OFFICE OF THE STATE CORONER

FINDING OF INQUEST

CITATION:	**Inquest into the deaths of Joanne Bowles, Michael Bowles, Sophie Bowles, Kevin Bowles, Andrew Morris and Christopher Andre le Gallo**
TITLE OF COURT:	Coroner's Court
JURISDICTION:	Brisbane
FILE NO(s):	COR/02 1577–COR/02 1582
DELIVERED ON:	7 September 2006
DELIVERED AT:	Brisbane
HEARING DATE(s):	16 July 2005, 1 September 2005, 19–21 December 2005 and 6–10 February 2006
FINDINGS OF:	Mr Michael Barnes, State Coroner
CATCHWORDS:	CORONERS: Inquest, aircraft accident, fuel selector warning, chief pilots' duties, securing of evidence.

REPRESENTATION:

Counsel assisting:	Mr Simon Hamlyn-Harris
Bowles Family:	Mr Peter Carter (Carter Capner Lawyers) & Mr Graeme Casse
Morris Family:	Mr David Tait, SC
Australian Transport Safety Bureau:	Mr Barry Cosgrove (Australian Government Solicitor)
Civil Aviation Safety Authority:	Mr Ian Harvey
Western Air Services Pty Ltd and Heli-Aust Engineering Pty Ltd:	Mr Tom Quinn (instructed by Norton White Lawyers and Notaries)

Findings of the inquest into the Hamilton Island aircraft crash

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The *Coroners Act 1958* provides in s43(1) that after considering all of the evidence given before a coroner at an inquest the coroner shall give his or her findings in open court. What follows are my findings in the inquest held into the deaths of Joanne Caroline Alexandra Bowles, Kevin Bowles, Sophie Alexandra Bowles, Michael Bowles, Christopher Andre Le Gallo and Andrew Morris.

Introduction

Shortly after 5.00pm on Thursday 26 September 2002, a single-engine Piper Cherokee Six aircraft took off from Hamilton Island on a charter flight to Lindeman Island, about 15 km to the southeast. On board were the pilot, a New Zealand family of four and a recently married Californian man.

The engine of the aircraft began malfunctioning very soon after take off. The plane banked steeply, before the engine cut out and the aircraft plummeted to the ground, approximately 300 metres to the west of the runway. All six occupants died.

These findings seek to explain the causes of the crash and make recommendations aimed at reducing the likelihood of similar incidents occurring in future.

The Coroner's jurisdiction

Before turning to the evidence, I will say something about the nature of the coronial jurisdiction.

The basis of the jurisdiction

Although the inquest did not commence until 2005, the deaths being investigated occurred before 1 December 2003, the date on which the *Coroners Act 2003* was proclaimed. In each case therefore it is a "*pre-commencement death*" within the terms of s100 of that Act and the provisions of the *Coroners Act 1958* (the Act) are therefore preserved in relation to it.

As the police to whom the incident was reported recognised the deaths to be *"violent or unnatural"* within the terms of s7(1)(a)(i) of the Act they reported the incident to the local coroner. Section 7(1) confers jurisdiction on a coroner to investigate such a death and s7B authorises the holding of an inquest into it.

As protracted inquiries such as this was bound to be create logistical and administrative difficulties for single magistrate courts and as the convenience of the families involved was better met by the hearing being conducted in Brisbane, I agreed to assume responsibility for the matter.

The scope of the Coroner's inquiry and findings

A coroner has jurisdiction to inquire into the cause and the circumstances of a reportable death (s7(1)).

The Act, in s24, provides that where an inquest is held, it shall be for the purpose of establishing as far as practicable:-

- the fact that a person has died,
- the identity of the deceased,
- when, where and how the death occurred, and
- whether anyone should be charged with a criminal offence alleging he/she caused the death.

After considering all of the evidence presented at the inquest, findings must be given in relation to each of those matters to the extent that they are able to be proved.

An inquest is not a trial between opposing parties but an inquiry into the death. In a leading English case it was described in this way:-

> *"It is an inquisitorial process, a process of investigation quite unlike a criminal trial where the prosecutor accuses and the accused defends… The function of an inquest is to seek out and record as many of the facts concerning the death as the public interest requires."* [1]

The focus is on discovering what happened, not on ascribing guilt, attributing blame or apportioning liability. The purpose is to inform the family and the public of how the death occurred with a view to reducing the likelihood of similar deaths. As a result, the Act authorises a coroner to make preventive recommendations[2], referred to as "*riders*," but prohibits findings being framed in a way that appears to determine questions of civil liability or suggests a person is guilty of any criminal offence.[3]

In *Queensland Fire and Rescue Authority v Hall* [1998] 2 QdR 162, Lee J observed in relation to s 7 of the Act:

> *"It may be noted that s. 7 first refers to 'the cause of the death' itself as the ultimate focus of the inquiry, i.e., the death, but there is the added requirement of '… and the circumstances of the death'. The death is the actual event and the cause of it is the process of happening which brought the death about and is the cause of it, whereas 'the circumstances' obviously covers a much wider area of inquiry as the word itself conveys and as the various sections of the Act referred to indicate. Circumstance means 'time, place, manner, cause, occasion, etc, surroundings, of an act or even': Concise Oxford Dictionary."*

The admissibility of evidence and the standard of proof

Proceedings in a coroner's court are not bound by the rules of evidence because s34 of the Act provides that "*the coroner may admit any evidence the coroner thinks fit"* provided the coroner considers it necessary to establish any of the matters within the scope of the inquest.

This flexibility has been explained as a consequence of an inquest being a fact-finding exercise rather than a means of apportioning guilt: an inquiry rather than a trial.[4]

A coroner should apply the civil standard of proof, namely the balance of probabilities, but the approach referred to as the *Briginshaw sliding scale* is applicable.[5] This means that the more significant the issue to be determined, the more serious an allegation or the more inherently unlikely an occurrence, the clearer and more persuasive the evidence needed for the trier of fact to be sufficiently satisfied that it has been proven to the civil standard.[6]

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1 *R v South London Coroner; ex parte Thompson* (1982) 126 S.J. 625
2 s43(5)
3 s43(6)
4 *R v South London Coroner; ex parte Thompson* (1982) 126 S.J. 625
5 *Anderson v Blashki* [1993] 2 VR 89 at 96 per Gobbo J
6 Briginshaw v Briginshaw (1938) 60 CLR 336 at 361 per Sir Owen Dixon J

It is also clear that a coroner is obliged to comply with the rules of natural justice and to act judicially.[7]This means that no findings adverse to the interest of any party may be made without that party first being given a right to be heard in opposition to that finding. As *Annetts v McCann*[8] makes clear, that includes being given an opportunity to make submissions against findings that might be damaging to the reputation of any individual or organisation.

The investigation

Island emergency services personnel were the first to respond to the crash. They quickly established that there were no survivors. They secured the scene to ensure the wreckage was not interfered with and notified all appropriate authorities.

Police investigation

There were no police on the island at the time of the accident, but later that evening, eight police officers travelled to Hamilton Island from various mainland centres, with the first officers arriving at about 10.00pm.

