FINDINGS, RECOMMENDATIONS and COMMENTS of Coroner Simon Cooper following the holding of an inquest under the *Coroners Act* 1995 into the quad bike related deaths of:

Heather Dawn Richardson, Jan Severin Jensen, Kendall Russell Bonney, Vicki Mavis Percy, Jay Randall Forsyth, Jacob Graham Green and Roger Maxwell Larner

Contents

Record of Investigation into Death (With Inquest)

Coroners Act 1995
Coroners Rules 2006
Rule 11

I, Simon Cooper, Coroner, having investigated the deaths of Heather Dawn Richardson, Jan Severin Jensen, Kendall Russell Bonney, Vicki Mavis Percy, Jay Randall Forsyth, Jacob Graham Green and Roger Maxwell Larner with an inquest held at Hobart in Tasmania make the following findings.

Hearing Dates

4 October 2016 to 10 October 2016, at Hobart in Tasmania

Representation

Counsel Assisting the Coroner – Mr Barclay

Counsel for Federal Chamber of Automotive Industries – Mr Dollar instructed by Mr Cash

Counsel for the Royal College of Surgeons – Ms McNamara

Counsel for the Director of Industry Safety – Mr Thompson

Introduction

1. Between 10 November 2012 and 27 December 2015, seven riders of quad bikes died as a result of accidents at various locations in Tasmania.

2. Quad bikes are combustion engine driven vehicles designed for 'off-road' use. They are common in Australia and are very popular for both work and recreation. Quad bikes are particularly ubiquitous in rural Australia where they are used extensively in farming operations. The common design characteristics of quad bikes are that they are operated (or ridden) by a rider straddling a seat, with her or his feet on footrests and holding handle bars, in a manner similar to a motorcycle. Quad bikes are fitted with large wheels with low-pressure tyres. They have a short wheel base, a narrow track and, relatively speaking, a high centre of gravity. Some quad bikes are designed to carry more than one person; some are

not – and it is very dangerous to carry a pillion passenger on a quad bike not designed for that purpose.

3. In a finding relating to nine quad bike related deaths in New South Wales published on 25 November 2015, New South Wales Deputy State Coroner Freund said at par 6:

> "According to statistics published by the Australian Centre for Agricultural Health and Safety, there have been over 200 quad bike related deaths in Australia since 2001, with approximately 64% of these deaths having occurred on farms. This makes quad bikes the highest killer of workers on farms in Australia. Moreover, on average, 1400 people are seriously injured in quad bike accidents in Australia each year. Of concern is that the data from the Australian Trauma Registry indicates that major trauma injuries from quad bikes, have been steadily increasing, from 26 in 2010 to 51 in 2012."

4. In these circumstances, and given that since 2000 there have been 20 deaths in Tasmania arising out of quad bike use, the use of them is a matter of general concern. Figures from the Australian Centre for Agricultural Health and Safety show 69 people lost their lives on farms in accidents in 2015, an increase from the 54 deaths nationally in 2014. Quad bikes and tractor fatalities accounted for 40 per cent of those deaths, with 9 per cent being children.

The Investigation of Deaths

5. The *Coroners Act* 1995 (the 'Act') provides that a death is reportable to the coroner if, *inter alia*, the death is one of a person that occurred in Tasmania, and that death is "unexpected, unnatural or violent" (see section 3). Obviously, death as the result of a quad bike crash meets this definition.

6. Section 19 of the Act creates an obligation upon any person who becomes aware of what is suspected to be a reportable death to report that fact to the coroner. The Act provides that where a death has been reported to a coroner then she or he has jurisdiction to investigate that death.

7. Other than the circumstances in which an inquest is mandatory (death in custody or care, where a coroner suspects homicide and the like – which had no application to any of the seven deaths the subject of investigation), the Act provides that where a coroner has jurisdiction to investigate a death he or she may hold an inquest if the coroner "considers it desirable to do so". I note section 3 of the Act defines 'inquest' as meaning "a public inquiry that is held by a coroner in respect of a death, fire or explosion".

8. In each case I was satisfied that it was desirable to hold an inquest, primarily because there seemed a clear public interest in publicly examining the safety of quad bikes, given the large number of deaths attributable to their use.

9. It is appropriate to say something of the role of a coroner. Although a judicial officer, a coroner performs a different role to other judicial officers. The coroner's role is inquisitorial. She or he is required to thoroughly investigate a death and to make findings with respect to that death. This process requires the making of various findings, but without apportioning legal or moral blame for the death (see *R v Tennent; ex parte Jaeger* [2000] TASSC 64, per Cox CJ at paragraph 7). A coroner is required to make findings of fact from which conclusions may be drawn by others (see *Keown v Khan* [1998] VSC 297; [1999] 1 VR 69, Calloway JA at 75 – 76). The coroner neither punishes nor awards compensation – that is for other proceedings in other courts, if appropriate.

10. One matter that the Act requires a finding to be made about is how death occurred (section 28 (1)(b)). It is well settled that this phrase involves the application of the ordinary concepts of legal causation (see *March v E. & M.H. Stramare Pty. Limited and Another* [1990 – 1991] 171 CLR 506). Any coronial inquiry necessarily involves a consideration of the particular circumstances surrounding the particular death so as to discharge the obligation imposed by section 28 (1)(b) upon the coroner.

11. In addition to being required to make findings pursuant to section 28 (1) of the Act a coroner is empowered, in appropriate cases, to make "recommendations with respect to ways of preventing further deaths and on any other matter that the coroner considers appropriate" (section 28 (2)) and to "comment on any matter connected with the death including public health or safety or the administration of justice" (section 28 (3)). Any comment or recommendation must be connected to the death the subject of the enquiry *(see Harmsworth v The State Coroner* [1989] VR 989).

12. On 1 February 2016, Coroner McTaggart, holding a delegation from the Chief Magistrate to perform various of the Chief Magistrate's functions under the Act, directed pursuant to section 50 of the Act that each of the seven deaths be investigated at the one inquest.

The Course of the Inquest

13. The examination of deaths arising out of the use of quad bikes is something that has been undertaken in several other jurisdictions, notably Queensland and New South Wales, where

coroners handed down findings in 2015 after lengthy inquests. Reference has already been made to Deputy State Coroner Freund's November 2015 finding.

14. In an effort to ensure the same ground covered in those inquests was not traversed a third time and in an endeavour to reduce expense for all parties involved, I was provided with the transcript of both inquests. Many documentary exhibits tendered at those inquests were tendered at this inquest without the maker being called. In addition, I had available to me written submissions of counsel in those inquests and the findings of the coroners themselves. This material was invaluable in dealing with the broader issues examined at inquest. Annexure B to this finding is a complete list of all documentary material tendered and considered.

15. As part of the preparation for the inquest, the fact of the inquest was advertised in all Tasmanian daily newspapers, as well as the only national daily. In the same advertisement notice was given of a case management conference on 1 March 2016.

16. The advertisement led to the inquest receiving a contribution from the Royal College of Surgeons. The College made a written submission which included copies of articles from local newspapers, extracts from 'Quadwatch' the Safework Australia government 'initiative' designed, according to its website, 'to raise awareness of quad bike safety', copies of three publicly available Tasmanian coronial findings in relation to quad bike related deaths, a copy of Deputy State Coroner Freund's November 2015 finding and various other documents broadly related to the issues at the inquest. Associate Professor Teague, a fellow of the College, was called to give evidence. Associate Professor Teague told the inquest that the objective of the College was to assist to achieve the safest outcome for quad bike users. He expressed particular concern about the use of quad bikes by children. Despite none of the deaths investigated at the inquest involving a person under the age of 18 years, the use of quad bikes by young persons is undoubtedly a matter of concern.

17. WorkSafe Tasmania did not respond to the advertisement and evinced no intention, at all, to participate in the inquest until written to by Counsel Assisting not long before the inquest commenced. In any event the state Director of Industry Safety made a written submission and was called to give evidence.

18. A very active participant in the inquest was the Federal Chamber of Automotive Industries (FCAI). Members of the FCAI import and distribute quad bikes in Australia. The inquest benefited from the FCAI's involvement.

The Issues at Inquest

19. A number of issues were identified in advance of the inquest as proper areas for examination. Those issues defined the scope of the inquest. They were as follows:

- Whether existing quad bike training can be improved, standardised and participation more effectively encouraged;
- Whether a mandatory licencing or certification scheme should be introduced;
- Whether an Australian Standard should be introduced for quad bike specific helmets;
- Whether wearing a helmet when operating a quad bike should be mandatory;
- Whether children under 16 years of age should be prohibited from riding adult sized quad bikes as operators and passengers;
- Whether carriage of passengers on quad bikes designed for single operators only should be prohibited;
- Whether the installation of a crush protection device or a roll over protection system ("ROPS") is an effective way to minimise deaths and injuries from quad bike accidents (including roll-overs);
- If so, whether the installation of such devices and systems could be more effectively encouraged or mandated, where appropriate;
- Whether an Australian Design Rule or Australian Standard based on American National Standard (ANSI-1-2010) should be mandated for the manufacture, import and supply of quad bikes in Australia;
- Whether the introduction of a star rating system (similar to the Australian New Car Assessment Program) would assist consumers to choose quad bikes or alternative vehicles that are fit for purpose and to further encourage safety innovation by industry;
- Whether a standardised police investigation template for quad bike fatalities should be introduced; and
- Whether police investigator training can be improved to cover specific issues arising in quad bike fatalities.

The Evidence Surrounding the Individual Fatalities

20. Much of the evidence at the inquest was not in dispute. This was especially the case so far as the circumstances of each fatality, with the possible exception of Mr Larner, was concerned. Apart from being investigated pursuant to the provisions of the *Coroners Act* 1995, at the time of the happening of each crash the circumstances of each was subsequently reviewed, at my direction, by an experienced traffic crash investigator with Tasmania Police, First Class Constable Housego. Constable Housego furnished reports dealing with each crash; those reports were tendered at the inquest. In addition, he gave evidence and was questioned about his conclusions in each case. I am satisfied that he possesses the necessary expertise to express the opinions that he has. I am satisfied that the opinions he expressed had a proper basis in fact in each case. The methodology applied in each case was clear, consistent and unassailable. I note that in no material sense was his evidence in any way challenged. I consider Constable Housego's conclusions to be reliable. They were extremely helpful in me making the findings of fact set out below in respect of each death investigated at the inquest.

21. I observe that WorkSafe Tasmania did not investigate any of the deaths. The Director of Industry Safety's submission said that WorkSafe Tasmania had no record of receiving any report as to the deaths of Mr Jensen, Mr Bonney, Mr Forsyth, Mrs Percy and Mr Green. It is understandable that no reports of those deaths were received by WorkSafe as each death arose out of the recreational use of a quad bike. However, no investigation was carried out by WorkSafe into either Mrs Richardson's or Mr Larner's death. There was no evidence as to why neither was investigated.

Heather Dawn Richardson

22. Mrs Heather Dawn Richardson, born on 6 October 1949 in Launceston and raised on a farm at Whitemore, was 64 years old when she died on 10 November 2012. Mrs Richardson lived on the family farm with her husband, Wayne, at RSD 1267 Mole Creek Road, Chudleigh, Tasmania.

