QUEENSLAND COURTS

OFFICE OF THE STATE CORONER

FINDINGS OF INQUEST

CITATION:	**Inquest into the death of Geoffrey Grahame Moore**
TITLE OF COURT:	Coroners Court
JURISDICTION:	Brisbane
FILE NO(s):	2012/833
DELIVERED ON:	26 September 2014
DELIVERED AT:	Brisbane
HEARING DATE(s):	20 May 2014, 6-8 & 11-12 August 2014
FINDINGS OF:	John Lock, Deputy State Coroner
CATCHWORDS:	Coroners: inquest, quad bike accident, mechanical defect, helmets

REPRESENTATION:

Counsel Assisting:	Mr P. De Waard, Office of the State Coroner
Federal Chamber of Automotive Industries (FCAI):	Mr Dollar of Counsel I/B Norton Rose Fulbright
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Mort & Co:	Mr A Girle of Sparke Helmore

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Introduction

Approximately 170 deaths over the past decade have occurred in Australia and New Zealand whilst Quad Bikes were involved. Most of these have occurred in a rural setting and the leading cause of death on farms in Queensland has some involvement with a quad bike.[1]

It is uncontroversial to say that a number of the statistical sources confirm that the majority of deaths occurred in the age group of 10 – 19 and a second highest age group for those over the age of 50.

Quad Bikes are essentially four wheeled motorbikes. They are motorised vehicles designed to travel on four low-pressure tires, having a seat designed to be straddled by the operator, and handlebars for steering control. They are used for both recreational purposes, either privately or in tourism, or for agricultural purposes. In Australia and New Zealand they are typically used in rural settings. They are utilised by search and rescue teams. In the United States of America they are also used in rural settings but the majority are used in a recreational setting.

Whatever may be said about their utility, they have become essential equipment on many farms. That being said, the evidence gathered during this multiple inquest raise many issues including the importance of active riding, good maintenance, use of correct tyre pressure, use of helmets, not allowing children to ride adult sized quad bikes, understanding the limitations of the vehicle and that tragic incidents can occur in quite benign conditions. The cases also emphasise the importance of riders making appropriate decisions.

Most standard quad bikes have no roll over protection system (ROPS). In broad terms, a ROPS is a cabin or roll bar structure on top of the quad bike, which incorporates a seatbelt to restrict movement outside the protective zone in the event of a roll over. Other possible protection mechanisms include Crush Protection Devices (CPD), which is a two bar or circular structure attached to the rear of the vehicle, which aims to provide a protective space in the event of a roll over, but without a seat belt. The utility of either device has been the subject of considerable debate.

Quad Bikes are referred to by the manufacturers and marketed to the public as 'All Terrain Vehicles' (ATVs). There has been some criticism of the use of that term.[2] In this inquest it is intended to adopt the term Quad Bike, but I do so conscious of both arguments and simply use the term in this phase of the inquest because it is one known better to the general public in Australia.

There has been considerable research, studies, reports and investigations carried out by varying persons and organisations considering how to reduce the number of quad bike related accidents. Although there is considerable agreement in relation to a number of issues, there has been robust debate between the main protagonists and considerable difficulty in reaching a consensus as to how to move forward on some of the more contentious issues.

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[1] Lisa Crockett, *National Coronial Information System Database Search.* The report was dated up to 1 January 2013 and noted there is a possibility of underreporting due to filing errors and currently open investigations. The deaths involved in this inquest would not be included. By the time of the inquest the figures estimated were closer to 195.

[2] Coroner John Olle, *Record of Investigation into Death of Thomas John Hutchings* (2009) State Coroner Victoria, case number 3067/02, p 4. Coroner HB Shortland, *An inquiry into the death of Carlos Mendoza,* Coroners Court New Zealand, CSU- 2010-WHG- 000185 at p 25

This inquest will examine the circumstances of the deaths of nine individuals. Findings in relation to each of those cases will be made in the first phase of this inquest. In the second phase I will hear evidence concerning what recommendations should be made to help prevent deaths occurring in similar circumstances in future.