The police officers did not set out to determine the cause of the accident, as it was not primarily their role to do so. The police took over security of the scene, caused the relatives of the deceased to be notified and arranged for the transportation of the bodies of the victims to Brisbane for identification and autopsy. The police officers also assisted the Australian Transport Safety Bureau (the ATSB) investigators who arrived on the island the next day. Fortunately, the police officers did obtain statements from most material eye witnesses which enabled those people to be called at the inquest.

Australian Transport Safety Bureau investigation

The investigation into the cause of the accident was undertaken by the ATSB in accordance with Part 2A of the *Air Navigation Act* 1920 (Cth).[9] A multi-disciplinary team utilized the expertise of appropriately qualified and experienced aviation engineers, human factors experts and other technicians and relevant professionals.

The focus and scope of the ATSB investigation is explained by Section 19CA of the Act to be to "*determine the circumstances surrounding any accident, serious incident, incident and safety deficiency, to prevent the occurrence of other accidents, serious incidents, incidents and deficiencies."*

This is similar to the purpose of the coronial investigation,[10] and the agency's final report, *Aviation Safety Investigation Report 200204328,* was published in March 2004 ("the ATSB report") following a comprehensive consultation process. It was of great assistance to me.

Harmsworth v State Coroner [1989] VR 989 at 994 and see a useful discussion of the issue in Freckelton I., "Inquest Law" in *The inquest handbook*, Selby H., Federation Press, 1998 at 13

8 (1990) 65 ALJR 167 at 168

9 Insofar as it relates to the investigation of such incidents that legislation has now been repealed and relaced by the *Transport Safety Investigation Act* 2003 (Cth), but the earlier Act continues in force in relation to investigations commenced prior to 1 July 2003.

10 Because these deaths were dealt with under the *Coroners Act 1958* I had also to consider whether anyone should be committed for trial in connection with the death – a purpose inconsistent with the "no blame" approach adopted by the ATSB. It is significant that the new coronial regime introduced by the *Coroners Act 2003* is more in line with the ATSB focus in this regard.

I consider the investigation was thorough and competently carried out. I am satisfied that it adequately engaged with the issues raised by the incident.

The inquest

A directions hearing was held on 16 July 2005, at which Mr Hamlyn-Harris was appointed as counsel assisting and leave to appear was granted to the families of each of those who had died in the crash, the operator of the aircraft, Western Air Services Pty Ltd, the Civil Aviation Authority (CASA), and the ATSB. The issues to be explored at the inquest were read into the record as was a draft witness list.

The hearing proper resumed on 19 December 2005 and continued for three days when it was adjourned for a further five days of evidence in February 2006. Thirty three witnesses gave evidence and 113 exhibits were admitted into evidence. I then adjourned to receive and consider written submissions. All those who had been granted leave to appear made written submissions. I found them to be of considerable assistance and thank their lawyers and Mr Casse for them.

The evidence

I turn now to the evidence. I cannot, of course, even summarise all of the information contained in the exhibits and transcript, but I consider it appropriate to record in these reasons the evidence I believe is necessary to understand the findings I have made.

I shall deal first with the relevant work history of the pilot and the plane and then deal with the events on the day of the crash and the subsequent investigation of those events.

Pilot training and work history prior to Hamilton Island

Andrew Morris commenced flying training in Sydney in March 1998. He obtained a commercial pilot's licence in July 1999 and a multi-engine instrument rating. He then continued training until he obtained a flight instructor rating in November 1999. Thereafter Mr Morris remained at the same flying school where he had trained and worked as an instructor until March 2002. The proprietor of the business, Ms Davis, gave evidence complimentary of Mr Morris' ability and attitude towards safety. While at the school, he flew 780 hours as an instructor.

Ms Davis also gave evidence that as part of his training and his teaching of other student pilots, Mr Morris would have been involved in responding to simulated power loss on the runway – aborted take offs, and total power failure soon after take off. He was also trained to respond to engine mal functions that led to reduced power being available, but not a combination of the two; that is engine malfunction, but not total failure, soon after take off.

When he left the flying school, Mr Morris took up employment with an air charter operator in Kununurra in the north of Western Australia. He there flew single engine planes on daily charter flights. While working there he met a Dutch tourist, Ana Bal who gave evidence that on occasions she witnessed Mr Morris drinking into the early hours of the morning on days when he had later to fly. She also gave evidence of him smoking marihuana at night, after work.

Mr Morris worked at Kununurra for about six months. He then secured employment with Western Air Services Pty Ltd where he was to be employed flying in the company's air taxi service between the mainland and the Whitsunday Islands. By then he had accrued 1300 hours flying time.

Mr Morris's induction to the air taxi service

Mr Morris arrived to take up the position on Hamilton Island on 17 September 2002. He spent that day with Mr Allan Gray, who was at the time the acting chief pilot for the company. Mr Gray gave evidence that he dedicated the whole day to Mr Morris' induction. They flew from Hamilton Island to Mackay and return in a Partenavia PN68 aircraft, with Mr Morris as pilot, as part of Mr Gray's assessment of him for the position. Mr Gray says he was very impressed with Mr Morris' flying.

Later that day, Mr Morris took part in a refresher course run by Mr Gray and attended by other pilots, at which a number of issues were discussed. These included engine failure after take-off (known as EFATO), and ditching into the ocean. Mr Gray and others who gave evidence were adamant that it was stressed that in the case of an EFATO in a single engine plane the only option was to ditch straight ahead. They discussed how to escape from the plane as it submerged. The group did not discuss a partial engine failure or engine malfunction on a single engine aeroplane.

When Mr Morris left in the evening, he took with him a copy of Western Air Services Pty Ltd's operations manual and the Cherokee Six manual, an aircraft, it seems he had not flown before.

Mr Morris did not work the next day, but when he started work on Thursday 19 September 2002, he told Mr Gray that he had read the manuals. For the first eight sectors, Mr Morris flew the Cherokee Six with Mr Gray accompanying him. Mr Morris then flew about three sectors on his own without Mr Gray, who said in evidence that by then he had deemed Mr Morris to be flying well and to be very competent. They did not undertake any EFATO drills. He was at this stage "*checked to line*" meaning that he had been assessed as having all the necessary competencies to be part of the charter operation, flying without direct supervision.

During the flights they made on 17 and 19 September, Mr Gray flew with Mr Morris to all five of the company's regular ports of call - Hamilton Island, Lindeman Island, Shute Harbour, Laguna Quays and Mackay, and he says they discussed the characteristics of the particular airstrips. Mr Gray said that although he believed that Mr Morris had not had any of his previous flying time on Cherokee Six aircraft, he was satisfied as a result of observing Mr Morris' flying skills that he was an extremely competent pilot.

Mr Morris then flew the Piper Cherokee unsupervised on 20, 22 and 23 September. He had rest days on 21, 24 and 25 September. By the time of the fatal incident he had logged 20 hours in the incident aircraft.

Some history of the incident aircraft

The incident aircraft was a Piper Cherokee Six PA-32-300, registration VH-MAR. It had been manufactured by the Piper Aircraft Company in 1970, and a Certificate of Airworthiness was issued when it was imported into Australia in August 1975. The plane was purchased by Western Air Services Pty Ltd in about July 2002.

Engine replacement

Before the purchase of the aircraft by that operator, maintenance was carried out on it by Lipair Maintenance Pty Ltd. At the end of 2001 that firm was engaged to replace the

engine in the incident aircraft because the original engine was due for a major overhaul on account of the hours it had flown. The then owners thought it would be cheaper to instead replace it with an engine that still had time to run before it needed an overhaul.

