CORONERS COURT
OF NEW SOUTH WALES

Inquest:	Inquest into the death of Mark Murphy
Hearing dates:	31 January 2022, 1 to 4 February 2022
Date of Findings:	1 July 2022
Place of Findings:	Coroners Court of New South Wales, Lidcombe
Findings of:	Magistrate Derek Lee, Deputy State Coroner
Catchwords:	CORONIAL LAW – occupational diving, sudden cardiac event, drowning, full face mask dislodgement, standby diver, risk assessment, The Pit, Australian Diver Accreditation Scheme, Occupational SCUBA to 30m (Part 1) Course, Standards Australia
File number:	2015/52737
Representation:	Ms D Ward SC, Counsel Assisting, instructed by Ms E McGee (Crown Solicitor's Office) Mr J Glissan QC & Mr P Barry, instructed by Colin Biggers & Paisley Lawyers, for Professional Divers Group Pty Ltd Mr J Wilcox for Mrs T Murphy

Findings:

Mark Murphy died on 20 May 2015 at Albury Base Hospital, East Albury NSW 2640.

The cause of Mark's death was global cerebral hypoxia due to cardiac arrest and drowning, with bilateral bronchopneumonia being a significant condition contributing to Mark's death but not relating to the condition causing it.

Whilst attempting to perform an underwater diving task of righting an overturned workbench it is most likely that Mark's full face mask accidentally became dislodged (although the precise mechanism of dislodgement is not clear) resulting in sudden facial exposure to cold water causing physiological stress and triggering a diving reflex, followed by hypoxia leading to drowning (respiratory impairment due to submersion) and cardiac arrest.

Recommendations:

See Appendix A

Table of Contents

1. Introduction

1.1 On 19 May 2015, Mark Murphy was participating in a night-time underwater diving training drill as part of an occupational diving course that was being conducted at a location in the Wodonga Wetlands near Albury. Whilst performing the drill with a fellow student diver, the full face mask that Mark was wearing was heard to flood with water. Moments later, Mark delivered a signal via an emergency lifeline to other course participants who were on the shore indicating that he was in distress. An emergency standby diver entered the water and found Mark floating in the water, unresponsive and with no signs of life.

1.2 After being brought to the surface, resuscitation attempts were initiated and Mark was conveyed to hospital where he was placed on advanced life support. However, Mark did not make any meaningful neurological recovery and, following certification of brain death, was tragically pronounced life extinct on 20 May 2015.

2. Why was an inquest held?

2.1 Under the *Coroners Act 2009* (**the Act**) a Coroner has the responsibility to investigate all reportable deaths. This investigation is conducted primarily so that a Coroner can answer questions that they are required to answer pursuant to the Act, namely: the identity of the person who died, when and where they died, and the cause and the manner of that person's death.

2.2 Certain deaths are reportable to a Coroner. Some examples of reportable deaths are where the cause of a person's death is not due to natural causes, or where the cause or manner of person's death may not immediately be known. In Mark's case, his death was reported because the cause of his death was not due to natural causes; rather, it occurred during the diving drill that Mark was engaged in at the time, in sudden and unexpected circumstances. In addition, the circumstances in which Mark's full face mask became flooded and how he came to be in distress were not immediately apparent or well understood. Therefore, a coronial investigation was required which attempted to understand the sequence of events leading up to Mark being found unresponsive in the water, and therefore the manner of Mark's death.

2.3 In this context it should be recognised at the outset that the operation of the Act, and the coronial process in general, represents an intrusion by the State into what is usually one of the most traumatic events in the lives of family members who have lost a loved one. At such times, it is reasonably expected that families will want to grieve and attempt to cope with their enormous loss in private. That grieving and loss does not diminish significantly over time. Therefore, it should be acknowledged that the coronial process and an inquest by their very nature unfortunately compels a family to re-live distressing memories several years after the trauma experienced as a result of a death, and to do so in a public forum. This is an entirely uncommon, and usually foreign, experience for families who have lost a loved one.

2.4 It should also be recognised that for deaths which result in an inquest being held, the coronial process is often a lengthy one. The impact that such a process has on family members who have

many unanswered questions regarding the circumstances in which a loved one has died cannot be overstated.

2.5 Inquests have a forward-thinking, preventative focus. At the end of many inquests Coroners often exercise a power, provided for by section 82 of the Act, to make recommendations. These recommendations are made to organisations and individuals in order to draw attention to systemic issues that are identified during a coronial investigation and examined during the course of an inquest. Recommendations in relation to any matter connected with a person's death may be made if a Coroner considers them to be necessary or desirable. Where an inquest is able to identify issues that may potentially adversely impact upon the safety and well-being of the wider community, recommendations are made in the hope that, if implemented after careful consideration, they will reduce the likelihood of other adverse or life-threatening outcomes.

3. Recognition of Mark's life

3.1 Inquests and the coronial process are as much about life as they are about death. A coronial system exists because we, as a community, recognise the fragility of human life and value enormously the preciousness of it. Understanding the impact that the death of a person has had on those closest to that person only comes from knowing something of that person's life. Therefore, it is important to recognise and acknowledge the life of that person in a brief, but hopefully meaningful, way.

3.2 Mark was born in 1965 to his parents, Leon and Betty. He grew up in the Northern Beaches area of Sydney and was a keen swimmer and surfer. Mark later took part in competitive swimming and whilst at a swimming club in Tweed Heads in 2001 he met his future wife, Thelma. Mark and Thelma married in August 2007.

3.3 Between around 2006 and 2014, Mark took part in various diving courses and obtained a number of diving certifications. Thelma describes Mark as living his dream by teaching others to dive. Thelma shared Mark's love of diving, and together they dived at numerous locations around the world, including the Cook Islands, Jamaica, Tahiti, and at various islands throughout the Caribbean.

3.4 Mark worked in the tourism industry at various locations in Surfers Paradise, the Gold Coast and Lady Elliot Island. He was also a keen conservationist and joined a number of conservation organisations. Mark was also generous with his time and often performed volunteer work as an open water SCUBA diving instructor.

3.5 Mark enjoyed a close relationship with his parents, and in particular with his father. Leon describes their relationship as more like brothers, rather than father and son. They did many activities together, including surfing, water-skiing, and fishing. One of Leon's fondest memories is Mark (who did not have any previous military service) marching with him during one ANZAC Day. Mark proudly wore his great-grandfather's service medallion from the Boer War and enjoyed the day with his parents.

3.6 Thelma describes Mark as the love of her life. They had previously bought a caravan together and had plans to renovate and eventually sell it before buying a house. Mark and Thelma also had many other plans for their future which included continuing to pursue their passion for diving and sense of adventure.

3.7 There is no doubt that the sudden and tragic way in which Mark was separated from his dearly loved ones is heartbreaking. It is equally evident that Mark's loss continues to be deeply felt by those who loved him the most.

4. Mark's previous personal circumstances

4.1 In the years leading up to 2015, Mark and Thelma had experienced significant financial and emotional challenges associated with the loss of their home and investment properties. In particular, Mark became frustrated regarding his dealings with his bank. In addition, Mark had been unable to maintain long-term paid employment.

4.2 It appears that these challenges culminated in a self-harm attempt by Mark on 2 February 2015, when Thelma and Mark's father described him as being at the lowest point in his life and having acted impulsively. As a result of this incident, Mark was admitted to hospital for a brief period. He was later discharged with a principal diagnosis of a suicide attempt and depression, and it was noted that he was experiencing ongoing issues with chronic back pain.

5. Mark's diving experience

5.1 Mark had previously worked in the recreational diving industry, having passed the Professional Association of Dive Instructors (**PADI**) open water dive certification in 2006, the dive master course in 2010, and the open water SCUBA instructor course in 2012. In 2014, Mark obtained further qualifications including as an enriched air instructor. At the time of his death, Mark had logged approximately 657 dives.

5.2 On 20 February 2015, Mark applied to attend an Occupational SCUBA to 30m (Part 1) course (**the Course**) operated by Professional Divers Training Academy (**PDTA**) in Albury. The Australian Diver Accreditation Scheme (**ADAS**) was responsible for accrediting and monitoring accredited training establishments (**ATE**) (such as PDTA) in their design and conduct of the course in accordance with Australian Standard (**AS**) AS2815.1 *Certification of Occupational Divers Part 1: Occupational SCUBA Dive.* The course, therefore, was known as the ADAS Part 1 Course.

5.3 As part of the medical requirements to attend the Course, Mark needed a current medical certificate certifying that he was fit to dive. This certificate was required to be issued following a diving medical examination in accordance with *AS/NZS2299 Occupational Diving Operations Part 1*.

5.4 On 19 March 2015, Mark attended upon Dr Alan Mackenzie in Surfers Paradise for the purpose of obtaining a current medical certificate. Although Mark had seen Dr Mackenzie earlier in the year for the same purpose, there is limited evidence as to any discussion between Mark and Dr Mackenzie regarding Mark's medical history. It appears that measurements were taken of Mark's respiratory function, blood pressure and pulse and regard was had to a chest x-ray performed in 2014. Ultimately, this assessment resulted in a medical certificate being issued certifying that Mark was fit to dive. However, it is not clear whether this certificate was ever provided to PDTA.

5.5 On 14 April 2015, Mark woke up experiencing left-sided chest pain and feeling like he was going to pass out. Mark was conveyed to hospital by ambulance where he was diagnosed with possible acute coronary syndrome. Investigations detected no pulmonary embolism and whilst neoplasia was not excluded, it was considered that findings relating to the pulmonary veins on the right lower lobe seen on imaging were, on balance, more likely to be insignificant rather than true pathology.

5.6 Mark was later discharged with a request made for Mark to attend upon his general practitioner (**GP**) for review within 48 hours and for a further PET scan to be performed with appropriate follow-up. However, there is no evidence to indicate that Mark attended upon his GP or for a further PET scan.

5.7 After being accepted into the Course, Mark travelled to Albury with his father to commence the Course.

5.8 Whilst undertaking the Course, Mark underwent a second medical assessment which included an ECG, a chest x-ray, assessments of Mark's vision, hearing and respiratory function, together with completion of a questionnaire. In completing this questionnaire, Mark denied having ever experienced the following: severe depression, mental illness, heart disease, palpitations, chest pain or discomfort on exertion, shortness of breath on exertion, pleurisy, severe chest pain, and any other chest complaint. Instead, Mark did refer to his previous back injury. In doing so, Mark did not provide the same level of detail that he provided to the mental health team following his discharge from hospital in February 2015. Similarly, Mark made no mention when completing the questionnaire of his previous self-harm attempt.

6. Nature of the Course

6.1 The Course was designed to run over a minimum of four weeks and covered activities and competencies required for the training and certification of divers who are required to work safely and competently using SCUBA to depths of 30 metres in accordance with AS/NZS 2299.1:2007. In particular, the Course intended to achieve the following for its participants:

(a) establish the first level of certification and occupational SCUBA diving skills for a commercial diver;

(b) establish competencies in at least the following areas: health and safety in diving operations, implementing emergency procedures for SCUBA, and undertaking basic diving work tasks, including lifting tasks; and

(c) preparing recreational scuba divers to work safely and effectively as members of a diving team using modern full face masks with effective communications to successfully achieve a variety of light work, inspection, and survey tasks.

6.2 The Course commenced on 4 May 2015 with nine students of varying age and dive experience. Richard Austin was the diver trainer manager and Brett Rapp was another diver trainer responsible for, amongst other things, supervising the student dive teams during diving exercises. By 19 May 2015, two of the dive students had deferred the Course (with one to complete a later course and the other having injured his hand during an earlier diving exercise) so that only seven student divers remained.

6.3 The first week of the Course consisted of a theory component which involved discussion and assessment of topics such as diver safety, dangers associated with high-risk occupations, use of line signals, anatomy and physiology, and the use of dive and cardiopulmonary resuscitation (**CPR**) equipment.

6.4 Diving exercises commenced in the second week of the Course. On 12 May 2015 the student divers conducted their first dive at a location known as The Pit which is situated within the Wonga Wetlands, an area owned and managed by Albury City Council. ADAS had accredited PDTA to conduct training dives at The Pit, with other dives also conducted at a nearby location.

6.5 During the course of this week, the dive students gained experience using different types of full face masks (**FFM**) that, amongst other things, permitted them, whilst performing underwater tasks, to communicate with an operator located on the shore. The students also performed various drills relating to different competencies including the ability to clear a flooded mask. Mark and the other students passed these various drills.

7. What happened on 19 May 2015?

7.1 The dive training on 19 May 2015 consisted of theoretical lessons in the morning, followed by the dive supervisors and students travelling to The Pit so that dives could be performed in the afternoon and, for the first time during the Course, at night. The supervisors and students were divided as follows:

(a) Mr Austin and students Thomas Erlington, Joel Irvine, Matthew McVicar formed Team 1; and

(b) Mark, Mr Rapp, and students Gianberto Garcia, Rowan Maguire, and Ewan van Teijlingen formed Team 2.

7.2 Richard (Richie) Essers was the standby diver for both the afternoon and night time dives. Mr Essers, a former PDTA student, had completed the ADAS Part 1 Course in January 2014 and was hoping to complete Part 2 of the course at a later time (possibly with the student divers undertaking the ADAS Part 1 Course in May 2015). After completing the ADAS Part 1 Course, Mr Essers had worked as a builder but was also available to perform casual work for PDTA, having previously "*operated as a tender*" and worked "*kind of like a standby diver*". Despite this previous work, 19 May 2015 was the first occasion that Mr Essers was tasked as a stand by diver for a group of student divers, and the first occasion that he had worked with Mr Rapp.