The evidence

1. Mr Geoffrey Moore was employed at the Mort & Co Feeders Pty Ltd Grassdale Feedlot as a Maintenance Supervisor. His duties included the oversight of on-site and off-site maintenance of plant and equipment. He was 51 years of age when he died at work as a result of crashing a faulty quad bike into a fence and it overturning. It is likely he was engaged in attempting to repair it.

2. The crash occurred between the hours of 2:30pm on Tuesday 6 March and 6:00am on Wednesday 7 March 2012. He died of massive head injuries.

3. Earlier, on Thursday 1 March 2012, a stockman at the business, Mr Hamish Pearce, rode the quad bike from the drafting shed. The quad bike was used for transport around the feedlot. Mr Pearce observed that the throttle was 'stuck', meaning that it was operating on full acceleration. It took him 60 – 70m to control the quad bike. He eventually stopped the quad bike and took it out of gear and restarted the quad bike. He did this to check if the throttle had become free. It had not and again it revved very high straight away. Mr Pearce had never experienced this problem with the quad bike before.

4. Mr Pearce turned the quad bike off and parked it on the side of the laneway, with the keys in the ignition. He then walked back to the shed and informed another worker by telephone. He thinks this was Ms Coralie Hawton, the Administration Co-ordinator of the business. He advised her that the quad bike had broken down.

5. The next day, on Friday 2 March 2012 at about 11:00am, another stockman, Mr Michael Craven, saw that the quad bike was parked at the end of the laneway and assumed that it had run out of fuel. He usually used that particular quad bike. He had last used it on Thursday morning and had not noticed any faults with it. He had also worked with Mr Pearce the day before and it does not appear that Mr Pearce mentioned anything about the faulty quad bike to him. Mr Craven informed Mr Young where the quad bike was parked and that it needed repair. He also says that he informed Mr Moore.

6. On Sunday 4 March 2012, Mr Pearce had a conversation with Mr Young to shift the quad bike. Mr Pearce towed the quad bike to the front of the workshop where Mr Moore worked. He was assisted by Ms Sarah Collins.

7. Mr Moore was last seen by a maintenance worker, Mr Samuel Tribe, on Tuesday 6 March 2012 at about 2:30pm. He was seen to be fit and healthy and was performing his usual duties.

8. Soon after, between about 2:55pm and 4:00pm, Mr Craven went to the workshop yard with Mr Steve Spencer to drop off some fencing equipment. He saw that the quad bike had been moved from the front of the workshop. He looked for Mr Moore to see if the quad bike was ready to be placed back into service but he could not find him. He noticed Mr Moore's dog wandering around the office

looking lost. He thought this was unusual as he had never seen Mr Moore's dog in the office before.

9. The following morning at about 6:00am on Wednesday 7 March 2012, Mr Tribe arrived at the workshop. Usually when he arrived for work, the gates and shed were open but on that day both the yard gates and the shed were still closed. He returned back to the office and opened the gates and the shed with a spare key. Mr Moore's vehicle was at the workshop, though Mr Moore was not there. He looked around the yard when he noticed that the fence at the northern side of the workshop yard was broken. He observed the quad bike lying upside down. He went over to inspect and found Mr Moore laying on the ground several metres from the quad bike.

10. The quad bike had collided with the fence some 77m from the workshop. No tyre tracks could be made out but the direction of travel appears to have been from the shed towards the fence. Due to the location of piles of material that were stored in the yard, and the location of the impact zone with the fence, it appears that the quad bike must have veered to the left as it approached the fence.

11. The fence was a 2m high chain wire fence. The quad bike had gone through the fence and overturned about 2.6m past the fence. The quad bike was upside down; entangled in the fence, and facing back towards the shed at the time Mr Moore was discovered. Mr Moore was located on the ground 6.9m away from the overturned quad bike.

12. Emergency services were contacted and QAS attended first at 8:00am. A paramedic, Ms Tania Takken, issued a Life Extinct Form.