The previous owner of the aircraft therefore purchased a second hand Textron Lycoming IO-540-K1C5 engine for this purpose. This was a similar engine to that originally fitted to the incident aircraft, a Textron Lycoming IO-540-K1A5, but it did require some modification.

The post-accident investigation established that the necessary conversion was carried out before the engine was fitted to VH-MAR, but that not all of the documentation that should have been completed properly reflected the work that had been done. There is also some doubt as to whether all of the procedures that should be undertaken during such a conversion were attended to.

The expert witnesses agreed that the engine itself was appropriate for the aircraft and, at the time of the accident, the engine as fitted was suitable for use. Therefore, while there is basis for concern about some aspects of the conversion, I accept the evidence that they had no discernable effect on the operation of the aircraft and were not a factor in the accident.

Maintenance procedures

Nor was there any evidence to suggest that there was any deficiency in the maintenance of the aircraft or the maintenance procedures adopted by the operator, Western Air Services Pty Ltd, or its maintenance organisation, Heli-Aust Engineering Pty Ltd, that caused or contributed to the accident. Other pilots who flew the aircraft in the days before the accident reported that it was not malfunctioning in any way.

The pilot's activity the night before the incident

As already mentioned, Mr Morris did not work on the two days before the incident. It is not known how he spent all of that time, but it was established that in the days before the accident he socialised with the Dutch woman he had met in Kununurra, Ms Bal, whose travels had, by then, taken her to Airlie Beach.

On the evening of 25 September, Mr Morris went to the camping ground where Ms Bal was staying and they had a few drinks. Ms Bal says she believes Mr Morris drank two glasses of wine. They then went to an hotel where they played pool, drank some beers and danced a little. Ms Bal says she believes Mr Morris had three glasses of beer but she can't say what size they were, nor what strength. When interviewed by ATSB investigators Ms Bal said Mr Morris may also have had some spirits to drink at the hotel, but by the time of the inquest she could not recall whether this was the case. They left separately around 12 or 12.30 am. Later Ms Bal received some text messages from Mr Morris on her mobile phone. Telephone records indicate that the last of these was sent at 12.42 am on 26 September.

The events of 26 September 2002 before the crash

On the morning of Thursday 26 September 2002, Mr Morris arrived for work at the Shute Harbour aerodrome about 10 or 15 minutes after his appointed starting time of 7am. He was unshaven and appeared slightly rushed and perhaps a little tired, but otherwise quite normal. He apologised for being late to the pilot who was to fly him to Lindeman Island to

collect the incident aircraft. They then made that journey which was uneventful. There were no indications that Mr Morris was under the influence of alcohol or any other drug.

Mr Morris collected the incident aircraft and flew it to Hamilton Island on the first of 17 sectors he would fly that day. Just after 9.00am, a senior pilot employed by the same operator, Edward Taylor, observed Mr Morris landing VH-MAR downwind at Shute Harbour. This was contrary to company policy as it increased the landing speed and therefore the risk of an uncontrolled incident. Mr Taylor approached Mr Morris, reprimanded him and asked why he had engaged in this manoeuvre. Mr Morris replied that he was aware of the downwind conditions but that in his previous employment, downwind landings were conducted to save time.

The only other noteworthy incident on that day of which we are aware, occurred on a flight from Lindeman Island to Hamilton Island on the sector immediately prior to the accident, when the aircraft's right cabin door latch partially released or "popped" during flight. This did not pose any danger and a senior company pilot who was on that flight reported that Mr Morris responded calmly and appropriately to the incident, and it was not felt to be of any concern.

An engineer examined the door and made a minor adjustment to the latch when the plane was on Hamilton Island just before the incident flight commenced. He said that the problem was easily rectified.

The incident flight

The Bowles family, Joanne and Kevin and their children Sophie and Michael were on holiday from New Zealand with their long time friends the Phillips family, Eileen and Dean and their children Evan and Nara. The two families were staying at Lindeman Island and went to Hamilton Island on 26 September 2002 to go snorkelling on the reef. Also on the day trip were Christopher Le Gallo and his wife, Laura Le Gallo, who were visitors from the United States on their honeymoon. Mr and Mrs Le Gallo had been married only five days.

After flying to Hamilton Island the day trippers were taken by boat to a pontoon on the reef. When they returned to Hamilton Island in the afternoon, the Phillips family and Laura Le Gallo travelled back to Lindeman Island in one aircraft, and the Bowles family and Christopher Le Gallo boarded the incident aircraft, flown by Andrew Morris.

The aircraft taxied for take-off from the runway at about 5.08 pm. It took off towards the south. According to the eye-witnesses, it took off a very long way down the runway, which was quite unusual as when operating normally the plane in question would only need about one quarter of the length of the runway to become airborne. The reason for this has not been established, although it is possible to speculate that the door may have popped again, making it necessary to stop during the take-off run to close it. There is no evidence that the engine was operating abnormally before the plane left the runway.

Eye-witnesses to the fatal incident

A number of eyewitnesses watched the aircraft as it took off, turned right, that is to the west, stalled and crashed. Some of these witnesses were at a clay pigeon shooting range, and others were at a golf driving range, both situated to the east at the southern end of the runway. All report hearing the engine operating abnormally and some expressed surprise at its flight path after take off.

For example, Steven Brindley described it as sounding "*like a sick 186 engine in a Holden … it was like it was missing on a cylinder*". His recollection was that the aircraft engine "*started coughing and spitting probably about five seconds after leaving the ground*". He did not hear any unusual sounds before the plane lifted off.

Mr Brindley also watched the aircraft go into a sharp turn soon after it took off. He said he was surprised that the aircraft did not go straight and land in the water, and instead "*tried to do this great big turn.*" Mr Brindley said that to his inexpert eye, when the aircraft started to do the right turn it was not high enough to complete it. When asked about the description in his statement that the turn was almost like a "hairpin turn", Mr Brindley described it as "*like a very sharp turn … he started to veer to the right and then … the plane actually went sort of up and then turned really sharp… and then came straight down."*

David Small was at the golf driving range with Mr Brindley at the relevant time. He also noticed the engine cutting out and, as he put it, "*struggling to remain operative*" after the aircraft lifted off. He then saw the plane bank sharply to the right before it appeared that the pilot had lost control and the aircraft fell nose first and struck the ground. Mr Small commented that the aircraft was "*obviously attempting to circle 180 degrees and land back on the runway".*

Scott Townley was employed at the Target Sports shooting range and watched the aircraft taking off. He said that although there was no chance of the clay target shooting interfering with a plane, he always tended to wait for a plane to take off before he allowed his customers to shoot. In his statement to the police, he said:

> "*I was watching a small white plane taking off on the runway. It looked like as he was taking off it was veering right, and as he got into the air, the engine got a bit sluggish. The engine seemed to be turning on and off, it sounded as if the pilot was trying to do something, but I don't know what. The motor on the plane then completely konked out.*
>
> *It wasn't very high at all, I don't think it was any higher than 200 ft or so.*
>
> *I don't know if he was trying to bring the aircraft back onto the runway or the wind was pushing him. It was going to the right the whole time. By that time I was already running towards it, I knew it was going to crash. It nosedived into the hill on the other side of the airstrip.*
>
> *As I was running I heard a bang, and saw a big puff of flame and* smoke."

