IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2013 004912

FINDING INTO DEATH WITHOUT INQUEST

Form 38 Rule 60(2)
Section 67 of the ***Coroners Act 2008***

I, PARESA ANTONIADIS SPANOS, Coroner,

having investigated the death of PETER EDWARD HALL without holding an inquest:

find that the identity of the deceased was PETER EDWARD HALL

born on 11 June 1942

and that the death occurred on 29 October 2013

at The Alfred Hospital, 55 Commercial Road, Melbourne, Victoria 3004

from: I (a) HEAD AND NECK INJURIES

Pursuant to section 67(1) of the **Coroners Act 2008**, I make findings with respect to **the following circumstances**:

1. Mr Hall was a 71-year old semi-retired mechanic who lived in Lobethal, South Australia, with his wife of 47 years, Margaret, with whom he had two adult children, David and Deborah. Mr Hall was reportedly in good health but was prescribed medication for hypertension, had had both hip joints replaced and was treated for melanoma in 2010. His family considered him to have sound perceptual awareness and quick reflexes.

2. Mr Hall was a motor vehicle racing enthusiast and had been involved in the industry for about 30 years in a variety of roles. He had competed as a driver in no less than 200 races in a number of vehicle classes, including about 20 races at the Phillip Island Grand Prix Circuit [PIGPC], was a driver and official training instructor, officiated at races as Clerk of Course, maintained membership of a number of car clubs and held organisational roles in racing bodies such as past Chairman of the Confederation of Australian Motor Sport [CAMS] State Council. Mr Hall had been awarded the Order of Australia Medal for services to motorsports.

3. Mr Hall and his wife left home for Phillip Island on Thursday, 24 October 2013 so that he could compete in the fourth round of the Victorian State Circuit Racing Championships convened by the Victorian Mini Club at PIGPC. The couple broke their journey and stayed

overnight at Bacchus Marsh before arriving at PIGPC the following morning. As racing was to occur over the weekend Mr and Mrs Hall stayed in an onsite cabin.

4. Mr Hall competed in a race on Saturday 26 October 2013 without incident in his Datsun 240Z, a vehicle in which he had raced for about eight years.

5. On the morning of Sunday 27 October 2013, David Hall met his parents at PIGPC so that he could watch his father compete in the Sports Sedan event, Race 17 of the program. He observed his father to be alert, in a good mood and keen to race. Mr Hall had performed a mechanical inspection of the vehicle that morning.

6. Race 17 was due to commence at 10.45am on Sunday, 27 October 2013. It was a fine, dry but overcast day. In order to watch the race, Mrs Hall and her son stood on the viewing platform above the pit garages located on the inside of the racing circuit, directly opposite the starting grid.

7. The 21 competitors completed a warm up lap of the track before taking up grid positions on Gardner Straight in their starting order. Four Grid Marshalls directed the cars to their allocated grid before returning to pit lane, behind a concrete wall a little over a metre high, along the inside of the track and adjacent to the grid.

8. The grid consisted of ten rows of two vehicles, and an eleventh row with only one car in it. Pole position, grid one, was situated in row one on the outside of the track, with subsequent odd numbered grids positioned on the rows behind it and even numbered grids in successive rows on the inside (pit-side) edge of the track. Mr Hall's Datsun was about halfway down the grid in row six on the outside of the track, in grid 13, directly behind Conrad Whitlock's Ferrari in grid 11. Also between Mr Hall's Datsun and pole position was a Lamborghini, driven by Edward Huglin, in grid five.

9. A green flag was raised by the Grid Marshall adjacent to the last row of the grid to indicate that all cars were in position. Once in pit lane awaiting the start of the race, each Marshall took up a yellow flag, which would be waved as a warning to drivers (and to other Marshalls to wave their flag) in the event of an incident or hazard on the track. Neither racing nor overtaking is permitted in a yellow flag zone.

10. The Clerk of Course indicated to the Starter that the race could commence.

11. In addition to starting the race, the Starter, positioned in an elevated box over the inside of the track, monitors the start to identify stalled vehicles and warn drivers of the hazard by displaying from his/her position a bright yellow coloured sign about one metre wide with black text – "Stalled Car" – inscribed on it.

12. The Starter initiated the starting lights procedure. A red light was illuminated indicating to the competitors that the grid was set and the race was about to begin. Race 17 commenced when the red light was extinguished at 10.48am.