23. Throughout her working life Mrs Richardson ran the farm with her husband. She was, at the time of her death, described as retired (although still engaged in working the family farm). The evidence was that her health was poor. Mrs Richardson reportedly experienced pain and deformity in her left hand for a number of years. In September 2012, not long before her death, she suffered the last of several strokes, which left her with little or no use of her left arm. In addition, Mrs Richardson had been diagnosed with a medical condition concerning

her lymph gland for which she was taking prescribed medication. Her husband reported in the lead up to her death that she frequently complained of weakness, fatigue and dizziness.

24. On Saturday 10 November 2012 at approximately 7.00pm, Mrs Richardson was riding an almost new Suzuki 500cc quad bike to deliver food to her son-in-law, Mr Dean Marshman, who was mowing grass for silage. The paddock in which Mr Marshman was working was approximately two kilometres from Mr and Mrs Richardson's home. After delivering the food to Mr Marshman, Mrs Richardson made her way back to the house along a track that was unsealed but in reasonable condition. On one corner of the track a steep incline led into a sweeping left hand bend. Subsequent investigation suggested that as she entered the corner Mrs Richardson lost control of the quad bike and ran off the track onto the grassy verge, through a wire fence into a paddock.

25. At approximately 7.15pm the same day, Mr Theo Cresswell visited the property and rode up the hill to see Mr Marshman. He (Cresswell) stated he had seen a quad bike sitting in a paddock but paid no attention to it, and due to the lie of the land and the long grass, Mr Cresswell did not see Mrs Richardson lying there. Mr Richardson returned to the home at approximately 8.00pm. The absence of his wife concerned him, particularly in light of her medical condition. Mr Richardson therefore set off on the same track on another quad bike to look for his wife. He found her lying in the paddock deceased near her quad bike, which had its engine still running.

26. Mrs Richardson was not wearing a helmet, although I am satisfied that in her case the absence of a helmet did not contribute to her death. This is because the injuries which caused her death were, according to the pathologist who performed an autopsy upon her body (and whose opinion I accept), a transected thoracic vertebrae at T5, a ruptured spleen, a ruptured left kidney and multiple rib fractures. In other words she suffered fatal injuries to her chest and internal organs and not her head.

27. The evidence was that Mrs Richardson had extensive experience in riding both motorbikes and quad bikes, having used quad bikes in a farming setting for around 30 years. She was described as a careful and cautious rider but had no formal training in either motorbike or quad bike riding.

28. Officers from both Tasmania Police and Ambulance Tasmania attended the scene. No circumstances giving rise to suspicion were identified, but it is impossible to determine what caused her to leave the track and crash into the paddock.

29. Samples taken at autopsy and subsequently analysed toxicologically at the laboratory of Forensic Science Service Tasmania, revealed that apart from a drug prescribed for her, no other drugs, licit or illicit, or alcohol were found to have been present in her body.

30. The quad bike she was riding was inspected and found to be free of mechanical defect that could have caused or contributed to the happening of the crash. The road she was riding on was however rather steep, with a gradient of 22.5 degrees. Constable Housego expressed the opinion, which I accept, that the gradient of the road and its superelevation was such that even at low speeds, without the use of active riding techniques, the risk of a roll over was high. Given Mrs Richardson's medical situation, especially the fact that she had little or no use of her left arm, it is unlikely, in my view, that even if trained in such t echniques, she would have been physically able to carry them out.

31. The following findings are made pursuant to section 28 of the *Coroners Act* 1995:

    (a) The identity of the deceased is Heather Dawn Richardson;

    (b) How Mrs Richardson died is addressed in detail in these findings;

    (c) The cause of Mrs Richardson death was multiple severe trauma; and

    (d) Mrs Richardson died at 1267 Mole Creek Road, Chudleigh in Tasmania on 10 November 2012.

Jan (Yanni) Severin Jensen

32. Mr Jan (Yanni) Severin Jensen, born in Denmark on 16 February 1965, was 47 years old when he died as a result of injuries received in a quad bike crash.

33. At the time of his death Mr Jensen was working full time in his own metal work business at Wivenhoe near Burnie on Tasmania's North West Coast. Mr Jensen lived nearby at Sisters Beach with his wife, Daniela Jensen.

34. Generally speaking in apparent good health, Mr Jensen was operated upon to treat a heart arrhythmia in February 2012. During the operation, a second arrhythmia was found. Following the operation he appeared to have made a full recovery, although he was seeing a naturopath, who suggested the use of an herbal remedy, which it seems Mr Jensen was taking at the time of his death.

35. There is no evidence Mr Jensen ever undertook any formal quad bike training.

36. On the morning of 16 December 2012, Mr Jensen left his home with his wife and several friends for a day of trail riding on quad bikes and trail bikes to Dip Falls, not far from Sisters Beach. Mr and Mrs Jensen travelled together on a quad bike; Mr Jensen riding and his wife was pillion passenger.

37. The group (which consisted of eight people travelling on three quad bikes and three trail bikes) made their way, without incident, to Dip Falls. At the falls the group had a barbeque lunch, during which, the evidence is, Mr Jensen drank one full strength can of beer.

38. On the return journey at about 3.00pm, the group came to a hill in the Shakespeare Hills Forest Reserve approximately 300 metres north of Newhaven Road at Montumana. Two trail bikes successfully negotiated the track up the hill. So did another member of the party on a quad bike.

39. Mr Jensen, with his wife still pillion passenger, was next to attempt the hill. Mrs Jensen told investigators later that she had been reluctant to remain as pillion whilst her husband attempted the hill. She said it was her normal practice to get off the quad bike for obstacles like that, in the knowledge that her weight on the back of the quad bike could affect its handling. She raised her concerns with her husband and he told her she would be “right” to stay where she was.

40. The pair nearly reached the summit of the hill. Just short of the top the quad bike flipped over backwards throwing Mrs Jensen off the left side of the quad bike and clear. Unfortunately, Mr Jensen was neither thrown clear nor able to remove himself from the quad bike. The quad bike landed on top of him and his chest was hit and crushed by the instrument panel and handlebars. He was wearing a helmet at the time of the crash.

41. While one member of the party used a mobile telephone to call emergency services, others rushed to Mr Jensen’s assistance. He was described as being semi-conscious and making “gurgling” sounds. No one could find a pulse but various members of the group carried out CPR for nearly 40 minutes until officers from Ambulance Tasmania arrived and took over. Despite attempts to resuscitate Mr Jensen, he was unable to be saved.

42. After formal identification at the scene by his wife, Mr Jensen’s body was transported by mortuary ambulance to the Launceston General Hospital. At the Hospital Morgue an autopsy was carried out by Dr Brain, a pathologist. Dr Brain found at autopsy that Mr Jensen had suffered fractures to his sternum, clavicle and ribs, as well as a torn left auricle of his heart. He expressed the opinion, which I accept, that the cause of Mr Jensen’s death was compressive force (or a crush injury) to his chest.

43. Samples taken at autopsy were subsequently analysed at the laboratory of Forensic Science Service Tasmania. The results of that toxicological analysis were unremarkable. A low level of alcohol was detected as having been present in Mr Jensen's body (0.012g/100ml of blood) consistent with his having consumed one can of beer at lunch.

44. The investigation into the circumstances surrounding Mr Jensen's death involved, *inter alia*, an inspection of the quad bike. It was noted to have suffered only minimal damage. All four tyres were inflated in good condition and suitable for the terrain on which it was being operated. Noteworthy was the fact that the quad bike had on it three separate stickers, each prominently displayed, warning in unequivocal terms that pillion passengers were not to be carried on it and that to do so would affect the handling of the quad bike and could result in serious injury or death.

45. I am satisfied on the evidence that the quad bike was well maintained and free of any mechanical deficiencies at the time of the crash.

46. I am satisfied that the cause of Mr Jensen's death was the mishandling by him of the quad bike, in particular the carrying by him of a pillion passenger on a quad bike not designed for that purpose.

47. The following findings are made pursuant to section 28 of the *Coroners Act* 1995:

    (e) The identity of the deceased is Jan Severin Jensen;

    (f) How Mr Jensen died is addressed in detail in these findings;

    (g) The cause of Mr Jensen's death was compressive force to the chest; and

    (h) Mr Jensen died in Montumana in Tasmania on 16 December 2012.

Kendall Russell Bonney

48. Mr Kendall Russell Bonney was born on 29 June 1989 in Burnie, Tasmania. At the time of his death on 13 February 2013, Mr Bonney was 23 years old. Mr Bonney was employed as a Mechanical Fitter, and lived at his home at 510 Raymond Road, Gunns Plain, Tasmania. There is no evidence that Mr Bonney ever undertook any formal quad bike training.

49. On Saturday 9 February 2013, Mr Bonney was riding south on Arthur Beach on the isolated West Coast of Tasmania on a quad bike. The evidence was that he had consumed in the order of 5 stubbies of beer before riding. His quad bike was a red 2006 Bombardier Can-Am

Outlander. The quad bike was designed to carry a passenger, seated behind the rider. Mr Bonney was carrying a pillion passenger, 19-year-old Mr Thomas Blokker. Mr Blokker later told investigators they were travelling at 30 – 40 km/h, although Constable Housego suggested, without being able to be definitive, that the quad bike was likely travelling faster than this. While riding along the beach the quad bike hit two 'wash outs' in close proximity, causing the quad bike to crash. A 'wash out' is known as a breach in a road or railway track or beach caused by flooding. Both men were thrown over the front of the quad bike. Neither man was wearing a helmet.

50. Mr Blokker saw Mr Bonney lying face down, unconscious in the sand, with the incoming tidal water swamping him. Mr Blokker dragged him away from the water and called 000 and asked for ambulance assistance. Mr Blokker then waited for approximately thirty minutes for other persons from their campsite to come to the scene of the accident to assist him. Upon police arrival at 6.34pm, the police noted that Mr Bonney was lying in a recovery position, surrounded by Mr Blokker and three other friends from the campsite. At approximately 6:40pm Tasmania Ambulance attended the scene and treated Mr Bonney for serious head injuries. Just before 8.00pm the police assisted with transporting Mr Bonney to the main road where they met with the Search and Rescue Helicopter at 8.13pm. Mr Bonney was flown from Arthur Beach to Wynyard Airport where he was transferred to a fixed wing craft and flown to Hobart for transfer to the Royal Hobart Hospital. He arrived at the hospital, critically injured, at 1.40am on 10 February 2013.

51. Upon arrival at the Royal Hobart Hospital, Mr Bonney was immediately transferred to the Intensive Care Unit where he died three days later of traumatic brain injuries. Ante-mortem blood analysis was negative for alcohol or illicit drugs.

52. After formal identification, his body was externally examined by Forensic Pathologist Dr Donald Ritchey, who also examined his medical records. Those records included Magnetic Resonance Imaging of Mr Bonney's skull and neck. That imaging showed a traumatic injury to Mr Bonney's spinal cord at T5 as well as evidence of diffuse axonal injury within the corpus callosum (part of the brain). Dr Ritchey noted significant blunt trauma of Mr Bonney's head, neck, thorax, abdomen and pelvis. He expressed the opinion, which I accept, that the cause of Mr Bonney's death was traumatic brain injury.