In his oral evidence at the inquest, Mr Townley said ;

> "*It was probably the latest plane I had ever seen take off. They normally take off well and truly before they're near us, and it took right off at the end of the runway, which surprised me …"*

When asked whether the engine was cutting in and out before it took off, Mr Townley said:

> "*It didn't seem like it was doing it before it took off. It was just really sluggish when it was taking off and I think where's (sic) just trying to give it a bit more power it just wasn't working for it."*

Keith Druery was also at the clay pigeon shooting range and he first saw the aircraft when it was approximately 80 metres off the ground. He then removed his ear muffs and could hear the engine of the plane misfiring badly. He continued to watch as the plane then banked steeply to the right to the point where its wings were almost vertical to the ground. It then fell out of the sky, nose first, into the side of the hill. He said that the pilot attempted to make such a steep turn that the wings were pointing at the ground and at the sky and that's when the motor cut completely. Mr Druery said it was very clear to him that the pilot was attempting to turn back and had got about half way around that turn.

Graeme Twaddell was also at the clay pigeon shooting range at Target Sports. He observed the aircraft take off and said in his statement:

> *"On it rising to approximately 150 m the engine began spluttering, and the plane went into a tight right hand turn. About half way through this turn, it began to nose dive toward the ground and was out of my direct view when it impacted on to the steep bank on a hill."*

Robin Stubbs is a motor mechanic by trade. He was also at the clay pigeon shooting range. He said in his statement:

> "*I was shooting at the range. I saw a small plane taxi-ing down the runway. I then directed my attention to the shooting trap and I saw the plane come into view. I estimate the plane to be about 100 feet from the end of the runway when the plane lifted off.*
>
> *As the plane has started to climb and as the engine was asked to respond, I could hear the engine starting to misfire. From my experience as a mechanic, I believe that the engine mixture was lean and this could have been the cause of the engine misfire.*
>
> *The plan then banked steeply to the right to the point where the plane's wings were almost vertical to the ground.*
>
> *It then went nose down and fell out of the sky nose first into the side of the hill."*

At the inquest he said:-

> *"… I heard an aircraft coming down the runway and … it appeared to be going normally until it started to ask for power to take off and then this misfiring started and … it wasn't electrical misfiring because it was a fuel air mixture misfiring … It wasn't like a spark plug or any those sort of things. It was fuel air – fuel starvation and the fuel air ratio. There was no fuel to go with the air. …It needed fuel. It didn't need air. It had air and it had ignition but it had nothing to burn."*

Mr Stubbs' recollection was that the engine stopped altogether just before the aircraft went into rapid descent.

The aircraft came to rest upright, aligned in an east-north-easterly direction, approximately 300 metres to the west of the runway centreline and approximately 100 m south of the departure end of the runway. A severe post-impact fire consumed the majority of the aircrafts fuselage.

Having regard to this evidence and that contained in the ATSB report which corroborates it, I find that the aircraft took off very late along the runway, and almost immediately, before the aircraft had climbed away from the airstrip, the engine began malfunctioning intermittently causing a loss of power. I accept the evidence that a short time after the engine began to operate abnormally, the aircraft commenced a sharp right hand turn and that part way around this turn, it went into rapid descent before striking the ground after which a severe fire erupted.

The post accident response

Emergency services personnel on Hamilton Island, including the chief fire officer and the local fire tender, the security manager and the operations manager of the airport went to the scene within a short time of the accident. They extinguished the fire as quickly as possible. However, the impact forces and the extent of the fire were such that none of the occupants of the aircraft survived the accident, and there was no possibility of rescue. Their actions in securing the scene and notifying the authorities were appropriate.

The retrieval of human remains and DVI

On Friday 27 September, five officers from the Queensland Police Service Disaster Victim Identification Squad travelled to Hamilton Island. Using internationally recognised procedures designed to ensure continuity of evidence and accuracy of identification of human remains, they extracted the bodies from the aircraft wreckage and placed them in a holding area where the government undertaker took over preparing them for transfer to Brisbane for autopsy. It seems that this process was not satisfactorily carried out but I am assured that problems that arose with that aspect of the response to the incident have been addressed.

The bodies were flown to Brisbane on the night of 27 September, where a comparison of dental records was used to identify the victims. I accept the accuracy of the opinions arrived at as a result of this process.

The autopsies

Three experienced forensic pathologists carried out autopsies on the bodies removed from the wreckage. In each case severe head and internal injuries consistent with the trauma generated by an aircraft crash were evident. In all but one case, there was no soot or other foreign material in the airways. This indicates that the person died almost instantly in that they drew no breath after the fire started. In the one case where soot was found, the extent of the head injuries almost certainly means that the person was unconscious and would not have been aware of the fire or suffered any pain. Those injuries would have resulted in very rapid death.

Toxicological analysis of blood from some of the deceased showed the presence of alcohol. This was found in the blood of Andrew Morris (0.081%), Kevin Bowles (0.019%), Joanne Bowles (0.184%) and six-year old Michael Bowles (0.043%).

Some of the passengers had consumed alcohol during the day: Mr Phillips says that on the return boat trip to Hamilton Island Joanne Bowles did not drink any alcohol and Kevin Bowles "*may have had one or two cans"* but young Michael did not have any. There is no evidence that the pilot had consumed any alcohol since he arrived for work and at that time he appeared quite sober. It is almost certain that the alcohol found in the bodies of some of the victims is a post mortem artefact brought about by their not being stored in sufficiently cool or sterile conditions before removal from the Island and lodgement in the John Tonge Centre mortuary.

I am satisfied that the presence of alcohol in the blood of the pilot at post-mortem analysis is of no significance to an understanding of the cause of the accident.

The pathologist who undertook the autopsy on the body of the pilot, Mr Morris, found no evidence of any pre-existing disease that may have caused or contributed to the crash.

There was found in the blood of Mr Morris metabolites of cannabis[11] indicating that he had used the drug but there was no way of determining whether that was within a few hours or a few days of the crash. However the pharmacologist who gave evidence at the inquest, Dr Drummer, said that if the pilot had not smoked marihuana that day he must have used it regularly in the days leading up to the crash.

It is significant that when police searched Mr Morris' hotel room on 1 October 2002 they located in a brief case owned and used by him, a small quantity of cannabis sativa, and a small metal pipe. On 4 October 2002, Sergeant Dooley searched Mr Morris' car, and located in the glove compartment a small wooden pipe which he said smelt of burnt cannabis that was to his experienced nose "*more fresh than stale."*

Also found in Mr Morris blood were traces of morphine, codeine and paracetamol which was consistent with his having ingested a normal dose of over the counter analgesics during the day of the accident. Dr Drummer expressed the view that these drugs would not have impacted upon Mr Morris' ability to fly.

The cause of the accident

There is no doubt that the aircraft crashing was the immediate cause of the deaths of the six occupants. The challenge for this inquest was to establish the cause of that crash and to consider how similar events might be avoided in future.

The ATSB report identifies three factors which the agency considers "*significantly contributed to the occurrence"*. They are:-

- the aircraft's engine commenced to operate abnormally shortly after take off;
- the pilot initiated a steepening right turn at low level; and
- the aircraft stalled at a height from which the pilot was unable to effect recovery.