7.3 The afternoon dives involved the student divers performing a variety of tasks at depths of around 9 to 10 metres. During these dives, students were given the opportunity to act as a trainee dive supervisor for the first time by operating the communications system. Mr Austin and Mr Rapp acted as the ATE Supervisor for Team 1 and Team 2, respectively.

7.4 It appears that one of the tasks that the student divers were to perform during the afternoon created a degree of tenson amongst the Team 2 members. The task involved locating a star picket some 30 metres from the water's edge at a depth of around 9 to 10 metres. After locating the star picket, the student divers were required to reattach a dislodged guide rope and then mark the location of the star picket with a float. Mark was operating the communications equipment during this task and Mr Austin noticed "*just a bit of agitation and frustration creeping in*" as the Team 2 members were not moving to the locations as directed by Mark, which caused confusion when trying to locate the star picket. Team 1 was eventually unable to complete the task.

7.5 After the student divers were assigned different roles, Team 2 attempted the task again. On this occasion, Mark was in the water with Mr Garcia. Mark was eventually able to locate the star picket, however Mr Austin became concerned that Mr Garcia may be entangled as the latter notified Mr van Teijlingen (who was operating the communications panel) that his main gas tank pressure was low. Mr Austin directed Mr Rapp to bring the divers to the surface and told Mr Essers to "*just start getting organised and just start getting dressed in*".

7.6 Mark was instructed to abandon the task, locate Mr Garcia, and assist in untangling him. Mark was able to do so and both divers returned to the surface. However, it appears that the challenges associated with this dive may, in combination with the agitation associated with the earlier dive that afternoon, have affected the group dynamics within Team 1.

7.7 After a storm passed through all the divers took a break and had something to eat. Following this the student divers were given a briefing by Mr Austin for about 10 to 15 minutes regarding the night dive. Team 2 were back in the water for the night dive ahead of Team 1.

7.8 The night dive task involved divers bringing a work bench with lift bag, cold chisel, mash hammer and length of chain to a designated location near a submerged car. After locating a suitable flat level area, the divers were required to assemble the work bench and then remove a link of chain and return it (**the Workbench Task**). According to Mr Garcia, Mr Rapp instructed he and Mark bring the work bench to a location in front of the submerged car and to assemble it there.

7.9 There is some uncertainty about the location where the work bench was to be assembled, whether it be the area in front of the submerged car, or to the left of that location. According to Mr Garcia, he was instructed by Mr Rapp to place the work bench down at a particular location. Mark accordingly began deflating the lift bag so that the work bench could be lowered into position. Some of the student divers had not previously used a lift bag.

7.10 Once the work bench was in position, Mr Garcia returned to shore on at least two occasions in order to collect the legs that were to be fitted to the workbench. At some point someone obtained the cold chisel, mash hammer and length of chain. It appears that the one of the intentions of the task was for the divers to separate at different times. As a result, the divers were unable to maintain visual contact with one another.

7.11 Once Team 1 had collected the four table legs the bench could be assembled. With this completed the table then needed to be turned around and stood on its legs which was difficult due to the heaviness of the table. Mark and Mr Garcia attempted unsuccessfully to lift the table which caused Mr Garcia to lose his balance. This prompted Mr Garcia to ask Mr van Teijlingen (who was again operating the communications panel) to tell Mark to slow the lifting down. Mr van Teijlingen told Mr Garcia to stand by as Mark wanted to stand the table up on its side by himself. As the table was located on a small incline and Mark was attempting to life the table from the higher side, the table kept sliding away from him. As this occurred Mark progressively moved away from Mr Garcia so that eventually Mr Garcia lost sight of Mark. This was the last occasion that anyone saw Mark conscious. Due to the difficulties that Mark was experiencing in trying to lift the table, Mr Garcia, Mr Austin, and Mr Rapp all formed the view that Mark was showing signs of frustration.

7.12 Whilst Mr Rapp was acting as dive attendant to both Mark and Mr Garcia, he felt a number of tugs on the line: four tugs and then a series of continuous tugs. In accordance with training provided to the student divers earlier in the course it was understood that four pulls on the communication life line was an emergency signal which did not require a response but rather immediate action in starting to use the life-line to pull a diver up to the surface. Mr Rapp describes the pulls that he felt to be "*distinctive as in it was, 'I need some help'*".

7.13 Despite his efforts Mr Rapp was unable to pull Mark up to the surface. As he started to bring the line in it became snagged almost immediately. Mr Austin directed Mr van Teijlingen to instruct Mr Garcia to find Mark. In response, Mr Garcia swam to the location where he had last seen Mark. Upon finding Mark, Mr Garcia noted that he was motionless with his body outstretched as if he was lying

on his back, but with his body suspended above the floor of The Pit. Mark's FFM was off his head and was instead down by his right side. Mr Garcia attempted to reattach Mark's FFM but was unable to do so as it appeared to be stuck on an unidentified object. Mr Garcia was instructed to bring Mark to the surface, but he was unable to do so.

7.14 As this was occurring, Mr Essers was acting as an attendant to another one of the student divers (Mr Maguire) from Team 2 who was still in the water. Mr Essers had not heard the sound of Mark's FFM flooding, nor seen the rush of bubbles to the surface. Mr Austin instructed Mr Essers to enter the water. In a later electronically recorded interview with the New South Wales Police Force (**NSWPF**), Mr Essers described the events in this way:

> I then returned to my post and then literally by the time I got to the post I heard …that's when Rick took over the comms and I remember Rick saying …to find the other diver...my dressing in was very short response afterward. Like I was already standing next to my gear...once I stared suiting up there was someone kind of helping me, like holding my mask…while I was fitting my mask I was already making my way to the water's edge. Brett was already ready kind of holding the umbilical [this is a reference to Mark's communication life line. There was no umbilical or CLL used for the stand by diver]…I didn't have a top mounted light I just had my kind of the one that was strapped to my harness and so I just kind of made the point of like I tried to call out to somebody to say you know…grab my torch for me. Obviously no one heard me so I took probably you know two or three seconds to locate it for myself …

7.15 Mr Essers entered the water without fins and without attaching himself to the lifeline that he was asked to follow. Instead, Mr Essers followed the lifeline with his hands and eventually reached Mr Garcia. Mr Essers pushed past Mr Garcia and found Mark floating in the water, unresponsive. In his interview with the NSWPF, Mr Essers described his attempts to assist Mark as follows:

> First thing, I kind of put my arm around me and gathered him to me…felt front of his torso, his wetsuit, like harness, held to him as best I could… Braced my feet against the gravel and just started trying to work my way back…tried to like pull…back…I kind of struggled to lift him…cradling him still …I kind of looked for BC…found it…flatted by BC a bit to give me a bit of extra force and momentum…I probably say this took place over maybe 10 seconds…so after inflating it and maybe another five seconds…still trying to pull at him. Realised that he was entangled…I remember grabbing his umbilical again…I just ran my hand down until I felt his umbilical…and then I followed that back to the sawhorse…wouldn't have been more than a metre…then I've just kind of you know kind familiarised myself…what end I was at. I believe that I saw the vice and I could see that, you know, part of the umbilical was wrapped around a leg and part of the vice…think sawhorse was lying on the side…with legs somewhat pointing in the downward direction…so the umbilical ran down…probably about a metre's worth of umbilical…I think it was down underneath this leg…this is one on the ground… then it appeared to be hooped around the vice…and then back down around this leg and then to Mark
>
> I considered actually cutting his umbilical. I decided not to because…I didn't know whether like I thought there was the inside possibility that once I cut his umbilical, one, I'd go to the surface because I'd already inflated not having, decided not having to brought my fins with me, it would've then been you know a difficult swim…a time consuming swim back to the bank which is the point that I…thought there would be still so a possibility that if I was to like let go of him or lose my grip or anything like that…he'd be lost

> Grabbing his umbilical, following it as best as I could, I then like the first thing I remember untangling is…I think I remember following it around a leg. I think you know with 1 hand I was …unhook from one leg…I'm fairly certain I let go of my torch at this stage…cause there was enough ambient light…and at the same time given myself enough slack to bring the hoop off the vice and then I remember it all kind of like being kind of pulled fairly quickly

7.16 Mr Essers was eventually able to bring Mark the surface. Mr Austin wrote a note that this occurred at 6:49pm with the flooded FFM having occurred at 6:43pm.

7.17 Once at the surface, Mark was brought to the bank where resuscitation attempts began. A defibrillator was used but Mark had no shockable rhythm. Emergency services were contacted and Mark was conveyed by ambulance to Albury Base Hospital. The paramedics were able to achieve a return of spontaneous circulation prior to arriving at hospital where it was noted that, despite this, Mark had no neurological function. Apparent brain death was noted at around 4:00am on 20 May 2015. Tragically, there was no meaningful neurological recovery and Mark was later pronounced life extinct at 12:10pm following the arrival of his family.

8. The postmortem examination

8.1 Mark was later taken to the Department of Forensic Medicine at Newcastle where a postmortem examination was performed by Dr Brian Beer, forensic pathologist, on 25 May 2015. Microscopic examination at autopsy revealed:

(a) that the left ventricle myocardium showed very focal sub endocardial interstitial fibrosis, with no other abnormality;

(b) moderate bronchopneumonia in both lower lobes of the lungs; and

(c) widespread acute ischaemic neuronal change throughout the cerebral hemispheres, cerebellum, and brainstem in keeping with the history of clinical brain death.

8.2 In the autopsy report dated 24 June 2015, Dr Beer noted that the toxicology results were non-contributory to death, and that "*there was no underlying cardiac or brain pathology to indicate a possible cause for a loss of consciousness thus leading to the near drowning*". Ultimately, Dr Beer opined that the cause of Mark's death was global cerebral hypoxaemia (brain death) secondary to near drowning, with bilateral bronchopneumonia being a significant condition contributing to Mark's death not relating to the condition causing it.

9. The death of Alan Vaughn

9.1 On 15 September 2006, Alan Vaughn died at Albury Base Hospital following a diving incident at The Pit. Mr Vaughn had been a student in an occupational diving course conducted by Descend Underwater Training Centre (**Descend**). Whilst PDTA later bought the business from Descend, the directors of PDTA were unconnected with Descend.

9.2 Mr Austin was the senior instructor for the dive. Mr Vaughn and his dive buddy were acting as in water standby divers for each other during a training exercise. This involved attaching a marker buoy to a drum that had ended up in a different area of The Pit during a previous dive. According to Mr Austin, Mr Vaughn was instructed to return to the surface. As this occurred, the sounds of a "*garbled scream or call*" was heard over the communications line, followed by the sounds of water entering a mask. It was noted that there were no bubbles coming from the approximate area where Mr Vaughn was located.

9.3 Mr Austin instructed another dive supervisor to swim out to Mr Vaughn's location, following the communications line. As this was occurring, Mr Austin was in the process of changing an oxygen cylinder and SCUBA set up for Mr Vaughn's dive buddy so that he could go back down and rescue Mr Vaughn.

9.4 Mr Vaughn was eventually located with his mask off his face and unconscious. Attempts were made to bring Mr Vaughn to the surface but it was found that he was entangled. With the assistance of another student diver a subsequent attempt was made to disentangle Mr Vaughn and he was eventually brought to the surface. Mr Vaughn was conveyed by ambulance to hospital but was unable to be revived and later pronounced life extinct. The cause of Mr Vaughn's death was later determined to be drowning.

10. What issues did the inquest examine?

10.1 Prior to the commencement of the inquest a list of issues was circulated amongst the sufficiently interested parties, identifying the scope of the inquest and the issues to be considered. That list identified the following issues:

(1) What was the cause of Mark's death, and what medical evidence supports or detracts from a finding death resulted from:

(a) a sudden cardiac arrest;
(b) a hypoxic arrest; or
(c) some other cause or combination of causes?

(2) What is the relevance of Mark's failure to disclose his April 2015 attendance at Tweed Heads Hospital prior to obtaining a medical clearance to commence the PDTA course?

(3) What training did Mark receive in clearing a flooded full face mask prior to the evening drill on 19 May 2015?

(4) Was a risk assessment performed at the site prior to the drills commencing on 19 May 2015 and if so, was the risk assessment adequate?

(5) Why wasn't the communication equipment working so as to record communication with the divers and when was this failure to record first uncovered?

(6) How were roles allocated for the evening drill on 19 May 2015 and to what extent did allocations take into account task loading involved for each participant?

(7) What briefing was given to students on Team 2 prior to commencing the evening drill on 19 May 2015?

(8) Where were Team 2 directed to perform the evening drill and where did they in fact perform the evening drill?

(9) How did Mark's mask flood or become dislodged during the evening drill?

(10) What level of preparedness was required of the standby diver under the PDTA operations manual then in force, and what level of preparedness did the standby diver have in practice during the evening drill?

(11) What Australian Standards applied to the conduct of the PDTA course as at May 2015 and what did those AS require in relation to the safe conduct of dive training and risk management during such training?

(12) What Australian Standards apply to similar courses currently and what do they require in relation to the safe conduct of dive training and risk management during such training?

(13) What did the Australian Diver's Accreditation Scheme Training Management System (Policy and Procedures Manual) require in relation to the safe conduct of dive training and risk management during such training as at May 2015?

(14) What do the Australian Diver's Accreditation Scheme Training Management System (Policy and Procedures Manual) require in relation to the safe conduct of dive training and risk management during such training currently?

10.2 Each of the above issues is discussed in detail below, and it will be convenient to consider some of the issues together and in chronological order. It should also be noted that Issues 11 and 13 above are not considered separately in these findings as reference will be made to them in the course of considering the other issues set out above.

