TRANSCRIPT OF PROCEEDINGS

CORONERS COURT

HENNESSY, Coroner

MKY-COR-63 of 2003

IN THE MATTER OF AN INQUEST INTO THE
CAUSE AND CIRCUMSTANCES SURROUNDING
THE DEATHS OF CRAIG LIDDINGTON,
STEWART EVA AND ANDREW CARPENTER

MACKAY

..DATE 14/10/2005

..DAY 1

FINDINGS

CORONER: Matter which has been listed for the delivery of findings in relation to the inquest into the deaths of Andrew Carpenter, Craig Liddington and Stewart Eva.

...

CORONER: There will be copies of the findings and recommendations available after today, however, I would remind everybody that the official record will be the transcript which will be available to all of the parties once it is prepared by the State Reporting Bureau. So I will just commence to read these findings now. If at any stage, anybody cannot hear me or there is some difficulty with the phone line, please let me know.

On the evening of the 17th of October 2003, the CQ Rescue Bell 407 Helicopter departed Mackay on an aero medical retrieval flight to recover a patient from Hamilton Island. On board, were the pilot, Andrew Carpenter, paramedic Craig Liddington and crewman Stewart Eva. The three men were tragically killed when the helicopter crashed into the sea approximately 3.2 nautical miles east of Cape Hillsborough near Mackay in Queensland.

Andrew Carpenter was 31 years of age at the time. Andrew was known as a careful pilot who enjoyed his work, was thorough, and was known for doing things correctly, and he was very keen to pursue his career as a pilot. He was, at the time, engaged to be married to Catherine McHerron at the time of the

accident, and Catherine has said in her statement that they were very happy together.

Craig Liddington was also 31 years of age and, in his father's words, he devoted his time and energy to his employment as a health care professional conscientiously. His colleagues have also said that he gave unconditional support to his peers, friends and patients, and undertook his duties as an Intensive Care Paramedic with diligence and integrity and that Craig was an outgoing, friendly and thoughtful person.

Stewart Eva was also 31 years of age and he was the father of a young son. Stewart had served in the Australian Army and saw tours in East Timor and the Solomon Islands and had worked on the security detail for the Sydney Olympics. He left the army and travelled to Mackay and joined the rescue service which he enjoyed.

The men were good mates and had a lot of respect for each other and they were all healthy young men and not suffering from any difficulties at the time. These three men died serving the public of Queensland in very responsible positions and had assisted many people in times of physical distress, bringing them safely to the medical facilities which would not have been immediately available to them but for the intervention of the community based helicopter rescue service.

This area of the provision of emergency medicine to those in need in Queensland could be seen to be at times an

intrinsically dangerous pursuit. It is however a service which significantly reduces the mortality rate in patients attended to. It is imperative that Government departments and provider organisations ensure that the provision of such services, including in rural and remote Queensland, is the safest possible for the emergency workers and the public alike.

The men and women working in this essential field of endeavour deserve to be afforded every opportunity to undertake their employment professionally and return to their families safely at the end of the day.

The extensive evidence provided during the course of this inquest address both the factors contributing to this tragedy and the means to reduce the risk of a similar happening in the future. Much has been done since this, and the previous incident at Marlborough in which five lives were lost, to improve emergency medicine services in this area. The extent to which further action may be warranted will be examined in these findings.

In relation to the facts of the incident. CQ Rescue formed in 1994 in Mackay and became operational on the 1st of September 1996. It came into being as the result of the local community responding to the need for the service. The organisation is a community helicopter provider and is partly funded by Government funds, public donations and sponsorships. It receives extensive corporate and community support which is a

testament to the hard work of the committee and the standing of the organisation in the community. The rescue service has corporate sponsorship from RACQ, Broken Hill Mitsubishi Alliance, the CFMEU, Thiess, Xstrata Coal, Local Government councils and community donations.

CQ Rescue provides a 24 hour seven day a week service over a large district including Mackay and the Whitsunday Islands. The service is used primarily for medical purposes, and that is said to be 55 per cent of the usage - refer 27 of the ATSB report.

Hamilton Island is a major resort island offshore from Mackay in the Whitsunday group of islands. The hills on Hamilton Island are quite steep in parts and the means of vehicular transport on the island, golf buggies, are apparently prone to turning over during use especially when driven too fast or in difficult terrain. The vehicles are quite heavy and can cause serious injury to passengers. Miss McGann was injured when she was dragged under the golf buggy she had been travelling in after it turned over. Miss McGann suffered an injury to her ankle making it difficult to walk, grazing, swelling and a sore neck; she was in a deal of pain. She sought assistance at the Hamilton Island Medical Clinic where she was treated by Dr Hames, a locum for the practice at the time. The doctor treated her and contacted Dr Thomas, the clinical coordinator on call at the Mackay Hospital, seeking transport to the hospital for the patient due to her condition. Dr Thomas contacted the Queensland Ambulance Service to seek the tasking

of tasking of the Rescue Service Helicopter to retrieve Miss McGann. Queensland Ambulance Service communications room staff contacted the pilot of the rescue service, Andrew Carpenter, who accepted the mission. The helicopter departed Mackay airport at 21:32 hours bound for Hamilton Island. Tragically, the helicopter and crew did not reach the destination.

The ATSB investigation was unable to determine what factors led to the loss of control of the helicopter and its crew. The circumstances of the accident were thought to be consistent with the pilot being disoriented and losing control to flight in the dark night conditions. There are a number of possible contributing factors to the pilot becoming disoriented, none of which were able to be positively substantiated on the facts, but included the lack of a visible horizon in dark conditions over water, a possibility of flying through cloud, the use of the night sunlight when in cloud which may have also explained the glow some witnesses reported seeing around the time, and the possible loss of an altitude indicator during flight.

In relation to the search. When AusSAR was notified that the helicopter was missing, they dispatched BK117 from Hamilton Island, a BKE IFR, that is, instrument flight rules helicopter with autopilot and operated by two pilots and two crew members.

Gary Cochrane was the pilot in command and located floating wreckage during the search. The search was conducted in the air by Mr Cochrane and his crew. The crash site was about four kilometres to the south of Cape Hillsborough and about five kilometres from the coast in the direction of Mackay. It is estimated that it took about four to five minutes after passing the coastline airborne to the crash site. A Volunteer Marine Rescue vessel took over from BK117 at the scene and searched for survivors. The bodies of Craig Liddington and Stewart Eva were recovered over the course of the following days.

ATSB investigators supervised a search for wreckage for the following 12 days utilising sight scan sonar, divers and trawling, to recover the wreckage of the aircraft. The high speed impact destroyed the cockpit and cabin and the tail boom, main rotor assembly and main transmission assembly, which separated during impact.

There was substantial damage to the fuselage and structure which was indicative of a high speed impact with the water. The damage indicated that at the time of the impact the nose of the aircraft was down and the left skid low - ATSB report page 19.

Examination of the engine compressor and the gyro rotor revealed evidence of high speed at the time of the impact. Not all of the wreckage was able to be recovered due to rough

sea conditions. The high speed impact was said to be not survivable - page 21 of the ATSB report.

Hamilton Island is a remote Queensland community and is operated by Hamilton Island Enterprises Limited. The island receives about 1,700 to 1,800 holiday makers at a time, with last year seeing 520,000 visitors from diverse age groups and nationalities. Approximately 361,000 of last year's visitors came to the island via the airport, the balance by sea.

The ferry service operates from Shute Harbour to the island with the first ferry departing Shute Harbour at 6.30 a.m. and the last departing the island at 5.45 p.m. Golf buggies are, as I said, the main mode of transport on the island, and there is a suitable road system for them to travel on. The buggies are registered with the Department of Transport and are said to be perfectly safe when operated appropriately. Security personnel monitor their use. The speed limit on the island is 20 kilometres per hour and the buggies are limited to that speed. The buggies are inspected and are required to be certified for use on the island.

The Hamilton Island Clinic is leased to Lewin Group which operates and staffs the medical clinic. The clinic is accessed by visitors to Hamilton Island, other islands and boats in the area. In the last six years, an estimated 1,400 patients were treated at the clinic, 217 of which required evacuation.

