



OFFICE OF THE STATE CORONER

FINDINGS OF INQUEST

CITATION: **Inquest into the death of Sean Lawrence Guy Edwards**

TITLE OF COURT: Coroners Court

JURISDICTION: Brisbane

FILE NO(s): 2013/3724

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FINDINGS OF: John Lock, Deputy State Coroner

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REPRESENTATION:

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Messrs D and W Holzheimer: Mr G W Diehm QC i/b Ashurst Lawyers

Work Place Health and Safety: Mr K Parrott i/b Crown Law

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Lilli Pilli Investments P/L trading as Action Tyres & More:
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Introduction

1. Sean Lawrence Guy Edwards was a professional racing car driver.
2. Mr David Holzheimer through his company Dellow Racing Pty Ltd contracted Sean Edwards to travel to Australia to provide instruction in motor racing to his sons, William and Charles Holzheimer.
3. Dellow Racing Pty Ltd hired the racing track at Queensland Raceway for that purpose.
4. At some time during the morning of 15 October 2013 Sean Edwards accompanied William Holzheimer in a left hand drive Porsche 996 vehicle belonging to William Holzheimer. Sean Edwards occupied the right front passenger seat. William Holzheimer occupied the left driver's seat. A number of laps were completed.
5. At approximately 11:30am the vehicle was travelling in a clockwise direction around the track at high speed. Upon the approach to 'Turn 6' the vehicle continued to travel straight ahead off the track, through a gravel trap and collided with a tyre safety barrier in front of a concrete wall. This caused the vehicle to ignite into flames. Sean Edwards died instantaneously from injuries received and William Holzheimer suffered significant injuries but survived.
6. Queensland Police Service attended and conducted an investigation. A mechanical inspection noted concerns as to the level of wear of the front disc brakes. The vehicle had been regularly maintained by Lilli Pilli Investments Pty Ltd trading as Action Tyres and More and was inspected by their mechanic the day before the crash. A GoPro in vehicle camera recorded William Holzheimer performing what seemed to be frantic attempts to apply and then pump the brake pedals immediately before the crash. These two pieces of evidence raised the possibility that some sort of brake or other mechanical failure had occurred. The Office of the State Coroner engaged the services of an independent expert Mr Karl Reindler to provide a report on this issue.
7. Workplace Health and Safety Queensland also conducted an investigation. WHSQ commissioned an expert review on this issue by Professor Rodney Troutbeck. He noted concerns as to the safety features of the track and in particular to the adequacy of the gravel trap and tyre barrier at Turn 6. The gravel trap is designed to retard the motion of a motor vehicle going off the track and the tyre barrier to attenuate any impact before the vehicle hits the concrete wall. Queensland Raceway commissioned an expert review by a mechanical engineer Mr Chris Hall. These experts appeared to come to different conclusions concerning the adequacy and efficacy of these safety features.
8. Given there were a number of concerns raised and there remained issues that required further exploration, a decision was made to hold an inquest.

The issues were defined at a pre-inquest conference held on 28 July 2015 as follows:

- i. The findings required by s. 45 (2) of the *Coroners Act 2003*; namely the identity of the deceased, when, where and how he died and what caused his death.
- ii. The circumstances leading up to the single vehicle crash at the Queensland Raceway on 15 October 2013 and the severity of injuries suffered by the deceased in that crash.
- iii. Factors that may have contributed to the vehicle leaving the track, and specifically whether such factors included:
 - a. contextual factors related to driver experience and motor sports driver instruction practices and safety standards
 - b. actions taken or not taken by the occupants of the vehicle
 - c. the mechanical condition of the vehicle
 - d. actions taken or not taken to ensure the vehicle was mechanically sound
- iv. Factors that may have contributed to the severity of injuries suffered by the deceased, and specifically whether such factors included:
 - a. the adequacy and appropriateness of track safety features at the Queensland Raceway
 - b. actions taken or not taken by relevant parties to ensure the track met any licencing and/or safety requirements relevant to its use on 15 October 2013

Circumstances leading up to the crash and severity of the injuries

9. At the time of his death, Sean Edwards was a 26 year old professional race car driver born in the United Kingdom and residing in Monaco. His father, Guy Edwards is a former high profile F1 driver. Whilst Sean was known for his driving ability overseas, he also had a business relating to performance driver coaching. He had been engaged by the Holzheimer family to fly to Queensland and provide coaching to William and Charles Holzheimer at Queensland Raceway, at Willowbank. The coaching took place over 14 and 15 October 2013, and involved Sean Edwards providing driving demonstrations, as well as sitting in the passenger seat and providing instruction whilst travelling around the circuit.
10. The raceway circuit at Willowbank had been hired in a private capacity by Dellow Racing, a company operated by David Holzheimer. The circuit is 3130metres in length and is a nationally recognised motor racing track and at the time held a Confederation of Australian Motorsport (CAMS) track licence. Dellow Racing had hired the track previously on multiple

occasions and was known to always request the attendance of a paramedic and ambulance even though this was not a requirement of Queensland Raceway. All participants at Queensland Raceway sign a disclaimer in terms of risk of injury and death before heading out onto the track. In addition to this disclaimer, David Holzheimer also paid an additional fee so that the occupants of the race car would have insurance for loss of income, death cover and public liability.

