OFFICE OF THE STATE CORONER

FINDINGS OF INQUEST

CITATION:	Inquest into the death of Philip Henry SCHOLL
TITLE OF COURT:	Coroners Court
JURISDICTION:	Mareeba
DELIVERED ON:	27th January, 2009
DELIVERED AT:	Mareeba
FINDINGS OF:	Mr Thomas Braes, Coroner
CATCHWORDS:	CORONERS: Inquest – Microlight Aircraft accident, pilot training, Civil Aviation Safety Authority oversight of recreational aviation, interaction between Civil Aviation Safety Authority & Australian Transport Safety Bureau.
REPRESENTATION:	
Counsel Assisting:	Mr J Tate, Crown Law
Mr David Keogh:	Mr Lynam instructed by O'Reilly, Stevens, Bovey Lawyers
Ms Leah Spriggs:	Mr Knell, Solicitor

INTRODUCTION

These are my findings in relation to the death of Philip Henry Scholl (Philip) who died in a microlight aircraft crash near Mareeba on the 20th October 2005, they will be distributed in accordance with the requirements of the *Coroners Act 2003* (the Act) and placed on the website of the Office of the State Coroner.

Section 28 (1) of the Act authorises the holding of an inquest into a reportable death if the Coroner considers it desirable to do so. If possible the Coroner is required to find: -

- Whether a death in fact happened;
- Identity of the deceased;
- When, where and how the death occurred;
- What caused the person to die.

The Act provides in sections 45 and 46 that when an inquest is held into a death the Coroner's written findings must be given to the family of the person who died and to each of the persons and organisations granted leave to appear at the inquest, and to the Minister and Chief Executive Officer of any government entity which deals with matters to which the comments relate.

There has been considerable litigation concerning the extent of the Coroner's jurisdiction to inquire into the circumstances of a death. The authorities clearly establish that the scope of the inquest goes beyond merely establishing the medical cause of death. 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."* R –v- South London Coroner, ex parte Thompson (1982) 126 S.J. 625.

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 of reducing the likelihood of similar deaths. As a result the Act authorises a Coroner to make preventative recommendations concerning public health and safety, the administration of justice or ways to prevent deaths in similar circumstances in the future.

At the commencement of these proceedings I indicated to the parties that upon a review of the material that had been gathered by the investigating Police Officer, I determined that the death was a reportable death and that it was desirable to hold an inquest. It was apparent at an early stage that there were issues relevant to public health and safety that deserved further investigation. The death of Philip was a tragedy, nothing can bring Philip back. I thought an inquest might highlight inadequacies in the systems of

training and competencies required for pilots, air worthiness certificates, aircraft maintenance, licensing of airfields, the sale of this type of aircraft and search and rescue protocols. These issues were referred to in the notice of inquest published as required and are, it would appear, connected to Philip's death and relate to public health and safety. The evidence I have heard during the inquest confirms my original concerns. As previously forecast I will in these findings make comments that relate to public health and safety and action that may prevent deaths from happening in similar circumstances in the future. My tentative view as expressed at the commencement of the inquest has been made out, that is that a death did happen, that the deceased was Philip Henry Scholl born on the 25th May 1963, and that Philip died between the hours of 7:00am and 5:00pm on the 20th October 2005 at Lot 412, East of Lockwood Road, Mareeba on private property owned by Mr Douglas Rankin.

How and what caused Philip to die was the focus of the evidence in this inquiry.
Section 46 also provides that the Coroner must not include in the comments any statement that a person is, or may be, guilty of an offence or civilly liable for something. Section 46 was considered in *Doomadgee & Anor v Deputy State Coroner Clements and Ors* (2005) QSC 392 (sic), in which Muir J made the following observations:

> *"… the scope of the inquiry under Section 45 is extensive and is not confined to evidence directly relevant to the matters listed in Section 45(2). The Coroner's role under Section 46 is ancillary to the role under Section 45. Section 46(1) does not make Coroners roving Royal Commissioners empowered to make findings and recommendations in respect to the matters described in paragraphs (a), (b) and (c) of Section 46. Comment under Section 46(1) must be on a thing 'connected with' the death under investigation and that thing must 'relate to' public health and safety, the administration of justice, or 'ways to prevent deaths from happening in similar circumstances in the future'. There is no justification, however, for construing Section 46(1), … as if it contained the qualification that any comment be directed to prevention of death from causes similar to that of the accident … the expressions 'connected with' and 'relates to' are of wide import and connote a connection or relationship between one thing and another … the expressions are 'capable of including matters occurring prior to as well as subsequent to or consequent upon' as long as a relevant relationship exists … Section 46(1), being remedial in nature, should be construed liberally".*

Muir J found there was no basis for reading the words *"connected with the death"* in Section 46 as meaning only *"directly connected with …".* (Source Proctor June 2006 article Glenn Cranny).

Section 48 of the Act provides that if, from information obtained while investigating a death, a Coroner reasonably suspects a person has

committed an offence; the Coroner must give the information to either the Director of Public Prosecutions or the Chief Executive of the department in which the legislation creating an offence is administered. Also the section allows a Coroner to give information about a person's conduct in a profession or trade to the relevant disciplinary body.

Proceedings in a Coroner's Court are not bound by the Rules of Evidence. Section 37 of the Act provides the Court *"may inform itself in any way it considers appropriate"*. That does not mean that any and every piece of information, however unreliable will be admitted into evidence and acted upon. However it does give a Coroner greater scope to receive information that may not be admissible in other proceedings and to have regard to its provenance when determining what weight should be given to the information. 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. 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. This means that the more significant the issue to be determined is, 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. It is also clear that a Coroner is obliged to comply with the rules of natural justice and to act judicially. This means that no findings adverse to the interest of any party may be made without that party first been given a right to be heard in opposition to that finding. As *Annetts v McCann* [1990 65 ALJR 167 @ 168] makes clear that includes being given the opportunity to make submissions against findings that might be damaging to the reputation of any individual or organisation. In accordance with this principle I circulated my findings to those against whom adverse comment has been made and called for submissions. Submissions were received from Queensland Police Service, Civil Aviation Safety Authority and Australian Transport Safety Bureau. These submissions have been considered and some changes made to the findings.

The evidence in this matter commenced on Tuesday the 12th of February 2008 and proceeded over nine days. On day one, the Court was given the benefit of a view of the Jaques Coffee and Microlight Air Park facility which included a view of the airstrip and aircraft hangar where the parties were able to view aircraft of a similar type to that involved in the crash and also more modern and sophisticated microlight aircraft. The view at Jaques Coffee was very informative and gave me a better understanding of the nature of the aircraft. The microlight aircraft that I observed were of much more substance than I had originally assumed. Following upon the view at Jaques Coffee the Court was able to view the wreckage of the aircraft T2-2776 which had been laid out at the Mareeba Race Course by local State Emergency Services volunteers. Mr Hicks the Recreational Aviation Australia (RA-AUS) investigator and Board member, a Level Two maintenance authority and flying school operator was able to maintain a commentary and explain the various parts of the wreckage: this made for a much clearer understanding of the evidence that followed. A number of observations were able to be made

by me which included clearly unserviceable cables, some cables showing discolouration of the outer plastic coating, rust spots and in some areas the cables were frayed. I also observed the degraded un-serviceable wing fabric particularly on the port side wing in the area where the tip had become detached from the wing. It was also very noticeable that the damage to the wing battens was less on the port side wing and became more pronounced toward the starboard side wing tip to the extent that the battens at the starboard extremity were grossly deformed. I thank the members of Mareeba S.E.S. who enabled the Court to view the wreck in such detail.

At the hearing Mr Tate from the Queensland Crown Law Office appeared as Counsel assisting the Coroner. Mr Lynam of Counsel instructed by Mr O'Reilly of O'Reilly, Stevens, Bovey Lawyers appeared for Mr David Keogh (Mr Keogh): Philip's instructor and the person who sold Philip the aircraft. Mr Knell, Solicitor, appeared for Philip's partner Ms Leah Spriggs and Philip's daughter, Jessica.

Queensland Workplace Health and Safety (WHSQ), the Civil Aviation Authority of Australia (CASA), the Australian Transport Safety Bureau (ATSB), Hang Gliding Federation of Australia (HGFA), and Recreational Aviation Australia (RA-AUS) appeared only in the sense that evidence was taken from them. These parties were invited to attend the inquest as were Mr and Mrs Jaques, and Mr Ogle. Although not appearing in a formal sense, these parties had the opportunity to give evidence and were each extensively cross-examined by Mr Tate, Counsel assisting. There has been a lot of evidence about the inadequacies of the regulatory framework of the recreation aviation industry which will be the subject of comment in my findings. The failure of CASA to directly participate in these proceedings further highlights the lack of priority given to the management of the recreation aviation industry by the statutorily appointed and government funded regulator.

At the conclusion of the evidence and upon a review of the various articles which had been provided to me, I took it upon myself, with notice to the parties, to contact Dr Guy Gratton CEng FRAeS MIMechE MSETP, Lecturer in Aeronautics at Brunel University West London. Dr Gratton is the author of a number of articles I had been referred to and which are a great source of information to me. With his consent I refer throughout to a number of his papers and the opinion which he subsequently gave me following a review of the transcript of evidence, photographs, selected reports and statements.

There is interest in these proceedings to determine whether the crash was as a consequence of pilot error. It appears that pilot error is most regularly the cause of aircraft crashes. It is not my intention to make a finding of pilot error in this inquiry. If it was argued that aircraft maintenance was a pilot responsibility (hence pilot error) then I would contend that Philip was a product of the culture which taught him. Any bad habits or inadequacies he may have had (there is no evidence to support a finding he had adopted any unsafe practices) would have been as a consequence of his training. He had only owned the aircraft for a very short time. He was entitled to regard the

aircraft as airworthy relying upon the inspection so recently carried out in his presence by Mr Ogle. There is certainly no evidence of any dangerous or irresponsible behaviour on Philip's part, in fact he is described as a very safety conscious person. A finding of pilot error is not open on the evidence and would, I believe, if established on the evidence, be an indictment on the *"informed participation"* policy of the recreation aviation industry.
I have now been provided with three expert opinions in respect of the possible cause of this crash. Mr Hicks believes the left wing tip separated in flight because of the un-airworthy condition of the aircraft, causing the aircraft to fall to earth with a regular trajectory ending in an almost vertical descent. This accounts for the way in which the aircraft was impaled on a single tree. Mr Hicks believes that upon the left wing tip separating from the aircraft the right wing failed giving the aircraft a parachute effect. Mr Lyne whose expertise is in safety management systems believes the pilot may have instigated a tumble event possibly by making an ill-advised sharp turn into the wake of the aircraft. Mr Lyne is comforted in this opinion by the fact it appears low flying and tight spiralling turns were a feature of flight practised by some in the local area. Dr Gratton echoes my belief that it is not possible to be sure what caused the aircraft to crash, but the evidence points most likely towards an in-flight structural failure of the wingtip.

At the end of the day it is quite speculative for me to attempt to determine what actually happened in flight, but I can say that my preference is towards port side wing tip separation as a consequence of the un-airworthy state of the aircraft, which I believe is on the balance of probabilities a reasonable and sound determination.

In determining matters of evidence a Court is required to determine conflicts that might exist between the witnesses. There are essentially very few conflicts in the evidence presented to me. One conflict as I have already mentioned is between the experts in that they have different views of what happened in the air; a second and very serious area of conflict arises between Mr Keogh and Mr Ogle both of whom have given sworn evidence that the other completed the document referred to as 12A of my brief and being the aircraft condition statement dated 26th September 2005. This was a document generated for all intents and purposes to be an aircraft condition report ("UCAR") and which was the documentation Philip would have relied upon at the time of purchasing the aircraft. Mr Ogle said he inspected the aircraft and Mr Keogh filled out the documentation. Mr Keogh said Mr Ogle inspected the aircraft and filled out the documentation. (Keogh page 34 et seq). Whilst I have a number of reservations about the evidence of Mr Keogh a review of the document appears to support the proposition that it was completed by Mr Ogle. I would ordinarily expect the author of the document could, when shown it as Mr Ogle was, recognise one's own hand writing.

The third and final major area of conflict exists between the evidence of Mr Hicks, Mr Keogh and Mr Cresswell and relates to the incident where Mr Hicks says he placed a "do not start" placard on the aircraft when it was hangared at his Montpelier Microlight Airpark. The evidence of Mr Cresswell does not assist in the determination of the conflict between Mr Hicks and Mr Keogh.

Mr Cresswell was only asked to make a statement in relation to this matter during the hearing. Although he had good and fond memories of the flight to Townsville and back he agreed he may not have heard all the conversation between Mr Hicks and Mr Keogh. Mr Lance Keogh, father of Mr Keogh, was also present at Montpelier Airpark and was present in Court throughout this inquiry. Whereas he may have been able to give evidence in respect of any conversations about the airworthiness of the aircraft he did not. Mr Keogh denied any conversation with Mr Hicks regarding the unsatisfactory state of airworthiness of the aircraft and even denied a placard had been placed on it. Mr Keogh is one of the people who have a direct interest in the outcome of these proceedings. He was Philip's instructor and he also sold the aircraft to Philip only weeks before the fatal flight. Mr Hicks presented as a genuine, honest, committed and sincere individual. I have no reason whatsoever to doubt his word and I accept his evidence totally in respect of the events surrounding the arrival and departure of Mr Keogh at the Montpelier Microlight Airpark. Additionally of course the photographic exhibits provided by Mr Keogh and as published in the August 2005 edition of "Air Tales" (a newsletter published by the Far North Queensland Ultralight Association) confirm the existence of the placard fixed to the aircraft. Mr Keogh admitted this was the case but still did not appear to be able to grasp the enormity of the evidence. The photograph supports the evidence of Mr Hicks; that he was so concerned about the airworthiness of the aircraft he placed the "do not start" placard on it. There is no evidence the "do not start" placard was simply a measure to ensure that other users of the facility did not interfere with the aircraft, other than Mr Keogh's suggestion at page 13 of his evidence. I reject this suggestion. The existence of the placard and the outwardly unairworthy appearance of the aircraft were further confirmed by Mr Tonking whose evidence I accept without hesitation. Mr Hicks had grave reservations about the airworthiness of the aircraft for good reason as was so tragically proven when the aircraft crashed and Philip was killed. The unairworthiness of the aircraft should have been apparent to any experienced microlight aircraft operator, particularly those involved in training, licensing and the inspection of this type of aircraft.
The medical cause of death as determined by Doctor Manypeney and not challenged at the inquest was that Philip died as a consequence of multiple injuries.

Throughout this inquiry it became obvious that a weakness in the current system is the regulatory regime and the enforcement of the rules applicable to the recreation aviation industry. Put simply, the regulator is CASA. CASA delegates some authority to RA-AUS and HGFA although this delegation does not extend to prosecutions. It became obvious the level of communication and co-operation between HGFA, RA-AUS, ATSB and CASA is such that the community at large could have no confidence that the regulatory regime, being the legislation and the rules of the delegated unincorporated bodies, are being adequately administered and enforced.

My own personal experience in this regard is that on a visit to Tinaroo Falls Dam while preparing these findings and comments, a microlight aircraft flew over the dam wall at a height which I, as a lay person suspect was less than

500 feet. Having been involved in this inquiry I looked to determine the registration particulars of the aircraft but could not observe any. It should be of concern to the industry as a whole that notwithstanding the tragedy of Philip's death, and the publicity which this inquiry no doubt has received within recreation aviation circles, people may still be prepared to push the envelope in respect of the statutory requirements for microlight flight.

THE EVIDENCE

PHILIP HENRY SCHOLL

Philip was a boilermaker by trade and was at the time of his death employed at the Osborne Mine as a maintenance supervisor with 20 people subordinate to him. He was safety conscious, both at work and in his day to day activities. He was fit and healthy with no apparent medical complaints and was described by Ms Spriggs as a fantastic, caring, loving son to his mother and as a most wonderful caring supportive father to their daughter, Jessica. Of their own relationship she described him as consistent, kind, loving and understanding. Philip's attitude to safety was further confirmed by his friend of many years, Mr Smith. Mr Smith is a Workplace Health and Safety Officer and training coordinator for International Energy Service and Resources. He described Philip as being pedantic when it came to safety issues.

THE AIRCRAFT T2-2776

The AirBorne Wind Sports Edge Weight shift controlled aircraft appears to have been manufactured in mid 1995. The first owner Mr Silver, took delivery of the aircraft on the 2nd June 1995. The aircraft was fitted with a Rotax 582 engine and GSC ground adjustable propellers. The aircraft was registered with HGFA and given registered number T2-2776. Mr Silver was a chief flying instructor and used the aircraft as a training aircraft. Mr Silver gave evidence that while he owned the aircraft the manufacturer arranged to replace the main mast. The original mast didn't have a sleeve in it and was classed by the manufacture's engineer as being *"a little bit under stress"* (Silver transcript page 124). No other modifications were made by Mr Silver to the aircraft. On about the 16th April 1998, Mr Silver sold the aircraft to Mr Purcell. At this time according to Mr Silver the aircraft had about 386 hours recorded on the aircraft engine clock. Mr Silver believed the wing fabric was in very good condition at the time of the sale. The book [Coroners exhibit C22] entitled "Edge pilot handbook" contains a Rotax operators manual for engine type 582 as well as three distinct maintenance schedules. The first schedule is entitled "Hang Gliding Federation of Australia Operations Manual" the second is entitled "AirBorne Wind Sports Pty Ltd Pilot Handbook – Edge Maintenance Schedule" and the third is entitled "Hang Gliding Federation of Australia Powered Hang Gliding Servicing Schedule". The multiplicity of these documents makes it extremely difficult to determine the extent of the maintenance carried out on the aircraft. It is not clear when these schedules were commenced. The AirBorne Wind Sports Pty Ltd Pilot Handbook – Edge Maintenance Schedule would appear to have been commenced upon purchase of the aircraft. The Hang Gliding Federation of Australia Powered Hang Gliding Servicing Schedule has no entry prior to the 200 hour mark, and it could therefore be assumed to have been commenced at that time. The

Hang Gliding Federation of Australia Operators Manual appears, and I believe this is confirmed by the evidence of Mr Purcell, to have commenced once the aircraft had reached the 400 hour mark. There does not appear to have been any formal inspection at the time it was transferred from Mr Silver to Mr Purcell.

Before examining the evidence of Mr Purcell, I wish to make some observations in respect of the maintenance requirements referred to in the various inspection guidelines and maintenance schedules.

The document headed HGFAWEIGHTSHIFT MICROLIGHT INSPECTION GUIDELINES says in part:
"Acceptable levels of wear and deterioration-
The level of acceptable wear and deterioration in any component is dependant on the specific component's purpose. Any component that is either under continuous in-flight load or that is critical to ensure flight safety is deemed to be an "essential component". The level of wear, degradation or deterioration that is acceptable in essential components is minimal. (my emphasis). Any essential component must be replaced where the level of wear or deterioration of the component in any way reduces the strength of the airframe; or where the degradation causes any change to the configuration to the airframe."

This article then sets out a number of particular parts of the aircraft and gives advice on what an examiner should be looking for when inspecting that part. For example:

RIGGING
Reference is made to "Cables, Thimbles, Swages and Tangs". The advice in part is:
"Examine cables for looseness, wear and stretching of the thimbles. Look for broken strands and signs of corrosion – usually seen as bulges in the cables or outer covering."

My own observation which accords with the evidence of Mr Hicks was that there were cables which showed signs of corrosion, of discoloration, degradation of the outer plastic coating and of broken strands. The luff lines from the port side wing had failed altogether. It is not possible to say whether or not those wires were badly degraded prior to the event, but the overall appearance would suggest they were. The degraded whole cables observed by me had not failed but should have I would expect been recorded on a UACR and replaced.

DEGRADATION
The guidelines advise;
"Test the sail cloth with a bettsometer, remember that it is a test and once the desired figure is reached (1360 grams) the sail has passed. Do not continue to exert further pressure. Sails should be tested with the sail tension applied. A bettsometer may be borrowed from the HGFA office. ***A sail that fails the***

bettsometer test must be replaced (my emphasis). [Bettsometer-Bettsometer Fabric Degradation Tester]

The HGFA WEIGHTSHIFT MICROLIGHT INSPECTION GUIDELINES that are in evidence do not bear a date although the document which is contained within the blue folder [Coroners exhibit C22] does have a fax header from HGFA of the 16th August 2000 and does have a number of pencil markings on it. I am unable to determine the author of those markings. I might assume however that as the document is contained within the blue folder that houses the various manuals and maintenance schedules the HGFAWEIGHTSHIFT MICROLIGHT INSPECTION GUIDELINES came into the possession of the owner of the aircraft on or about the 16th August 2000.

Cables and wing fabric are I believe "essential components". The maintenance schedule provides in respect of wing wires and attachment fittings that every 50 hours those wires should be checked for insecurity, cracks and wear and faulty operation. The maintenance schedule provides in respect of the wing fabric deterioration and tears that it is checked as directed every 50 hours and at every 200 hours that it be removed, inspected and replaced if necessary. The maintenance schedule then recommends replacement or overhaul of the wing fabric at 400 hours. The Pilot Handbook – Edge Maintenance Schedule is similar to the maintenance schedule already referred to although this schedule contains an additional category which is Item 6 "Mandatory Replacement". A perusal of the Pilot Handbook – Edge Maintenance Schedule appears to indicate the wing wires and attachment fittings were replaced (number 6) at 175 hours and 350 hours and the wing fabric was repaired at 400 hours.

The Hangliding Federation of Australia Powered Hang Gliding Servicing Schedule document is somewhat similar to the two previous documents; however it has limited entries at the 200 and 300 hour mark. It would suggest some wires were replaced at 200 hours and it records that *"This aircraft had rear brakes fitted March 96, power supply fuse box April 96",* otherwise the Hang Gliding Federation of Australia Powered Hang Gliding Servicing Schedule contains little useful information.

Mr Purcell's evidence is that he purchased the aircraft around April 1998 from Mr Silver. At the time Mr Purcell purchased the aircraft he was a trainee pilot. He purchased the aircraft while he was still training as this saved him the expense of hiring an instructor's aircraft. Mr Purcell believes that during the time he owned the aircraft he maintained it to the standard that was required. The state of the aircraft at the time he sold it would suggest it had not been maintained as it should have been. Certainly the wing fabric and wires should have been replaced. Once again the documentary evidence as to maintenance is difficult to follow and incomprehensive. The document [Coroners Exhibit C22] contains the various maintenance schedules at the time of purchase by Mr Purcell. The aircraft is said to have recorded 386 hours. Neither of the maintenance schedules which I suspect were prepared by Mr Silver (AirBorne Wind Sports Pty Ltd Pilot Handbook – Edge, and the Hang Gliding Federation of Australia Powered Hang Gliding Servicing

Schedule) record clearly a change of ownership or maintenance procedures. The first document, AirBorne Wind Sports Pty Ltd Pilot Handbook – Edge, appears clearly to have been completed by Mr Silver and covers the period from 25 hours up to 400 hours. There is no suggestion this document has been completed by anyone other than the original author. The document purports to confirm that maintenance has been carried out up to and including the 400 hour mark. It records for instance an engine overhaul at that time (being a number 5 "recommended replacement or overhaul") as well as other extensive 400 hourly maintenance. The word "repaired" has been written against the entry "wing fabric deterioration and tears". This entry being a number 5 "recommended replacement or overhaul". The entry by, I assume, Mr Silver up to and including the 400 hourly mark is somewhat curious as his evidence is to the effect that the aircraft was sold at 386 hours and Mr Purcell appears to have commenced a maintenance schedule from 400+ hours. There is no documentation from the HGFA to confirm the number of hours the aircraft had flown when it was sold by Mr Silver to Mr Purcell. Mr Purcell's evidence is that the aircraft had 408 hours on it at the time he purchased it. There are a number of possibilities relevant to this confusion, the most obvious would appear that Mr Silver did carry out the 400 hourly maintenance which, if the AirBorne Wind Sports Pty Ltd Pilot Handbook – Edge is accurate, included an engine overhaul and amongst other things the replacement or overhaul of the engine rubber mounts, the spark plugs, the fuel lines, the fuel filter, the fuel pump, the throttle cable, the air cleaner, the muffler, the muffler springs and tie wire, and the wing fabric stitching. It would also mean the main hang bolt was replaced and the wing fabric deterioration and tears were "repaired". There was apparently no formal inspection of the aircraft done by Mr Silver or Mr Purcell at the time of the transfer of ownership.

It appears the HGFA required five yearly inspections of aircraft and this changed to a biennial inspection but I am unable to determine that this is in fact the history of the inspection regime and if so when the biennial inspections were introduced. Mr Purcell advised me that when he sold the aircraft it had about 640 hours on the engine clock and was due to be registered and have its two yearly inspection as directed by HGFA. He did not do that inspection as he sold the aircraft and considered it to be the responsibility of the new owner. Mr Purcell had on the 5th September 2000 written a letter to the HGFA with which he enclosed a completed inspection report and advised he no longer required the Bettsometer as *"I checked the sail fabric with the bettsometer sent out to W Robinson".* I was provided with a copy of the inspection report; a document dated 25th August 2000 and signed by Mr Purcell as the inspector. The report records a tick against every component of the predetermined checklist with the exception of the Compression test and the Cyclone Bearing test, both of which are marked "N/A". There are no informative comments in the report other than that the total engine hours and total airframe hours are recorded as 565.5 hours. Mr Purcell confirmed in evidence that at the time of completing that inspection report he had no inspection authority or maintenance authority. He was the holder of a pilots licence which he believed gave him a Level One maintenance authority with the authority to carry out the inspection of his own aircraft. Looking at this procedure objectively one could be very critical of a

procedure which allows an aircraft owner who has no recognised training or competencies in aircraft maintenance to complete an inspection report. The fact a person is allowed to carry out the report on his own aircraft is of course also very difficult to accept as being a proper procedure. Mr Purcell's testimony is somewhat different to what he told HGFA in his letter of the 5th September, 2000. In his testimony, he advised me he had had his instructor do the Bettsometer test as he was away that weekend and his instructor had advised him the fabric had passed the Bettsometer test (See transcript page 132 Purcell).

The other maintenance issue that occurred during the time Mr Purcell owned the aircraft was he said *"On about the 10 April 2004 I removed the sail to have the leading edge replaced, purely for aesthetic reasons. The aircraft had 631 hours on the engine clock. I decided to sell the aircraft as I was moving to Emerald and had no where to keep it or means of getting it to Emerald. I also decided that I would stop flying for a while and maybe buy a boat or something which could involve the whole family".* The maintenance schedules clearly indicate the wing fabric should be replaced or overhauled at 400 hours. It is apparent from the maintenance records that this was not done. Mr Purcell for aesthetic reasons only had the leading edge of the fabric replaced at 631 hours. Mr Purcell in his testimony told me that *"When – it was completely faded and because of the two tears in the front, I just chose to put a new edge on it and one – one of the other people I was flying with had put a new edge on his and, yeh, and I was – well ---- thought it looked better".*

This aircraft crashed on 20th October 2005, a year and a half after the leading edge had been replaced, and with 695 hours on the engine clock. The aircraft was sold by Mr Purcell at 640 hours. The wing fabric was inspected by Mr Hicks during the flight from Goondiwindi to Mareeba after being purchased by Mr Keogh from Mr Purcell. Mr Hicks was so concerned about the degradation of the wing fabric that he put a "do not start" placard on the aircraft. It is difficult to accept the wing fabric having exceeded the recommended replacement or overhaul age of 400 hours by 231 hours and where the heaviest grade fabric in the leading edge was "completely faded" that the lesser weight top surface of the wing was not also completely faded and required replacing. Mr Purcell commenced a new maintenance schedule from 400 hours which in itself might suggest that Mr Silver did service the aircraft up to 400 hours and if the maintenance schedule kept by Mr Purcell is an accurate reflection of the maintenance carried out, he has completed the maintenance schedule requirements (leaving aside the criticisms already expressed regarding the replacing of the wing fabric) up to 625 hours. This maintenance schedule does not however record anywhere that the leading edge wing fabric was replaced at 631 hours. The maintenance schedule documentation does not of itself appear to allow any additional space for recording such repairs, but I would have thought that in an attempt to maintain a complete accurate service and maintenance schedule everything that was done to the aircraft would be recorded somehow. I have not found in the evidence any material of a record of maintenance carried out to the aircraft by Mr Purcell, Mr Keogh or the deceased after 625 hours.