10.3 In order to assist with consideration of some of the above issues, opinion was sought from the following experts. Each of the experts provided reports which were included in the brief of evidence, and some of the experts also gave evidence during the inquest:

(a) Associate Professor Mark Adams, Head, Department of Cardiology, Royal Prince Alfred Hospital;

(b) Professor Gordian Fulde, Director of Emergency Medicine, St Vincent's Public Hospital;

(c) Associate Professor Anna Holgate senior staff specialist in emergency medicine;

(d) Professor Anne Keogh AM, senior heart transplant cardiologist, St Vincent's Public Hospital;

(e) Dr Ian Millar, occupational physician and specialist in diving and hyperbaric medicine; and

(f) Dr Judith Perl, consultant pharmacologist.

11. What was the cause and manner of Mark's death?

11.1 Examination of the cause and manner of Mark's death requires consideration not only of the events on the evening of 19 May 2015, but also the considerable expert evidence that has been gathered over the course of the coronial investigation.

Expert reports

11.2 Professor Keogh was instructed by the legal representatives for PDTA to provide an expert report which addressed a number of aspects regarding the circumstances of Mark's death. In that report, Professor Keogh opined as to the following:

(a) The sub endocardial interstitial fibrosis of the left ventricle is an area of scar tissue which forms as the result of a prior heart injury. In Mark's case, this "*appears likely to have been caused by prior inflammation of the heart muscle, likely a subclinical myocarditis occurring a month before*" 19 May 2015.

(b) The prior inflammation of the heart muscle was clinically undetectable, meaning that it was a minor and did not affect cardiac muscle function enough to raise clinical suspicion at the time nor lead to cardiac tests which may or may not have diagnosed it.

(c) The most important consequence of the sub endocardial interstitial fibrosis manifesting itself is sudden cardiac death (colloquially, cardiac arrest).

(d) The assumed facts described to Professor Keogh in the letter of instruction are "*consistent with sudden cardiac death on the substrate of focal sub endocardial interstitial fibrosis, with the primary arrhythmia likely to have been ventricular fibrillation, degenerating into asystole*".

(e) The available evidence strongly suggested that "*the cause of death was a primary cardiac arrest which occurred under water rather than a primary drowning*".

11.3 In expressing the above opinions, Professor Keogh considered that (on the information that she was provided with) after the sounds of Mark's FFM flooding were heard, four or five tugs were felt on his umbilical line, followed by no further movements or struggle. Professor Keogh assumed that Mark was an experienced diver and "*would have been well practised in underwater procedures of mask off or entanglement*", but that he did not take any action to reattach his FFM, resurface, disentangle himself or tug on the umbilical line again. Professor Keogh concluded:

> The fact that [Mark] did not seem to achieve any of these after the short sequence of tugs, indicates to me that he was not able to, not because of lack of experience or training, but because of unconsciousness. The sequence is consistent with his physical volition having been taken from him by sudden unconsciousness.
> […]
> The most likely cardiac event to cause such swift incapacitation would have been ventricular fibrillation (or possibly ventricular tachycardia) the generating into cardiac standstill (cardiac arrest).

11.4 In his report, Professor Fulde (who was also instructed by the legal representatives for PDTA) thought the finding of very focal sub endocardial fibrosis of the left ventricle to be "*very significant*". Professor Fulde also expressed agreement with the opinion expressed by Professor Keogh regarding the nature and significance of this pathology, noting that "*it explains the poor outcome initially and subsequently*". In addition, Professor Fulde indicated that whilst he was unable to form a definite opinion on whether Mark deliberately removed his FFM, he noted that it is common for patients in a medical setting who are experiencing severe difficulties in breathing to instinctively resist placement of an oxygen mask over their nose/mouth and to often "*reflexively 'tear' it off their face even if they know, understand it may be critical to their survival*".

11.5 Associate Professor Adams was instructed to provide a report as part of the coronial investigation. In his report, Associate Professor Adams opined as to the following:

(a) The most likely cause of the focal sub endocardial fibrosis "*may be an episode of subclinical myocarditis at some point in the preceding years*". Associate Professor Adams considered that this did not correlate with the episode of chest pain that Mark experience in April 2015 because the troponin I level was normal, in circumstances where it would most likely have been increased in an episode of myocarditis.

(b) It is possible that the sub endocardial fibrosis could have been a factor if Mark had experienced a sudden death. However, Associate Professor Adams noted that if Mark "*had experienced a sudden cardiac death it would not have been possible for him to send an emergency signal via the 'umbilical' line*". Therefore, Associate Professor Adams considered that the surrounding events do not support sudden cardiac death as the mode of death.

11.6 Associate Professor Holgate opined that the very focal sub endocardial interstitial fibrosis had no role in Mark's death. Associate Professor Holdgate further noted:

> [S]uch injury is associated with evidence of abnormal cardiac function such as regional wall motion abnormalities and poor contractility. While the cause of the very focal area of sub endocardial interstitial fibrosis is unknown, in the absence of any other evidence of cardiac pathology on ECG, echocardiogram or autopsy, this is an incidental finding that is of no clinical significan[ce].

11.7 Associate Professor Holdgate also noted that where an underlying cardiac abnormality causes cardiac arrest, the rhythm is typically ventricular fibrillation or ventricular tachycardia, both of which are amenable to shock from a defibrillator. In this regard, Associate Professor Holdgate expressed the following view:

> When [Mark's] heart rhythm was first assessed by the Ambulance officers he was in asystole. This cardiac rhythm is the absence of any electrical activity and is typically seen when cardiac arrest is caused by a lack of oxygen, such as in immersion injuries. The [defibrillator] applied by his fellow divers did not demonstrate an arrhythmia that was amenable to electric shock, and the rhythm at this time was most likely also asystole.

> The absence of such a rhythm in [Mark] confirms that the sequence of events that caused his cardiac arrest was a lack of oxygen which subsequently caused the heart to stop beating. There is no evidence that any underlying cardiac abnormality contributed to [Mark]'s death.

11.8 As to the possibility of a primary cardiac event occurring, Associate Professor Holdgate opined:

> The presence of asystole as the initial rhythm is entirely consistent with primary drowning causing severe hypoxia (lack of oxygen) which eventually lead to cessation of cardiac activity. That the ambulance crew were able to re-establish a pulse after providing supplemental oxygen, respiratory support and intravenous adrenalin, strongly supports primary hypoxia as the likely cause of cardiac arrest. The fact that they were able to restart [Mark's] heart suggests that the heart itself was healthy but for the sudden deprivation of oxygen which caused it to stop beating.

11.9 A supplementary report was also sought from Dr Millar as part of the coronial investigation. In that report, Dr Millar opined as to the following:

(a) The most likely sequence of events was entanglement, accidental loss of Mark's FFM, drowning, cardiac arrest, followed by Mark's rescue and resuscitation efforts being initiated.

(b) Mark's delivery of pulls along his lifeline suggests that at the time he was physically and mentally capable of a trained emergency action. As he had lost his FFM a short time earlier, the lifeline signals "*does not suggest the actions of a diver incapacitated by panic, but rather his final purposeful, trained survival actions*".

(c) Dr Millar expressed the view that it does not seem critical to determine which of the following physiological explanations underlie Mark's loss of consciousness: cardiac arrest causing unconsciousness due to cessation of cerebral circulation or hypoxia becoming critical when oxygen levels fell below the threshold for consciousness due to lack of respiration and continuing consumption by muscle and metabolic activity.

(d) Notwithstanding the above, Dr Millar opined that "*it is somewhat more likely that loss of consciousness due to cardiac arrest terminated lifeline signals from [Mark] rather than loss of consciousness due to hypoxia, with cardiac arrest occurring at some time later during the rescue attempt*".

(e) Following dislodgement of the FFM, Mark's sudden facial exposure to water within the 10 to 15°C range generates a maximal response of both the gasp reflex (an uncontrollable large gasp that can result in water inhalation) and a diving reflex (which stimulates a number of autonomic system responses including vagus nerve stimulation which normally slows the heart rate, amongst other effects).

(f) Dr Millar noted that the diving reflex may have been a significant factor following FFM dislodgement as it is reported to be maximal after around 30 to 60 seconds following facial exposure to cold water. Dr Millar also noted that the "*diving reflex is proposed to be a key factor in the 'autonomic conflict' which is hypothesised to be a trigger for early onset cardiac arrest in some drowning victims*".

Expert conclave

11.10 On 3 September 2021 an expert conclave was held in an attempt to resolve some of the issues central to the inquest. Associate Professor Adams, Dr Beer, Associate Professor Holgate, Professor Keogh, and Dr Millar all participated in the conclave with a number of questions posed to the experts. The relevant outcome of the conclave is summarised below:

(a) Mark was unlikely to have experienced any signs or symptoms as a result of the very focal sub endocardial interstitial fibrosis which was identified at autopsy. He may have experienced separate events triggering the development of the fibrosis over time, which could have occurred at any time. However, even if identified in life, the fibrosis could not have been treated.

(b) The experts noted that there is no single definition of sudden cardiac death.

(c) As to the question of whether Mark suffered a ventricular rhythm disturbance leading to cardiac arrest:

(i) Dr Beer expressed the view that there was not any disease initiating the event that caused Mark's death, and that the fibrosis was not of a sufficient size for it to be the stimulus;

(ii) Professor Keogh considered that Mark experienced a cardiac arrhythmia and then became unconscious;

(iii) Associate Professor Holgate opined that the primary event was FFM dislodgement leading to hypoxia, followed by Mark making four pulls for assistance before going into cardiac arrest at some later time; and

(iv) Dr Millar agreed with the chronology described by Associate Professor Holgate, and opined that Mark's exposure to cold water "*caused extreme physiological stress and initiated both a sympathetic response and parasympathetic response, which triggered a cardiac arrest and made his death inevitable*".

(d) As to the question of whether the fact that Mark was able to tug on the lifeline supported or detracted from a conclusion that he experienced a cardiac arrest prior to FFM flooding:

(i) Professor Keogh referred to the fact that whilst a patient is being monitored a stuttering pattern of rhythm disturbance may be observed prior to cardiac arrest; and

(ii) Associate Professor Adams, Associate Professor Holgate and Dr Millar all expressed the view that Mark experienced a cardiac arrest after FFM dislodgement, and after he completed the four pulls on the lifeline. Relevantly, Associate Professor Adams noted that if Mark was experiencing ventricular tachycardia with no output or asystole it would have been virtually impossible for him to tug on the lifeline, and Dr Millar noted

that after a person goes into cardiac arrest, their ability to exert energy in any meaningful way is temporally limited to seconds.

(e) All the experts agreed that Mark did not go into ventricular fibrillation just before or around the time that FFM dislodgement occurred.

(f) As to the question of what type of cardiac arrest led to hypoxia:

(i) Professor Keogh expressed the view that Mark suffered a ventricular fibrillation or an asystole cardiac arrest;

(ii) Dr Beer expressed the view that there was no primary cardiac disease cause for the cardiac arrest but that it was initiated by accidental FFM dislodgement and therefore due to a training mechanism; and

(iii) Associate Professor Holgate expressed the view that it is most likely that FFM dislodgement was the primary event leading to hypoxia and a sequence of other physiological effects ultimately culminating in cardiac arrest.

(g) As to the ultimate question of how best to record the cause of Mark's death:

(i) Dr Beer expressed the view that this was accurately described in the autopsy report, namely global cerebral hypoxia caused by drowning;

(ii) Associate Professor Adams agreed the direct cause of Mark's death is best described as global cerebral hypoxia;

(iii) Professor Keogh opined that the direct cause of death is best described as cerebral hypoxia;

(iv) Associate Professor Holgate expressed a similar view that the direct cause of Mark's death is best described as brain death due to global cerebral hypoxia; and

(v) Dr Millar expressed the view that in relation to the direct injury sustained by Mark, the most accurate description is that he suffered an ischaemic injury.

Expert evidence at inquest

11.11 Professor Keogh, Associate Professor Adams and Dr Millar all gave evidence concurrently at the inquest. At the outset, both Associate Professor Adams and Professor Keogh expressed no difficulty in accepting Dr Millar's definition of drowning as respiratory impairment due to submersion. Dr Millar indicated that he personally adopted this definition after becoming aware that this definition was used by the World Health Organisation.

11.12 As to the view he expressed during the expert conclave as to how to best describe Mark's cause of death, Dr Millar indicated that this was "*just a definitional point*". Dr Millar accepted that global cerebral hypoxia is a commonly used description in many cases of brain death which he was happy

to accept, whilst noting that "*from a strict physiological point of view, it's more about global cerebral damage due to hypoxaemia and ischaemia reperfusion injury*" which "*would be a more complete and more exact description*".

11.13 As to the question of whether or not there was a likelihood that Mark's global cerebral hypoxia was caused by drowning, Associate Professor Adams indicated that it could be due to drowning primarily causing hypoxia, or secondary to a primary cardiac event. However, Associate Professor Adams opined that "*it sounded much more likely to be a drowning incident rather than a primary cardiac one*", whilst acknowledging that it is "*very hard to be completely certain 100% which of those things is responsible*".

11.14 Professor Keogh expressed the view that Mark experienced a cardiac event which was not necessarily an immediate arrest, and that Mark's heart did not stop before FFM dislodgement occurred as he subsequently tugged on the umbilical line. Professor Keogh summarised her view in this way:

> My true sort of feeling about this that [sic] he was having a cardiac event that subsequently led to arrest but is often a sequence of rhythm changes. But [Mark] can't have had a stopped heart when his mask flood [sic] and then gone on, whilst now with no blood flow to his brain, and physically tugged on the line 3 or four times, which Dr Millar has told us would take a good two seconds per pull. That it wasn't a simple little tug; it was a proper - it would have taken some seconds to do that deliberate action.

11.15 Ultimately, Professor Keogh agreed that the direct cause of Mark's death could accurately be described as global cerebral hypoxia with the antecedent cause being in-water cardiac arrest and drowning, with the understanding that cardiac arrest encompasses the four different types of rhythm disturbances which can be collectively called cardiac arrest.