11. The position of Mr Holzheimer is that notwithstanding the above he relied upon Queensland Raceway as to the condition and safety of the track, and relied upon Action Tyres & More with respect to the upkeep and maintenance of the vehicle. From his point of view Queensland Raceway was providing a CAMS approved race track, which in itself gave him a sense of assuredness that the track met certain safety standards suitable for such activities.
12. On 15 October 2013, a Dellow Racing 2004 Porsche 996 GT3 was in use on the circuit. The Porsche was being driven by William Holzheimer with Sean Edwards in the passenger seat providing coaching to William. Sean Edwards also set up a GoPro camera, so that he could play the recording later on and provide advice and tips.
13. The Porsche drove around the circuit for 12 complete laps with no incident. At just after 11:30am, whilst approaching the final turn of the 13th lap, William is seen on the GoPro footage to attempt to decelerate so as to navigate the turn, but the car does not slow noticeably at all. The footage appears to show William unsuccessfully attempt to slow the car by (rather frantically) depressing the pedals on the driver's floor. However, the Porsche remained at high speed, continued in a straight direction through a gravel trap without any significant reduction in speed and collided front-on into a tyre barrier consisting of two rows and the concrete wall. This took all of a matter of seconds.¹
14. The QPS retained information from the data 'black' box from the vehicle. This was downloaded by Motec and produced in a report under the hand of the product manager at Motec, Mr Jamie Augustine. Mr Augustine explains that the data logger is wired into the car, and is used to collect and store data whilst the car is powered up. The data is stored from numerous sensors, including rear and front wheel speed. The data seems to confirm a lack of deceleration in the lead up to the final turn of the final lap and it left the track at a speed of approximately 165 kilometres per hour.
15. The vehicle then caught on fire (the fuel tank is at the front), which in turn combusted the tyre barrier, thus resulting in a significant blaze. Trackside assistance was able to drag the vehicle away from the burning tyres so as to allow for the vehicle fire to be extinguished and for medical aid to

¹ 4.3 seconds to be exact – report of Karl Reindler

commence. Sean Edwards was declared deceased at the scene. William Holzheimer was flown to the Royal Brisbane Hospital with critical injuries. Mr Holzheimer was excused by the court from having to give evidence.

Autopsy results

16. The forensic pathologist who conducted the post-mortem external and CT scan examinations, as well as reviewing information contained in the initial police report of the death, concluded that Sean Edwards sustained severe head, pelvic and limb injuries most likely resulting in brain injury and significant blood loss.
17. The pathologist also noted that carbon monoxide levels were not elevated in Sean Edwards' blood, indicating that he had stopped breathing before any smoke from the fire reached him. This supports the likelihood that death was due to injuries sustained in the crash rather than any injuries he may have sustained in the subsequent fire.

Confederation of Australian Motorsport (CAMS) investigation

18. CAMS is the main sanctioning agency with respect to motorsport in Australia. Motorsport vehicle licencing, and race track certifications, are all granted by CAMS.
19. CAMS conducted an investigation into the incident and a report was provided to the investigating police. The report's purpose is stated as being to assemble the information made available to CAMS regarding the incident. The information was intended to be used by CAMS and the Federation Internationale de l'Automobile (FIA) in the interests of improving safety in motor sport.
20. The report did not contain any further information over and above what is contained in the police report. The report does not make any conclusions or recommendations as to the cause of the incident. No adverse comments are made within the report as to the track condition and state of the equipment in the vehicle other than an observation that the depth of loose gravel in the gravel trap when observed on 2 November 2013 was between 150-180 mm.
21. Mr Bruce Keys is the Manager of Track Safety at CAMS. He had also been involved in inspections of Queensland Raceway for the issuing of a track licence each year between 1999 and the end of 2013. A CAMS track licence is required where CAMS events are held and indicates it has been inspected and presents an acceptable risk for the level of event to be held. Mr Keys stated this does not guarantee the venue is safe but provides an indication that when an event is held at the track under the entire risk management system of CAMS (driver conduct, official processes, vehicle specification etc.) that CAMS considers it meets a level of risk considered to be acceptable.
22. Since the beginning of 2014, a permanent CAMS track licence has not been issued for Queensland Raceway but there have been event specific

licences issued for two specific dates on two occasions. This permits CAMS sponsored motor races to be conducted but was subject to the installation of specific safety devices, which were then removed following the events for which the CAMS track licence was issued. Relevantly to this case, this included the introduction of a four-row tyre buffer at Turn 6. A permanent track licence has not issued since 2014, as Queensland Raceway indicated it did not need or want to have a permanent licence. It is evident from correspondence that a somewhat testy relationship now exists between CAMS and Queensland Raceway.

23. Mr Keys stated that when the Queensland Raceway track was first designed, it was intended to meet the requirements of the CAMS Track Safety Guide, particularly in relation to the design and location of the first line of protection. Notwithstanding the track guide, licences were still issued even though it apparently did not meet all of those requirements. Mr Keys' statement seems to suggest that this was due to largely financial reasons of the operator when the track first started operating. It seems there was an expectation that matters would improve as time evolved but this may not have occurred.
24. Mr Tetley from Queensland Raceway also told Mr Keys subsequent to the death of Mr Edwards of their intention to install an additional single row of 'articulated' 'snake' tyre barriers at Turn 6. CAMS have concerns with respect to this proposed improvement as they are not aware of any controlled or scientific testing which has taken place on articulated barriers. CAMS believes the FIA standard tyre buffer system has been used by many race tracks and has been tested by the FIA and has proven to be valuable in reducing the consequences of impacts.
25. Given there is no permanent track licence, there is no opportunity for CAMS to sanction any non-competitive activity at Queensland Raceway, such as a vehicle testing or driver training day. The activity being conducted which led to the death of Sean Edwards was not conducted under the sanctioning of CAMS.

