

**SHERIFFDOM OF GRAMPIAN, HIGHLAND AND ISLANDS AT LOCHMADDY**

[2020] FAI 44

LMD-B10-20

DETERMINATION

BY

SHERIFF GARY AITKEN

UNDER THE INQUIRIES INTO FATAL ACCIDENTS AND SUDDEN DEATHS ETC  
(SCOTLAND) ACT 2016

into the death of

**PETER ANTHONY CLUNAS**

Lochmaddy, 5 November 2020

**Determination**

The sheriff, having considered the information presented at the inquiry, determines in terms of the Inquiries into Fatal Accidents and Sudden Deaths etc. (Scotland) Act 2016, (hereinafter referred to as “the 2016 Act”):

**In terms of section 26(2)(a) of the 2016 Act (when and where the death occurred)**

The late Peter Anthony Clunas, born 9 March 1959, died about 10.15 hours on 13 June 2018 whilst piloting a helicopter registered number G-PLMH in the course of his employment, which crashed in Loch Scadavay, North Uist.

**In terms of section 26(2)(b) of the 2016 Act (when and where any accident resulting in the death occurred)**

The accident resulting in death took place about 10.15 hours on 13 June 2018 immediately prior to the helicopter piloted by the said Peter Anthony Clunas crashing in Loch Scadavay, North Uist.

**In terms of section 26(2)(c) of the 2016 Act (the cause or causes of the death)**

The cause of the death of said Peter Anthony Clunas was 1 (a) head injury and drowning due to (or as a consequence of) (b) helicopter crash.

**In terms of section 26(2)(d) of the 2016 Act (the cause or causes of any accident resulting in the death)**

The cause of the accident resulting in the death of said Peter Anthony Clunas, was the underslung boat being carried by the helicopter flying up, the lifting chain connecting the boat to the helicopter striking and damaging the tail rotor of the helicopter and the lifting chain becoming wrapped round the tail rotor boom of the helicopter. This rendered the helicopter uncontrollable and it thereafter descended rapidly and struck the surface of Loch Scadavay.

**In terms of section 26(2)(e) of the 2016 Act (any precautions which (i) could reasonably have been taken and (ii) had they been taken, might realistically have resulted in death, or any accident resulting in death, being avoided)**

There are no precautions which could reasonably have been taken that might realistically have resulted in the death, or accident resulting in the death, being avoided.

**In terms of section 26(2)(f) of the 2016 Act (any defects in any system of working which contributed to the death or the accident resulting in death)**

There were no defects in any system of working which contributed to the death or the accident resulting in death.

**In terms of section 26(2)(g) (any other facts which are relevant to the circumstances of the death)**

There are no other facts relevant to the circumstances of the death of said Peter Anthony Clunas.

### **Recommendations**

**In terms of sections 26(1)(b) of the 2016 Act (recommendations (if any) as to (a) the taking of reasonable precautions, (b) the making of improvements to any system of working, (c) the introduction of a system of working, (d) the taking of any other steps, which might realistically prevent other deaths in similar circumstances)**

There are no recommendations made.

### **NOTE**

#### **Legal Framework**

[1] This inquiry was held in terms of section 1 of the 2016 Act and was governed by the Act of Sederunt (Fatal Accident inquiry Rules) 2017 (hereinafter referred to as “the 2017 Rules”). This was a mandatory inquiry in terms of section 2 of the 2016 Act as Mr Clunas died as a result of an accident in the course of his employment or occupation.

[2] The purpose of the inquiry is set out in section 3 of the 2016 Act as being to establish the circumstances of the death and to consider what steps, if any, might be

taken to prevent other deaths in similar circumstances. It is not intended to establish liability, either criminal or civil. The inquiry is an exercise in fact finding, not fault finding. It is not open to me to engage in speculation. The inquiry is an inquisitorial process. The Crown, in the form of the Procurator Fiscal represents the public interest.

[3] In terms of section 26 of the 2016 Act the inquiry must determine certain matters, namely where and when the death occurred, when any accident resulting in the death occurred, the cause or causes of the death, the cause or causes of any accident resulting in the death, any precautions which could reasonably have been taken and might realistically have avoided the death or any accident resulting in the death, any defects in any system of working which contributed to the death, and any other factors relevant to the circumstances of the death. It is open to the Sheriff to make recommendations in relation to matters set out in subsection 4 of section 1 of the 2016 Act.

### **Introduction**

[4] This inquiry was held into the death of Peter Anthony Clunas. Mr Clunas sadly died on 13 June 2018 when a helicopter which he was piloting in the course of his employment crashed into the water at Loch Scadavay, North Uist. Mr Clunas was using the helicopter to transport a boat. The boat was suspended underneath the helicopter on a chain. Shortly after take-off the boat began to swing and the chain connecting the boat to the helicopter came in contact with the tail rotor of the helicopter. The chain became wrapped around the boom connecting the tail rotor to the main fuselage of the helicopter. This resulted in the helicopter becoming uncontrollable. It crashed into the

water at Loch Scadavay and Mr Clunas sustained a significant head injury. The time frame from the chain striking the tail rotor to the impact with the loch was little more than 10 seconds. Mr Clunas was unable to escape from the helicopter. The helicopter was submerged in the water. Mr Clunas was unresponsive when rescued from the helicopter and at 10.55 hours paramedics confirmed that he had died. The death of Mr Clunas was reported to the Procurator Fiscal (hereinafter referred to as “the Crown”) on 13 June 2018.

