

SOUTH



AUSTRALIA

FINDING OF INQUEST

An Inquest taken on behalf of our Sovereign Lady the Queen at Port Lincoln in the State of South Australia, on the 17th day of March and the 11th day of April 2003, before Wayne Cromwell Chivell, a Coroner for the said State, concerning the death of Paul William Buckland.

I, the said Coroner, find that, Paul William Buckland aged 23 years, late of 3/6 Bishop Street, Port Lincoln, South Australia died at sea off Smoky Bay, South Australia on the 30th day of April 2002 as a result of exsanguination from amputation of his right leg.

1. Introduction

- 1.1. On 30 April 2002 Paul William Buckland, then aged 23 years, was a professional scallop fisherman. He operated a 6½ metre aluminium boat and leased a scallop fishing licence from his brother.
- 1.2. On that day, Mr Buckland was fishing with Shannon Luke Jenzen in the Great Australian Bight, off Smoky Bay, about 40 kilometres south of Ceduna.
- 1.3. The two men left Smoky Bay at about 7:30am and tried about four locations without much success.
- 1.4. When they arrived at the fifth location, at about 11:30am, Mr Jenzen began diving and found good quality fish in about 32 feet of water with good visibility. Mr Jenzen dived for about an hour and came up at about 12:30pm, at which time Mr Buckland replaced him in the water.

- 1.5. Mr Buckland had been diving for between five and ten minutes when tragedy struck. Mr Jenzen described what happened as follows:

'I was sorting a catch and I was about three-quarters of the way down the hose when I heard Bucky calling out to me, he was yelling my name. I didn't see him come up but I knew something was wrong. I think he was saying "Shannon come quick". He was between 50 and 100 metres away. I kicked the motors over and put it in gear and started to motor over to him. The shark attacked virtually straight away and I saw it happening in front of me. I saw that it was a white pointer and it had Bucky in its jaws. It lunged out of the water and shaking its head and thrashing around. It didn't take Bucky under. I steamed up to the shark and it was still attacking him it wouldn't let him go. The shark was enormous it was the size of the boat. The girth of it was huge. It was just thrashing him on the top of the water. Bucky wasn't screaming at all it was just so violent. I reached him and hit the shark with the side of the boat. I went around to the steps at the side got on the steps and pulled Bucky in. The shark let go as I pulled Bucky in. As I pulled Bucky from the water I felt the Shark Pod zapping me. If the pod is on it will give out little electric shocks when it comes out of the water.

Bucky was still alive when I was pulling him in but I saw that his injuries were so extensive. As I pulled him in he just said "get me in the boat". He died pretty well straight after I had got him in.'

(Exhibit C1c, p2)

- 1.6. Unfortunately, the VHF radio on the boat was defective, and the mobile telephone on the boat had a flat battery, so Mr Jenzen was unable to contact the shore. He steered the boat back towards Smoky Bay, stopping on the way to ask some fishermen to radio for an ambulance, which they did. He warned other fishermen in the area to get their divers out of the water. He then headed to the boat ramp and awaited the ambulance but it was clearly too late for Mr Buckland.

2. Cause of death

- 2.1. A post-mortem examination of the body of the deceased was performed by Professor R W Byard at the Forensic Science Centre on 2 May 2002. Professor Byard noted that Mr Buckland's right leg had been completely amputated through the hip joint. There were also multiple irregular incised bite marks of the buttocks and upper left leg.
- 2.2. Professor Byard commented:

'Death was due to exsanguination from amputation of the right leg through the hip joint. This was associated with multiple incised wounds typical of those found with shark attack. Further assessment of the bite marks will be available in a separate odontology report (see attached). No underlying organic diseases were present which could have

caused or contributed to death. There were no other significant traumatic injuries. Toxicology was negative.'

(Exhibit C3a, p1)

- 2.3. Dr Helen James, Forensic Odontologist, examined Mr Buckland's injuries, and his wetsuit, bathers and diving vest. She concluded that the pattern of wounds was consistent with the dentition of a great white shark. She was unable to accurately determine its size (Exhibit C5a).