11.16 Dr Millar expressed agreement with the proposition that the antecedent cause for Mark's global cerebral hypoxaemia was drowning and cardiac arrest in this way:

> So, by using the word "and" you have not specifically suggested the conclusion as to which one came first. I agree that both were clearly involved. There was drowning […] In that there was a similar version and water inhalation, some of which reach the lungs and cause impairment. And there clearly was a cardiac arrest in that [Mark's] heart stopped
> […]

11.17 As to the autopsy finding of sub endocardial focal fibrosis, Professor Keogh noted that it had been quantitated by Dr Beer as being small and therefore unimportant. However, Professor Keogh explained that whilst it may be regarded as small to a pathologist, in cardiology practice, "*a small thing could be externally disruptive*" and that a small area of fibrosis could be a "*meaningful source of an electrical trigger*" which might result in electrical disturbance precipitating cardiac arrest.

11.18 Associate Professor Adams referred to the fact that whilst the isolated area of myocardial fibrosis could be a nidus for developing an arrythmia, more recent MRI studies have demonstrated how frequent such a finding is in certain cohorts of the population. Therefore, whilst the sub endocardial focal fibrosis raises the possibility that it precipitated cardiac arrest, Associate

Professor Adams indicated that he did not "*think there's enough to really say that this is what caused [Mark's] cardiac arrest*". However, Associate Professor Adams again expressed doubt that the myocardial fibrosis was associated with Mark's episode of chest pain April 2015, due to the absence of any increase in his troponin levels or any significant ECG changes at the time.

11.19 Dr Millar expressed this view:

> […] Although, from a mechanistic point of view, the fibrosis may have been a predisposition to early tachyarrhythmia or ventricular fibrillation cardiac arrest, the outcome would have been the same even if it hadn't been present in my opinion because of the time between loss of mask and recovery to the surface so, although it was probably involved, it was not a absolutely necessary event and as I said, my opinion is that if it's not - if it had not been present, the outcome would have been the same […]

11.20 Associate Professor Adams expressed agreement with this view:

> […] Whether there was a cardiac condition there or not, probably the outcome was going to be the same. And I think we could either go down one street of looking just a single cause for it which might have been entanglement or something else, and just simple drowning. Or we could look at there being two underlying things: one, sort of, the problems with the diving and the exacerbation with a cardiac underlying problem as well. I, I usually like things that are nice and tidy without multiple things, but neither could be possible. I don't think there's any real way we'll ever be sure.

Consideration

11.21 It is submitted on behalf of PDTA that, in essence, the opinions expressed by Professor Keogh ought to be accepted as to the cause and manner of Mark's death. In other words, it is submitted that Mark experienced a sudden cardiac event in the form of ventricular fibrillation or ventricular tachycardia which resulted in him reflexively removing his FFM in "*panic or confusion*". Removal of the FFM in this way resulted in hypoxia leading to cardiac arrest and explains, it is submitted, why Mark had sufficient time to pull on the umbilical line but insufficient time to take any other steps to self-rescue.

11.22 In support of the above submissions, reliance was placed on the following factors:

(a) "*the extreme difficulty of accidental removal of [a] FFM*"; and

(b) the absence of any attempt by Mark to take any steps, other than pull on the umbilical line, to assist himself.

11.23 As to the first factor:

(a) reference was made to a statement provided by Acting Inspector James Rowe a member of the Australian Federal Police (**AFP**) Dive Team and ADAS Part 1 and Part 2 diver. Acting Inspector Rowe expressed the view that full FFM dislodgement would be almost impossible without the assistance of a diver removing the FFM; and

(b) it is clear that there is divergent anecdotal evidence (discussed further below) as to the possibility of a FFM becoming dislodged so as to result in the mask becoming fully flooded. On this basis, it is not possible to positively conclude that Mark's FFM could not have become accidentally dislodged in the process of attempting to complete the Workbench Task.

11.24 As to the second factor, it is submitted on behalf of PDTA that Mark could have attempted self-rescue by taking action to reattach and purge his FFM, pressing the inflation button on his flotation vest to return to the surface or using his equipped knife to cut his umbilical line. It is also submitted that for a diver like Mark, with experience of more than 600 dives, it is unlikely that he "*would not attempt to assist himself in the absence of a cardiac event which inhibited his ability to do so*".

11.25 In support of these submissions, there was significant focus placed on the time taken for Mr Garcia to locate Mark. Senior Counsel Assisting submits that it is possible that it took Mr Garcia up to 3 minutes to locate Mark. In contrast, it is submitted on behalf of PDTA that it could not have taken Mr Garcia more than 60 to 90 seconds to locate Mark. The relevance of attempting to establish an accurate timeframe between when Mark's FFM flooded and when he was found by Mr Garcia to be unconscious is that a shorter timeframe may tend to support the conclusion that Mark suffered a primary cardiac event. That is, if Mark suffered a primary cardiac event which preceded the flooding of his FFM it would likely explain why he was already unconscious when found by Mr Garcia a short time later.

11.26 Ultimately, given the evidence of Mr Garcia who, in May 2015, gave estimates varying between 60 to 90 seconds on the one hand, and up to 2 or 3 minutes on the other as to how long it took him to locate Mark, it is not possible to arrive at a precise conclusion as to the actual timeframe. Regardless, even if the shorter timeframe submitted on behalf of PDTA is accepted, this still fits within the chronology described by Dr Millar (entanglement, accidental FFM dislodgement, drowning and cardiac arrest) with which both Associate Professor Holgate and Associate Professor Adams agree.

11.27 In support of this chronology, it should be noted that Dr Millar expressed the view that following FFM dislodgement, regardless of how it occurred, Mark's facial exposure to cold water triggered a diving reflex which was a significant factor in that it can trigger early onset cardiac arrest in a drowning scenario. In other words, the inability of Mark to perform any self-rescue measures which he was trained in could be explained by a sequence of events consisting of accidental FFM dislodgement, sudden facial exposure to cold water and triggering of the diving reflex.

11.28 **Conclusions:** It is clear from the above that even with the input of expert opinions from a variety of different specialties, no unanimous position could be reached regarding the exact sequence of events that occurred underwater when Mark was performing the Workbench Task on 19 May 2015. However, the available evidence allows for the following conclusions to be reached.

11.29 First, in relation to the sub endocardial interstitial fibrosis, the evidence from Professor Keogh, taken at its highest, is that it might have been a trigger resulting in electrical disturbance precipitating ventricular fibrillation or ventricular tachycardia. However, neither Dr Beer or Associate Professor Holgate considered the fibrosis to be either pathologically or clinically significant. In support of these views, Associate Professor Adams explained that with advancements in imaging studies, the finding of such fibrosis has become an increasingly frequent finding, and certainly more so since 2015.

11.30 Second, whilst Professor Keogh opined that Mark had experienced a primary cardiac event, Associate Professor Adams expressed the view that Mark would not have been able to pull on the umbilical line if he had suffered a sudden arhythmic event of this nature, leading him to conclude that it was more likely that Mark experienced a drowning incident rather than a primary cardiac event. In support of this view, Associate Professor Holdgate explained that Mark was in asystole when first assessed by the attending paramedics, which is typically seen when cardiac arrest is caused by a lack of oxygen, such as in immersion injuries. Associate Professor Holdgate further opined that as return of spontaneous circulation was able to be achieved following the resuscitation efforts, this suggested that primary hypoxia was the cause of the cardiac arrest, and that Mark's heart was otherwise healthy (and therefore not intrinsically damaged as a consequence of a primary cardiac event) but for the sudden deprivation of oxygen which caused it to stop beating. Overall, the balance of the expert evidence persuasively indicates that Mark did not experience a primary cardiac event. Rather, Mark's eventual cardiac arrest was a secondary to hypoxia caused by drowning.

11.31 Third, as the pathological and clinical significance of the finding of sub endocardial interstitial fibrosis is doubtful, and the evidence does not reliably establish a temporal or causal connection between it and the events of 19 May 2015, this makes the possibility of Mark experiencing a primary cardiac event less likely.

11.32 Fourth, the evidence demonstrates that unintentional contact with an object and movement of a diver's head can cause accidental FFM dislodgement. Therefore, it cannot be said that the only way in which Mark's FFM could have been removed from his head is if he removed it himself as part of an instinctive reflex in response to a primary cardiac event.

11.33 Fifth, the inability of Mark to perform any of the self-rescue measures that he had been trained in and that were available to him can equally be explained by swift incapacitation due to a cardiac event, or sudden facial exposure to cold water causing physiological stress and triggering of the diving reflex.

11.34 Sixth, if the scenario hypothesised on behalf of PDTA were accepted it would mean that Mark experienced a primary cardiac event, reflexively removed his mask in panic or confusion, but then was able to execute purposeful, trained survival actions in pulling on the life-line. Such a scenario is contrary to the evidence of Dr Millar who described Mark's actions as not suggestive of a diver incapacitated by panic.

11.35 Having regard to all of the above, and the opinions expressed by the various experts both in conclave and in evidence as to the most likely cause of death, Mark's cause of death is best described as global cerebral hypoxia due to cardiac arrest and drowning, with bilateral bronchopneumonia being a significant condition contributing to Mark's death but not relating to the disease or condition causing it. It is most likely that Mark did not experience a primary cardiac event whilst underwater. Rather, it is most likely that Mark's FFM accidentally became dislodged, although the precise mechanism of dislodgement is not clear, resulting in sudden facial exposure to cold water causing physiological stress and triggering the diving reflex, followed by hypoxia leading to drowning (respiratory impairment due to submersion) and cardiac arrest.

12. What is the relevance of Mark's failure to disclose his April 2015 attendance at Tweeds Heads Hospital prior to obtaining a medical clearance to commence the PDTA course?

12.1 Mark attended the Surfers Paradise Medical Practice on 19 February 2014 and obtained a medical certificate (**the 2014 Medical Certificate**) which was purportedly issued in accordance with the requirements of AS2299.1. The 2014 Medical Certificate was later provided to PDTA at some point. It appears that Mark recognised that it was due to expire and had been deferring obtaining a more current medical certificate until closer to the start of the Course.

12.2 On 19 March 2015, Mark returned to the Surfers Paradise Medical Practice. However, there is no evidence to indicate whether any medical examination was performed in accordance with AS2299.1 or whether any medical certificate as to Mark's fitness to dive was issued.

12.3 This meant that the 2014 Medical Certificate was no longer current by the time that Mark was required to undertake the first dives of the Course. In addition, Mr Austin noted that the 2014 Medical Certificate was insufficient for what was required for an occupational diving course in that it was issued as a recreational diving medical certificate.

12.4 Accordingly, at Mr Austin's instruction, Mark completed a AS/NZS2299 Diving Medical Examination – Medical Questionnaire on 9 May 2015. Relevantly, the questionnaire asked whether Mark had previously experienced severe chest pain. In answer, Mark did not disclose either that he had previously experienced chest pain which had woken him from sleep with sharp pain increasing on aspiration, or that he had attended hospital in April 2015. After completing the questionnaire, Mark attended a medical practice in Wodonga on 11 May 2015 for an examination. This examination was performed by Dr Colwell and occurred before the first dive at The Pit, but after Mark had already performed a chamber dive earlier in the day on 11 May 2015.

12.5 Dr Colwell later signed a medical certificate in accordance with AS/NZS-2299 (**the 2015 Medical Certificate**) confirming that Mark was fit to dive/work under pressure for all occupational diving. Dr Colwell then spoke to Mr Austin on the phone, confirming that he had passed Mark as fit to dive. On this basis, Mr Austin permitted Mark to continue diving, pending receipt of the 2015 Medical Certificate.

12.6 **Conclusions:** If Mark had disclosed his previous complaint of chest pain and presentation to hospital in 2015 it is most likely that this would have prompted questions from Dr Colwell to understand the nature of this presentation and whether any investigations were performed. This in turn may have identified that Mark was provided with advice to see his GP and arrange for a PET scan but that this did not occur.

12.7 The evidence indicates that the PET scan was likely ordered to investigate the possibility of cancer following a CT pulmonary angiogram performed during Mark's presentation to hospital in April 2015. There is no evidence to suggest that a PET scan would have identified the very focal sub endocardial interstitial fibrosis observed in the left ventricle at autopsy.

12.8 However, disclosure of this information, particularly the complaint of previous chest pain, would have been relevant to consideration of whether the 2015 Medical Certificate ought to have been issued.

12.9 Having regard to the circumstances in which Mark obtained his medical certification prior to the Course, and in the absence of information regarding his previous chest pain and admission to hospital, it is necessary to make the following recommendations.

12.10 **Recommendation:** I recommend that ADAS review how the structure and operation of the ADAS Occupational SCUBA to 30m (Part 1) Course by Professional Divers Training Academy verifies that a trainee diver has obtained any necessary medical certificate prior to commencing any diving (including any chamber dive) during a course.

12.11 **Recommendation:** I recommend that ADAS give consideration to whether applicants for the ADAS Occupational SCUBA to 30m (Part 1) Course should be required to provide the contact details for their treating medical practitioner (if any) when completing any medical questionnaire for the purpose of seeking certification of fitness to dive.

13. What training did Mark receive in clearing a flooded full face mask prior to the evening drill on 19 May 2015?

13.1 On 12 May 2015, the dive students were assessed in a number of skills including mask floods and clears. This training drill was recorded in a number of documents:

(a) the dive plan for 12 May 2015;

(b) a document titled *PDTA Part 1/2 Combined Course 32* which was apparently based upon Mr Austin's diary notes;

(c) Mark's PDTA Student Log Sheet;

(d) an ADAS Occupational Diver's Log Book, apparently completed by Mark, which referred to one dive using the AGA Full Face Mask (**FFM**) and another dive using the Guardian FFM (with a third dive involving a half mask), with the work description for each FFM dive referring to "*mask floods and clears*".