53. After the accident the quad bike was inspected by a Transport Inspector. That inspector found that there were a number of deficiencies with the quad bike. The inspector expressed the opinion that "prior to and at the time of impact [the quad bike] … would be classed as not being mechanically sound, due to loose front suspension bolts, a worn steering tie rod end

and excessive clearance in the left rear wheel bearings". However there is no evidence to suggest that any mechanic deficiency in the quad bike caused or contributed to the happening of the crash.

54. I am satisfied on the evidence that had Mr Bonney been wearing a helmet at the time of the crash then he would not have suffered injuries to his head to the extent that he did and it is likely he would have survived the crash. I am also satisfied that excessive speed played a significant role in the happening of the crash. It is possible that the alcohol that Mr Bonney consumed prior to the crash also contributed, but I am unable to express a concluded view about this.

55. The following findings are made pursuant to section 28 of the *Coroners Act* 1995:

    (a) The identity of the deceased is Kendall Russell Bonney;

    (b) How Mr Bonney died is addressed in detail in these findings;

    (c) The cause of Mr Bonney's death was traumatic brain injury; and

    (d) Mr Bonney died at the Royal Hobart Hospital, Hobart, Tasmania on 13 February 2013.

Vicki Mavis Percy

56. Mrs Vicki Mavis Percy, born on 2 November 1949, lived at 254 Table Cape Road, Wynyard, Tasmania with her husband of 45 years, Wayne. She was 64 years old.

57. Like Mrs Richardson, Mrs Percy was, at the time of her death, semi-retired, after a lifetime of farming. She was an experienced quad bike rider, but had never undertaken any farm safety course or any other training in relation to quad bike use.

58. Apart from wearing a small hearing aid in each ear to assist with poor hearing, Mrs Percy was in good health and, according to her husband, 'never saw a doctor'. On the day of her death, 16 August 2014, she was reportedly happy and in good spirits; Mr and Mrs Percy were due to leave on the Spirit of Tasmania Ferry from Devonport that evening for a holiday on the mainland of Australia.

59. At about 2.15pm on 16 August 2014, Mrs Percy rode her quad bike 600 metres or so along Table Cape Road from her home to the home of her son and daughter-in-law.

60. At about 3.30pm she left to return home by the same route.

61. Her quad bike, a 2006 Bombardier Outlander, was towing a small trailer. At the same time two motorcyclists, 21-year-old Nathaniel Arnold and his friend, 20-year-old Brady Neasey, were travelling north on Table Cape Road (the same direction as Mrs Percy). Mr Arnold was in front of Mr Neasey, but each was riding the other's motorbike (having swapped motorbikes shortly before).

62. As they headed north on Table Cape Road Mr Arnold saw Mrs Percy ahead in the distance on her quad bike. Table Cape Road, in that area, is straight and the view along it unobstructed.

63. Mr Arnold and Mr Neasey were both travelling at around 90-100 km/h. Both attempted to overtake Mrs Percy. As they did so Mrs Percy began to turn her quad bike from the road into her driveway, across their path. Mr Arnold collided in a T-bone type impact with the right hand side of Mrs Percy's quad bike. He was thrown off the motorcycle he was riding and knocked unconscious. Mrs Percy was thrown from her quad bike and the quad bike itself was pushed twenty metres away from where the collision took place, coming to rest on the side of the road. Mrs Percy was found lying close to the quad bike she had been riding.

64. Mr Neasey braked heavily and managed to avoid hitting either the quad bike or the other motorcycle but locked up both wheels of the motorcycle he was riding and slid along the road. Relatively speaking uninjured, he got up, called 000 on his mobile telephone and made his way to Mrs Percy where, under the guidance of the emergency service operator, he checked for signs of life, but could find none. He later told investigators he noticed Mrs Percy's helmet had come off her head in the crash.

65. Members of the public, including a medical practitioner and a registered nurse, quickly arrived at the scene and rendered Cardiopulmonary Resuscitation (CPR) to Mrs Percy. Police, fire and ambulance officers were also on the scene within a short time of the happening of the crash. Sadly, Mrs Percy was unable to be resuscitated and she died at the scene.

66. Although Mrs Percy was wearing a helmet it was found at the scene of the crash some distance from her, suggesting it had not been done up properly, or at all. Certainly there was no evidence at all it was removed by anyone at the scene and Mr Neasey said it came off in the collision.

67. I note that no officers from Tasmania Police Crash Investigation Services attended the accident scene. In my respectful view this is most unfortunate.

68. After formal identification of Mrs Percy at the scene, her body was transported by mortuary ambulance to the mortuary at the Royal Hobart Hospital. There an autopsy was performed by Dr Ritchey, forensic pathologist. Dr Ritchey found Mrs Percy had suffered severe blunt trauma to both her head and neck as well as blunt trauma to her thorax, abdomen and pelvis. Significantly, she suffered skull fractures including a linear fracture of the left side occipital skull, transverse fracture of bilateral middle cranial fossae and communited fractures of her cribriform plate and bilateral supra orbital plates. It is unlikely any of these injuries would have been suffered by Mrs Percy had she been wearing a properly fastened helmet at the time of the crash.

69. Samples taken at autopsy were the subject of routine toxicological analysis at the laboratory of Forensic Science Service Tasmania. The result of that testing was unremarkable and certainly no alcohol or drugs were located as having been present in Mrs Percy's body at the time of the crash.

70. Investigations carried out pursuant to the *Coroners Act* 1995 in relation to the circumstances of Mrs Percy's death involved samples being taken for analysis from both motorcyclists, inspection of the quad bike and the motorcycles involved in the crash, a full investigation and inspection of the scene of the crash, a speed analysis conducted as a result of data obtained at the accident scene, a review of weather and road conditions at the time of the crash and interviews by police with Mr Arnold and Mr Neasey.

71. Both Mr Arnold and Mr Neasey returned negative results for the presence of alcohol and illicit drugs in their systems at the time of the crash.

72. Both motorcycles were found to be in a road worthy condition at the time of the crash. The quad bike was found generally speaking to be in a road worthy condition, allowing for the extensive damage sustained to its right side as a consequence of the crash. It was noteworthy however, that it was found not to be fitted with either indicators or rear vision mirrors.

73. Investigation indicated that at the time of the crash, the weather was fine and clear, the road surface was undamaged and dry, and visibility was excellent.

74. A speed analysis conducted by an experienced Tasmania Police traffic crash investigator indicated that at the time of the crash it is likely the quad bike ridden by Mrs Percy was

travelling at somewhere between 13 and 20 km/h and Mr Arnold's motorcycle was travelling in the order of 90 to 100 km/h. I note at interview with police, Mr Arnold, after his release from hospital, said this was the speed at which he was travelling immediately prior to the happening of the crash.

75. I am satisfied that Mrs Percy suffered fatal injuries in the circumstances set out above. As noted above, had she been wearing a properly fastened helmet at the time of the crash I am satisfied that it is likely she would not have suffered the injuries to her head which caused her death.

76. The following findings are made pursuant to section 28 of the *Coroners Act* 1995:

    (a) The identity of the deceased is Vicki Mavis Percy;

    (b) How Mrs Percy died is addressed in detail in these findings;

    (c) The cause of Mrs Percy's death was multiple injuries; and

    (d) Mrs Percy died at Table Cape Road, Wynyard, Tasmania on 16 August 2014.

Jay Randall Forsyth

77. Mr Jay Randall Forsyth, a boilermaker/welder by trade, was born on 31 October 1985. He was 29 years old when he died as a result of injuries sustained by him in a quad bike crash. Mr Forsyth was a single man, with no dependents and an active and engaged member of his local community at Bridport.

78. Mr Forsyth was reportedly experienced in the use of both motorbikes and quad bikes. However, there is no evidence that he completed, at any time, any formal training in relation to quad bike use.

79. At the time of his death he was disqualified for a period of 2 ½ years by reason of a court order from holding or obtaining a drivers licence as a result of a breach by him of the *Road Safety (Alcohol and Drugs) Act* 1970.

80. In the early hours of 1 January 2015, Mr Forsyth, heavily intoxicated and without a helmet, was riding a quad bike on Acacia Drive, Ansons Bay, Tasmania. He had dropped a friend to a shack nearby, turned around on Acacia Drive, accelerated heavily, apparently attempting to perform a 'fishtail' manoeuvre in front of several friends, lost control of the quad bike, fell from the vehicle and landed heavily on the road surface, causing extensive and fatal injuries

to his head. His friends and other persons nearby rushed to his aid and performed CPR. Emergency services were called. Ambulance Tasmania officers arrived about 55 minutes after the crash, having travelled from Scamander. However, Mr Forsyth was unable to be resuscitated.

81. His body was removed from the scene and transported (via St Helen's District Hospital) to the mortuary at the Royal Hobart Hospital. After formal identification, an autopsy was performed upon Mr Forsyth's body by the State Forensic Pathologist, Dr Lawrence. Dr Lawrence expressed the opinion, which I accept, that the cause of Mr Forsyth's death was a head injury. Mr Forsyth was found to have a laceration on the left occipital scalp, left occipital skull fracture, frontal contusions of the skull and bilateral frontal subdural and subarachnoid haemorrhage.

82. Samples taken at autopsy were subsequently analysed at the laboratory of Forensic Science Service Tasmania. A blood alcohol concentration of 0.349 g/100ml was found to be present in those samples. The forensic scientist who conducted that analysis expressed the opinion, which I also accept, that a blood alcohol concentration at that level (nearly 7 times the legal limit for driving or riding on roads, which Acacia Drive is) would "significantly impair driving performance to the point of being unable to properly control a motor vehicle. It has been estimated that the relative risk of a driver with a blood alcohol concentration of 0.18g/100ml being involved in an accident is approximately 50 times that of a driver with nil blood alcohol. It is therefore expected that a blood alcohol concentration higher than this would be associated with an even greater relative risk of accident involvement." Other evidence was that the blood alcohol level detected as being present in Mr Forsyth's body at the time of the crash falls within the so-called "stupor stage of alcoholic influence where a person can range from general inertia to impaired consciousness".

83. The quad bike which Mr Forsyth was using at the time of his fatal crash was inspected by a transport Inspector as part of the investigation under the *Coroners Act*. The inspector, after inspecting the quad bike, concluded that "prior to and at the time of the incident, this vehicle would have been classed as mechanically sound except for the operation of the rear brake light and taillight". I accept this conclusion. Neither the defective rear brake light nor taillight could possibly have caused or contributed to the happening of the crash.

84. The location of the death was at Acacia Drive, Ansons Bay (approximately 20 metres north of number 86). It is known that Mr Forsyth was a disqualified driver for 2 ½ years for exceeding 0.05 Blood Alcohol Content (BAC), as well as a number of other convictions including

another drink driving charge, four charges of failure to wear a seatbelt and a speeding infringement.

85. Police conducted a careful investigation at the scene. Importantly, the crash was investigated by two experienced officers from Tasmania Police Northern Crash Investigation Services as well as experienced officers from Northern Forensic Services.

86. The investigation conducted by those officers revealed that Mr Forsyth's fatal crash had occurred directly outside number 86 Acacia Drive on a straight section of bitumen sealed roadway. There was nothing about the condition of the roadway or the weather which caused or contributed to the happening of the crash.

87. Skid and other scuff marks were located on the roadway in the vicinity of the scene of the crash. Those skid and scuff marks were, I am satisfied, caused by the quad bike Mr Forsyth was riding. An analysis of his speed was calculated and determined to be approximately 30 km/h as a minimum speed at the time of the crash.