3. The shark repellent device

- 3.1. I have already mentioned Mr Jenzen's evidence that Mr Buckland was wearing a 'Shark Pod' at the time of the attack, and that it was functioning as he pulled Mr Buckland out of the water.
- 3.2. I heard evidence from Ms Helena Wescombe-Down, the Commercial Manager of Sea Change Technology Pty Ltd. Ms Wescombe-Down was previously a Managing Director of Shark Protection Pty Ltd, the company which imported the 'Shark Pod' device from South Africa. The device works as follows:

'The deterrent technology, which surrounds the user with an electrical field, was developed by the Natal Sharks Board in Kwa Zulu Natal, South Africa, approximately 10 years ago. It works by surrounding the user with an electrical field, which impacts on special receptors in the snout of the shark. These receptors, called the Ampullae of Lorenzini, appear as many tiny black dots on the snout of the shark. The receptors are filled with an electrically conductive gel that connects external electrical fields to an array of nerves.

The shark repelling technology produces electrical field strengths that impact on a shark's central nervous system. As a shark approaches, the impact of the field first creates discomfort, and then produces muscle spasms causing the shark to flee the immediate area. A distinct advantage of the unique electronic wave-form is that it only repels sharks.' (Exhibit C10)

- 3.3. The 'Shark Pod' consists of three main components which are described as the 'main body', in which the electronic componentry and the battery are located, and which is attached to the air cylinder or the buoyancy vest of the diver, the 'fin electrode' which attaches to the diving fin of the diver, and the 'hand switch' which is a cable device which comes over the divers shoulder and is attached to the front of the buoyancy vest.

3.4. The User Manual for the equipment states:

'Note: For maximum protection the diver unit should be left on for the full duration of the dive. It may also be switched on, or off, at any time under water.'

(Part of Exhibit C10, p7)

3.5. Ms Wescombe-Down said that in order to be fully effective, the electrodes in the main body and the fin electrode need to be at least 1.5 metres apart (see the User Manual, page 6).

3.6. Mr Jenzen told me that when he and Mr Buckland used the device, the fin electrode was actually attached to the air hose with a float, so that it was above the diver's head, rather than below him. He said that divers found this more convenient, enabled them to get the electrodes further apart, and avoid electric shocks to the legs (T15).

3.7. Mr Jenzen also told me that he and Mr Buckland were in the habit of turning the unit off once they reached the sea bed, again to avoid shocks, because they felt safest on the sea bed, and that they were most at risk when 'mid-water' (T16). He also explained that this method reduced battery consumption, although this was a less important factor (T17).

3.8. Ms Wescombe-Down explained that the problem with having the electrode on the air hose is that because the hose is flexible, and is inclined to bend, the electrodes become too close together and are less effective. This is particularly the case when the diver is on or near the surface.

3.9. I also heard evidence from Senior Sergeant R B McDonald, the Officer in Charge of the Water Operations Unit, part of the STAR Group, South Australia Police. Senior Sergeant McDonald is a highly experienced diver and has been in charge of the Water Operations Unit for about five years.

3.10. Senior Sergeant McDonald arranged for the 'Shark Pod' unit worn by Mr Buckland to be tested at Sea Change Technology Pty Ltd on 22 May 2002. He said the unit was tested alongside two others, including one owned by SA Police. All three units performed satisfactorily and the battery, even three weeks after the attack, was still carrying an effective charge (Exhibit C9, p5).

- 3.11. Senior Sergeant McDonald explained shark behaviour when confronted with a repellent device as follows:

'It is my belief and understanding that Great White sharks are generally instinctive and unpredictable in their behavioural patterns. They are known to have highly developed senses of smell, hearing and sight and possess an ability to detect a presence through vibration from quite some distance. Once the presence of something of interest is detected (a food source) a shark will often commence to circle to further investigate. During this stage if it passes through the electronic pulsating field produced by the Shark Pod it is more than likely going to move away. As the creature becomes more interested or excited during circling it may begin to commence making passes of the object of interest thus using all of its senses of smell, sound and sight. During this stage also it is more than likely that it may be deterred by the presence of the electronic pulsating field emitted by the Shark Pod. Eventually all of the various stimuli associated with a food source will lock into place and the shark reaches a point or level of excitement where it will attack. Attacks can be in the form of a "mouthing" or "feeling" with its mouth or in the case of Paul Buckland straight out attack. It is more than likely at this stage that the wearing of any form of shark repellent device would have little or no effect in discouraging a shark from attacking.'