13. The lead cars pulled away cleanly. However, Mr Huglin's Lamborghini in grid five moved forward a few metres and then stalled. Within seconds of the Lamborghini stalling, the two Grid Marshalls monitoring the first three rows of the grid started waving their yellow flags from pit lane, soon followed by two Grid Marshalls positioned further down the grid. Simultaneously, the "Stalled Car" sign was lowered from the Starter's box.

14. Nonetheless, vehicles continued to draw away from their starting positions, with those starting from grids on the outside of the track, behind the Lamborghini in row three, accelerating more slowly than those in front of it or starting from grids on the inside of the track. The vehicles starting in grids seven, nine, 11 and 13, as if in convoy, gathered speed and were steered towards the centre of the track to avoid the stalled Lamborghini, which was likely only visible to the driver of the grid seven car directly behind it. Mr Hall's Datsun, last in line and accelerating quickly, attempted to overtake Mr Whitlock's Ferrari by manoeuvring further towards the inside of the track but, unable to do so, veered back towards the outside of the track and collided with the rear of the stalled Lamborghini. The force of the impact lifted the rear of each vehicle from the track, shunted both forward and caused the Datsun's windscreen to blow out. The Clerk of Course called for the red flag to be displayed, indicating to drivers that a major incident had occurred requiring them to stop racing, and to the Fire, Rescue and Medical Intervention Units that they should immediately proceed to the incident site.[1]

15. Within 30 seconds of the collision, Fire, Rescue and Medical Intervention Units were at the collision site. The medical chase car was immediately behind the race competitors and so the doctor on board was first to assess the drivers.[2] Upon opening the Datsun's driver side door, Mr Hall was found restrained in an approved racing harness and wearing a helmet but no forward head restraint [FHR]. He was unconscious, not breathing spontaneously and had no peripheral pulse. A bag-valve oxygen mask was applied to aid respiration before the arrival of Dr Brent May, Chief Medical Officer of Team Medical Australia who were providing motorsports medical services for the event.

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[1] Victorian Mini Club Medical Response Plan for the event.

[2] Despite a brief loss of consciousness and experiencing pain in his lower back after the collision, Mr Huglin was able to get out of his Lamborghini unaided and was assessed by paramedics and taken by ambulance to Wonthaggi Hospital. Mr Huglin had been using a frontal head restraint.

16. At Dr May's direction, medical, ambulance and fire teams rapidly extricated Mr Hall from the Datsun so that resuscitation could commence in the back of a road ambulance. Mr Hall was intubated and cardiopulmonary resuscitation was commenced. A cervical collar and pelvic splint were applied, intravenous fluids administered and bilateral needle thoracostomies inserted. Once circulation was re-established, Dr May directed that Mr Hall be transferred to the PIGPC medical centre and that a Helicopter Emergency Medical Service crew be summoned to attend. Mr Hall's vital observations stabilised but he remained unresponsive with a Glasgow Coma Score of three indicating deep unconsciousness.

17. The air ambulance arrived at PIGPC at 11.45am and was en route to The Alfred Hospital Emergency and Trauma Department [The Alfred] with Mr Hall aboard within 30 minutes. On arrival at The Alfred, CT investigations revealed that Mr Hall had sustained left pontine infarction (brainstem injury), subarachnoid haemorrhage, cranio-cervical dislocation with ligamentous injuries, and bilateral pneumothoraces and pulmonary contusions. He was taken to theatre and underwent insertion of right frontal intracranial pressure (EVD) monitor via a burrhole, and application of a halo brace.

18. Throughout 28 October 2013, Mr Hall remained deeply unconscious and sedation was discontinued.

19. On 29 October 2013, somatosensory evoked potential (SSEP) studies were performed, the results demonstrating severe brainstem injury. An MRI showed extensive contusion throughout the brainstem and upper cervical cord. Neurosurgical and neurological specialist opinions confirmed that Mr Hall's prognosis was extremely poor. His family were informed of the prognosis and agreed that life support measures would be withdrawn. Mr Hall was extubated on 30 October 2013 and died the same day.

20. Senior forensic pathologist, Dr Michael Burke of the Victorian Institute of Forensic Medicine, reviewed the circumstances of the death as reported by police to the coroner and post-mortem computer assisted tomography [PMCT] scans and performed an external examination in the mortuary. Dr Burke observed that PMCT demonstrated subarachnoid haemorrhage with intraventricular extension and separation of the atlanto-occipital joint. On physical examination, he identified signs of medical intervention consistent with Mr Hall's known clinical course. Ante-mortem toxicology detected morphine, midazolam, bupivacaine, lignocaine and paracetamol at levels consistent with their therapeutic use in hospital. The pathologist advised that it was reasonable to attribute Mr Hall's death to *head and neck injury* without the need for autopsy.