In evidence, the ATSB chief investigator, Mr Sangston, said that the aircraft stalled because of the steepening right-hand turn, and therefore the third of those factors is closely related to the second.

An understanding of the cause of the deaths in the broader sense therefore requires consideration of two main issues:–

- why did the engine malfunction? and
- why did the pilot respond as he did?

The cause of the engine malfunction

Adequacy of fuel

As a result of considering the aircraft flight records and the records of the refuelling of the aircraft on the day of the incident, I am satisfied that it was carrying sufficient fuel for the planned flight.

[11] 11 – nor tetrahydracannabinol - Δ^9 – carbolic acid - 0.10 mg/kg

The aircraft was fitted with left and right main tanks and left and right wing tip tanks. It was company policy, or at least a practice, that the tip tanks were not normally used when the plane was undertaking its standard air taxi work which consisted of short flights between the mainland and the islands. However, a small amount of residual fuel was generally left in those tanks. Such a policy was consistent with acceptable practice and with the safe operation of the aircraft.

Fuel tank selector

Although the main tanks contained sufficient fuel for the incident flight, the engine could be deprived of fuel if an error was made in fuel tank selection. The aircraft was fitted with a fuel tank selector control on the cockpit floor to the right and below the position of the pilot. It was the responsibility of the pilot to select the required fuel tank at the beginning of a flight using this control. The pilot should alternate between the left and right main tanks to keep the fuel load evenly distributed. The experts who gave evidence suggested that prior to take off a pilot should check the position of this selector, not just by looking at it but also by moving it out and back into the detent which corresponds with the fuel tank he/she is desirous of using. This allows the pilot to feel that the selector is correctly positioned.

If a pilot inadvertently selects a near empty tank, the engine will begin to miss as the tank is drained of fuel and air is sucked into the engine. Similarly, if the selector is inadvertently positioned between two fuel tanks, one of which is empty, the engine could also be deprived of sufficient fuel for the same reason.

The expert witnesses appeared to be in broad agreement that this was the most likely explanation for the malfunction of the engine at the critical stage of flight immediately after take-off.

Mr Sangston said that although the ATSB did not come to any definite conclusion as to what led to the engine operating abnormally:

> "*The hypothesis that would've resulted in symptoms consistent with what the witnesses reported… was that the fuel selector had inadvertently or mis-selection or whatever (sic) in a partial tank selection which resulted in an incomplete fuel flow, if you like, to the engine in that it's… being compromised by air as opposed to having a full fuel flow.*"

Another ATSB investigator, Mr Brett Leyshon, said that an error with the fuel selector was "*possibly one of the most likely scenarios*" and suggested that other possible scenarios considered by the ATSB investigators were less likely.

An ATSB engineer, Mr Andrew Roberton noted that it was possible that if a fuel injector nozzle became blocked and then unblocked and blocked again the symptoms reported by eye witnesses could occur. He also thought the alternative hypothesis that the engine was starved of fuel because of an error in fuel tank selection was a plausible one. Mr Roberton mentioned that it was a design feature of the particular fuel selector that if it was positioned between a tank which has fuel and one that does not, air can be sucked from the empty tank and interrupt the flow of fuel to the engine, and this could have produced the symptoms the witnesses described. He also indicated that it would be consistent with that explanation if the engine did not begin to malfunction until just after take off, because of the time it might take for the small amount of fuel in the wing tip tank being drawn down to a level where it would start to suck air. The effect could also be related to the angle of the aircraft on take off, or it might be a combination of those two factors.

The opinions of the ATSB witnesses appear to be consistent with that of the relevant expert witness from CASA, Mr Jason Clarke, who said in paragraph 49 of his witness statement:

> *"There is a strong likelihood that the pilot, in a rushed and fatigued state, in the absence of a well practised cycle of fuel tank management in the PA-32-300, has taken off with the selector not in a positive detent position or on a tip tank containing insufficient fuel."*

The evidence indicates, however, that at the time of the accident, Mr Morris was in fact not behind schedule, and the accident flight departed earlier than scheduled. Having regard to that evidence, Mr Clarke indicated that he would delete reference to the pilot being rushed but not to him being fatigued.

Mr Clarke described the process of fuel tank selection as "*a combined visual and physical selection*". He said:

> "*… there certainly is a certain amount of play in the selector and it's certainly in a position there where it can either easily be knocked by a pilot or passenger's foot and that has – that has certainly occurred to me during my experience with the Cherokee-6 aircraft and if the selector is used in a rushed manner, there is – there is every likelihood that it reached an intermediate position between a main and a tip.*"

It is relevant that there have been numerous other recorded incidents involving the selection of fuel tanks in Cherokee Six aircraft employing the same fuel selection system. An examination of the ATSB Notifiable Occurrences database indicated that of the 134 occurrences involving Piper Cherokee Six aircraft that had been reported between 1969 and 2001, 46 or 34.2% of those related to fuel tank selection errors.

There were suggestions made during the course of the inquest that some defect in the fuel selection valve may have played a part in the engine malfunction. No evidence of this was discovered. While the damage caused by the crash means such a defect was not able to be categorically ruled out, I am satisfied that it can be discounted and that mis-selection by the pilot is far more likely to have been the cause.

The pilot's response to the engine malfunction

Probable flight path and speed of the aircraft

Mr Sangston gave evidence that the investigators had calculated the probable flight path of the aircraft from the descriptions given by various witnesses and their respective positions. The ATSB report notes that the *"maximum height reached by the aircraft was reported as approximating the 98 m (322ft) elevated ground to the southwest of the runway end and in the background of the witnesses field of vision"* .

The ATSB investigators considered it unlikely that the pilot achieved a climb speed much beyond the recommended take off speed of about 60 knots. Although they could not determine the exact stall speed for the aircraft which varies depending up on its angle of bank, they estimated that the stall speed for a turn at 60º angle of bank would have been more than 70 knots and, at 80º angle of bank, more than 121 knots. The stall speed is the slowest speed at which an aircraft can aerodynamically maintain flight.

Dealing with the effect of angle of bank on aircraft load factor and stall speed, the ATSB report refers to the publication *Aerodynamics for Naval Aviators* which stated that above 45º angle of bank, the increase in aircraft load factor and stall speed was quite rapid, and the author of the publication "*emphasised that pilots should avoid steep turns at low air speeds, labelling that flight condition as being common to stall – spin accidents."*

Accordingly, if the witnesses who said that the plane wings were almost vertical are right, the crash was inevitable when this manoeuvre was attempted.

Mr Sangston put it this way:-

> *"Stalling is an aerodynamic effect. The engine doesn't have a direct effect on an aircraft stalling. … as an aircraft is put into an angle of bank, the stall speed increases, and its … virtually an exponential*[12] *effect in that as you go to increasingly higher angles of bank, your stall speed will increase commensurately, and ultimately the aircraft will be at its stall speed where aerodynamically it can't maintain flight."*

He summarised the significance of the way in which the pilot attempted to turn the aircraft as follows:

> *"If the nature of the turn wasn't such that it was a steepening right turn at low level then the accident wouldn't have occurred."*

Having regard to the evidence of eyewitnesses given at the inquest as well as the evidence of relevant expert witnesses as to the aerodynamics of aircraft flight, I accept these findings of the ATSB as to the likely flight path of the aircraft and what is likely to have occurred to the aircraft between the time it left the runway and when it made impact with the ground.