Turn 6



Factors that may have contributed to the vehicle leaving the track

The vehicle

26. The motor vehicle involved in the crash was a 2004 Porsche 996 GT3 cup car. It was purchased by Dellow Racing in December 2011. It is a class of vehicle built to compete in motor racing events and is not a road

registrable vehicle. The engine is in the rear, and the fuel tank is in the front. The vehicle is fitted with a full roll cage. It is a left-hand drive, with the driver's seat having a 6-point racing harness type seatbelt and the passenger's seat having a 4-point harness.

27. The car was fitted with a factory fire system which could be activated manually by a button on the dashboard, as well as by a button on the outside of the vehicle near the windshield. The system had nozzles in the region of the fuel tank, occupant compartment and engine bay. The vehicle was also fitted with tow recovery points at the front and rear.
28. The evidence supports a conclusion that William Holzheimer was a reasonably experienced amateur driver of Porsche racing class vehicles and this training activity did not take him beyond his capabilities. It is not suggested that he was driving recklessly or any specific action or inaction on his part caused this crash.
29. As well, there is no suggestion that any action or inaction on Sean Edwards' part played a role.
30. A mechanical inspection was conducted by Sergeant Bradley Dieckmann of the QPS Vehicle Inspection Unit. He conducted an initial inspection on 22 October 2013, and then a more thorough inspection on 11 December 2013. During this inspection he noted that the rear brake pads were in good condition. However, the upper 1/3 section of the right front outer disc brake pad was in metal to metal contact with its brake rotor. The remaining left front outer disc brake pad and both the front right disc brake pads were worn to replacement levels considering the extreme driving requirements of the vehicle. Sergeant Dieckmann concluded that the vehicle was in an unsatisfactory mechanical condition due to these factors.
31. At inquest Sergeant Dieckmann conceded that he had only very limited experience with motor racing vehicles and was not aware of the performance capabilities of high performance disc brake pads, such as those that were used in this vehicle. He was also unable to comment on the extent to which the impact or the subsequent fire may have affected the level of wear that could be seen on the front disc brake pads following the incident.
32. Sergeant Dieckmann noted in his statement that under extreme driving conditions, worn front disc brake pads may cause the brake fluid to boil prematurely, which can then cause some or total brake fade. However, he also noted that brake fade is usually progressive with tell-tale signs of a depleting and spongy foot brake pedal, which would have been obvious to the driver.
33. In the lead up to the crash, the car was maintained by Action Tyres & More, a mechanics company that offers racing car preparation as part of its business. The company operates out of Southport on the Gold Coast. Thomas Gyori, a mechanic from Action Tyres, was at the raceway on the

day of the crash. His statement confirmed he is a German citizen who came to Australia on a work and holiday visa in November 2012. He obtained work as a mechanic with Action Tyres from December 2012.

34. Mr Gyori came to Australia with extensive experience in motor mechanics, particularly relating to performance race cars. He was employed by Action Tyres as a mechanic specialising in, but not limited to, Porsche vehicles. He confirmed that he worked on the Porsche involved in the crash, and that it was fitted with an Anti-Lock Brake System which operates on a similar basis to a road vehicle fitted with ABS.
35. Mr Gyori recalled servicing the relevant Porsche on 12 September 2013, about a month before the crash. He replaced the rear brake pads on this occasion. After replacing the brake pads he asked someone else in the workshop for assistance with bleeding the brakes. This is a process whereby any air bubbles in the brake fluid are brought out. The assistant applied pressure to the brake pedal whilst Mr Gyori allowed some of the brake fluid to drain out, thereby getting rid of an amount of fluid which may have been affected.
36. Mr Gyori confirmed that the service record for 12 September 2013 is incorrect in saying that the rear discs were machined. He confirmed that the rear discs were not machined, and that he was taught to never machine the discs on race cars because if the discs are too worn, they should just be replaced.
37. On Monday 14 October 2013, Mr Gyori was at Queensland Raceway in his capacity as a mechanic working for Action Tyres. He inspected the Porsche 996, namely the tyre pressure, the data box, and the brake fluid reservoir. Sean Edwards took the 996 out for a drive by himself and when he finished, he said that the brakes felt a bit soft. Mr Gyori subsequently checked the braking system and bled each of the wheels again to make sure there was no air in the system. Sean then took the 996 out for another drive, and when he returned he said the brakes were fine. Mr Gyori did not do any further work on the 996 that day.
38. On Tuesday 15 October 2013, Mr Gyori was again at Queensland Raceway but on this day he says he was working as mechanic for Matthew Kingsley, the managing director of Action Tyres. Matthew Kingsley was driving a 997 Porsche. He had been invited by Dellow Racing to take part in the event after Dellow's other Porsche could not participate as it had been damaged at an earlier event. Mr Kingsley stated his 997 was having some problems with the water pump and Mr Gyori was working on those problems. He was doing this when the 996 crashed.
39. Matthew Kingsley has provided a sworn statement, where he confirms that he was on the track on the day of the crash. He had no involvement with the 996 Porsche, and was working on his own car at the time the crash occurred. He assisted in the aftermath of the crash with extinguishing the fire and pulling the Porsche away from the tyre barrier.