13. Police attended the scene that morning and commenced an investigation. There were no suspicious circumstances surrounding this death. Nor was there any evidence to suggest that Mr Moore had purposely harmed himself.

Autopsy results

14. An external autopsy was ordered and this was conducted on 9 March 2012 by a forensic pathologist, Dr Boris Terry, at the Toowoomba Hospital mortuary. Toxicology testing and a full body Computed Tomography scan were also undertaken. Toxicology analysis found no drugs or alcohol in Mr Moore's system.

15. The CT scan revealed multiple fractures of the skull and a large amount of intracranial gas, with some diffuse subarachnoid and intraventricular haemorrhage.

16. Dr Terry concluded that the medical cause of Mr Moore's death was: *massive head injuries*.

The investigation

17. Sergeant Stephen Ryan, Officer in Charge of the Millmerran Police Division, attended the scene on the morning of 7 March 2012 and commenced his investigation. Senior Constable Jason Lenz, from the Dalby Scenes of Crime Section, also attended the scene and took a series of photographs.

18. Sergeant Ryan submitted a police report to the Coroner dated 7 March 2012. He also produced a statement with his updated findings dated 21 November 2012.

Quad bike details

19. The quad bike involved was an automatic 2007 model Yamaha YFM350FAW, 350cc. It had been purchased new by Mort & Co either in 2007 or 2008.

20. There were no accessories or modifications to the quad bike. There was no CPD or ROPS installed on the quad bike.

Mechanical inspections

Police Inspection

21. The quad bike was inspected by Mr Robert Manwaring of the Queensland Police Service Vehicle Inspection Unit, on 4 June 2012, some three months after the incident.

22. Mr Manwaring found a defect in the throttle system. The throttle control was inoperative so he removed the cover from the throttle control and found corrosion inside the housing. He disconnected the throttle cable from the control lever and found the control lever operating satisfactorily. He found that the throttle cable seized at close to the full throttle position.

23. Mr Manwaring noted that the quad bike had suffered impact damage to the right front guard and front cargo carrier. The handle bars were twisted forward. The left steering knuckle of the suspension had been damaged upon impact, though all other parts were connected and operational. The steering components were connected and operational. The tyres were in good order. The tyre pressures at the time of the incident are unknown.

24. As a result of his inspection, Mr Manwaring was of the opinion that the quad bike was in a dangerous mechanical condition at the time of the incident due to the throttle being seized in close to the full throttle position.

Inspection of the quad bike by the Company Director of Dalby Moto

25. The quad bike was sent by the police investigating officer for a second opinion to Dalby Moto. Dalby Moto had performed all major servicing and major repairs for the makes of quad bikes owned by Mort & Co that they distributed through their dealership. The Company Director, Mr Craig Hartley, provided a mechanical inspection report to police. He also provided oral evidence at the inquest.

26. Mr Hartley checked the service history of the quad bike. He noted that the quad bike had received a full major service in April 2011.

27. Mr Hartley noted during his inspection that the throttle cable was stuck in the open or full throttle position. He observed that there was considerable corrosion in the throttle housing and inner throttle cable. He was of the opinion that the corrosion was probably caused by the wet conditions that had prevailed over the Darling Downs area over the past 12 months or longer, as well as the damp and dirty conditions within a cattle feedlot. He was of the opinion that the corrosion may have been caused by the egress of water into the throttle cable via the thumb throttle. Over time, this would have caused the inner cable to seize.

28. Mr Hartley also noted that the rear foot brakes were not fully adjusted. The rear brake handle lever and front brake handle lever were operating effectively. He advised that this meant that if Mr Moore had applied the rear brakes by the foot lever only, he would not have been able to stop the quad bike under full throttle.

29. The owner's manual recommended that the throttle system on the quad bike should be serviced by an authorised dealer every six months or 1,500km, whichever occurred first. Mr Hartley stated in oral evidence that he sent out six monthly notices to customers reminding them that their quad bikes were due for a service. Mr Scott Braund, the National Feedlot Services Manager of Mort & Co, advised that such notices would have been processed by the Site Manager at the Grassdale Feedlot. The quad bike had not been serviced by an authorised dealer for close to 12 months, although day to day maintenance would have been performed at the workshop.