[5] A preliminary hearing was held by Webex on 10 September 2020. At that time the Air Accident Investigations Branch (hereinafter referred to as “the AAIB”) were represented by a solicitor, however it was subsequently intimated that while a solicitor instructed by them would observe the inquiry they did not wish to formally participate. Likewise, Mr Clunas’ employers, PDG Helicopters, were also represented by a solicitor at the preliminary hearing but were observers at the inquiry, as they did not wish to be formally represented. It was clear that much of the evidence was not in dispute and the Crown were instructed to prepare a Notice to Admit Information in terms of rule 4.12 of the 2017 Rules.

[6] The inquiry proceeded, by Webex, on 22 October 2020. Mrs Arthur, Procurator Fiscal Depute, represented the Crown. The Crown lodged a substantial Notice to Admit Information, which was not objected to. I accepted the facts set out in the Notice to Admit Information.

[7] The Crown also lodged an inventory of productions as follows:

1. Storm Incident

2. Post Mortem Examination Report dated 24 July 2018
  3. Report by AAIB published 18 July 2019
  4. HIAL Transcript
  5. CAA CAP 426 Helicopter External Load Operations
  6. Album of Photographs
  7. E-mail from Dr Mark Ashton, Consultant Pathologist
  8. Peter Clunas CV
  9. Peter Clunas Training Records
  10. PDG – Note of Actions Post Incident
  11. Death certificate
- [8] The Crown lodged a list of witnesses as follows:
1. Johnathan Davis
  2. Niall James Levenson-Gower
  3. Paul Prior Pitt
  4. Peter Johnston
  5. Henry Dalgety
  6. Kenneth Dickson
  7. Alasdair Kenneth Mackay, Air Traffic Controller
  8. Ross McClenaghan, Police Constable
  9. Alan Thorne, Inspector, AAIB
  10. Paul Hannant, Senior Inspector, AAIB

The evidence of the first eight witnesses was contained in the Notice to Admit Information. The evidence of witnesses 9 and 10 was contained in the AAIB report, lodged as Production 3. However, I also heard oral evidence from witnesses 9 and 10 to supplement said report.

### **The facts**

[9] Peter Anthony Clunas was born on 9 March 1959. He was 59 years old at the time of his death.

[10] At the time of his death Mr Clunas was employed as a helicopter pilot by PDG Helicopters, a commercial aviation service provider. He had worked for PDG Helicopters since 28 August 2016. He had previously worked for them between 1997 and 1999. Mr Clunas had flown professionally since 1986. His previous experience included flying military, offshore and air ambulance helicopters. Prior to re-joining PDG Helicopters in 2016 he had accrued 9260 hours of flying time in helicopters. Of that period, 2100 hours related to lifting underslung loads. Since re-joining PDG Helicopters Mr Clunas had accrued an additional 1890 hours of flying time, all in the type of helicopter he was flying on 13 June 2018. He had carried out 4072 lifts of underslung loads in that period.

[11] Mr Clunas held a valid EASA Class 1 medical and an EASA Airline Transport Pilot's Licence (Helicopters). He was appropriately qualified to fly the AS350 helicopter registered number G-PLMH (hereinafter referred to as "G-PLMH") which he was

piloting on 13 June 2018. He was appropriately qualified to carry out the helicopter external load operations which he was carrying out that day.

[12] The Civil Aviation Authority (hereinafter referred to as “the CAA”) is the independent aviation safety regulator in the United Kingdom. After the fatal accident the CAA reviewed its records for Mr Clunas, the helicopter G-PLMH and PDG Helicopters. All licences, certificates and approvals required for the operation of the accident flight were held and valid.

[13] On 13 June 2018 Mr Clunas began work at approximately 8.50 hours. He was working with his colleague, witness Johnathan Davis. Mr Davis was carrying out the duties of Task Specialist Ground. They were working on North Uist.

[14] The duties of Mr Clunas and Mr Davis that day were to use G-PLMH to transport two passengers from Loch Scadavay to Loch Hunder, both in North Uist and thereafter to use G-PLMH to transport two boats, in two separate lifts, from Loch Scadavay to Loch Hunder. The transportation of the passengers and the first boat were unremarkable. The transportation of the second boat began at approximately 10.11 hours that day. The fatal accident occurred about 10.15 hours in the course of transporting that second boat.

[15] Loch Scadavay is approximately 7.5 nautical miles north-east of Benbecula Airport. Loch Scadavay and Loch Hunder are part of the North Uist Estate with Loch Scadavay being the larger of the two lochs. A contract is in place between North Uist Estate and Scottish Fish Farms who have a fresh water fish farm and site equipment at



Loch Scadavay. A small jetty which is just off the main road provides access to the south side of the loch.

[16] After the first boat had been successfully moved, Mr Clunas landed the helicopter at Loch Scadavay and shut down the engine. He and Mr Davis discussed the practicalities of lifting the second boat, which they recognised as a potentially unstable load. Lifting straps were attached to the second boat and secured in place with ropes. The boat was to be lifted in a horizontal position. It was recognised that the boat was a light load and might catch the wind. This dynamic risk assessment was not, and did not require to be, committed to writing. Mr Clunas had left his flying helmet in the helicopter during this discussion. That was to be expected.

[17] The lifting of the second boat was an unscheduled task which was within the capabilities of Mr Clunas and G-PLMH, but was subject of a dynamic risk assessment by the pilot on the ground as no prior notification of the task had been provided to the operator, PDG Helicopters. The operator had an approved procedure for dealing with such events and the responsibility for compliance with this rested with the pilot in command, Mr Clunas. He had the training necessary to complete the assessment on the safe lifting of the load.

[18] The second boat was lifted by attaching the lifting straps to a guarded hook attached to a 10 metre long chain, with a 1 metre section of rope at the top to act as a shock absorber prior to being connected to a special load lifting hook on the underside of G-PLMH. The lifting hook on the underside of G-PLMH was fitted with an

emergency release allowing the pilot to jettison the underslung load in the event of an emergency.