40. Mr David Holzheimer contends that in fact Mr Gyori was responsible for servicing their vehicle on the day of the incident. This was somewhat of a side issue but it seems more likely than not that Mr Gyori and Action Tyres had been engaged by Dellow Racing to provide mechanical services that day as well as no doubt working on the employer's motor vehicle. I had some difficulty in accepting the evidence of Mr Kingsley and Mr Gyori on this point and in particular find it difficult to accept that given the close business relationship they had, that Mr Kingsley would accept the invitation to participate that day at the track and simply ignore the needs of what appeared to be a valued customer. Rather on this point I accept the evidence of David Holzheimer that he would not have set up this event without a mechanic being available on both days. This side issue is of little consequence to the ultimate outcome given what unfolded during the inquest as to the likely cause of the incident. The cause of the incident was most likely not related to the brakes as such and could not have been reasonably identified by a mechanic prior to the incident.
41. The service records for the Porsche 996 were obtained. Those records confirm that the vehicle was regularly serviced by Action Tyres & More. Servicing was not conducted at consistent intervals, it seems that sometimes there would be periods of only a fortnight between services, compared with periods of five months between services.
42. The service records confirm that the last service occurred on 27 September 2013 and was conducted by Thomas Gyori. The invoice does not state anything relating to the brakes. The records for the service which occurred on 12 September 2013, confirm that the rear brake pads were replaced on this occasion. Thomas Gyori also conducted this service. The records confirm that the rotors were given 'a quick machine' but that they 'will need replacing soon'.
43. Mr Gyori was asked at inquest about the brake pad wear. Essentially, Mr Gyori's evidence was that he would have visually observed the width of the brake pads during work to '*bleed the brakes*' at the track the day before the incident, and presumably did not consider they needed replacing at this time, otherwise he would have recommended this to Dellow Racing that day. Mr Gyori explained that the work to '*bleed the brakes*' was in response to a comment made by Sean Edwards that the brakes felt soft, and that by replacing the brake fluid in the vehicle, which had been heated during Sean Edward's driving sessions, this had resolved the issue to Sean Edward's satisfaction.
44. The mechanical condition of the vehicle was an issue that was extensively explored at the inquest. I accept the evidence indicates that the vehicle was well maintained. Dellow Racing ensured it was serviced regularly by a company specialised in servicing and maintaining these types of vehicles. When asked at the inquest, Thomas Gyori agreed that Dellow Racing was responsive to any recommendations made by Action Tyres and More as to work to be done on the vehicle. Significant money was spent by Dellow Racing on parts and labour and no expense seems to

have been spared. The fact that David Holzheimer's two sons were frequent drivers gave added interest to his commitment in ensuring the safety of the vehicle both for drivers and passengers.

45. There is clearly some difficulty in reconciling the evidence of the police mechanic (supported by photographs taken by him) with the evidence of Mr Gyori in respect to the state of the brake pads. It is my conclusion that the front disc pads should have been identified as being worn by the mechanic at least on 14 October when he inspected them. As will be seen, the condition of the brakes ultimately was not contributory to the cause of the crash.

Report of Mr Karl Reindler

46. Mr Karl Reindler is a professional motor racing driver, coach and engineer. His expert report was commissioned to inform the coronial investigation. In addition to the police statements and evidence, he also had the benefit of access to the GoPro footage and the vehicle's 'black box' data.
47. Mr Reindler opined that brake pad wear could be ruled out as the cause of the vehicle's inability to decelerate at the final turn. Mr Reindler agreed with the evidence of the police mechanic that brake pad wear would result in a progressive loss of braking friction and performance in the laps prior to the final lap. Mr Reindler considered that there was no evidence of this, with the data and footage showing that William effectively and efficiently braked on every lap prior.
48. Using the black box data, Mr Reindler was also able to rule out other potential driver errors including 'missing' or 'slipping off' the brake pedal, and accidentally hitting both the throttle and brake at once.
49. As to what did cause the vehicle's inability to decelerate at that final turn, Mr Reindler offered two hypotheses:
 - i. The throttle butterfly was jammed open by some sort of obstruction (a nut or bolt even), which effectively means the vehicle was being braked and accelerated at the same time, preventing deceleration.
 - ii. The ABS system was '*tripped*' on, possibly by a loss of grip being detected by the ABS system, creating a very firm brake pedal and restricting the vehicle's ability to decelerate. This could also explain the pumping seen on the brake pedal.
50. A witness who provided information by email to the Office of the State Coroner during the course of the inquest, and was subsequently called to give evidence, offered a similar scenario to the one identified by Mr Reindler regarding the throttle being jammed open. This witness was a former police officer with experience in crash investigations and driver instruction, and the owner of two Porsche 996 GT3 Cup Cars identical in make to the vehicle being driven by William that day. He described an

experience of the throttle in his 2003 Porsche 996 Cup Car becoming 'locked at full throttle' whilst he was driving it in racing conditions. Upon inspection, he found a split in the hose that links the air intake to the engine manifold, causing the intake hose to roll over itself and lock the throttle on. This split was not clearly visible to the naked eye, and it was only under throttle that the problem became apparent.

51. Mr Reindler was informed of this new information during the course of his giving evidence at the inquest, and agreed that this scenario could prevent deceleration and was otherwise consistent with what could be seen from the data and footage obtained from the vehicle just before the crash.
52. Mr Reindler concluded in his report that '*a mechanical failure of sorts (not necessarily in the braking system) could certainly be seen as a significant contributing factor to the Porsche leaving the circuit. As to what the failure was and what caused it, there simply isn't enough available information to accurately diagnose*'.
53. After considering Mr Reindler's expert evidence I can now conclude the vehicle left the track due to mechanical failure affecting the brakes rather than simply brake failure related to the condition of the brake pads. There is difficulty in finding a precise cause. The matters raised by Mr Reindler and the other witness cannot now be investigated because an inspection of the vehicle in the condition it was found after the crash is not now possible, and in any event an inspection may not have uncovered evidence of these possible failures. I accept the likely causes are some type of mechanism causing the throttle to lock on, or the ABS being 'tripped on'. In either of these scenarios, William would have been unable to decelerate the vehicle sufficiently to navigate Turn 6, given the speed the vehicle was travelling at the time.