Mr Purcell owned the aircraft between April 1998 and June 2005. The history of his storage of the aircraft is not entirely complete although he says in his statement that during the time he owned the aircraft it was hangared in a hangar at the Goondiwindi airport except for a few occasions when he had attended fly-ins, or at the farm of his parents-in-law. In the hangar the wing was slung from a steel bearer in the roof. The sling was placed through a hole where the king post goes through the sail and then around the pole that goes from the nose to the keel. The wing was then winched to the ceiling and an "ockie strap" was hooked to the starboard side sail through an eyelet to stop it swinging around. It cannot be said how long the aircraft was actually stored in this manner. It appears the wing was separated from the trike section of the aircraft and suspended as described under the roof, while the trike section was stored elsewhere in the hangar. Mr Purcell was not sure about the distance the wing fabric was from the roof but estimated it varied from half a metre at the closest point to up to three metres at the furtherest or centre point of the hangar. The hangar was of corrugated iron structure with a concrete floor. Other people had access to the hangar. The doors were generally closed. The hangar was situated in Western Queensland at Goondiwindi. The temperature in that hangar, particularly near the corrugated iron roof, would on occasion have been very high and on other occasions quite low. This would not appear to be the optimum method of storage of a wing sail. The AirBorne Australia Streak 2B maintenance manual refers briefly to storage and notes if a wing is stored under a roof, but the roof does not have doors on the front – i.e. an open hangar, the wing will still experience UV degradation. Further it notes if a wing is flown, and/or left in the open for a day, this will equate to eight/ten hours of UV exposure. There is no direct evidence on the effect of heat and UV waves on a fabric wing stored in such a way, but it would be common sense to assume a fabric wing left for any time suspended in such close proximity to an iron roof could suffer fabric degradation that might not occur if the wing was folded and wrapped away. The AirBorne manual further advises the sail should be kept covered when not in use as continued exposure to ultraviolet radiation dramatically reduces sail life. The manual further confirms that generally the method used for fabric testing is a Bettsometer test (on an annual basis), and *"annual testing has been found to be adequate for the recreational user where the operator takes care to avoid unnecessary exposure to UV. More frequent testing (200 operating hours or 750 UV hours) is applied where operators exceed these hours prior to the annual test".* The manual confirms the acceptable weight for both the upper and lower surface and stitches is 1,360 grams. The manual does not specifically require that the wing be condemned if it should fail the 1,360 grams Bettsometer test.

Coroners Exhibit C35 is the net result of the documentation apparently held by the HGFA in respect of this aircraft. If that is the case, the documentation is a sorry shadow of that which one would expect as representing the registration, transfer and maintenance history of the aircraft. The aircraft was first registered on the 20th June 1995 and given registration number T2-2776. Mr Silver's evidence at page 122 is that the aircraft was registered with the HGFA the whole time that he owned it. Somewhere along the way the aircraft began to be referred to as T2-2775 and I note from the document lodged by

Mr Purcell that the engine number was also referred to incorrectly. The HGFA documentation records the registration to Mr Silver (Skybound Pty Ltd) and the registration to Mr Purcell. The form which was used in accordance with CAO 95.32 is headed "Weight Shift Microlight Registration Application". It is not so much a transfer of ownership, but an application to register in the name of the purchaser. There is very little information recorded on the document so far as the maintenance or condition of the aircraft is concerned. The form does request *"Attach copies of: Certificate of Conformance, Certificate of Clearance and Microlight Aircraft Certificate of Fitness for Flight from BCAR section S or equivalent certificates".* No such documents are attached to the registration application; I can only assume that no such documents were ever provided to the HGFA. This would appear to be in accordance with the evidence of Mr Silver and Mr Purcell that no airworthiness certificates were issued at the time of sale to Mr Purcell or to Mr Keogh. The other relevant evidence contained within the documents obtained from the HGFA is that on the 12th October 2005 the HGFA wrote to RA-AUS advising that as of the 12th October 2005 Microlight T2-2776 had been deregistered as requested by Mr Scholl. The fact is that the evidence supports a finding that the aircraft registration with HGFA expired on the 20th June, 2005. Mr Fogg has confirmed to me that on the 20th October, 2005:

"*Philip was not a member of HGFA; Philip's aircraft T2-2776 was not registered with HGFA and Philip was not a registered pilot with HGFA*."

As previously indicated, Mr Silver gave evidence that the aircraft had 386 hours on the engine clock at the time when he sold it to Mr Purcell. Mr Purcell's evidence is that the aircraft had 408 hours on the engine clock at the time when he purchased it. No other documentation that is available to me is able to assist in this regard other than the anomaly and conflict which I have already pointed to in the maintenance schedules which clearly would suggest that Mr Silver was carrying out maintenance on the aircraft at 400 hours.

Although the correspondence from the HGFA to the RA-AUS confirms that the aircraft T2-2776 had its registration cancelled at the request of Mr Scholl on the 12th October 2005, the evidence is also that the aircraft was unregistered, or the registration had expired on the 20th June 2005. This is another example of the inadequacies of the paperwork of recording ownership transactions and maintenance of aircraft within HGFA and RA-AUS**.**

Mr Purcell also gave evidence about a letter he had received from the HGFA regarding the renewal of registration for the aircraft registered T2-2776. This letter was not included in the documents [Coroner's Exhibit C35] but a copy is included in the brief which was provided to me by Mr Tate. I note from the fax header that it appears to have been faxed from RA-AUS. This letter which Mr Purcell confirmed would have been written in 2005 – he counted back the years to determine when he was living at the Emerald address on the letter – again confirms that *"to gain renewal of the aircraft registration for another two year period, a two yearly inspection must be carried out and a renewal fee of $55 (including GST) must be paid".* A HGFA Microlight inspection report and

inspection guidelines were said to be attached and Mr Purcell was advised that to complete the inspection *"a bettsometer must be used to test the integrity of the sail cloth".* Part of the transcript of Mr Purcell's evidence is set out hereunder. (Page 134-137)

If you go to the letter that you received from Hang Gliders which very, very helpfully is not dated? -- Okay.

You'll see there-----? -- They've received it on the 12th of September - yeah, it's - the 5th - oh, the one they sent - sorry.

Now, what I'm trying to get to is that there's some suggestion that initially Hang Gliders had this requirement for an inspection report every five years-----?-- Yep.

-----and then it went to every two years and I'm just wondering whether there was the 2000 report?-- No, I - I'm sure I only did it the once-----

All right, that's the 2000?-- -----and that's - and it would have been only when I would have been requested to by the Hang Gliding Federation. I - I wasn't aware that it was a biennial.

Well, maybe-----?-- Well, it does say here on the thing.

Every two years?-- Yeah.

So what I'm wondering is whether you can help us. Did this letter that I've taken you to-----?-- Mmm.

-----the one to you from Hang Gliders-----?-- Yep.

-----come to you in about 2005 because they don't help us with a - a date. You can't trust the fax date because that's-----?-- Okay.

-----going off to other people?-- It came to me in Emerald. I was only in Emerald for two and a-half years. I - I'm just trying to count back. I've been in Blackwater for 18 - about 19 months. I was in Dalby for four months so it's came to me some time - it would have been - this would have had to-----
About 2005 perhaps?-- Yeah, it would have had to have been the one for the current - like the one that was due when I was selling the - the machine.

So, it was about 2005?-- Yep.

And it seems that in that letter they're saying, "righto, well, you now need to do this every second year."?-- Yep. So, it would have been-----

All right. Now, we can understand that?-- Yep.

Now, that was when you had the wind fabric tested, was that - that was back in 2000 with a-----?-- That was back in 2000, yep.

All right. You didn't have it tested subsequently with a Bettsometer?-- No, I - I told, what's his name, Dave that it was due for - like it was due for registration. He'd - he'd purchased it from me and then I said, well, because he's buying it. He can do the inspection to make sure the - the aircraft is roadworthy so he could - for his piece of mind more so than anything.

Yes?-- He had arranged to pick it up, I believe, while it was still registered and take it back to Atherton or-----

Now, this might stretch the memory a bit, but do you remember when it fell out registration, when was it registered to, this is-----?-- I would not - would not be able to warrant a guess for that.

Obviously some time after?-- It would have been - yeah, no, I couldn't-----

Couldn't say?-- No.

All right. Now - and I think you say that in the second last paragraph when you sold the aircraft it had 640 hours on the engine clock, was due to be registered and have its two yearly inspection as directed by HGFA?-- Yep.

So, really that's reflecting the change from 2000 through to 2005 and then it would have been required every two years afterwards?-- Yeah, I must have got that two year inspection from the-----

That's-----?-- -----the information I had.

That's all right. Which is why I've asked you the questions because it was a little bit confusing to me, probably a little confusing to you?-- Yeah, I - the other one must have been - must have been five years 'cause I only - I did them when they sent them to me and if the other one was 2000, then the next one would have been-----

Yes?-- Then they must have changed it somewhere.

Yes. So, if I understand the situation then, and tell me if I've got this wrong. Back at the time that you sold the plane to Mr Keogh?-- Yep.

It's May 2005 and in order for it to continue to be registered with hand gliders before the lapsing of the registration, whenever that was, it had to have another - another complete report-----?-- Yep.

-----and that, I assume, would have also included another Bettsometer test?-- Yes, yeah, I would say - yeah, I'd say so, yeah.

Thank you. And, of course, because it was sold on to Mr Keogh you don't know whether that registration of hand gliders continued, whether he did the necessary checks and report back to hand gliders-----?-- No, don't know anything-----

-----or anything else?-- No.

All right. Would your Honour pardon me for a moment. Thank you, your Honour.

The importance of this section of the evidence is that at the time when the aircraft was sold to Mr Keogh it was coming up for registration and inspection. Ultimately, it was sold to Mr Keogh without either registration or inspection and Mr Keogh transferred it directly from Mr Purcell and HGFA to Mr Scholl and RA-AUS, accompanied only by the Ogle inspection statement. Although the evidence is inconclusive and somewhat confused in respect to the periodic inspection requirement, the registration certificates issued by the HGFA would appear to suggest that registration was for a two year period. It would be reasonable to assume that HGFA actually would require the inspection reports to be lodged with the registration renewal. Mr Purcell in his testimony confirms that the only inspection that he carried out was the inspection on the 25th August 2000. Although Mr Purcell purchased the aircraft on the 16th April 1998, the registration certificate issued by HGFA was issued on the 20th July 1998; therefore the report done in 2000 was two years after registration commenced in Mr Purcell's name. This might indicate that HGFA actually required these inspections every two years. On the state of the evidence before me however, if that was the case, HGFA has either not provided me with all the material or alternatively, has a completely incompetent system of management of its membership/aircraft register.

As far as Mr Purcell was concerned, the matter of registration and transfer of registration was a matter for the buyer to take care of.

Mr Keogh was a flying instructor based in Mareeba at Jaques Australian Coffee and operated a business known as Adventure Microlights. He received his chief flying instructor accreditation in January 2005 and was Philip's flying instructor. In April 2005, he went to Goondiwindi to look at the aircraft owned by Mr Purcell. Mr Keogh said that the aircraft looked in excellent condition. The aircraft which was packed up was assembled and flown; he said it flew perfectly. On his first trip, Mr Keogh paid a deposit and then returned to Mareeba intending to return to Goondiwindi to take possession of the aircraft at a later date. As there does not appear to be any flight log, the evidence would I think support a conclusion that the flight by Mr Keogh and his father in the aircraft from Goondiwindi to Townsville occurred on the 19th and 20th July 2005. According to the article written by Mr Keogh's father and published in Air Tales-August 2005, the flight from Goondiwindi to Townsville was of 14 hours duration. Their return trip to Townsville to collect the aircraft I believe was on the 17th August 2005. There is no evidence of the use Mr Keogh made of the aircraft once he returned with it to Mareeba other than as recorded in the flight training documents of Philip. On or around the 26th September 2005 Philip purchased the aircraft from Mr Keogh. Amongst the various documents which purport to be the records of flight and/or flight training, only one document, being a single page document,

headed “Hang Gliding Federation of Australia Microlight Aircraft Log” records the engine clock details.

The flight details which I have available to me are recorded in the document already referred to and in the two loose pages headed, “Student Progress Sheet” and a booklet headed, “Ultra light Pilot Log Book Philip Scholl”. As indicated by me during the hearing, it is very difficult to try to reconcile the hours of flight and flight training from these various documents. Refer for instance to the transcript of the evidence of Mr Keogh at pages 57 to 61 wherein under questioning from myself, Mr Keogh agreed that Philip had a total of 20.5 hours in the air, 6.3 hours of which were on his own, leaving 14 hours of instruction. I am unable to make any clear reconciliation of the documentation other than to conclude that on the 26th September 2005, the aircraft engine clock recorded 686.2 hours. It is probable from the evidence that delivery of the aircraft occurred on the 6th or 7th October 2005 when the aircraft engine clock recorded 685.5 hours. The entries in the Hang Gliding Federation of Australia Microlight Aircraft Log on the 7th, 8th, 9th and 10th October appear to have been made by Philip and are the only entries of flight after delivery of the aircraft. The first entry on the 7th October 2005 being what might be thought to be the first flight by Philip in the aircraft then owned by him, also records maintenance tasks of “check plugs-changed and repair windscreen”.

The documentation and the evidence of Mr Purcell and Mr Keogh supports a finding that no maintenance was carried out on the aircraft (other than for any preliminary servicing carried out by Mr Keogh prior to flying the aircraft from Goondiwindi and that which I have already referred to carried out by Philip) between 625 hours and 695 hours. As the records are inconclusive, it is not possible to determine how long the aircraft had been in storage by Mr Purcell and when the 625 hour maintenance check was carried out. The aircraft T2-2776 does not appear in any of the flight records material until the 24th September 2005 when Philip has written it in his Ultralight Pilot Log Book, being a solo flight with the remark “test flight on Edge”. There is therefore no evidence to say what flight the aircraft had endured after its arrival at Mareeba on or about the 17th August 2005 and Philip’s flight on the 24th September 2005. The records do show that on the 26th September 2005, Philip again flew the aircraft and on that date the engine clock started at 685.5 hours. On my rough estimation bearing in mind the 14 hour flying time from Goondiwindi to Townsville and allowing five hours from Townsville to Mareeba, there is approximately 25 hours of time unaccounted for. As the article “Phoenix from the ashes” referred to in Air Tales earlier, noted *“David had purchased it a month earlier for his flying school”* I might assume therefore, that the then unregistered aircraft was upon its arrival at Mareeba put to work as a training aircraft in Mr Keogh’s flying school.

Mr Keogh in his statement said that upon return to Atherton the aircraft was left in a private hangar which I assume is a reference to the Jaques facility, he further states that the aircraft was taken out for a few flights to keep it running, that he fixed the front brake as the cable had snapped and that he replaced

the gearbox oil and radiator fluid. Otherwise there is no reference to any additional maintenance or inspection of the aircraft at that time.

I have previously commented on the conflicts in the evidence and that in respect of the conflict between Mr Hicks and Mr Keogh surrounding the Townsville events, I prefer the evidence of Mr Hicks. The consequence is of course, that the aircraft clearly should not have been flown and clearly should not have passed a competent inspection.

At the request of Mr Ungermann, Mr Hicks provided the following statement.

"Re: fatal accident Mareeba 20/10/05

Dear Lee,
This is in response to your request for a written statement of the conversation with Mr David Keogh regarding the provision of RA-Aus UCAR in relation to a microlight aircraft marked T2-2776.

***Date of conversation**.*
I'm unsure of the exact date of the conversation. However, it occurred early winter 2005. I believe it occurred in middle to late-May 2005. Mr Keogh and his father (Mr Lance Keogh Senior) had arrived after an extended trip. The purpose of the trip was to fly a microlight T2-2776 from Southern Queensland to Mr Keogh's home base on the Atherton Tablelands. My recollection is that they arrived around midday. I supplied them some fuel for the next leg of their trip to the Tablelands.

As with any "new" micro light there is some more than normal interest in the aircraft; because of the age of the ACFT I paid more than usual interest. After a more than cursory inspection, I asked Mr Keogh who was going to do the UCAR or had he had it done prior to the trip. Mr Keogh stated that he would get it done at home. I half joked that it was a good idea that he didn't ask me as "it (the ACFT) needed a bit of work and wouldn't be leaving quickly!"

Mr Keogh inquired of what I thought would be needed. I said that I would need to see the log book, but I would guess that it would need at least a 100 hour service and at least new flying wires. I stated that there was a bit of corrosion on the rest of the wing bolts and that I wasn't too happy with some of the "electrics" or mast stay wires. I remember saying that it might be a good idea to simply buy all the wing bolts and wires and simply replace them.

I vividly remember explaining how to do a cursory fabric test by cupping your index finger and thumb on the upper surface of the trailing edge wing fabric and pressing rather forcibly on the corresponding lower surface. I explained to listen for any tearing sounds. At this point I demonstrated the procedure and heard slight tearing. I stated that I had not better continue or I would push a hole in the fabric. I explained that I believed that Mr Keogh should try to get a Bettsometer and check the fabric as I thought he may need a new wing skin. I stated that I had a wing skin in the hanger that was in better

condition than the one on the ACFT. To make my point, I also explained that the skin was from an ACFT that had been involved in an incident.

Because of this discovery, and because the weather on the day steadily grew more windy and I did not feel that it warranted, and was apprehensive of them continuing flying; I endeavoured to talk Mr Keogh out of continuing the FLT. As Mr Keogh intended to continue his flight, I joked that I would have to cut a hole in the wing to stop him flying. After some discussion, I successfully persuaded Mr Keogh, with a little encouragement from Mr Keogh Senior, to stay the night and proceed in the morning. The weather degraded overnight and if I correctly recollect it began to rain. Mr Keogh and his father hired a car the next day and drove to the Tablelands.

Other Parties
During the period that the micro light T2-2776 was hangared at Montpelier, I had a number of students who inquired as to the owner of the ACFT. (The ACFT was situated at the back of my main hangar.) I was intrigued as none were interested in buying the aircraft. Rather, all commented about the unairworthy "look" of the ACFT. (Please feel free to contact Mr Peregrine Tonking on number deleted (M) number deleted (W) to get a statement regarding his observations. Mr Tonking stated that I should ground the ACFT. I explained that I felt it was unnecessary as I understood that the owner was going to get the ACFT brought back into an airworthy state before it was flown.)

Second Conversation
Mr Keogh returned a few weeks later to collect the micro light. I explicitly remember asking, as is my habit because of liability issues, and because I felt and had stated that the ACFT should be trailered to Mareeba, "Are you satisfied that the aircraft is in an airworthy state?" To this, although I believe he felt I was joking, he responded that everything was okay!. After T2-2776s departure I remember being very concerned, so concerned as to ring Mr Keogh on both his mobile and home telephone when he failed to contact me as to his safe arrival in Mareeba.

Mr Keogh's evidence in chief may be found in the transcript of his evidence between pages 6 and 14. The evidence of Mr Hicks is strongly supported by the evidence of Mr Tonking. Mr Keogh confirmed that he and his father flew the aircraft into the Montpelier Microlight Airpark owned by Mr Hicks and because of the rainy weather, left the aircraft with Mr Hicks and returned to Atherton in a hire car. Three to four weeks later they returned with a number of friends and flew the aircraft back to Atherton. The concerns of Mr Hicks were put to Mr Keogh but he denied them. Mr Hicks had been very concerned about the condition of the aircraft, particularly the wing skin, the electrics and the wing bolts and wires. Mr Keogh denies that Mr Hicks showed him how to do the fabric test by cupping the index finger and thumb on the upper surface of the trailing edge wing fabric and pressing rather forcibly on the corresponding lower surface and that when Mr Hicks did this there was the sound of tearing fabric. Somewhat incredibly, Mr Keogh even when shown the photograph with the 'Do Not Start' placard fixed to the

aircraft denied that the placard was on the aircraft. An example of the state of Mr Keogh's evidence may be found at page 12, and 13 of his evidence.

MR TATE: Yes. Perhaps I can just show it to your Honour. Now, can I show you that photograph, which I think is the bottom one; is that correct?-- That's - yes.

And it seems to be a bit of - a bit better resolution than we have in the Air Tales?-- Yes.

You can see the placard that I've drawn your attention to?-- I can.

And I think the words that are written on it are visible?-- Yes.

And what does it say?-- Do not start.

All right. Now, are you certain that there was no placard on that plane on your return?-- I'm certain, yes.

Could you be mistaken?-- No, I don't think so.

How do you explain the photograph?-- That could've been the - the first time that we - the night that we arrived, and it was on there.

Right. But, as I understand it, you've been clear in your recollection that at no time was there a placard saying "do not start", "do not operate"?-- Not that I recall at all. I don't recall it being there.

All right. Well, now, with the benefit of having a look at the photograph, could your recollection be wrong?-- I don't think so.

Well, how do you explain it?-- Possibly if - if it said "do not start" that I thought that - that he just put for a reason for other people not to start the aircraft while it was - while it was in his care.

All right. Well, you see, Mr Hicks tells us, and I've read out all of the various bits of pieces - I'll tender those photographs, your Honour, as well as Air Tales - and that will get a number in due course like so many other things. The problem I've got really, Dave, is this, a fair amount of time has passed since that flight; is that correct?-- Correct. Yes.

And you're being asked to recall today the events of that time; is that right?-- Correct.

Yes. Now, where we have a photograph that clearly indicates that it's got a placard on it, and you're telling us that you don't have any recollection, can you understand that people will be more inclined to think that the photograph is probably the better indicator of what was happening in the past?—Yes.

The placard is clearly visible in the photographs. There can be no doubt that Mr Hicks placed the placard on the aircraft as he said for the reasons that he said. I have attempted to read the whole of the placard with the benefit of magnification however I have not been able to read the whole of the notice. Mr Hicks has provided me with a copy of the notice which reads in its entirety "Do Not Start" "This aircraft is not serviceable". The photographs which are Coroners exhibit C26 and which appeared in Air Tales are further confirmation of Mr Hick's evidence. It is reasonable I believe to find that the photographs confirm that the placard was placed on the aircraft by Mr Hicks when the aircraft was flown into his facility on 19th July 2005. In determining the occasion I have regard also to the clothing being worn by Mr Keogh and also the fact that the photograph which shows the placard is the photograph which shows Mr Hicks and Mr Keogh relaxing with Mr Keogh holding a guitar. The Air Tales caption to this photograph is *"David & Andrew having beer and sing song".* There is no evidence to suggest that there was any relaxation, beer or sing song when Mr Keogh and his friends returned to Townsville to take possession of the aircraft. Mr Cresswall gave evidence that the time spent at Mr Hicks' facility on this occasion was about two hours.

At the time of his death and at the time of the purchase of the aircraft, Philip was working at the Osborne Mine and was only able to fly the aircraft when he returned to Cairns on days off. There is no record of any particular maintenance being carried out by Philip from the time he purchased the aircraft in September and the date of the crash on the 20th October 2005. It does appear however, that Philip had purchased some parts, presumably for replacement purposes. A small 64 page exercise pad [Coroners Exhibit C21] started by Philip records "parts" "nose bracket", "exhaust springs x 6".

The 64 page exercise book also includes an envelope which I believe Philip has made a note on. That note reads: "nose, exhaust springs x 6, tie wire, exhaust grease?, radio bits and pieces, spark plugs, cover tarp 3x2m, nose channel, bolts-M8x82 and M6x42".

A box of parts that was in Philip's vehicle was unable to be located by the investigator at the time of the inquest.

It surprises me given the obvious state of the wing fabric and the cables that no one other than Mr Hicks was concerned. Philip was apparently a fastidious person. He was however in a situation where he had less than five months experience with this or any other sort of aircraft and where he had purchased the aircraft from his flying instructor. The process surrounding the purchase, inspection, and transfer of the aircraft is open to a number of criticisms. Philip as a student was able to purchase an aircraft from his instructor without any competent third party involvement. Mr Keogh had purchased the aircraft from Mr Purcell; he did not obtain an aircraft inspection report from a Level Two maintenance authority at the time of purchase. He said in his evidence that such an inspection was only required at the time of transfer. Mr Purcell believed that any such inspection was the responsibility of the purchaser. It may be that given the state of regulation both these statements are correct. It is generally understood that with the transfer or

sale of a registered motor vehicle the seller must obtain a safety certificate which remains in force for a predetermined period. That certificate must be obtained before the vehicle is advertised for sale. There is an obligation on the parties to a transaction for the sale or purchase of a motor vehicle to ensure that the transfer of registration is lodged within a prescribed period. Stamp Duty is payable on the transfer. Motor vehicles are of course, registered with one central registration authority. On the occasion that Philip purchased this aircraft the transfers that were affected were a transfer from the HGFA to the RA-AUS, and a transfer of ownership from Mr Purcell directly to Philip, notwithstanding Mr Keogh's ownership of it and the fact that Mr Keogh was registered with RA-AUS not HGFA at that time. The documentation has been shown to be inaccurate, and inappropriate. The whole system of transferring of microlight aircraft requires an overhaul by the authorities. My concerns in respect of these procedural aspects were put to Mr Ungermann at pages 68 to 73 of his evidence. These concerns are summarised as follows;

1. On the 20th October 2005, Philip was not a licensed pilot. He had at the commencement of his training on the 1st June 2005 become a student registered with RA-AUS. Officially his status had not changed. Apparently Mr Keogh completed documentation which was given to Philip for him to lodge with RA-AUS. Mr Keogh was unable to provide a copy of that documentation and the original has not been found. It was not received by RA-AUS. I would think that a proper regulatory scheme would place the responsibility of lodging such documentation on the instructor, not the student.

2. RA-AUS had however, received a request for passenger endorsement. Luckily an office person within Mr Ungerman's organization picked up the anomaly and as Mr Ungerman said, "Hang on a second, student pilot, passenger rating there's a disconnect there". (Page 69 transcript Ungermann). As a consequence of this anomaly Mr Ungerman contacted Mr Keogh. When reviewing the evidence and the documents I have had reference to Philip's HGFA Pilot Training Work Book. Section 13 of that workbook entitled "passenger carrying endorsement" is however completely blank.

3. The aircraft T2-2776 which had been flown from Goondiwindi to Atherton and which had according to the evidence been flown by Mr Keogh, his father and Philip was not registered with HGFA or RA-AUS. Philip's ultra light pilot log book records a flight on the 8th and 9th September 2005 (should be October) where the aircraft was occupied by both Philip and Mr Keogh. It is difficult to determine whether this was necessarily a training flight. The entry for the flight being "from Jaques to Atherton then onto Innisfail. stay overnight. Innisfail to Currimine (sic) Beach and back to Jaques". As Philip was neither licensed nor endorsed for passengers, it might however be reasonably assumed that this was a training flight. That is a training flight in an unregistered aircraft. It is difficult to reconcile Philip's ultralight pilot log book with the other documents. I have two loose sheets of paper

entitled “Student Progress Report” the students name being Philip Scholl. There do not appear to be any entries on this document for aircraft T2-2776 and the entry on the 8th September is for .1 of an hour dual flight .9 of an hour solo flight with the endorsement “solo flight-remainder of syllabus – engine off etc.” The other flight record, a single sheet entitled “Hang Gliding Federation of Australia Microlight Aircraft Log” records two dual flights on the 8th and 9th October 2005. The occupants being front seat, Philip, back seat, Dave (Mr Keogh). Although on this document, the aircraft registration number is not shown it is clearly T2-2776 as the engine hours are recorded and coincide with the engine clock on Philip’s aircraft.

4. The transfer documentation received by RA-AUS included an aircraft condition statement. This is not an aircraft condition report. Mr Ungerman confirmed that this was the form of inspection statement that was required to transfer an aircraft from one organization to the other. The system that existed in October 2005 to transfer an aircraft from one person to another did require an aircraft condition report. None was provided in the transaction from Mr Purcell to Mr Keogh to Philip. The documentation received by RA-AUS included a HGFA form that is incomplete, refers in part to the aircraft T2-2775 which is incorrect, and endorses the form to the effect that microlight registration number T2-2776 expires on the 20th June 2005. Upon registration of the transfer documentation the aircraft was given new RA-AUS registration number 324456. Although it is a requirement that these numbers are placed on the aircraft, at the time of the crash on the 20th October 2005, that had not been done. As I have pointed out in my discussion with Mr Ungerman, the transfer documentation is endorsed by the officer inspecting the documentation that the aircraft was registered. This was not the case. Mr Ungermann suggested that perhaps the officer had registered the aircraft momentarily before completing the change of ownership form.

5. The documentation also confirms that an aircraft condition report was received and that it was complete, when in fact it was not an aircraft condition report at all. Further the documentation confirms that the transfer form was complete with all signatures, whereas in fact the form was only signed by Mr Keogh and Philip. Information was available to RA-AUS that Mr Purcell had an interest in the aircraft (his name was on the form) but no enquiry appears to have been made of him to give consideration to Mr Keogh’s possession of it. The documentation records that the “aircraft cleared for transfer” on the 13th October 2005.

The transfer documentation includes a declaration by Mr Keogh dated 6th October 2005 wherein he certifies that:

1. He is the current registered owner of the aircraft (He was not), and

2. The aircraft is in flyable condition. (It was not)

As indicated above, Philip may be forgiven for thinking that the aircraft was in an airworthy condition.