88. Various witnesses were interviewed. All gave accounts to investigating police that leads to a conclusion that Mr Forsyth had been drinking heavily for many hours prior to the happening of the crash and was plainly heavily intoxicated when it occurred.

89. I am satisfied that the fatal head injuries sustained by Mr Forsyth occurred in the circumstances set out above. I am quite satisfied on the basis of evidence that had he been wearing a helmet then he would have survived the crash.

90. The following findings are made pursuant to section 28 of the *Coroners Act* 1995:

    (e) The identity of the deceased is Jay Randall Forsyth;

    (f) How Mr Forsyth died is addressed in detail in these findings;

    (g) The cause of Mr Forsyth's death was head injuries; and

    (h) Mr Forsyth died at Ansons Bay, Tasmania on 1 January 2015.

Jacob Graham Green

91. Mr Jacob Graham Green, born on 16 September 1993, was 21 years old when he died as a result of injuries sustained in a quad bike crash on the west coast of Tasmania in May 2015.

At the time of his death Mr Green was a single man living at 14 Pontifex Street, Strahan, Tasmania, and employed as a deckhand on a commercial crayfishing boat.

92. In the early hours of 22 May 2015, Mr Green, heavily intoxicated and not wearing a helmet, was thrown from the quad bike he was riding as he attempted to turn from Innes Street into Fraser Street, Strahan in Tasmania.

93. The weather was cool but clear with little or no wind and the surface of the road was dry.

94. It is apparent on the evidence that alcohol and excessive speed were the causes of the crash.

95. Mr Green suffered terrible injuries as a result of the crash which included most significantly a cranial fracture across the base of his brain. Despite the best efforts of emergency services Mr Green died in an ambulance en route to hospital on the north-west coast of Tasmania.

96. After formal identification, his body was transported by mortuary ambulance to the mortuary at the Launceston General Hospital where an autopsy was carried out by a pathologist. The pathologist expressed the opinion that the cause of Mr Green's death was a fractured skull. I am satisfied on the evidence that had Mr Green been wearing a helmet he would have almost certainly survived the crash.

97. Samples taken at autopsy were subsequently toxicologically analysed at the laboratory of Forensic Science Service Tasmania. Relevantly, alcohol was detected as having been present in those samples at a level of 0.243 g/100ml of blood. This is almost five times the legal limit for driving on Tasmanian roads.

98. The forensic scientist who conducted the analysis expressed the opinion in her report that a blood alcohol concentration at that level would "significantly impair driving performance to the point of being unable to properly control a motor vehicle." I accept this opinion.

99. Subsequent inspection of both the quad bike Mr Green had been riding immediately prior to the crash and the scene generally, demonstrates there was nothing about the road conditions or weather which caused or contributed to the crash. Further, the quad bike had no mechanical deficiency which caused or contributed to the crash.

100. The evidence was that Mr Green was an experienced quad bike rider. However, there was no evidence that he had ever undertaken any formal training in relation to quad bike use. I am satisfied that had he not been intoxicated and speeding then the crash would not have

occurred. Even if it had, if Mr Green had been wearing a helmet, he would almost certainly have survived.

101. The following findings are made pursuant to section 28 of the *Coroners Act* 1995:

    (a) The identity of the deceased is Jacob Graham Green;

    (b) How Mr Green died is addressed in detail in these findings;

    (c) The cause of Mr Green's death was head trauma; and

    (d) Mr Green died whilst being transported by ambulance to hospital on the Murchison Highway, Tasmania on 22 May 2015.

Roger Maxwell Larner

102. Mr Roger Maxwell Larner spent a life time on the land. He was born on 31 July 1940 and was 75 years old when he died. Mr Larner died as a result of injuries received in a quad bike crash on his farm at Palmers Lookout Road near Port Arthur in Tasmania on 27 December 2015.

103. Mr Larner was reportedly a very practical man with high level bush skills and was most proficient in the use of machinery. He had been riding quad bikes since the 1970s and his 650cc quad bike was his main form of transport on the farm. The evidence was that if he rode his quad bike on a public road he wore a helmet; however he did not wear a helmet on the farm, apparently considering that it restricted both his vision and hearing. As with the other 6 riders whose deaths were investigated, there is no evidence Mr Larner had at any stage undertaken any formal training in quad bike safety.

104. Described as retired at the time of his death, Mr Larner was still actively engaged in working the family farm. He had separated from his wife, Mrs Adriana Marita Larner (known as Marion), 10 years prior to his death but the couple were not divorced and were on amicable terms. Mr Larner lived in a caravan at the top of his property as he finished building himself a new house. Mrs Larner remained in the family home about two kilometres away.

105. On the afternoon of his death Mr Larner was working with contractors on his property baling hay. He was working in the top paddock of the farm.

106. At approximately 6.15pm to 6.25pm, Mr Larner left the top paddock on his quad bike on his way to his wife's house to pick up meat for dinner. Mr Gary Wylie (a contractor who was

working with Mr Larner) saw Mr Larner leave. He described him as “going fairly quickly”. As was his normal practice, Mr Larner was not wearing a helmet.

107. At about 8.00pm, Mr Wylie on a tractor and his wife and son in a ute, left the area. They travelled along a private road towards the front of the property. As Mr Wylie negotiated a right hand bend he found Mr Larner’s quad bike rolled over into a bank with Mr Larner’s upper torso and head pinned under the rear wheel.

108. Mr Wylie stopped his tractor, got off and went straight to Mr Larner. Mr Larner was not breathing and had blood on his face. Mr Wylie could not see any signs of life. The quad bike engine was still running so Mr Wylie turned the engine off and, using a UHF radio, asked his wife to call 000.

109. An ambulance arrived about 20 minutes later, followed shortly after by police and SES personnel. Nothing could be done to resuscitate Mr Larner and he was pronounced dead at the scene.

110. A forensic officer also attended the scene and conducted an investigation. He noted tyre tracks indicating that the quad bike had been travelling downhill prior to the crash. Other marks at the scene indicated that as Mr Larner’s quad bike approached a sharp right hand bend it had collided with an embankment and rolled twice.

111. In addition, it was noted that there were scuff marks in the gravel near Mr Larner’s feet. I am satisfied they were made by Mr Larner’s feet indicating Mr Larner was alive in the immediate aftermath of the crash.

112. Various points of significance were identified and marked for further examination the following day, by a very experienced Tasmania Police traffic crash investigator. That investigator, Senior Constable Cordwell, conducted a further careful inspection of the site of the crash and amongst other things, prepared a plan of the scene, which was tendered at the inquest. Senior Constable Cordwell also gave evidence at the inquest.

113. In addition, like the other six deaths the subject of the inquest, the circumstances of Mr Larner’s crash was reviewed by Constable Housego.

114. I am satisfied on the basis of the evidence of Constables Housego and Cordwell, which was not contradicted and supported by clearly documented observations at the scene, that as Mr Larner’s quad bike travelled downhill and approached a sharp right hand bend, he applied the brakes. The quad bike slid for 27 metres before it rolled twice and came to rest on Mr

Larner. Significantly, Constable Cordwell said in evidence that the skid marks were constant for that distance, indicating the application of consistent braking pressure. Such constant braking pressure indicates that the rider was conscious at the time.

115. The quad bike was inspected by a transport investigator after the crash. It was noted to be fitted with large square 'after market' racks, apparently designed to carry fauna. Those racks would, I am satisfied, offer a measure of protection to the rider in some circumstances in the event of a roll over. However, in other circumstances, such as those in which Mr Larner died, the large square racks prevent the quad bike from continuing to roll.

116. After formal identification, Mr Larner's body was removed from the scene and transported to the mortuary at the Royal Hobart Hospital. At the mortuary an autopsy was carried out by experienced forensic pathologist, Dr Ritchey. Dr Ritchey also gave evidence at the inquest.

117. At autopsy Dr Ritchey found extensive injuries to Mr Larner's chest area, including multiple bilateral rib fractures, but no injuries of significance to his head. Dr Ritchey's evidence was that traumatic asphyxia occurs when external compression of the chest prevents normal breathing. He said that the heavy weight of the quad bike on the upper torso and head, combined with multiple bilateral rib fractures would likely have impaired Mr Larner's breathing such that normal respiration was impossible. I note the evidence was that Mr Larner's quad bike weighed 350 kilograms.

118. Dr Ritchey also noted that Mr Larner was, at the time of his death, suffering from advanced atherosclerotic coronary vascular disease.

119. Toxicological analysis of samples taken at autopsy was unremarkable.

120. Dr Ritchey expressed the opinion, which I accept, that the cause of Mr Larner's death was traumatic asphyxia. I note his opinion is supported, entirely, by the findings at autopsy and also by the observations of investigators at the scene, particularly of the scuff marks made by Mr Larner's feet.

121. Given his age, Mr Larner was in reasonable health. However, he was diagnosed in July 2015 (as a result of a brain CT scan) with a right posterior cerebral artery thrombosis. In addition, Mr Larner was known to suffer from Wolf Parkinson White arrhythmia. Reportedly, Mr Larner had surgery for this condition on three occasions, the last a year or so before his death. The surgery involved nerves being cauterized and a stent being 'placed'. His GP said in a report tendered at inquest that Mr Larner was "almost certainly in and out of Atrial Fibrillation and Atrial Flutter". The GP also suggested that it seemed possible, in his opinion, that Mr Larner's

"fatal accident was caused by a cerebral thrombotic event rather than driver error". However, I note Dr Ritchey found nothing at autopsy to support such a conclusion and I am satisfied there is no evidence to indicate that any medical condition caused or contributed to the happening of the fatal crash. The evidence of constant brake pressure in the immediate lead up to the loss of control and roll is a significant factor in reaching this view.

122. I note Mr Larner was not wearing a helmet at the time of his crash. However, in light of my finding as to the cause of his death, I am not satisfied that, had he been wearing a helmet, the outcome of his crash would have been any different.

123. The following findings are made pursuant to section 28 of the Coroners Act 1995:

    (a) The identity of the deceased is Roger Maxwell Larner;

    (b) How Mr Larner died is addressed in detail in these findings;

    (c) The cause of Mr Larner's death was traumatic asphyxia; and

    (d) Mr Larner died at Palmers Lookout Road, Port Arthur, Tasmania on 27 December 2015.

Training

124. There was no evidence that any of the persons whose death was investigated at the inquest had ever undertaken any formal training in quad bike use, operation or safety. All had experience in riding quad bikes - in some cases many years of experience. However, in the cases at least of Mr Jensen, Mr Bonney and Mr Larner, basic handling errors were directly causally related to their death.

125. It was common ground that presently in Tasmania (or for that matter elsewhere in the country) there is no requirement for any quad bike operator to undergo any training at all. It was also common ground that training in safe quad bike riding techniques is both essential and will have a direct and positive impact on fatalities and serious injuries.

126. The evidence was that training in safe quad bike operation is widely available, being offered in Tasmania by, amongst other organisations, TAFE Tasmania.

127. Counsel assisting submitted that it was appropriate to recommend that consideration be given by the Tasmania Law Reform Institute and the Attorney-General, to the introduction of legislation requiring mandatory training and licensing of all persons using quad bikes.