Factors that may have contributed to the severity of injuries suffered

54. This issue explored the adequacy and appropriateness of track safety features at Turn 6 of the Queensland Raceway track. The inquest was assisted by two experts who provided reports and gave evidence, namely Professor Troutbeck and Mr Chris Hall. They appear to have come to slightly different conclusions but to some extent this is due to the different questions they were asked to address. Professor Troutbeck was asked to consider the suitability and appropriateness of the gravel trap and tyre wall as safety features. Mr Hall was asked to comment upon whether the circuit, tyre wall and gravel trap comply with Confederation of Australian Motor Sport (CAMS) and the Federation Internationale De L' Automobile (FIA) Standards. As will be seen the answers to those questions are not inclusive of each other.

Track safety features – gravel trap and tyre buffer

55. Professor Troutbeck is a road and motor-racing safety expert and qualified civil engineer. He was commissioned by WHSQ to provide a report as to

the adequacy and effectiveness of track safety features at Turn 6 of Queensland Raceway.

56. Professor Troutbeck stated the function of gravel traps is to retard vehicles through four basic actions; namely impaction of material, bulldozing of the material, momentum exchange and side shear of the material with the side of the wheel.
57. The design and specification of the gravel traps for motor sport is contained in FIA guidelines. Prof Troutbeck stated that these guidelines have changed over time and the guidelines that were current at the time Queensland Raceway was designed are different to the current guidelines. The FIA guidelines also assumes the vehicle's brakes are operating satisfactorily. ²
58. Professor Troutbeck's report was critical of two safety features at Turn 6 being the gravel trap and the tyre barrier. In his report and at the inquest, Professor Troutbeck stated that whilst the overall design of Turn 6 was not intended to prevent the type of impact that may be experienced by a vehicle leaving the track at high speed with no braking ability such as in this incident³, both the gravel trap and the tyre barrier could have been better.
59. Professor Troutbeck based his opinion regarding the gravel trap on an inspection he conducted on 1 November 2013. Professor Troutbeck considered that the uncompacted depth of the gravel in the gravel trap at that time was less than recommended by the Confederation of Australian Motor Sport (CAMS) and the Federation Internationale De L' Automobile (FIA)⁴, and contained a higher proportion of angular stones⁵, making it less likely to be able to arrest vehicles than gravel traps constructed and maintained to FIA specifications.
60. With regards to the tyre barrier, Professor Troutbeck noted that a newer design of tyre barrier, consisting of three rows of tyres with high density polyethylene tube inserts and 'conveyor belting' on the outside of the tyres, was developed by FIA in 1998 for use in head-on positions behind a gravel trap or run-off area. Having regard to this design, Professor Troutbeck considered that the two-row tyre barrier at Turn 6 was not 'best practice'⁶ and would attenuate less than a quarter of the energy able to be attenuated by the FIA designed barriers. To illustrate this point, Professor Troutbeck stated that the existing two-row tyre barrier would not be expected to attenuate the energy of a 1.5 tonne vehicle impacting the barrier at speeds greater than 60 kilometres per hour, whereas the FIA

² Vehicles approaching turn 6 would be assumed to be under braking and the design speed for the corner is 90 km/h - D19 page 13

³ Prof Troutbeck's report exhibit D19 states the gravel trap is not likely to arrest vehicles travelling at speeds over 115 km/h

⁴ 25 cm

⁵ Should be spherical, river-washed stones or an approved equivalent

⁶ Only 2 rows of tyres, plastic strapping is used, tyres bolted through their walls and not the threads, no conveyor belting fixed

designed three-row tyre barrier could attenuate such a vehicle at speeds up to 110 kilometres per hour.

61. Mr Chris Hall, is a mechanical engineer who was commissioned by Queensland Raceway to prepare an expert report as to whether the tyre barrier and gravel trap at Turn 6 complied with CAMS and FIA standards at the time of the incident. Mr Hall was also asked to comment on the general effectiveness of gravel traps in arresting vehicles that have suffered from complete brake failure.
62. Mr Hall concluded that the run-off length, tyre barrier and geometry of the gravel trap at Turn 6 all complied with relevant CAMS and FIA guidelines for V8 Supercars and would be therefore suitable for Porsche GT3 events. In particular he stated the run-off length at Turn 6 of 58 metres of gravel bed in the straight ahead run-off direction met the guidelines. He further stated that on the basis of the run-off length alone Turn 6 complied and the gravel bed was not even a required feature and therefore provided a deceleration zone over and above what was required under the 1993 and 2012 CAMS guidelines.
63. In relation to the tyre barrier Mr Hall concluded the barrier complied with CAMS/FIA guidelines at the time of construction. Although there have been subsequent upgrades to the guidelines, as noted by Prof Troutbeck, there was no recommendation in the guidelines as to when such new treatments should be applied. His report therefore concluded the tyre barrier still complied.
64. A key difference between the expert opinions of Mr Hall and Professor Troutbeck was whether a three-row barrier with inserts and conveyer belt, as set out in the current CAMS and FIA guidelines (but are not mandated), was likely to have altered the outcome of this incident had such a barrier been installed at Turn 6 at the time.
65. Mr Hall agreed with Prof Troutbeck that this particular designed three row tyre would improve energy attenuation but Mr Hall expressed the opinion that whilst there were more effective designs available, *'adopting the suggested three-row tyre buffer with inserts and conveyor belt was unlikely to have altered the outcome of this incident'*. To support this opinion Mr Hall analysed data related to severe and fatal injuries sustained by drivers involved in frontal collisions with another vehicle on public roads in the United Kingdom from 1983 to 2010. From this data, Mr Hall extrapolated the 'relative potential for fatal injury' for a driver involved in an impact with a solid barrier (not taking into account the protective equipment and restraints such as those that were being worn by the driver and passenger at the time of the incident). Mr Hall concluded that, in this incident, if the vehicle had impacted a three-row tyre barrier with inserts and conveyer belt, rather than the two-row tyre barrier that was in place at that time, the relative difference between risk of a fatal injury would be in the order of one per cent (1%). At inquest, Mr Hall agreed that this relative difference could in fact be higher, and possibly as high as around ten percent (10%). However, Mr Hall maintained his view that it was still