The causal significance of the right hand turn

The issue of the pilot's response once he became aware that the engine was operating abnormally is of central relevance to this inquest.

None of the expert witnesses could suggest with any certainty why the pilot apparently chose to manoeuvre the plane in a manner that would almost certainly lead to it falling from the sky. They did agree, however, that the pilot was in a very difficult situation with very little time to react, and they were reluctant to criticise him while relying on the benefit of hindsight.

Given the pilot's experience, the investigators considered it unlikely that he commenced the right turn with the intention of deliberately applying the angle of bank described by the witnesses. They thought it possible that he may have increased the angle of bank in response to having re-acquired sight of the intended landing area once part way around the turn. It was also possible that the increased angle of bank may have been induced from the effects of what they refer to as "*the G excess illusion*". This is a form of vestibular disorientation which can result in spatial disorientation in pilots, causing inappropriate actions leading to loss of control.

Mr Sangston thought that the pilot was probably "*trying to find the most suitable place to recover the aircraft be it via ditching or via back to the runway"*. No other reason was suggested by the expert witnesses as to why the pilot attempted to execute a turn which, according to them, was too

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[12] The transcript records the word "*expediential* ", but it is likely that Mr Sangston in fact used the word "*exponential*".

sharp for him to be able to prevent the aircraft from stalling. Mr Morris was clearly faced with an extremely difficult, emergency situation, and the point of this inquiry is not to vilify him, but to attempt to analyse what factors, be they personal or environmental, that may have led to him responding to the emergency as he did.

Alternative pilot responses

When considering the appropriate response by a pilot to an emergency just after take off, it is necessary to distinguish between engine failure and an engine operating abnormally.

Mr Sangston explained, if there is an engine failure after take-off, or EFATO, then *"in a single engine aircraft there's only one way to go and that is down."* All witnesses agreed that when that happened it was accepted practice to angle the nose of the plane slightly downward to achieve the best angle of glide and select the best available landing area that requires deviation from the path of travel by no more than 30 to 45 degrees. This should be adhered to even if that means putting the plane into the ocean.

The best response when the engine in a single engine aircraft commences to operate abnormally but does not fail completely, appears to be more uncertain. Mr Sangston said that there are many variables and in this case the pilot was in a very difficult situation. As to the options open to the pilot, he said:

> "*You could go to 10 pilots and probably get 10 different answers to that*"

Mr Sangston also said:

> "*…there are a number of publications, any number you'd like to look at, which talk through the various options. One is the Federal Aviation Administration Airplane Flying Handbook which specifically says if you've got an engine which is giving you some degree of power, use it*".

He continued:

> *"The options included the conduct of a low-level procedural turn and low-level circuit in order to maintain height and air speed prior to landing on the runway [or] flight to an alternate landing area, or to an appropriate area in which to ditch the aircraft."*

This description of the difficulty facing Mr Morris was endorsed by all of the expert witnesses who gave evidence.

Mr Brett Leyshon, a senior transport safety investigator with the ATSB said that an engine failure and an engine operating abnormally both have the potential to be a very critical problem for the pilot. He gave this evidence:

> *"If you look at the engine failure case, first of all, so that there's some context on which you can then frame any other question, an aircraft – if it's a single-engine aircraft and the engine fails, for all intents and purposes it becomes a glider and it will return to earth under the force of the gravity. With an engine operating abnormally, the pilot is faced with a very difficult decision to make and looking at the literature on this in a lot of training manuals, a lot of instructor manuals, there is a lot of, um, not very clear cut information as to what to do with an intermittent engine operation. With an engine failure it is very clear. You lower the nose to maintain gliding speed, keep turns to a minimum to avoid obstacles and attempt to land the aircraft somewhere ahead of the aircraft, ideally within an arc of about 30 degrees either side of the nose. With an intermittent*

abnormal engine, the documentation ranges from saying absolutely nothing about what to do with that particular failure, to saying if you have an intermittent operation you close the throttle and proceed with an engine failure case, to telling you if you have some power to do what you can with that engine power to take you to a place where you may land or manoeuvre to return to the runway. There is no clear cut and dry consistent story in any of the documentation that I've (seen)."

Mr Leyshon commented that, in the case of intermittent engine abnormality, a pilot does not know how long the engine may operate for and any decision he makes may need to take that into account. He said:

"… This pilot was faced with very ill defined set of circumstances in the text for what he should do. If it was a complete engine failure the text is very clear. In this case, it was very ill defined and he was in a very unenviable position, based on the current literature."

The expert witness from CASA on flying operations, Mr Jason Clarke, expressed this opinion:-

"Each case needs to be taken on its own merits but generally speaking, a partial engine failure should be treated as an impending total failure at any time."

Mr Clarke referred to the Aircraft Flight Manual for the Piper Cherokee Six PA-32-300, which gives the following advice:-

"ENGINE POWER LOSS DURING TAKEOFF

If sufficient runway remains for normal landing, land straight ahead. If area ahead is rough, or it is necessary to clear obstructions, maintain airspeed and make only a shallow turn if necessary to avoid obstructions…

If power is not regained, proceed with power off landing."

Mr Clarke considered the minimum safe altitude below which a turn-back manoeuvre should not be attempted *"to be in the order of 800 to 1000 feet above ground level depending upon aircraft design*".

That was also the opinion of an experienced pilot, Ms Davis, who it will be recalled owned and operated the flying school where Mr Morris trained:-

"*…if it's at low altitude and you've got an engine malfunction, you would assume engine failure would be following fairly quickly, so, if you had an engine malfunction at 200 feet, you would probably still assume engine failure and act accordingly.*"

Ms Davis said that the accepted practice that Mr Morris was taught was to locate the best available landing position in an arc of not more the 45 degrees from straight ahead because turning back caused far more rapid loss of height. She said that she considered that an aircraft would need to have achieved at least 900 feet of elevation to attempt this manoeuvre. Even if landing straight ahead meant ditching the plane into water this was the safest option. However, Ms Davis acknowledged that the best response was not so clear cut if the engine did not completely fail but was only malfunctioning. In that case an assessment would need to be done as to the best option in the prevailing circumstances.

Having regard to this evidence, it seems that Mr Morris made a serious error of judgement in very difficult circumstances. He attempted a far too steep turn at too slow a sped and at too low an elevation. However, it is important to remember that, in addition to the effects of the physiological and psychological phenomena referred to earlier, he also had weighing on him the knowledge that he had two small children on board. It is by no means clear that the outcome would have been any different had he ditched into the ocean. The evidence of a number of the experts was that escaping from the submerged aircraft would have been very difficult.

Mr Morris was not helped by a lack of instruction about how to respond to such a situation in his initial training, the documentation provided to him by his employer and his induction to the new position.

During the hearing there was a suggestion that the front seat passenger, Mr Le Gallo may have grabbed the controls and executed the turn. This was based solely on his being a pilot who would therefore know how to do this. He would also know of its consequences. There is no evidence to support this speculation.