The transfer documentation also included the aircraft condition statement which is one of the areas in conflict in the evidence. I find that the statement was completed by Mr Ogle as is the evidence of Mr Keogh. Mr Ogle said that he inspected the aircraft and that Mr Keogh completed the document. The document is completely inappropriate and insufficient to record the airworthiness of the aircraft. The document in fact contains a note "this is not an airworthiness report: it is a summary of condition at the actual time of transfer to the RA-AUS". It is the only evidence of any inspection that was carried out on the aircraft. It is difficult to believe that the statement prepared by Mr Ogle relates to the same aircraft that Mr Hicks was so concerned about. Mr Ogle reports that the wings, ailerons and flaps were good, that the condition of visible cables, rods and connections were good, that the skins, coverings and paintwork were good and that the aircraft was in good condition and well maintained. Mr Ogle was aware that Philip was purchasing the aircraft from Mr Keogh. As a Level Two maintenance authority I would expect Mr Ogle would be aware of the procedures for inspecting and reporting on the condition of an aircraft at the time of sale. Mr Ogle also gave evidence that there was no maintenance log to inspect as the aircraft was registered with HGFA and HGFA did not require a maintenance log. The evidence of course, contains documentation of three maintenance logs or schedules to which I have already referred, two of which are published by the HGFA and one by AirBorne Wind Sports.

During my review of the evidence I have had reference to document tab 95 of my brief. This is an ultra light aircraft condition report of unknown author. As a result of my inquiry to Constable Howlett, Mr Hicks has confirmed to me that this document was prepared by him in respect of Philip's aircraft to show the way that he thought a condition report for that aircraft should have been completed. It includes comments such as, "Comment on the aircraft's flight manual and its completeness highlight any deficiencies – unsatisfactory", "air frame coverings for strength wear and damage – unserviceable", "Comments – all fuselage cables should be replaced and luff-lines". "Comments – ACFT in general in poor condition". "Comment here on the general condition of the aircraft. For example, was the aircraft complete, fully rigged and did it appear to be in flyable condition. If not, what was the state of the aircraft – unsatisfactory". Effectively, Mr Hicks in the preparation of this aircraft condition report concludes that, "This ACFT should be considered unairworthy until the cables and the wing fabric have been renewed".

Mr Ogle's evidence confirms that RA-AUS was very concerned about his professionalism in carrying out inspections and in fact wrote to him and informed him that RA-AUS would not be recognising further work conducted by him as a Level Two maintenance authority until such time as RA-AUS was satisfied that he had shown cause for his actions. As a consequence of this correspondence Mr Ogle responded to RA-AUS raising his own concerns about the professionalism of that organization. He then resigned his

membership with RA-AUS and joined the HGFA. It concerns me that Mr Ogle was able to maintain a Level Two maintenance authority when he clearly, by his actions, was not competent to maintain that authority. His casual attitude to the inspection of the aircraft, his inability to accept responsibility for completing the report (indicating in evidence that Mr Keogh had completed the document) and the evidence of Mr Stockdale of various incidents that had occurred in the Northern Territory, only add weight to my suspicions that the recreation aviation industry is more concerned to promote an image of affordable flying rather than an image of air safety consciousness. There is no evidence that Mr Ogle was, at the time he prepared the aircraft condition statement, engaged in a profession or trade. He was a Level Two maintenance authority but he did not charge for any services provided. As he said in evidence, "It never was my living it was my sport". Mr Ogle theorised that the crash was caused by Philip colliding in-flight with a tree. He also gave evidence that there was bark and sap around the point of the break on the wing. There is no other evidence at all that there was any bark or sap around the point of the break on the wing and my own observations failed to show me any such material. There was some bark staining on the wing fabric. Mr Ogle's suggestion that the crash was caused by Philip hitting a tree in mid-flight is inconceivable and is totally inconsistent with the evidence including the fact that the left wing tip was located some 80 metres from the crash site.

TRAINING

Philip commenced his training in microlight aircraft flight with Mr Keogh on 1st June 2005. He became a member of RA-AUS. I have different competing flight or pilot log books. Coroners Exhibit C39 is the ultralight pilot log book for Philip Scholl which commences with the first entry on 1st June 2005. The second record that I have is two loose pages headed "Student Progress Sheet- Philip Scholl" the first entry being the 1st June 2005. The third document is a single loose leaf sheet entitled "Hang Gliding Federation of Australia Microlight Aircraft Log" the first entry being on the 26th September 2005. Other training documentation includes the Hang Gliding Federation of Australia pilot training work book which does not record flight times but is more in the form of sections which are then divided into numbered questions to which the student must offer an answer. These various sections are to be completed, dated and checked by the training instructor. Twelve of the sections have been apparently completed by Philip. The first three are endorsed or initialled by Mr Keogh as having been checked. The final sections to be completed by the instructor to show the student's level of competency are blank. The final document that is in evidence in respect of training is eleven loose pages of document entitled "syllabus of flight training – weight shift microlighting".

It is not easy to gain an idea of Philip's level of competency particularly in respect of emergency situations from this amalgam of training material. Ms Spriggs and Mr Smith spoke of Philip's nature and character and said that he was a careful and safety conscious person. Mr Keogh said that Philip was easy to teach and was a natural pilot who went solo at about 12 hours. He said that he had covered all the requirements with Philip and that he had

passed with 100 percent. He said that Philip didn't develop any bad habits. It would be desirable if CASA and the Recreational Aviation Administration Organisations ("RAAO's") endorsed one training syllabus and recording documentation.

Some criticism was levelled at Mr Keogh at the inquest because of the training record keeping. I assume that there are other published documents relative to training to which the trainer and the student have reference. A serious criticism was made in respect to the document "syllabus of flight training –weightshift microlighting". This document is a record of the progress of the student through various modules of the training syllabus. It is difficult without explanation to understand how the document is to be read and completed. The document contains no information on tumbling. It does include a section on stalling and another section on turning and a section on emergency procedures. The criticism of Mr Keogh in respect of this document is that it is meant to be acknowledged with a signature by both the student and the chief flying instructor. The document records a number of initials by Mr Keogh on the first two pages and a fair percentage of initials by Philip. There are a number of areas including most of the area on stalling where Mr Keogh has initialled all of the criteria and Philip has initialled only two. There are other areas where Mr Keogh has initialled some or all of the criteria and Philip has initialled some or none. The area entitled "emergency procedures" contains six criteria of competency. All six have been endorsed by Mr Keogh. **None** have been endorsed by Philip. The remaining pages of the document are either **completely blank**, or contain some pencil marks and are endorsed not by initial in the individual criteria section but by elongated signatures and initials along the length of the page. **Philip has not endorsed any of those pages**. The obvious criticism which is levelled at Mr Keogh is of course that these competencies had not been completed by Philip, and that Mr Keogh had, subsequent to the crash, endorsed the documentation as if it had all been taught to Philip. Although the signing of the sections by an instructor before a student has done so is inappropriate and raises the suspicion mentioned, there is no evidence upon which such a finding could be made.

The completing of a document by a chief flying instructor without the student completing and endorsing the document must surely be of concern to those who are charged with regulating pilot training in Australia. These areas which have not been endorsed by Philip include stalling, circuit planning, approach and landing, emergency procedures, an understanding of various aeronautical terms, relationship of a number of factors in the production of lift and drag by an aerofoil, the relationship of a number of factors concerning airspeed, wing strength, ground speed, stall speed, G loading etc, an understanding of the primary controls and how they should be used, stalling, take off, approach and landing, aircraft maintenance, rules and procedures, meteorology, soaring strategies, emergency procedures, airmanship, WM specific.

The HGFA Pilot Training Workbook contains a number of responses to questions in which Philip has shown some knowledge of the stall phenomenon. For instance;
1.7 – Define a stall – When the angle of attack on an aerofoil becomes too steep, smooth airflow over the wing is lost, this results in a reduction of pressure which produces the major part of lift.

1.8 – When does a stall occur – If airspeed is too low, the angle of attack becomes too steep, two thirds of lift will be lost. Angle of attack >15 degrees (or stall angle).

1.9 – How can the stall be avoided - Maintain airspeed sufficient to keep the angle of attack below stalling speed.

1.10 – How does a stall effect pitch – In a stall a aircraft will be pitch up. On stall the nose will drop and airspeed will start to increase.

1.11 – How does a stall effect roll – In a stall the aircraft will have a tendency to roll less easily.

1.12 – How does a microlight recover from a stall – The nose will drop, the microlight will increase in airspeed, when flying speed is reached, normal flight can be resumed also washout.

2.2 – How is a stall related to angle of attack and washout on a microlight wing – Too steep an angle of attack will cause a stall but the wing tips will washout and keep producing lift.

2.3 – What happens to lift, drag and airflow over the wing as the angle of attack increases – Will partially increase lift but substantially increase drag. The airflow over the top of the wing is also increased.

2.4 – How do the following effect stall speed:
a) Flying at MTOW (Maximum take off weight) – The more weight the more speed required. (Here also Philip has made an arrow referring to a text “Cosgrove p37 and p35”)
b) Turning with 45 degree angle at bank – Stalling speed increases

2.5 – Why does a weightshift microlight wing recover from a stall – Outer tips of the wing in a stall washout and maintain lift, the nose will drop, airspeed will increase.

2.19 – What is a high speed stall, why does it occur and when could it occur in a microlight – When diving at a fairly high speed and you decide to pitch up the aircraft for a moment continues on a descent. This can create an excessive angle of attack. There should not be a problem for a microlight.

3.1 – What is the effect and recovery procedure from the following situations;

a) a stall from straight and level flight – nose will drop, airspeed will increase. Keep control bar forward until flying speed is reached then bring control bar back to trim position.
b) a stall from a nose high unusual attitude – As above.
c) engine failure at 30/agl after take off – Loss of speed. Pull control bar in to maintain high speed, land directly ahead on runway.
d) engine failure at 200/agl after take off – As above.
e) engine failure at 2000/agl – loss of airspeed aircraft will start to descend. Maintain best glide angle, take evasive action to land at an appropriate emergency landing site.
f) a spiral dive situation – use control bar to roll wing level.
(It does appear to me that Mr Keogh has written in this section "raise nose attitude")

This information does not assist me in determining whether Philip was competent in these criteria. I can only assume that his responses to the questions were checked by Mr Keogh and that his understanding of the concepts was correct. The items that I have referred to are located in parts one, two and three and are the parts which have been checked and initialled by Mr Keogh.

As a consequence of my reviewing the training documentation, I must have concerns whether Philip's training was comprehensive and adequate. It would appear that Philip was competent to the extent of his knowledge. It is inconceivable to me that a person could in such a short time, with such a minimal amount of theory training and with as little as 20 hours flight training be licensed as a aeroplane pilot. The other three training documents record flight times. The Student Progress Sheet records times between the 1st June and the 8th September, 2005. The Hang Gliding Federation of Australia Microlight Aircraft Log records times between the 26th September and 10th October 2005 and the Ultralight Pilot Log Book records times between 1st June and 10th October 2005. In respect of this last document it is I think clear, that the last three entries, 7th September, 8th September and the 10th September should in fact be references to the 7th, 8th and 10th of October, 2005.

I have had some difficulty trying to reconcile these documents, the purpose of which would be to determine the actual flight hours that Philip had amassed prior to the crash, the number of dual flight hours that Philip had prior to being allowed to fly solo and the number of solo hours that Philip had flown. It may be that other authorities may wish to construct a proper spreadsheet of these documents to determine those questions. I did pursue these matters with Mr Keogh at pages 89 to 92 of the transcript of his evidence. As I pointed out to Mr Keogh, 12.1 hours plus 5.4 hours does not add up to 19.5 hours. These are not matters that I intend to dwell on here now, but these records should be scrutinised by the appropriate authorities, not only to determine whether or not Philip may or may not have had the requisite flight time before being qualified as a pilot, but also to determine the extent of which aircraft T2- 2776 was used in flight and as a training aircraft while it was unregistered.

So far as my assumption that the entries for the 7th, 8th, 9th and 10th of September 2005 should be entries for the 7th, 8th, 9th and 10th of October 2005, a suggestion that Mr Keogh rejected, the entry in the Ultralight Pilot Log Book records these dates as September; the entries occur after all of the entries for September, the last being the 26th September and the document, Hang Gliding Federation of Australia Microlight Aircraft Log records the Innisfail excursion on the 8th and 9th of October 2005. I therefore believe that evidence supports a finding that reference should in fact be to October, not September.

WEATHER CONDITIONS

It appears that there were no adverse weather conditions that would affect flying on the 20th October 2005. Mrs Jaques observed Philip to take off at about 7am while taking her early morning walk. She made no comment about any adverse weather conditions. Mr Keogh, Mr Jaques and the search and rescue helicopter all flew on the day in question. There was no suggestion that there were any adverse weather conditions.

The Australia Government Bureau of Meteorology documentary evidence is divided into data from a number of weather stations, those being the Mareeba Airport, the Walkamin DPI, the Atherton Shire Council and the Kairi Research Station. The Mareeba Airport weather station reports that at 7am the wind was from the South West at a speed of 2km gusting to 8km, the air temperature was 20.3 degrees Celsius. At 8am this weather station reported that winds were calm with gusts of up to 5km per hour. The air temperature had increased to 22.6 degrees Celsius. The highest winds recorded were around 2pm where the wind was from the North, North, East at 22km per hour, gusting to 31km per hour. Air temperature had risen to 30.6 degrees. The daily maximum wind gust was 31km per hour from the North North East at 3.45pm. The other weather stations reported similar conditions. The Walkamin DPI recording at 9am, horizontal visibility of 50000 metres and one okta's cloud cover. It appears that there may have been some rain around the area, the Mareeba Airport Station recording 30.2 millimetres of rain to 1am on the 20th October 2005. The document RAA Accident Investigator Check List being at tab 89 of my brief is not dated or authored, however, it notes in section 12 "Nil significant weather/verbal reports indicate it was a perfect flying day". This document also records in a number of instances that this aircraft was not serviceable prior to take off and in (s13) concludes that in "this ACFT should have been grounded as unairworthy prior to the accident". I expect that this document was completed by Mr Hicks or Mr Ungermann from RA-AUS.

REGULATIONS

Civil air operations in Australian Territory are regulated by the *Civil Aviation Act 1998*. CASA was established on the 6th July 1995 as an independent statutory authority by an amendment to the *Civil Aviation Act 1998.* Under s.9 of the Civil Aviation Act CASA has the primary function of conducting the safety regulation of civil air operations in Australian Territory and is required to regard the safety of air navigation as the most important consideration in

the exercise of its powers and the performance of its functions. The *Civil Aviation Regulations 1988* and the *Civil Aviation Safety Regulations 1998* developed under the Civil Aviation Act, provide for general regulatory controls over air navigation safety. The Civil Aviation Act and regulations allow CASA to issue Civil Aviation Orders on detailed matters of regulation.

The November – December 2006 Flight Safety Australia Magazine at page 25 carries an article entitled "Right Stuff". It reports on a change of attitude and some simple marketing techniques that have turned the Shepparton Aero Club around. Although used in a different context, I believe the sentence "it should not make any difference whether it is a microlight or a multi-engine jet – you are still a pilot" is correct. It makes no difference whether you fly a microlight or a multi-engine jet, the regulatory framework that applies to the training of pilots and the maintenance of aircraft, should be of sufficient quality to ensure the safety of those within and those outside of the industry. It should make no difference whether you are a microlight pilot or a multi-engine jet pilot or instructor, you should observe the Civil Aviation Regulations and the organizational rules that apply to you.

It is regrettable that the RA-AUS article on the regulatory framework for RA-AUS as published by it in "Fly Light" (tab 42 of my brief) should start with the words, "It is boring, perhaps even mind numbing, to attempt to interpret all the regulatory material to which all recreational aviators, including RA-AUS certified pilots, are currently subject – presuming you can first find all the applicable rules and regulations; there is quite a load of it". This negativity would not instil enthusiasm into those who are about to engage in the task of locating and understanding the way that the Civil Aviation Act and Regulations apply to their intended flight activities. I have borrowed several passages from this article in an attempt to set out something of the regulatory framework.

"*Australian Ultralight Aviation, in common with all other forms of civil aviation, is subject to several levels of government regulations and rules. The prime enabling legislation is the Civil Aviation Act 1988 which is "…..an Act to establish a civil aviation safety authority (CASA) with functions relating to civil aviation, in particular to the safety of civil aviation, and for related purposes. The main object of this Act is to establish a regulatory framework for maintaining, enhancing and promoting the safety of civil aviation, with particular emphasis on preventing aviation accidents and incidents."*

"Thus CASA has the function of conducting the safety regulation of civil air operations in Australian Territory, in accordance with this Act and the Regulations.

The regulatory tier below the Act contains the wide – ranging civil aviation regulations [CARs]. The CARs are the responsibility of CASA but new or amended CARs must be approved by parliament before they can become effective - as do the CAOs. The level below CARs contains the civil aviation orders [CAOs] which were intended to amplify the Regulations contained in CARs or – as demonstrated in Section 95 CAOs – provide exemptions to

some provisions of the CARs. However, over the years the CARs and CAOs have become somewhat of a mess; where they are in conflict, CARs take precedence over CAOs. CASA believes that they are "….overly prescriptive, ambiguous, disjointed, *too reliant on exemptions, and difficult to interpret, comply with and enforce".*

Whether these final comments relate to CARs or CAOs, I am not certain however, this passage from RA-AUS "Fly Light" certainly sounds like an indictment on the regulator that its regulations are too complex and difficult for people to understand.

"Since 1994 or 1995, CASA has been in a process of reviewing and rewriting all of the CAR and CAO legislation in the form of Civil Aviation Safety Regulations [CASRs]."

I am not informed of the progress of the review process. RA-AUS is part of the consultation with the aviation industry participating via the standards consultative committee.

"The F.A.R (Federal Aviation Regulations) parts (Australia will move to a F.A.R style regulatory system) of particular interest to RA-AUS are;-
Part 21-35: Aircraft certification and airworthiness standards
Part 42: Aircraft maintenance
Part 47: Aircraft registration
Part 61: Certification of pilots and instructors
Part 91: General operating and flight rules
Part 103: Sport and recreational aviation operations
Part 149: Recreational aviation administration organizations"

These areas are similar to areas of concern that I published in the notice of inquest in these proceedings. According to the RA-AUS Fly Light article, "some parts have been implemented and parts 103 and 149, which are of most interest to ultralight aviation, may be concluded late 2007/early 2008. Parts 103 and 149 are an example of how CASA is moving its classification system from a purely operation based scheme to a more contemporary risk orientated activity based system".

It is not my function to try to prepare a full commentary on the regulatory framework of the aviation industry. So far as these proceedings are concerned, I have been referred particularly to Civil Aviation Order 95 subsection 32. The RA-AUS article to which I have been referring, further advises "three CAOs provide ultralight aviation with the necessary operating exemptions from some sections (listed within each CAO) of the regulations but, of course, all other CARS, CASRS and CAOs apply to RA-AUS registered aircraft and RA-AUS certificated pilots. These three exemption CAOs are CAO 95.10, CAO 95.32 and CAO 95.55. It is expected that with the implementation of CASR part 103 and part 149, these three CAOs will be rescinded but their intent will be incorporated partly within the two CASRS but chiefly as rules/requirements/procedures within redrafted RA-AUS operations and technical manuals".

The Fly Light article further advises, “if the conditions set out in CAOSs 95.10, 95.32 or 95.55 are complied with in relation to an aeroplane to which each CAO applies; the aeroplane/pilot is exempt from compliance with the following parts of the regulations and a few individual regulations. In most cases the exemption from the part or an individual regulation is replaced to some extent by rules or requirements stated in the RA-AUS operations or technical manuals. Failure to comply with the rules/requirements of the manuals renders the exemptions null and void thus the exemption regulations below and associated penalties become immediately applicable”. Thereunder is a list of exemptions common to CAO 95.10, 95.32 and 95.55. This list is somewhat different to the exemptions actually set out in the CAO 95.32 that is tab 40 of my brief. It may be that the RA-AUS article is much more contemporary than the copy of the CAO that was provided to me. That copy of course may have been relevant to the regulation as of the time of the crash.

Reference has been made to the RA-AUS (Australian Ultralight Federation) procedures manual. The RA-AUS operations and technical manuals comprise the RA-AUS procedures manual. I have been provided with a copy of both of these documents. Mr Hicks in his evidence referred to the operations manual as *“our bible”*. Having perused these documents I suggest that they are essential reading for everybody involved in the recreation aviation industry. I am somewhat surprised that there was no evidence that Philip had or had available to him copies of these documents. The operations manual itself contains advice that;
“Civil aviation orders (CAO) 95.10, 95.25, 95.32 and 95.55, where applicable, require that all ultralight aeroplanes operated under provisions of the relevant CAOs, be operated in accordance with the standards and procedures specified in the Australian Ultralight Federation Operations Manual (I understand this now to be RA-AUS).

The manual and its supplements have been compiled to meet the requirements of the relevant CAOs and is the only manual recognised by the AUF for the control of ultralight operations.

The manual is approved by the Civil Aviation Safety Authority (CASA) and is effective from the date of approval by the authority.

Changes and amendments to the manual must be approved by the CASA prior to incorporation into the manual. All such changes and amendments will be entered into the manual immediately upon receipt by the manual holder, and the details of the changes and/or amendments noted in the amendment records section of the manual.

The manual sets out the requirements and procedures to obtain and maintain the following qualifications to operate an ultralight aeroplane;
1. Student pilot certificate
2. Pilot certificate
3. Instructor rating

4. Senior instructor rating
5. Chief flying instructor approval
6. Pilot examiner approval
7. Regional operational coordinator approval

To achieve standardisation of pilot training methods and procedures, thus ensuring a high and continued level of ultralight pilot competency, the procedures contained in this manual will be strictly adhered to.

General information concerning this manual can be obtained by directing enquiries to the AUF executive director.

Technical information concerning specific ultralight aircraft should be obtained directly from the manufacturer's handbook or by directing enquiries to the manufacturer or designer.

The AUF will be the sole authority in regard to the interpretation of all or part of this manual and the AUF interpretation will be final.

NOTE: the Civil Aviation Regulations apply to all ultralights, just as they do other aircraft except for the following:

(a) Where the AUF member is specifically exempted from some regulations in either CAOs 95.10, 95.32 or 95.55; or
(b) Where a regulation explicitly specifies Australian aircraft"

The operations manual in Section 1.01 provides that a student pilot is obliged to possess a personal copy of the operations manual. Other requirements are set out for pilot, instructor, senior instructor, chief flying instructor and pilot examiner. All are required to maintain accurate records of their flying experience in their pilot log book. Section 3.01 of the operations manual sets out a number of requirements for the establishment of flight training facilities. At the view on day one of this inquest I had the opportunity to visit and view the facilities at Jaques Coffee. I understand the facility that I observed was not dissimilar to that being used by Mr Keogh in 2005 as a flight training facility. From my observations it would not appear that the facility met the requirements for equipment and documentation that is required by the operations manual.

The operations manual in Section 3.02 provides that prior to a student pilot being allowed to attempt a first solo flight; he/she is required to pass a written examination of the rules of the air (air legislation) appropriate for ultralight aircraft operations. Although I may not be privy to all the documentation that was utilised for Philip's training, Philip's ultralight pilot log book and the student progress sheets indicate that Philip first flew solo on the 12th July 2005. The only documentation that I have that might in any way be regarded as a written examination is the documentation to which I have already referred in the Hang Gliding Federation of Australia Pilot Training Workbook. The three modules or phases which have been signed off by the instructor, Mr Keogh, are all dated the 13th July, after Philip's first solo flight.

Whilst I could not suggest that I have studied the operations manual, I have found a number of matters of interest to this inquiry. For instance, in the syllabus of basic aeronautical knowledge, I found reference to stalls, turning, spins and spirals, etc, but I found no mention of the tumbling phenomenon. I also observe that the technical manual contains in Section 4.3 a procedure for defect reporting in air worthiness notices. The evidence that I received in the inquiry was somewhat confused; Mr Silver believed that as a Level Two maintenance authority he had power to ground an aircraft whereas Mr Hicks did not appear to think that he had that power. I am unable to provide the definitive answer to that question; however the technical manual in Section 4.3 does provide that any AUF member can submit a defect report. Presumably that report, when received by RA-AUS is acted upon and the ultralight aircraft airworthiness notice [annex B to Section 4.3] is issued to the owner of the aircraft. That is a procedure which might have been adopted when Mr Hicks observed the aircraft to be unairworthy at his facility.

The technical manual also contains maintenance schedules and periodic inspections for ultralight aircraft which are essentially the same as all of the other schedules which I have observed. Again, this schedule provides that fabric is recommended for replacement or overhaul at 400 hours. The technical manual also contains a warning that continued exposure to sun dramatically shortens the life of wing and tail covers – possibly to as little as six months. Other than for this warning, I did not find a great deal of information to do with ultra violet degradation of the wing fabric in the manuals. The technical manual also provides in Section 4.2.4 for periodic inspections and informs the reader that “ultralight aircraft operated under the exemptions of CAO 95.10, 95.32, 95.55 shall be maintained in accordance with the manufacturer’s maintenance manual. Where no manufacturer’s manual exists, the aircraft should be maintained to the schedules contained in this Manual. Ultralight types used for hire or reward shall always be maintained in accordance with the manufacturer’s schedules.”

“When maintenance is performed a log-book entry must be made. This entry must include the signature of the person authenticating the maintenance, their name (in block letters), the date the entry was made and AUF membership number”. Clearly the maintenance records of this aircraft would not comply with those requirements. I hasten to add of course that this aircraft was not registered with RA-AUS until Philip obtained registration of the aircraft with RA-AUS on the 13th October 2005.

There is evidence in this inquiry which touches upon matters referred to in CAO Section 95.32, particularly: (i) sub-Sections 4.1(b)(i) the carriage (free of charge) of persons or goods; (ii) 4.1(f) the aeroplane must be maintained in accordance with the maintenance standards set out in the appropriate technical manual; (iii) 5.1(b) the aeroplane must not be flown at a height of less than 500 feet above ground level unless one of the conditions set out in paragraph 6.2 is complied with; (iv) 5.1(c) the aeroplane must not be flown above the sea at a horizontal distance from land of more than 20 kilometres.

The areas where the evidence has touched upon the foregoing include;

(i) In respect of the carriage (free of charge) of persons or goods, to the Trial Instructional Flights offered at the Jaques Coffee plantation. These flights are charged at the rate of $80 plus $11 insurance per person. The concern was raised during the inquest that these flights were in fact a commercial operation or joy flight disguised as something else. This is not a matter which is directly relevant to my considerations.

(ii) A great deal of time and evidence was devoted to the question of maintenance of the aircraft (4.1(f)). The evidence of Mr Hicks is unambiguous. This aircraft had not been properly maintained. He raised concerns in respect of the electrics, the cables, and the wing fabric. The current system allows a pilot or Level One maintenance authority to carry out maintenance on his/her aircraft, notwithstanding that the pilot may have little mechanical or aeronautical knowledge. Maintenance logs and records are clearly inadequately kept and maintained. The concept of informed participation appears to allow such latitudes as to allow Mr Ogle, then a Level Two maintenance authority to argue that the Bettsometer was not an appropriate testing device for wing fabric, this, notwithstanding, that HGFA required Bettsometer testing of wing fabric biennially.

(iii) Evidence was given concerning low flying of aircraft in the Mareeba area. These matters have been brought to the attention CASA although it does not appear that any enforcement or prosecution action has been taken in respect of those incidents (5.1(b).

(iv) The issue of flight over the sea, as referred to in 5.1(c), was also referred to in the evidence. Mr Keogh admitted he flew a microlight aircraft from Weipa, across the Gulf of Carpentaria, to Gove, a distance of 600 kilometres. This flight does not appear to have been authorised. The flight was readily admitted to by Mr Keogh. Mr Keogh gave evidence that he thought that there was no particular authority that was required for this flight and relied on conversations that he said he had with Mr Fogg from HGFA and Mr Rosenberg from CASA in Cairns. The evidence in relation to this flight is at pages 14 and 15 of the transcript of Mr Keogh's evidence. Details of the flight were published on the front page of the Tablelands Advertiser newspaper on Wednesday 5th September 2007 as is shown by Coroners exhibit C29. As a chief flying instructor Mr Keogh would be required to be familiar with CAO 95.32. As I have already mentioned, Section 5.1(c) provides that an aeroplane must not be flown above the sea at a horizontal distance from land of more than 20 kilometres. CAO 95.32 Section 7 sets out specifically the procedure that a person must go through if he/she wants to fly an aeroplane other than in accordance with the flight conditions set out in paragraph 5.1. There is no evidence from any party, to suggest that this process was followed.

The Australian Ultralight Federation operations manual contains other information which all within the industry should be familiar. The procedures that were in place at Jaques Coffee and at Mr Keogh's flying school did not

meet the standards set out in Section 4.01 “airfield control”. This Section requires, amongst other things, that when more than one ultra light aircraft is operating from a flying field, other than a training field, a duty pilot shall be elected from those pilot certificate holders present. I do not believe that there was any evidence to confirm that this was the case at the Jaques Coffee facility.

This same provision provides that all ultralight aircraft operating from the field are to be registered. The evidence is clearly to the effect that Philip’s aircraft was unregistered between the 20th June 2005, when HGFA registration expired, and 13th 0ctober 2005 when it became registered with RA-AUS.