[19] Mr Clunas lifted the second boat with the helicopter. The boat began to swing. Mr Davis radioed Mr Clunas suggesting that he reduce his speed and saw the nose of the helicopter rise, indicating that Mr Clunas was slowing the helicopter down. To hear the radio message from Mr Davis, Mr Clunas must have been wearing his flying helmet.

[20] At 9.20 hours that day the recorded weather at Benbecula Airport was wind from 180 degrees at 14 knots, 9,000 metres visibility in light rain, a few clouds at 900 feet, scattered cloud at 1,600 feet, broken cloud at 2,500 feet and a temperature of 12 degrees centigrade. In the course of a radio conversation between Mr Clunas and the Air traffic Controller at Benbecula Airport Mr Clunas was advised that the wind at the airport was 180 degrees and 13 knots. He responded that the wind at the lifting site felt a lot stronger than that.

[21] As the boat was swinging it suddenly swung up, described by Neil Levenson-Gower as being like a kite. The boat went over the top of the tail boom of G-PLMH and the lifting chain struck and badly damaged the tail rotor. The lifting chain thereafter became wrapped around the tail boom.

[22] The helicopter was only approximately 180 feet above the ground when the chain hit the tail rotor and tail boom. The helicopter crashed into the water of Loch Scadavay. The fuselage was submerged in the water.

[23] The emergency services were contacted at 10.15:10 hours. Mr Clunas' flying helmet was seen floating in the water, still attached to the helicopter by the cable. Mr

Clunas was strapped in his seat in the helicopter when assistance got to him. He was cut free and brought back to shore. He had been trapped in the helicopter for approximately 15 minutes. He was unresponsive but CPR was carried out. Paramedics arrived at the scene about 10.45 hours and at 10.55 hours confirmed that Mr Clunas had died.

[24] A post mortem examination established that Mr Clunas had died as a result of a head injury and drowning, as a consequence of the helicopter crash. The head injury sustained by Mr Clunas was severe and would have almost certainly led to an immediate loss of consciousness. Mr Clunas was submerged in water after the helicopter crashed and was unresponsive when recovered from the helicopter. At the time that he sustained the head injury Mr Clunas was not wearing his flying helmet. Had Mr Clunas been wearing his flying helmet at the point of impact the outcome would have been the same.

[25] The AAIB is the body in the United Kingdom charged with the investigation of air accidents. The statutory remit of the AAIB is to investigate air accidents with a view to making safety recommendations and seeking to prevent a recurrence of a similar accident in the future. Inspectors from the AAIB attended at the scene of the fatal accident and carried out investigations.

[26] Arrangements were made for the wreckage of G-PLMH to be recovered and examined. The helicopter was found to be well maintained and there were no defects which contributed to the cause of the accident. The flying helmet used by Mr Clunas was examined and found to be undamaged. The lifting chain was still wrapped round

the tail boom. The tail rotor showed damage consistent with being hit by the chain. The lifting chain had been jettisoned from the lifting hook on the underside of G-PLMH.

[27] At the conclusion of the AAIB investigations a report was produced and published on the AAIB website. That report is available to the public. A copy of the report was lodged by the Crown as Production 3. The AAIB did not make any safety recommendations in said report.

### **The evidence**

[28] Johnathan Paul Davis is employed by PDG Helicopters as ground crew and was working with Mr Clunas on 13 June 2018. His statements to the police are contained in the Notice to Admit. He described his working relationship with Mr Clunas and the duties they were to carry out on 13 June 2018. He described the risk assessment carried out by Mr Clunas and himself in relation to the second boat and described the lifting of the second boat. He saw the boat beginning to move and radioed Mr Clunas to tell him to slow down. He saw the helicopter moving, as if Mr Clunas was slowing it down. He saw the boat swing over the top of the tail boom, there was a loud bang and it looked as though Mr Clunas had lost control of the helicopter. It appeared that Mr Clunas was fighting to regain control of the helicopter for about 10 seconds before the helicopter crashed into the loch.

[29] Mr Davis described how the helicopter came to rest upside down in the loch. It was about 15 metres out from the shore. He phoned 999. He, Mr Levenson-Gower and another man rowed out to the helicopter. He saw Mr Clunas' flying helmet floating in

the water next to the helicopter, still attached by the cable. Mr Clunas was under the water, strapped in his seat. They got a knife and cut him free. There was no sign of life from Mr Clunas. He thought Mr Clunas had been submerged in the water for about 15 minutes. The emergency services arrived. He telephoned his employers to tell them what had happened.

[30] Niall James Levenson-Gower is the land owner at the North Uist estate. His statement to the police is contained in the Notice to Admit. He described the arrangements which were in place for PDG Helicopters to lift a boat for him, boat 1, and later arrangements for a second boat to be lifted on behalf of someone else. He did not know Mr Clunas or Mr Davis. He described the transportation of two workers and subsequently boat 1 to Loch Hunder. He explained that Mr Davis had expressed some doubts about lifting boat 2 by helicopter. He described Mr Davis and Mr Clunas discussing the lifting of boat 2 and boat 2 being lifted. Shortly after take-off he saw boat 2 spinning in both directions. The weather was gusty but not extreme. The boat lifted in the air, "like the boat had turned into a kite" and he heard a bang. The boat had come in contact with the helicopter. Something broke and fell away from the helicopter. The helicopter crashed into the loch. He retrieved rowlocks from his nearby hotel to allow them to row out to the helicopter. He saw Mr Clunas' flying helmet floating in the water. They found Mr Clunas, still strapped in the helicopter and submerged. A knife was retrieved from the shore and Mr Clunas cut free. He could see that Mr Davis was very upset. They brought Mr Clunas back to the shore and a policeman started CPR.