Terrain and conditions

30. The maintenance holding yard where the incident occurred was a flat surface made up of clay and gravel. The yard had a number of piles of material scattered throughout but there was a relatively straight open path from the concrete slab at the back of the workshop to the fence.

31. There was heavy rain on the afternoon and evening of 6 March 2012.

32. It is unknown whether the incident occurred in daylight or night time hours and it could have been raining at the time.

Speed

33. Police were unable to determine what speed Mr Moore would have been travelling at the time of the incident. Mr Hartley advised during oral evidence that if the quad bike was at full throttle over a 70–80m distance, it could have achieved a speed of between 65–75km/h before colliding with the fence.

Personal Protection Equipment

34. It was usual practice for Mr Moore to be working alone around machinery such as quad bikes. Mr Braund advised that it was expected he would ride quad bikes in order to diagnose problems for repair purposes.

35. Mr Braund further stated that helmets were compulsory for all employees riding quad bikes. The initial WHSQ Investigating Officer had been told by employees that some helmets were available but it was not a requirement to wear them.

36. A helmet was located at the scene between the quad bike and the shed, some 40m away from the quad bike. The helmet was not in the direct path of the likely direction of travel and appears to have been left there by someone else at another time.

37. No other helmet was found and it is apparent Mr Moore was not wearing a helmet at the time. Given he was probably commencing to test the quad bike the subsequent events may have been very unexpected.

38. Mr Moore was wearing boots, rugby style shorts and a thin long sleeved shirt at the time of the incident.

Training and experience

39. Mr Braund advised that Mr Moore was never given any formal training in relation to operating and riding quad bikes. Informal training existed at the business

whereby employees more familiar with quad bikes would assist other less familiar employees. It is unknown whether Mr Moore ever received informal training.

40. Mr Braund advised that the owner's manuals for machinery, including quad bikes, were held in a central location at the feedlot site. It was not compulsory for employees to familiarise themselves with the manuals before operating the quad bikes. It is unknown whether Mr Moore ever read the manual.

41. Mr Moore was expected to operate quad bikes in order to diagnose mechanical problems. It is uncertain whether he had extensive experience riding quad bikes.

42. Mr Moore had been working at the property for a number of years and he would have been familiar with the holding yard behind his workshop and the fact a fence was there.

Health issues

43. Mr Moore had long term back pain with degenerative changes, which was being treated by Norspan patches; stable type II diabetes, complicated by peripheral neuropathy; and he was taking Champix as an aide to tobacco cessation.

44. Mr Moore's doctor, advised police that he had recently seen Mr Moore on 2 March 2012. He was in a very good mental state and his medical conditions were stable.

Reports of Professor Duflou

45. Professor Duflou, a forensic pathologist in NSW was engaged by the legal representatives of the employer and provided three reports.

46. He concluded that Mr Moore likely died primarily of his injuries sustained during the collision. He did not exclude as a reasonable possibility that Mr Moore lost control of the quad bike because of a mechanical fault in the vehicle.

47. However, he also was of the view that it can reasonably be expected that Mr Moore had a number of conditions, which could have led to either partial or total incapacitation at the time he was riding the quad bike, and one or more of these conditions could reasonably be the cause of losing control of the vehicle.

48. He noted that Mr Moore had significant risk factors for cardiovascular disease including obesity, diabetes mellitus and heavy smoking. He was also known to have at least one complication of diabetes, being peripheral nephropathy. His medical records did not give any indication he had undergone formal investigation for cardiovascular disease.

Workplace health and safety issues

49. This incident was extensively investigated by Workplace Health and Safety Queensland (WHSQ). An initial report was concluded by the Regional Investigations Manager, Ms Tara-Louise Bobf, and Regional Director, Mr David Spann, on 20 March 2013.

