is a sitter for a 50% reduction of injuries and deaths.

Merv Rusk.

Appendix: The origin of the Domino Theory.

The Original Domino Theory

The following famous quotation presages Heinrich's Domino Theory, and explains it using a different **metaphor** (horseshoe nails) than Heinrich (dominoes falling over in a line).

"For the want of a nail, the shoe was lost; for the want of a shoe the horse was lost; and for the want of a horse the rider was lost, being overtaken and slain by the enemy, all for the want of care about a horseshoe nail." --*Benjamin Franklin, Poor Richard's Almanack.*

Herbert William ("Bill") Heinrich developed the Domino Theory while working at Travellers Insurance Company in 1929, and expanded on it many times over many years. Heinrich spent quite a few pages elaborating on the Domino Theory in the beginning of his famous book, Industrial Accident Prevention, first published in 1931.

What Is an Accident ?

Of accidents, Heinrich says, "The occurrence of a preventable injury is the natural culmination of a series of events or circumstances which invariably occur in a fixed and logical order." (Death can only follow injury)

What is The Domino Theory ?

Heinrich's Domino Theory states that accidents result from a chain of sequential events, metaphorically like a line of dominoes falling over. When one of the dominoes falls, it triggers the next one, and the next...but removing a key factor (such as an **unsafe condition** or an **unsafe act**) prevents the start of the chain reaction.

The Life and Times of The Domino Theory:

By 1950, and the fourth edition of Industrial Accident Prevention, Heinrich was still promoting the same Domino Theory as in 1929. By 1976, however, two scholars named Bird and Loftus were working with Heinrich to update the Domino Theory.

By 1976, the Domino Theory had been updated and changed slightly to reflect new developments in safety theory, and a changing social and political climate. Bird and Loftus (along with input from Heinrich) put forth this new revised version of the Domino Theory in their well-known book Loss Control Management.

By 1994, the Domino Theory was still in use, although it had changed dramatically from Heinrich's initial postulation. In his textbook Basic Guide to Accident Investigation and Loss Control (1994), Jeffrey W. Vincoli gives a detailed description of this updated Domino Theory, and even seems to use its premises as the basis for the entire text.

By 1994, and Vincoli's book, the dominoes had been re-labelled and updated (with a new emphasis on management, and incident as property loss), but the basic structure and premises of the theory were still in place. The revised model re-labels the dominoes as Management: Loss of Control, Origins/Basic Causes, Symptoms/Immediate Causes, Contact: Incident, and Loss: People – Property.

For a full description please see the online edited excerpt from Incident Causation Models, Incident Investigation Course Module 2, for the HSEP Certificate Programme at the University of New Brunswick, written by Sara Stewart with input from Peter Crisp and Don Sayers. (c) Don Sayers and Associates, used with permission.

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