‘unlikely’ that a three-row tyre barrier with inserts and conveyer belt would have made a difference to whether Sean Edwards survived the incident.

66. Professor Troutbeck suggested that even if the ‘relative potential’ for fatal injury between the two different tyre barriers was low, a three-row tyre barrier would have increased the chance of Sean Edwards surviving the incident. Professor Troutbeck noted that William Holzheimer did in fact survive the very same impact in which Sean Edwards was killed. Professor Troutbeck stated that there may have not been that much more to make the incident more survivable and the inserts and conveyor belt are all significant benefits and a good chance of making a difference to fatality, but not injury.
67. In relation to the gravel trap, Mr Hall commented that gravel traps are designed to arrest vehicle under heavy braking, which was ‘*not the case in this incident*’. Mr Hall expressed the opinion that the gravel trap at Turn 6 ‘*appeared to provide deceleration for a free-wheeling race-car consistent with a well-prepared gravel trap*’.
68. Another difference between each of these expert opinions is in relation to the characteristics and arrangement of the gravel in the gravel trap. Specifically, whether the gravel was sufficiently ‘spherical’ or otherwise of a shape that would have enabled the gravel to behave as intended when a vehicle enters the trap, allowing the vehicle’s tyres, wheels and bodywork to dig or sink into the gravel (known as ‘bulldozing’) rather than the gravel pieces locking into each other, which would prevent or reduce this effect. There was also an issue as to whether the gravel pieces were aerated sufficiently to ensure there was enough ‘loose’, non-compacted gravel of a sufficient depth (at least 250mm, by CAMS and FIA standards) to achieve the ‘bulldozing’ effect.
69. Mr Hall did not inspect the gravel in the gravel trap. Mr Hall relied on data taken from a vehicle that had entered the same gravel trap 16 months prior to the incident resulting in Sean Edward’s death, and compared it with the data obtained from the vehicle in which Sean Edwards was travelling. Mr Hall opined that the data ‘*suggests that the gravel bed was performing in a manner consistent with that expected of a well-prepared gravel bed*’.
70. Professor Troutbeck did not agree with this conclusion, and said the deceleration rates arrived at as a result of Mr Hall’s analysis could have been arrived at ‘*regardless of the surface*’. In Professor Troutbeck’s opinion, the data does not conclusively show that the small amount of deceleration achieved when the vehicle crossed the gravel trap was as a result of a ‘*well-prepared*’ gravel trap. This deceleration rate may have equally been achieved by a sub-optimal gravel trap.
71. On this issue I prefer the opinion of Professor Troutbeck given he conducted a personal inspection of the track and there remains some uncertainty in relying on data comparing two incidents with different makes

of vehicle, fitted with different tyres, travelling at different speeds and traversing the gravel trap in different directions, sixteen months apart.

72. On the issue of maintenance of the gravel bed and track generally, staff of Queensland Raceway, including their CEO Mr John Tetley gave evidence at the inquest. There appears to be no formal schedule for maintaining the gravel traps, with traps being attended to '*as needed*' or '*when we had time*'. There were inconsistencies between the evidence given by each of the staff members as to how the gravel traps were raked, and whether the aim was to make the surface '*as smooth as possible*' or to rake '*furrows*' across the surface to help vehicles dig into the gravel. The groundsman, who had day-to-day responsibility for physically raking the gravel traps, was unaware of the depth at which the gravel was required to be maintained and aerated. When asked at inquest to comment on the groundsman's lack of knowledge about this issue, Mr Tetley replied along the lines of '*why would he know, he's only a groundsman*'. All of the staff members gave evidence that there were no regular measurements taken to ensure the depth of the aerated gravel in the gravel traps was appropriate.
73. Professor Troutbeck noted it may be difficult for track operators to source 'optimal' gravel, and that it may be the case that track operators have to make do with what is available. He also acknowledged the expense involved in filling gravel traps, which may mean that for some track operators, replacing the gravel over time as it became degraded may be cost prohibitive. However, Professor Troutbeck also described other things that can be done to improve the performance of the gravel, including thorough and effective aeration, as well as regular removal and sieving of the gravel to remove debris and broken gravel pieces that build up over time.