50. Mr Scott Munro was the first WSHQ investigator at the scene on 7 March 2011 and had made initial enquiries. He also provided oral evidence at the inquest. Mr Munro expressed concerns that Mort & Co:

a. did not have a formal system of recording faults with machinery such as quad bikes. They relied on verbal communication. A maintenance spreadsheet was kept but it was used for job allocation, not for detailing faults;

b. the faulty quad bike was left in the open for over 24 hours with the keys in the ignition. They did not have any specific processes in place to ensure that unsafe equipment was not used; and

c. there was no formal training provided to employees in relation to the inspection and operation of quad bikes.

51. As a result of their initial investigation, WHSQ issued a prohibition notice to Mort and Co directing them to stop the activity of allowing workers to operate quad bikes without the provision and maintenance of a safe system of work.

52. In oral evidence, Mr Braund accepted Mr Munro's criticisms of their systems prior to Mr Moore's death. He explained that since the prohibition notice was issued, they had reviewed their systems and had remedied those deficiencies. Mort & Co also reassessed their need to utilise quad bikes as a transportation vehicle and have now opted to use 'side by side' vehicles in their place. Side by side vehicles are designed so that a rider is seated in the vehicle and controls it with a steering wheel, similar to how a driver sits in a small car. They are designed so a passenger can sit alongside the driver (hence the name 'side by side'). They normally have ROPS, seatbelts, and a relatively wide track and long wheelbase, providing a high degree of stability. They are increasingly being used on farms and workplaces in place of quad bikes, and are part of the 'fit for purpose' vehicle selection being promoted in a number of cases by quad bike industry groups and workplace regulators. Mort & Co came to the realisation that they had no real need for quad bikes, given their properties were on relatively flat terrain. Mr Braund agreed that it was about using the right tool for the job and they were after the additional safety benefits that side by side vehicles offered.

Conclusions

53. There is no doubt Mr Moore collided with a fence when he attempted to ride the quad bike, which had a faulty throttle cable. When inspected, if the throttle was placed in the full open position, it seized. The throttle was in the full open position when found at the scene and the evidence is it was at full revs at the time it stopped.

54. It was argued by the legal representatives for the employer that the only logical conclusion was that at the time Mr Moore drove into the fence, he was not conscious due to a medical incapacitation issue. The reports of Professor Duflou were relied upon. It was noted the inspection of the quad bike took place three months after the incident. There was no evidence that he attempted to skid or brake. There were no lacerations on his knuckles or injuries to his upper limbs, which were likely to occur if his arms were extended at the point of impact. The emergency stop button was in working order and clearly visible. The fact that Mr Moore rode in a near straight line 70m towards the fence was also referred to, although it was conceded there was evidence he may have veered slightly.

55. Whilst it is possible that Mr Moore could have suffered from a medical incident at the time of the accident, the evidence to support this is based largely on conjecture. It is accepted that the finding of corrosion in the throttle assembly was

three months later and some of this could have occurred in that time given storage conditions.

56. However, of major significance is that a few days before the crash another co-worker came across the quad bike and found that it revved excessively and was difficult to control for a similar distance as in this incident. That meets precisely the scenario of events consistent with what was found at the scene.

57. The weight of the evidence is significantly in favour of a finding that the likely cause of the incident was a mechanical fault with the quad bike. I am unable to determine whether the quad bike revved excessively when first started or if Mr Moore thought he had fixed the bike and was testing it when the same thing occurred again.

Findings required by s. 45

Identity of the deceased – Geoffrey Grahame Moore

How he died – Mr Moore died from head injuries after the quad bike he was riding lost control and collided with a fence. The quad bike had a corroded and faulty throttle assembly which caused the quad bike to rev excessively.

Place of death – Grassdale Feedlot, 35 Grassdale Road Grassdale QLD 4405

Date of death– Between 06 – 07 March 2012

Cause of death – 1(a) Massive head injuries, due to or as a consequence of
1(b) Quad bike accident (rider)

Comments and recommendations

I close this inquest in respect to my findings as required by s. 45. I will be considering any comments and recommendations in the second phase of this multiple inquest.

John Lock
Deputy State Coroner
Brisbane
26 September 2014