21. Senior Constable Garth Campbell of Bass Coast Highway Patrol had attended PIGPC on the day of the collision in which Mr Hall was injured and subsequently compiled the coronial

brief of evidence on which this finding is largely based. SC Campbell's comprehensive brief contains statements from a number of eye-witnesses to the collision, race officials, clinicians involved in Mr Hall's care as well as Race Control and Critical Incident Logs, Incident Report Forms, Vehicle Damage Reports, CAMS Organising Permit for the event, Victorian State Circuit Racing Championships Series Regulations and Supplementary Regulations, Victorian Mini Club Medical Response Plan for the event, CAMS policy relating to the management of Critical Incidents, information about head and neck support devices and photographs taken at the collision scene. Materials in the brief indicate:

a. The following timeline derived from video footage at PIGPC –

    i. 10.48 and 49 seconds [10.48:49] the race commences;

    ii. 10.48:51 yellow flags are displayed by Grid Marshalls;

    iii. 10.48:53 Datsun collided with the Lamborghini; and

    iv. 10.49:09 red flag is displayed.

b. Racing vehicles in the Sports Sedan event were likely to achieve a speed of about 100 kilometres per hour in under five seconds. Video footage retrieved from a camera inside the vehicle on the grid behind the Datsun was used to estimate the speed of the impact as about 80 km/p/h.

c. When starting a race from a stationary grid, vehicles accelerating from positions on the grid behind a stalled vehicle have little time to avoid a collision with a stalled car, particularly if it is unsighted or blocked from view by other vehicles.

d. Mr Huglin observed that at the time of the collision his 'attention was fully occupied, reacting to the situation' and that he 'cannot comment on flags or warnings'.[3]

e. Mr Whitlock stated that he 'did not see any yellow flags' because all his attention was on the Lamborghini and avoiding a collision himself.[4]

f. Although the race officials activated the flag and sign[5] hazard system very quickly after the Lamborghini stalled, it appears that the positioning of these warnings was inadequate to effectively alert the drivers.

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[3] Statement of Edward Huglin, Coronial Brief of Evidence.

[4] Statement of Conrad Whitlock, Coronial Brief of Evidence.

[5] The hazard warnings system for race competitors at PIGPC consist of the yellow flags displayed by four Grid Marshalls from pit lane, the one metre wide yellow "Stalled Car" sign lowered from a box above the pit side of the track and the red flag indicating cessation of racing.

g. A high speed nose-to-tail impact collision had occurred between Mr Hall's Datsun and Mr Huglin's Lamborghini. The Datsun sustained extensive front-end damage, involving concertinaing of the bonnet and damage to bodywork, chassis rails, front suspension, the steering column and the engine had been pushed back into the firewall. While the Lamborghini appeared less seriously damaged, inspection revealed that the impact had moved the engine and caused damage to the fuel tank, gearbox and firewall.

h. Post-collision management was in accordance with the requirements of the Victorian Mini Club Medical Response Plan for the event and the CAMS policy relating to the management of Critical Incidents.

i. A frontal head restraint device [FHR] is designed to support the head and neck of the user relative to the torso and in so doing, reduce the force applied to the neck upon impact and lessen the likelihood of serious injury to this area of the body. It was not compulsory for competitors to use a FHR in all motorsport activities regulated by CAMS at the time of Mr Hall's death. Competitors were not required to use such a device in order to participate in Race 17 at PIGPC, a state level race, and Mr Hall had not worn one, unlike Mr Huglin and Mr Whitlock.

j. CAMS changed its regulations in relation to the use of FHR in March 2014.

22. SC Campbell's investigation led him to conclude that insufficiency of hazard warnings for drivers at PIGPC, Mr Hall's inattention to circuit conditions and the failure to use a FHR were factors contributing to the collision and Mr Hall's death.

23. At my request, CAMS provided further information about changes to its FHR regulations. The Chief Executive Officer of CAMS, Eugene Arocca, advised that in late 2013, CAMS reviewed the use of FHR and conducted risk assessments across a range of motorsports regulated by it. CAMS noted that safety test research demonstrated reduced risk of neck injury from frontal collisions when a FHR is used and that the use of FHR was becoming more widespread throughout the motorsport community due to the perceived safety benefits of the device. Consequently, in March 2014, CAMS' regulations were changed to require the mandatory use of an approved FHR[6] in race, road/rally and off-road competitions and related activities (like practice and demonstrations) on 1 July 2014 for national events and on 1 January 2015 for state level events.[7]

[6] Such as the HANS Head and Neck Support or the Simpson Hybrid Pro styles of FHR.