They all took turns at CPR until the paramedics arrived. He saw that Mr Clunas had a very bad cut on his head.

[31] Paul Prior Pitt works on a fish farm. His statement to the police is contained in the Notice to Admit. He described being flown from Loch Scadavay to Loch Hunder with one of his colleagues by Mr Clunas in the helicopter. He described Mr Clunas flying to Loch Hunder with the first boat, which he helped to disconnect. That boat was carried from an eyelet on the front of the boat. The helicopter flew back to get the second boat. The helicopter did not come back. About 10 or 15 minutes after the first boat was delivered he heard a funny whirring sound. He found out that the helicopter had crashed.

[32] Peter Johnston works on a fish farm. His statement to the police is contained in the Notice to Admit. He has had training in how to safely unhook loads from a helicopter. On 13 June 2018 he was aware that a helicopter was to be used to move a couple of boats from Loch Scadavay to Loch Hunder. The helicopter arrived at Loch Scadavay about 9.30 hours. He described being flown to Loch Hunder in the helicopter with one of his colleagues. The helicopter flew back to get the first boat. He helped to unhook the first boat, which was moving about in the wind. He described the wind at Loch Hunder as being a fair breeze and gusty. There were white waves on the loch. They waited for the helicopter to come back with the second boat, but it did not. He heard an unusual slow motion whirring noise 10 or 15 minutes later. He was advised by telephone that the helicopter had crashed.

[33] Henry Christopher Dalgety works on a fish farm. His statement to the police is contained in the Notice to Admit. He described the arrangements for the lifting operations to be carried out on 13 June 2018 and the transportation of two staff and then the first boat by helicopter to Loch Hunder. The helicopter returned and landed. Mr Clunas and Mr Davis checked the second boat. The helicopter took off. He is not sure what happened, but the chain suspending the second boat looked like it hit the tail rotor. The helicopter nose fived into Loch Scadavay. Mr Davis told him he had radioed Mr Clunas to slow down. Mr Davis wanted to go into the water but he would not let him, but went in himself. There was fuel from the helicopter in the water. He could not get to the helicopter and went back to the shore.

[34] Kenneth Dickson was driving near Loch Scadavay on 13 June 2018. His statement to the police is contained in the Notice to Admit. He described the weather as being very windy. He saw the helicopter flying in front of him. He saw that it was lifting a boat. The boat seemed to be getting blown by the wind and was swinging about. He describes a "massive gust" of wind and the boat swinging up and coming into contact with the rear of the helicopter. The helicopter came down and he heard a huge splash and saw water fly up into the air. He stopped driving and dialled 999. He explained that he had seen a helicopter crash. He could see that the helicopter was fully submerged in the water of the loch. All he could see above the water were the landing runners. He saw that the pilot was recovered from the helicopter by boat. The incident happened very quickly.

[35] Alasdair Kenneth Mackay has been employed as an Air Traffic Controller at Benbecula Airport for 18 years. He was on duty on 13 June 2018. His statement to the police is contained in the Notice to Admit. He described his radio conversations with Mr Clunas on 13 June 2018. These have been transcribed and were lodged by the Crown as Production 4. The first radio message from Mr Clunas was at 9.20 hours that day. At about 10.10 hours Mr Clunas advised him that he was taking off for second lift. That was the last radio transmission received from Mr Clunas. At 10.22 hours he received a telephone call from the police advising of a report of a helicopter crashing into a loch in North Uist and seeking confirmation if any helicopters were in the area. He advised the police of Mr Clunas' helicopter and tried, unsuccessfully, to make radio contact with Mr Clunas.

[36] Ross McClenaghan is a Constable of the Police Service of Scotland with eleven years' service as at 13 June 2018. His self-prepared statement is contained in the Notice to Admit. He commenced duty at 9.00 hours on 13 June 2018 at Balivanich Police Station, Isle of Benbecula. He was single crewed. At 10.15 hours that day he was instructed to attend a possible helicopter crash at Loch Scadavay, North Uist. He arrived at the jetty at Loch Scadavay at 10.35 hours. He could see a helicopter in the water about 200 metres from the pier. It appeared to be upside down. All he could see were the landing skids. A rowing boat came back to the shore bringing the pilot, Mr Clunas, who appeared to be lifeless. One of his police colleagues commenced CPR. He saw that Mr Clunas had a significant, deep wound to the front left of his head. He



assisted the paramedics to bring equipment to the shore line and at 10.55 hours the paramedics confirmed that Mr Clunas was dead.

[37] Alan Leslie Thorne gave evidence that he is employed as an Inspector with the AAIB. He is a specialist in engineering and technical matters. He has 9 years' experience in that role. Prior to joining the AAIB he was an aeronautical engineer with British Airways. He was the senior air safety investigator with British Airways for 10 years. He holds a Masters Degree in Air Safety Management. He estimated that he is involved in six to eight field deployments with the AAIB a year. He described the statutory functions of the AAIB.

[38] Mr Thorne was referred to Crown Production 3 and confirmed that this was the report published by the AAIB following the conclusion of the AAIB investigation into the crash of G-PLMH in which Mr Clunas was fatally injured. He explained that a report published by the AAIB does not name individuals or operators involved as the purpose is not to attribute blame but to report the circumstances of the incident to improve safety for the future. A report is a collaboration between the various inspectors involved in the investigation. Prior to publication all reports are subject to an internal peer review and editing process. Published reports are available to the public on the AAIB website. No formal recommendations were made in the report relating to the fatal accident involving G-PLMH but proactive, voluntary steps taken by the operator, PDG Helicopters, were recorded in the report.