The island management has developed a very good relationship with Queensland Ambulance Service and has developed a skills base on the island of an emergency response team, consisting of 10 to 12 people, which is fully funded by island management, five honorary ambulance officers and the island has successfully negotiated for a paramedic to be based on the island.

The volunteer emergency services and medical clinic on the island are often called upon by other islands to assist them. The island assists emergency services with fund raising efforts. Staff members make salary contributions to the rescue service. Residents and island management pay the ambulance levy, approximately 550 contributions through electricity bills and the island management supported the construction of the helipad at Proserpine Hospital.

There is also an aviation company on the island, Aviation Tourism Australia, which operates a number of helicopters and fixed-wing aircraft. The company holds three air operator certificates, Island Air Taxi, which is fixed wing aircraft including sea planes, HeliReef based in Shute Harbour providing a tourist operation servicing Hayman Island and HeliOz Whitsunday trading as Hamilton Island Aviation, mainly involved in offshore marine pilot transfer. Mr Gary Cochrane is the chief pilot of the latter organisation. HeliReef and HIA have a pool of helicopters which are used between them.

Miss McGann was treated at the Hamilton Island Medical Clinic by Dr Hames, the locum on duty at the time. Dr Hames felt it necessary to evacuate the patient for assessment of her leg injury. The doctor was, "reasonably convinced that due to the level of pain in the patient, the swelling and the patient's history, that there was a fracture to her ankle." - page 26 of the transcript.

Due to that opinion and the situation of possible neck injuries, evacuation was required as the patient needed to go to hospital for further investigation as soon as was possible. Dr Lewin, the operator of the clinic, considered on reviewing the notes, that the patient was in a serious situation and required specialist care and testing which were not available on Hamilton Island. There was a difficulty with management of the patient at the island clinic overnight as there was not sufficient treatment area or nursing staff to care for non ambulatory patients overnight.

It was said for the future that it was not to be an appropriate use of the QAS paramedic to necessarily assist in overnight care in this setting, taking in to account the necessity for the paramedic to be free to attend to the next case. It might be possible for honorary ambulance officers to assist, depending on their skills base, and the needs of the particular patient at the discretion of the medical officer.

Dr Hames contacted the clinical coordinator in accordance with the clinic's policy and relayed information regarding his

assessment of the patient and her needs. Dr Hames' understanding was that there was no more difficulty in dispatching a helicopter for patient retrieval in the evening than there was during the day and there was no increased risk for the helicopter to fly at night.

He understands that it was a responsibility of the doctor at the hospital to make the decision whether a helicopter was dispatched. On previous occasions a fixed-wing aircraft or the Townsville Queensland Rescue Helicopter had retrieved patients when the Mackay Helicopter was not available to come to the island. Patients were also sometimes sent by ferry to Shute Harbour and are met by ambulance to be taken to hospital. Dr Lewin's evidence was that a very small number of patients were actually medivac'd from the island.

Dr Hames commented in evidence that if there was an increased risk for the helicopter to fly at night, that there should have been clear protocols for medical personnel requiring transfer or retrieval of patients, to call for a helicopter at night, only in cases of severe emergency.

Dr Lewin gave evidence that he has significant difficulty in attracting adequately qualified nurses to positions on the island and the last hiring took six months to source an applicant. Dr Lewin stated,

> "She [the patient] needed a specialist opinion. So having a holding thing wouldn't have made any difference. Most of, I would say a lot if not most, of the people that go off the island and are medivac'd from Hamilton

> Island, it would be inappropriate to hold them there even if you had another nurse or doctors or suitable staffing and a place to put them."

Page 106 of the transcript.

In order to man a 24-hour nursing service, Dr Lewin considers that four additional nurses would need to be employed at the island. In relation to the need for communities to be able to properly care for and manage patients overnight, Dr Elcock the Clinical Coordinator Head said,

> "It's not just specific to islands, I think, whether it's up the Torres Straight or it's a small community somewhere, the risk benefit ratio to pick up a non ambulant, non critical care or non emergent care patient, people may say, 'Well we may have to get someone to look after that person overnight and they'll be tired the next day and we won't be able to staff the clinic.' I'm sorry, but that in comparison to the flip-side of losing an air craft and having a tragedy occur - I'm sorry but we have to go with trying to look at ways of ensuring that care is adequate at the facility they are at."

Page 385 of the transcript.

Dr Lewin praised the efforts of island management over the years, in saying,

> "Hamilton Island have been very pro-active and I give them their due. They put in place emergency services soon after I came there, when we discussed what they used to do, and they built up an emergency service and they got people in to train them. They got a second-hand four wheel drive ambulance and started an emergency response team. They had that and then they went further and got Queensland Ambulance to come and start to teach a lot of enthusiastic people who were in the emergency response team and they geared them up to become honorary ambulance officers.

> Queensland Ambulance did that and they did a wonderful job, so we now have on the island an ambulance service as well as an emergency response team. And so we have an ambulance service staffed by and trained by Queensland Ambulance and staffed by honorary people - honorary ambulance officers, on the island. And now the next step, which I understand is happening in September, is that the Queensland Ambulance are opening a station on the island and it will be manned by a paramedic."

Page 11 of the transcript.

Clinical Coordination. Pursuant to the Department of Emergency Services Aero-medical and Air Rescue Network Helicopter Tasking Guidelines, the decision to request the despatch of a helicopter for an aero-medical retrieval lies with the Clinical Coordinator. In a situation where a patient was not able to be managed in a local health service, or required emergency hospitalisation, the local medical practitioner contacts the clinical coordinator.

At the time of this incident that position rested with the emergency medicine specialists at the Mackay Hospital on a rostered basis. At the time of this particular matter, Dr Thomas was the clinical coordinator. He had commenced the role of principle house officer on the 1st of July 2003. In that role he was also the clinical coordinator from time to time. He had, in that period and others, been the clinical coordinator for approximately 100 evacuations,sometimes being on the helicopter to treat the patient during the evacuation.

Neither the clinical coordinator nor the Queensland Ambulance Service staff, the conduit between clinical coordinator and

CQRESQ, had any aviation experience and the clinical coordinator was certainly not in the position to judge the feasibility of the particular aircraft undertaking flights in certain weather conditions. In fact, the guidelines require that all operational flying decisions are for the pilot alone.

In the present case, QAS communications room staff had, through the use of the service computer ranking system, categorised this patient's condition as code 2B; certainly not in a life threatening condition and the coding was automatically changed to 2C when the helicopter is being tasked to give more time for the dispatch of the air craft. This mission was a category B intervention under the DES guidelines, given that a qualified medical resource was already at the scene of a pre-hospital medical emergency.

The clinical coordinator agreed with the priority level in this case. The Clinical Coordination Data Form assessment indicated that the ankle injury was the major concern and the potential neck injury was not noted, mistakenly, according to the evidence. The form noted that the patient had suffered a traumatic injury requiring semi-urgent priority attention, within six to 24 hours, with low dependency level of care.

Doctor Thomas indicated that if the patient had been transferred to the hospital that evening, it was unlikely that X-rays would have been taken that night. Despite the circumstances, there were no considerations given by the clinical coordinator to the necessity for urgent retrieval of

the patient by helicopter at the instant, or by some other means.

There was no real understanding in the clinical coordinator of the issues relating to the risks associated with the type of transport being deployed. No consideration was given to alternate means of transport and would not have been until the pilot of the helicopter declined the task. Dr Thomas stated in evidence, at page 169 to 170 of the transcript, that when talking to Dr Hames, he had not formed the view that the patient needed to be medivac'd from the island.

He later stated that there was no immediate situation to, "Get her off the island that night." - page 170, transcript, because if there had been and the helicopter was not available, he would otherwise not have been contacting Townsville for a plane. In Dr Thomas's view it seems that the reason for removing the patient from the island was rather for the management of a seemingly difficult patient in a situation where the available staff on the island was limited.

His conclusion was that as the clinic was not designed or meant to cater for overnight patients, Dr Hames' request to transfer the patient from the island was appropriate. It would appear that Dr Thomas had no actual training in the rules and procedures of the position. He was unaware of the manual, which was located in the office, but had undertaken the task many times before and had completed the relevant forms during those tasks.