128. The FCAI submitted that it was their position that quad bike training be expressly mandated by law through either a certification or licensing system. The evidence considered at the inquest leaves, in my view, no room for doubt, that quad bike operators should be appropriately trained. Counsel assisting submitted this was so, as did the FCAI. It is accepted that there is a need for training in relation to the appropriate and safe use of quad bikes. The real question is whether training should be mandatory or voluntary.

129. Both the New South Wales Deputy State Corner and the Queensland Deputy State Coroner dealt with the issue of training and both made recommendations. Those recommendations included:

- The development of an improved and standardised nationally accredited training package;
- Promotion of the need for training by various organisations; and
- Training rebates.

130. Both findings expressly addressed whether training should be mandated. Both coroners made recommendations addressing the need to mandate training. The Queensland Deputy State Coroner recommended that once an improved nationally accredited training package was developed, government should introduce legislation to mandate the completion of training either through certification or licensing. The New South Wales Deputy State Coroner recommended that consideration be given by the New South Wales Attorney-General and the New South Wales Law Reform Commission to the introduction of legislation requiring training and licensing.

131. I am satisfied that mandated training whether by licensing or certification is essential. Reliance upon voluntary undertaking of training is unlikely to achieve any significant take-up. The only way to ensure that more unnecessary deaths are prevented by ill-advised operation of quad bikes is to mandate the undertaking of training.

132. The content of such training is of course not a matter properly within the remit of this inquest. I do however have particular regard to the evidence given to the Queensland inquest by Mr Cameron Cuthill about the issue of training in quad bike operation. Mr Cuthill was accepted by the Queensland Deputy State Coroner as an expert. It is apparent he had considerable experience in training and education in their use, being an instructor with recognised qualifications from, *inter alia*, the SVIA (Specialty Vehicle Institute of America). The evidence in the Queensland inquest was that Mr Cuthill had trained “thousands” of quad bike users.

He explained to the inquest the details of the American SVIA training package currently available through the ATV Safety Institute. Various examples of the available training package were given to that inquest. Of particular note was the capacity of that training package to provide industry specific training. Mr Cuthill's evidence was that the SVIA training had been professionally developed and delivered in North America for very many years. Mr Cuthill told that inquest the program is focused on developing skills to ride safely but also addresses behavioural requirements associated with risk assessment.

133. The FCAI submitted that the SVIA training program is superior to any course currently available and delivered in this state.

134. The Queensland Deputy State Coroner's recommendation was that an appropriate starting point would be to adopt the SVIA's so-called "off-the-shelf" training package. The FCAI supported such an approach. Such an approach has much to commend it in my respectful view.

135. I am satisfied that it is appropriate to make a recommendation about training as follows:

I <u>recommend</u> that consideration be given by the Tasmania Law Reform Institute and the Attorney-General to the introduction of legislation requiring mandatory training and licensing of all persons using quad bikes.

136. I also comment that it seems to me an appropriate starting point in this regard to adopt, as the Queensland Deputy State Coroner suggested, the "off-the-shelf" SVIA training package already in existence. Consideration should also be given to adding additional Australian work environment focused components or modules.

<u>Use of Helmets</u>

137. Apart from Mr Jensen, none of the riders whose deaths were the subject of the inquest were wearing helmets, or had properly fastened helmets on their heads, at the time they suffered fatal injuries. In the cases of Mr Bonney, Mr Forsythe and Mr Green, I am satisfied each would have survived the crash had they been wearing a helmet. In the case of Mrs Percy, I am satisfied there is a reasonable chance, that, had she been wearing a correctly fastened helmet, she may have survived the crash.

138. The issue of helmet use was considered in both New South Wales and Queensland. Extensive evidence was heard in relation to the wearing of helmets in both of those inquests. That evidence, both in the form of reports and transcript, was before this inquest. The

Queensland Deputy State Coroner recognised the importance of the wearing of helmets, describing them as an essential safety initiative.

139. Material produced at the inquest indicated that there was a very poor uptake of helmet wearing amongst those killed whilst riding a quad bike. In one study tendered – TARS quad bike performance project, supplemental report at pages 1 - 38 – 109 quad bike fatal crashes were reviewed. It was found that in only 24 of the 109 fatalities riders were wearing helmets and that skull fracture was involved in 32.4% of all fatalities and 44.4% of fatalities involved traumatic brain injury.

140. There seems to be many reasons why helmets are not widely used. In a rural setting in particular they seem regarded as unnecessary, impractical, uncomfortable and perhaps too hot. The same thinking tends to regard them as restricting hearing and vision. The Director of Industry Safety said in his evidence he was aware of such concerns. It is noted that the evidence in relation to Mr Larner was that he was resistant to the use of a helmet for these reasons. All of these arguments are arguments that might be advanced as to why helmets should not be worn on motorbikes ridden on public streets. Similar arguments may be thought to exist (at least in relation to comfort and necessity) with respect to the use of PFDs on small boats. The use of such safety devices in appropriate circumstances plainly required significant cultural change, a cultural change supported by legislation.

141. Manufacturers of quad bikes clearly recognise the need for helmets to be worn. Several owner manuals, which related to the quad bikes involved in the deaths the subject of the inquest, were tendered in evidence. All have clear and prominent warnings (both in written and pictorial form) advising in unequivocal terms that a helmet must always be worn.

142. The results of research placed before the inquest makes the case in my view for the use of helmets beyond argument. Making their use mandatory was supported by counsel assisting, the FCAI and the Royal College of Surgeons.

143. The Director of Industry Safety said in his submission that “WorkSafe Tasmania promotes elimination and/or control of risks within the workplace context, including the wearing of appropriate personal protective equipment such as helmets”. However, no details were furnished as to how it is WorkSafe Tasmania promotes the use of helmets other than by reference to the WorkSafe Tasmania website. That website reproduces a Queensland publication about the use of helmets while riding quad bikes, but otherwise appears not to address the issue at all.

144. The FCAI called Mr Scott Kebschull to give evidence. I am satisfied he was well qualified to give the evidence that he did. I accept that his methodology was sound. Mr Kebschull said in his detailed oral evidence to the inquest that helmet usage on quad bikes resulted in an extremely high net benefit and reduction in injury costs in the order of 60%. The results of other equally reputable research predicted a net benefit as high as 64% when helmets are used by quad bike riders. Mr Kebschull said that this net benefit was broadly equivalent to the net benefit that arises from the wearing of helmets whilst riding motorcycles. There is no evidence at all that the introduction of mandatory helmet use would have anything other than a very high net benefit. There is no rational argument identified or indeed imaginable as to why the wearing of helmets whilst riding quad bikes ought not to be mandatory.

145. The Queensland Deputy State Coroner recognised as much in his decision. At paragraph 120 of his decision he addressed concerns of the rural community. He recognised that lighter but safe helmets were available. Samples of such helmets were furnished at that inquest and at this inquest.

146. It would be inappropriate for this court to descend to consider the type of helmets that should be worn. It is sufficient to observe that there was evidence before the inquest that there has been significant advances in relation to helmet design in recent times. In addition, helmets are available both in Australia and overseas which are designed expressly for use with quad bikes. Moreover, helmets have been designed with Australian rural use expressly in mind. However, approval of the type of helmet is a matter best left to the appropriate regulatory authorities.

147. Mr Dollar, on behalf of the FCAI, submitted that "if there is one single recommendation that has the potential to result in a significant reduction in [quad bike] deaths and injuries, it is clear that that recommendation concerns helmets." The proposition is beyond argument.

148. I am satisfied that it is appropriate to make a recommendation in the following terms:

I <u>recommend</u> that urgent consideration be given, by the Tasmania Law Reform Institute and the Attorney-General, to the introduction of legislation requiring the use of a suitable approved helmet by all persons using quad bikes.

<u>Child Safety</u>

149. None of the deaths the subject of this investigation involved children. Despite that, it was considered an appropriate area for examination with a view to the making of

recommendations if appropriate, consistent with the authorities outlined at the beginning of this finding. The issue of children riding quad bikes was considered both in New South Wales and Queensland. Deputy State Coroner Lock said at paragraph 140 of his finding:

> "*Although it has been suggested by some that children under the age of 16 should not be permitted to ride any quad bike, including youth sized quad bikes, there is limited evidence that suggests fatalities have occurred where the correct category of age-appropriate quad bikes was involved. Accordingly, it is my view that children between the ages of 6 -16 should be permitted to ride "youth sized" quad bikes … According to the category set down by manufacturers, and of course, subject to appropriate adult supervision".*

150. This approach enjoys considerable merit. The strength of the position expressed by Deputy State Coroner Lock is enhanced when regard is had to the fact that Dr Teague, who gave evidence on behalf of the Royal College of Surgeons, said in his evidence that he was unable to identify a single case in Australia of the death of a child on an age appropriate quad bike.

151. A considerable amount of material was before the inquest in relation to the different sizes and types of quad bikes. The evidence indicated that there was a clear distinction between adult sized quad bikes and youth sized quad bikes that complied with both ANSI (American National standards Institute) and SVIA requirements and recommendations. In summary, so-called youth sized quad bikes are lighter and smaller than adult size quad bikes and have devices fitted which limit the speed at which the quad bike can travel. The evidence was that age appropriate quad bikes are the only quad bikes that should ever be ridden by children. Presently however there is no impediment to children riding quad bikes not appropriate to their age.

152. The New South Wales inquest heard evidence that some states in the United States of America have introduced legislation prohibiting children from using adult sized quad bikes. That inquest was told that that legislation was one of the most successful legislative safety provisions, enjoying almost universal acceptance. The New South Wales inquest was told by an expert in the area that "the most important thing that can be done to keep children safe was keeping them off adult sized vehicles".

153. The FCAI and the Royal College of Surgeons both strongly supported the position articulated by counsel assisting that a recommendation be made addressing the issue of children and quad bikes. I am well satisfied that a recommendation is required to ensure the safety of

children in relation to quad bike use. I consider that the making of a recommendation as follows is justified:

I <u>recommend</u> that consideration be given by the Tasmania Law Reform Institute and the Attorney-General to the introduction of legislation that:

a) prohibits children under the age of 16 from operating adult sized quad bikes;

b) prohibits children between the ages of 6 and 16 from operating "youth sized" quad bikes other than in accordance with what is specified by the manufacturers to be the appropriate minimum age for such vehicle; and

c) prohibits children under the age of 6 from ever operating any quad bike in any circumstances whatsoever.

<u>Passenger Safety</u>

154. Although none of the persons whose deaths were the subject of the inquest were passengers, Mr Jensen and Mr Bonney were carrying passengers at the time of their fatal crashes. At least in the case of Mr Jensen, there is little doubt that his carrying his wife as pillion passenger, on a steep hill, on a quad bike not designed to carry a passenger, was a factor which contributed, directly, to his death.

155. Therefore it was considered that the issue of passenger safety arose in a general sense for consideration. It was an issue considered in both Queensland and New South Wales. The issue is in some respects, very simple. No passenger should ever be carried on a quad bike that is not designed for that purpose.

156. The evidence was that there are Type I and Type II quad bikes. The former, which Mr Jensen was riding at the time he suffered his fatal injuries, are not designed to carry passengers. They are single person vehicles. Type I quad bikes carry prominent warnings on the vehicle against carrying passengers. All owner's manuals also carry warnings against this practice. Mr Jensen's quad bike carried such warnings prominently displayed in three places. It is absolutely clear that under no circumstances, ever, should passengers be carried on quad bikes designed for one person.