[39] Mr Thorne was taken through the terms of the report by Mrs Arthur. He explained that G-PLMH was an AS350B2 Ecureuil (or Squirrel) helicopter initially

manufactured in 1989. It was destroyed in the crash. Mr Clunas was an experienced pilot and in particular in the last 90 days had 127 flying hours and 37 flying hours in the last 28 days.

[40] Mr Thorne spoke to the Synopsis and History of the flight contained in the AAIB report. In relation to the photograph of the lifting site contained on page 8 of said report Mr Thorne commented that this was a good site from which to operate the helicopter.

[41] Mr Thorne gave a detailed description of G-PLMH, with reference to the Description of the helicopter section of the AAIB report, beginning on page 9. Mr Thorne explained that the pilot could activate an emergency release on the external load hook fitted to the underside of G-PLMH which would jettison the load and lifting line in an emergency. He confirmed that on recovery the lifting line had been detached from the external load hook, inferring that Mr Clunas had activated the emergency release.

[42] The helicopter was fitted with manually activated floatation devices on the landing skids to allow the helicopter to land on water. The floatation devices had not been activated on G-PLMH. Mr Thorne was of the opinion that activation of the floatation devices would not have reduced the impact of the crash in the current circumstances. The helicopter was also fitted with a life raft, which had automatically deployed as expected.

[43] The helicopter had been well and properly maintained. Helicopters require maintenance after a prescribed number of flying hours have elapsed. G-PLMH had been subject to a 100 hours inspection on 12 June 2018 and no faults had been noted. It had

thereafter flown for approximately two hours prior to the accident flight, with no faults noted.

[44] Mr Thorne gave evidence in relation to the lifting line used and the loads carried, with reference to pages 10 and 11 of the AAIB report.

[45] Mr Thorne described his arrival, with his colleagues, at the crash site the following day. Figure 10 on page 12 of the AAIB report was taken about midday on 14 June 2018 and shows the helicopter upside down in the loch. The life raft is visible. Boat 2 was still attached to the tail rotor boom by the lifting line but had sunk by the time the photograph was taken. The weather conditions for recovering the wreckage of the helicopter were quite challenging. There was a lot of debris round the loch. Much of it was composite material from the helicopter. Shards of wood from boat 2 and sections of the tail rotor of G-PLMH were recovered from the ground under the point where witnesses described the tail rotor strike as having occurred. These pieces of debris were on a headland and appeared to have fallen to ground during the incident.

[46] An initial assessment of the wreckage was made. Expert recovery divers assisted. Figure 11 at page 13 of the AAIB report is a photograph of the tail rotor boom taken by a camera attached to one of the diver's helmets. The lifting chain is visible wrapped around the boom. The tail rotor boom was still attached to the main fuselage, but only by control cables and wires. It may well have fractured on impact with the water.

[47] Mr Clunas' flying helmet was recovered, still attached to the helicopter by the microphone and earphone cable. Mr Thorne considered it unlikely that Mr Clunas

would have been able to engage in any radio communication or respond to any radio communication if he had not been wearing his flying helmet.

[48] Mr Thorne explained that the loch was quite shallow and G-PLMH was settling on the bottom of the loch. It was difficult to get lifting equipment to the helicopter. Floatation bags were used to lift the helicopter and float it closer to the shore where it was lifted by crane onto a lorry for transportation to the AAIB facilities at Farnborough for detailed inspection. A thorough examination was carried out at Farnborough and there was no evidence of pre accident faults or damage. The damage noted was attributable to the crash.

[49] Mr Thorne advised that the helicopter was quite a light structure and had been severely disrupted in the cockpit area. The pilot's seat had detached from the floor by the violence of the crash.

[50] Mrs Arthur referred Mr Thorne to Crown Production 6, an album of photographs produced by Police Scotland. Mr Thorne described the photographs as follows –

1. This photograph was taken prior to the arrival of AAIB and shows the helicopter, life raft and boat 2, still afloat.
2. This photograph was taken much later and shows the helicopter being lifted by the crane. The blueish circle is where the tail rotor boom should be connected to the back of the helicopter. The tail boom was still attached and is floating on the right hand side of the picture. All three

main rotor blades were still attached, but damaged. The crane was attached to the top of the main rotor.

3. This photograph shows boat 2 after it had been recovered. The purple strops were to take the load and the green rope was to hold the purple strops in place. The damage to the boat where the strops meet the hull was probably caused by the boat being squeezed when the chain hit the tail rotor.
4. This photograph shows the cockpit of the helicopter from the front. In a helicopter the pilot always sits on the right hand side, the same side as a British car. In a fixed wing aircraft, the pilot sits on the left.
5. This photograph shows the front of the helicopter again, after the doors had been removed. They were flapping loose and have quick release hinges. The damage to the cockpit is as a result of the crash.
6. This photograph shows the fuselage, sitting on the landing skids, after the tail rotor boom and gearbox had been removed and prior to being lifted onto the lorry for transportation.
7. This photograph shows the fuselage being lifted onto the lorry. The cockpit is to the right. The engine is to the left. The tail rotor boom would attach to the left. The gearbox and main rotor head have been removed.
8. This photograph shows the tail rotor boom, from the tail end. The lifting chain can be seen wrapped around the boom.

9. This photograph shows the tail rotor boom being lifted onto the lorry. The boom is upside down. The tail rotor skid is visible on the right, at the top.
13. This photograph shows the underside of the tip of one of the main rotor blades. The leading edge is at the top. The blade shows impact damage. The scrapes where the paint has come off are due to ordinary erosion and are not significant.
15. This photograph shows the control console of the helicopter. The black rectangle on the right is an electronic display which shows altitude and heading, when powered up. The airspeed indicator is to the right of that rectangle and the altimeter is to the left. The altimeter was set to the correct settings.