It was evident that the clinical coordinator did not have a complete knowledge of the form and was completing it according to the usual practice as opposed to a real understanding of the form. Some of the items on the form were incorrectly ticked. Dr Sadler the appointed clinical coordinator for Mackay region stated in evidence,

> "The role of clinical coordinator was I guess not part of our core business if you like. It was often a competing demand on our time , Often at busy times and compliance with filling out the form was variable. They weren't always filled out."

Page 256, transcript.

Dr Sadler further stated that there were discussions held with Dr Thomas as to the role he was to take as clinical coordinator, when called upon. It seems that the itinerant nature of Dr Thomas's comings and goings from the hospital, six months on and six months in Spain each year, may have played havoc with his orientation for this role and the procedures guiding it.

Dr Sadler indicated that the guidelines did not really cover this sort of situation at the time. That is, a patient not requiring urgent treatment, but with questions about the availability of interim care. The appropriate course of action in Dr Sadler's view would have been to have a discussion about the options with the QAS in relation to the

mode of transport and the timing of transport appropriate in the circumstances. Page 265 transcript.

Dr Thomas stated in evidence, at page 188 of the transcript, that he said to Dr Hames, the only way a helicopter was coming to the island that night was if the helicopter really wanted to fly, as the patient would wait for the ferry - could wait for the ferry the following morning. He, Dr Thomas, seemed to have the impression that there was a culture that pilots needed to obtain flight experience and in effect that there was a general tendency to want to fly.

He said, regarding speaking to QAS communications staff,

> "I'm just presenting a patient and I remember saying, 'They do not have to go tonight but if they want to, you know, it's nicer for the patient. You know.'"

Page 189, transcript.

He said he rang the QAS and said, "Do you want to go or not?" This statement is not borne out by the transcript of that conversation.

He also had the impression that there is a community expectation that the helicopter should be used. He said,

> "And it's more for reasons of being nice to people. See if you were that patient and you were lying there in a collar on that small bed, you know, if I could have got you to my hospital, you know you'd have had the collar off a bit quicker possibly and you'd have more people to look after you and the other factor was the doctor out there would probably have had a better day the next day,

> so it was more for reasons of sort of compassion and we do have a helicopter, you know, so the decision whether to use it or not - it's there, so of course I rang up saying, 'Can we have the helicopter for this lady?' But the decision, if they'd said no, then I would have rung back and said look sorry mate, she's got to stay there. And I wouldn't have been worried about it. I wouldn't have been ringing for the aeroplanes, which would have been the other decision, if she'd had a compound injury or cervicale spine injuries. If they'd of said no, we don't want to fly because of the weather, then I would have had to go for the aeroplanes."

Page 189 of the transcript.

He relied on its being the pilot's call as to whether or not to fly. When it was put to him that it was his call as to whether their medical emergency was sufficient to justify a helicopter, he said,

> "My call was, if everyone's happy, if the pilot's happy to fly, then it would be nice. It's more that sort of level, but if he's not happy to fly then that would have been it and I would of told the doctor there'd be no helicopter."

Page 190 of the transcript.

Dr Sadler commented that he was surprised that Dr Thomas would indicate that there was some need for the helicopter to be used for the pilot's sake. He confirmed that the decision to request a helicopter be tasked, should be made on purely clinical grounds. During the call to the QAS communications room, Dr Thomas did not make a firm request for the dispatch of the helicopter. It was the doctor's view that he gave QAS staff the notion that the helicopter did not need to go if it didn't want to. His words were somewhat different and he

later said his intention was asking for a helicopter to be tasked that night. He was later informed that he helicopter was going to the island by QAS. He was mildly surprised, he said, and thought it was a 50/50 call as to whether or not the helicopter would fly that night.

It would seem that Dr Thomas's contribution to the matter was that he was ill-prepared for the role he was in on the night of the incident. He did not communicate clearly with those who were relying on his communication. He paid poor attention to detail in documenting the matter and he appeared to treat the matter as routine with an expectation that the helicopter service was there to be used, even in situations which were not medical emergencies.

The QAS communications room staff, Miss Duncan and Miss Canning, correctly understood their role in the process was to facilitate the request of the clinical coordinator, by contacting to the rescue service to see if they would accept the mission. There was no discussion of the necessity for the helicopter as opposed to any other means or transport or the timing of the retrieval of the patient.

The first resource for retrieval of a patient from an island was the helicopter. The clinical coordinator rang requesting a helicopter, the only purpose of the call in the process, and QAS made contact with the rescue service and continued in their support and coordination role. Upon contact with the pilot he indicated immediately that he was able to fly. Ms

Duncan gave evidence at page 224 of the transcript that the usual case was that the pilot would return the call with a decision after checking on the weather.

With reference to the issue of whether or not the details of the mission should be disclosed to the pilot, Mr Wilson the chief pilot for Q-Rescue, gave evidence,

> "Merely being rung by a doctor every time that they want to use a helicopter places an expectation, well, you know, someone's sick; we've got to go and help them. And obviously by trying to have controlling checks and balances in place, then getting to the stage where, if we can negate some of the non-necessarily urgent missions, then when we do contact a flight crew the flight crew do know that okay, we've done the best we can at this stage to say this is an ongoing task, and then the flight crew now have the opportunity of assessing that particular mission, but it's not just going to be a straight pick-up and it was certainly trialled and error-ed in places like the United States.

> There was one particular thought of, 'Should we tell the flight crew the type of incident we are going to?' For example, if someone was to tell a pilot or a flight crew that, 'You are going to save a five year old girl at an accident scene' as opposed to an 85 year old gentleman that had had a heart attack, would the decision be any different? One would like to say, no, that it is not. Perhaps sometimes it is. That had a negative reaction where pilots thought, oh, it could be a bus crash and there is a number of people and the rate of EMS incidents and the accidents increase during that time so I believe it is a very proactive approach in the number of mitigating barriers." Page 498 of the transcript.

And there seemed to be general acceptance amongst those giving evidence that it was not a good idea to be giving the details of the mission to the pilot when tasking.

Personal liaison between the pilot and the clinical coordinator in relation to the mission, however, in light of these issues, could be seen to be very important in this regard, to discuss the aircraft capabilities as they relate to the mission circumstances.

Weather Conditions. All regulations and guidelines require that there be celestial lighting and that a visual horizon exist for night visual flight rules flying to be undertaken.

The forecast weather, notably the possibility of cloud at the altitude to be flown at, did not preclude flying under night VFR on this particular night. The flight needed to be undertaken before moonrise was due at 0006 hours. Consequently, the moon could not provide celestial illumination of the horizon during the period of the flight. Night VFR is said to be an inherently dangerous undertaking

and is contraindicated in the absence of peripheral lighting or a visual horizon.

The workload on the pilot when flying night VFR over water is substantial, with navigation, maintaining altitude and communications, the primary tasks. The pilot was required to obtain a meteorological forecast within one hour of the flight, especially as the flight was to be at night and over water. The last record of any access of weather information from the base was at 1752 hours; three hours and 40 minutes prior to the flight.

The Bureau of Meteorology website was usually open on the computer at the base, but was apparently only functioning part time from 2050 to 2250 hours with limited information available during that period. Although, apparently, not accessed by the pilot, the later forecast did not revise any details until 2125 hours when the reference to thunderstorms and some cloud were removed.

Whilst the pilot seems not to have satisfied the regulations relating to weather checks, he effectively had the accurate forecast for the period of the flight. Witnesses in the area reported some rain showers around the time of the flight, whilst others indicated an absence of cloud over Sandy Bay.

The forecast weather conditions that night did not preclude a flight under night VFR rules. Clouds are very difficult to see during night conditions and, consequently, avoiding flying

into cloud can be problematic for pilots. They usually cannot be seen at night before being in, or upon, them. So the possibility of cloud is always something which needs to be taken into account.

Mr Cochrane, the search pilot, gave evidence that this was an exceptionally dark night with two layers of cloud; one at 3000 feet and high overcast above, at the time of the search. There was a total lack of celestial lighting, he said. He described the conditions at page 304 of the transcript:

> "The minute we crossed the coast heading north, there was two layers of cloud. Because of the darkness of the night, the minute we left the lights of Mackay, the minute we crossed the coast, it was black."