(Exhibit C9, p2)

- 3.12. Senior Sergeant McDonald gave his opinion as to what happened to Mr Buckland as follows:

'It is quite possible that this shark was in the vicinity or and aware of the presence of Shannon Jenzen whilst he was underwater and could have been circling and passing him without his knowledge. Because the Shark Pod was turned off, the shark was not deterred. During the change over of divers I feel that this partially interested or excited shark became more excited and interested by the movement of Jenzen to the surface, movement on the surface by both divers and then the descent of Buckland to the sea floor. Scallop divers spend the greater majority of their time on the sea bed looking down to identify and pick up scallops by hand. It is highly likely that this shark continued to circle and pass Buckland undeterred by his non activated Shark Pod. It would appear that after 5-10 minutes into this dive which would ordinarily have lasted for at least an hour on the bottom, Paul Buckland has spotted the shark, probably as it was making a pass. By this stage the shark must have been quite excited or preparing to attack. Instead of staying on the sea bed and making his way along the bottom to a point directly below the vessel with his Shark Pod turned on, he appears to have immediately left the bottom and commenced an ascent switching his Shark Pod on as he went. In doing so he was surfaced 50-100 metres (a considerable distance) from the boat and called for assistance. Once on the surface his Shark Pod is more than likely ineffective because the second electrode designed to be fitted to his flipper or foot had been fitted to his airline above his head. On the surface, this electrode would have been out of the water thus preventing it from performing as designed to produce the pulsating electronic field output.'

Due to the distance that he has surfaced from the boat and the time that it has taken for him to raise the alarm and for his partner to start up and move to his location he was unable to get out of the water and away from this shark. He was subsequently attacked by a single bite from this shark as he waited on the surface and died a short time later aboard his boat.'

(Exhibit C9, p3-4)

Senior Sergeant McDonald is very experienced in these matters, and I accept this evidence.

- 3.13. Senior Sergeant McDonald also explained that once Mr Buckland reached the surface, the electrode attached to the airhose would have been ineffective since it was no longer fully submerged. Ms Wescombe-Down agreed, although she stated that it might still have been partially effective since the underside of the electrode would still have been in the water and so might have sent out a smaller electronic pulse (T49).
- 3.14. This, combined with the fact that the airhose may have bent while on the surface, thereby reducing the gap between the two electrodes and rendering the device even less effective, may have combined to rob Mr Buckland of the protection it might have otherwise provided.

4. Conclusions

- 4.1. Taking the above evidence into account, I form the following conclusions:
- That Mr Buckland was wearing his 'Shark Pod' device incorrectly at the time of the attack on 30 April 2002 in that the fin electrode, instead of being attached to his fin, was attached to his airline supported by a float which had the potential, particularly when he reached the surface, to make the shark repellent device less effective;
 - The practice, adopted by Mr Buckland and Mr Jenzen, of turning the 'Shark Pod' device off when they reached the sea bed and commenced working, also reduced the potential effectiveness of the device in that it failed to repel the shark during its initial investigation of their presence.

5. Recommendations

- 5.1. The 'Shark Pod' device has now been superseded by a device called the 'Shark Shield'. This is a device which was developed by Sea Change Technology Pty Ltd using the same core technology under licence from the Natal Sharks Board. Both Ms

Wescombe-Down and Senior Sergeant McDonald told me that this device is much more ‘user friendly’ than the ‘Shark Pod’, in that it is lighter, easier to put on, and has better batteries. Senior Sergeant McDonald told me that it is SAPOL policy for these units to be worn by members of the Water Operations Unit when underwater in areas where the presence of sharks may pose a risk. He said that when worn, the units are switched on for the entire duration of the time spent underwater.

- 5.2. Taking into accounts Senior Sergeant McDonald’s comments, together with the ‘testimonials’ from divers who use the equipment (including one from Mr David Buckland, a brother of the deceased), it seems clear that this equipment can be effective in repelling sharks in a significant proportion of circumstances. Of course, having regard to the unpredictability of these creatures, it cannot be said with certainty that the device will always be effective in any circumstances. It seems to me, however, that both commercial and recreational divers who dive in areas where they may encounter sharks should be encouraged to wear this equipment. Ms Wescombe-Down used an analogy with seatbelts and airbags in motor vehicles, saying that although they will not guarantee that the passenger will survive every crash, the chances of survival are enhanced. I agree that the same applies to these devices.
- 5.3. I therefore recommend, pursuant to Section 25(2) of the Coroners Act, that commercial and recreational divers, when operating in waters where there is a risk of the presence of sharks, should wear a shark repellent device of the ‘Shark Pod’ or ‘Shark Shield’ type, provided that the equipment should be used in accordance with the manufacturers instructions, and should be turned on for the entire duration of time in the water.

Key Words: Shark Attack; Diving - Underwater; Shark Repellent Technology

In witness whereof the said Coroner has hereunto set and subscribed his hand and

Seal the 11th day of April, 2003.

Coroner