157. Type II quad bikes are designed to be used by a rider and a single passenger. They also carry very clear warnings to "never carry more than one passenger". They are designed differently to Type I quad bikes. The evidence was that it is clear that the carriage of

passengers on quad bikes not designed to carry passengers or carrying more than one passenger on Type II quad bikes can, and will, adversely affect the handling characteristics of the vehicles. This adverse effect is starkly and tragically illustrated by the circumstances surrounding Mr Jensen's death.

158. Counsel assisting submitted a recommendation should be made with respect to the introduction of legislation dealing with this issue. The FCAI strongly supported the making of a recommendation. I am satisfied in the circumstances that it is appropriate to recommend as follows:

I <u>recommend</u> that consideration be given, by the Tasmania Law Reform Institute and the Attorney-General, to the introduction of legislation prohibiting the carrying of passengers on Type I quad bikes and any more than one passenger on Type II quad bikes.

<u>Operator Protection Systems</u>

159. The use of Operator Protection Systems also known as Crash Protection Devices (CPDs) and Rollover Protection Systems (ROPS) was the area of most difficulty at the inquest. The Director of Industry Safety seemed to contend that such devices ought to be fitted, but without identifying which (and there are a number). The Director pointed in his submission to the requirement to be found in regulation 216 (1) of the *Work Health and Safety Regulations* 2012 for roll cages to be fitted to tractors and suggested "given the widespread usage of quad bikes within our farming sector, a similar regulatory approach for operated active devices would be one approach".

160. The evidence does not support treating quad bikes in the same way as tractors, given the many differences between the two types of vehicle. The Director acknowledged this in his evidence to the inquest. In addition, it is observed that regulation 216 (3)(b) of the *Work Health and Safety Regulations* 2012 provides that the regulation does not apply to a tractor with a mass of less than 560 kilograms. I note the evidence was that few, if any, quad bikes exceed 560 kilograms in weight. Any comparison of quad bikes to tractors is erroneous and not supported by the evidence.

161. It is clear that there are strongly held views, in many cases by the manufacturers of such devices, as to the utility of fitting Operator Protection Systems. The Deputy State Coroners in both New South Wales and Queensland heard extensive evidence in relation to the issue. All that evidence was before me. I also heard oral evidence from Mr John Lambert, an engineer

strongly in favour of their fitment. *Contra*, I heard evidence from Mr Scott Kebschull, another engineer and a director of Dynamic Research Inc. (DRI). Apart hearing from Mr Kebschull, I was greatly assisted by the provision to the court of the results of a number of studies carried out by DRI.

162. It is unnecessary to analyse the results of research into the area in great detail. It is sufficient to say that in light of that research, and in light of the evidence given at the New South Wales and Queensland inquests, as well as this inquest, it is impossible to conclude that, as contended by the proponents of such systems and devices, fitment to all quad bikes should be recommended.

163. As counsel assisting pointed out in his submissions "the basis of assessment for the efficacy of a proposed safety device (of which ROPS are one) is whether there is a net benefit (and a risk benefit percentage of an acceptable level) albeit that ultimately it is the net benefit which determines whether the proposed protective device should be considered for use".

164. The concepts of 'net benefit' and 'risk benefit' were explained by Mr Kebschull in the following way:

> *"Then we add up all of the cases where the device increased the injury cost, and we call that risk, and we add up all of the injury cost where the device reduced the injuries and we call that the benefit, and then the net benefit is the benefit, the total benefit minus the total risk divided by the baseline cost, so in other words, if you have a net fatality benefit of 10 per cent, that means that if, for example, in your baseline sample you had ten fatalities, and in your protective device sample you had nine fatalities, you have a net benefit of 10 per cent of the fatalities. You've protected or prevented 10 per cent of the fatalities."*

Of 'risk benefit' he said in his evidence that it was a very different concept to 'net benefit' and:

> *"the idea with that is that … it's a comparison of the risks and the benefits, so risk benefit is just that total risk that I talked about before, divided by the total benefit, and expressed [as] a percentage. So a risk benefit of 100 per cent means the risks are equal to the benefits, your numerator is equal to your denominator, that's a 100 per cent risk benefit."*

165. The weight of evidence, except for that from Mr Lambert (to which I will turn in a moment), was that the net benefit was insufficient to justify a requirement for fitting of any operator protection system of any type currently available on the market. In light of that evidence, the Deputy State Coroner in Queensland was not able to conclude that operator protection devices would likely result in a net safety benefit. He recommended further research into the

issue. Similarly, the New South Wales Deputy State Coroner reviewing much the same evidence reached much the same conclusion and made a similar recommendation.

166. Counsel for the FCAI urged the court to conclude that the research of DRI, John Zellner and Scott Kebschull, was the most comprehensive, that its depth the most impressive and their expertise formidable. There is no doubt as to the scientific rigour which attends that research. The evidence as to the research is that it remains ongoing. The position of the experts referred to above was not that operator protection devices should never be fitted but that as things stand the evidence does not support a conclusion that the net benefit to be derived from fitting such devices supports their fitment.

167. Mr John Lambert expressed, in florid terms, a contrary view. I can do no better than set out the summary of counsel assisting in relation to the inadequacies of Mr Lambert's evidence and conclusions. Counsel assisting said:

> "Mr Lambert's evidence was that the principal benefit of a ROPS was to prevent operators being trapped under a quad bike in a roll over situation. Mr Lambert based that conclusion on two cases he had been involved in (but did not give evidence), some videos online and some reports he had collected of other fatalities. He had not provided any of that material in his report to the coroner.
>
> It transpired that Mr Lambert had not undertaken any detailed tests or studies to prove this thesis. It also transpired that it was likely that Mr Lambert used impermissible reasoning in concluding that there was a net benefit to the fitment of ROPS.
>
> Mr Lambert agreed that one was to look for the net benefit of the proposed ROPS. However it became apparent that he may have used a risk benefit analysis which does not produce a net result. This of course means that Mr Lambert's conclusions are unreliable.
>
> Further cause for concern was Mr Lambert's initial failure to accept that an analysis of a quad bar type ROPS concluded that the use of such a device was not indicated. He initially tried to assert that the analysis related to different ROPS. When shown a picture of the ROPS which was in the form of a "T" and was designed to work in a similar way to the Quadbar be failed to accept that the conclusion of the study about which he was being asked was that such a device should not be fitted.
>
> It is submitted that his failure to accept what was plainly the case reflects poorly on his independence as an impartial and independent expert.

Finally Mr Lambert opined that he had difficulty in understanding how a quad bar might hit a rider in a forward pitch scenario. When asked whether he had done any full scale testing or computer simulations he said he had not.

Illustrative of the apparent scientific bases relied on by Mr Lambert's to give his evidence is the following exchange the totality of which justifies setting out in full:

I'd ask you to address that proposition –you don't accept that the – the forward pitch scenario either that I presented to you?……I don't accept that it would be likely that a rider would end up in a position where the quad bar would hit them, in a forward pitch scenario.

Okay. Mr Lambert, how have you come to that assessment, have you done any full scale testing of vehicles with the quad bar?……No.

No, have you done any computer simulations?……Not of quad bikes with quad bars, no.

No. How have you come to that assessment?……I am, to quote BHS Engineering, "an engineer's engineer", I am very good at understanding the dynamics of any vehicle, any mobile vehicle. I can visualise the – what occurs with those vehicles, and in court cases I have proven other experts to be wrong through that ability, and I'm – so I have the ability to personally visualise what's likely to occur with quad bikes. Added to that I have owned an ATV since 1978 and I've owned a quad bike since 2006, and I've used them extensively, and so I have the ability to know how they perform in reality. I have had a rearward tip-over of an ATV, which I generated myself, I understand how that happens. So, based on my very good engineering knowledge and my very in-depth experience with ATVs and quad bikes, I can look at a paper and visualise the relevance of it, and in fact in regard to the DRI original report when Ray Newell provided me with the videos of the computer simulations. As soon as I looked at the videos I knew that the simulation was – I won't – well I could say "rubbish" but it was obviously completely wrong because what was shown on those videos for physically impossible

HIS HONOUR: Can I ask you this, Mr Lambert – I'm sorry, Mr Dollar – I just want to understand your evidence and where you're coming from and what it's based, and I don't want to be unfair –

WITNESS: Yeah.

HIS HONOUR: - but I need to understand it. Am I to take from the answer to Mr Dollar's question that the opinions that you are expressing to this Court are entirely based on subjective considerations?

WITNESS: No, because they're based on reviewing, for instance, all the videos that have been provided – that I've been able to get from the DRI work and analysing those.

HIS HONOUR: I understand that but –

WITNESS: Yeah.

HIS HONOUR: - but it's subjective in the sense that it's – you're effectively saying to me, trust me rely on me?

WITNESS: In effect, yes.

HIS HONOUR: I see, and you haven't carried out any testing at all?

WITNESS: I have done static tests, I've got underneath a quad bike and tried to push it off my body, a physical impossibility.

HIS HONOUR: Right.

WITNESS: So I've done limited tests myself. I've checked the stability of a quad bike, limited testing, both with – in the static situation and with a rider on, but I have done nothing that would compare with the TARS' work –

HIS HONOUR: No.

WITNESS: - and nothing that would compare with the erroneous simulations that DRI have undertaken.

It is clear that the exchange reveals a complete lack of scientific rigour and Mr Lambert's evidence was that the principal benefit of a ROPS was to prevent operators being trapped under a quad bike in a roll over situation.[1] Mr Lambert based that conclusion on two cases he had been involved in (but did not give evidence), some videos on line and some reports he had collected of other fatalities.[2] He had not provided any of that material in his report to the coroner."

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1 Transcript p. 193

2 Transcript p. 190 - 192

I agree. I reject Mr Lambert's evidence. He evinced an attachment to the cause of fitting operator protection systems that was simply not justifiable on the basis of any objective evidence and which was wholly inconsistent with the role of an expert witness. He had conducted no tests, at all, and simply asked the court to accept his opinion, without providing a single rational reason why it should. His evidence was that of an advocate, and a vocal one at that, rather than an expert. I found his evidence to be extremely unsatisfactory.

168. I am satisfied that it is quite clear on the evidence that it would be inappropriate, and not justifiable, to make any recommendation with respect to the fitment of any operator protection device to quad bikes. I join in the comments of the Deputy State Coroners of Queensland and New South Wales that evidence that all interested parties should be urged to continue to try to develop appropriate alternative safety devices.

Quad Bike Safety Design Standards

169. There was agreement between interested parties that it was essential that there should be a national minimum standard dealing with safety and design of quad bikes. The evidence was that all quad bikes sold by FCAI members imported into Australia and sold here comply with an American standard which has been mandated in that country at least since 2012. The evidence also was that that standard (ANSI/SVIA) has either been formally adopted or at least applied in some 30 countries worldwide.

170. The ANSI/SVIA standard was tendered at the inquest. It is a comprehensive and complex document consisting of some 22 parts that deals comprehensively with design, safety and the like. There is considerable merit in my respectful view in the adoption of that standard in Australia. As the FCAI submitted, the market in the United States of America is much bigger than that of Australia's and it follows that greater resources, expertise and experience are able to be committed to the design and development of quad bikes.