On the 28th of October 2003, the ATSB investigators conducted a simulation flight which was videotaped and played in evidence. The flight was conducted in a fixed wing aircraft which was IFR rated and followed the radar track as closely as was possible in a less manoeuvrable aircraft. The flight was conducted in very similar weather conditions with a similar forecast to the rescue helicopter flight. Mr Webb of the ATSB gave evidence that there was ground based lighting from the airport to just past North Mackay. After that point, ground based lighting was completely lost until the return journey at a point between Green Island and the mainland which is closer to Mackay than the crash site.

The flight was, for the most part, conducted in complete darkness. The flight lost all reference lighting for some minutes before the point in the radar track when the rescue service flight had banked around towards Mackay.

On the night of the simulation flight there was some cloud at a certain level, such that from Green Island travelling towards the mainland there was some glow, a reflection of the lights of Mackay. The ATSB report stated, at page 46:

> "Although the forecast weather conditions met the regulatory requirements for flight under the night VFR, the flight was conducted clear of cloud, maintaining a visual reference to the horizon was not possible."

Helicopter. The helicopter was owned by Lloyd Helicopters Australia Proprietary Limited trading as CHC Helicopters Australia and was operated by CHC under contract with CQ Rescue. CHC Helicopters Australia, hold an air operators certificate. CHC is a large international company with many years experience in aviation with its head office located in Adelaide. CHC holds all necessary CASA certifications to provide aviation services including EMS.

CHC provide the helicopter, pilot and crewmen for rescue operations. The Department of Emergency Services, specifically Queensland Ambulance Service, provide paramedics or clinical crew, for operations as necessary.

The helicopter was a single engine Bell 407, rated for VFR flying only, to be operated by one pilot. The ATSB investigation found that the aircraft was within the approved specifications and was appropriately equipped for night VFR for the model.

There were no pre-existing defects in the aircraft and it had been properly maintained according to manufacturer's requirements and regulations. The helicopter was fitted with an altitude indicator, artificial horizon, directional gyro, turn and balance indicator and other flight instruments, but was not fitted with an autopilot or stability augmentation system or a standby artificial horizon. The latter were not required at the time, although CQ Rescue had received a quote for the installation of such equipment.

The helicopter was equipped with GPS and was not experiencing any communication difficulties. The ATSB was unable to ascertain whether the altitude indicator was operating at the time of the incident. If it had ceased operation during the flight, this could have caused a distraction for the pilot.

There had been an intermittent problem with a section of the instrument lighting circuitry over the months preceding the incident. Ultimately, the transistor was replaced on the 20th of August 2003 and the issue was resolved. There was also a call from the pilot to the engineer at 2100 hours on the night of the flight concerning a transmission oil pressure indicator which was discussed. Neither of these issues would seem to

have been an issue in the incident given the analysis of the wreckage.

Mechanical failure was found to be an unlikely contributing factor by ATSB investigation. The examination of the electronic evidence from the engine control unit indicated no apparent anomalies in the engine during flight which could have contributed to the incident. The engine control unit recorded information after sensing a "main transmission over speed condition" page 53-54 of the report, indicating that at that point in time the aircraft was not in controlled flight and was in an "unusual latitude." Page 73 of the transcript.

The examination of the information recorded indicated that the engine and rotors were operating at the time of impact with the water.

An independent report commissioned by The Department of Emergency Services following the incident, recommended an upgrade of the aircraft used by similar organisation, The Torres Strait Community Helicopter provider, to a twin engine IFR rated helicopter due to all flights being over water and with no towns in sight and no visual reference to the horizon on moonless nights. This requirement meant provision of an aircraft with greater navigational capacity. It was also recommended that the single engine VFR rated helicopter be used for daytime flights only.

The report examined implementing full IFR capacity across all community helicopter providers would be onerous, costly, up to two to three times current budgets, and time consuming to achieve.

The Pilot. The pilot, Andrew Carpenter, held a valid air transport pilot license, a helicopter license and medical certification-type endorsements for the Bell 407 and was qualified and endorsed to fly night VFR.

There was no indication on the evidence, of any medical problems prior to the incident apart from a suggestion only of a touch of flu which was not borne out by the evidence. There seems to have been no issue with appropriate rest periods prior to the flight, incapacity of the pilot during the flight was unlikely due to his age and good health, and the fact that he was properly rested. The ATSB analysis of the recorded flight information does not indicate any sudden pilot incapacity during the flight.

At the time of Mr Carpenter's hire, he had 2,456 hours total flying time. Three thousand total flying hours, and substantial night and instrument flying were required by the specifications unless a waiver was obtained. There was no requirement in the service agreement for the experience in night flying over water. The pilot did, however, have excess to requirements in the service agreement; that agreement between the helicopter provider and DES for total in command

flying hours and night flying hours. The pilot was also a grade 1 instructor and former chief pilot.

The pilot had previous experience in marine pilot transfer in Gladstone. Those operations were completed close off shore, three to five nautical miles off the coast, and were of an average .6 of an hour duration.

The pilot's experience of long flights over water was said to be limited. The marine transfers were generally not undertaken in bad weather. The pilot had been taught that if he was inadvertently in bad weather during flight, to turn 180 degrees and exit the conditions. This flying was said to include navigating to a single point of light in the water and taking off ships outbound, that is, away from the coast, into blackness and sometimes wind, with no reference to onshore lighting. Completing that task consistently and safely was said to demonstrate very good airmanship.

Mr Cochrane stated in evidence that:

> "For that type of flying this pilot had considerable experience, especially as a single pilot VFR."

The CHP preferred to hire instrument rated pilots. It would seem that Mr Carpenter's marine transfer experience was influential in hiring the pilot in relation to these factors. The company training conducted from the 1st to the 11th of August 2003, with Mr Carpenter, included night VFR, familiarisation, type endorsements on the bell 407 and may have included some degree of instrument training. There were no concerns regarding the pilot's skills during that training.

At the time of the incident, the pilot had 2,570.3 hours flying experience, 46.1 hours experience on that type of helicopter, 149.4 night VFR hours, and 12 hours flown on instruments, the last time being on the 3rd of April 2003. The pilot's night VFR qualifications were obtained on the 18th of February 2000 and reviewed on the 18th of August 2003, which satisfied CASA requirements. His last night VFR flight prior to the incident was on the 15th of October 2003, which was of a .2 hour duration. He had flown 75.5 hours night VFR in the preceding year. Since his employment with CQ Rescue, he had average 4.8 hours night VFR over a period of three months. The company required pilots to maintain night recency through one flight in each 30 day period. The CASA requirement is three night take-offs and landings in a 90 day period.

The pilot was, according to the ATSB report, reasonably inexperienced in long distance over water flying, particularly at night in this helicopter type. He was new to CHC and to emergency medical service operations. He had limited instrument flying experience and did not hold an instrument rating.

On the 16th of August the pilot lodged a voyage report with CHC in relation to a mission that he had refused due to weather conditions. The evidence of all witnesses indicates that Mr Carpenter was a careful pilot. He had conducted a night flight medical retrieval from Hamilton Island in similar conditions recently before this matter. Shortly after take-off on that occasion from Hamilton Island, enroute to Mackay, the pilot lost reference to the ground, due to the landing zone lights being extinguished before they should have been and the pilot seemed quite uncomfortable until he manoeuvred to a position where he could see ground lighting. There was some question in the report as to the appropriateness of the manoeuvres the pilot undertook, possibly indicating a lack of confidence in difficult night VFR conditions.

The pilot had no recent instrument flying hours, which may have adversely affected his ability to recover from unusual altitude in flight if he had inadvertently encountered poor weather conditions such as cloud. It is said that IFR rated pilots recover more quickly in this situation than other pilots do. The radar information indicated an altered track from the flight-path. The pilot turning back towards Mackay

may have been as a result of flying into cloud, or attempting to avoid cloud in the flight-path, which could have caused spatial disorientation and consequent loss of control. It seems the situation where the pilot's workload was very high, if something else is thrown into the situation, for instance flying into cloud, spatial disorientation can occur. There are inherent risks associated with night VFR operations, which do not apply to daytime flights. The risks include a reduced amount of visual information to the pilot and the potential for visual illusions, especially in marginal conditions, which increases the potential for the pilot to succumb to conditions such as spatial disorientation.