[51] Mr Thorne was referred to page 14 of the AAIB report and gave evidence in relation to Mr Clunas' flying helmet. He stated that there was no sign of damage on the helmet and if it had been worn when Mr Clunas sustained the severe head injury he would expect to see some damage. He was not aware of any evidence as to how Mr Clunas' flying helmet came off or whether Mr Clunas struck his head against something, or if something struck his head. Mr Thorne explained that the harness worn by Mr Clunas was attached to the floor of the helicopter at the waist, and to the pilot's seat at the shoulders. An optional improved seat is available for this type of helicopter. It was not mandatory for that seat to be fitted. Mr Thorne could not say whether the fitting of

the improved seat would have made any difference to the fatal outcome in this particular collision.

[52] Mr Thorne was referred to the Engineering Analysis section at page 24 of the AAIB report. He explained that the purpose of the tail rotor is to stop the helicopter spinning in the opposite direction. Damage to the tail rotor would cause a lot of vibration and loss of control. In addition, the chain wrapped round the tail rotor boom would unbalance the helicopter.

[53] Finally, Mr Thorne was referred to the Survivability section at page 27 of the AAIB report. He explained that the AAIB looked at equipment, clothing etc. to see if any safety lessons could be learned for the future. There is no legal requirement to wear a flying helmet but some operators make it an operational requirement, as PDG Helicopters had done. Mr Clunas sustained a large head injury. From the circumstances it is likely that Mr Clunas was wearing his flying helmet but the chin strap was not fastened and it came off in the course of the crash. Even if his helmet had not come off, the outcome may have been the same. Mr Thorne also stated that it was not possible to state whether the upgraded seats would have made a difference to the outcome in this case. Once the tail rotor was damaged pieces of the helicopter would have broken off and been thrown about. The tail rotor rotates at 400 revolutions per minute. There is a lot of energy in the system if something breaks.

[54] Paul Hannant gave evidence that he is a Senior Inspector (Operations) with the AAIB and has held that post for twenty one years. He holds a pilot's licence for both fixed wing (aeroplanes) and rotary aircraft (helicopters), he is an examiner and is a

qualified Helicopter External Sling Load Operations (hereinafter referred to as “HESLO”) pilot. He advised that he had been involved in the investigation of over 250 incidents and had been involved in over 70 field deployments. He confirmed that Production 3 was the AAIB report produced in relation to the fatal incident involving G-PLMH. He stated that he had not personally been involved in the investigation but was able to speak to the report and give evidence on the findings.

[55] Mr Hannant was referred to the AAIB report and specifically the section of History of the flight at page 1 of the report. Mr Hannant explained that most of the information in this section had been obtained from witness statements. He commented that the wind recorded at Benbecula Airport was 180 degrees at 13 knots. He explained that 180 degrees is the compass point that the wind is blowing from. He stated that the wind at the accident site could have been different. He also commented that there had been a meaningful discussion between Mr Clunas and Mr Davis in relation to lifting boat 2, a potentially unstable load. In summary, as Mr Clunas accelerated, boat 2 flew up, hitting and damaging the tail rotor and resulting in the lifting chain being wrapped round the tail rotor boom. Mr Hannant described this as a very fast, destructive event. In the final stages the helicopter had been descending at the equivalent of 3,600 feet per minute, described by Mr Hannant as a very high descent rate.

[56] Mr Hannant gave detailed and clear evidence as to the purpose of the tail rotor on a helicopter by reference to a model of a similar single engine helicopter. He explained that the main rotor and the tail rotor are powered by the same power train. A drive shaft runs through the tail rotor boom to the tail rotor to provide power. The main



rotor turns clockwise, when viewed from above the helicopter. As a result, the torque will cause the helicopter to yaw to the left. The tail rotor opposes that yaw. The tail rotor rotates much faster than the main rotor. The tail rotor is controlled by the foot pedals in the cockpit. Altering the speed of the tail rotor alters the yaw and allows the helicopter to be turned in a controlled manner. The amount of the yaw depends on the amount of power going to the main rotor. The more power, the more torque, the more yaw. More power would be applied to climb, for instance.

[57] Mr Hannant went on to explain the consequences of a tail rotor failure. Pilots are trained to react to a tail rotor failure and there are steps that can be taken to recover control and land the helicopter. The pilot must first lower the collective to take lift off the main rotor. The helicopter will run straight. At 65 knots the engine is switched off and the helicopter will descend, without power. At 60 feet the engine is restarted and the helicopter "flared", meaning that more power is sent to the main rotor to lift the nose of the helicopter. At 10 feet the helicopter is levelled out and at 5 feet full power applied to cushion the landing. This recovery process requires time and speed to complete. Mr Clunas was flying at about 40 knots, 150 feet above ground. There was insufficient time or height for him to recover control of the helicopter after the tail rotor failure.

[58] Mr Hannant explained that once the lifting chain had wrapped round the tail rotor boom there was an additional 200 kilos of weight at the rear of the helicopter making it tail heavy and bringing the tail down. This would have reduced the airspeed of the helicopter further. As a consequence the rate of descent would increase. Mr

Clunas was left with insufficient control to be able to lift the nose of the helicopter and did not have an opportunity to take remedial action.