171. I was told that a recent round of revisions to the ANSI/SVIA standard had been completed in the United States of America.

172. The issue of applicable safety and design standards was considered in both the New South Wales and Queensland inquests. The Queensland Deputy State Coroner saw the merit, as do I, in basing an Australian national standard on the US standard. The New South Wales Deputy State Coroner said there appeared to her to be no reason why an Australian standard could not be implemented, simply by the adoption of the applicable US standard as it exists from time to time. I consider that there is considerable merit in this approach.

173. Associated with the question of safety and design standards was the question as to whether an ANCAP type star rating be adopted in relation to quad bikes. Counsel assisting submitted that the evidence does not justify a rating system. There is considerable merit however in continuing to pursue research with a view to developing such a rating system at some stage in the future.

174. I am satisfied that recommendations should be made in the following terms:

I <u>recommend</u> that interested parties, including the FCAI and State and Commonwealth industrial safety authorities, work collaboratively with a view to initiating the process of implementing a safety and design standard for quad bikes that is in the terms of the relevant American National Standards Institute (ANSI) standard applying for the time being; and, pending implementation of any such standard by Standards Australia, any quad bikes imported into Australia should comply with the applicable ANSI standard; and

I <u>recommend</u> that Commonwealth and State industrial safety authorities work collaboratively with other interested parties to develop a star rating system to assist in the reduction of serious injury and deaths to users of quad bikes.

<u>Increased Consumer Awareness</u>

175. The Director of Industry Safety said in his submission that WorkSafe Tasmania was 'considering' adopting an approach similar to that in Queensland, via the establishment of a 'taskforce' to consider 'innovative strategies to reduce injury and mortality in all areas of quad bike usage'. He said that it was envisaged that the taskforce would result in a 'co-ordinated, collaborative approach' which in turn would lead to a 'more comprehensive strategy [being] developed and rolled out'.

176. The Director explained that it was envisaged that the taskforce would include representatives of WorkSafe Tasmania, Consumer, Building and Occupational Services, Public Health Services and Communities, Sport and Recreation. The intention was to attempt to cover both work-related and recreational use of quad bikes. Such an approach, if long overdue, is to be commended.

177. Before closing submissions had been made by counsel, and thus before the inquest was complete, an email from Consumer, Building and Occupational Services, Department of

Justice (presumably a part of WorkSafe Tasmania – although that is not clear) and addressed to the Coronial Division was received in the following terms:

> *"Please find attached the discussion paper – Quad Bike Safety in Tasmania.*
>
> *This paper was developed by the Quad Bike Safety Taskforce, a multi-agency group formed by the Minister for Building and Construction Mr Guy Barnett, to look at innovative statewide strategies to improve safety outcomes for quad bike users in the State.*
>
> *Your organisation has been identified as a stakeholder in quad bike use and safety in Tasmania and we hope you will help provide valuable insight as the Taskforce works towards the development of a statewide plan.*
>
> *If you believe there is a more appropriate person in your organisation to provide feedback to this paper, please feel free to forward this email to them."*

The court is not a 'stakeholder in quad bike use and safety in Tasmania'. The email is inappropriate. It is discourteous to the court and should not have been sent. That aside, both counsel assisting and the FCAI submitted I should recommend that such a taskforce be established. The email set out above suggests that it has been already. I agree there is considerable merit in such an approach.

I <u>recommend</u> that a taskforce be established across relevant state government agencies to consider and develop strategies to reduce fatalities and serious injuries arising from work and recreational use of quad bikes.

<u>Improving Investigations and Safety Research for the Future</u>

178. In at least the case of the death of Mrs Percy, no specialist police crash investigators attended the scene and indeed were not involved until the investigation was reviewed as part of the coronial process. I have already commented that this is unfortunate. Notwithstanding the best efforts of attending officers, the area of crash investigation is one that requires specialist skills and training. Apart from the fact that specialist knowledge and training is essential for the proper investigation of individual cases, the data collected by investigators is crucial in so far as improving safety of quad bike users generally.

179. Constable Housego told the inquest that Tasmania Police has adopted a standard approach to the investigation of fatalities and serious injuries arising from quad bike use. This is to be commended.

180. It is important to ensure that the training of crash investigators in relation to quad bikes is constantly improved. I consider that a recommendation in this regard is appropriate.

I <u>recommend</u> that Tasmania Police liaise with other state and territory police services to ensure that the approach to investigation of quad bike serious and fatal accidents is standardised and to ensure ongoing training and improvement in quad bike accident investigation.

Alcohol

181. The deaths of Mr Green and Mr Forsyth were directly attributable to the amount of alcohol they consumed before using their quad bikes. The death of Mr Bonney is probably attributable, in part, to his consumption of alcohol prior to the fatal crash. Alcohol (ethanol) is a central nervous system depressant. Its effects on the central nervous system are proportional to its concentration in the blood. Alcohol causes cognitive, sensory and motor disturbances. These disturbances increase as the blood alcohol concentration increases. At high concentrations alcohol causes the loss of critical judgement, lack of coordination, impaired balance, and a decrease in activity including sedation and eventually sleep. It hardly needs to be said that riding a quad bike whilst affected by alcohol is inherently dangerous. Self-evidently, if a quad bike is ridden on a public street (as was the case in relation to Mr Green and Mr Forsyth) then the provisions of the *Road Safety (Alcohol and Drugs) Act* 1970 are directly applicable. Whether those provisions apply on private property or not is less straightforward.

182. However, no one should ever ride a quad bike whilst affected by alcohol.

Conclusion

183. A summary of the recommendations that I have made pursuant to section 28 (2) of the *Coroners Act* 1995 is annexed to this finding and marked ‘A’.

184. A complete list of the documentary exhibits including transcripts of other inquests and evidence tendered to those inquests is annexed to this finding and marked ‘B’.

185. I extend my thanks to all counsel who appeared at the inquest for their assistance, in particular Mr L Dollar, counsel for the FCAI. In addition, I am especially grateful for the very great assistance of Mr DJ Barclay, now President Barclay of the Tasmanian Industrial Commission.

186. I thank Mr TA Cooper for his co-ordination of the exhibits and general assistance in relation to the preparation for, and the running of, the inquest.

187. I acknowledge and thank Constable N Housego for his assistance in relation to the inquest.

188. In conclusion I extend my condolences to the family and loved ones of Mrs Richardson, Mr Jensen, Mr Bonney, Mrs Percy, Mr Forsyth, Mr Green, and Mr Larner, on their loss.

Dated 25 August 2017 at Hobart in the State of Tasmania.

Simon Cooper
Coroner

Annexure A

1. **I recommend that consideration be given by the Tasmania Law Reform Institute and the Attorney-General to the introduction of legislation requiring mandatory training and licensing of all persons using quad bikes.**

2. **I recommend that urgent consideration be given, by the Tasmania Law Reform Institute and the Attorney-General, to the introduction of legislation requiring the use of a suitable approved helmet by all persons using quad bikes.**

3. **I recommend that consideration be given by the Tasmania Law Reform Institute and the Attorney-General to the introduction of legislation that:**

    a) **prohibits children under the age of 16 from operating adult sized quad bikes;**

    b) **prohibits children between the ages of 6 and 16 from operating "youth sized" quad bikes other than in accordance with what is specified by the manufacturers to be the appropriate minimum age for such vehicle; and**

    c) **prohibits children under the age of 6 from ever operating any quad bike in any circumstances whatsoever.**

4. **I recommend that consideration be given, by the Tasmania Law Reform Institute and the Attorney-General, to the introduction of legislation prohibiting the carrying of passengers on Type I quad bikes and any more than one passenger on Type II quad bikes.**

5. **I recommend that interested parties, including the FCAI and State and Commonwealth industrial safety authorities, work collaboratively with a view to initiating the process of implementing a safety and design standard for quad bikes that is in the terms of the relevant American National Standards Institute (ANSI) standard applying for the time being; and, pending implementation of any such standard by Standards Australia, any quad bikes imported into Australia should comply with the applicable ANSI standard; and**

6. **I recommend that Commonwealth and State industrial safety authorities work collaboratively with other interested parties to develop a star rating system to assist in the reduction of serious injury and deaths to users of quad bikes.**

7. **I <u>recommend</u> that a taskforce be established across relevant state government agencies to consider and develop strategies to reduce fatalities and serious injuries arising from work and recreational use of quad bikes.**

8. **I <u>recommend</u> that Tasmania Police liaise with other state and territory police services to ensure that the approach to investigation of quad bike serious and fatal accidents is standardised and to ensure ongoing training and improvement in quad bike accident investigation.**

Annexure B

No.	Description
	Heather Dawn Richardson – R Exhibits
R1.	Subject Report and Witness Synopsis Constable Triffitt
R2.	Report of Death Constable Blake
R3.	Affidavit Life Extinct Dr Peterson
R4.	ID Affidavit Senior Constable Triffitt
R5.	ID Affidavit Mr C O'Connor
R6.	Autopsy Report Dr T Brain
R7.	Toxicology Report Ms M Connor
R8.	Medical Report Dr Raphael
R9.	a) Affidavit Wayne Richardson b) Affidavit Wayne Richardson
R10.	Affidavit Mr D Marsham
R11.	Affidavit Mr T Cresswell
R12.	Affidavit Mr C Chapman
R13.	Affidavit Ms D Eastley
R14.	Affidavit Senior Constable Triffitt
R15.	Affidavit Constable Blake
R16.	Affidavit Constable Midson

R17.	**Photographs**
R18.	**Affidavit Constable Housego**
R19.	**Affidavit Transport Inspector Mr A Gates**
R20.	**Scene Map (Google)**
R21.	**Medical Records**
	Jan Severin JENSEN – J Exhibits
J1.	**Subject Report Constable Barnard**
J2.	**Report of Death Constable Barnard**
J3.	**Life Extinct Affidavit Dr S Singh**
J4.	**Affidavit of ID Constable Radford**
J5.	**Affidavit of ID Mr C O'Connor**
J6.	**Autopsy Report Dr T Brian**
J7.	**Toxicology Report Ms M Connor**
J8.	**Med Report Ambulance Tasmania**
J9.	**Affidavit Senior Constable Combes**
J10.	**Affidavit Transport Inspector Mr Phillips Evans**
J11.	**Affidavit Ms D Jenson**
J12.	**Affidavit Ms H Jensen**
J13.	**Affidavit Mr L Hite**
J14.	**Affidavit Mr J Jensen**

J15.	**Affidavit Mr B Jago**
J16.	**Affidavit Ms J Jacques**
J17.	**Affidavit Mr M Sheehan**
J18.	**Affidavit and Map Mr K Maguire**
J19.	**Affidavit Mr J Radford 3/1/2013**
J20.	**Affidavit Mr J Radford 23/1/2013**
J21.	**Affidavit Constable Barnard**
J22.	**Photographs**
J23.	**Crash Report Constable Barnard**
J24.	**a) Ice Transport Search** **b) Circular head Motorcycles invoice**
	Kendall Russell BONNEY – K Exhibits
B1.	**Subject Report Constable Barnard**
B2.	**Report of Death Senior Constable Barber**
B3.	**a) Life Extinct Affidavit Dr Georgina Alexander** **b) ID Affidavit Michael Barber**
B4.	**RHH Report of Death to Coroner Dr Georgina Alexander**
B5.	**Autopsy Report Dr D Ritchey**
B6.	**Toxicology Report Ms M Connor**
B7.	**Affidavit Mr D Bonney**
B8.	**Affidavit Mr T Blokker**