Passenger seat and harness

74. In his report, Mr Reindler commented that he noticed '*an amount of flex*' in the passenger seat when viewing the footage of Sean and William's drive around the circuit. Mr Reindler went so far as to describe the level of give as '*disconcerting*', and stated '*if it were me, I would have chosen not to continue once I noticed how much movement there was*'. Mr Reindler's report also noted that the passenger seat was positioned '*noticeably higher*' than the driver's seat, '*exposing the passenger to more risk in an accident*'.
75. CAMS also noted the passenger seat was of a visibly different design and smaller compared to the driver's seat but otherwise did not comment about the seat other than it was that of a typical race driver seat. There were no signs of obvious movement on the seat mountings in the impact.
76. There is no evidence to suggest the seat and harness were installed or positioned incorrectly or did not meet the requisite safety standards. The mechanic who looked after the vehicle at the track the day before the incident, Mr Gyori, stated at inquest that Sean Edwards did not raise any

issues regarding the passenger seat or harness, nor did he personally notice any issues with the seat or harness when assisting Sean Edwards with the vehicle that day.

77. There is insufficient evidence to conclude the state of the passenger seat and harness contributed to the severity of injuries experienced by Sean Edwards in the crash.

Helmet worn by Sean

78. Sean Edwards was wearing a partly open-faced helmet compared with the full-faced helmet worn by William Holzheimer. The vehicle did not have access to a digital or radio communications system for communicating with driver and instructor inside the vehicle.
79. Mr Reindler stated that in his opinion the wearing of a partly open-faced helmet is appropriate in a coaching situation where there is a need for the coach to communicate verbally with the driver. Mr Reindler agreed a partly open-faced helmet was not as good as a full-faced helmet on a safety view, however he did not express any concern about Sean wearing a partly open-faced helmet.
80. However, on the evidence, no conclusion can be made that wearing a full-faced helmet or other Personal Protection Equipment would have prevented the severity of the injuries suffered by Sean Edwards and enabled him to survive the crash.
81. Counsel Assisting submitted that nonetheless there may be merit in introducing a requirement that coaches are provided with a digital or radio communication system when coaching from the passenger seat, alleviating the need for them to wear a partly open-faced helmet.

Coaching practices

82. Mr Reindler was also asked whether it was appropriate for Sean Edwards to sit in the passenger seat when providing instruction to William that day.
83. Mr Reindler stated it was common practice to coach from the passenger seat for practical reasons, and explained why this was beneficial over providing feedback retrospectively after reviewing data or video footage. Mr Reindler's opinion was that it was not inappropriate for Sean Edwards to be in the passenger seat when providing driver instruction to William.
84. However, in respect of coaching practices generally, Mr Reindler also noted it is also common practice to request only '90% *pace*' from the driver when they are responsible for someone else in their car. Mr Reindler commented in his report that it was probably too subjective to debate whether William was pushing the vehicle and himself to only 90%.
85. Of more significance was Mr Reindler's evidence that it is rare to coach from the passenger seat of a vehicle for more than three laps at a time. Mr Reindler advised that most amateur drivers cannot physically maintain

the level of concentration required for longer than this period, and that it takes years of training to be able to drive a race car for significant lengths of time whilst maintaining a high level of skill and precision.

86. In his report, Mr Reindler described this particular session as '*an incredibly long*' coaching session.
87. Based on his review of data and footage from that session, Mr Reindler reported that he could '*clearly see*' the number of mistakes increasing towards the latter part of the session, and that the standard of driving '*dropped*', requiring Sean's intervention on several occasions. Mr Reindler pointed in particular to an incident that occurred on the previous lap, whereby the vehicle '*dropped a wheel off the track*' as it was exiting Turn 6. Mr Reindler suggested this alone should have caused Sean Edwards to stop the session.
88. There was no suggestion that Sean Edwards was under any pressure or expectation to drive a certain number of laps. I accept Mr Holzheimer's evidence that decisions as to how the instruction would be provided to William and Charles were left completely to Sean Edwards. Subject to issues for consideration for the future in relation to coaching activities, there is no evidence that there was any particular failing or lack of care in the coaching by Sean Edwards that contributed to the crash occurring.
89. There is also no evidence that William Holzheimer's driving caused or contributed to the vehicle leaving the track. Counsel Assisting submitted and I agree that whilst driver fatigue may be an issue warranting further consideration in the context of guidelines or regulation for motor sports coaching in Queensland in the future, it does not appear to have been a factor in Sean Edwards' death.

Conclusions

90. The QPS mechanical inspection found two of the front brake pads were worn to a dangerous level and I conclude this should have been identified in mechanical inspections the previous day. This however did not play a part in the cause of the crash. Rather the crash was caused due to an unknown mechanical failure unrelated to the state of the front brake pads. I find that William Holzheimer approached Turn 6 at a speed similar to earlier efforts and when applying the brakes they totally failed. His actions and those of Sean Edwards in endeavouring to slow and redirect the vehicle were always going to be futile. There was no specific driver or coaching error which contributed to the cause of the crash.
91. Both Sean Edwards and William Holzheimer were wearing appropriate safety clothing, helmets, restraints, HANS devices (Head and Neck Support) and William Holzheimer was suitably qualified and experienced to be driving that type of vehicle.
92. The track at Queensland Raceway has been in use in its current form for many years. During that time, the track was inspected and approved by

CAMS to conduct a number of high profile race meetings where the speeds were far greater than any reached during this incident.