13.2 In addition, other dive students confirmed that they were provided with training in clearing a flooded FFM and were required to demonstrate that they had acquired the ability to do so.

13.3 **Conclusions:** The available documentary material and accounts provided by the other dive students establishes that Mark was provided with training to clear a flooded FFM and demonstrated the ability to do so in order to participate in the ADAS Part 1 Course. It should of course be noted, that whilst such competency had been demonstrated in training scenarios, there is no evidence to establish that Mark had experience in demonstrating such competency in a real-life emergency situation.

14. Was a risk assessment performed at the site prior to the drills commencing on 19 May 2015 and if so, was the risk assessment adequate?

14.1 In considering the issue of risk assessment as it specifically related to the drills performed on 19 May 2015, some distinction should be drawn between assessment of general risk factors on the one hand, and specific dynamic or variable risk factors on the other. Examples of dynamic or variable risk factors included the different level of dive experience and ability within a cohort of students, weather conditions at The Pit during any particular dive and specific variations in tasks to be performed for each dive. For example, the drill performed by Team 2 on 19 May 2015 was varied to include locating the star picket and reattaching a guide rope which had been dislodged by a student during an earlier drill on another day.

14.2 There is evidence that risk assessment of a general nature was performed in the following ways:

(a) During an electronically recorded interview with the NSWPF, Mr Austin referred to performing "*a generic risk assessment which covers um, all the sites and, and all the courses*";

(b) Mr Austin regularly spoke to the dive students regarding some of the inherent risks associated with occupational diving, including repeatedly emphasising the importance of not rushing when performing a drill, not removing a FFM until out of the water and knowing where a student diver's umbilical line was located;

(c) PDTA had a Construction Risk Assessment Workshop (**CRAW**) spreadsheet from December 2013 which recorded some hazards including "trap diver" and "fouled umbilical", and identified "procedural controls" in response to such risks; and

(d) The generic dive plans were focused on the drills to be repeated from course to course.

14.3 The PDTA Diving Operations Manual required the dive supervisor to ensure "*that a risk assessment is carried out prior to every dive*". The PDTA Diving Operations Manual included a Daily Risk Assessment Form (**PDTA Risk Assessment Form**) which required a daily assessment of matters including environmental factors, task-related factors, and emergency response factors. However, Mr Austin gave evidence that in May 2015 he did not use this form, in its existing format, on a daily basis.

14.4 Instead, on 19 May 2015 Mr Austin completed the ADAS Daily Risk Assessment and Job Hazard Assessment Form (**ADAS Risk Assessment Form**), one each for the afternoon dive and evening dive. Mr Austin gave evidence that 19 May 2015 was the first occasion that he had completed a daily risk assessment form for the Course.

14.5 The ADAS Risk Assessment Forms for the afternoon and evening dives on 19 May 2015 were completed separately and included a Register of Attendance, which provided that all the persons named in the register had read an attached Job Hazard Assessment (and associated documentation) and "fully understood all the steps to perform the task safely". Whilst the names of the dive students were written in the respective registers of each ADAS Risk Assessment form,

they were not signed as required. There is therefore no evidence that the dive students were made aware of the contents of the risk assessment.

14.6 Mr Austin gave evidence that he spoke to students about the risks associated with diving but that they had not been asked to complete risk assessment forms. In addition, Mr Austin indicated that these risk assessment forms were contained within a "*student bundle*" and that the students had seen it, although it is not clear on the evidence whether Mr Austin was referring to the PDTA Risk Assessment Form or the ADAS Risk Assessment Form.

14.7 The evidence from the dive students themselves is relevant to this issue:

(a) In an electronically recorded interview with WorkCover (as it then was), Mr van Teijlingen said the following:

> We do have an operations manual which was given to us on the first day upon starting the training and mine is always situated in my dive bag…so we've all got that. However, we had not done anything out of the manual specifically. So it had been given to us but we haven't been required to use it as such.
> […]
> We weren't instructed to read anything specific from it.
> […]
> I'm quite familiar with [safe work method statements and job safety analysis] in the industry I'm in, I've not seen any of those done for specific jobs that we've done.
> […]
> I suppose [Mr Austin] would lay down the foundation of what we're doing and what safety precautions we're taking and we'd all discuss it and decide whether we all consent and happy with the level of safety, I suppose. So if anyone had an issue they could've voiced it but for the most part [Mr Austin] lays down the safety rules… I haven't personally completed a risk assessment no … not for any of the dives doing … haven't completed a dive plan or seen one during training.

(b) Mr Maguire said the following in his statement to the NSWPF:

> We have not in the course thus far covered off on risk assessments. No risk assessment has been explained to the group in regards to 'The Pit' location. If you have had no experience with risk assessments prior to this course then I believe you would be unaware of risk assessments. Throughout the course to date we have not had a formal briefing where any sorts of hazards relating to The Pit have been explained in a formal briefing. Most of [Mr Austin]'s briefing are informal and disjointed, I mean disjointed and not delivered in a given time period. Instead broken up into several conversations. I am a person who understands clear and precise directions so I require instructions being short and to the point.

(c) Mr Garcia stated the following to the NSWPF:

> Firstly we would discuss the proposed dive in the classroom prior to attempting it. Every dive has a different task and we would talk about what the task required is to do and what we needed to be mindful of to complete the dive safely. Before every dive and even during the classes [Mr Austin] would always be saying 'know where your umbilical cord is.' And 'slow down and take your time.'

(d) Mr McVicar said the following in his NSWPF statement:

> [Mr Austin] repeatedly discussed the dangers and risks of commercial diving. He repeatedly discussed the importance of not rushing. He repeatedly stressed the importance of not removing your mask until out of the water. He also discussed a previous drowning and why it had occurred to highlight the importance of following correct diving procedures.

14.8 The ADAS Course Requirements Manual required that "*trainees must be assessed on at least two occasions on the preparation of an effective risk assessment*". However, by 19 May 2015, the dive students had not yet reached the stage where they would be provided with instructions regarding undertaking such a risk assessment.

14.9 Notwithstanding, it was suggested by Senior Counsel Assisting to Mr Austin in evidence that if he conducted daily risk assessments (as contemplated by the PDTA Manual) that this would demonstrate to the dive students the type of formal and documented approach to take:

> Q. I want to suggest to you that it's hardly going to ingrain for students the fundamental importance of appropriate risk assessments if the dive supervisor is not modelling that behaviour by completing daily risk assessments throughout the course. What do you say to that?
> A. The students are unaware of the risks initially until they've experienced some dives in the condition and with the equipment that they are using on the course.
>
> Q. This isn't about getting the students to complete the risk assessment too early. This is about you as the dive supervisor modelling for these students the act of carefully undertaking a daily risk assessment to ensure your safety and their safety. What do you say to that?
> A. Every dive brief that I do thoroughly covers all the risks associated with every dive that the student would be doing.

14.10 Mr Austin gave evidence that the 2006 death of Alan Vaughn emphasised the importance of having a qualified standby diver equipped and ready to jump as soon as practicable once given an instruction to do so. In this regard, Mr Austin also gave evidence that he believed he had done enough to have such a standby diver ready to jump on 19 May 2015.

14.11 In 2015, AS2815.1-2008 provided for an additional risk assessment requirement for the use of a standby diver:

> A risk assessment process shall be used for all dive scenarios to determine the level of standby diver support required and the number of divers which a standby diver can provide reasonable coverage. The outcomes of the risk assessment shall also be used to indicate the required qualification level of the standby diver(s).

14.12 As to the qualification level and selection of standby diver, AS2815.1-2008 provided that such divers are to be "*competent to act in that role*". There is no documented evidence that any risk assessment in relation to the standby diver was conducted in relation to the dive on 19 May 2015. It is accepted that the ADAS Risk Assessment Form completed by Mr Austin on 19 May 2015 did not contain any provisions relating to a risk assessment for the use of a standby diver as contemplated by AS2815.1-2008.

14.13 It was acknowledged by PDTA that Mr Austin did not undertake a documented risk assessment in accordance with AS2815.1-2008. However, it was submitted on behalf of PDTA that a risk assessment still occurred given that:

(a) Mr Austin had supervised the dive scenario on 19 May 2015 many times previously ("*hundreds if not thousands of times before*", according to the evidence of Mr Rapp);

(b) the particular scenario (with one standby diver to four in-water trainees, operating in pairs, approximately six metres apart) had passed an ADAS audit; and

(c) by 19 May 2015, the student divers for 19 May 2015 had previously been required to demonstrate competency in key skills such as mask clearing and line signals.

14.14 **Conclusions:** Although Mr Austin completed the ADAS Daily Risk Assessment Form for 19 May 2015 there is no evidence that the student divers saw and signed the form as required. Relevantly, there is no precise evidence that the student divers fully understood all the steps necessary to perform the 19 May 2015 drills safely. Therefore, in considering whether any risk assessment performed prior to the 19 May 2015 drills was adequate, regard is to be had to the evidence as to Mr Austin's general and usual practice, and the general evidence from the student divers themselves.

14.15 Mr Austin had significant experience with the task involved and personal knowledge of the type of risks involved. He (together with Mr Rapp) was entitled to, and did, rely upon such experience and knowledge to inform any assessment of the potential risks involved for the 19 May 2015 task. However, in the absence of any documented and transparent risk assessment, there is no evidence to establish that Mr Austin applied his knowledge and experience to the particular student cohort that was performing the 19 May 2015 task, and the particular diver who was tasked with the role of standby diver. Therefore, viewed in this way, it could not be said that any risk assessment performed prior to the task on 19 May 2015 commencing was entirely adequate. Having regard to these matters, the following recommendation is necessary.

14.16 **Recommendation:** I recommend that ADAS review how the structure and operation of the ADAS Occupational SCUBA to 30m (Part 1) Course by Professional Divers Training Academy (a) provides for daily risk assessments to be performed prior to every dive; and (b) ensures that trainee divers fully understand all the steps to perform a dive task safely.

15. What briefing was given to students on Team 2 prior to commencing the evening drill on 19 May 2015?

15.1 Following the afternoon dive, the students were provided with a brief regarding the evening drill during a meal break. This briefing was in addition to what general discussion took place during a theory session in the morning before the students arrived at The Pit. Mr Austin described the briefing as "extensive" and lasting between 10 to 15 minutes. Mr Rapp indicated that he did not time the meeting but estimated that it took between 5 to 10 minutes.

15.2 The students variously described the briefing in this way:

(a) Mr Elrington stated that Mr Austin described the tasks required but did not consider this to be "a formal briefing" with "no formal paperwork handed to the class and discussion had regarding risk assessments and dive plans";

(b) Mr Irvine also stated that Mr Austin described the tasks to be performed and that "everyone was near the table area" when this briefing was provided. Mr Irvine stated that he understood the briefing and believed that "everyone else understood what was required";

(c) Mr McVicar similarly stated that Mr Austin described the tasks to be performed, and that he understood from the briefing that Mr Austin wanted to the students "to demonstrate a timely and enthusiastic response, much like an employer would expect from employees tasked with a job when there is a deadline. I did not get the impression he wanted anyone to rush or enter the water unprepared";

(d) Mr McGuire stated that some of the students were attending to their gear and that Mr Austin only explained to those present the task involved in the night dive, and that this explanation "would have been for two minutes";

(e) In his signed statement to the NSWPF, Mr Garcia stated:

> [Mr Austin] had mentioned some things to Margot and myself whilst we were eating. He told us that our task was to take the work table with the lift bags and assemble it underwater. This was by no means a detailed briefing, it was very brief as he was tending to a different group. [Mr Rapp] was tending our group that day as he was the supervisor of our team for that day.

(f) In another, unsigned statement, Mr Garcia described the tasks outlined by Mr Austin and then said:

> Rick always constantly says take your time, don't rush, slow down, check your umbilical, what your gas, check your bailouts are close at any pre-much says it all the time, every dive. It's good to me because it doesn't take everything for granted as you don't take it all for granted. It reminds you.
>
> Prior to getting in everyone was focused and [Mr van Teijlingen] was checking everything really well. Our mood was good and we were looking forward to completing the task. [Mr van Teijlingen] was directing me what to do and I was happy about that. We were busy getting ready and [Mr van

> Teijlingen] was really briefing both of us in detail and I felt the briefing was pretty clear. No one asked any questions.

15.3 Perhaps most significantly, Mr van Teijlingen described the briefing in this way:

> In my opinion there wasn't quite an extensive break because I remember feeling that our dinner was essentially cut a bit short to get the dives underway so I'd say maybe 15 minutes, 15 to 20 minutes from exiting the water to basically starting to put on their gear again and get ready for the second dive and in all of that the briefing the briefing from [Mr Austin]'s side was fairly detailed and well understood and I'd had more time to listen in on these things as I was on the top side most that afternoon. However I do recall some of Mark or [Mr Garcia] saying that he wasn't quite clued up on what's happening, he didn't quite understand what they're doing and that's where myself took Mark and [Mr Garcia] through a briefing of exactly what they're going to do. So my opinion the briefing wasn't very precise and detailed however the gist of it would've been there and I had reiterated what they're going to do myself.

15.4 There is no evidence that Mr Austin took the opportunity during afternoon to enquire with the students how they might respond if confronted with any of the "potential accidents or hazards" that he had recorded on the ADAS Risk Assessment Form or the "safe condition or activity required" in response to such hazards. For example, the list of potential accidents or hazards for the task included entanglement, entrapment, and visibility, with the safe condition or activity required including ensuring that the umbilical line was clear and "umbilical management communications".