B9.	**Affidavit Mr S Robertson**
B10.	**Affidavit Mr A Croom**
B11.	**Affidavit Ms K Griffiths**
B12.	**Affidavit Ms C House**
B13.	**a) Affidavit Constable Combes** **b) Photos**
B14.	**Affidavit Constable Barnard**
B15.	**Affidavit Transport Inspector Mr Colin Jones**
B16.	**Ambulance Tasmania Patient Care Report**
B17.	**Tasmania Police Traffic Crash Report**
B18.	**Tasmania Police Incident Report**
B19.	**a) Letter from RHH to Coroner's Associate Riley 13/3/1** **b) Letter from RHH to Coroner's Associate Riley 15/5/13**
B20.	**Vehicle Receipt**
B21.	**Aerial Photographs**
	Vicki Mavis PERCEY – P Exhibits
P1.	**Subject Report Constable Barnard**
P2.	**Report of Death Constable De Bomford**
P3.	**a) Affidavit Constable SnooksID** **b) Affidavit Mr C O'ConnorAffidavit** **c) Life Extinct Dr J Peters**
P4.	**Autopsy Report Dr D Ritchey**

P5.	**a) Toxicology Report Ms M Connor** **b) Report Analysis Nathan Arnold Blood** **c) Report Analysis Brady Neasey Blood**
P6.	**Affidavit Transport Inspector Mr C Jones**
P7.	**Affidavit Ms L Percey**
P8.	**Affidavit Mr S How**
P9.	**Affidavit Mr N Arnold**
P10.	**Affidavit Mr B Neasey**
P11.	**Affidavit Mr K Pearson**
P12.	**Affidavit Ms M De Boer**
P13.	**Affidavit Dr I Bewsher**
P14.	**Affidavit Mr S Percy**
P15.	**Affidavit Mr W Percey**
P16.	**Affidavit Constable Douglas**
P17.	**Affidavit Constable Lloyd**
P18.	**Affidavit Constable Barnard**
P19.	**a) Affidavit Senior Constable Wylie 3/9/2014** **b) Affidavit Senior Constable Wylie 20/5/15** **c) Photographs**
P20.	**Crash Report**
P21.	**Patient Care Report Ambulance Tasmania**
P22.	**Scene Diagram**

P23.	**Incident Report**
	Jay Randall FORSYTH – F Exhibits
F1.	**Subject Report Sergeant Clark**
F2.	**Report of Death Sergeant Clark**
F3.	**Affidavit Life Extinct Dr R Austin**
F4.	**Affidavit ID Constable Ebsworth**
F5.	**Autopsy Report Dr C Lawrence**
F6.	**Toxicology Report Mr N McLachlan-Troup**
F7.	**Patient Care Report Ambulance Tasmania**
F8.	**Affidavit Transport Inspector Mr M Leonard**
F9.	**Affidavit Mr B Butler**
F10.	**Affidavit Mr A Faulkner**
F11.	**Affidavit Mr J Krushka**
F12.	**Affidavit Ms J Cox-McKinnin**
F13.	**Affidavit Mr R Forsyth**
F14.	**Affidavit Constable Ebsworth**
F15.	**Affidavit Constable Gordon**
F16.	**Affidavit Sergeant Clark**
F17.	**Affidavit Senior Constable Rybka**

F18.	**a) Affidavit Constable Williams** **b) Photos**
F19.	**a) Location Sketch** **b) Sketch of injuries to body** **c) Sketch of ATV**
F20.	**Certificate of approved operation**
	Jacob Graham GREEN – G Exhibits
G1.	**Subject Report Constable Bradford**
G2.	**Report of Death Constable Bradford**
G3.	**Affidavit Life Extinct Dr Kan**
G4.	**Affidavit ID Constable Turner**
G5.	**Affidavit ID Mr C O'Conner**
G6.	**Autopsy Report Dr T Brain**
G7.	**Toxicology Report Ms M Connor**
G8.	**Affidavit Transport Inspector Mr Jones**
G9.	**Affidavit Ms T Scardifeld**
G10.	**Affidavit Mr B Marriott**
G11.	**Affidavit Mr T Murphy**
G12.	**Affidavit Mr A Kerr**
G13.	**Affidavit Mr V Green**
G14.	**Affidavit Constable Bradford**
G15.	**Affidavit Constable Swifte**

G16.	**Accident Investigation Documents Constable Mason**
G17.	**a) Affidavit Constable Kubiak** **b) Photographs**
G18.	**Traffic Crash Report**
	Roger Maxwell LARNER – L Exhibits
L1.	**Subject Report Constable McKenzie**
L2.	**Report of Death Constable McKenzie**
L3.	**Affidavit Life Extinct Dr H Blunden**
L4.	**a) ID Affidavit Anthony Cordwell** **b) ID Affidavit Constable McKenzie**
L5.	**Autopsy Report Dr Ritchey**
L6.	**Toxicology Report Ms M Connor**
L7.	**Affidavit Ms A Larner**
L8.	**Affidavit Mr M Larner**
L9.	**Affidavit Mr G Wylie**
L10.	**Affidavit Senior Constable Hyland**
L11.	**Affidavit Senior Constable Cordwell + annexure + diagram**
L12.	**Affidavit Mr J Hardy**
L13.	**Affidavit Constable McKenzie**
L14.	**Affidavit Constable Powell**
L15.	**Affidavit Senior Constable McIntee**

L16.	**Affidavit Constable Jackson**
L17.	**Crash Investigation Documents Bundle**
~~**L18.**~~	
L19.	**Photographs**
L20.	**Medical Records**
	Court Book/General Exhibits – C Exhibits
C1.	**WorkSafe Tasmania Submission- Coronial Inquest into Quadbike Deaths. 11pgs 6th July 2016 (Mark Cocker)**
C2.	**ATV computer simulation report (review of DRI), John Lambert and associates, March 2011, 80pgs.**
C3.	**Risk Engineering, 10 pgs. Comments by John Lamberts on the ATV Distributors' position paper made December 2010, 19pgs.**
C4.	**Safety of quad and side by side vehicle on Australian farms revised, 20pgs.**
C5.	**WorkSafe Victoria Rollover Devices, 1 March 2016, 3pgs.**
C6.	**American National Standard for Four Wheel All-Terrain Vehicles, 46pgs.**

C7.	**Queensland Quad Bike safety plan 2016-2019, August 2016,** **20pgs.**
C8.	**Quadbike safety test- All-terrain vehicle safety, crush prevention device, 13pgs.**
C9.	**University of Adelaide (CASR) - Quadbikes in South Australia and** **investigation of their use, crash characteristics and associated injury risks, January 2016, 112pgs.**
C10.	**TARS Quadbike performance project, Report 1, Static Stability** **Test results, 154pgs.**
C11.	**Quadbike performance project, Fatalities and injuries 2015, 218pgs.**
C12.	**Quadbike performance project, Report 3, Crashworthiness Test Results Jan 2015, 179pgs.**
C13.	**Quadbike performance project, Report 4, Final project summary report, 96pgs.**
C14.	**NSW coronial findings, 78pgs.**
C15.	**QLD coronial findings, 76pgs.**

C16.	**Technical report, DRI comments on NSW TARS. Final Project Summary Report, Jan 2015, 8 July 2015, 71pgs.**
C17.	**RACS SUBMISSION TO: Inquest into the death of 7 riders of quadbikes in Tasmania, 7 April 2016, 16pgs + Dr. Teague Curriculum Vitae**
C18.	**Review 1, Constable Housego 16pgs.**
C19.	**Review 2, Constable Housego 3pgs.**
C20.	**CPSC memorandum (Rodgers), "1989 ATV Risk Analysis", 17 September 1990.**
C21.	**MUARC report - All-Terrain vehicle Injuries and deaths, March 19th 2003.**
C22.	**Transmittal of Draft SAE papers on ATV Engineering authored by CPSC staff and contractors, May 2nd 1989.**
C23.	**Scheers et al - Four-Wheel ATV's and lateral Stability, Emergency Room treated Injuries, September 1990.**
C24.	**Transcript of Testimony of DAVID RENFROE, September 11th 2014. CASE: Birch v. Polaris.**

C25.	**Transcript of Deposition of DAVID RENFROEC, Serrano v American HONDA Motors, 13 November 2014.**
C26.	**Queensland Coronial Inquest, Exhibit related to testimony of:** **Terry Smith, Ph.D (AIS coding).**
C27.	**QLD Transcripts.**
C28.	**NSW Transcripts.**
C29.	**Various Quad Bike Manuals.**
C30.	**Design Considerations, R.H. Macmillian, July 2016.**
C31.	**Quad bike Instability, R.H. Macmillian, July 2016.**
C32.	**Annexure D to closing submissions of FCAI to NSW Inquest (safety ratings of ATVs and SSVs)**
C33.	**FCAI code – "Use of all-terrain vehicles in the workplace"**
C34.	**SVIA – "ATV Safety and Design"**
C35.	**DRI - 'Measurement of "Rider Active" Effects on ATV** **Performance', 19 February 2014**
C36.	**DRI - 'Updated Injury Risk/Benefit Analysis of Quadbar CPD for ATVS', 8 August 2016**

C37.	**DRI - 'Full-Scale Dynamic Overturn Tests of an ATV with and without a "Quadbar" CPD Using an Injury Monitoring Dummy', March 2015**
C38.	**Dr Robert Anderson: Curriculum vitae and Report titled 'All-Terrain Vehicle Engineering / Safety Issues' dated 13 November 2014.**
C39.	**Exponent, Inc. - 'All-Terrain Vehicle Handling and Control', 6 March 2015**
C40.	**Prof Terrance Smith: Report titled 'Impact Testing of Various Helmet Samples to the NZS8600:2002 ATV Helmet Standard', November 2014 and PowerPoint presentation titled 'Queensland Coronial Inquest', November 2014.**
C41.	**Design Research Engineering, Inc. - 'ATV Rollover, Rider Response, and Determinants of Injury: In-depth Analysis of Video-documented ATV Rollover Events', 11 October 2014; and 'Comments on Preliminary Lifeguard Investigation', 11 November 2014;**
C42.	**PowerPoint presentation titled 'ATV Rollover, Rider Response and Determinants of Injury: In-depth Analysis of Video-Documented ATV Rollover Events', 24 November 2014.**
C43.	**SVIA Model Law**
C44.	**Mr John Lambert – Comments on DRI-TR-15-04**

C45.	**Mr John Lambert – A paper reviewing Quad bike design**
C46.	**5 Star Safety DVD**
C47.	**5 Star Safety User Guide**
C48.	**Sudden Loss Support Kit**
C49.	**Quad Bike Crash Investigation Guidelines – DPEM**
C50.	**Curriculum Vitae Mr John Lambert**
C51.	**Replies to Lower (2011) Comments Zellner, Van Auken and Kebschull Second Revision – 7 May 2014**
C52.	**Slides / Printout – Simulation Approach ISO 13232 Motorcycle Standard**