[59] Mr Hannant advised that G-PLMH was not, and did not require to be, fitted with a cockpit voice recorder. Nevertheless, his colleagues had recovered data from a number of different sources and the data is displayed in Figures 4 and 5 on pages 6 and 7 of the AAIB report. There were four principal sources of information. Firstly, radar records, although none were available for the accident flight. Secondly, a tracker system fitted to the helicopter by the operator for asset management which provided twelve 'snap-shots' that day. The third and most important source of information was an i-pad used by Mr Clunas which was recovered from the wreckage of the helicopter. A programme on the i-pad contained information relevant to the operations undertaken. Although the i-pad had been submerged in the water AAIB specialists were able to recover the data from it. Fourthly, recordings were available of the radio conversations between Air traffic Control and Mr Clunas. A transcript was lodged as Crown production 4.

[60] Mr Hannant advised that it was not mandatory to use a tablet computer to record flight details but many pilots do so. The software is extremely useful to pilots in planning and executing operations and in the event of an incident the recorded data can be of significant value to investigators. Mr Hannant agreed with my observation that the use of such a computer programme was an indication of Mr Clunas' being a conscientious pilot.

[61] Mr Hannant was referred to Figure 3 at page 4 of the AAIB report and explained that the green dotted line was the direction of the flight of G-PLMH when the incident occurred. Immediately after the strike of the tail rotor the helicopter began to turn to the left, due to the yaw effect described by him earlier in his evidence.

[62] Mrs Arthur then referred Mr Hannant to Figure 4 on page 6 of the AAIB report. He explained that the line labelled "Track" shows the route across the ground by reference to degrees from north; the line labelled "Groundspeed" is obtained from the positioning part of the system and is worked out from distance and time; and the line labelled "Altitude" is the GPS altitude above mean sea level. At the accident site, the ground was 30 feet above mean sea level so that needs to be deducted. On the Track line, after 360 degrees the helicopter was no longer moving. Mr Hannant advised that a tail wind would increase ground speed. Having spoken to the engineer who recovered the data, Mr Hannant was able to advise that the final GPS altitude readings were considered to be inaccurate, most likely due to poor signal to the appropriate satellites.

[63] Mr Hannant was then referred to Figure 5 at page 7 of the AAIB report and explained that this showed a comparison between the data for the lifting of boat 1 and the lifting of boat 2. The groundspeed in lifting boat 2 was more modulated and linear showing a reduced level of acceleration, but getting to the same speed. Mr Hannant was aware that Mr Davis had told Mr Clunas to slow down and the data for the accident flight reflects Mr Clunas causing the helicopter to slow down. The helicopter reached the same altitude faster in the lift of boat 2, perhaps due to less weight of fuel on the helicopter, some having been consumed, or perhaps because the load was lighter.

[64] At my request Mr Hannant gave some general information about helicopter performance. He explained that a helicopter similar to G-PLMH would usually cruise at around 110 knots, or 120 knots if the fuel load was light. It could go faster in a dive. One of the advantages of a helicopter is that they can fly at extremely low speed, little more than 5 or 10 knots, or hover in a stationary position. A helicopter can fly fairly fast with a stable load, or very slowly with an unstable load. To recover from a tail rotor failure the optimum speed would be 60 to 65 knots.

[65] By reference to page 9 of the AAIB report Mr Hannant confirmed that Mr Clunas held the highest level of licence from the European Aviation Safety Authority (EASA) available and was qualified to carry out HESLO lifting operations. He described Mr Clunas as being a very experienced pilot, very experienced on this type of helicopter and with a very high number of flying hours carrying underslung loads. He described Mr Clunas as a hugely experienced underslung loads pilot. He was well able to carry out the role he was doing.

[66] Mr Hannant explained the requirements for carrying out HESLO operations by reference to pages 15 to 17 of the AAIB report and The Civil Aviation Authority advice on helicopter external load operations, which had been lodged as Crown production 5. In particular Mr Hannant referred to Section 6.19 on page 16 of the AAIB report. The advice is that the weight of the cargo "should" not be less than 227 kilograms. Boat 2 weighed less than 227 kilograms. He explained that different underslung loads will behave in different ways. A sheet of corrugated iron would be an unstable load, whereas a cannon ball would be very stable. He explained that when flying forward,

the lifting chain will swing back, particularly if the load catches the wind. This is called the "trail angle". With reference to Section 6.20 on page 16 Mr Hannant explained that oscillation of a load is the swinging of the load fore and aft or laterally. To stabilise oscillation the pilot would turn the helicopter. The advice contained in Section 6.20 is to reduce speed by 10 %. At 40 knots, that would be 4 knots, which is not much. From the data available Mr Clunas had cut the groundspeed of the helicopter from 36 knots to 25 knots, which Mr Hannant considered a very good thing to do.

[67] Mr Hannant went on to consider the information obtained from the operator, Mr Clunas' employer. This is recorded in pages 17 to 23 of the AAIB report. The standard operating procedures produced by the operator were in order and Mr Hannant advised that from the paperwork it appeared that the CAA, the regulator, held the operator in fairly high regard. Mr Hannant considered that the training materials provided by the operator represented a good training package which would allow staff to perform HESLO operations safely. Mr Hannant had no adverse comments to make in relation to the material provided by the operator or their processes.

[68] Mr Hannant went on to read out the Load Characteristics section of the Analysis contained at page 24 of the AAIB report. He explained that the lift a wing develops is from the upper surface. Boat 2 had a round hull and therefore the potential to create lift. That in combination with the hollow interior gave the possibility that it would act like a kite. Under constant acceleration there is a risk that a load will become unstable. Mr Hannant confirmed that Mr Clunas had activated the emergency release on the hook on the underside of G-PLMH but explained that it was impossible to say when that had

occurred, or what had prompted Mr Clunas to do so. He may have felt the impact with the tail rotor or it could have been for some other reason.

