MAGISTRATES COURT TASMANIA

MAGISTRATES COURT *of* TASMANIA

CORONIAL DIVISION

Record of Investigation into Death (Without Inquest)

Coroners Act 1995
Coroners Rules 2006
Rule 11

(These findings have been de-identified in relation to the name of the deceased, family, friends, youths and others by direction of the Coroner pursuant to s57(1)(c) of the Coroners Act 1995

I, Olivia McTaggart, Coroner, having investigated the death of AW

Find, pursuant to Section 28(1) of the *Coroners Act* 1995, that

a) The identity of the deceased is AW, born 19 July 1964.

b) AW was 57 years of age at his death and he lived in St Helens with his wife. Together, they have two adult daughters. AW spent much of his life working as a commercial diver. At the time of his death he was employed in a glass manufacturing business. He was generally in good health and not undergoing medical treatment for any conditions.

At 6.50am on 24 December 2021, AW left with his daughter, son-in-law and best friend to go diving for crayfish near St Helens Island. AW was in good spirits. The group arrived at St Helens Island at approximately 7.55am and AW entered the water alone. AW was diving with a hookah compressor system. The equipment used in this system comprised a compressor unit mounted on the transom of the boat, a breathing hose, a jacket with integrated weights and a demand valve regulator. The equipment and boat were owned by AW.

Initially, AW dived to a depth of 21 metres. After approximately 10 minutes he came to the surface and said that he was not getting enough air. He appeared uncharacteristically irate at this time and banged the throttle area of the compressor with his abalone knife and then with a filleting knife. He then asked that the boat be driven to a particular area with a depth of 16 metres. Upon arriving at this shallower area, AW re-entered the water to dive. Approximately 10 minutes later, AW came to the surface but then immediately started sinking.

I cannot determine his state of consciousness at this stage. AWs son-in-law dived into the water in an attempt to hold him up but could not do so. AW was pulled to the surface by his air hose and dragged onto the boat. He was unresponsive and his son-in-law commenced CPR. Emergency services were called.

At 8.30am St Helens police were tasked to assist Ambulance Tasmania with a report of a probable cardiac arrest of a diver at St Helens Island. The police vessel was launched with two police officers and a volunteer paramedic on board. Another paramedic and a doctor were already on route in the St Helens Volunteer Marine Rescue vessel. The Marine Rescue vessel arrived at 9.25am and the doctor took over CPR upon AW. However, it was determined that he had died before their vessel had arrived.

Police officers then arrived. AWs boat was transported back to the Burns Bay boat ramp following which his boat and equipment were seized and an investigation commenced into his death.

An autopsy upon AW was conducted by forensic pathologist, Dr Christopher Lawrence, who formed the opinion that AW likely died due to cerebral arterial gas embolism (CAGE). Dr Lawrence noted the difficulty of determining which gas bubbles formed after death, but stated that the gas in the right and left ventricles of the heart may have been caused by a rapid ascent to the surface.

In this investigation, I have had the benefit of a very helpful report prepared by Karl Price, Facility Manager of the Department of Diving and Hyperbaric Medicine at the Royal Hobart Hospital. Mr Price conducted tests upon AW's diving equipment, and he concluded that multiple configuration, operation and maintenance issues with the equipment likely contributed to AW's death including:

- Inappropriate snorkel and prime mover exhaust arrangement. Both were orientated upward, with potential to draw contaminated air into the compressor. This would result in the diver breathing excess carbon monoxide and suffering the effects of carbon monoxide poisoning;
- Insufficient air filtration, with the additional filter pack also compromised. There was no suitable filtration material to remove carbon monoxide contaminants, and contaminants in the air would be compressed in the reservoir from which the diver breathed;

- The compressor did not deliver its stated airflow of 509.8 litres per minute but produced only 180 litres per minute when tested. This reduced the air availability to the diver when breathing at depth;
- There was an inoperative prime mover throttle governing mechanism which compromised the ability of the compressor to increase RPMs to maintain air supply for the diver to breathe;
- There was a poorly adjusted compressor relief valve;
- There was an excessively long hose to the diver which would have lowered the flow and pressure to the diver reducing significantly the amount of breathing air available; and
- The diver wore a weighted jacket that was not easily ditched in the event of an emergency either by the diver during self-rescue or by tenders. Ditching of individual weights was not possible.