The pace of operations and the condition of the pilot

Although the ATSB report suggested the possibility that the pilot might have been affected by the pace of operations in the air taxi service, Mr Renshaw a senior transport safety investigator, aviation and human performance, with the ATSB, suggested in evidence that the pace of operations was not exceptional for the nature of the operation of an air taxi service "*which is a very heavy operation where the workloads tend to be higher than other forms of charter operation."*

Mr Morris flew 17 sectors on the day of the accident. The chief pilot for the operator, Mr Allan Gray, described that as a reasonably busy day. (He said a "*really busy day*" might be 25 sectors).

The incident flight was not running late, and in fact departed some minutes before its scheduled departure time, according to the aircraft manifest, of 5.15pm. I am not persuaded that the work load was so excessive that it could be considered a contributor to the accident.

I have already dismissed any suggestion that Mr Morris was intoxicated at the time of the accident and have acknowledged that it can not be shown that he was under the influence of marihuana. However, that does not mean that alcohol and drugs played no part in the crash. Mr Morris was drinking the night before the accident and seems likely to have also used marihuana that day or the day before. He had no more than six hours sleep and then had a busy day flying. It is likely that he had little opportunity to eat during the day. He apparently had a need for analgesics.

Evidence was given by an aviation medicine consultant, Dr David Newman, who was the author of two reports published by the ATSB concerning the effects of cannabis and alcohol on pilot performance. Dr Newman stressed that when considering these issues it was necessary to distinguish between the acute effects of the drugs and the post intoxication impairment or residual effects.

He was not prepared to concede that there was no likelihood of any acute effects of either drug impacting on Mr Morris at the time of the crash, but that was, I assume, because he hadn't seen all of the evidence that to my mind makes that an issue which can be easily dismissed. Dr Newman confirmed the obvious though; when he indicated that acute effects of these drugs severely degraded a pilot's ability to undertake many of the demanding tasks and complex assessments necessary for safe flying.

Dr Newman's evidence in relation to the residual impairment was to the effect that even after blood alcohol returned to zero there could be lingering performance problems for pilots, associated with things such as spacial disorientation, preventing the pilot from accurately detecting angular or lineal acceleration – attributes which can be particularly important for responding to sudden emergencies. He referred to studies which indicated negative effects could prevail for up to 48 hours after blood alcohol returned to zero and 24 hours after the acute effects of cannabis had subsided. Dr Newman also advised that the negative effects of these drugs would be cumulative and would be exacerbated by fatigue and environmental stresses such as heat or dehydration.

In my view, the effect of this evidence raises a real possibility that the alcohol and marijuana Mr Morris ingested the day or days before the crash may have contributed to his poor decision making or execution and therefore, indirectly, to the crash.

Findings required by s43(2)

I am required to find, so far as has been proved, who the deceased were and when, where and how they came by their deaths. As mentioned earlier, these are not criminal proceedings and I am therefore to apply the civil standard of proof when considering these issues.

Having regard to all of the evidence presented to the inquest I make the following findings:-

Identity of the deceased

The persons who died were:-

Joanne Caroline Alexandra Bowles
Kevin Bowles
Michael Bowles
Sophie Alexandra Bowles
Andrew Morris
Christopher Andre Le Gallo

Place of death

All of those persons died on Hamilton Island, Queensland

Date of death

They all died on 26 September 2002

Cause of death

In each case, the cause of death was multiple injuries sustained in an aircraft accident.

Should any person be committed to stand trial?

In addition to the findings concerning the particulars of the death that I have just pronounced, I am also required by s43(2)(b) of the Act to find whether anyone should be charged with murder or manslaughter as a result of the death.

In this case there is no evidence indicating that anyone committed a criminal offence in connection with the deaths. Therefore, I find that no person should be committed to stand trial on any of the charges listed in s41(1)(a) of the Act.

Riders

Pursuant to s43(5) of the Act I am authorised to make riders or recommendations designed to reduce the occurrence of similar deaths to those investigated by this inquest.

Obviously, I have no independent knowledge of matters impacting on safety in the aviation industry. I must base my recommendations on the expert reports and the evidence of the witnesses who do have experience in the industry. As a result of considering the information obtained from those sources, I am of the view that this matter raises the following issues to be addressed from a prevention perspective:-

- fuel tank selection errors;
- pilot training and induction issues;
- monitoring of chief pilot responsibilities;
- the adverse after-effects of alcohol and/or cannabis use; and
- access to evidence relevant to an understanding of air crashes.

Fuel tank selection errors in the Cherokee Six

At my request, the ATSB conducted searches of relevant data bases which indicted that between 1969 and 2001 there of the 134 reported accidents or serious incidents involving a Piper Cherokee Six aircraft, 46 of which involved mis-selection of fuel tanks.

Evidence given during this inquest indicated that while a check of the fuel tank selector was part of the standard pre take off check, a problem could arise as a result of the selector appearing to be in the intended position when it was in fact in between tanks.

Accordingly, the ATSB recommend that CASA inform pilots and operators of this danger and suggest that as standard practice pilots double check by manually moving the selector out of and back into the detent to confirm that it is correctly positioned.

CASA, in its formal response says it accepted that air safety recommendation, and indicated that "(*t)he issue will be addressed during the year with articles in Flight Safety Australia (FSA) regarding fuel management practices.*" It also suggested that ATSB could provide a contribution to that magazine for this purpose. I have scanned the editions of FSA published since that response was made and could find nothing specifically dealing with the issue.

In my view, the evidence indicated that the risk of fuel selector misalignment is high and the consequences severe. I understand that there are only 180 aircrafts of this type currently on the Australian register. I consider more may need to be done to address this issue.

Recommendation 1– Warning to Cherokee 6 operators.

Fuel tank selector misalignment was identified as the most likely proximate cause of the incident investigated at this inquest and a factor in 35% of all reported safety incidents involving this aircraft type. I recommend that CASA reconsider whether it has adequately responded to this risk and whether a more definitive and targeted reaction is warranted.

Pilot induction and training in emergency procedures

Mr Renshaw, a senior transport safety investigator with the ATSB who gave evidence related to human factors, said that Mr Morris had sufficient experience to be employed in his role with

Western Air Services Pty Ltd and the company had fulfilled all of the regulatory requirements before he commenced as a pilot in the air taxi operation.

However, while recognising that it conformed to existing requirements, the ATSB report expresses reservations about the sufficiency of the induction given to Mr Morris by the operator, particularly as it related to the demands in a busy air taxi service and to responding to over water emergencies.

> *"The only specific after take-off emergency flight maneuver recorded during the occurrence pilot's induction and check and training procedure was the practice of an EFATO in a Partenavia aircraft. The investigation considered that the performance of the twin-engine Partenavia in an EFATO situation, and the resulting pilot flyaway emergency considerations and actions, bore little resemblance to those necessary in a single-engine aircraft such as the Cherokee Six."*
>
> ….
>
> *The lack of comprehensive induction training and check to line actually provided, most likely prevented the occurrence pilot from developing a full appreciation of the nature, operational tempo and risks inherent in the air taxi operation. Given that company management considered risks in that operation 'elevated' when compared to other charter operations; the investigation concluded that the occurrence pilot was under prepared for the demands of air taxi operations."*

The final submissions on behalf of CASA note that the operation of VH-MAR on 26 September 2002 was a charter operation and that there is no legislated pilot induction program for pilots involved in this work. The submission notes that to date CASA has encouraged operators to adopt an appropriate pilot induction program and has issued an advisory publication – CAAP 215 – that recommends the inclusion of more specific provisions in the operations manual.