93. SC Bellchambers stated in his report that some changes to the track have been made by Queensland Raceway. This included the contentious additional tyre barrier that concerns CAMS. SC Bellchambers also was told the depth of gravel has been deepened in the gravel trap so as to improve deceleration properties. Interestingly Mr Tetley seemed to be unaware of this.
94. Motor sport activities are largely self-regulated. There does not appear to be any specific regulation or standard that applies to track standards other than those applied by CAMS in its licensing process and/or generally in respect to risk assessments applicable to work places (of which a racing track utilised for business purposes is) pursuant to workplace health and safety legislation.
95. Motor racing, similar to many other sporting/recreational activities involves increased levels of risk of injury and death, and to a point, participants are taken to have accepted those risks. That does not mean the risks should not be managed by conducting appropriate risk assessments and informing participants what the risks are and if measures have been put in place to minimise the risks.
96. At the time of hiring Queensland Raceway, the track was the subject of a CAMS licence. What is unclear is to what extent that should provide participants with some assurance as to its safety. CAMS position is a licence does not guarantee the venue is safe but provides an indication that when an event is held at the track under the entire risk management system of CAMS (driver conduct, official processes, vehicle specification etc.) that CAMS considers it meets a level of risk considered to be acceptable.
97. CAMS guidelines are not mandated. Further it is apparent that the Queensland Raceway track had been licensed by CAMS for many years, even though aspects of the track did not meet their more updated guidelines in respect to tyre barriers. It was however licenced and to that extent it must be accepted that it therefore complied with CAMS requirements.
98. It is now quite apparent Turn 6 was not designed in such a way that it would arrest a vehicle travelling at high speed on the approach to that turn in the event of total brake failure. The track design models developed by FIA assume full effective braking. Mr Hall pointed out in his report, he is '*unaware of any race circuit in the world that has a gravel bed within a run-off zone that is designed to arrest the fastest race-car using that track in the event of total brake failure*'.
99. Accepting that is the position, that should not mean that the risk of a total brake failure should not be addressed. That could be done by considering the gravel trap and barriers and either making appropriate changes to the

trap and barrier or at the least informing participants of that risk so that they can take appropriate steps to manage the risk and to improve safety and reduce the risk of death and serious injury.

100. The problem is that information is not readily known or apparent to private participants when they may wish to hire the track for the types of activity being conducted on this occasion. If the track is to be licenced by a body such as CAMS then there should be risk assessments performed by either CAMS officials or other independent qualified persons and this information should be readily available to those who may wish to hire the track. The signing of some form of disclaimer should not obviate the need of the track owner to inform participants of assessed risks and if these have been managed. It is clear that reliance on some past certification by a body such as CAMS is insufficient.
101. Counsel Assisting submitted that appropriate motor sports regulatory bodies including CAMS and similar organisations should work together to develop guidelines for driver coaching and recreational activities conducted on race tracks in Queensland, such that individuals who provide venues for, organise and participate in these activities are appropriately informed about the risks involved and how to make these activities as safe as possible.
102. There was general agreement to this submission by counsel representing the Edwards and Holzheimer families. CAMS Topcar Agreement provides for a comprehensive set of risk management conditions for non-competition activities. These provide for such issues as activity description, insurance, numbers of officials and site visitors, control of circuit, qualifications of driving observers and instructors, licenses and driving age, track density and vehicle speed, passengers in vehicles, vehicle presentation and scrutiny, driver's briefing and induction, vehicle and driver safety, apparel including helmets and compliance with instructions.
103. Counsel Assisting also submitted that there should be a requirement that driving instructors are provided with a digital or radio communication system when coaching from the passenger seat, alleviating the need for them to wear a partly open-faced helmet. Alternatively or in addition to this, the introduction of a requirement that driving instructors wear full-faced helmets when coaching from the passenger seat.
104. Accepting the validity of that submission I consider this should be an issue that should be considered as part of the safety conditions referred to in the proposed guidelines.
105. I am not suggesting or endorsing the CAMS Topcar Agreement as the only applicable regime for those activities but it does provide a current guideline which could be a starting point for developing a number of guidelines for the varied private activities conducted at such race tracks. I would anticipate a range of requirements could be considered. Relevantly

to this case, if the risk of total brake failure was considered and a particular part of the circuit was identified as a problem there could well be a requirement that the speed of entry into a corner was reduced to manage that risk so that if the worst happened the gravel pit and tyre wall could do their job and minimise the injuries and risk of death.

106. In this case this was not anticipated or considered and the speed of the vehicle was such when total mechanical brake failure occurred there was a high risk of injury and death, both of which resulted.

Findings required by s. 45

Identity of the deceased – Sean Lawrence Guy Edwards

How he died –

Sean Edwards was a professional racing car driver who was conducting private coaching for a relatively experienced amateur driver. This took place at Queensland Raceway at Willowbank which at the time was the subject of a CAMS track licence. The private coaching activity was not conducted as a CAMS activity. In the course of that coaching session the vehicle was approaching Turn 6 at a high speed when there was a total mechanical failure of the brakes. The vehicle proceeded through a gravel trap and into a tyre barrier and impacted with a concrete wall. The safety features of the gravel trap and tyre barrier were not designed to prevent serious injury or death in the event of total brake failure. The cause of the total mechanical brake failure is unable to be ascertained. There is no evidence that actions or inactions on the part of the coach or driver contributed to the crash.

Place of death –

Champions Road, Willowbank Qld 4306

Date of death–

15 October 2013

Cause of death –

1(a) Multiple injuries

1(b) Motor vehicle collision (passenger)

Comments and recommendations

I recommend that:

1. Appropriate motor sports regulatory bodies including CAMS and similar organisations should work together to develop guidelines for driver coaching and recreational activities conducted on race tracks in Queensland, such that individuals who provide venues for, organise and participate in these activities are appropriately

informed about the risks involved and how to make these activities as safe as possible.

2. Information about this incident be provided to Porsche (if this has not occurred already) so that the company can satisfy itself as to whether this was a one-off incident, or whether there may be any design or manufacturing faults with this particular vehicle.

I close the inquest.

John Lock
Deputy State Coroner
Brisbane
5 February 2016