Spatial disorientation is a situation in which the pilot fails to:

> "Correctly identify the position, motion or altitude of the aircraft, or the inability to know which way is up."

ATSB report, page 36. Pilots with instrument rating have been shown to recover from this phenomenon more quickly than others, due to the additional skills that they have acquired during that training. In relation to spatial disorientation, Mr Wilson, the chief pilot with Queensland Rescue stated, at page 494 of the transcript, that it:

> "Takes a reasonably strong mindset to disbelieve the senses that you've been believing for the last so many years and to put entire trust into the instrumentation of the aircraft."

Mr Cochrane said of the condition, at page 311 of the transcript:

> "It's a terrible thing, you get lost in your space. A doctor can probably describe it far better than I can, but basically your body tells lies. You can swear black and blind that you're in a left-hand climbing turn where in fact you're in a right-hand descending turn. Without reference to your instrument, it's hard. You've got this body that's been telling you what to do for years and all of a sudden you've got to ignore it and say 'you're wrong and those instruments are right'. I've personally experienced where the aircraft has been straight and level and I've been pushed up hard against the door because the body has told lies like that. A lot of things will bring spatial disorientation on. It could be something simple like not blowing your nose, like having a blocked nasal passage. It can be something like a blocked sinus. It can be wax in your ears. It can be a bright light on your dashboard. You know things will make you keep looking that way, it's a terrible thing. I don't know if any pilot that's flown of a night that hasn't experienced it in some form or another."

The requirement of CHC for pilots to document refused missions, in particular the voyage report, was another matter considered by the ATSB as potentially placing pressure on pilots to accept missions in marginal conditions, pressure which could be elevated by being on probation in the employment as this pilot was at the time. The voyage reports are required to be lodged with head office during a weather report, detailing the reason for the refusal of the operation.

Also pertinent to the ATSB, was the location of the chief pilot to whom the pilot in Mackay would defer to, as being in Adelaide. Evidence was given that any queries, concerns, requests for advice et cetera, could be addressed to the chief pilot over the phone at any time. ATSB were concerned that the distance from the base of operations, Mackay, to Adelaide,

could have affected the efficiency of communication between the pilot and the chief pilot. Mr Jibson, the base manager in Mackay, gave evidence at page 451 of the transcript that:

> "The culture in the company was for open communication and encouragement to make contact with the chief pilot with any issues".

Flight information. The difficulties in the flight commenced at about 21.43 hours and 43 seconds, according to the analysis of the radar track. Mr Webb interpreted the radar tracked information by saying:

> "It shows that the aircraft was varying in altitude and also varying in air-speed, and it shows that he deviated from track about 21.43 and 43 seconds and that at that point, deviated from his online track to Hamilton Island towards the west, and then at about .15, you can see that he did an abrupt turn to the north-east, to the right. Several seconds later he did another abrupt turn to the right and then at point 21, at 2,839 feet, that's the point he went off the TATS radar system."

Page 63 of the transcript. The helicopter was descending when it was lost from radar. There was about a minute and a-half from the time the helicopter went off radar to impact. Experts witnesses stated that it would have been very difficult for a pilot to regain control of the aircraft in those circumstances, even if orientation by reference to lighting, was possible.

Organisational issues. The organisational structure for the provision of the helicopter EMS system across Queensland, is overseen by the Department of Emergency Services, primarily through the Aviation Services Unit. Queensland Rescue, based

in Brisbane, Townsville and Cairns, are fully government funded services, with four community helicopter providers covering the balance of the state. There is partial funding from the government for CHPs of $894,000 per annum. An interdepartmental QES and Queensland Health advisory committee, called QEMS, Queensland Emergency Medical Service, has been overseeing this system since 1997. The organisations responsible for the provision of helicopter EMS system in the Mackay region, are the Department of Emergency Services, Queensland Rescue and CHC. No one organisation has the responsibility for operational safety. Each organisation has differing roles and responsibilities, which are governed by a service agreement between the department and the CHP and a contract between CHC and the CHP. The ATSB considered this situation, "Divided and diminished" responsibility for safety. The service agreement between the department and CQ Rescue, expires on the 31st of January 2007. In 2001, CQ Rescue sought tenders for a five year period for the provision of a helicopter and aviation services. They were seeking the provision of an IFR capable single or twin engine helicopter able to fly in all conditions, day and night, on short notice and in emergency situations. An independent audit of the tender process in 2000 concluded that a twin engine helicopter was a more viable option, increasing capability beyond VFR operations. CHCs tender recommended an IFR rated helicopter as the primary option.

CQ Rescue approached the acquisition of the helicopter in a different way to Queensland Rescue and were heavily impacted

by financial considerations attempting to fit the aircraft to the budget rather than the reverse. Queensland Rescue operates a Bell 412 helicopter, IFR equipped, from Townsville, which can provide cover for the Mackay region in situations where CQ Rescue is unable to attend to an operation. Queensland Rescue operates twin engine IFR capable helicopters and other aircraft. Non-IFR flights are conducted under strict guidelines, including a visible horizon for night VFR flights and pilots to have helicopter in command instrument rating qualifications. The latter recognises the advantage of the additional skills for pilots. Such requirements were not in place at the time for CHPs.

The service agreement includes the requirement for the pilot to assess operational issues including weather conditions and take the decision whether it is safe to undertake a flight. The service agreements and contract at the time of the incident, contained little reference to operational safety issues and these were largely left to the organisations delivering the service. The organisation with the highest degree of expertise in helicopter EMS, the Department of Emergency Services, was said to have relatively little input into the operation on an ongoing basis. There appears to have been no links between CQ Rescue and Queensland Rescue, stifling the opportunity for the exchange of information and the passing on of results of lessons learned by Queensland Rescue.

CQ Rescue had the most input into operational issues, but was the organisation with the least experience in the organisational structure.

Ultimately, however, the organisation with the operational safety responsibility is CHC as the helicopter operator. ATSB found that CQ Rescue demonstrated a limited awareness of safety issues relating to helicopter EMS and that this compounded the diffused responsibility across the relevant organisations for operational safety issues. In particular, the ATSB noted the apparent lack of knowledge about historical helicopter EMS safety issues which have been the subject of discussion and published information in the industry for sometime.

Despite CQ Rescue and CHC being aware of the pilot's limited instrument experience, they do not appear to have attempted to confirm the pilot's competence in this area. Whilst not formally required, this altitude indicates a failure to mitigate the potential risk in night VFR flying in the organisation, particularly taking into account the helicopter being used had no backup systems in the nature of a standby altitude indicator or autopilot.

Risk management issues. At some point some organisation in the structure must undertake a risk assessment on the appropriate mode of transport to be tasked for EMS operations as they arise, depending on the medical and transport issues of each matter. At present some issues are considered separately by various wings of the organisational structure but there seems to be no co-ordinated approach to the over-arching issues.

Whilst there was no formal requirement to do so, CHC had no formal risk management policy in place. Mr Jibson, the base manager, gave evidence at page 459 of the transcript that in his position of base manager with CHC he had no formal training in risk assessment. He stated that at the time there was a company safety system in place, an integrated safety management system, which saw monthly reviews by the base manager of activities undertaken at the base, and an assessment of risk associated with those.

He agreed that there was no formal operational risk management program in place at the base. The base manager was operating on assumptions that flight service wing of CHC had assessed competencies of the pilots in relation to the flight operations manual, for instance. There were no formal reporting procedures for this type of information to the base manager. The base manager follows the procedures in company manuals relating to risk assessment but has self-trained in this regard. No formal training has been conducted since this incident.

The absence of a formal operational risk management policy did not provide the environment in which analysis of certain flight factors was specifically and formally required. A requirement for the application of an analytical assessment of the conditions in which each flight was to be conducted would create a risk assessment environment more conducive to safety.