The rusted and corroded condition of the compressor and regulator as illustrated in the forensic photographs is consistent with the conclusions of Mr Price. Upon the evidence in the investigation, AW had not been diving using the compressor during the previous 12 months as he had not had anyone to assist him in crewing his boat. Further, the dive hose was laid out on the boat in a way that was conducive to kinks and thus airflow restriction to a diver. The fittings on the hose were worn and leaking and were not of diving quality.

AW was thought to be meticulous and knowledgeable with his diving equipment. However, I am satisfied that he did not maintain his hookah equipment to a standard where he was able to dive safely on the day in question.

I find that AW was aware that there was a significant issue with the compressor and his ability to breathe after surfacing from his first dive at a depth of 21 metres. I cannot determine whether he made an excessively rapid ascent from this dive or whether he developed issues that contributed to his death. In any event, he should not have continued diving, but instead chose to dive in shallower water where he believed there would be less demand upon the compressor.

After a short time in the second dive, it is likely that he was again forced to make an ascent. This ascent may have been rapid, causing gas emboli in the blood. If AW was not fully conscious, he may not have exhaled sufficiently in the ascent, further increasing the development of gas bubbles.

It is not possible to determine whether AW absorbed excessive carbon dioxide due to his equipment faults as referred to above. However, the toxicological evidence suggests that it is quite possible that intake of abnormally high levels of carbon monoxide caused AW to be breathless and confused. This may well have contributed to the circumstances surrounding his death.

c) AW's cause of death was cerebral arterial gas embolism (CAGE).

d) AW died on 24 December 2021 in the Tasman Sea in the vicinity of St Helens Island, Tasmania.

In making the above findings, I have had regard to the evidence gained in the comprehensive investigation into AW's death. The evidence includes:

- The Police Report of Death to the Coroner;
- Affidavits confirming life extinct and identification;
- Opinion of the forensic pathologist regarding cause of death;
- Toxicology reports of Forensic Science Service Tasmania;
- Ambulance Tasmania electronic patient care records for AW;
- Tasmania Health Service and Ochre Medical Centre records for AW;
- Affidavit of RC, wife of AW;
- Affidavit of DU, friend of AW;
- Affidavit of OT, son-in-law of AW;
- Affidavit of PM, daughter of AW;
- Affidavits of six attending and investigating officers, together with photographs;
- Diving equipment report from the Diving and Hyperbaric Medicine Unit at the Royal Hobart Hospital; and
- Marine and Safety Tasmania information and fishing licence for AW.

Comments

AW's death was preventable and due directly to unsafe hookah diving equipment which he had not adequately maintained.

Hookah owners must be aware that their apparatus is a life support system when they are under water, and it must be fit for purpose, well maintained and produce adequate supply of good quality breathing air to divers.

Hookah divers should, where possible, carry an accessory air supply and a buoyancy apparatus, for use in an emergency.

Hookah divers should also ensure they can easily release their weight belt in an emergency.

Unfortunately, coroners are regularly required to investigate deaths involving unsafe hookah diving equipment.

There are currently no governing regulations in this state imposing standards for hookah diving equipment, and formal qualifications for divers are unnecessary. There may be good reason for introducing regulatory oversight of recreational hookah diving, and an inspection system to assess apparatus safety and maintenance schedules. I do not, however, consider it appropriate in this investigation to make formal recommendations in this regard.

I note that, several years ago, an excellent educational video was produced by MAST in conjunction with the Department of Diving and Hyperbaric Medicine at the Royal Hobart Hospital in order to promote hookah diving safety. The video can be viewed at https://mast.tas.gov.au/safe-boating/marine-safety-guides-and-tips/hookah-diving-safety/ .

The video is a good reminder to recreational hookah divers of the risks and critical safety precautions. Those involved in recreational hookah diving should take the time to view it. Agencies and bodies involved in this area should also continue to promote this video and promulgate safety messages for hookah divers generally.

I extend my appreciation to investigating officer, Constable Carlene Barcham, and the experts who provided assistance in this case.

I convey my sincere condolences to the family and loved ones of AW.

Dated: 10 April 2024 at Hobart, in the State of Tasmania.

Olivia McTaggart
Coroner