As I have already indicated, I have not attempted to study the operations manual however I have not found any reference to a requirement that the facility contain visibly published search and rescue procedures. Section 3.01, to which I have already referred, does contain a requirement that the facility have documentation which includes “hand out copies of local ‘operating procedures’ (These procedures will lay down any special requirements of the facility and operating procedures including operating procedures or operating conditions peculiar to the facility and the local area.)” The only evidence of the existence of anything that might equate to local operating procedures at the Jaques Coffee facility was that in one of the photographs of the Jaques facility there appeared taped to the blackboard a single sheet of paper headed, “Local Operations”.

The Australian Ultralight Federation operations manual also provides in Section 4.11 that “ultra light aeroplanes operated in accordance with this manual are required to have a current AUF registration certificate and display AUF aircraft registration markings”. This provision is relatively straight forward and means that an unregistered aircraft should not be operated and that a registered aircraft should not be operated until the registration markings have been affixed to the aircraft. As I have indicated, the evidence is to the effect that Philip’s aircraft was not registered and did not display the RA-AUS aircraft registration markings. Although of a technical nature, as opposed to a safety feature, this aircraft should not have been flown and in accordance with the AUF technical manual should not have been registered or transferred until the RA-AUS requirements for the transfer were properly complied with.

I have not been able to locate any provisions which relate to CA0 95.32 aircraft. Section 7 of the Technical Manual refers to the requirements for registration, renewal of registration and transfer of registration. Forms are provided, these include an Ultra Light Aircraft Condition Report, however the forms all refer to CAO 95.10. I have also been provided with an aircraft condition report which was completed by Mr Ogle in respect of aircraft 32-3854 on 21st June 2006 and was itself the subject of investigation. This form refers to CAO 95.55 and 95.32 and is endorsed with Section 7.1.4 Annex B. The technical manuals that I have been provided with do contain Section 7.1.4 but this specifically refers to CAO 95.10 aircraft as does the form Annex B.

Unfortunately, I am unable to reconcile the transfer requirements of a CAO 95.32 aircraft nor is it entirely clear to me which aircraft condition report applies to a CAO 95.32 aircraft. The reason for this is probably partly because of the amount of material which I have been given in this inquiry but also because the material which I have been given is somewhat confusing and irreconcilable. Perhaps this accounts for some of Mr Ogle's confusion in determining what was the appropriate form to use on the inspection of the aircraft and explains the difficulties which I have encountered.

I have been provided with at least one other Ultra Light Aircraft Condition Report, which is tab 95 in my brief. (Referred to earlier). This document is headed, "RAA Technical Manual Section 7.1.4 Annex Ultra light Aircraft Condition Report". It does not refer in its heading to CAO 95.10, CAO 95.32 or CAO 95.55. Nor does it refer to an Annex number. It does, however, have a date published and that was 3rd September 2002. These inconsistencies do raise difficulties in interpretation and perhaps, once again, confirm why there should be a review of the regulatory system that controls recreation aviation.

I believe that CASA and the recreation aviation industry is duty bound to review the regulation of the industry with emphasis on registration of aircraft types, pilot training, and aircraft maintenance. As well, it is necessary that those bodies review and restructure an enforcement regime that is effective.

Mr Ungermann, the operations manager of RA-AUS provided a statement to me and gave evidence at the inquest. He advised me that on 10th October 2006 (almost a year after Philip's death) he received an email from Mr Rob Glen, the self-administration oversight co-ordinator in the general aviation operations group of CASA. I copy that email hereunder:
"Last Thursday afternoon (September 28), three members of the public were at Jaques Coffee Plantation which is located about 5 nm east of Mareeba in North Queensland. One had driven there on business to see the owners of the Plantation, the other two had accompanied them on the drive. Two of the three persons were offered flights in microlights kept on the property. The availability of microlight flights is prominently advertised on the Plantation's promotional material as "T.I.Flights", with "T.I." in small print. There are two fleets of microlights in adjacent hangars - one fleet is operated by the owner of the Plantation, a Mr Nat "Jake" Jaques, who is apparently a selling agent for trikes; the other fleet is operated for flight training purposes by a gentleman known as "David'. Both said they had instructor ratings. David told the male passenger they prefer to operate the trikes under the HGFA rules rather than RAAus, as RAAus did not deal with trikes in their Operations Manual. The male passenger flew with David, the female passenger with Nat Jaques. Both trikes were reportedly owned by Nat Jaques. Although the male passenger asked David for a straightforward and smooth ride, Nat Jaques told David to make the flight more thrilling. The male passenger subsequently impressed on David his desire for a smooth ride. David secured the male passenger in the rear aircraft seat. Paying for the flight was not discussed, although the male passenger assumed payment would be required as advertised. Take-offs commenced about half an hour before sunset. The male

passenger reported he did not receive a passenger safety briefing before take-off, and suggested this may have been because he had already advised David that he held a Private Pilot Licence and a pilot certificate issued by RAAus. That flight lasted about 15 minutes and consisted of demonstrating a stall, stall with attempted spin (to show how trikes were unspinnable), and some steep descending turns. David told the passenger he would normally have allowed him to fly the aircraft using extensions on the control pole, however, they had not been installed for that flight. The passenger had been drinking coffee liqueur supplied by the Plantation prior to the flight, and David had not queried whether the passenger had consumed any alcohol. During the flight with David, the male passenger observed the second trike flown by Nat Jaques conducting manoeuvres involving low level passes and tight turns. "Hooning" was the male passenger's description of the other trike's activities. After landing, the male passenger was unable to release himself from the harness. This was because two pieces of harness had been tied together in a knot as there was no quick release clip fitted to the front part of the rear seat harness. The male passenger offered David money for the flight, but he refused, saying he was going up anyway to try out the wing which was new. The second trike returned to land about 15 minutes later, at around sunset."

On 16th October Mr Ungermann replied to Mr Glen. He advised;

"Rob, thanks for the heads up, adventure micro lights has been permanently suspended from operations under the RA-AUS and is currently appealing my decision to the Board and a disciplinary hearing has been set for January to hear the case. They have gone to HGFA and I believe are operating under their umbrella, I have spoken to Chris Fogg about this and he is aware of the situation (he flew to F N Qld and checked them out) however these guys are still acting in a dangerous and reckless manner that has bought [sic] them into disrepute with the RA-AUS".

If these concerns were not so serious the situation would be laughable. The fact that a licensed instructor (Mr Keogh) could fly an aircraft with a passenger who had his seat belt tied in a knot and as a consequence was unable to release himself from the harness, must be an indication of the respect being given to CASA and its delegated authorities by those who hold positions of authority within the industry.

At the inquest Mr Glen gave evidence and advised that he would provide me with details of enforcement proceedings. Mr Glen did provide me with a bundle of documents which included a list of infringement notices issued by CASA to persons involved in sport aviation aircraft, investigation reports relating to persons involved in sport aviation aircraft, and prosecution results relating to persons involved in sport aviation aircraft

I was unable, upon a perusal of the documentation, to find any infringement notices or prosecutions in relation to anyone in Far North Queensland. The only disciplinary procedures that I am aware of are those referred to by Mr Ungermann, being the permanent suspension of Mr Keogh's CFI approval,

his instructor ratings and the cancellation of Adventure Micro Lights as an RA-AUS FTF. (Flight Training Facility).

This disciplinary action did not appear to have been for any single incident but as a consequence of grave concerns by RA-AUS about Mr Keogh's operational standards. These concerns stemmed from, but were not confined to matters relating to Philip's death. These concerns, and the resultant permanent suspension, were conveyed to Mr Keogh in correspondence from Mr Ungermann, dated 9th August 2006. It surprises me that in that correspondence Mr Ungermann points out to Mr Keogh that one of the incidents complained of carries a penalty of two years imprisonment. As I understand the regulatory and enforcement regime in respect of these aircraft, RA-AUS is not able to present a prosecution in Court for the alleged breach of the Civil Aviation Act. This would be the function of CASA.

Mr Keogh subsequently appealed the decision to permanently suspend his operations. That appeal was, to an extent, successful in that the disciplinary panel of RA-AUS substituted an order that Mr Keogh's CFI approval, FTF approval and instructor ratings be suspended for 12 months from 15th August 2006. According to the RA-AUS membership card and pilot certificate, issued on 12th April 2007, by Recreational Aviation Australia Inc., Mr Keogh re-registered with RA-AUS on that date as a pilot with Level One maintenance authority and aircraft groupings, three axis and weight shift aircraft, and endorsements for cross-country passenger and flight radio. This membership and registration was to expire on 9th April 2008.

It is confusing to me that when Mr Keogh's RA-AUS registration and endorsements were cancelled for 12 months, from 15th August 2006, he was then able on the 9th April 2007 to regain registration with RA-AUS and endorsement as aforesaid.

FINAL FLIGHT

Philip's final flight commenced at about 7am on 20th October 2005 at the Jaques Coffee Plantation Airpark. He was observed by Mrs Linda Jaques preparing his aircraft for take-off. Ms Leah Spriggs said that Philip had previously told her that he was going to fly his ultralight plane that day and that he was planning to return at about 11 am. He told her that he was going for a joy flight and that he was planning to fly for about an hour and a half and that he might fly around Lake Tinaroo.

The last entry in the Hang Gliding Federation of Australia Microlight Aircraft Log records the aircraft engine clock at 694.8 hours. The photograph of the aircraft engine clock which is in evidence shows the hours as 00695 with the decimal recorder showing partly .1 and partly .2 indicating that the engine clock was in the process of changing over from 695.1 hours to 695.2 hours. The red hand of the engine clock is stopped on what I believe to be six minutes. The engine clock is an indication that Philip's final flight was very short, no longer than .3 of an hour. I understand .3 of an hour to equate to 18 minutes. The actual flight time would of course be somewhat less than this as the engine clock would have recorded the engine operating time which

included warm up and taxi time. Mrs Jaques observed Philip preparing the aircraft for flight. It is I believe safe to assume that the warm up and taxi time would have taken between 10 and 15 minutes. The importance of the very short flight time is that this supports the theory that the event occurred shortly after take off and not after Philip had flown to any destination and was returning. The crash site was some three to four nautical miles from the Jaques Coffee airstrip which would be, even by microlight aircraft standards only minutes of flight. This assumes further importance when one gives consideration to the search and rescue techniques that were employed on this occasion.

Mr Keogh gave a statement in which he said that Philip would usually call him the night before a flight just to let him know that he was coming up. On 19th October 2005, Philip rang him at about 8.30 pm and told him that he was coming for a flight. Mr Keogh informed Philip that he would be flying at Atherton Airport, Philip then indicated that he was going to fly over Tinaroo Dam and Mr Keogh mentioned that he should come to Atherton for a chat. Philip didn't say what he was going to do. Mr Keogh's evidence at the inquest was somewhat different. This is referred to in Mr Keogh's evidence at page 46 et seq. Mr Keogh informed me that – *"I expected him, roughly – to meet him in Atherton at about, I think it was 7.30 or 8 o' clock, around that time".*

Mr Tate had been discussing with Mr Keogh the local operating procedures that applied at the Jaques Coffee Micro light Aircraft Facility. This passage of evidence warrants repeating so I set out hereunder the conversation between Mr Tate and Mr Keogh, commencing at page 44 and proceeding through to page 50 of Mr Keogh's evidence:

And I want to show you this document. Prior to Philip's death, had you ever been shown that document?-- I created this document.

You created that document. All right, what is it?-- Just the local operating procedures.

All right, and what's the purpose of the local operating procedures?-- Basically to give students an idea of the local area and-----

Right?-- -----and basically the - try to control the noise with some neighbours who don't like microlights flying in their area.

All right, now, do they have some particular status in a aircraft landing area, such as Jaques Coffee?-- A status?

Yes?-- The procedures?

Yes?-- Yes.

What's the status?-- I'm not sure.

You're not sure, but aren't they the rules?-- The rules for that - for that particular airfield, yes.

Yes, yes, and if they're the rules for the airfield, did that give them any particular status?-- Well, I-----

I'm hoping you're going to tell me that everyone's supposed to follow them?-- Yes, that's correct.

That's correct? They're important?-- Yes.

Now, I'll show you a picture that was taken just after Philip passed away of your area of the hanger. Can you identify that photograph for me?-- Yes, that was the area that I used - the briefing area.

All right, and can you just take us through, what - what exactly is the blackboard used for?-- Basically to highlight diagrams.

Yes?-- And give briefings and conduct theory.

All right, and what is this map here on the far right?-- That's - that's a topographical map basically.

Right, and this map?-- It's an airspace chart.

And these two forms down here, which appear to be below the blackboard?-- That's just some Rotax - Rotax servicing, talks specific specifications for different parts of the engine.

All right, and what is this - this here, which appears to be a whiteboard?-- That's just a whiteboard for writing notes down.

Right. Now, this seems to be encased in a larger sort of board that presumably you can stick things on?-- Yes.

Is that correct?-- Yep.

Now, were there any other whiteboards near this particular larger board?-- Not in that area, no.

Not in that area, it was only this whiteboard?-- At the time, yes.

Now, we understand that there has been some discussion about Phil not leaving some sort of indication about where he was going on the day that he passed away?-- Yes.

Are you aware of that?-- Yes.

Is that the whiteboard that you can see in the picture that you would have expected him to have left those-----?-- Either the whiteboard or the blackboard, yeah.

Whiteboard or the blackboard?-- Yep.

It wouldn't have been in any other-----?-- No.

-----place? One of those two spots?-- Yes.

And I think in your statement you tell us that there was no message that was left?-- No, that's correct.

All right. Now, are you able to produce a copy of those procedures that wrote noting that Phil had read, understood and signed them?-- No.

Did you ever show them to him?-- No.

Right, thank you, can I have that back. Can you tell me why you never showed them to him?-- Because we basically formalised those - those local operating procedures after the accident.

After the accident?-- Yes.

Right. I did ask you at the beginning whether this was something that you had seen before his death and you said "yes", have I got that wrong, have I?-- Yes, sorry.

So this was done afterwards?-- Yes.

Prior to Phil's death, was there any form of local operating procedures at all?-- Not written down like that?

Where were they kept?-- Where were they kept? It was just a verbal-----

Just a verbal?-- Yes.

And so what were the verbal rules that you had in your head before Phil's death that constituted the local operating procedures in your training school at Jaques Coffee?-- Basically the area that we used to train-----

Yes?-- -----to always let someone know where you're going and what time you're back.

Yes?-- And there were a number of houses to be avoided or to - to not fly anywhere in the vicinity of.

How did you know your - your students understood these rules?-- Because basically for every lesson you are abiding by them every time Phil came to fly, we - he would abide by them.

Is there anything in any of those syllabuses that indicate that a student is to be informed of the rules, the importance of the rules and to follow them?-- No.

There's not? Can you explain why it was that Phil allegedly didn't leave any indication of where he was flying?-- Well, I spoke to him the night before.

Is that when you gave him your helmet?-- No, I don't remember when exactly I gave him my helmet, I only spoke to him on the phone the day before-----

Yes?-- -----and he let me know his basic flight plan at that stage, so-----

All right, what did he tell you his basic flight plan was?-- He said he was going to - or intended to fly around Tinaroo Dam.

Yes?-- And I invited him to - to meet him at Atherton-----

Yes?-- -----the airfield and - and so that was all that was discussed-----

All right?-- -----and perhaps that he would have done a local flight around the Tablelands as well.

All right, did he tell you what time he was going to be leaving?-- No, not exactly.

All right, did you inquire into what time he would be leaving?-- No.

See, at that stage he was still your student, wasn't he?-- As far as I was concerned he had been signed off at that stage so he was a fully fledged pilot, I thought that he would have simply - paperwork or the RAA would have had the paperwork at that stage, signing him off as a pilot.

Well, of course, that presupposes that the RAA was satisfied with the paperwork, quite apart from anything else, would it not?-- Well, if they had received the paperwork, they would have been, yes.

All right. Now, did you - did you train him in emergency procedures?-- Yes.

And in SARS procedures?-- Yes.

And I think you've told us on what date you did that?-- Yeah, in the emergency procedures.

Yes, and - just go back to the only form that we've got that helps us with that, now, what does that notification - or note of - what does that form say in relation to what you taught him about emergency procedures?-- It doesn't contain anything specific.

No, and how long was that particular session?-- One point one.

So, in 1.1 hours you did all of the emergency procedures that you say relate to things such as stalls, tight turns-----?-- Yes.

And does it-----?-- -----either way, on a board or verbally.-----stalling in other ways, not going outside the envelope, is that correct?-- Yes.

As well as things to watch out for in terms of tumbling?-- Yes.

As well as the emergency procedures around SARS and so forth and so on?-- Well, the search and rescue points is something that you enforce all the time, if, you know, a student is going flying by themselves or a pilot is going by themselves, you always make sure that they let someone know where they're going-----

Right. So would it come as no surprise to you to hear that he didn't put anything on the board, given that he'd spoken to you at least the day before?-- Not particularly, no.

It would be something that you'd expect as normal because he'd told you?-- Yes.

Now, when you were speaking with him, why didn't you inquire of him exactly what he was proposing to do, what time he was proposing to leave, where he was proposing to go and what time he was proposing to land, whether at Atherton, Mareeba, somewhere else or back at Jaques Coffee?-- Basically because it was - it was a nice forecast for the next day and he could have chosen to explore different areas of the - the local area.

Well - well, what does that say about your - your training and emergency procedures, because surely, your training would have said appointing a SARs is very important. That is the only way that we'll know if there's an emergency and we can then signal to the emergency services people or - that a pilot's lost and if you're going to deviate from the plans that you've told me, you need to let me know; didn't your training include that?-- Yes, but, there - there are no hard and fast, specific guidelines as to, if - if someone is overdue, when you - when you start looking for them or what may have happened.

Was that your training?-- Yes.

So your training was that, "Phil, there's no hard and fast rules about when someone comes looking for you"? See-----?-- Well, if-----

-----that's not answering my question; my question is, what did you train Phil about in terms of appointing a SARs, letting you know - or letting someone know - or writing on the board where he was going, what time he was coming back, et cetera, et cetera? What was the training that was given to him?-- Basically to always let someone know where you are-----

Yes?-- -----and what time you're going to come back.

And he did that with you?-- Yes.

So you knew what time he was going?-- Not exactly.

You knew-----?-- I - I-----

-----what time he was going to come back?-- I knew roughly.

And what time were you expecting him, roughly, to be back?-- To be - I expected him, roughly - to meet him in Atherton at about, I think it was 7.30 or 8 o'engine clock, around that time.

In the morning?-- Yes.

You were at Atherton that time in the morning?-- Yes.

And you didn't meet him?-- No.

Why did you not sound the alarm at that point?-- I thought he may have deviated from his original plan.

You're his instructor, you would have known that that was totally unacceptable?-- Quite often, people do deviate from their original flight plans. I either-----

You were his instructor, you knew that that was totally unacceptable, given the training you'd given him?-- No, I wouldn't have said that was completely unacceptable.

It's acceptable? From your perspective?-- If a flight's being conducted just locally, in the area, there-----

Mr Keogh, I'm asking you whether, from your perspective, as his trainer, his CFI, deviating in the way that you thought that he might of, given that he told you where he was going the night before and the time that he was, you know, the details of his trip, was that acceptable? And I would have thought the answer is either yes or no?-- No.

It's not?-- No.

All right. Now, he had your helmet?-- Yes.

You were at Atherton Airport?-- Yes.

You knew the frequency and how the radio that you'd given him would be helmet-worked?-- No.

You didn't?-- He was getting the radio repaired at the time.

On his helmet?-- Yes.

And you gave him your helmet?-- Yes.

Your helmet had a radio?-- No. The helmet's just a helmet.

I see. Did Phil have a radio?-- Yes.

Did he have a mobile phone?-- Yes.

Did you know the telephone number of his mobile phone?-- Yes.

Did you know how to contact him with his radio?-- No. I knew that his radio wasn't going to be working.

All right. Was the fact that he was up on a flight without a working radio of concern to you?-- No.

Why?-- Radios aren't mandatory in ultralight aircraft.

And so, the mere fact that it wasn't required meant that it wasn't a trouble?-- Yes.

He didn't meet you at Atherton Airport?-- No.

That was the arrangement?-- Yes.

And how long did you wait for him at Atherton Airport?-- It would have been probably a few hours.

Did you make any attempt, during that period of time, to contact him?-- Yes.

And what was the result of that?-- By mobile phone and-----

Yes?-- -----I couldn't contact him.

So at what time did you decide to leave Atherton Airport?-- When Mr Jaques had notified me that he hadn't returned back there.

And what time was that?-- I don't remember exactly, it would have been possibly 10.30.

Ten-thirty? What did you do then?-- Returned to Jaques Coffee.

Yes. And what time did you arrive at Jaques Coffee?-- Around probably 11.30-----

Right?-- -----I think.

And what happened then?-- We discussed what we were going to do.

Yes. And what did you - did you decide?-- To conduct a search ourselves.

In this passage of evidence, Mr Keogh confirms that the local operating procedures were formulated by him **after** Philip died. I have already referred to the fact that the photographs show that there was a single page document on the wall near the whiteboards. As best I can understand the evidence of Mr Jaques in respect of that document, he was unsure how it was created. The other document, which was document 7A in my brief, I believe Mr Jaques was confirming was the document put together by himself and Mr Keogh, which is the document Mr Keogh referred to as being created after Philip's death.

Mr Tate put to Mr Keogh, *"Can you explain why it was that Philip allegedly did not leave any indication where he was flying?"* Mr Keogh, *"Well, I spoke to him the night before".* He goes on to confirm that Philip intended to fly around Tinaroo and perhaps that he would have done a local flight around the Tablelands as well. Although Philip did not tell Mr Keogh exactly what time he would be leaving, Mr Keogh said, at the beginning of page 49 of the transcript of his evidence that he had expected roughly to meet Philip in Atherton at about 7.30 or 8 am. When Philip had not arrived by 10.30, Mr Keogh returned to Jaques Coffee where it was decided that a search would be conducted.

There is no evidence to support the theory that Philip did write down his flight details on the whiteboard. It has been suggested that he would have written it down, and that somebody subsequently wiped the information off the whiteboard. For those who have these suspicions I say that there is no evidence to support such a theory and to hold these suspicions now is counter productive and destructive. I urge anyone who may be consumed by such thoughts to let them go. Mr Keogh's evidence on the use of the whiteboard might suggest that Philip had not been trained to use it, as Mr Keogh says at Paragraphs 16 and 17 of his statement *"at the airfield there is a notice board that is filled out by pilots departing on flights and their estimated time of return which is an informal search and rescue guide. When I was instructing Philip I was present at the airfield we did not leave any trip details on the notice board as I would give Philip a flight course to follow ……".*

Philip did phone Mr Keogh the night before his final flight and may have thought it unnecessary to make an entry on the whiteboard.

Mr Keogh's statement given to Police on the 26th October, 2005 at paragraph 23 says;

"The morning of 20th October 2005 I started my day as usual and started flying at Atherton Airport at about 6.30 am with a student. At about 10.30am, Nat Jaques called me on my mobile phone and said, "Have you seen Philip because he hasn't returned" he was concerned as it was reasonable to expect Philip back at 9 am".

This is somewhat confusing as Mr Jaques had not observed Philip take off, although it appears that he knew that Philip had departed the airfield. By about 11am he was becoming concerned, and then telephoned Mr Keogh.

It is of concern that there was no formal system in place to ensure that flight details were recorded and that no effective search and rescue procedures were in place. It is of concern that Philip's instructor, Mr Keogh, did not act more decisively when Philip had failed to arrive in Atherton as planned. Search and Rescue was regrettably not contacted until just after 5pm as a consequence of Ms Spriggs agitation and Mrs Jaques concern and initiative.

The Search and Rescue helicopter located the crash site relatively quickly once it became involved and Philip's body was located shortly afterwards by Mr Rankin. There is a possibility, notwithstanding the extent of the injuries Philip suffered, that had the alarm been raised earlier the outcome may well have been different.

CAUSE OF DEATH

The medical cause of death identified by Dr Manypeney, who conducted the autopsy on Philip's body on 24th October 2005, was "multiple injuries". Dr Manypeney confirmed that there was no alcohol detected in Philip's blood and the routine urine immunoassay detected no evidence of any drugs. Dr Manypeney found no medical condition of relevance in his examination of Philip, or in Philip's medical records, which Dr Manypeney had examined.

Dr Manypeney had had experience in a fatal ultralight crash several years previously and was able to conclude from the comparison of Philip's injuries to those of the pilot on that occasion, that *"the height involved here would be not that great".* The extent of Philip's injuries drew the attention of Counsel as it is believed that trauma to the front of the chest may be the result of the brace bar being forced onto the chest of the pilot. This may be evidence of what is referred to as a "tumble event", a hazardous in-flight occurrence studied by Dr Gratton of Brunel University, West London, and the subject of a number of articles written by Dr Gratton.

Mr Tate also assisted Dr Manypeney by advising him that a pilot may suffer broken wrists in a tumble event. Understandably, Dr Manypeney was unable to comment confidently as to whether a tumble injury had occurred. He confirmed that Philip had suffered a broken right wrist. On at least two occasions in evidence-in-chief, he advised that in attempting to determine the actual cause of Philip's injury, he was venturing beyond his level of medical expertise.

Initially, he indicated that Philip's injuries might be consistent with injury from the front or from the back. Philip's frontal chest injury appears to have been quite slight, limited to a split costal cartilage on the right-hand side. Dr Manypeney thought that the internal chest injuries were the key rather than injuries to the front or back. Dr Manypeney described that there were more rib fractures on the right than on the left and the rib fractures were in the

poster lateral part of the chest. Ribs 7 to 10 were fractured on the left-hand side of the chest and ribs 6 to 11 on the right-hand side were fractured.

He also observed a number of punctures to the pleura and some small tears on the lung which corresponded to the rib fractures. Blood was detected between the lung and the chest wall in the pleural space. Dr Manypeney said that although it was hard to say with certainty the nature of Philip's injuries were really quite large and even with emergency care he may not have pulled through.

The photographic evidence of the crash site shows that Philip's aircraft's descent was almost vertical just prior to impact as the aircraft was impaled on a small tree. This tree appears to have had its top broken off and all branches and foliage stripped so that in the photographs it appears like a single stalk. The trunk of the tree has apparently passed between Philip and the backrest of his seat and pierced the wing fabric above. I believe that it is entirely reasonable to find that Philip's rib fractures post-laterally were caused by impact against the tree during the final moments of the descent, as the aircraft was slightly aligned to the right, the rib fractures observed by Dr Manypeney to be greater on Philip's right-hand side, would also be consistent with this impact.

It should be noted that there is another important fact to be drawn from the way in which the aircraft crashed to the ground. This is I believe consistent with the aircraft being slowed in its descent by the parachute-effect of the damaged wing structure. I believe that this is a more reasonable and acceptable hypothesis than that proposed by Mr Ogle of Philip flying the aircraft into the trees.

Subsequent to the taking of evidence, and at the request of Dr Gratton, I asked Dr Manypeney whether the autopsy results were compatible with Philip having received a heavy blow in the chest from a horizontal bar, somewhere around the lower to middle rib cage, in the front of his chest, very shortly before the ground impact. Dr Manypeney responded;

"I have revisited my PM notes re: injuries, and given some thought.
Multiple fractured ribs with concomitant laceration of perital pleura. Ribs 6 – 11 on R, posterlaterally. 150 ml haemothorax on R. Ribs 7 - 10 fractured posterlaterally on left with 100 ml haemothorax and less marked tears to outer pleura. Split costal cartilage on the right, approximately T8.
On reflection, the deceased may well have suffered two distinct chest traumas supporting your theory.
1. Costal cartilage 8th right tear. The costal cartilages are on the front of the chest on either side and are much more flexible than ribs with a consistency something like fishbone. Hence, a blow needed to split the cartilage would need to be very forceful and quite deep. A heavy localised blow from a horizontal bar could well cause this.
2. Blunt compressive chest trauma has likely caused the posterior rib fractures, underlying lung and pleural damage and superficial soft tissue

trauma to the posterior chest. The same force may have occurred to the back of the abdomen causing bleeding into the retroperitoneal tissues.
Of course, the two forces may have occurred at different times."

The further explanation by Dr Manypeney is, I believe, self-explanatory and supports a minor frontal trauma and major rear trauma being suffered by Philip in the crash.

CRASH INVESTIGATION
TRANSCRIPT OF EVIDENCE OF MR UNGERMANNN PAGES 7 – 11.

Now, one of the things though that has been troubling me is, my understanding of the internal arrangements for the actual report itself, and which is at our guide card 32, is that Andrew Hicks prepares his working notes-----?-- Yes.

-----for want of a better word - it comes into head office-----?-- Yes.

-----quite properly, for review and I understand you review it?-- Yes.

And then you wrote up the actual accident report that we have?-- Correct.

Now, before it was published, did you give that accident report back to Andrew Hicks to read and confirm that it was accurate against his observations and his findings?-- No.

Now, I'll tell you why that's important. Could we - have you got a copy of the accident report?-- Yes, I do.

And this might also help you understand that we actually go through these reports in a fair amount of detail. You can see here at 2.2-----?-- Yes.