15.5 **Conclusions:** Apart from any general discussion that took place during a theory session on the morning of 19 May 2015, there is no persuasive evidence that the students were provided with a detailed briefing before commencing the evening drill at The Pit. Rather, the evidence establishes that the briefing was informal, opportunistic in the sense that it occurred on site following the afternoon drill and during a meal break and was conducted when the attention of some students was diverted with performing concurrent tasks. In addition, there is no evidence that any specific reference was made to the potential accidents or hazards recorded on the ADAS Risk Assessment. Rather, any mention made by Mr Austin regarding such potential accidents or hazards appears to have been a repetition, in general terms, of advice provided to the students throughout the Course before every dive.

15.6 The differing accounts as to the duration of the briefing (ranging between about 2 to 15 minutes) and the nature of its content suggests that there were varying degrees of understanding amongst the student divers. So much is clear from the contrasting accounts provided by Mr Garcia. Most relevantly, Mr van Teijlingen, recognised that Mark and Mr Garcia did not entirely comprehend from Mr Austin's briefing the task to be performed during the evening. As a result, Mr van Teijlingen took it upon himself to restate what Mark and Mr Garcia were required to do. This evidence alone indicates that the briefing provided by Mr Austin was not entirely adequate.

16. How were roles allocated for the evening drill on 19 May 2015 and to what extent did allocations take into account task loading involved for each participant?

16.1 AS2815.1-2008 required the following as minimum personnel for in water diver training:

> The minimum dive team for all in-water diver training operations shall be a qualified dive supervisor, a qualified standby diver, a trainee diver, two divers attendants (qualified or trainee) and sufficient personnel to ensure emergency procedures can be effected immediately. A risk assessment shall be conducted to determine if additional personnel are required and shall include consideration of the effective span of control of the dive supervisor.

16.2 AS/NZ2299.1:2007 provided for the requirements for a dive supervisor, divers attendant and the standby diver. Relevantly, it provided that "the divers attendant shall not be engaged, other than as specified in clauses 5.2 and 6.3, on any task other than that of divers attendant while the diver is in the water".

16.3 Clause 6.3 provided that:

> The dive shall be controlled by a dive supervisor on the surface. Where supported by a documented comprehensive risk assessment, the supervisor may act as the diver's attendant or carry out minimal surface duties, provided this does not compromise the dive team's ability to respond to an emergency.

16.4 There is no evidence that a documented comprehensive risk assessment was conducted to address the issue of whether a dive supervisor could act as a diver's attendant.

16.5 Further, AS2815.1-2008 provided that:

> Suitable standby divers shall be selected, ensuring they are competent to act in that role. As trainees by definition are potentially more vulnerable than fully qualified divers, the standby diver shall be appropriately qualified and sufficiently experienced to cope with the full range of situations that may arise. The overriding principle is that the safety of the trainees takes precedence over all commercial or planning issues.
>
> A risk assessment process shall be used for all dive scenarios to determine the level of standby diver support required and the number of divers for which a standby diver can provide reasonable coverage. The outcomes of the risk assessment shall also be used to indicate the required qualification level of standby diver(s).

16.6 Further, clause 6.3 provided:

> NOTES: 1. Where two or more divers are in the water at the same time a standby diver may not be necessary for each diver. The number of standby divers should be chosen after consideration of the dive profiles or each diver, their proximity to each other, the tasks at hand, the water conditions and their ability to assist each other.

16.7 Clause 7.4.4 of the ADAS Administration and Operations Procedures provided:

> For occupational scuba training and assessment, there is to be one (1) supervisor and one (1) standby diver allocated per each independent dive team of up to six (6) divers unless the risk

assessment demonstrates that such arrangement can effectively and safely provide cover for two teams in the water at once under the circumstances pertaining at a particular dive site.

16.8 However, there is no evidence that a risk assessment process was used to determine whether a standby diver could provide reasonable coverage for four trainee divers in the water at one time, spread across two teams.

16.9 The PDTA Diving Operations Manual provided the following:

> The divers attendant is to give his full time and attention to attending to the diver from the time the diver commences preparation for the dive until he has exited from the water […] and has stated he is fit and well. The attendant is not to be employed on any other task while the diver is in the water […]
>
> And that diver's attendant duties include:
>
> To make and answer all necessary signals throughout the dive, including frequent checks on the diver, reporting each to the dive supervisor.

16.10 On 19 May 2015, Mr Austin was the ATE supervisor and dive instructor for Team 1 and Mr Rapp performed the same roles for Team 2. Mr Essers was the standby diver for both teams across the afternoon and evening dives.

16.11 It appears that the drills performed by Team 2 carried a significant degree of task loading for the following reasons:

(a) it was the first night dive of the Course;

(b) a trainee diver was managing the communications equipment;

(c) whilst the sample Course program that PTDA provided to ADAS in the course of their accreditation/reaccreditation application included a specific reference to a night dive involving a chisel task, it may no reference to the task including having to use a lift bag to take out and assemble a workbench before the chisel task was completed; and

(d) Mr Garcia expressed this view regarding the lift bag:

> I guess on the task that day I felt that the other guys had used bags before and we had not. I would have liked to have use a lift bag before. The bag is a 50kg bag and I had no trouble inflating the bag, I know what to do, it would have been good to have use one before. I don't think the lift bag was a major contributor factor, it was more communicating between Mark and I.

16.12 It also appears that Mr Rapp was acting as dive attendant to both divers in the water for Team 2 during most, if not all, of the evening dive:

(a) There were only three student divers in Team 2 (with Mr Maguire having moved over to Team 1) and two of them were in the water;

(b) Mr van Teijlingen was managing the communications equipment and indicated that Mr Rapp "did for the full duration of that dive been [sic] attendant on the lines"; and

(c) Contrary to Mr Rapp's oral evidence that Mr Austin and Mr van Teijlingen were acting as attendant to Mr Garcia, Mr Rapp in his own statement said that he was attending the lines to both divers. In oral evidence, Mr Rapp agreed that this account given in 2015 was more reliable than by the time of the inquest in 2022.

16.13 It also appears that Mr Essers was acting as dive attendant for one of the divers from Team 1 during the majority of the evening dive:

(a) Mr Irvine, Mr McVicar, Mr Maguire, Mr Elrington, and Mr Teijlingen all stated that Mr Essers was acting as dive attendant for Team 1;

(b) Mr Ellington was managing communications until he was told to dress in, at which stage Mr Austin took over this role;

(c) Mr Garcia and Mr Irvine also stated that Mr Essers will was performing the dive attendant role for at least part of the afternoon dives;

(d) In his electronically recorded interview with the NSWPF Mr Essers stated that he had been talking to Mr Irvine (which placed him in the vicinity of Team 1) before having to return "to my post"; and

(e) Mr Essers gave the following evidence: "I vaguely remember holding a tender line and it might have been to relieve someone if they went to the bathroom".

16.14 In evidence, both Mr Essers and Mr Austin sought to draw some distinction between the physical act of holding a communications line or tender line, even if only temporarily, and being formally assigned the role of diver attendant. Later, Mr Essers conceded that regardless of any assigned formal role, the person holding a diver's lifeline is responsible for the safety of that diver:

> Q. From the point of view of the diver in the water, what matters is that there is a diver's attendant on the shore who is holding the comms lifeline and fulfilling the role of diver's attendant regardless of whether or not that person has been designated as a diver's attendant while they're holding the line. Do you agree with that?
> A. Yeah, I, I believe that they would, they would deem whoever's been put in the position of their diving attendant to be responsible for the safety of their umbilical. Correct.

16.15 It is acknowledged by PDTA that any risk assessment regarding whether one standby diver could provide coverage for four student divers across two teams, and whether a dive supervisor or standby diver could also act as a diver's attendant was not documented. It is also acknowledged by PDTA that to the extent that this resulted in "one or more to technical breach of any applicable documentation, this breach should not have occurred". However, it is submitted on behalf of PDTA

that irrespective of any such technical breach, there is no evidence to indicate, in practical terms, any deficiency in the roles performed by Mr Rapp and Mr Essers.

16.16 **Conclusions:** The increased task loading for both dive teams during the night dive on 19 May 2015 meant that it was imperative that the assigned standby diver was able to "*cope with the full range of situations that may arise*". The evidence establishes that Mr Essers was acting as both the diver's attendant for Team 1 and was also acting as the standby diver for both Team 1 and Team 2. This was contrary to the provisions of both AS/NZS2299.1:2007 and the PDTA Diving Operations Manual.

16.17 It can be accepted that Mr Essers entered the water within one minute of being instructed by Mr Austin to do so. However, the use of Mr Essers in performing both roles created an undesirable situation which could have potentially adversely impacted on his ability to perform each individual role appropriately, and to cope with the full range of situations that might have arisen during the course of the drills which the student divers were performing. Having regard to these matters the following recommendation is necessary.

16.18 **Recommendation:** I recommend that ADAS review how the structure and operation of the ADAS Occupational SCUBA to 30m (Part 1) Course by Professional Divers Training Academy ensures that documented risk assessments are conducted to determine whether a standby diver can effectively and safely provide cover for a particular number of trainees at once, under the circumstances pertaining at a particular dive site.

PDTA Student Log Sheets

16.19 Similar to the evidence which establishes that no documented risk assessment was performed prior to the night dive on 19 May 2105, the acknowledgement by PDTA that there were one or more technical breaches in relation to the capacity of a standby diver to perform his/her responsibilities and whether a diver's attendant could perform another role raises another issue for consideration. This issue concerns the recording of entries in the PDTA Student Log Sheets of Training Dives (**Log Sheets**) by Mr Austin.

16.20 Mr Austin completed the Log Sheets for each dive performed by each of the students on the Course. At different intervals, the Log Sheets were given to the students so that they could enter the details into their ADAS Occupational Diver's Log Book. Mr Austin transcribed information contained in the Log Sheet into a table within the ADAS Training Record Book. This was necessary because the ADAS Course Requirements Manual set out the minimum number of dives at particular depths which students were required to complete during the Course.

16.21 Further, AS2815.1-2008 established units of competency which students were to be instructed in, and against which they were to be assessed. These units included both pre-dive preparations and post I procedures. The importance of this was explained by Robert Gatt, the former Executive Director of ADAS:

> […] Each dive during the course, even short dives, is meant to give the student repeated exposure to the full dive experience including donning equipment, checking equipment, entering the water, approaching the dive site, leaving the surface, completing a task (if relevant) and maintaining

communication with the supervisor, returning to the surface and ultimately removing equipment and debriefing about the dive.

16.22 In addition, Mr Gatt explained:

> ADAS requirements then in place required if the accredited training establishments to use the Defence and Civil Institute of Civil Medicine (Canada) diving tables, commonly known as the DCIEM tables. The calculation is within those tables require a diver to be on the surface for a period greater than 15 minutes between dives those dive to be treated as independent dives. From an ADAS perspective, that definition form the basis for the definition of a dive for the purpose of achieving the minimum number of dives to be completed during the course.

16.23 Relevantly, on the afternoon of 19 May 2015, Mr Austin logged three separate dives on Mark's Log Sheet listing only a minute between when Mark reached the surface at the end of Dive 1 and when he left the surface for Dive 2. An identical interval of one minute was logged between Mark reaching the surface at the end of Dive 2 and leaving the surface for Dive 3. In his interview with the NSWPF, Mr Austin sought to explain that he had some discretion as to how he divided a dive which was to take a minimum of 90 minutes and that the number of dives recorded "on paper" did not necessarily correlate with the actual number of physical dives performed.

16.24 Examination of the Log Sheets for a number of the other students on the Course indicates that there was a pattern where one longer dive would be divided into two or more separate dives, with usually only seconds being recorded on the surface between each dive. Relevantly, in evidence Mr Austin agreed that such a pattern existed for dives recorded on Mark's Log Sheets on 12, 13 and 15 May 2015. Mr Austin gave evidence that recording the dives of the students in this way was inconsistent with the principles outlined by Mr Gatt, and deprived the students of the opportunity of repeated exposure to the full dive experience.

16.25 Notwithstanding the above, later in his evidence, Mr Austin gave evidence that, by way of example, two Log Sheets that he recorded for Mark on 12 and 13 May 2015 contained inaccurate information as to the amount of time that Mark spent on the surface between dives. Instead, Mr Austin indicated that more accurate information was to be found within the work description located at the bottom of the Log Sheets:

> […] you will see that I've logged four dives for [Mark] and you will see in the work description at the bottom of that page, he was involved in doing stand-by diver drills. Now, there are four different stand-by diver scenarios that each student does and each student does a practise run of those four different scenarios and then an assessment of each of those four different scenarios. During that time [Mark] would have done or been involved in at least 16 rescues as either the rescue or the rescuer and during that time he would have had multiple ascents back to the surface at the end of each of those rescues and while on the surface I would spend time with [Mark] debriefing him on that rescue that he'd just done. Giving him guidance and suggestions as to improving the rescues and improving his overall rescue time and the dive times at the top of that sheet don't accurately reflect the amount of ascents and descents that [Mark] would have done, nor the time spent on the surface doing those 16 rescues at least as well.

16.26 Mr Austin gave evidence that where a conflict existed between the dive times recorded for a student on their Log Sheet and the student's statement of achievement, the latter was to be

preferred. However, Mr Austin frankly acknowledged that it would be impossible for someone reading the Log Sheets, who was not present on 12 and 13 May 2015, to understand exactly how much time Mark spent on the surface between dives and what instruction and debriefing was provided to him during any interval between such dives.

16.27 **Conclusions:** The available evidence regarding the manner in which the Log Sheets were completed is concerning in that it is not possible to coherently and accurately understand the information contained within them. This is because Mr Austin gave conflicting evidence about the way in which this information was recorded. On the one hand, Mr Austin appeared to exercise a discretion in recording one long dive as two or more shorter dives; on the other hand, the dive times were described by Mr Austin to be inaccurate in that the interval between dives did not accurately reflect the time that a diver spent on the surface.