CASA has also issued a Flight Instructors Manual (Issue 1) which sets out the considerations that must be taken into account in dealing with an emergency engine malfunction; CASA plans to issue a second edition of this manual in 2006.

Further, CASA is preparing new Civil Aviation Safety Regulations for submissions to government. It is anticipated that these will require operators to establish relevant operational and training procedures. The proposed new Part 121 will introduce common safety requirements for charter operators and regular public transport operators.

In its response to the ATSB report, CASA observed that the issues raised by the ATSB in relation to pilot induction training will be covered in the proposed new Part 121 B of the Civil Aviation Safety Regulations.

CASA has also prepared a draft advisory circular (AC 121B-04(0) – Flight Crew Training and Checking) which is intended to support the new regulation when enacted. A copy of the draft advisory circular was provided as an attachment to the final submissions on behalf of CASA.

I am satisfied that this issue has been adequately addressed.

Monitoring of chief pilot responsibilities

CASA approves the appointment of chief pilots as part of its Air Operator Certificate processes. Those processes focus on the proposed chief pilots experience and assessed competencies.

It apparently does not descend to considering how the chief pilot will discharge his/her responsibilities which include ensuring the flying operations comply with regulatory requirements.

One of the CASA experts who gave evidence said that he considered in an air taxi operation such as that operated by Western Air Services about two thirds of the chief pilot's time should be devoted to these compliance issues. In this case the evidence indicates that the chief pilot instead spent the majority of his time flying, leading to the conclusion that he is unlikely to have devoted sufficient time to his other duties. A number of witnesses commented on how quickly Mr Morris was "*checked to line*" and I have already made mention of the inadequacy of some aspects of his induction to the air taxi service. There are no CASA surveillance or audit procedures that would have identified this anomaly.

Recommendation 2 - Regulatory surveillance of chief pilots duties

I recommend that CASA consider requiring AOC holders to demonstrate that their work practices will not unduly impinge on their chief pilot's ability to discharge the supervisory aspects of the position and that checking of this be made part of CASA's audit or surveillance processes.

Drug use by pilots

The facts of this case drew attention to the dangers posed by pilots using alcohol and/or cannabis. Understandably, the family of Mr Morris were distressed by inaccurate media reports that suggested he was flying while intoxicated or "stoned." There was no evidence that this was the case. However, the expert evidence of Dr Newman made clear that the safety implications of pilot drug use need to be addressed with reference to the danger of flying while intoxicated and the different but potentially as dangerous practice of flying while suffering the residual effects of these drugs.

The aviation industry has generally relied on adherence to the *"8 hour bottle to throttle"* rule. This policy was included in Western Air Services' operations manual. If adhered to this approach would largely address safety being compromised by the acute effects of the intoxicants. Compliance is the issue. The literature search undertaken by Dr Newman when preparing his reports indicated that numerous studies had shown that adherence to this rule was not universal. Accordingly, the Department of Transport and Regional Services and CASA were directed by the then Minister for Transport (Cwth), the Honourable Mr John Anderson, to jointly address this issue by conducting an investigation into the safety benefits of introducing drug and alcohol testing of safety-sensitive employees in the aviation sector.

Their report concluded that a testing regime is justified from a safety perspective and provides a framework for how such a regime might be implemented. The Minister for Transport and Regional Services, the Hon Warren Truss MP, announced on 2 May 2006 that drug and alcohol testing is to be introduced in the aviation sector.

Last month, CASA announced that a series of nationwide workshops to help the aviation industry prepare for the introduction of mandatory alcohol and other drugs testing would be held in the near future, around the country in capital cities and regional centres.

The regulator also announced that CASA is developing a draft set of regulations for mandatory alcohol and other drugs testing. These draft rules are set to be released later this year. CASA is aiming for aviation organisations to introduce alcohol and drugs testing programs during 2007.

I support that initiative and encourage CASA to progress the scheme as quickly as possible.

Testing is unlikely to be as effective for detecting and deterring pilots flying while suffering from the residual effects of alcohol or cannabis use. Steps that might be taken to minimise these risks include the publication of information to all pilots to make them more aware of them. Accordingly, the ATSB recommended in its report into this crash that CASA revise the pilot Day VFR Syllabi to include contemporary aviation medical knowledge about these issues and disseminate it to pilots. This recommendation was accepted by CASA and implemented. There is therefore no need for me to make any further comment on the issue.

Access to relevant information

Despite the similarity of the purpose of the ATSB investigation and this coronial inquiry, the confidentiality provisions of the *Air Navigation Act* 1920 meant that not all of the information gathered by the ATSB was automatically available to this Court. For example, the ATSB investigators in their report and in evidence did not name the people they interviewed. As most of those potential witnesses were identified by the police officers who assisted in the initial stages of the investigation, those witnesses were able to be called to give evidence at the inquest. This is essential as, notwithstanding the technical expertise of the ATSB investigators, I am sure they accept that they do not have the forensic experience of the counsel who appeared at the inquest and they could not therefore so effectively examine those witnesses.

The risk of evidence being lost as a result was exemplified in this case when it became apparent that the ATSB investigators had not obtained all relevant information from a woman who had socialised with the pilot on the night before the incident. In this case I was able to ameliorate the harm that could have caused by directing the disclosure of that witness' name and contact details under section to 19HC(8) of the Act. However, the relevant provisions have since been amended in a manner that would make that more difficult in cases where the ATSB investigation commenced after 1 July 2003.[13]

The policy underpinning this cloak of confidentiality can be found in the 1944 Convention on International Civil Aviation (the Chicago Convention) which presumes that investigations which eschew the attribution of blame or the apportionment of liability and focus exclusively on prevention will be hindered if the information provided to the investigator is attributed to identified individuals. Little is likely to be achieved by a mere coroner taking issue with the assumptions upon which the regime is based. However, it is essential that coroners protect their inquiries from the negative impact this secrecy can have on their ability to examine the circumstances of a reportable death in an open and public process that provides the coroner and those most directly affected by the death with an opportunity to test the accounts of witnesses by cross examination.

There has been a tendency in some cases for QPS officers to assume that the ATSB investigators will obtain all of the information the coroner to whom the death has been reported will need. This can be a mistake. I readily acknowledge the special expertise of the ATSB to investigate aircraft incidents and greatly appreciate the technical specialists they willing make available to the court. I expect their investigators equally benefit from the forensic medicine evidence coroners, as a matter of course, provide to the Bureau. However, the differences between their procedures and those of a

[13] The reason that disclosure is now more difficult is that s 60 (4) (c) the Transport Safety Investigation Act 2003 permits disclosure in civil proceedings only where (i) the Executive Director issues a certificate under subsection (5) and (ii) the court makes an order under subsection (6).

coroner make it essential that a coroner take early steps to protect sources of information that may otherwise be lost. The conducting of parallel investigations is undesirable but may be necessary in some cases.

Recommendation 3 - The securing of evidence

I recommend that police officers to whom aviation deaths are reported should record the contact details of all potential witnesses and a précis of the evidence they may be expected to be able to provide. They should liaise with the investigating coroner at an early stage to allow a determination to be made as to the extent to which witnesses should be interviewed by coronial investigators.

I close the inquest.

Michael Barnes
State Coroner
Brisbane
7 September 2006