-----we go down, "The aircraft performed an uncontrolled descent into a wooded area. The impact site exhibited little or no forward horizontal motion as the impact was almost vertical after contact with the surrounding trees."?-- Yes.

Now, the first question I have for you in relation to that is where did you get the evidence to support the proposition that it hit trees?-- Due to photos.

Mr Hicks tells us that no tree was impacted, bar one. So he says it only hit one tree, which is the tree that impaled-----?-- Yes, that it impaled.

-----and he tells us that it came down?-- Yes.

If we read the report that you've prepared which has not been verified by Mr Hicks-----?-- Mmm.

-----we have a situation arising where at least an implication is open that this craft hit one or more trees before reaching and being impaled in the tree that we know about from the photographs?-- I see, so-----

So, I'm just - I'm just wondering, where did you get the independent information that was not available to Mr Hicks to draw a conclusion that it hit trees?-- Okay. My - looking at the accident scene from the photos, okay, perhaps there may have been a presumption on my part but I was referring to the tree as being singular.

That's not what the report says?-- Sure.

So - I'm not being critical of you?-- No.

But just in answer to your question, you can be assured that we've gone through this report with a fine-toothed comb, okay?-- Most certainly.

And that might be an example of it?-- Sure.

And the ATSB report has undergone the same scrutiny. I'd only suggest to you, Lee, that prior to publishing your report, and I fully approve of the idea that it is reviewed independently from the investigator, but it really does need to go back to the investigator, such that, if there are any differences-----?-- Mmm.

-----between your interpretation of the facts and the investigator's interpretation of the facts that is clarified before publication?-- Okay, I can accept that.

Does that make sense? All right. Now-----

CORONER: Is that report available on the net?-- The report is not available on the net at the present time, your Honour, because we cannot release information with regard to a police investigation until you're satisfied and finished with the documentation.

That's good?-- Once then, if that information is able to be released after the fact, then certainly we will.

MR TATE: All right. So-----

CORONER: Well, I just wish the ATSB would adopt the same protocol.

MR TATE: Indeed. I'll leave that with you. That might be something internally that you'd like to just implement?-- Certainly.

Now, the other thing that we have is that you've talked about the accident investigation and I'm certainly not being critical of you, your organisation or Constable Howlett but perhaps, from my perspective, things began to go terribly wrong in the investigation the moment that Constable Howlett -

Howlett contacted CASA. CASA said, firstly, that they weren't - I'll paraphrase - they weren't really interested in the - in the accident and it was a matter for police and that there was no need for the scene to be guarded. Were you aware of that?-- Sorry, there was no need for the-----

For the accident scene to be guarded?-- I was not aware of this.

No. That's all right. That's all right. So what then happened is that - and Constable Howlett got the job, may I say, and he's done the most remarkable job of preparing this investigation-----?-- I most certainly agree.

-----for this hearing - was left with the situation where he was the first response police officer on the scene. Now, how he managed to get that role was that unfortunately he got the short straw of being on duty doing general duties that day and there was a communication call and he and his partner went out to attend the scene. We then have the usual things that you'd expect, the ambulance, the police arrive, the fire service arrived and there were things occurring at the scene for Mr Scholl and then subsequently overnight the plane was not guarded because that's the advice that police received from, at least, CASA?-- Mmm.

The next day they returned, David Hicks comes up. No criticism there. He was very prompt in attending the scene. Mareeba is a fair way from Townsville when you look at driving or catching planes. We then find that a lot of the various physical items had not been seized. For example, the plane was secured at that time, photographs were taken but, ultimately, it seems to have gone back to Jaques Coffee for a period of time and, so far as I can tell, Mr Jaques at no time has been an honorary property officer for the QPS. We also have the fuel being minded by him. Mr Keogh, as the chief flying instructor talks to one of Mr Scholl's friends who arrives to take back his ute and all of the flying records and other pieces of inventory that was in the back of his car-----?-- Yep.

-----went to Mr Keogh. Now, ultimately, these things came into the possession of the police-----?-- Mmm-hmm.

-----except the microlight, which was, very kindly, being stored by Leah Spriggs, who was Philip's partner?-- Yes.

And that's where it currently is-----?-- Mmm.

-----and I assume that what we will be doing is tendering that and it will now go into the possession of the police and will be stored somewhere in their lock-up, or wherever they're going to do it?-- Yes.

So in terms of the accident investigation course that you talk about at the beginning, as well as being the coordinator of the accident investigation, it's really been a terribly fragmented early investigation; did you know any of that?-- I - I was aware that the aircraft was taken back to - to Jaques Coffee Plantation.

Mmm?-- I can most certainly tell you that in all of the other accident investigations that I've been involved with, the police have used their own storage facilities where there would be a hangar that they have leased that is in a lock-up position. Most of the time we were advised to put a guard on - on the aircraft overnight. There are some instances in the Northern Territory where that has been impossible due to police manpower, where, if the accident site has been remote - we've had one in Western Australia recently, which was exactly that, where evidence was not placed under police guard, because generally it's a police consideration that it's considered a crime scene.

That's - that's the whole point?-- Yes.

Anyway, we probably don't need to talk too much more about that?-- Certainly.

But, you see, a lot of things come from that: in this case, the question of the appropriateness of the fuel has been excluded, although Constable Howlett, for instance, would not be able to tell us that he could vouch for the continuity of the fuel, that is to say, we really area at sixes and seven to be certain beyond reasonable doubt that the fuel that was subsequently tested was the fuel that was being used in the plane?-- Right.

My friend's client, Mr Keogh, has been left in a very awkward position as the CFI in the sense that, quite obviously, there's been a lot of attention given to Philip's training records?-- Yes.

They were in his possession for a period of time, and because they were in his possession for a period of time, his client, possibly quite unfairly, is open to the assertion that he amended the documents before they went to the police. So again we lose evidence continuity?-- Certainly.

And people are exposed-----?-- Mmm-hmm.

-----in ways that, quite frankly, they shouldn't be. Does that all make sense?-- I - I agree.

Anyway, we don't need to go any further-----?-- I have a comment, if that's possible.

Yes, please, yes?-- My comment is, is that RAA investigates the accident to assist the police. We have no jurisdiction and we assist the police. We-----

On what - look, I understand that, and I'm not being critical-----?-- Mmm.

-----I'm just simply saying when we start looking at the investigation courses and how the reports are done-----?-- Yes.

-----and this sort of thing, we need to be very mindful that until such time as the police can certify to the Coroner, to his Honour, that there are no suspicious circumstances-----?-- Yes.

-----it is a crime scene?-- I understand.

The transcript of the evidence of Mr Ungermann, set out above, highlights the shortcomings of this investigation. Everything that I say about the shortcomings of the investigation must be read subject to my praise and appreciation of the efforts of Constable Howlett in assembling a comprehensive brief of evidence for my consideration. As a junior officer, Constable Howlett should not have been tasked this investigation. He has however, through his thoughtfulness and inquiring approach to the investigation, uncovered much important history and many important and relevant facts for my consideration. I also wish to compliment Mr Andrew Hicks on his investigation, his commitment to assisting in determining the cause of this crash and his full co-operation with Constable Howlett and the Court.

I have been provided with a copy of edition 4, Civil and Military Aircraft Accident Procedures for Police Officers and Emergency Services Personnel. This document confirms that the ATSB does not investigate all aviation accidents. Section 21 of the *Transport Safety Investigation Act 2003* defines the powers of the Executive Director of the ATSB to investigate aircraft accidents. The ATSB records data from aircraft accidents and incidents for possible future safety analysis and selectively investigate (within its finite budget) those serous occurrences, including fatal accidents that the ATSB believe will yield the most useful safety benefits especially for fare-paying passengers.

In general, the ATSB does not investigate sports aviation accidents or those involving amateur-built or experimental category aircraft. All military aviation accidents are investigated. I am of the opinion that this aircraft crash was one which should have been investigated by ATSB as there had already been a number of fatalities involving AirBorne Edge aircraft. After listening to the evidence in this matter of how the recreation aviation industry is structured and regulated, the community could have no confidence that any safety or other issues identified relevant to recreation aircraft flight would find their way back to CASA or ATSB. Both organisations should take a more active role in the regulation of the industry and the investigation of aircraft accidents involving the recreation aviation industry.

CASA, ATSB, RA-AUS, HGFA, Queensland Police Service (QPS) and WHSQ must review the way that these crashes are investigated. QPS operational procedures manual (OPM) contains references to aircraft incidents resulting in death. [See sections 8.5.12 and 17.3.3.OPM]

The QPS OPM policy is that, *"the appropriate police officer to investigate an aircraft incident which involves death or serious injury to any person is a forensic crash unit trained investigator or an officer from the Criminal*

Investigation Branch". This policy was not implemented in this investigation. As first response officer, Constable Howlett acted appropriately to secure the scene. However, as the Queensland Police Service running log confirms;
"1815hrs Australian Transport Safety Bureau, Bill FRY who is the duty officer for today, they advised that Ultra-Lights do not fall under ATSB or CASA and they do not have involvement and do not require the scene secured, due to recreational nature of the flight. They stated that the Ultra light Federation may be interested and Canberra Search and Rescue will contact the Federation."

As a consequence, Constable Howlett vacated the scene some time between 9pm and 10.30pm on 20th October 2005, after the QPS and the Queensland Ambulance Service (QAS) attended the scene and photographs were taken. Philip's body was removed from the crash site, and the paddock in which the aircraft was located was locked. Constable Howlett did not observe any unauthorised person approach the aircraft while he was at the site. Constable Howlett re-attended the scene the following morning at approximately 7.30am in company with Mr Hicks who had been appointed the RA-AUS investigator and who had travelled up from Townsville. I make no criticism of Constable Howlett for vacating the scene of the crash. He acted according to the instructions he was given. (see Constable Howlett's evidence pages 8 and 17).

I have set out the exchanges between Mr Tate and Mr Walsh of the ATSB, being the transcript of Mr Walsh's evidence at pages 150, to and including page 155.

No, that's all right. And there's a - an interesting situation that - that arose, and I'm just going to - to let you know how it came about and really seek your advice about what we might be able to do to try and close some of these investigative gaps. What basically happened is on the 20th October 2005, sadly for the Scholl's plane crashed to the ground. So it was a - it was a hitting of train, and I guess one of the things that this inquest or fatality enquiry is attempting to understand, is whether it may have been as a result of a tumbling event or whether it was as a result of maintenance with the wing fabric simply tearing and we loose a - one point to two metres or thereabouts at the left wing tip, and then that causes the crash. So the - the jury's out, as it were in terms of nature and cause but going right back to the beginning of the investigation, the running log from a very, very thorough police officer who was the first response officer, says this, "At 1815 hours the Australian Transport Bureau duty officer for today was called.", and the police officer's note is, "That the ATSB advised that ultralights do not fall under the ATSB or CASA.", and that, I guess, CASA and the ATSB do not have any involvement. Now, I'm not being critical of the duty officer by any stretch of the imagination, but it seems that police then gained the understanding that there was no requirement by the ATSB or CASA for the scene to be secured because it was - the recreational nature of the flight and the duty officer suggested that the Ultralight Federation may be interested and, you know, Canberra Search and Rescue will contact the federation or something along those lines. Now, the - the first thing I was wondering is that as I have read the Queensland

Police Service OPMs, which is their Operational Procedures Manual, there's a fairly clear indication to police that they should ring the ATSB as soon as they're aware that there is a - an incident involving an aeroplane. Now, I take it from your perspective that's exactly what you would want to have happen?-- That - that is correct. In fact, under the Transport Safety Investigation Act, those things are required to be reported to the ATSB.

Yes. And obviously that then makes you the first port of call and decision maker about whether your investigators need to go out or whether some other course is adopted. It's - it's not magic, is it? It's what you'd expect?-- Absolutely.

Now, equally, I don't have any difficulties with the duty's - duty officer's comment about, you know, look this is recreational so you need to talk to the recreational people about it, they may have an interest. But, the - the one piece of information that has created a bit of a kerfuffle for us is that there was no need or no requirement from the ATSB or CASA to secure the scene and what flowed from that was that the police left the plane unguarded, from about - the times aren't really important, 7 o' clock in the evening, 7.30 in the evening through to first light the next day when they returned with Mr Hicks, the investigator from the RAA and various other things also flowed. We didn't have the same degree of securing exhibits, as it were, or securing the scene, obtaining all of the records, obtaining the - the petrol, all that sort of stuff. It became very fragmented over the next number of days. Now, you wouldn't have been aware of any of those sort of difficulties within the investigation, I take it, in terms of [indistinct]-----?-- No, I'm not aware of that at all.

What I-----?-- I mean, in terms of-----

What I was going to-----?-- I don't want to be critical of - of my duty officer either, but I - you know-----

What I was going to - to ask you and I thought this might be the nicest way of dealing with it is, I'm just wondering whether the ATSB could work with the state police services and the recreational services to have some sort of protocol or do something so that first response police actually can get a bit of paper that tells them what they should do. Do you follow what I mean?-- Certainly.

Is - is there anything like that in place at the moment? I mean, I think-----?-- Yes, there is.

I think the problem we've got, Julian, is that for someone like yourself this is your bread and butter and you know exactly what to do, but my feeling is that a lot of first response police, particularly with recreational centre - recreational sector really don't quite know what to do and are uncertain whether this is a bit like another car crash and we should get the - the, you know, traffic accident branch out to have a look at it or exactly how it should all piece together?-- Mmm.

Can you - have you got some advice for the Coroner on that point?-- Well, there certainly is a - a - a handbook for first respondents to aircraft accidents which is a - it's a small handbook that is developed by the ATSB also in conjunction with defence-----

Yes?-- -----because there's a fair bit of information in there relating to the hazards of military aircraft.

Yes?-- That handbook also describes the sorts of things that should be done in terms of preserving evidence in the - in the first instance.

Now, you'll be - you'll be - how many pages would that be, just as a matter of interest, that handbook?-- Look, it's - it's very much of a brochure style-----

Yes?-- -----but I - I - it's on our website and available. I haven't got one in front of me but my recollection is that it may be 40 or 50 pages but more of in - in a brochure sort of style.

Yes - yes. And that - if I asked Constable Howlett to contact you, not today, because it'll be too late, but tomorrow morning, would you be able to show him where to get that downloaded off your website?-- Certainly, I can - I can arrange for that for you and - and I can also send you - you know, send you hard copies if you'd like some - some proper hard copies sent.

If - if that could be sent to the Coroner at Mareeba, I think that would be a great help, because I think-----?-- Yes, I can do that, not a problem.

I think one of the issues that clearly flow from this is whether the police OPMs need to be amended so that we're better able to, you know, get it right initially?-- Yeah. Well, look I - you know, there's certainly significant issues that you raised in relation to preservation of the site. I mean, our advice always to - to any police that we're speaking to, 'cause generally they're the - obviously the - the ones who get there generally first.

Yes?-- But it's like a crime scene, which - and obviously if we're investigating, we - we - we place a protection order under our Act on - on the scene.

Yes?-- And on - on various components, even documentation and the like. But - and the best way that we can describe that to police when we - when we tell them that we're placing a protection order on it under our Act is, we essentially say, treat it like a crime scene, so you know, don't touch anything unless you need to, to preseve life or-----

Yes?-- And/or for removal of deceased if they need to as well.

Yes?-- Which is - which is fine. So, we're also doing some - we are doing some training, we've been providing some training to - to RA-Aus, to the Recreational Avaiation people.

They - they told us about that. What is your hope with that training, where do you want to try and take these - I'm going to be awful here, but in a sense they're - they're all lovely people that we've met, but they do remind a little bit of the boys that get together on a - on a Saturday afternoon to run their model train sets. They're very much enthusiasts, very keen on what they do, but-----?-- Yeah, look, I've had dealings with - with a number of the - the officials from RA-Aus and certainly see them as being well motivated.

Yes?-- The - they participated well in our - in our training courses. We certainly had a couple of representatives from RAA assist us with an investigation down in Latrobe Valley in Victoria recently, where we had a - a VH civil registered aircraft and an ultralight aircraft collided-----

Yes?-- -----in the circuit area of Latrobe Valley, and unfortunately the - the pilot of the ultralight aircraft died in the accident.

Yes?-- And I have to say that our people were very impressed with the two particular individuals that came to assist us there. They - they seemed very well prepared, they had very good equipment. I think they had undertaken some training with us at least-----

Yes?-- -----that I'm aware of.

Now, I think Lee Ungermann was one of those people, wasn't he?-- Yes, I think he might have been; that's correct.

Do you recall who the other was? Julian, it doesn't-----?-- Sorry, I don't - I can't-----

That's all right?-- -----recall who it was, but-----

If we can square away that - that initial thing, the - the second thing is, is it possible to help us understand where you want to take through your training that you offered to these investigators, where do you want to take them, what sort of competency are you hoping to give them and do you certify them in any way?-- No, look, we don't provide any certification and - and clearly, I - I wouldn't want any sort of misunderstanding that we would be intending that they act on our behalf of that they're our representatives or anything like that.

Certainly not, we - I'd see it-----?-- [Indistinct].

-----as a recognised training organisation, if you know, that's a Queensland term saying you're a training organisation. You empower other organisations, you're - they're not acting as your agents, they're not your sub-investigators or - or if you're the sheriff, they're not your deputies?-- That - that's correct. We - we are a registered training organisation and our training is generally done through our own people but obviously there are opportunities for others to come and participate in those courses and that's generally where we - we offer RA-Aus some opportunities where we have vacancies and we don't

charge them any professional fees for them to - to join in those training opportunities.

How long are those courses and do they come out with a certificate?-- There is - they are a range of different specialist courses that - or training activities that - that we've offered to them and some - some that they come in on. One of them is our analyst course which - we've got one coming up later this year and I've just recently in fact today written to - to Mr Ungermann offering some positions on that.

Yes?-- We also have a - a two day training course in cognitive interviewing coming up which is also in a letter that I've written to Mr Ungermann today about.

Now, that - that sounds to me very exciting, what is cognitive interviewing?-- Well, it - it's the interviewing process that the ATSB employs so it's really giving them the - the interviewing skills to-----

I see?-- -----try and extract as much information in a non-threatening way to - to people involved in - in occurrences.

Okay, I understand?-- So, look, it's really an opportunity basis type thing. They - they don't really come out with any formal qualification in relation to it. The only one where we do give them a - we can give them a - it's actually a card which shows that they've undertaken blood borne pathogen's training-----

Yes?-- -----to - which we - we require of anybody who's working on site with us, but it's obviously an important thing for others as well so we again provide the opportunity for that and I think Mr Ungermann's done that training with us.

Yes, he has. I'm just wondering, Julian whether there's some benefit in the Coroner considering the construction of some sort of course. Now, it's going to be elementary in comparison with the skills and experience and the training that your people have, but whether there shouldn't be some sort of attainment requirement before one of the investigators appointed by the recreational organisations are actually permitted or encouraged by their organisation to go out and undertake an investigation; do you have a few on that?-- My only view, I think, would be in terms of how - how they achieve that standard.

They'd need to-----?-- In terms of ATSB investigations it's - there's not a one size fits all, sort of qualification and our - our people come to the - the bureau, they receive training in a number of areas, a number of specialist - short specialist courses on various aspects of investigation, but they do that over a fairly extensive period of time and while they're doing that they're also learning on the job.

Yes?-- And it's - you know, it's a process that can take realistically 18 months to two years before we consider we've, sort of finished our - our training process although even after two years there's - people are still very clearly developing and we have a - a diploma program within the bureau and is a - a

process that takes generally probably 18 months to two years but a lot of that is actually competency based in terms of demonstrating competency in the field and those sorts of things so in terms of RA-Aus having to, you know, provide some sort of qualification for their people before going out I'm not sure how practically they - they would be able to achieve that so that - that would be my only reservation, but obviously some form of development and training program and obviously then some sort of monitoring and demonstration of competencies as people do work with other people who are - who do have some sort of training competency would be very useful for them.

And certainly it would, you know, need to be appropriately funded and all that sort of stuff but, I guess, the other aspect is that where Coroners don't have the benefit of assistance from the ATSB and you people from my experience do the more thorough reports that are around matched only by the Queensland Mines Department I suspect, but it's a very difficult situation for both the Coroner as well as the Sports Recreation Investigate. The investigator tell us, "Well, we've got no right to be there. We offer our services to the police.", and you can imagine the police are only too happy to accept that special input-----Yes.

-----and ultimately we end up with a - a report to the Coroner and you'd agree with me, I think, that normally any aircraft accident is quite a complicated set of inter-relating factors that ultimately end in a tragedy and it's a bit ask to have these people then turn up in a Court situation to try and assist a judicial officer determine nature and cause and I'm just wondering whether you have a view about what we can do in that area?-- Look it is - it is difficult and I think us, you know, we certainly try to assist various state authorities, you know, where there have been accidents that we have not been investigating.

Julian, your organisation is legend. I'm really wondering here whether you had any advice for the Coroner concerning, you know, helping these other organisations where - in circumstances where you can't do it to ensure that they're - they're fully equipped to - to be able to carry out what might be described as an investigation on behalf of the Coroner and the awkwardness there, as you know, with the Australian system is that we have Coroners and their jurisdiction is state, but it's to look into fatalities, understand the nature and cause, and then attempt to ensure that there are recommendations to improve public safety or to avoid a reoccurrence?-- Yeah, look, it's a very difficult question. I don't know that I've got any easy solutions. I know in the case of New South Wales they - the police there have set up an aviation support unit that actually is - is doing and is specialising in, as I understand it, aircraft accident investigations to cover, in particular, those sorts of cases where - where the ATSB is not investigating. We've had a fair bit of interaction with - with those various people and I think they're attached to the New South Wales Coroner's office.

Constable Howlett understood that CASA and the ATSB were not interested in the investigation and that the investigative role would be handled by RA-AUS. He was justified in having this belief. Had a more senior officer been

appointed to the investigation the crash scene may have been treated more as a crime scene and proper steps taken to secure the aircraft, fuel, aircraft maintenance and training documentation, and any other relevant material evidence. Ideally QPS, WHSQ, CASA, ATSB, and RA-AUS would have co-operated to determine a head investigator and the appropriate investigative steps to take.

Issues of continuity and the spoiling of evidence have not assumed any great importance in these proceedings, although these issues have been undercurrents throughout the course of the inquiry. As Mr Tate has pointed out, Mr Keogh was placed in a difficult situation of possible criticisms being levelled against him to the effect that endorsements in Philip's training manuals were made after the occurrence of the crash.

As I expressed at the inquest, it is of concern to me, and I expect would be of concern to the community at large, that the ATSB does not involve itself in the investigation of all fatal aircraft crashes. This incident is one of several involving the Edge Microlight aircraft. Thorough investigation of these incidents by a central organisation may well have brought to light issues that may still be relevant in preventing further fatalities. It is also of concern that, at least so far as Mr Walsh is aware, the recommendation of the State Coroner in the Lockhart aircraft crash, that there be some external consultation to try to remedy any difficulties that might exist between CASA and the ATSB has not yet occurred. The community must therefore assume that the difficulties referred to by the State Coroner, Mr Barnes in the Lockhart aircraft crash between CASA and the ATSB still exist. CASA and ATSB made submissions to me about the concerns I have raised. ATSB advised me; "The 'Miller Report' was subsequently released by the Government on 20 March 2008 for industry comment, which was to be provided by 30 April 2008. The Miller Report and feedback provided as part of the industry consultation process are being used as one the sources to inform the Government's Aviation Green Paper processes. The National Aviation Policy Green Paper was released by the Minister for Infrastructure, Transport, Regional Development and Local Government on 2 December 2008". CASA advised me; "..it would not be accurate to state that difficulties referred to by the State Coroner in the Lockhart accident still exist. On 30 April 2008, the Minister for Infrastructure, Transport, Regional Development and Local Government, the Hon Anthony Albanese MP, released a report dated November 2007 on the relationship between the Australian Transport Safety Bureau (ATSB) and CASA." Although the advice from ATSB and CASA is not identical I hope that the result is that the concerns raised by Mr Barnes have been addressed.
Mr Walsh's evidence relevant to these matters is set out here in full and appears at pages 160 and 161 of the transcript of his evidence.
CORONER: Yes, so maintenance and training records really are imperative to the history of the aircraft?-- Imperative to the history of the aircraft and to the - the - the history and the - of the - of the pilot and the experience of the pilot.

Mmm. I'm just having a bit of difficulty coming to grips with what appears to be the - the case that the ATSB is not required to be responsible for the

investigation of aircraft incidents involving fatalities. I - I would've thought that - that your organisation would have, as a matter of course, investigated all aircraft incidents where there were fatalities. That's not the case?-- No, that's not the case. And we - we do not, as a matter of policy - obviously the - the ultralight end of the business we - we generally do not look at although obviously we've assisted on - on a number of occasions to do some sorts of component testing on - on occasion. But even in the VH-registered aircraft that were alluded to before there are a number of those aircraft that are on the civil aircraft register but they're - they're classified as experimental category aircraft or amateur built aircraft. And even those, as a general rule, we do not investigate although on occasion we have where there's a particular concern. For example, recently there was a - a number of accidents or two fatal accidents in very quick succession involving Lance Air amateur built aircraft which are experimental aircraft and I - we normally would not investigate those fatal accidents but given that there were two in very quick succession and both happened in built up areas we - we did end up having a look at those. So, on a case by case basis, we may consider doing some of those but certainly there are - we don't generally look at those at all.

Would the priority be any higher if it was a recreational type aircraft like the microlight which was being used in a commercial sense, that is carrying passengers. Joy flights if you like?-- Well, probably not. In - in terms of the - with the controls on that type of aircraft it's a - it's a higher risk activity that - that - that generally we - we would not look at. And it's the same for some higher risk flying involving, again, VH-registered aircraft where people might want to go flying in a - in a - in a Warbird or something like that and if it was an experimental category aircraft which, again, isn't subject to the same level of scrutiny and - and inspection that a normal aircraft is exposed to we - we wouldn't necessarily look at it.

I suppose the point that I'm making is that unless these things are properly investigated by somebody with your expertise we're bound to repeat the mistakes of the past. And it's been brought to my attention that this is at least the third of this type of incident - probably involving the same sort of aircraft. So, it seems the lessons have not yet been learnt by the industry. Look, finally, I just - this may not be relevant and you may not be able to comment on it, but I notice that the State Coroner in his findings in respect to the Lockhart incident actually highlighted a difficulty between the interaction - or the interaction between the ATSB and CASA. Now, at this stage, I obviously have not formulated any recommendations at all but I was simply interested to know whether or not the recommendation that there be some external consultation to try to remedy any situation that might have existed, whether that's been attended to since last August?-- The - the previous minister agreed to a set of terms of reference for a review between - of the co-operation and the relationship between the ATSB and the Civil Aviation Safety Authority. That was conducted by Mr - Mr Miller. He completed his review in December last year and provided his report. He's the new minister and - the report is still under consideration by the government.

Another concern regarding the investigation relates to the involvement of WHSQ. Prior to the taking of evidence in this inquiry, RA-AUS, HGFA, CASA, ATSB, WHSQ, Mr Keogh and Philip's family were provided with a copy of the report prepared by Mr Lyne, the Court appointed expert. At the hearing Mr Tate, Counsel assisting, gave the witnesses opportunity to comment on the report and the recommendations being put forward by Mr Lyne. In particular, Mr Lowe gave evidence on behalf of the WHSQ. At the time of giving his evidence, which was by telephone, he was accompanied by Mr Lee who also had input into the evidence. Further comments were received from Mr Henneken, Director-General of the Department of Employment and Industrial Relations by letter dated 12th May 2008.

Unfortunately it appears to me that the attitude that the recreation aviation industry is less deserving of resources permeates throughout the system so that regulatory vacuums exist in the areas of regulation, inspection, investigation, and enforcement.

In respect of the recreation aviation industry it appears that there is a duplicitous responsibility shared by CASA and WHSQ. The effect is regrettably that WHSQ defers to CASA which in turn regards the recreation aviation industry as one of, if not the lowest of its priorities. Mr Henneken appears to confirm this in his correspondence to me where he advises;

"It is clear that CASA has a primary role for air safety regulation and I am concerned that the introduction of another regulator, such as Workplace Health and Safety Queensland, would produce unnecessary duplication and confusion for the bodies being regulated."

"The fact that the primary regulator does not prioritise a sector such as sports aviation and will not generally conduct direct routine surveillance of non-passenger carrying operations should not mean that regulatory responsibility automatically defers to an alternative regulator. I would strongly advise against making any recommendations that Workplace Health and Safety Queensland has a greater role in aviation safety that it has at present."

"The Workplace Health and Safety Act 1995 applies to all persons who conduct a business, or undertaking, to ensure the workplace health and safety of themselves, their workers and all other persons who might be affected by the way they conduct their undertaking."

"Does the Act apply to Keogh/Adventure Micro lights?
From the information provided Mr Keogh undertook the business of providing microlight aircraft flight instruction and therefore the Act does apply to him."

"The question to be determined, then, is whether the incident occurred as the result of some act or omission by Keogh in the course of his business of providing training. However no evidence to support this point was presented".