A quality risk assessment was undertaken during the bedding of the contract between the parties. The assessment did not assess day-to-day operational risk, or the potentially hazardous issues relating to flight regimes and equipment.

Queensland has the highest rate of accidents and fatalities in the country, despite not having the highest quantity of flying hours for EMS. Page 41 of the ATSB report.

All of the accidents for the period 1987 to 2002 occurred in community helicopter provider operations. All fatalities in Australia in EMS helicopter operations have occurred in Queensland, in two incidents, Marlborough and the present one, resulting in the deaths of eight people.

EMS is categorised in Australia as aerial work, the second lowest of four categories, attracting a lesser standard of regulation by CASA, less than regular public transport and charter operations. There is an argument that EMS patients, not in a position to make a decision regarding assumption of risk in flying in single engine aircraft, and sometimes inhospitable conditions, should have the protection of the aircraft being governed by charter or air transport regulations.

At present, medical patients are not afforded the same level of safety and protection as those members of the public who charter an aircraft or fly in the aviation transport industry. The aerial work category under which EMS presently falls

caters for those on board as being essential personnel to the flight. This does not really take into account the presence of medical patients on those flights. The ATSB has made a recommendation that CASA review this situation. Any correction of the present situation for EMS will have huge cost implications on the industry. It may be more appropriate for EMS to be considered a separate category of operations for regulatory purposes.

Further, Australia does not have a national standard or system of accreditation for EMS operations. The need for a national system of accreditation and uniform standards across Australia has been formally acknowledged since the early 1990s.

Queensland Rescue night VFR in single engine helicopters are only undertaken where pilots hold night VFR and command instrument rating, and with fully qualified air crew officers to support the pilot over water only when celestial lighting and visual horizons exist. It is quite apparent that the same rules do not apply to community helicopter providers.

Missing controls. A formal requirement, whether from within the organisation or without, to document the access of weather information by the pilot pre-flight within a certain timeframe may ensure that the task is undertaken appropriately and would certainly assist any post-flight investigations. The existence of an autopilot or stability augmentation system in a helicopter reduces the pilot's workload when flying and may assist a pilot to maintain controlled flight. The existence

of such additional equipment allows the workload of the pilot to be reduced, which is already significant in night VFR, and allows the pilot to attend to matters hands free, which can be difficult otherwise.

In the present situation an autopilot would have been able to be engaged prior to the area where the flight fell into difficulty. The additional cost for an autopilot was said to be in the vicinity of $200,000.

Further, a standby altitude indicator with separate power source safeguards against failure of the primary instrument. In the event of failure of a single altitude indicator, flying the aircraft on limited instrument would be a very demanding workload for the pilot.

Mr Webb gave evidence:

> "Of a benefit to have an autopilot stabilisation system for a single pilot night VFR operation over water, and that's mainly because, for one thing, it eliminates the pilot's workload issues and it allows stabilisation of the aircraft." Page 66 of the transcript.

CASR draft regulation point 133 will, if implemented, require the presence of these instruments in helicopters flying over waters for distances exceeding 10 nautical miles.

Community helicopter providers should be required to adopt a similar testing regime to Queensland Rescue in relation to

night VFR skills. Mr Wilson detailed the Queensland Rescue approach:

> "We have an approved training and checking schedule by the Civil Aviation Safety Authority of which we provide a number of progressive tests throughout the year and there's various components of what we're competency-based assessing because of the amount of tasks and type of tasks that we do. During the night visual component checks, they're normally done at either three monthly or six monthly intervals as they are staged. It's a level of assessment of flying on the instrument skills, night navigation, as well as remote area night landings to remote landing sites, single land sources, day/night winching operations, and that type of thing." Page 486 of the transcript.

Base pilots in the area were also not aware of the part-time functioning of the Bureau of Meteorology website at the time leading up to the flight. Pilots may well have accessed the website without realising the display shown was not complete for a period of time.

QAS communications standard operating procedure did not require a call from the pilot to QAS at the conclusion of the flight in the circumstance where the flight was less than 40 minutes duration. As a result, there was a 26 minute delay from the time of the incident to when OSSA was notified by QAS communications that the helicopter was missing. In the present situation such a delay would have made no difference, but in the situation where there may have been survivors, any delay could be crucial.

QAS communications centre had out-of-date contact information and incorrect helicopter registration details with OSSA. QAS

were also unaware of the presence of a locational underwater beacon on the rescue flight, and consequently OSSA was not armed with that information for the search.

The international civil aviation organisation requirements provide for instrument flying training in the pilot licence qualifications. The only instrument training required by CASA regulations is that which is a component of the night VFR qualification. However, the draft CASR point 61 regulation addresses this situation.

CASA regulations relating to night VFR flying contain a provision for visual horizon below 2,000 feet. This could be seen to be placing the pilot in an unfair position in a situation of near IFR environment higher than 2,000 feet without the necessity for qualifications or adequate training or recency requirements. Further, there is no requirement at present to review a pilot's night VFR rating or competence in those skills.

Formal risk management training for the base manager at CHC would better place that person to properly undertake assessments in relation to issues not properly presently addressed.

Transition from IFR to VFR in flight is a very challenging task for pilots. Training and self-awareness is required. Instrument rating qualification for pilots costs about 30 to $40,000 and consists of about 40 hours training.

IFR aircraft instrumentation maintenance carries an increased cost as it is maintained to a higher standard and more often, every 100 flying hours or 12 months, whichever comes sooner. Most EMS flights fly VFR for at least some of the journey as it is more economical due to less reserve fuel being required.

Systemic changes since the incident. The majority of the reviews of the Coroner in the Marlborough inquest, the Cornish and Wilson reviews, were implemented by the Department of Emergency Services. The Department of Emergency Services has done much in the two years since this incident, which occurred shortly after the delivery of the Marlborough crash findings, to strengthen the safety requirements in the service agreements and to improve QAS systems.

The Department of Emergency Services has also worked with Queensland Health on the significant restructure of the clinical co-ordination system, which has been applauded in evidence by employees of those departments. The centralised and specialised clinical co-ordination system seems to take on some aspects of the respected New South Wales system.

Following the Marlborough crash in July 2000, the service agreements were strengthened in relation to safety issues, including a new requirement for pilots to have 100 hours of night flying experience in CHP operations; an increase in pilot recency and training requirements for command instrument rating; crew resource management training; safety management

systems and safety officers. Primary aircraft and CHPs have also been fitted with autopilots.

The establishment of centralised clinical co-ordination was implemented by Q-Health and the Department of Emergency Services in 2004 for Southern Queensland, and late 2005 for Northern Queensland.

At present, even though local hospitals may take initial calls regarding patient needs, the call is referred to the Central Clinical Coordination Centre in Townsville for the region in this case. The evacuation is arranged through that office, but patients are still routed to the closest appropriately resources centre, according to the patient's needs. Notification is made to the receiving hospital of the patient's arrival by the Clinical Coordination Centre.

Clinical Coordination has been integrated with QAS, the Royal Flying Doctor Service and the helicopter providers. The new system provides for:

> "Much more robust and standardised procedures across the whole state, and that allows for consistency of tasking, which is much better in terms of ensuring a quality governed system."

That was Dr Elcock's statement, who's the State Clinical Coordinator, at page 374 to 5 of the transcript. Dr Elcock went on to say:

> "The Clinical Coordinator has a much greater appreciation of the assets available and the tracking of the aircraft is performed centrally by Queensland Ambulance Service now, so that you can actually almost real-time look at what aircraft that are around, and which one you can use. That makes it much more efficient in terms of how you use those assets, but I also think that the other major step forward has been that we have a small group of more specifically trained or directed clinicians, who have a greater appreciation of the aviation environment and almost all of them have worked extensively in a helicopter environment and fixed ring as in RFDS. So over a period of time it's a specialisation of sub-specialisation of medicine that has developed for the group of people who are committed and skilled to be doing that."

Page 377 of the transcript.

Better and more informed decisions are consistently being made by a narrower group of decision makers. There now more structured and refined roles and responsibilities in the process.