16.28 The end result is an unsatisfactory documentation of records relating to the training of the dive students on the Course, which is not inconsistent with the deficits in documentation that have already been described above. The recording of information contained in the student Log Sheets represents another example where the documentation of records by PDTA in relation to the Course is not entirely transparent. Having regard to these matters it is necessary to make the following recommendation.

16.29 **Recommendation:** I recommend that ADAS review how the structure and operation of the ADAS Occupational SCUBA to 30m (Part 1) Course by Professional Divers Training Academy ensures that (a) accurate records are kept in relation to the number of dives performed by trainee divers; (b) minimum surface intervals between dives are accurately recorded; and (c) trainee divers are given repeated exposure to the full dive experience, in accordance with the ADAS Course Requirements Manual.

17. What level of preparedness was required of the standby diver under the PDTA Operations Manual then in force and what level of preparedness did the standby diver have in practice during the evening drill?

17.1 The PDTA Diving Operations Manual provided for the following as to the responsibilities of a standby diver:

> The standby diver responsibilities include –
>
> 1. Being available at all times to enter the water and lend immediate assistance to the diver. He must not be assigned to any other task, which would interfere with those duties for the divers in the water.
> 2. Being positioned adjacent to the diving control position and in communication with the Diving Supervisor and diver.
> 3. Ensuring that he is fully kitted in accordance with the results of the risk assessment.
> 4. Being at all times alert to the condition of the diver and ready to enter the water at any time to render assistance.
>
> When a trainee diver is undertaking AS 2815 training, a fully qualified and experienced standby diver must be at each dive site. His degree of readiness and responsibilities will be term and by the outcomes of the diver risk assessment and he will be directed by the Supervisor as to his standard of readiness and duties.

17.2 AS/NZS 2299.1:2007 relevantly provided the following:

> A standby diver shall be present whenever a diver is underwater and shall be –
> …
> (b) wherever possible, located on the surface; and
> (c) if located on the surface, dressed and equipped to enable immediate entry into the water for the purposes of providing aid or assistance to a diver.
> NOTES:
> 1. The intention of standby diver arrangements is to provide help to a diver in need of assistance with the minimum of delay after receiving an instruction to do so from the supervisor.

17.3 Clause 7.5.1.14 of the ADAS Administration and Operational Procedures Manual also provided:

> ATEs must appoint suitable certified, trained, and assessed staff standby divers to be in place on every site where ADAS diver training is being undertaken. Staff standby dives are to:
> …
> b) undertake a fitness test prior to the commencement of every training activity by competently towing a simulated unconscious diver for a minimum of 100 meters.

17.4 Further, clause 7.5.4 of the ADAS Administration and Operational Procedures Manual provided:

> As a minimum staff standby divers shall be exercised at least once per month during the conduct of the activity. All relevant standby diver drills are to be recorded in Operations Record and Diver's Logbook.

17.5 As at 19 May 2015, Mr Essers had not undertaken a standby diver role for any diver training course, had not performed a standby diver role for at least six months and had not been seen in the water

by Mr Austin since he completed the training course in 2014. As to these matters Mr Austin gave the following evidence regarding the need to have Mr Essers complete a standby diver drill prior to the evening dive on 19 May 2015:

> Q. Yet on 19 May 2015 you didn't elect to organise a stand-by drill to jump Richie into the water for a simulated rescue prior to using him with the trainee divers, did you?
> A. I had indicated to him on the day that that was my intention.
> Q. Come back to my question and just answer it if you can. You didn't elect to organise a stand-by drill to jump him into the water for simulated rescue prior to using him with the students on 19 May?
> A. No that is correct.
> Q. Why not?
> A. I'm not sure. I'm just trying to recall as to when I was intending for him to do it. Whether it was during the afternoon or prior to the evening.

17.6 There is also no evidence that Mr Essers was required to undertake a fitness test prior to 19 May 2015 or that he was exercised at least once per month in accordance with the ADAS Administration and Operational Procedures Manual.

17.7 At the time that Mark's FFM flooded, Mr Essers was acting as dive attendant to Mr Maguire. Whilst Mr Essers was aware that Team 2 was "*having like complications with standing their bench*", he did not hear the sound of Mark's FFM flood despite being positioned relatively close to the communications panel.

17.8 Upon being instructed by Mr Austin to jump in, Mr Essers needed to pass the line he was holding to Mr Irvine to act as dive attendant for two student divers still in the water. Mr Essers then needed to finish dressing in, which included obtaining his top mounted light.

17.9 It is submitted on behalf of PDTA that the reference to "*immediate*" in AS/NZS 2299.1:2007 does not suggest that a standby diver is to instantaneously enter the water upon being instructed to do so. It is submitted that there will always be some brief delay following such an instruction because, at a minimum, the standby diver will be required to put on their mask and possibly don their fins. Reference was made to the present AS2815.1 (issued in 2021) regarding the definition of "*immediate entry*" as referring to:

> […] Where the diver is at the water's edge and would enter the water directly after donning the mask. The expectation is that this would be 10 to 15 s between when the standby diver is directed into the water and the standby diver actually enters the water.

17.10 **Conclusions:** Consistent with both the PDTA Diving Operations Manual and AS/NZS 2299.1:2007 , on 19 May 2015 a standby diver was required to be dressed in and equipped in order to enter the water at any time to aid a diver with the minimum of delay. As noted above, whilst Mr Essers was fully equipped (apart from having to retrieve his top mounted light) and in close proximity to the diving control position, he was assigned another task of divers attendant at the time that Mr Austin instructed him to jump in. This was contrary to the provisions of the PDTA Diving Operations Manual.

17.11 By virtue of being assigned another task, Mr Essers was required to pass on the lifeline that he was holding to another diver before he could finish dressing in. Mr Essers then needed to gather his remaining equipment. Whilst these preparatory steps each took a matter of seconds, it meant that Mr Essers did not enter the water immediately and with the minimum of delay. Further, if it can be accepted that Mr Essers entered the water within one minute of being instructed to do so by Mr Austin, then this timeframe exceeds how immediate entry by a standby diver is regarded under the current Australian Standard. This also supports the conclusion that Mr Essers did not enter the water with a minimum of delay. Whilst it is not possible to gauge the extent to which any such delay was affected by the absence of Mr Essers performing a standby diver drill prior to the evening dive, the evidence establishes that it most likely would have been of benefit to have done so, particularly given Mr Austin's evidence that this was his intention.

17.12 Having regard to the absence of Mr Essers performing a standby diver drill, despite Mr Austin's intention for this to occur, it is necessary to make the following recommendations.

17.13 **Recommendation:** I recommend that ADAS give consideration as to whether the ADAS Administration and Operation Procedures Manual should be amended to explicitly require that prior to a standby diver being used for the first time in any course, a standby diver simulated rescue drill is to be conducted so that the standby diver's current fitness to perform the role can be assessed and verified.

17.14 **Recommendation:** I recommend that ADAS review how the structure and operation of the ADAS Occupational SCUBA to 30m (Part 1) Course by Professional Divers Training Academy ensures that a diver's attendant is not assigned or performing any other task which would interfere with the duties of the diverss attendant.

18. Why was the communications equipment not working so as to record communications with the divers and when was this failure first uncovered?

18.1 The PDTA Diving Operations Manual required the diving supervisor to ensure "*that the plant and equipment being used meets all regulatory requirements and that it is suitable for performing the role and is in working order*". The dive on 19 May 2015 was the first occasion in which students were given responsibility for managing communications. One of the elements of competency that the students were to be assessed against was the ability to "*communicate effectively within a team*".

18.2 In his electronically recorded interview with the NSWPF, Mr Austin indicated that it is a requirement for all courses for communications to be recorded and that it was his usual practice to do so by way of a digital voice recorder. However, Mr Austin indicated that the batteries for this recorder were flat as at 19 May 2015 and that "*for reasons that [he could not] explain*" the batteries had not been changed. In addition, Mr Austin indicated that no communications during the Course up to 19 May 2015 had been recorded.

18.3 **Conclusions:** The communications equipment on 19 May 2015 was not functional because the apparent system used by Mr Austin was not put into effect. Indeed, on Mr Austin's own account to the NSWPF, no dive communications had been recorded for any part of the Course up to 19 May 2015. Whilst the failure to ensure that the communications equipment was functioning properly on 19 May 2015 is not relevant to the manner of Mark's death, it is indicative of an oversight in ensuring that equipment was in appropriate working order and contrary to PDTA's own manual.

19. Where were Team 2 directed to perform the evening drill and where did they in fact perform it?

19.1 The dive locations at The Pit were of different gradients. Mr Maguire described the topography in this way:

> I have dived on both the left and right hand sides of The Pit. I would describe the left hand side as geographically the hardest of the two sides, this being because of the steep nature of the bank and the more significant erosion. The right hand side has a more flat surface it tends to flat out a lot quicker.

19.2 Mr Austin indicated that in order for the teams to complete the Workbench Task it was his intention for each team to "*get a good flat spot to start*". Accordingly, Mr Austin intended that each team would "*take the workbench out to a flat level area in and around the [submerged] car*".

19.3 Team 1 and Team 2 were approximately 6 metres apart and less than 10 metres from the shoreline. Team 1 apparently performed the task in the location intended by Mr Austin. Notwithstanding, the team still encountered difficulties with the topography as noted by Mr McVicar:

> This task was hard work as the table was heavy and the ground was sloped. Once the table was standing upright Rowan returned to get the tools and I realigned the table so that it was orientated longways up the slope. The meant that its legs were across the slope and it was much more stable, despite being angled to match the slope. It had previously been orientated across the slope and it felt unstable and like it was going to tip down the slope.

19.4 In contrast, Team 2 did not take the workbench to the location intended by Mr Austin. Instead, Team 2 were positioned 2 to 3 metres from where Mr Austin intended them to be. Despite this, Mr Austin indicated that "*at no point even though [that location] wasn't where I told them to be, neither [Mr Rapp] nor I was concerned about the fact that it was in the wrong spot because if they had have thought it wasn't right then they could have told us*". In evidence, Mr Austin rejected the proposition that this placed the onus on the trainees to identify whether they were in the correct location.

19.5 In evidence, both Mr Austin and Mr Rapp sought to diminish the location where Team 2 was actually performing the task as having any bearing upon the ability of the students to successfully complete the task. Mr Austin sought to explain that "*the area that they were in was no different to the area that they were supposed to be at*", whilst at the same time agreeing that the location where Team 2 attempted to perform the Workbench Task had "*some slope*". In contrast, Mr Garcia relevantly described his ability to complete the Workbench Task in this way:

> Because the floor was on a bit of a slope and Mark was trying to lift the table from the higher side, the table just kept sliding away from him. I could see Mark going further away from me when this happened. After a while I couldn't see Mark's light. I just thought that Mark was still trying to lift the table.

19.6 Relevantly, Dr Millar noted that the workbench was a heavy steel item configured like a carpenter's sawhorse but significantly larger, and that when on its side two of the legs rest on the ground and two legs point diagonally upwards. Dr Millar expressed the following view:

It would have been very difficult to turn this item over and stand it up on a slippery slope - the task was apparently intended by the dive school to be conducted on a relatively level, gravelled underwater area.

19.7 It is submitted on behalf of PDTA that to the extent that it can be said that the location where Team 2 commenced performing the evening drill made their task "*slightly harder*", the intention of the Course "was to build the trainees' skill and confidence in performing difficult tasks and problem-solving underwater, in preparation for a professional diving career".

19.8 **Conclusions:** Whilst Team 1 was able to perform the task in the location intended by Mr Austin, it is evident that the topography impacted upon their ability to do so. As Team 2 was not performing the task in the location intended by Mr Austin, the impact of the topography upon their ability to do so was even more pronounced. It is clear from Mr Garcia's account that this directly affected his ability and Mark's ability to complete the Workbench Task. Whilst the overall intention of the Course may have been to develop the skill and confidence of the student divers by performing difficult tasks and problem solving underwater, as submitted on behalf of PDTA, there is no evidence that Mr Austin intended on 19 May 2015 for the location of Team 2 to contribute to any such development. Instead, Team 2 commenced performing their drill at an entirely unintended location.

19.9 Whilst Mr Austin recognised that Team 2 was not in the correct location at any point this did not cause him any concern. This is because Mr Austin considered that the onus rested with the student divers to inform him if they considered that the location was not correct. However, the evidence establishes that the ability of the student divers to do so was affected by a number of factors namely the task being performed for the first time, during a night dive, with poor visibility and Mark and Mr Garcia using a lift bag for the first time. In these circumstances, it was not reasonable for Mr Austin to expect that the student divers could have reliably indicated any concerns regarding the location of the Workbench Task. Having regard to the task loading associated with this task it is necessary to make the following recommendation.

19.10 **Recommendation:** I recommend that ADAS review how the structure and operation of the ADAS Occupational SCUBA to 30m (Part 1) Course by Professional Divers Training Academy appropriately assesses the degree of task loading for a trainee diver prior to the trainee driver performing a task which introduces new competencies and/or requirements.

20. How did Mark's mask flood or become dislodged during the evening drill?

20.1 The circumstances in which Mark's FFM became flooded or dislodged were not witnessed. At the time that the FFM became dislodged, Mark was engaged in a task which he had not performed before, without a full briefing and with a limited understanding of the precise nature of the task, with limited visibility and where the topography likely adversely impacted upon his ability to perform the task. The evidence indicates that Mark was attempting to lift the workbench on his own as it kept sliding away from him.

20.2 Mr van Teijlingen did not hear any signs of distress over the communication system prior to hearing the sound of the FFM become flooded. Mr Rapp, who was attending to Mark's line did not feel or hear anything to suggest that something was amiss until he heard the rush of bubbles.