"While Workplace Health and Safety Queensland has jurisdiction in these situations, it is a dual jurisdiction with the Commonwealth. The Civil Aviation

Safety Authority is the lead regulatory authority primarily responsible for aviation safety matters, including approved training schemes for pilots, registration of aircraft, the safety of airfields and the associated emergency procedures. Accordingly, Workplace Health and Safety Queensland does not have jurisdiction in above matters."

It is accepted that CASA is the primary regulator and has the primary responsibility for ensuring safe skies in Australia. Equally clearly WHSQ has an identifiable statutory role in respect of some aspects of the recreation aviation industry. There is evidence of unsafe and illegal flying practices within the Mareeba area. There are a limited number of flight training schools/aircraft landing areas in the area, investigation should not be difficult. It has been suggested to me that Philip's death is as a consequence of the lack of appropriate training and/or the acceptance and passing on of bad practices. The authorities need to take notice.

WHSQ should clearly identify its area of responsibility within the recreation aviation industry and manage that responsibility as it does with any other industry sector that falls within its legislative sphere. It is of concern that an incident such as that which caused Philip's death should so readily be determined by all concerned to be the responsibility of some other organisation. This decision appears to have been made quickly and before any of the concerns which are the subject of this inquiry were identified.

It is as well in these findings to set out below a portion of the transcript of evidence from the 21st February, being at pages 165 to 170 and being the evidence of the WHSQ officers Lowe and Lee. Mr Lowe was called to give evidence; his evidence was taken over the telephone. It became apparent to me during his evidence that he was not alone, and then Mr Lee who was present with Mr Lowe was drawn into the inquiry. The effect of the evidence is to confirm that WHSQ does have a role to play in the regulation of safe practice within the recreation aviation industry in Queensland and that notwithstanding any duplicity of regulatory involvement preliminary inquiries should be undertaken to determine the proper extent of WHSQ's involvement in such events.

The next aspect of this is that from the same premises they also offer you the opportunity of taking micro - microlight flights and it would appear that whilst they are covered by the recreational aviation organisation there - therewith, it's nonetheless very much a part of the business. So, for example, if - if I can suggest this, if Adam you came and you were accompanied by Adam Lee and I, the three of us, went out there we'd be able to drink tea or coffee, we'd be able to go for our ride round the plantation in the truck and then after doing all of that we could go for our recreational flight. When we started to look at aspects of the business we found that in common with many agricultural areas they are very weak at understanding safety and health management systems?-- Mmm.

And we found very little to really support the safe operation of that aspect of the business that related to a flying school, which was on site and was a

commercial arrangement with the owner of the - the business so that we had two businesses there, we found very little in the way of emergency response, risk management or anything else that might be usually required by Workplace Health and Safety in terms of the normal expectations your organisation has of a workplace. The only other thing I need to tell you is that there is a takeoff from Jaques coffee by someone who is technically still a student of the flying instructor who is part of all of this and there's a fatality. Whilst I can understand that there's good reason for Workplace Health and Safety to say, well we need a specialist investigation to understand what may have occurred in flight. What I've never really understood is why Workplace Health and Safety would not investigate the workplace to see whether there was, for want of a better word, ground breaches of your - your statutory obligations on the obligation holders, can you help us understand that? And - and please in talking to us we all know that no-one told you about this incident?-- Mmm, thanks, Mr Tate. In the circumstances you've described, on face value there might - well I would suggest there would be some grounds for - certainly at the very least a preliminary investigation by Workplace Health and Safety. Workplace Health and Safety investigate workplace incidents, workplace activities and incidents arising out of workplace activities, and central to our interest in such matter is what is the undertaking of the obligation holder, the relevant person. So, if there's someone conducting an undertaking, one of the very important issues we would examine is what is the undertaking? Is it, in these circumstances, the provision of an airfield? Is there - are there directions and instructions? Is there a reliance upon the obligation holder? And these are all issues that we would need to explore and apply the test of: what is the undertaking and is there a hazard and a risk which emanates from that undertaking. Now, they are the grounds that we would certainly take a preliminary look, and in the circumstances you have described, I would say that had this issue been brought to our attention, then there certainly would have been some questions asked. Insofar as how far our role extends into issues of when there is a flight and the operation of an - an ultralight, these would need to be very closely explored to see if there's any existing or superior legislation or governing bodies such as CASA or the ATSB, I think it is, that would have - have primacy in such issues.

In this case, what I can ask you to just simply accept is that the ATSB would see itself as having no role in investigating the incident. That's what they have told us. And so their legislation really wouldn't be applicable?-- I - I can't really comment on their position.

No, I'm - I'm just telling you that's - that's what we've been told by the deputy director of investigations this afternoon. So we have - that's the evidence, as we understand it?-- Okay.

All right. Well, the - we had the whole situation reviewed by a Court appointed expert and he's suggested a number of recommendations to the Coroner, or given advice to the Coroner about recommendations, and I just wanted to let you know that in that report there has been some advice to the Coroner that relates to workplace health and safety, and this might be something that I - I'll speak fairly slowly; there's not too much for me to read it,

and it's probably the case that Adam Lee may want to take a note of this as it might be more applicable for - for him to help us, although you might both be able to help us. And the suggestion is simply this: that Workplace Health and Safety Queensland consider the need for new regulations such as, one, all aircraft flying over public property and roads must be registered with CASA or its delegates. Adam, did you catch that?-- Yes, I did.

(b) all private airports where commercial activities are undertaken must be registered as a work place. Now, I'll just have to give you a little bit more information there. The airport that we have on Jaques Coffee - this is where the microlights take off and land - is not an airport that is really registered in any way whatsoever with CASA, and CASA would say that it was simply an aircraft landing area. So it doesn't fall within their ambit of regulation, and the concern that we have at the moment, I think, or the expert has, is that, well, who is it then that can take regulatory ownership of a private air landing area which is really part and parcel of a conglomerate business such as the one we're talking about, which is Jaques Coffee. The third is that pilot training only to be conducted in currently registered aircraft and by currently accredited training providers, and lastly, (d) private airfield operators must ensure that pilots - and these are recreational certified pilots in microlights and what have you - using their facilities are fully briefed on and implement emergency procedures in use at the site. So that's very much a - risk management thing. Now, of course, if the Coroner made these recommendations, it would be up to Workplace Health and Safety to consider their relevance, and I'm going to ask you what your thoughts are in a moment, but just before I do, one of the things that we have been told about is low flying as a real problem, and apparently these - these craft are being landed on public roads and there seems to be quite a legal issue about who might have jurisdiction to say, "You're not allowed to land on public roads", whether it's CASA, whether it's the Queensland Police for - I don't know - landing a vehicle on a road contrary to TORUM or something or other, or whether it's the local council or whether it's Workplace Health and Safety, and so I guess the concern is that there appears to be some sort of legislative vacuum that might be really needing to be looked at to properly protect the public. They're all - that's all of the information and suggestions that have been made. Do you have any advice for the Coroner, either or both of you?-- The issues that are raised, they're all very good questions. I'm probably not in a position - a lot of these issues go - are policy related positions - policy related questions that would need to be considered by our dedicated policy branch of our department.

Yes?-- I'm - I'm really sort of not the person to be commenting on those - those aspects, so I'm not sure I can really help you in those respects. We would be very pleased to provide a response to those recommendations, and I think you identified some particularly pertinent issues there, and I could guarantee that we would provide you with some feedback subsequent to this hearing, but there's nothing more I can add. I'm not sure whether Mr Lee can expand upon that?

Well, just before we go to Mr Lee, if we were to provide you with a copy of the Jaques pamphlet, so you - you have that-----?-- Yes.

-----together with, perhaps, the opportunity of speaking further with Constable Howlett to make sure that you've got those particular issues written down, how long would it take you to get a - a letter back to the Coroner?-- Oh, I'd say we could - in response to the issues you've raised-----

Yes. We can also, if this is of any assistance, send you a copy of Mr Lyons' report?-- Okay, look, if you could get us that information, we could endeavour to - to have a response back by late next week. That's not too late?

MR TATE: Your Honour, would that be a suitable timeframe?

CORONER: I'm not going to get the findings done in that time, that's for sure.

MR TATE: Look, that would be more than suitable. Now, I think Constable Howlett has your contact details, doesn't he?-- Yes, yes, he does.

All right. You can expect a call from him tomorrow and, with his Honour's leave, I'll just ask him to make sure that you have a copy of Mr Lyons' report. A lot of that really isn't relevant to you, but you might pick up the flavour of the - the concerns that are being expressed. Mr Lee, was there any contribution that you could offer at this point of time?

MR LEE: I would offer one contribution. Your Honour, do you require me to take an oath and be sworn in relation to this matter?

CORONER: I don't think that's necessary.

MR LEE: Well, my observation is that - or my contribution is to supplement the answer given by Mr Low in relation to your original question concerning the nature of the undertaking. I think that, from a Workplace Health and Safety perspective, the difficulty, if one looks at section 28, particularly section 28 subsection 2, which is the primary obligation section for persons conducting businesses or undertakings, it says that the obligation is discharged if the person or each of the persons, workers and any other persons are not exposed to risk to their health and safety, and importantly, it goes on to say "arising out the conduct of the relevant person's business or undertaking", and that's, I think, the central question that would be analysed given exposure to particular hazards. It would be - the question would be whether the risk that emanated from that hazard in fact arose out of the conduct of a particular business or undertaking, and you gave a number of scenarios in relation to this particular matter

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MR TATE: It's not so much, Adam, scenarios, it's rather that it's a conglomerate business which is very difficult to not consider in a Gestalt, in other words, as a whole.

MR LEE: Yes. I guess if one looks at it by way of example, if you have a private - a - a pilot operating privately, operating their own aircraft and there was an incident involving their own airmanship it may not be something that arose - the hazard and consequent risk may not have arisen out of the conduct of the undertaking carried out by someone who may manage the airfield or who may conduct the coffee shop or activities of that nature. So, whilst there being a workplace is a necessary prerequisite to the operation of the Act it is also necessary to determine if the obligations themselves in fact have application to any particular scenario. And that I think is a fact that it's relevant or would be relevant to our preliminary investigations.

Right. Now, that's all the questions I have. If you just wait there, please, there could be some further questions. Apparently not.

CORONER: Yes.

MR TATE: So, it's back, I think, to his Honour.

CORONER: Mr Low or Mr Lee, I'm just having a look at section 9 of the Workplace Health and Safety Act?-- Yes, your Honour.

Now, we have an airfield which is - has an associated infrastructure in the form of sheds or hangars and from that airfield and associated infrastructure people conduct business. They conduct the business of training, they conduct the business of, I was going to say, maintenance, I'm not sure if that's strictly correct, but maybe we should stick with training?-- Yes.

Now, that would seem to me to make that facility a workplace?-- Yes, that's correct, your Honour.

And picking up on the analogy which is actually - or the example which is actually given in the Act, "A vessel used for teaching members of the public to scuba dive.". So, if that aircraft, that microlight is used for teaching members of the public to fly why wouldn't it be regarded as a workplace?-- I think in that scenario, your Honour, it would be regarded as a workplace and if the training activity was being undertaken it may well be - the risk that may arise on that particular occasion may in fact be risks that are required to be managed by the - the entity conducting the undertaking and therefore potentially section 28 would have application.

Well, it seems to me to be clearly the case that-----?-- Yes.

-----that that's the way it is and regrettably you may not have been aware of this, but as Mr Tate I think has pointed out neither CASA nor the ATSB has any particular interest in investigating these types of incidents and that is left to a voluntarily organisation who are doing their best - or who do do their best but it would seem to me that there is some scope for your organisation to be involved in the registration of these workplaces and of the investigation of the incidents which arise at and as a consequence of the use of the - the aircraft

as a workplace?-- Yes, your Honour, I - I would agree and that's acknowledged in the correspondence that's been forwarded by the department for your Honour's consideration.

Well, it certainly may be ultimately that the Queensland Police Operations Manual will have to be amended to ensure that, if it hasn't already got this in it, that your organisation be conducted in respect of these matters immediately?-- Yes, your Honour. Subject to the qualification that I made earlier, if your Honour was - there was a situation where the aircraft was operated privately and there was no connection with a workplace-----

Yes. Yes?-- -----it is a matter that we may in fact not have jurisdiction to-----

Oh, certainly. That - that - that would be a given?-- Yes.

In recommending that there be a review by CASA, ATSB, HGFA , RA-AUS, QPS and WHSQ of policies and procedures in respect of all matters relating to the recreation aviation industry, I point out that the QPS OPM at 17.3.3 specifically provides that, *"officers who attend an aircraft incident where any person has been killed or injured or where there has been damage to property, are to ensure that the following agencies are advised of the incident; ……(ii)* ***if the aircraft incident may have occurred at a workplace*** *(see Section 9 of Workplace Health and Safety Act), a local Workplace Health and Safety inspector".* This procedure appears to limit the police officer's duty to report the incident to WHSQ to the occasion where the incident occurred at a workplace. With respect to the many dedicated police officers involved in investigating accidents of all sorts, a police officer may not necessarily be appropriately equipped to determine whether an event occurred at a workplace or not.

The procedure is in conflict with the memorandum of understanding between QPS and WHSQ paragraph 10 Schedule I "*dealing with incidents and complaints where aircraft are involved*", which is to the effect, *"QPS agrees that QPS officers who attend an aircraft incident* ***where any person has been killed or injured will advise the local DIR office****".* Although paragraph 10 does go on to say that, *"if the aircraft incident falls within the scope of the Workplace Health and Safety or Electrical Safety legislation, DIR procedure, "dealing with incidents and complaints where aircraft are involved" will apply".* The latter part obviously is an obligation on the DIR officer to determine the procedure to be adopted whereas the obligation on the police officer is to report every death and injury to the DIR office. The QPS OPM should be reviewed to ensure consistency with the memorandum of understanding.

Where an incident occurs that involves the crash of an aircraft it would seem sensible that all regulators and investigators be involved and that either a joint preliminary investigation be undertaken or that a lead investigator be appointed to conduct the immediate inquiry with a view of then determining whether or not other investigators and/or regulators would become involved in the inquiry. A formal identifiable approach to such matters should be in place

so that tragedies such as Philip's death and those of many others in the recreation aviation industry do not go unnoticed even when there may be threads of commonality and concern which link them.

The final concern about the investigation is in respect of the preparation of the RA-AUS report by Mr Ungermann. This matter is referred to in the transcript set out above (being pages 7 to 11 the transcript of Mr Ungermann's evidence), and relates to the inclusion in the official RA-AUS accident report prepared by Mr Ungermann of the statement that, "*the impact site exhibited little to no forward horizontal motion as the impact was almost vertical after contact with the surrounding trees"*. Mr Ungermann indicated that he drew the conclusion that the aircraft had collided with "trees" from the photographic evidence. However, the evidence of Constable Howlett and Mr Hicks is categorical that the damage to the sole tree was the only damage that they observed to any of the standing timber in the near vicinity. The assumption by Mr Ungermann, and the use of the word "trees", may be understandable and appear innocent enough however the matter does assume some importance in trying to determine the trajectory of the aircraft and what caused it to crash to the ground. It is no doubt, but one of many lessons to be learnt by everyone involved in this investigation, that it is the facts which are to be recorded and not an unverified assumption.

CONCERNS REGARDING THE EDGE MICROLIGHT AIRCRAFT

Item tab 27 of my brief contains correspondence between Chris Brandon and the Hang Gliding Federation of Australia. There is also included correspondence between Shane Press and Chris Brandon. Mr Brandon and Mr Press were expressing concerns about pilot instruction and commercial operations in respect of weightshift microlight aircraft. Concerns about the Edge aircraft were also being raised. This correspondence took place between 1993 and 1996. The concerns expressed by Chris Brandon and Shane Press edited from their correspondence include:

Chris Brandon to HGFA. *"The minimum standards are required, to maintain an acceptable level of safety within Sport Aviation. To compromise these standards is definitely a significant backward step.*

The current model Edge aircraft manufactured is most definitely over weight. The electric start, longer based tube, modified seating and the reinforced mast tube have added at least 10/12 kilograms to the MTOW. But why is it still placarded 178 kg? The Edge aircraft weighed 176 kg in 1992, and that was without all the add-on extras! So how can this aircraft be legally registered?

The incident rate over the past 12 months for Edge aircraft pilots having incidents/accidents is far too high – even if we consider their (sic) are more Edge aircraft operating than other models. We have had one Edge aircraft tumble and a second incident that may have been a tumble. A double fatality at Kyogle in a brand new aircraft – pilot skill on earlier Edge type 200 hours+ ! The Edge aircraft had five mast failures before an Airworthiness Directive was disclosed in the national journals to allow a new modified mast to be

mandatory fitted. Numerous pilots complained about the pitch stability and handling characteristics of the Edge. Airborne conducted modifications to the wing to improve this, but is the Edge still certified 100 per cent?"

Concerns about the Edge aircraft were raised by Shane Press. He advised Chris Brandon that, *"I purchased a 10-93 model Airborne Edge new… Right from the start, my new aircraft was terrible in turbulence with little or no pitch pressure. This aircraft was just not stable and was quite frankly a hand full in rough weather. On the 5 May 1995 I took my wing to the AirBorne factory to modify my wing, by machining 20 mm from the length of the cross bar and they made other small alterations to the wing. This was to bring my old spec wing up to the new executive spec wing. To this day this wing is a dog and is unstable. I believe I was sold a lemon."*

It is apparent from this correspondence that there have been a number of concerns about the Edge aircraft and generally about the way that the recreation aviation industry has been controlled. HGFA did respond to the concerns of Chris Brandon, concluding in their correspondence of the 5th April 1996, *"If you have not provided substantiating details supporting your claim by 15 April 1996 the Board will assume that you are no longer concerned about the operational safety of the Airborne Edge 582E".* I have not been provided with any other material in respect of the matter. It is certainly unfortunate that HGFA did not involve itself more vigorously in investigating the concerns raised. Perhaps the fatalities that have occurred since these concerns were raised by Mr Brandon could have been avoided if more notice and concern had been shown at the time.

As a result of my inquiry I have found that there have been a number of other fatalities involving this type of aircraft. My search for fatality events involving AirBorne Edge aircraft has not been as thorough as it no doubt could be and I do not have the resources for unearthing the statistics and reports regarding all such crashes, however I did in my inquiry locate more fatality events involving AirBorne Edge aircraft.

On 25th March 1997 a Coroner published findings in the inquest into the cause and circumstances of the death of **Alan Caruana.** At the time of his death Mr Caruana was flying his "Airborne Edge" micro light aircraft. This incident might also be referred to as the **Hexham incident.**

Then there is the matter of **Mr Panckhurst** who died at Benalla Airport, Benalla Victoria on 14th April 2001 while flying his AirBorne Edge X582 fitted with a Wizard Wing powered hang glider, and the matter of reference **NSW.2003.2437 and NSW.2003.2436 (two deaths)** names unknown, Airborne Edge micro light aircraft being take off from Tyagarah Airfield in the Byron Bay area. This incident note records, *"Bureau of Air Safety informed and did not attend".*

The next incident refers to the findings of Ms Helen Roberts, Deputy Coroner, released on 19th July 2006 and relates to the death of Peter **Ewald Brisch** on 2nd October 2005 on the Stuart Highway in the Coomalie (Northern

Territory) area, the aircraft was an Airborne Edge X, fitted with a Rotex 582 two stroke engine with an aero fibre, Brolga propeller.

There is also the matter of aircraft **32-4388**, a fatality that occurred at Cessnock on the 21st January 2006 and which is referred to in the ATSB report.

AirBorne Edge fatalities that have been brought to my attention therefore are the matter of Philip Scholl, the Hexham incident , the Brisch incident, the Cessnock incident of the 21st January, 2006,(referred to later) the Panckhurst incident, the Byron Bay incident in which two people died, and the matters referred by Dr Gratton in his advice to me. Dr Gratton advised that he was aware of five incidents involving this type of aircraft, they being; two in Australia, one in Cyprus, one in South Africa and one in the UK, *"none of which seem to be lending themselves to any kind of straight forward explanation"* – Dr Gratton.

If the ATSB would not attend a double fatality it is unlikely that identifying these incidents is going to arouse any further interest. It is my recommendation that CASA review the registration of the AirBorne Edge aircraft and that the ATSB identify and investigate all fatalities and serious accidents involving the AirBorne Edge aircraft. There is sufficient nexus between the incidents to warrant a review of the AirBorne Edge aircraft.

Another incident occurred on Saturday 7th April 2001 when an ultralight aircraft crashed into Oakey Creek, 200 metres south of **Cessnock Airport.** I have little information in respect of the **Cessnock** matter (NSW 2001.2175). It is noteworthy however, that Coroner M Morahan recommended that, ***"I recommend that the Civil Aviation Safety Authority of Australia and Air Transport Safety Board consider whether it is an appropriate time for their organisation to become more involved in the operation of Ultra Light Aircraft in Australia".***
These findings were made on 28th February 2002.

STATISTICS
In the course of considering my findings, I have had recourse to, and the assistance of, the National Coroners Information System (N.C.I.S.). I now reproduce the statistics obtained from N.C.I.S. being ultra light/gyrocopter fatalities between the 1 July 2000 and 17 April 2008. In that period of less than ten years, seventy-two people have died in Australia in ultra light/gyrocopter crashes. I note from the information available to me that forty of these fatalities occurred between the 2nd September, 2004 and the 17th April, 2008, a period of about three and a half years, and that twenty of these occurred in Queensland. These statistics must surely on their own be evidence that the recreation aviation industry requires more rigid regulation and enforcement of the rules and that CASA and/or the ATSB should become more directly involved in the investigation of these fatalities. Unfortunately, despite best efforts by NCIS I have been unable to obtain a statistical comparison of microlight and general aviation fatalities.

Ultralight / Gyrocopter Fatalities
Between 1st July 2000 and 17th April 2008

Jurisdiction

Jurisdiction	Number of Deaths
Australian Capital Territory	0
New South Wales	17
Northern Territory	2
Queensland	30
South Australia	3
Tasmania	5
Victoria	14
Western Australia	1
TOTAL	**72**

Age / Gender

Age	Gender		Number of Deaths
	Male	Female	
0-9	0	2	2
10-19	3	1	4
20-29	2	2	4
30-39	5	1	6
40-49	15	3	18
50-59	21	0	21
60-69	11	1	12
70-79	4	0	4
80+	0	0	0
TOTAL	**61**	**10**	**71***

*The remains of 1 deceased person are yet to be identified, and are therefore not reflected in this table.

Case Types

Case Type	Number of Deaths
Death due to External Causes	65
Death due to Natural Causes	1
Still Enquiring	6
TOTAL	**72**

Transport

Mode	Number of Deaths
Ultralight/Microlight	59
Gyrocopter	13
TOTAL	**72**

ATSB INVESTIGATION AND REPORT

In the course of preparing my findings I have read a number of fatal aircraft incident reports including reports into deaths which occurred under the

umbrella of the recreation aviation industry. A regular feature in the various reports was, and I paraphrase, "*that the ATSB would not be investigating the matter*".

CASA and the ATSB did not investigate this matter, the investigation being left to Constable Howlett and Mr Hicks from RA-AUS.

The ATSB did examine some of the aircraft components and Messrs Ferdinand and Dinukshi prepared the report which was reviewed by Mr Blyth. Mr Blyth gave evidence at the hearing. For reasons that are unknown to me and have never been explained, the report is the "Microlight Structural Analysis, Airborne Edge, Aircraft Registration; 32-4456 *and 32-4388*". (my emphasis)

In the final analysis, I am very interested in incidents such as the fatality involving Airborne Edge aircraft 32-4388; however the combining of information relevant to the two events is somewhat confusing from an evidentiary point of view.

In the abstract to the report the authors advise*, "During the investigation of two fatal micro light accidents, Recreational Aviation Australia (RA-AUS) requested the assistance of the Australian Transport Safety Bureau (ATSB) in conducting technical examination and analysis of parts recovered from the accident sites. The first accident occurred in Atherton, Queensland (Registration 32-4456) on 20 October 2005 and the second in* ***Cessnock****, New South Wales (Registration 32-4388) on 21 January 2006. During the course of the investigation a third fatal accident was identified. The third accident had occurred in Hexham; NSW (Registration T2-2625) in 1996, with coronial findings (0063/96) delivered on 25 March 1997.*

In all three accidents, the failure of the main wing spar had occurred near the wing tip. Qualitative analysis of the structural design and loading of the part during this safety investigation and examination of the coronial findings from the Hexham accident revealed that the main wing spar had failed under negative "G" loading. Such loading was likely, if the aircraft entered or encountered flight conditions outside the manufacturers' flight envelope. No other material or mechanical defects were identified as being a contributing factor to these accidents."

I have a number of concerns about this ATSB report, the first of which is the conclusion that, *"no other material or mechanical defects were identified as being a contributing factor to these accidents".* In the present case, the authors appear to have over-looked the unsatisfactory condition of a number of components of the aircraft. In the event that the ATSB investigation was to be limited to a specific aspect of the inquiry, the authors' remarks should have been restricted to the matter of the inquiry. It would have been much better of course had the ATSB conducted the full investigation and a complete and thorough review of the whole of the aircraft frame.

The three fatal crashes referred to in the ATSB report are the present case of **Mr Scholl** who died near Mareeba on 20th October 2005, the **Cessnock** matter which occurred on 21st January 2006, and the **Hexham** matter where Mr Caruana died on 2nd March 1996. At times the records have been a little confusing as there appear to be two fatalities at Cessnock, one being an ultra light crash (NSW 2001.2175) and the other an Edge aircraft registered 32-4388.

The ATSB report provided to me advises that in respect of this matter, the Cessnock matter and the Hexham matter, *"in order to determine possible connections between all three accidents, the Australian Transport Safety Bureau (ATSB) was asked to conduct technical examination and analysis on recovered parts from 32-4456 and 32-4388, to assist the RA-AUS investigation. Information regarding the accident involving T2-2665 was taken from coronial findings 0063-96, delivered on 25 March 1997".* [This third matter is the matter of **Mr Caruana**].

It is difficult to accept that the report could identify any possible connection between all three accidents given the apparent lack of investigative material sourced for the purpose of the investigation. In the present case the report was always bound for practical irrelevance and inconclusiveness as the authors' examination was limited to the detached portion of the port side wing tip and another portion of wing which was cut from the wreckage to facilitate the examination and report. The authors, I believe without justification, draw the conclusion that an examination of the canopy material indicated that the failure of that material was unlikely to have contributed to the accident. I reject that conclusion as it is unreasonable for the authors to make such a finding in the absence of an examination of the wreckage and the aircraft log books.

The report advises that the left wing *"fractured traversely through the tubular section, at the insertion of the reinforcing sleeve. The fracture site showed typical characteristics of bending (i.e. the thin-walled tubular section had collapsed) with evidence of tearing of the aluminium tube, the concave surface of the collapsed section was located on the underside of the spar, indicating a downward bending load (normal to the plane of the wing)".* The report goes on to advise that the intact right wing spar was also supplied and was *"bowed along its length, approximately 25 mm from its standard longitudinal axis. The concave surface was the underside section of the spa, again indicating a downward bending load, normal to the plane of the wing".* Confusingly, the reference to the left spar is to "figure 4" however figure 4, has the heading, "Fracture of the *Right* Wing Spar of 32-4456".

The evidence is, of course, that the right wing spars were also both broken and at the crash site part of the starboard wing was in an up attitude. The report becomes further confusing to the state of being of little assistance to me in that in the failure analysis it advises that "*examination of leading edge wing spar failures from 32-4456 and 32-4388, and expert witness statements (Hexham accident) suggested that the applied load on the wing spars was a downward bending moment".* I am left wondering in respect of the right wing

spars, although a casual observation of the right wing spars might also conclude that the fractures occurred as a consequence of a downward bending load.

The authors of the ATSB report were also provided with samples of wing fabric. The report regrettably does not identify the position of the wing from where the samples were taken and the report makes no mention of this. I believe that the evidence is to the effect that the samples were taken from the starboard side wing. The examination of the wing fabric by ATSB was inconclusive and no Bettsometer or other load bearing test was applied. Constable Howlett was able to tear the fabric in the same way that Mr Hicks demonstrated with a tissue (see Hicks transcript 14/02/2008 page 72).

The report does not appear to give any consideration to the design and construction of the wing as explained by Mr Hicks in the transcript of his evidence on 14th February 2008 at page 42 where he explains how the outside end of the wing flies in a negative attitude so that if the aircraft approaches a stall situation this outside section of the wing would start to fly the aircraft in a positive attitude. Mr Hicks argues that as the bending was downward the wing was then experiencing positive gravitational pressure and not negative gravitational pressure.

My observation of the evidence is that the leading edge wing spar port side broke downwards, the leading edge starboard side broke in a less obvious way but slightly downwards, and that the starboard side cross spar broke in a forwards direction. Part of the confusion which surrounds the direction of the break of the various aircraft components appears to arise from the different levels of expertise and terminologies used by the parties. As a lay person, I look at a broken piece of metal and regard the break to be in a particular direction. Perhaps a downwards direction as the ends of a broken pipe show evidence of being bent in a downwards direction. However Mr Hicks might describe a similar break in a different fashion with reference not necessarily to the physical direction of the observable break but with reference to the direction of application of force.