Further, the induction training and education of clinical coordinators is standardised and consistent and includes education on the medical facilities and capabilities in the regions. For instance, Dr Elcock gave evidence that clinical coordinators would be taking into account the resources of a community, particularly in small or remote centres, to ensure that the community retains capability to respond to an emergency. For instance, not sending the one ambulance in a town some hours away, leaving that town without any emergency capability.

In the present situation, Dr Elcock would have looked to other tasking options as a retrieval was, in his words, "not particularly urgent". Page 379 of the transcript.

A more collaborative approach is taken to tasking with the clinical coordinator having more interaction with QAS and helicopter providers in the decision making process.

The current policy appears to be that the primary resource tasked, if possible, is IFR aircraft, particularly at night. This policy has come about in response to work bans imposed by

medical staff on VFR flights. Standard operating procedures 7.2, which became Exhibit 112, which was implemented only some weeks before the inquest, addresses the night flying issue and highlights the need for appropriate clinical reasons to fly at night.

In relation to the procedures for doctors accessing clinical coordinators, Dr Elcock said:

> "We have tried to introduce a much more streamlined way of doctors accessing EMS, which is split patients into low acute, medium acute and high acute, which we have a specific one of those for each island in the Whitsundays, and that is to try and get the islands when they think they require an aircraft, to go triple 0, and that allows us to have a check in there to ensure that we only use these types of resources when it's emergent type, critical response, but there has to be other ways of looking after non-emergent, non-ambulant patients."

Page 385 of the transcript.

The Department of Emergency Services have implemented a requirement for night operation in excess of those required by CASA, which reflect the policies of Queensland Rescue.

A requirement for safe arrival broadcast a nomination of SAR time for flights less than 30 minutes duration has been introduced. Standard operating procedures have been reviewed to provide for attempted communication with aircraft, when communication has been lost for five minutes. In the event of a failure of communication, immediate contact is to be made with OSSA.

Community helicopter providers are now required to provide up-to-date contact and aircraft details, every six months. Service agreements have been amended to require CHPs to ensure sufficient celestial lighting exists for night VFR flights to maintain a visual horizon.

CHC issued a flight safety instruction on IFR operations with celestial lighting considerations, all base pilots are now required to whole command instrument rating.

CHC provided a replacement helicopter, a Dofin 365 CI, IFR rated helicopter, to CQ Rescue shortly after the incident. The aircraft is IFR rated and the three pilots on the base, are IFR qualified. Recently CQ Rescue took delivery from CHC of a Bell 412 helicopter at reduced rates until September 2006, which is IFR rated and able to be flown by a single pilot. This is also the aircraft operated by Queensland Rescue in Cairns, Townsville and Brisbane and by Care Flight on the Gold Coast.

From September 2006 however, the operating costs of the aircraft will increase by $700,000 per annum. The Dofin will be operated as backup aircraft.

ATSB recommendation 200304282, that CASA review its classification and/or minimum safety standards required by EMS operations, including increase in minimal pilot qualifications, experience and recency, operational procedures and equipment for night operations, including two pilots or

stability augmentation and/or auto-pilot system, recency requirements in EMS operations for pilots and training processes, focussed on the EMS environment, was made. CASA response on the 29th of August 2005, indicated an attitude of monitoring on these issues.

CHC has updated and changed it's manuals by issuing more details relating to night flying, and relocating various instructions from multiple manuals into one more concise document for pilots.

Extensions to the medical clinic on Hamilton Island are virtually complete. The extensions are at a cost of $40,000 to $45,000, funded by island management, to add rooms, make a more manageable clinical and provide for expansion for proposed visits by allied health services such as physiotherapy.

Queensland Ambulance Service has also seen changes. Ms Duncan gave evidence at page 230 of the transcript, of the changes in the QAS system since the incident:

> "Things were changed with the helicopters calling up. It will indicate on the computer screen, you've got to check them over with a certain period of time. Things have been changed too, where we actually put into the system the amount of fuel capacity that they have, the number of people on board and you've actually got to enter that into the system before you can go any further, just so that you're aware of the distance they can travel with their fuel, and how many people they've got on board. Everything is done through Brisbane or Townsville, through the coordinator, and they have the final say. I'm under the impression that sometimes even the coordinator will ring an officer that is actually on the scene with a patient, to get a bit more follow-up from

> being actually there with the patient, so they can, because we're only getting what they're relaying to us."

Further, Ms Duncan gave evidence that the standard operating procedures are able to be accessed by QAS staff directly through the computer system now, giving staff members greater and ready access to those procedures.

Potential further changes. Night vision goggles were mooted as a possible solution to the issues relating to night vision, but there are said to be problems with availability and questions over the appropriateness for them for use in this field.

In relation to requirement of pilots to be IFR qualified, issues of expense and training time have been raised. There would be a more limited pool of pilots to draw from. Currency of skills and competency are more often assessed for this rating, causing increased cost and time. Operational considerations of maintaining currency of pilot skills and to attempt training of others within those operations tasked to the service, and the financial ability of the organisation for training flights to be undertaken, are also concerns.

There's also a need for change in the culture of organisations involved in EMS, most particularly to move towards being prepared to operate within the limitations of the equipment, in the operating environment in which it's being used.

Upgrading aircraft to IFR was said to cost approximately $1 million per aircraft. In emergency missions, a disadvantage of flying IFR, apart from the fuel loading, is that there is often no approved IFR procedures for set-down in unusual locations, such as on roadways and in those instances, many prefer to fly VFR to see the ground and set down.

On the issue of access to pre-flight documentation and checks, given that the only copy accompanies the pilot in flight, Mr Wilson gave evidence of the cultural difficulty with requiring duplicate information:

> "It's with this that the pilot has a number of other legal requirements to perhaps carry a copy of his flight forecast, his flight-plan, weight and loading, passenger manifest et cetera. If the flight is going to be undertaken night VFR, we certainly are encouraging and requiring the pilots to not only I guess, access and look at just if the weather's okay."

Page 487 of the transcript. He further stated there was a risk of creating a negative culture by requiring all details to be duplicated. The organisations are said to be trying to build trusting safety culture. Mr Wilson was of the view that there's a fine line between internal auditing and regulating and looking like you're trying to catch the pilot out. Weather information in particular, he said would only go to the assessment of the first leg of the trip and the weather would need to be checked again during the journey, in other areas particularly, if there were delays. And so the duplicate copies would only go to establishing what happened pre-flight.

It's apparent that it will be necessary for there to be a significant cultural shift in organisations such as these, to enable any further accountability measures, of issues such as pre-flight checks to be imposed.

It has been topical in this matter that there was no indication of the pilot checking on weather details in the hour before the flight. If pre-flight information had been left in duplicate at the hangar, then in this tragic situation that issue would have been answered definitively. There may well be other legitimate uses for such information to be used advantageously in the enterprise, but it seems there is some resistance to the suggestion that even professional persons such as pilots, could benefit from double checks.

I find this somewhat surprising, given that aviation seems to be an industry which uses checklists and backups significantly.

Conclusion. Public perception expressed to Sergeant Male during the investigation, showed concern as to the use the rescue service was being put to, that is not necessarily in life-saving missions.

Mr Wilson expressed this issue in another way, which seems to pertinently put the point:

> "I think what needs to be ascertained is certainly what level of service are you requiring that particular organisation to perform; with what particular service of equipment do you want them to perform; and then some type of auditing and educational process to ensure that obviously does occur within the boundaries of what you're allowing or funding et cetera to certainly achieve. One end of the approach spectrum is if the government requires a VFR service, or a night VFR service, then there is a level of expectation and limitation as to what that service will be required or asked to do." Page 485 of the transcript.

Dr Wishaw, an EMS specialist of some considerable experience, wrote and expressed another bottom line issue in this matter:

> "Retrieval and medical helicopter services save the Queensland Government enormous sums of money by avoiding the necessity of trying to upgrade facilities in a myriad of smaller hospitals. However, such service requires sufficient funding to ensure safe operations can occur."

It would also seem that in addition to assisting smaller community medical facilities, the community helicopter providers are being operated on a much lower budget, particularly relating to government funds, than the State run equivalent service.

The recommendations and riders that I will detail soon are being proposed with a view to ensuring that all Queenslanders are provided with a safe EMS helicopter system, and that all emergency service personnel, whether in Government employ, in community organisations, or private enterprise, are provided

with the hardware and skills necessary for them to perform this much needed service efficiently and safely.