20.3 When Mr Garcia was able to reach Mark, he observed that Mark's FFM was off his head and down by his right side. Mr Garcia attempted to put the FFM back onto Mark's face but found that it was stuck. When Mr Essers reached Mark, he believed that he saw part of the umbilical line wrapped around a leg and part of the workbench. When Mr Essers attempted to pull Mark back to the surface, he realised that Mark was entangled.

20.4 As discussed above, Acting Inspector Rowe stated that the majority of occupational diving performed by the AFP is conducted using the AGA Divator FFM which is similar to the Guardian FFM including the five-point head harness. Acting Inspector Rowe noted that with the FFM fitted correctly, it is possible that a narrow item (such as a work line) may get in between the regulator and the FFM and that if a diver forcefully moves their head to the side, the mask seal may be compromised causing a minor-league to occur. Acting Inspector Rowe stated that whilst there have been a number of instances where AFP divers have become entangled resulting in a FFM becoming momentarily dislodged, there has not been an instance where accidental dislodgement of a FFM resulting in the mask being fully flooded has occurred. Ultimately, Acting Inspector Rowe expressed this view:

> It is considered extreme are difficult if not impossible to accidentally remove the full face mask without first releasing the two buckles closest to the jaw line […] full dislodgement is considered almost impossible without the assistance of the diver removing the mask.

20.5 Senior Constable Brendan Nix from the NSWPF Diving Unit is a qualified NSWPF diver with 12 years' experience (as at 2015), holding ADAS Level 3 Commercial Diver and Level 2 Dive Supervisor certification. Singing gospel Nix conducted a number of FFM test dives regarding the possibility of FFM dislodgement and reached the following conclusion:

> Multiple entanglement scenarios were conducted in both controlled and uncontrolled methods, where the five-point spider was either loosened off in preparation prior to a ditch or left adjusted in maintaining a firm fit. In view of these tests I am happy to conclude it is possible for a FFM to be accidentally dislodged, as a result of entanglement and abrupt head movement in a forwards or a downwards direction, where a traction is applied against the point of obstruction. Dislodgement is still possible despite the FFM being firmly fitted.

20.6 Senior Constable Nix also referred to an ADAS safety alert issued in relation to an incident in February 2015 concerning a dive training course in Tasmania. The incident involved a student inadvertently entangling their FFM regulator in a jackstay line, resulting in the FFM being pulled from the student's head when he moved. A standby diver was immediately jumped and the student was assisted to the surface without injury. The student was using an AGA FFM, similar to the Guardian FFM used by Mark.

20.7 In addition, Dr Millar indicated that he had received advice from a number of colleagues who have worked as commercial or military divers, using FFMs of the type involved on 19 May 2015. In this regard, Dr Millar noted:

> All have reported that accidental mask dislodgement is possible and has occurred. Some have experienced this themselves. Two descriptions of such events included moving around an underwater structure, with the diver catching the "chin" of the mask on a protruding item, dislodging the mask upwards and off the head; and a case where a tightening lifeline caught was pulling upwards as it crossed the diver's chest, becoming taught under the diver's chin and "flipping" the mask upwards and off. Either of these explanations would seem consistent with the events at the Albury Pit.

20.8 There is no evidence to suggest that Mark removed his FFM in an intentional act of self-harm. Although had attempted self-harm in February 2015 there is no evidence that Mark had voiced any suicidal ideation approximate to 19 May 2015. Indeed, by this time, the evidence indicates that Mark was keen to participate in the Course and viewed it as part of his plans for the future.

20.9 **Conclusions:** The precise mechanism by which Mark's FFM became dislodged from his face and flooded is not entirely clear. This being the case, it is accepted that the test dives conducted by Senior Constable Nix could not replicate the precise manner in which Mark's FFM potentially became accidentally dislodged. However, these test dives represent the best reconstruction evidence available. In addition, the 2015 incident in Tasmania, whilst again not replicating the events of 19 May 2015, represent a real-life scenario resulting in a FFM similar to the one worn by Mark becoming accidentally dislodged after coming into contact with an object. It is not difficult to envisage a similar scenario occurring when Mark was attempting to stand the workbench upright as it moved down the contour slope of The Pit. The fact that Acting Inspector Rowe has not witnessed FFM dislodgement resulting in a mask becoming fully flooded, but is aware of a FFM becoming loosened after coming into contact with an object, does not exclude this as a possibility.

20.10 Further, the absence of any signs of distress prior to the sound of the FFM flooding being heard, and the appearance of a rush of bubbles to the surface indicates that dislodgement of the FFM occurred suddenly. Having regard to the relative complexity of the tasks that Mark was performing prior to this point, and both the FFM and Mark observed to have been entangled, it is most likely that the FFM became dislodged as Mark was attempting to control the workbench (which was sliding away from him) in order to lift it into place.

21. What Australian Standards apply to similar courses currently and what do they require in relation to the safe conduct of dive training and risk management during such training?

What does the ADAS Training Management System (Policy and Procedures Manual) require in relation to the safe conduct of dive training and risk management during such training currently?

21.1 It is convenient to deal with these issues together.

21.2 Following Mark's death, ADAS issued a notification dated 29 July 2015 (**ADAS Notification**) which included standby diver guidelines and additional diver guidelines to be implemented immediately by all ATEs, pending the development of a model program to be provided to all ATEs and some changes to the ADAS Course Requirements Manual. Relevantly, the ADAS Notification required the following:

(a) All standby divers to carry an additional second stage regulator that could be deployed under water to a diver in distress;

(b) every scuba diver undertaking in-water training to have an alternative second stage regulator that could be deployed should the primary breathing stage be lost or fail;

(c) each diver undertaking in-water training to have their own and dedicated life-line tender/attendant.

21.3 Unlike the ADAS Notification, the current version of AS 2815.1 does not provide for the matters referred to at (a) and (b) above. However, relevantly, it provides for the following:

(a) The concept of how a standby diver is to be dressed in similar to the ADAS Notification; and

(b) in order to allow for the immediate entry of a standby diver, that diver is to be situated at the water's edge and to enter the water directly after donning mask, and fins in some circumstances. As to the issue of immediate entry, AS 2815.1-2021 provides that "the expectation is that this would be 10 to 15 s between when the standby diver is directed to enter the water and the standby diver actually enters the water".

21.4 **Conclusions:** The ADAS Notification introduced significant improvements relevant to the safe conduct of dive training and risk management during such training. Ideally, such improvements should be reflected across the ADAS Training Management System and in the applicable Australian Standards. Therefore, it is desirable to make the following recommendations.

21.5 **Recommendation:** I recommend that ADAS ensure that the changes made in its 29 July 2015 notification are reflected in any updates to the ADAS Training Management System, if such updates have not already occurred.

21.6 **Recommendation:** I recommend that ADAS give consideration as to whether the change made in its 29 July 2015 notification, requiring that each diver undertaking in-water training must have their own and dedicated life line tender/attendant, requires clarification that the attendant should only attend upon one trainee diver at a time.

21.7 **Recommendation:** I recommend that a copy of the findings in the Inquest into the death of Mark Murphy be provided to Standards Australia for consideration as to whether AS2815.1 ought to be amended to provide that (a) all standby divers are to carry an additional second stage regulator that can be deployed in the water to a diver in distress; and (b) every scuba diver undertaking in-water training is to have an alternative second stage regulator that can be deployed should the primary breathing stage be lost or fail.

21.8 Separate to the above, but addressing purported matters of a systemic nature, it was submitted on behalf of PDTA that recommendations should be made which:

(a) seek to prescribe the manner in which the NSWPF investigates a death which occurs in a diving setting; and

(b) define the respective investigative roles of the NSWPF and SafeWork NSW when investigating a death which occurs in a diving setting.

21.9 Neither the NSWPF nor SafeWork NSW were regarded as parties of sufficient interest. The coronial investigation and the inquest did not examine the matters referred to above. In particular, the inquest did not receive any evidence regarding the manner in which the NSWPF ordinarily investigates a death which occurs in a dive setting, or any evidence regarding investigative methodologies which may have existed in May 2015, and which exist currently. Similarly, the inquest did not receive any evidence regarding the interface between the investigative roles performed by the NSWPF and SafeWork NSW regarding a death which occurs in a diving (and workplace) setting. Having regard to these matters, there is no evidentiary basis from which a conclusion can be reached that it is necessary or desirable to make the recommendations proposed above.

22. Findings

22.1 Before turning to the findings that I am required to make, I would like to acknowledge, and express my gratitude to Ms Donna Ward SC, Senior Counsel Assisting, and her instructing solicitor, Ms Ellyse McGee from the Crown Solicitor's Office. The Assisting Team has provided tremendous assistance during the conduct of the coronial investigation and throughout the course of the inquest. I am extremely grateful for their dedication and meticulousness, and for the sensitivity and empathy that they have shown during all stages of the coronial process.

22.2 I also thank Detective Senior Constable Darryl Glynn, the police officer-in-charge, and Senior Constable Brendan Nix for their respective roles in the coronial investigation.

22.3 The findings I make under section 81(1) of the Act are:

Identity

The person who died was Mark Murphy.

Date of death

Mark died on 20 May 2015.

Place of death

Mark died at Albury Base Hospital, East Albury NSW 2640.

Cause of death

The cause of Mark's cause was global cerebral hypoxia due to cardiac arrest and drowning, with bilateral bronchopneumonia being a significant condition contributing to Mark's death but not relating to the condition causing it.

Manner of death

Whilst attempting to perform an underwater diving task of righting an overturned workbench it is most likely that Mark's full face mask accidentally became dislodged (although the precise mechanism of dislodgement is not clear) resulting in sudden facial exposure to cold water causing physiological stress and triggering a diving reflex, followed by hypoxia leading to drowning (respiratory impairment due to submersion) and cardiac arrest.

22.4 It is truly distressing to know that Mark lost his life whilst diving, which was one of his life's true passions, and in circumstances where the diving course he was undertaking was very much a part of Mark's plans for his, and Thelma's, future. The loss that continues to be felt by those who miss Mark the most is indescribable.

22.5 On behalf of the Coroners Court of New South Wales and the Assisting Team, I offer my deepest sympathies, and most sincere and respectful condolences to Thelma, Leon, and Betty, as well as Mark's friends and loved ones, for their most painful and devastating loss.

22.6 I close this inquest.

Magistrate Derek Lee
Deputy State Coroner
1 July 2022
Coroners Court of New South Wales

Inquest into the death of Mark Murphy

Appendix A

Recommendations made pursuant to section *82 Coroners Act 2009*

To the Executive Director, Australian Divers Accreditation Scheme (ADAS):

1. I recommend that ADAS review how the structure and operation of the ADAS Occupational SCUBA to 30m (Part 1) Course by Professional Divers Training Academy verifies that a trainee diver has obtained any necessary medical certificate prior to commencing any diving (including any chamber dive) during a course.

2. I recommend that ADAS give consideration to whether applicants for the ADAS Occupational SCUBA to 30m (Part 1) Course should be required to provide the contact details for their treating medical practitioner (if any) when completing any medical questionnaire for the purpose of seeking certification of fitness to dive.

3. I recommend that ADAS review how the structure and operation of the ADAS Occupational SCUBA to 30m (Part 1) Course by Professional Divers Training Academy (a) provides for daily risk assessments to be performed prior to every dive; and (b) ensures that trainee divers fully understand all the steps to perform a dive task safely.

4. I recommend that ADAS review how the structure and operation of the ADAS Occupational SCUBA to 30m (Part 1) Course by Professional Divers Training Academy ensures that documented risk assessments are conducted to determine whether a standby diver can effectively and safely provide cover for a particular number of trainees at once, under the circumstances pertaining at a particular dive site.

5. I recommend that ADAS review how the structure and operation of the ADAS Occupational SCUBA to 30m (Part 1) Course by Professional Divers Training Academy ensures that (a) accurate records are kept in relation to the number of dives performed by trainee divers; (b) minimum surface intervals between dives are accurately recorded; and (c) trainee divers are given repeated exposure to the full dive experience, in accordance with the ADAS Course Requirements Manual.

6. I recommend that ADAS give consideration as to whether the ADAS Administration and Operation Procedures Manual should be amended to explicitly require that prior to a standby diver being used for the first time in any course, a standby diver simulated rescue drill is to be conducted so that the standby diver's current fitness to perform the role can be assessed and verified.

7. I recommend that ADAS review how the structure and operation of the ADAS Occupational SCUBA to 30m (Part 1) Course by Professional Divers Training Academy ensures that a diver's attendant is not assigned or performing any other task which would interfere with the duties of the diver's attendant.

8. I recommend that ADAS review how the structure and operation of the ADAS Occupational SCUBA to 30m (Part 1) Course by Professional Divers Training Academy appropriately assesses the degree of task loading for a trainee diver prior to the trainee driver performing a task which introduces new competencies and/or requirements.

9. I recommend that ADAS ensure that the changes made in its 29 July 2015 notification are reflected in any updates to the ADAS Training Management System if such updates have not already occurred.

10. I recommend that ADAS give consideration as to whether the change made it its 29 July 2015 notification requiring that each diver undertaking in-water training must have their own and dedicated life line tender/attendant requires clarification that the attendant should only attend upon one trainee diver at a time.

To the Chief Executive Officer, Standards Australia:

1. I recommend that a copy of the findings in the Inquest into the death of Mark Murphy be provided to Standards Australia for consideration as to whether AS2815.1 ought to be amended to provide that (a) all standby divers are to carry an additional second stage regulator that can be deployed in the water to a diver in distress; and (b) every scuba diver undertaking in-water training is to have an alternative second stage regulator that can be deployed should the primary breathing stage be lost or fail.