Photograph P1010111 master – 2005-12-01 is an example of this. This photograph shows leading edge starboard and port side spars centre keel and wing battens. The wing structure is set out post-crash on a concrete floor. The section of port side leading edge spar is bent to a boomerang-shape with the bend, or knuckle or knee of the bend being roughly in the middle of the spar. Whereas I would describe the bend or break, as a backward bend or break, Mr Hicks may well describe it as being a bend into the prevailing wind and implying that to achieve such a result would require force to be applied to the reverse, or leeward side, of the spar forcing the spar forward and into the wind if the aircraft was flying at the time when the bend was caused. The wing tips, being in negative load, are under downward pressure all of the time during flight whereas the internal portion of the wing is under upward or positive load. The ATSB report concludes that there was no evidence of material deficiencies or inconsistencies that could have contributed to the failure of the wing spars. This finding should, I believe be

read in the context of the examination of the limited samples. To draw such conclusions may well be argued to be inaccurate. Photograph P1010024 on master-2005-12-01 shows a number of white "oxidation-type" marks which might be an indication of age, wear and tear of the spar. I appreciate that the photographs were taken after the event and that these "oxidisation" marks are of themselves not evidence of any inherent weakness in the aluminium tubing.

Unfortunately, I found that the technical results of the ATSB report were less than convincing and at best inconclusive even in respect of this aspect of the matter. The report advises that material data provided by the manufacturer for the wing spar, specified the material as aluminium alloy 6061-T6 temper. Representative sections were removed and prepared for metallographic examination. Five Vickers Hardness Tests were completed for each of the samples. Hardness ranged between $98HV_5$ and $104HV_5$ (average $101HV_5$). This was typical of aluminium alloy 6061-T6.

Unfortunately, no other indication was given that assists me in determining whether the aluminium spars were at 100 per cent tensile strength or at some other percentage or score. I am simply not able to determine from the report the state of the aluminium spars, or where within the range of hardness required for aluminium alloy 6061-T6 the samples fell. To confuse matters further, the representative sections from the tips of both aircraft, 32-4456 and 32-4388, were removed and examined. The report confirms that 5 Vickers Hardness Tests were completed for each of the three samples and that the hardness range, between $98HV_5$ and $104HV_5$, *but does not advise which readings applied to which aircraft*. At the end of the day, the only finding I am able to make from the ATSB report is that the aircraft aluminium tubing spars were made of aluminium alloy 6061-T6 temper as they in fact purport to be.

It does not necessarily appear from the evidence of Mr Blyth that he had considered the situation where the wing tips of the aircraft were constantly under negative gravity while in-flight. He says, in fact at page 37 of the transcript of his evidence: *"If I relate it back to the context of the wing itself, the wing is designed under normal flight circumstances, i.e. positive, what is commonly referred to as positive G flight, that is a weight acting down towards the centre of the earth".*

In his evidence at page 18 Mr Blyth also said, *"Certainly, the normal design of wing is to carry load – a lifting load and that will – that will essentially be expressed and as upward force on the wing structure, the failure that we have observed is a downward bending failure and in – in its nature it's implicit that it was caused by a downward bending force on the outer spar link to the wing tip. The failure of fabric in the wing may or may not have influenced that. It really depends on where the fabric failure occurred".*

At page 20 of Mr Blyth's evidence, he says; *"Under normal circumstances the lift generated while the wing is in – is applied to – is applied to the fabric and transferred from the fabric to the wing structure or the tubular structure. Upward – upward force it – it is a – is lift, it is generated by the lower surface*

of the wing and the bending force at the wing tip would be expected to be an upward force, upward bending force. By implication therefore, the – the failure of the wing structure, which is an overload failure that is it has exceed the physical strength of the structure. In a downward bending force implied the generation of a – of a large downward force on the end of the wing. That's in – in – in converse to – and that implies directly an abnormal load or a load outside of what would normally be expected during normal lift positive load on the – on the wing."

Once again these comments appear to be at odds with the explanation of the design and flight characteristics of the microlight Delta wing as explained by Mr Hicks.

The difficulty I face in accepting the ATSB report other than as I have already referred to is that the ATSB investigators did not view the aircraft as a whole and no Bettsometer or other similar test was carried out on the wing fabric. Mr Hicks on the other hand attended the crash scene, became intimately familiar with the components of the crashed aircraft and did conduct a number of Bettsometer tests on the wing fabric.

The ATSB report concludes that there was no evidence of material deficiencies or abnormalities that could have contributed to the failure of the wingspars. There are, however, other incidents involving AirBorne Edge aircraft where a wing tip has separated. I do not have sufficient information available to determine whether those failures were caused, or contributed to, by metal fatigue, fabric degradation, the application of sheer force to the wing of the aircraft, or engineering/design fault in the wing structure.

I do not believe that the authors of the ATSB report had sufficient access to the aircraft, or information to draw the conclusions drawn in the executive summary of the report. The executive summary refers to the other AirBorne Edge crashes as well and draws conclusions, the results of which I can have no confidence in as I have been able to observe in this incident the extent of the ATSB involvement and the rash conclusions that were drawn from that limited involvement.

During the course of the inquest I was critical about the ATSB metallurgical report and commented that because of apparent inaccuracies in that report, it should be withdrawn from public access, it apparently being available to the public via the ATSB web site. I trust that this has been attended to. The ATSB submission received by me on the 10/12/2008 advised that action had been taken to amend the published report. In the submission summary ATSB advised me; "In summary, with respect to the ATSB report, the primary intention was to provide technical information and assistance to RA-AUS; hence facilitating their investigation. At no time did the ATSB intend for the conclusions drawn in the report to be taken in the broader context of establishing accident causation, and it was unfortunate that this was not appreciated during the inquest proceedings. With respect to ATSB investigation of fatal accidents involving sport aviation activity, substantial additional funding and resources would be required to implement such a

recommendation. The issue of funding is a matter for the Government. The ATSB faces the reality of operating within a defined budget. While such constraints exist, the ATSB will need to allocate priority to the provision of resources for the investigation of accidents and serious incidents involving fare paying passenger operations, over high risk activities such as those the subject of this inquest."

FINAL ANALYSIS

In the course of this inquiry I had the assistance of three experts. Mr Hicks may not strictly qualify as an expert. He is a chief flying instructor operating a microlight flying school from Montpelier Airpark near Townsville. He is an RA-AUS investigator and was the investigator appointed by Mr Ungermann to investigate this microlight crash. He travelled from Townsville to Mareeba and the air crash site and inspected the aircraft in situ. He also took photographs of the aircraft wreckage and with Constable Howlett later examined the wreckage and tested the sail fabric. He has a Bachelor of Arts in linguistics and language, a post graduate diploma with honours in computer-enhanced learning and mathematical models of phonetics. He is a pilot examiner, chief flying instructor, Level Two maintenance authority, and is a current board member of RA-AUS. He is also a school-based Chaplin.

I found Mr Hicks to be an honest and compelling witness. His explanation for the event is attractive to me. His explanation is that an event occurred in flight because of the poor airworthiness condition of the aircraft, as a consequence, approximately 1.2 metres of the port side wing separated from the aircraft causing Philip to lose control of it, and the aircraft to fall towards the ground, eventually impaling itself on the lone tree.

Mr Lyne was appointed by me to assist the Court in trying to understand and determine the cause of the crash. Mr Lyne favours that the aircraft was flown outside the flight envelope which caused a tumble phenomena with the resultant crash.

Subsequent to the hearing, I contacted Dr Gratton of the Brunel Flight Safety Laboratory. Dr Gratton's papers had been referred to me during the course of the evidence. Dr Gratton graciously, and without remuneration, reviewed the transcript of evidence, photographs, reports etc which I was able to provide to him and has given me a brief report which I referred to the parties and will comment on later.

Mr Hicks does not believe that the engine failed. There is no evidence to support a proposition that the engine did fail. I accept that the engine did not fail (page 37 transcript Hicks). As already mentioned, Mr Ogle put forward a proposition that Philip had flown into a tree. This proposal was discussed with Mr Hicks and soundly rejected. I accept the explanation given by Mr Hicks and set out here his answer to Mr Tate which appears at pages 41, 42 and 43 of his evidence.

Now, just while we're at this stage I might - it might be the most convenient time to do this. There are a couple of different proposals that have been put

forward to indicate what the actual cause of this crash were and at guide card 12, your Honour, volume 1, we have a statement from Mr Ogle who says this at paragraph six, and I'll just read out, you won't need to go to it. "Two days after the crash I attended Jaques Coffee Plantation at Mareeba to have a look at the ultra light involved in the crash. The ultra light was being stored next to some buildings under a tarp at this location. When I had a look at the ultra light I could see that the tip of the left wing had been broken off and that there was bark and sap around the area where the wing had broken off. This indicated to me that the wing had come into contact with a tree causing the tip to break off. This would have caused the left wing to act like a parachute and would have forced the right wing down and in my opinion the craft would have struck the ground on the right-hand side. When the tip of the left wing broke off it would have resulted in the pilot losing total control of the craft. I could also see that the right-hand side of the tryke had been compressed due to impact but the compression was of such a degree to indicate that the craft had only fallen a short distance instead of a great altitude or terminal velocity. The propeller of the craft was also smashed which indicated to me that the motor was still operating at the moment when the craft struck the ground. From my observations of the wreckage I could see nothing that would suggest that the condition of the craft contributed to the crash." Now, the condition of the craft is one issue, the other issue is Mr Ogle's suggestion that we can understand this terrible tragedy by Philip hitting a tree. That's how I would read it?-- Well, I mean, the final part was that he did hit the tree. However, in - in my understanding of those photos that we just looked at beforehand, the left wing tip did not hit a tree. And now if we talk about the left wing tip, we're talking about that 1.2, 1.4 metre section, it left the aircraft well behind and there's actually no evidence - and when you see this photograph you can see where the bark striation appeared on the wing. It came from where it actually finally came to final rest and on the wing tip pictures that we have there there is not a skerrick of evidence that all it did was - it was like a pair of scissors came along and removed it. It's sitting in the paddock, not a mark on it, except for the fact that it's torn off. And in actual fact if you looked at another wing tip beforehand there's not a mark on it except for the final graze as it came down to rest where you will see it in this other picture. You know, it's remarkable that - I don't disagree with the fact, but many things that he said as to what would happen to the aircraft would occur, but the wing tip didn't let go because it hit a tree, the wing tip was not there. And by - and I will say this about - you know, he said that it didn't become unflyable. Now, it would become very unflyable, but it depends upon where you lose your wing tip. And as I think I said out at the - at the racecourse, if you lose 200 millimetres of your wing, which has happened beforehand, you can fly the aeroplane. When you start to lose 1.2 metres of your wing it becomes unflyable. The person that lost the 1 - the 2 metre hit - was because he was hit by a biplane. This is in England and you can get it out of the CAA records. This one was not a biplane and it was broken downwards. I mean there is - there is - I mean ATSB said it was broken negative. Now, I'm - I'll tell you that the gentleman's mistaken, it broke in positive. Now, if it was a normal aircraft wing I would say, "Yes, he's dead right." But because it's a tryke wing, because it's a micro-light wing - and one of the things you - you may not have noticed is - because the two wing tips

are down with ATSB is that they have what's called dive sticks. What it effectively does is that the outer surface of the wing, the outer four or 500 millimetres, probably 700 to a metre, is actually held in negative, it's actually held up into the wind. All right? And you've got to remember this is not a static either. The fabric is always moving and that's - that's one point I would like to make. We think of, you know, aluminium on an aircraft or aluminium on a wing on a 737 just sitting there doing nothing. Calm weather it does very little, but you'll notice that the wings are always moving. The fabric in a micro-light is always moving, it's always working. Now, that's why we put fabric there. And so we've got this situation where even on the most beautiful calm day we have fabric movement and something occurred, and it could just be age, which is a proposition that I have, and the fact that it should - the wing fabric should have been replaced at its - at the appropriate time in the manual. But just from age and UV degradation and the fact that it is always moving, it doesn't take much, when a wing is kept negative so that the top surface is not flying as it would normally be, air flowing over the top, being sucked up into the air so to speak, it's actually being kept like that on purpose and the reason for this, if you can understand, if you can imagine that this section of my - this section of my arm is - is angled like that, all right. So as the wind comes towards me I'm being sucked up and lifted up into the air. The outside parts of my wing are like this in actual fact, in negative, and they're kept there so that when I - if I - if and when I stall the aircraft, which could go into a stumble - a tumble, sorry, these outside section of the wing is there to - to be able to start flying at that time so that I don't tumble one way or the other way. It's part of the design of the Delta wing, of the weight shift Delta wing. So that when I get - approach a stall by changing the angle of - my wing tips now start to fly positively not negatively. So if it was a normal wing which is faced this way I would say, yes, he's correct. But because it's the opposite direction and it broke down, it broke positively not negatively and that's one of the understandings of the Delta wing. There's a big stick called the dive stick, it sits up in the end about at that angle and holds one of the battens and whole of the wing tip up like that. Actually it sits in that direction on the left wing and holds it all up so that when we go to a - to a stall it now starts to fly. Whereas in this particular case it didn't, the fabric failed here, dive stick's on the outside and so you've got actually - you've got a - it's like an aileron now and at that speed, it just settles down.

So - I don't want to take you away from the wing-----?-- That's correct.

-----but it just seemed to be a very, very convenient time to look at Mr Ogle's helpful suggestion about how this tragedy could have occurred. The other proposition I'd like you just to consider, and this is probably a very short answer and then we need to go back to where we were, he does tell us at the bottom of paragraph six on page 3 of his statement dated the 2nd of May 2006, that from his observations of the record - wreckage, he could see nothing that would suggest that the condition of the craft contributed to the crash. Is that a proper position that you would agree with?-- I don't believe anybody, after seeing the photographs, with that amount of corrosion, can come to that conclusion.

All right. Thank you. If - I'm sorry, I've taken you off in one direction, but if we can return to your narrative, you were explaining the wing to us again?-- Right. As you've noticed we've taken some of the fabric off. It was about this time that Constable - Constable Howlett and myself started doing the Bets testing.

In his evidence Mr Hicks discounts a tumble event as the cause of the crash and relies on the damage to the aircraft which is not as he would expect to find in a tumble induced crash. Mr Hicks believes that the aircraft would have been flying between 1,000 – 2,000 feet agl. He believes that 1.2 metres of the port side wing tip separated causing the aircraft to become unflyable, that the wing fabric caused a parachute effect, slowing the aircraft's descent and reducing the crash impact area. Mr Hicks' hypothesis relies on the observable damage to the aircraft including the damage to the port side internal wing battens, the damage being as he describes it "relatively not tumble-like".

My own observations of the damage to the wing battens was that the port side wing battens were not grossly deformed and that the level of deformity to the battens increased as one moved toward the extremity of the starboard wing. This it seems to me is consistent with an event happening which caused the aircraft to falter and crash, not with an event which caused a falter or tumble which caused the wing tip to rip off. If there had been an event that was so severe as to tear the wing tip from the wing then I would expect there to be observable damage to the wing tip.

I find Mr Hicks' explanation plausible and backed-up by his explanation of the damage to the aircraft which he observed. Whatever happened in the air, it is irrefutable that approximately 1.2 metres of the port side wing tip separated from the port wing and fell to the ground approximately 80 metres from the crash site. The port side wing tip was located by Mr Hicks and Constable Howlett intact. The wing fabric had not separated from the internal aluminium tubing structure of the wing. As a lay person I have some difficulty accepting that there could, as a consequence of any event, be sufficient force applied to the wing structure to cause the port side wing tip to separate in such a fashion. The fact of the matter is that it did.

In his evidence, Mr Hicks explains in some detail how he says the aluminium tubing could be forced to break in such circumstances. His evidence, at page 72 and 73, is repeated hereunder:-

What would have provided the force to - accepting that the tear we can understand in terms of age and UV degradation, surely it must have taken quite a force to remove the - or break the aluminium rod that was keeping the wing in place?-- Do you remember - I remember being, as a child, sticking my hand out the window at about 80 kilometres an hour and how as you jam it out it'd be thrown back fairly forcibly. A section of wing that large that's suddenly got no structural support here is not - I think we're thinking of tearing as, for want of an example, this'll do. We're thinking of tearing like that, I think. I think what you're talking about is you're tearing - thinking about it

tearing and it started to - my belief is, it started to probably somewhere in the middle and tore like that. Pressure. Remember all the time this fabric's being sucked up, it's being sucked - you know, it's being pushed up at the bottom and you've got this sudden decompression of a wing so just to demonstrate again, the wing fabric just-----

Well, we'd better record that?-- -----tears.

That - you've taken a tissue and rather than tearing it in a normal motion from the edge you've actually pulled it apart having first made a small tear in the middle of the fabric to demonstrate how you believe the fabric actually tore on this wing tip?-- And also at that same time, if you can imagine that same fabric as being held up by a number of batons which will be simulated by my finger at the present time, the main - I'll do the hand - the main wing tip - we don't even have to take into account the crossbar at this time, okay. The main wing tip is actually coming through if you think like this. Now, suddenly it separates and you've got this stick inside - the dive stick that's holding up a baton. The wing hits it, it's tearing and it's got to tear down because the under surface fabric is better than the upper surface fabric, it's being pushed and pushed and at that time if you think about it, it comes down, it pushes and at some point it's going to rotate, it has to rotate and it's going to rotate at the point that it actually fractured because there is no other give in the wing. The only - it was rotational force and as it - as it's coming down it has to rotate, it starts the full top surface being hit, pushes it down further which also causes it to break downwards and back as said in the ATSB report which is my personal belief what happened.

Mr Hicks was examined by Mr Lynam, in particular the ATSB report was put to him, that there was no evidence of material deficiencies or inconsistencies that could have contributed to the failure of the wing spans. Despite the cross-examination, Mr Hicks maintained his opinion that the crash was not caused initially by a tumble event. He spoke a number of times about the fact that the port side wing tip, which had separated, was itself not damaged whereas the remainder of the port side wing and the starboard side wing suffered obvious and substantial damage. As he expressed at page 69 of the transcript of evidence of the 15th February;

"The point about that it seemed to me that that part of the left wing hadn't itself experienced any trauma or event so as to cause damage to those battens -----?---- That was one of the reasons that I – that I came away from the tumble theory".

Mr Lynam also cross-examined Mr Hicks in respect of Mr Lyne's opinion, it was put to him that the aircraft had been flown outside of the flight envelope and at page 66 of the transcript of 15th February, Mr Hicks said "*I would have expected, if that was the case, that the damage to the battens of the left wing tip would have been consistent with the damage to the battens on the right".*

He further said; *"There is no damage to the left wing tip at all, and as I said beforehand, there is evidence of tumble-like characteristics to the right wing tip, but not to the left wing tip."*

Mr Lyne was disadvantaged in not observing the crashed aircraft and then relying almost exclusively on the ATSB report. Mr Lyne was appointed by me to assist with the preparation of an expert report. I have already expressed my concerns regarding the ATSB report. Mr Lyne has a great deal of experience in the mining industry with particular emphasis on risk safety management systems and the regulatory regime that surrounds those systems. Mr Lyne was quite critical of the regulatory regime under which the recreation aviation industry operates in Australia.

Mr Lyne made a number of useful recommendations to me. Mr Lyne believes that the wing fabric would not have failed unless there was first a failure of the wing spar to create a jagged edge which would then in turn cause the fabric to be cut and tear.

I find that I favour Mr Hicks' explanation in respect of the port side wing tip separation. If a tumble force applied to the wing caused the leading edge wing spar to break I should surely expect to observe other damage to the port side wing tip, particularly to the internal wing battens. The force that would be applied to the wing spar in a tumble event would surely be applied to the wing as a whole therefore causing some damage to the wing tip. Here the port side wing tip was not damaged in any noticeable way; it simply separated from the aircraft. It is feasible, and I do not believe that there is any evidence to contradict a finding, that a tear which started in the degraded white sail cloth would rapidly tear and with such force as to be able to tear the less degraded sail cloth, and the stitching. Upon there being a tear in the fabric, whether that tear was complete to the whole of the wing fabric in that section or not, increased forces would be applied to the direct portion of the wing spar corresponding with the tear in the wing fabric. It may be fantastic to accept that those forces would be sufficient to cause an aluminium wing spar to break but this hypothesis is, I believe, as consistent and reasonable as any other given the complete lack of damage to the port side wing tip of the aircraft. Those forces would no doubt have an immediate effect on the aircraft and the pilot.

Mr Lyne's evidence in respect of the safety systems, or lack of them, and the failings generally in relation to the registration and supervision of the microlight industry is *"The indications I have is that the failings were symptomatic of a larger problem".* His evidence in this regard is recommended reading for the regulator and delegates. So far as the mechanics of the cause of the crash are concerned however I prefer the evidence of Mr Hicks to that of Mr Lyne.

Much has been said throughout these proceedings about the tumble event as it relates to microlight aircraft. Dr Guy Gratton has written widely about this event. His articles were referred to throughout the inquiry and I have had the opportunity of communicating with him extensively following the conclusion of

the taking of evidence. Dr Gratton was amongst other things, chief technical officer at the British Microlight Aircraft Association from 1997 to 2005 which manages the airworthiness of a fleet of about 3,100 aircraft operating primarily within the United Kingdom. The airworthiness of this fleet presents many problems which are of course very similar to the problems experienced in Australia. The Australian recreation aviation industry would do well to align itself more closely with the British recreation aviation industry and thereby benefit from the research being conducted by the British Micro light Aircraft Association.

The British have encountered many microlight aircraft crashes. I recommend that those interested in such matters read the report on the accident to Pegasus Quik, G-STYX at Eastchurch, Isle of Sheppey, Kent on 21 August 2004. This report raises many issues similar to those raised in this case. The analysis and safety recommendations sections are particularly interesting. The full report is at http://www.aaib.gov.uk/publications/formal_reports/2_2005_g_styx.cfm.

The tumble event is described in section 1 of this report (1.16.1) as:

"The tumble is a departure from controlled flight whereby the angular momentum of the aircraft causes the micro light to rotate about its pitch axis with a very angular velocity and acceleration; angular velocities of one revolution per second and transient accelerations of 8g are not unknown. During the tumble the forces are so great that the base bar usually hits the front strut with sufficient force to cause either the base bar or the front strut to fail. A tumble normally results in the break-up of the aircraft and the occupants to be fatally injured.

For a microlight to tumble the trike must swing with sufficient momentum to overcome the aerodynamic damping forces from the wing and allow the establishment of a pitch autorotation. This is possible if the pilot mishandles the aircraft, severe turbulence is encountered at low speed, or the micro light enters a stall from a high climb angle. Mishandling, or a deep stall, normally result in the micro light tumbling nose down".

The article "Towards the Tumble Resistant Micro light", a collaboration between Dr Guy Gratton MSETP and Dr Simon Newman of the School of Engineering Sciences, University of Southampton UK describes the tumble entry mechanisms as; the whip stall; spiral instability; failed loop; and flight through (own) wake vortex.

As a consequence of the AAIB report into the accident to G-STYX, referred to above, a fifth entry mechanism was identified. This article at page 5 notes:

"Description of the Accident Causes.
The AAIB report into the accident to G-STYX concluded that the initiating event was a partial structural failure of the upper joint of the starboard control frame upright. A maintenance error caused the joint, which is normally

loaded in compression, to buckle. In itself, this would be serious but unlikely to cause rapid loss of the aircraft; however, on this particular aircraft (in common with many flex-wing micro lights of the same or previous generation), the pitch trim mechanism consists of a tensioning device pulling upon the luff lines. This in turn is linked to a trim control on the starboard upright via cable which passes through the upright and its top joint. When the top joint failed, this suddenly shortened the pitch trimmer cable, tensioning the luff lines and creating (combined with what onboard data recording showed to be high speed – full power flight) a sudden nose – up control input. It is believed that once the aircraft had pitched steeply nose-up the pilot rapidly closed the throttle, leading to a whip stall as described above".

It is interesting to read in the above description that the tensioning of the luff lines contributed to the sudden nose-up attitude of the aircraft. The luff lines on Philip's aircraft are broken and badly frayed. It is not too difficult to reason that these wires broke in flight causing in-flight instability, and, by striking the wing fabric were the cause of the fabric tear. This instability and tearing of the fabric combined may have been sufficient to cause the port side wing tip to separate all of which was the precursor for the aircraft to crash to the ground. The aircraft does not look to me as if it tumbled to the ground; it crashed in an almost vertical descent, landing like a helicopter. The damage to the aircraft, and Philip's injuries, would indicate that the event occurred at a low height. The catastrophic damage caused as a consequence of the precursor events created somewhat of a parachute or air anchor allowing the aircraft to more gently fall to its final crash destination than might have otherwise been experienced in a violent tumble manoeuvre. A tumble I understand means just that, the aircraft "tumbles", or spins in a loop or loops. This appears to be the case in the tumble event recorded on video and viewed by me during the hearing. Having said that, there is some evidence in the wreckage and in Philip's injuries which is consistent with a tumble, or a partial tumble. Whether a tumble event occurred is I think incidental as I am convinced that it was the failure of the port side wing tip that caused the aircraft to crash and that this did not occur as a consequence of any misadventure on the part of the pilot.

In their conclusions and recommendations, Drs Gratton and Newman at paragraph two warn, *"That in weight shift controlled micro light aeroplanes, there remain four identifiable entry mechanisms, although it has been shown that structural failure can also lead to tumble entry, via an introduction to the whip-stall".* It is imperative that the Australian recreation aviation industry ensure that pilots are taught about the tumble event and the emergency procedures to be adopted in the event of encountering such a situation.

After reviewing the substantial amount of evidence that I was able to provide to him Dr Gratton advised that the evidence was strongly indicative of a tumble. He concedes however that separation of the port side wing tip, essentially intact, points to some form of structural failure, but that in-flight structural failures of microlight aeroplanes are extremely rare. Although Dr Gratton advises that the evidence points most likely towards an in-flight structural failure of the wing tip he would not expect any form of fabric failure

to lead to structural failure. Dr Gratton's views are similar to my own although I am more inclined to accept that the tearing of the fabric occurred first and that the separation of the wing tip followed. The weight of opinion (there is no scientific evidence on the point) would appear to support the argument that the tearing of the fabric alone would not be sufficient to cause the wing spar to break. One might wonder that if the fabric tore first would not it have slipped off the frame of the wing tip and become separated? Certainly it might have, which could support a finding that the wing spar failed first causing the cloth to tear as Mr Lyne suggests. Alternatively if the fabric started to tear any weakness in the wing spar may have been overloaded with pressure so that the final tearing of the fabric and the breaking of the spar occurred simultaneously. It also occurs to me that if there was a tearing of the fabric, and or a breaking of a cable or cables that the resultant instability and forces exerted on the wing spar could have been severe and possibly sufficient to cause the separation.

However it happened, the lack of damage to the wing tip does not support a finding of any event capable of causing damage to the aeroplane frame structure occurring prior to separation. I am reminded that the manufacturer of this wing has withdrawn it from service, although I expect that some will still be in use; that the wires and wing fabric of this aircraft were in an unsatisfactory state, and that other AirBorne Edge microlight aircraft have suffered similar occurrences. I also refer to the evidence of Mr Silver (page 124) where he said that the manufacturer had replaced the mast on the aircraft as it "didn't have a sleeve in it as – and they were classed by their engineer as being ***a little bit under stress***". It would be appropriate for CASA and ATSB to identify and fully investigate all such events to identify the cause of the failure of the wing. It is too easy to suggest the aircraft was flown outside the manufacturer's envelope when as in this case there is no evidence to suggest that the aircraft entered or encountered flight conditions outside the manufacturer's specified flight envelope.

The flight envelope has been referred to by a number of persons in this inquiry however no definition was able to be provided. The flight envelope was described in terms of the pitch to which an aircraft could be put in certain circumstances. Dr Gratton in his article, "Pushing the Envelope" describes it as;

"We all know the term 'flight envelope', but what is it? Gung-ho pilots in films talk about 'pushing the envelope', qualified test pilots carefully 'explore the envelope' and the rest of us, if we wish to live long and uneventful lives stay well 'within the envelope'. The flight envelope is the range of speeds and G-levels at which your airplane has been shown safe to operate and within which you can guarantee the continued safety of the airplane."

Dr Gratton in his article goes on to discuss how the flight envelope is worked out, what it means to a pilot, and how the flight envelope will be affected if a pilot increases the weight of the airplane. This article also might be regarded as essential reading for microlight aircraft pilots.