It is acknowledged that the formal relationship between DES and the community helicopter providers is governed by service agreements which are not due for renewal in the near future. It has been possible for the parties to agree on changes since this incident but changes proposed which cannot be agreed upon or implemented should be given priority when the service agreements are next renegotiated.

Changes to contractual arrangements with aviation companies which may be necessary should not of themselves prevent the DES in ensuring the service agreements are appropriately drawn. CHS has, in submissions, indicated its willingness to participate in any renegotiation of the contract to which it is a party which "gives the highest possible priority to achieving enhanced safety goals" within budgetary limits. It is also acknowledged that the recommendations may go beyond the current regulatory requirements.

Findings as to the cause of death. I formally find that the deceased persons, Andrew Lee Carpenter, born on the 1st of November 1971, died on the 17th of October 2003 near Cape Hillsborough, Queensland, from an unascertainable cause, but due to, or as a result of injuries as a consequence of a helicopter crash into water. Craig Neville Liddington, born on the 9th of January 1972, died on the 17th of October 2003 near Cape Hillsborough, Queensland, from an unascertainable

cause, but due to, or as a result of injuries as a consequence of a helicopter crash into water. Stewart Matthew Eva, born on the 21st of December 1971, died on the 17th of October 2003 near Cape Hillsborough, Queensland, from an unascertainable cause, but due to, or as a result of injuries as a consequence of a helicopter crash into water.

There are some acknowledgements. There was significant assistance to the investigating police from CQ Rescue, CHC Australia, Hamilton Island Management, Hamilton Island Medical Centre, and the Queensland Ambulance Service. The local marine industry in Mackay, particularly the Volunteer Marine Rescue Service, contributed significantly with the ATSB personnel to the retrieval of the wreckage and the recovery of the deceased men to the extent that was possible. The Queensland Police Service Disaster Victim Identification Team, and Sergeant Zane Male, were tireless in their efforts to assist the families of the deceased men in this tragedy. And Sergeant Male and the ATSB have honoured those men with a very detailed examination of the circumstances surrounding the tragedy in order to avoid further loss of life.

The recommendations:

1. The Department of Emergency Services should give serious consideration to upgrading the requirement for community helicopter providers that the primary aircraft used in the service be a twin-engine IFR rated helicopter where at all possible, and that

there be restrictions on the use of single-engine VFR rated helicopters in line with the inherent limitations of those aircraft.

2. That there be a requirement in service agreements with community helicopter providers that pilots in command be IFR qualified and that their competency and recency be maintained in accordance with Queensland Rescue current practices.

3. That where VFR aircraft are utilised by community helicopter providers that primary aircraft should be twin-engine, and that there be a requirement for a standby artificial horizon with separate power and autopilot or stability augmentation system fitted to the aircraft as a minimum requirement for community helicopter providers.

4. That there be a requirement in the service agreements with community helicopter providers that there be competency-based review of pilots' night VFR skills on a regular basis.

5. That the Queensland Government increase funding to community helicopter providers commensurate with the increased requirements already imposed on the community helicopter providers, and those recommended herein, with a view to community helicopter providers being in a position to provide

a similar quality service to the State run EMS service across the State.

6. That the Department of Emergency Services foster and encourage in the community helicopter providers a more proactive approach to aviation standards, and build an organisational culture of operating beyond bare compliance with regulations, particularly performance-based regulations, with a view to improve safety.

7. That the service agreements between the Department of Emergency Services and community helicopter providers provide for the department to facilitate formal and regular liaison, training, policy development, and other contact between the Department, Queensland Rescue, and community helicopter providers on operational and other relevant matters. There should be similar operating procedures, as far as possible, to allow for a consistency in approach to reflect that in the present clinical co-ordination system, and an equitable service and working environment across the State.

8. That to reflect the increase in funding to community helicopter providers, and in order to further improve safety, the service agreements between Department of Emergency Services and community

helicopter providers include a clause to permit the department to require audits by appropriately qualified independent auditors, and that auditing periods be of a frequency consistent with industry standards.

9. That Hamilton Island Management and Lewin Group Holdings give serious consideration to the provision of a capability on Hamilton Island for overnight care of patients who may be required to be provided care until appropriate EMS transport can be safely provided.

10. That the Queensland Ambulance Service, Queensland Health, and island management companies and communities investigate the appropriateness of undertaking an analysis of facilities for first-aid, emergency assistance and medical facilities on residential and resort islands referrable to workload and patient needs, and taking into account use of EMS transport for them.

11. That Department of Emergency Services conduct a review of helicopter services and their aero-medical capabilities available on Hamilton Island, water-based transport available in the Whitsunday Group suitable for EMS use; and conduct an assessment of any need for the extension or addition to the existing community helicopter provider, EMS Service.

12. That CASA consider regulating for the initial training of a helicopter pilot to include night VFR training.

13. That CASA and the industry move towards a national system of accreditation and uniform standards for provision of EMS services in Australia.

14. That CASA investigate reclassification of EMS helicopter operations into charter category, or create a separate EMS category of aviation in order to provide the benefits of increased level of regulation and CASA oversight, than that presently available under the aerial work category.

15. That CASA ensure that appropriate information be provided to pilots on an ongoing basis regarding the issue of spatial disorientation.

16. The Coroner supports CASR draft regulations point 61 and 133 becoming final.

17. That beacons, both visual and radio, be placed on prominent and appropriate high points along routes commonly utilised by aero-medical retrieval teams, including Cape Hillsborough.

18. The Coroner supports the ATSB recommendations

20030213, review night VFR requirements and promulgation of information to pilots; 20040052, assessment of safety benefits of requiring a standby altitude indicator with independent power source in single pilot night VFR; 20040053, assessment of safety benefits of requiring an autopilot or stabilisation augmentation system in single pilot VFR; and R20050002, review operator classification and minimum safety standards for helicopter EMS operations.

19. That Hamilton Island management give consideration to financial support of CQ Rescue further to that already detailed, in much the same way as other communities and major corporations in the region provide financial support.

Those are my findings and recommendations.

…

CORONER: I would like to thank everybody that has appeared in this matter, particularly the families of the deceased men, for their patience and co-operation, and to you, Mr Tate, and to those other members of the Bar, solicitors and representatives of community organisations that have assisted me during the course of the inquest.

OFFICE OF THE STATE CORONER

FINDING OF INQUEST

CITATION:	**Inquest into the deaths of Craig Liddington, Stewart Eva and Andrew Carpenter**
TITLE OF COURT:	**Coroner's Court**
JURISDICTION:	**Mackay**
FILE NO(s):	**Mackay 63, 63A & 64/2003**
DELIVERED ON:	**14 October 2005**
DELIVERED AT:	**Mackay**
HEARING DATE(s):	**26-29 July 2005**
FINDINGS OF:	**Ms Annette Hennessy, Coroner**
CATCHWORDS:	**CORONERS: Inquest – Emergency Medical Service (EMS) helicopter rescue, risks of night flying over water, Community Helicopter Providers - minimum standards for helicopters and pilots in EMS work, spatial disorientation in pilots, Clinical Co-ordination of EMS missions, provision of overnight medical care in remote communities (Hamilton Island), funding of Community Helicopter Providers**

REPRESENTATION:

Assisting:	Mr John Tate, Counsel, Crown Law
Family:	Mr Patrick Murphy, Solicitor, for Mr Carpenter's family Mr Patrick Cullinane, Counsel instructed by Shine Roche McGowan, Solicitors for families of Messrs Liddington & Eva
Department of Emergency Services:	Mr John Tait, Counsel
Qld Health:	Mr Desmond Lang, Counsel, Crown Law
CHC Helicopters (Australia):	Mr Ron Ashton, Counsel instructed by Minter Ellison Sols
CQ RESQ:	Mr Graham Crow, Counsel inst. by Macrossan & Amiet, Sols
ATSB:	Mr Barry Cosgrove, Solicitor, Aust. Govt. Solicitor
Dr Lewin:	Ms Tania Waring, Solicitor United Medical Protection