[7] On July 2014 CAMS announced that mandatory use of FHR would be phased in over two years commencing 1 January 2015 in a range of historic motorsports categories as well.

24. In light of concerns about the adequacy of the driver hazard warning system at PIGPC, I convened a meeting with two senior researchers, Dr David Logan and Professor Tim Horberry, of the Monash University Accident Research Centre [MUARC] to identify avenues through which the safety of race drivers could be enhanced. We discussed -

    a. The safety challenges presented by a starting grid incident when competitors were likely to be focussed on the starting lights ahead of them and gaining the competitive edge of a good start to the race.

    b. The suboptimal positioning of the yellow warnings flags at the driver's eye-level, over or through a safety barrier and a small sign above eye-level when drivers' peripheral vision is restricted by their helmet.

    c. The researchers advised that in order to appropriately assess and mediate the safety risks of this scenario, engineering and human factors[8] expertise should be brought to bear and guide the formulation of evidence-based recommendations about safety and warning systems.

25. I find that Mr Hall, late of Cudlee Creek Road in Loebethal, South Australia, died at The Alfred Hospital, Melbourne on 30 October 2013 and that the cause of his death was head and neck injury. Those injuries were sustained when the vehicle he was driving collided with another vehicle stalled ahead of him on the starting grid of a motorsports event at the Phillip Island Grand Prix Circuit on 27 October 2013. It was a high speed collision, producing a forceful impact, and it is tolerably clear that had Mr Hall been wearing a frontal head restraint – or if he had been required to wear one when competing – the risk of sustaining injuries likely to prove fatal would have been significantly reduced.

26. Notwithstanding that only seconds were available to detect and warn drivers of the hazard posed by Mr Huglin's Lamborghini stalled on the starting grid, the evidence before me supports a finding that the hazard warning system employed at PIGPC was inadequate to alert competitors of the danger in all the circumstances pertaining.

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[8] 'Human factors' is the discipline that applies knowledge of human capabilities and limitations to the design, operation and maintenance of technological systems. It draws from established disciplines such as psychology, ergonomics, physiology and engineering. By applying human factors knowledge about people at work to the functional relationships between people, tasks, technologies and the working environment it is possible to reduce the potential for human error, limit the consequences of human error, increase the margin for safety and increase efficiency and effectiveness.

COMMENTS

Pursuant to **section 67(3)** of the ***Coroners Act* 2008**, I make the following comments connected with the death:

1. I commend the Confederation of Australian Motor Sport for its amendment of regulations so as to mandate the use of frontal head restraint devices in a range of motorsport activities. This requirement appears likely to enhance driver safety. Its undertaking to continue to review the use of FHR in motorsport and potentially applying its mandatory use to all levels of competition and activity is entirely appropriate and laudable.

2. That said, optimising safety in any sport or activity having an inherent risk of harm is unlikely to be achieved purely through the minimisation of the *consequences* of adverse events. Rather, the regular and comprehensive assessment of risk – environmental, technological, systematic, human capability and the interactions between these risks – by individuals with appropriate expertise is the essential precursor to the development, implementation and monitoring of evidence-based solutions to these safety challenges.

RECOMMENDATIONS

Pursuant to **section 72(2)** of the ***Coroners Act* 2008**, I make the following recommendation connected with the death:

1. That the Confederation of Australian Motor Sport and event organisers collaborate with engineering and human factors experts to formulate strategies to prevent and mitigate the severity of adverse events occurring in motor races at Phillip Island Grand Prix Circuit any all other venues where races are conducted under its auspices.

2. That the Confederation of Australian Motor Sport circulate this finding among its members.

I direct that a copy of this finding be provided to the following:

Mrs Margaret Hall

SC Garth Campbell, Baw Baw Highway Patrol (Wonthaggi Police)

Confederation of Australian Motor Sport Limited

Victorian State Race Series Incorporated

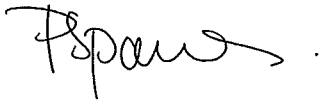
Clinical Governance Unit, the Alfred Hospital

Dr Brent May, c/o MDA National

Dr Alice Roberts-Thomson, Medical HQ GP Family Practice

Monash University Accident Research Centre

Signature:



PARESA ANTONIADIS SPANOS

CORONER

Date: 28 October 2016

Cc: Manager, Coroners Prevention Unit