[69] Mr Hannant expressed the view that PDG Helicopters had a good safety attitude. After the fatal accident they made changes to their procedures and took positive action to prevent a similar situation occurring again. They suspended lifting operations of unstable loads and have increased the length of lifting chains from 10 to 20 metres. Mr Hannant read out the Conclusions of the AAIB report, recorded at page 28 of the report.

[70] Mr Hannant accepted that a sudden increase in wind speed would make the instability of a load worse.

[71] Mr Hannant confirmed that the AAIB did not make any recommendations to the operator at the conclusion of their investigation. The operator had already taken action proactively. Had the AAIB investigation raised matters of concern these would have been included in the report as recommendations. Mr Hannant also explained that if an AAIB investigation revealed anything urgent a special bulletin or interim report would be published to draw attention to that issue, for the guidance of operators and pilots. No such special bulletin or interim report was published relating to the investigation into the crash of G-PLMH.

[72] At the conclusion of Mr Hannant's evidence Mrs Arthur referred me to Crown production 10 which detailed the actions taken by PDG Helicopters as a consequence of this tragic incident.

**Crown Submissions**

[73] Mrs Arthur invited me to make formal findings, in keeping with information contained in the notice to admit, the productions and the oral evidence. This did not appear to me to be controversial. I will go on to expand on my reasons, particularly in relation to the cause of the accident which resulted in the death of Mr Clunas and whether there were any precautions which could reasonably have been taken that might realistically have resulted in the accident and therefore the death of Mr Clunas being avoided, in the following section.

**Discussion and Conclusions**

[74] I have no reason to consider that any of the witnesses who gave statements to the police and which were included in the Notice to Admit Information were doing anything other than trying their best to recall what had happened in the course of a fast moving and traumatic event. I accepted their evidence as credible and reliable. I had the benefit of hearing oral evidence from Mr Thorne and Mr Hannant. Both gave their evidence in a clear and helpful manner. Their evidence was of considerable assistance to me. I had no hesitation in accepting them both as credible and reliable. The AAIB report, lodged as Crown production 3, is a clear and detailed account of the investigation into this incident. The report has been invaluable in the course of this inquiry and is publically available for anyone interested in this incident to refer to.

[75] There is clearly no dispute that Mr Clunas died at Loch Scadavay, North Uist on 13 June 2018 when the helicopter which he was piloting crashed into the loch. The crash

occurred at approximately 10.15 hours that day, the accident which caused the crash being the lifting chain hitting the tail rotor boom, which occurred a matter of seconds before the helicopter hit the loch. Although the paramedics certified that Mr Clunas was dead at 10.55 I am satisfied on the evidence I have heard that he was dead before the witnesses were able to recover him from the wreckage of the helicopter. The medical evidence clearly demonstrates that he sustained a significant head injury which I am satisfied resulted in loss of consciousness while submerged under water. Accordingly, I follow the cause of death as certified in Crown production 11 by Dr Ashton.

[76] So far as the cause of the accident which resulted in Mr Clunas' death is concerned, it is also clear that the accident was caused by the underslung boat being carried by the helicopter flying up, the lifting chain connecting the boat to the helicopter striking and damaging the tail rotor of the helicopter and the lifting chain becoming wrapped round the tail rotor boom of the helicopter. This impact caused significant damage to the helicopter and rendered it uncontrollable in the circumstances.

[77] It is clear that in the matter of seconds which passed between the impact with the tail rotor and the impact with the water Mr Clunas did react and take remedial action. He released the external hook on the underside of the helicopter. He clearly made control inputs to the helicopter. However, there simply was insufficient height and time for him to bring the helicopter under control.

[78] The more complex question is what caused the boat to fly up in the first place, allowing the lifting chain to come in contact with the tail rotor and tail rotor boom. That question cannot be answered with certainty. The physical characteristics of boat 2 made



it a potentially unstable load. This was recognised and assessed by Mr Clunas and Mr Davis. During the lifting operation Mr Davis recommended to Mr Clunas that he slow down and the helicopter was seen to react indicating that Mr Clunas was doing so. There is evidence of a strong gust of wind close to the accident site close to the time of the accident.

[79] In her submissions Mrs Arthur refers to a number of potential causal factors highlighted in the evidence and productions, namely the shape of the load, the weight of the load, the method of carrying the load, the length of the rope that attached the load to the helicopter, the potential for decision making bias in accepting the load, the unfastened helmet, the seat structure, the flying speed, the reduction in the speed and the windy conditions that the helicopter and its load were flying in.

[80] However, despite a full and thorough investigation a conclusive view cannot be taken as to which, if any, of these factors caused the boat to swing up. As already noted, it is not open to me to engage in speculation. The reality of life is that sometimes tragic events happen, and we are unable to determine why.

[81] From the evidence available to me I consider that it is a reasonable inference that Mr Clunas was wearing his flying helmet but that in the course of the crash, and prior to him sustaining the serious head injury, his flying helmet came off. I am also satisfied on the medical evidence that had his flying helmet remained in place it would not have altered the outcome in this tragic event.

[82] Following the fatal crash involving Mr Clunas his employers very properly reviewed their procedures to see what lessons could be learned for the future. While

they have taken certain steps, as described at pages 28 and 29 of the AAIB report and in Crown production 10, to enhance their procedures I am satisfied that there was no defect in the system of working in place at the time of the fatal crash and I do not consider that the improvements can properly be characterised as precautions which could reasonably have been taken and had they been taken, might realistically have resulted in death, or any accident resulting in death, being avoided.

[83] I am obliged to Mrs Arthur for her careful presentation of the evidence in this inquiry and to all the participants for the assistance which their involvement gave to the inquiry.

[84] In closing this Determination, may I once again express my condolences to the family and friends of Mr Clunas. He was clearly a very experienced pilot and well regarded and respected by both his employers and his colleagues.