Mr Mael is a helicopter pilot with Emergency Management Queensland. He advised me that, *"safety is driving the aviation industry today to an extent like never before".* After sitting through nine days of evidence which looked fairly closely at the microlight aspect of the recreation aviation industry I think that I am able to comment on this opinion. My observation of the recreation aviation industry is that it is not being driven by a culture of safety consciousness. This end of the aviation industry appears to attract less priority from CASA and perhaps as a consequence of that and the uncertainty surrounding the extent of the delegation given to the RAAO's and the authority and responsibility these organisations have, it attracts people who are keen to fly but who are not prepared or able to spend the time and money required to ensure a high level of safety and competency at every level of the industry. This type of flying is said to be "cheap" or an inexpensive way to enjoy the pleasures of flight. It should not however he relegated to "nasty". Uninformed, unacceptable, offhand, or dangerous conduct or culture should not be tolerated, if the price of having a world class recreation aviation industry in Australia is tighter regulations and enforcement then that is the price the industry must bear. Flight safety of the recreation aviation industry is not a matter of concern only to those within the industry it is a concern to the whole community.

In the final analysis it is not possible to find exactly what happened to cause this crash. There are a number of known facts and a number of hypotheses. It is known that: Philip was a novice pilot; the recreation aviation industry is thought of as an affordable way to fly and some in the industry do not observe the highest standards of operation; the recreation aviation industry has a haphazard regulatory system; there have been concerns expressed about the Edge Micro Light weight shift aircraft; this aircraft was not airworthy; the left wing tip of Philip's aircraft broke off in flight; the aircraft crashed; Philip was a safety conscious person and was unlikely to be "hooning"; there is no evidence to support a finding that the event was caused by pilot misadventure, recklessness, or error.

On the balance of probabilities therefore I must find that the event was caused as a consequence of the state of the aircraft, not because Philip pushed the aircraft beyond its flight envelope. In all likelihood the cause was a combination of frayed and corroded wires and degraded sail cloth. There is also the possibility that the wing spar, which fractured at the "insertion of the re-inforcing sleeve" (ATSB report 1.5.), was under engineered. This is a plausible hypothesis considering the similar events referred to earlier involving this type of aircraft. It may be as Mr Hicks said that the forces applied to the wing structure as a consequence of the failure of the wing fabric applied sufficient pressure to the structure to cause it to fail. Those who are charged with overseeing the safety of air flight in Australia should note that in both wing spars examined by ATSB (32-4456[Scholl] and 32-4388) the fracture occurred though the outer end of the internal re-inforcing sleeve.

I order that a copy of the transcript of the proceeding be provided to CASA, ATSB, RA-AUS and HGFA to assist in understanding the serious issues

which have been raised throughout the proceeding with respect to the operation of recreation aviation aircraft. As already stated, it is regrettable that these organisations having been given notice of the inquest were not represented other than when the various witnesses gave evidence. I also order that WHSQ and QPS be provided with a copy of the transcript of the evidence so that issues raised by me may be thoroughly considered.

Was the death of Philip Henry SCHOLL a preventable death? Yes. Philip's death was as a result of a conjunction of lack of; adequate training, proper maintenance, regulation of the sport of microlight flying, and enforcement of the rules and regulations. If the regulators, trainers, inspectors, sellers and aircraft operators all fulfilled their respective obligations relevant to their involvement with the aircraft and Philip, he would not I believe have died in the way that he did. They are the rusting chain of causation which now needs replacing with fresh, strong, visibly connected links to replace the out dated, uncaring, head in the sand, irresponsible attitudes that appear to be the hall mark of some in the industry. Is the regulator so blind as not to see that people will ignore safety in the pursuit of expedience until there is a regulatory regime with mandatory application that is enforced by it through an appropriate identifiable single properly funded delegated authority? There is evidence in this enquiry that the funding provided to the RAAO's is grossly inadequate for the function they serve. Regulation is often an unwanted and unwarranted interference with the conduct of an enterprise or pursuit. However, it is implausible in such a fast growing, high risk sport were the lives of pilots, passengers, bystanders and members of the public are put at risk that there is such inadequate control, regulation and compliance. How can it be thought to be appropriate that the main regulator in Australia of civil air operations, delegates control of the recreation aviation industry to not one but two unrelated voluntarily associations? How is it a person such as Philip is able to purchase and fly an aircraft that was clearly un-airworthy? How is it that Philip was able to fly the aircraft solo when he was not licensed to do so? How is it that Mr Keogh was able to purchase the aircraft without an aircraft condition report and transfer the aircraft directly from the previous owner to Philip with only minimal supporting documentation and again without a proper aircraft condition report? How is it that Mr Keogh was able to ignore the "do not start" placard placed on the aircraft by Mr Hicks? How is it that the alarm was not raised until about 5:00pm on the 20th October, 2005 when the anticipated flight time was less then two hours? How is it that Mr Ogle was able to issue an aircraft condition statement for the aircraft after Mr Hicks had put a "do not start" placard on it?

These questions highlight the lack of attention given by CASA to the recreation aviation industry in Australia.

For the convenience of the parties I set out hereunder a number of excerpts from these findings.

Page 5
"At the end of the day it is quite speculative for me to attempt to determine what actually happened in flight, but I can say that my preference is towards

port side wing tip separation as a consequence of the un-airworthy state of the aircraft, which I believe is on the balance of probabilities a reasonable and sound determination."

Page 13
"Although the correspondence from the HGFA to the RA-AUS confirms that the aircraft T2-2776 had its registration cancelled at the request of Mr Scholl on the 12th October 2005, the evidence is also that the aircraft was unregistered, or the registration had expired on the 20th June 2005. This is another example of the inadequacies of the paperwork of recording ownership transactions and maintenance of aircraft within HGFA and RA-AUS."

Page 22
"The whole system of transferring of microlight aircraft requires an overhaul by the authorities."

Page 26
"It would be desirable if CASA and the Recreational Aviation Administration Organisations ("RAAO's") endorsed one training syllabus and recording documentation."

Page 26
"The completing of a document by a chief flying instructor without the student completing and endorsing the document must surely be of concern to those who are charged with regulating pilot training in Australia."

Page 28
"As a consequence of my reviewing the training documentation, I must have concerns whether Philip's training was comprehensive and adequate. It would appear that Philip was competent to the extent of his knowledge. It is inconceivable to me that a person could in such a short time, with such a minimal amount of theory training and with as little as 20 hours flight training be licensed as a aeroplane pilot."

Page 28
"I have had some difficulty trying to reconcile these documents, the purpose of which would be to determine the actual flight hours that Philip had amassed prior to the crash, the number of dual flight hours that Philip had prior to being allowed to fly solo and the number of solo hours that Philip had flown. It may be that other authorities may wish to construct a proper spreadsheet of these documents to determine those questions. I did pursue these matters with Mr Keogh at pages 89 to 92 of the transcript of his evidence. As I pointed out to Mr Keogh, 12.1 hours plus 5.4 hours does not add up to 19.5 hours. These are not matters that I intend to dwell on here now, but these records should be scrutinised by the appropriate authorities, not only to determine whether or not Philip may or may not have had the requisite flight time before being qualified as a pilot, but also to determine the extent of which aircraft T2- 2776 was used in flight and as a training aircraft while it was unregistered."

Page 30
“It makes no difference whether you fly a microlight or a multi-engine jet, the regulatory framework that applies to the training of pilots and the maintenance of aircraft, should be of sufficient quality to ensure the safety of those within and those outside of the industry. It should make no difference whether you are a microlight pilot or a multi-engine jet pilot or instructor, you should observe the *Civil Aviation Regulations* and the organizational rules that apply to you.”

Page 32
“I have been provided with a copy of both of these documents. Mr Hicks in his evidence referred to the operations manual as *“our bible”*. Having perused these documents I suggest that they are essential reading for everybody involved in the recreation aviation industry. I am somewhat surprised that there was no evidence that Philip had or had available to him copies of these documents.”

Page 33
“Although I may not be privy to all the documentation that was utilised for Philip’s training, Philip’s ultralight pilot log book and the student progress sheets indicate that Philip first flew solo on the 12th July 2005. The only documentation that I have that might in any way be regarded as a written examination is the documentation to which I have already referred in the Hang Gliding Federation of Australia Pilot Training Workbook. The three modules or phases which have been signed off by the instructor, Mr Keogh, are all dated the 13th July, after Philip’s first solo flight.”

Page 34
“There is evidence in this inquiry which touches upon matters referred to in CAO Section 95.32, particularly: (i) sub-Sections 4.1(b)(i) the carriage (free of charge) of persons or goods; (ii) 4.1(f) the aeroplane must be maintained in accordance with the maintenance standards set out in the appropriate technical manual; (iii) 5.1(b) the aeroplane must not be flown at a height of less than 500 feet above ground level unless one of the conditions set out in paragraph 6.2 is complied with; (iv) 5.1(c) the aeroplane must not be flown above the sea at a horizontal distance from land of more than 20 kilometres.

The areas where the evidence has touched upon the foregoing include;
(i) In respect of the carriage (free of charge) of persons or goods, to the Trial Instructional Flights offered at the Jaques Coffee plantation. These flights are charged at the rate of $80 plus $11 insurance per person. The concern was raised during the inquest that these flights were in fact a commercial operation or joy flight disguised as something else. This is not a matter which is directly relevant to my considerations.

(ii) A great deal of time and evidence was devoted to the question of maintenance of the aircraft (4.1(f)). The evidence of Mr Hicks is unambiguous. This aircraft had not been properly maintained. He raised concerns in respect of the electrics, the cables, and the wing fabric. The

current system allows a pilot or Level One maintenance authority to carry out maintenance on his/her aircraft, notwithstanding that the pilot may have little mechanical or aeronautical knowledge. Maintenance logs and records are clearly inadequately kept and maintained. The concept of informed participation appears to allow such latitudes as to allow Mr Ogle, then a Level Two maintenance authority to argue that the Bettsometer was not an appropriate testing device for wing fabric, this, notwithstanding, that HGFA required Bettsometer testing of wing fabric biennially.

(iii) Evidence was given concerning low flying of aircraft in the Mareeba area. These matters have been brought to the attention CASA although it does not appear that any enforcement or prosecution action has been taken in respect of those incidents (5.1(b).

(iv) The issue of flight over the sea, as referred to in 5.1(c), was also referred to in the evidence. Mr Keogh admitted he flew a microlight aircraft from Weipa, across the Gulf of Carpentaria, to Gove, a distance of 600 kilometres. This flight does not appear to have been authorised. The flight was readily admitted to by Mr Keogh. Mr Keogh gave evidence that he thought that there was no particular authority that was required for this flight and relied on conversations that he said he had with Mr Fogg from HGFA and Mr Rosenberg from CASA in Cairns. The evidence in relation to this flight is at pages 14 and 15 of the transcript of Mr Keogh's evidence. Details of the flight were published on the front page of the Tablelands Advertiser newspaper on Wednesday 5th September 2007 as is shown by Coroners exhibit C29. As a chief flying instructor Mr Keogh would be required to be familiar with CAO 95.32. As I have already mentioned, Section 5.1(c) provides that an aeroplane must not be flown above the sea at a horizontal distance from land of more than 20 kilometres. CAO 95.32 Section 7 sets out specifically the procedure that a person must go through if he/she wants to fly an aeroplane other than in accordance with the flight conditions set out in paragraph 5.1. There is no evidence from any party, to suggest that this process was followed.

Page 37
"I believe that CASA and the recreation aviation industry is duty bound to review the regulation of the industry with emphasis on registration of aircraft types, pilot training, and aircraft maintenance. As well, it is necessary that those bodies review and restructure an enforcement regime that is effective."

Page 38
"If these concerns were not so serious the situation would be laughable. The fact that a licensed instructor (Mr Keogh) could fly an aircraft with a passenger who had his seat belt tied in a knot and as a consequence was unable to release himself from the harness, must be an indication of the respect being given to CASA and its delegated authorities by those who hold positions of authority within the industry."

Page 40

“The crash site was some three to four nautical miles from the Jaques Coffee airstrip which would be, even by microlight aircraft standards only minutes of flight. This assumes further importance when one gives consideration to the search and rescue techniques that were employed on this occasion.”

Page 47
“It is of concern that there was no formal system in place to ensure that flight details were recorded and that no effective search and rescue procedures were in place. It is of concern that Philip’s instructor, Mr Keogh, did not act more decisively when Philip had failed to arrive in Atherton as planned. Search and Rescue was regrettably not contacted until just after 5pm as a consequence of Ms Spriggs agitation and Mrs Jaques concern and initiative.”

Page 54
“The transcript of the evidence of Mr Ungermann, set out above, highlights the shortcomings of this investigation. Everything that I say about the shortcomings of the investigation must be read subject to my praise and appreciation of the efforts of Constable Howlett in assembling a comprehensive brief of evidence for my consideration. As a junior officer, Constable Howlett should not have been tasked this investigation. He has however, through his thoughtfulness and inquiring approach to the investigation, uncovered much important history and many important and relevant facts for my consideration.”

Page 54
“I am of the opinion that this aircraft crash was one which should have been investigated by ATSB as there had already been a number of fatalities involving AirBorne Edge aircraft. After listening to the evidence in this matter of how the recreation aviation industry is structured and regulated, the community could have no confidence that any safety or other issues identified relevant to recreation aircraft flight would find their way back to CASA or ATSB. Both organisations should take a more active role in the regulation of the industry and the investigation of aircraft accidents involving the recreation aviation industry.”

Page 54
“CASA, ATSB, RA-AUS, HGFA, Queensland Police Service (QPS) and WHSQ must review the way that these crashes are investigated.”

Page 60
“Had a more senior officer been appointed to the investigation the crash scene may have been treated more as a crime scene and proper steps taken to secure the aircraft, fuel, aircraft maintenance and training documentation, and any other relevant material evidence. Ideally QPS,WHSQ,CASA,ATSB, and RA-AUS would have co-operated to determine a head investigator and the appropriate investigative steps to take.”

Page 61
“As I expressed at the inquest, it is of concern to me, and I expect would be of concern to the community at large, that the ATSB does not involve itself in the

investigation of all fatal aircraft crashes. This incident is one of several involving the Edge Microlight aircraft. Thorough investigation of these incidents by a central organisation may well have brought to light issues that may still be relevant in preventing further fatalities. It is also of concern that, at least so far as Mr Walsh is aware, the recommendation of the State Coroner in the Lockhart aircraft crash, that there be some external consultation to try to remedy any difficulties that might exist between CASA and the ATSB has not yet occurred. The community must therefore assume that the difficulties referred to by the State Coroner Mr Barnes in the Lockhart aircraft crash between CASA and the ATSB still exist."

Page 62
"Unfortunately it appears to me that the attitude that the recreation aviation industry is less deserving of resources permeates throughout the system so that regulatory vacuums exist in the areas of regulation, inspection, investigation, and enforcement.

In respect of the recreation aviation industry it appears that there is a duplicitous responsibility shared by CASA and WHSQ. The effect is regrettably that WHSQ defers to CASA which in turn regards the recreation aviation industry as one of, if not the lowest of its priorities."

Page 63
"It is accepted that CASA is the primary regulator and has the primary responsibility for ensuring safe skies in Australia. Equally clearly WHSQ has an identifiable statutory role in respect of some aspects of the recreation aviation industry. It should not be acceptable in circumstances where there is a veneer of duplicitous responsibility that both regulators should ignore the sector."

Page 63
"WHSQ should clearly identify its area of responsibility within the recreation aviation industry and manage that responsibility as it does with any other industry sector that falls within its legislative sphere. It is of concern that an incident such as that which caused Philip's death should so readily be determined by all concerned to be the responsibility of some other organisation. This decision appears to have been made quickly and before any of the concerns which are the subject of this inquiry were identified."

Page 68
"In recommending that there be a review by CASA, ATSB, HGFA , RA-AUS, QPS and WHSQ of policies and procedures in respect of all matters relating to the recreation aviation industry, I point out that the QPS OPM at 17.3.3 specifically provides that, *"officers who attend an aircraft incident where any person has been killed or injured or where there has been damage to property, are to ensure that the following agencies are advised of the incident; ……(ii) if the aircraft incident may have occurred at a workplace (see Section 9 of Workplace Health and Safety Act), a local Workplace Health and Safety inspector".* This procedure appears to limit the police officer's duty to report

the incident to WHSQ to the occasion where the incident occurred at a workplace. With respect to the many dedicated police officers involved in investigating accidents of all sorts, a police officer may not necessarily be appropriately equipped to determine whether an event occurred at a workplace or not.

The procedure is in conflict with the memorandum of understanding between QPS and WHSQ paragraph 10 Schedule I "*dealing with incidents and complaints where aircraft are involved*", which is to the effect, *"QPS agrees that QPS officers who attend an aircraft incident* ***where any person has been killed or injured will advise the local DIR office****".* Although paragraph 10 does go on to say that, *"if the aircraft incident falls within the scope of the Workplace Health and Safety or Electrical Safety legislation, DIR procedure, "dealing with incidents and complaints where aircraft are involved" will apply".* The latter part obviously is an obligation on the DIR officer to determine the procedure to be adopted whereas the obligation on the police officer is to report every death and injury to the DIR office. The QPS OPM should be reviewed to ensure consistency with the memorandum of understanding.

Where an incident occurs that involves the crash of an aircraft it would seem sensible that all regulators and investigators be involved and that either a joint preliminary investigation be undertaken or that a lead investigator be appointed to conduct the immediate inquiry with a view of then determining whether or not other investigators and/or regulators would become involved in the inquiry. A formal identifiable approach to such matters should be in place so that tragedies such as Philip's death and those of many others in the recreation aviation industry do not go unnoticed even when there may be threads of commonality and concern which link them."

Page 71
"It is apparent from this correspondence that there have been a number of concerns about the Edge aircraft and generally about the way that the recreation aviation industry has been controlled. HGFA did respond to the concerns of Chris Brandon, concluding in their correspondence of the 5th April 1996, *"If you have not provided substantiating details supporting your claim by 15 April 1996 the Board will assume that you are no longer concerned about the operational safety of the Airborne Edge 582E".* I have not been provided with any other material in respect of the matter. It is certainly unfortunate that HGFA did not involve itself more vigorously in investigating the concerns raised. Perhaps the fatalities that have occurred since these concerns were raised by Mr Brandon could have been avoided if more notice and concern had been shown at the time."

Page 72
"AirBorne Edge fatalities that have been brought to my attention therefore are the matter of Philip Scholl, the Hexham incident , the Brisch incident, the Cessnock incident of the 21st January, 2006,(referred to later) the Panckhurst incident, the Byron Bay incident in which two people died, and the matters

referred by Dr Gratton in his advice to me. Dr Gratton advised that he was aware of five incidents involving this type of aircraft, they being; two in Australia, one in Cyprus, one in South Africa and one in the UK, *"none of which seem to be lending themselves to any kind of straight forward explanation"* – Dr Gratton."

Page 72
"If the ATSB would not attend a double fatality it is unlikely that identifying these incidents is going to arouse any further interest. It is my recommendation that CASA review the registration of the AirBorne Edge aircraft and that the ATSB identify and investigate all fatalities and serious accidents involving the AirBorne Edge aircraft."

Page 72
STATISTICS
In the course of considering my findings, I have had recourse to, and the assistance of, the National Coroners Information System (N.C.I.S.). I now reproduce the statistics obtained from N.C.I.S. being ultra light/gyrocopter fatalities between the 1st July 2000 and 17th April 2008. In that period of less than ten years, seventy-two people have died in Australia in ultra light/gyrocopter crashes. I note from the information available to me that forty of these fatalities occurred between the 2nd September, 2004 and the 17th April, 2008, a period of about three and a half years, and that twenty of these occurred in Queensland. These statistics must surely on their own be evidence that the recreation aviation industry requires more rigid regulation and enforcement of the rules and that CASA and/or the ATSB should become more directly involved in the investigation of these fatalities. Unfortunately, despite best efforts by NCIS I have been unable to obtain a statistical comparison of micro light and general aviation fatalities."

Page 74
"I have a number of concerns about this ATSB report, the first of which is the conclusion that, *"no other material or mechanical defects were identified as being a contributing factor to these accidents".* In the present case, the authors appear to have over-looked the unsatisfactory condition of a number of components of the aircraft. In the event that the ATSB investigation was to be limited to a specific aspect of the inquiry, the authors' remarks should have been restricted to the matter of the inquiry. It would have been much better of course had the ATSB conducted the full investigation and a complete and thorough review of the whole of the aircraft frame."

Page 75
"It is difficult to accept that the report could identify any possible connection between all three accidents given the apparent lack of investigative material sourced for the purpose of the investigation. In the present case the report was always bound for practical irrelevance and inconclusiveness as the authors' examination was limited to the detached portion of the port side wing tip and another portion of wing which was cut from the wreckage to facilitate the examination and report. The authors, I believe without justification, draw the conclusion that an examination of the canopy material indicated that the

failure of that material was unlikely to have contributed to the accident. I reject that conclusion as it is unreasonable for the authors to make such a finding in the absence of an examination of the wreckage and the aircraft log books."

Page 76
"The report does not appear to give any consideration to the design and construction of the wing as explained by Mr Hicks in the transcript of his evidence on 14th February 2008 at page 42 where he explains how the outside end of the wing flies in a negative attitude so that if the aircraft approaches a stall situation this outside section of the wing would start to fly the aircraft in a positive attitude. Mr Hicks argues that as the bending was downward that the wing was then experiencing positive gravitational pressure and not negative gravitational pressure.

My observation of the evidence is that the leading edge wing spar port side broke downwards, the leading edge starboard side broke in a less obvious way but slightly downwards, and that the starboard side cross spar broke in a forwards direction. Part of the confusion which surrounds the direction of the break of the various aircraft components appears to arise from the different levels of expertise and terminologies used by the parties. As a lay person, I look at a broken piece of metal and regard the break to be in a particular direction. Perhaps a downwards direction as the ends of a broken pipe show evidence of being bent in a downwards direction. However Mr Hicks might describe a similar break in a different fashion with reference not necessarily to the physical direction of the observable break but with reference to the direction of application of force."

Page 76
"Unfortunately, no other indication was given that assists me in determining whether the aluminium spars were at 100 per cent tensile strength or at some other percentage or score. I am simply not able to determine from the report the state of the aluminium spars, or where within the range of hardness required for aluminium alloy 6061-T6 the samples fell. To confuse matters further, the representative sections from the tips of both aircraft, 32-4456 and 32-4388, were removed and examined. The report confirms that 5 Vickers Hardness Tests were completed for each of the three samples and that the hardness range, between $98HV_5$ and $104HV_5$, *but does not advise which readings applied to which aircraft*. At the end of the day, the only finding I am able to make from the ATSB report is that the aircraft aluminium tubing spars were made of aluminium alloy 6061-T6 temper as they in fact purport to be."

Page 78
"The ATSB report concludes that there was no evidence of material deficiencies or abnormalities that could have contributed to the failure of the wingspars. There are, however, other incidents involving AirBorne Edge aircraft where a wing tip has separated. I do not have sufficient information available to determine whether those failures were caused, or contributed to, by metal fatigue, fabric degradation, the application of sheer force to the wing of the aircraft, or engineering/design fault in the wing structure.

I do not believe that the authors of the ATSB report had sufficient access to the aircraft, or information to draw the conclusions drawn in the executive summary of the report. The executive summary refers to the other AirBorne Edge crashes as well and draws conclusions, the results of which I can have no confidence in as I have been able to observe in this incident the extent of the ATSB involvement and the rash conclusions that were drawn from that limited involvement.

During the course of the inquest I was critical about the ATSB metallurgical report and commented that because of apparent inaccuracies in that report, it should be withdrawn from public access, it apparently being available to the public via the ATSB web site. I trust that this has been attended to."

Page 84
"Mr Lyne's evidence in respect of the safety systems, or lack of them, and the failings generally in relation to the registration and supervision of the microlight industry is *"The indications I have is that the failings were symptomatic of a larger problem".* His evidence in this regard is recommended reading for the regulator and delegates. So far as the mechanics of the cause of the crash are concerned however I prefer the evidence of Mr Hicks to that of Mr Lyne."

Page 85
"The Australian recreation aviation industry would do well to align itself more closely with the British recreation aviation industry and thereby benefit from the research being conducted by the British Micro light Aircraft Association."

Page 85
"The tumble is a departure from controlled flight whereby the angular momentum of the aircraft causes the micro light to rotate about its pitch axis with a very angular velocity and acceleration; angular velocities of one revolution per second and transient accelerations of 8g are not unknown. During the tumble the forces are so great that the base bar usually hits the front strut with sufficient force to cause either the base bar or the front strut to fail. A tumble normally results in the break-up of the aircraft and the occupants to be fatally injured.

For a microlight to tumble the trike must swing with sufficient momentum to overcome the aerodynamic damping forces from the wing and allow the establishment of a pitch autorotation. This is possible if the pilot mishandles the aircraft, severe turbulence is encountered at low speed, or the micro light enters a stall from a high climb angle. Mishandling, or a deep stall, normally result in the micro light tumbling nose down".

Page 85
"Description of the Accident Causes.
The AAIB report into the accident to G-STYX concluded that the initiating event was a partial structural failure of the upper joint of the starboard control

frame upright. A maintenance error caused the joint, which is normally loaded in compression, to buckle. In itself, this would be serious but unlikely to cause rapid loss of the aircraft; however, on this particular aircraft (in common with many flex-wing micro lights of the same or previous generation), the pitch trim mechanism consists of a tensioning device pulling upon the luff lines. This in turn is linked to a trim control on the starboard upright via cable which passes through the upright and its top joint. When the top joint failed, this suddenly shortened the pitch trimmer cable, tensioning the luff lines and creating (combined with what onboard data recording showed to be high speed – full power flight) a sudden nose – up control input. It is believed that once the aircraft had pitched steeply nose-up the pilot rapidly closed the throttle, leading to a whip stall as described above".

Page 86
"It is interesting to read in the above description that the tensioning of the luff lines contributed to the sudden nose-up attitude of the aircraft. The luff lines on Philip's aircraft are broken and badly frayed. It is not too difficult to reason that these wires broke in flight causing in-flight instability, and, by striking the wing fabric were the cause of the fabric tear. This instability and tearing of the fabric combined may have been sufficient to cause the port side wing tip to separate all of which was the precursor for the aircraft to crash to the ground. The aircraft does not look to me as if it tumbled to the ground; it crashed in an almost vertical descent, landing like a helicopter. The damage to the aircraft, and Philip's injuries, would indicate that the event occurred at a low height. The catastrophic damage caused as a consequence of the precursor events created somewhat of a parachute or air anchor allowing the aircraft to more gently fall to its final crash destination than might have otherwise been experienced in a violent tumble manoeuvre. A tumble I understand means just that, the aircraft "tumbles", or spins in a loop or loops. This appears to be the case in the tumble event recorded on video and viewed by me during the hearing. Having said that, there is some evidence in the wreckage and in Philip's injuries which is consistent with a tumble, or a partial tumble. Whether a tumble event occurred is I think incidental as I am convinced that it was the failure of the port side wing tip that caused the aircraft to crash and that this did not occur as a consequence of any misadventure on the part of the pilot."

Page 86
"It is imperative that the Australian recreation aviation industry ensure that pilots are taught about the tumble event and the emergency procedures to be adopted in the event of encountering such a situation."

Page 87
"It would be appropriate for CASA and ATSB to identify and fully investigate all such events to identify the cause of the failure of the wing. It is too easy to suggest the aircraft was flown outside the manufacturer's envelope when as in this case there is no evidence to suggest that the aircraft entered or encountered flight conditions outside the manufacturer's specified flight envelope."

Page 87
"The flight envelope has been referred to by a number of persons in this inquiry however no definition was able to be provided. The flight envelope was described in terms of the pitch to which an aircraft could be put in certain circumstances. Dr Gratton in his article, "Pushing the Envelope" describes it as;

"We all know the term 'flight envelope', but what is it? Gung-ho pilots in films talk about 'pushing the envelope', qualified test pilots carefully 'explore the envelope' and the rest of us, if we wish to live long and uneventful lives stay well 'within the envelope'. The flight envelope is the range of speeds and G-levels at which your airplane has been shown safe to operate and within which you can guarantee the continued safety of the airplane."

Dr Gratton in his article goes on to discuss how the flight envelope is worked out, what it means to a pilot, and how the flight envelope will be affected if a pilot increases the weight of the airplane. This article also might be regarded as essential reading for microlight aircraft pilots."

Page 88
"Mr Mael is a helicopter pilot with Emergency Management Queensland. He advised me that, *"safety is driving the aviation industry today to an extent like never before".* After sitting through nine days of evidence which looked fairly closely at the microlight aspect of the recreation aviation industry I think that I am able to comment on this opinion. My observation of the recreation aviation industry is that it is not being driven by a culture of safety consciousness. This end of the aviation industry appears to attract less priority from CASA and perhaps as a consequence of that and the uncertainty surrounding the extent of the delegation given to RAAO's and the authority and responsibility these organisations have, it attracts people who are keen to fly but who are not prepared or able to spend the time and money required to ensure a high level of safety and competency at every level of the industry. This type of flying is said to be "cheap" or an inexpensive way to enjoy the pleasures of flight. It should not however he relegated to "nasty". Uninformed, unacceptable, offhand, or dangerous conduct or cultural should not be tolerated, if the price of having a world class recreation aviation industry in Australia is tighter regulations and enforcement then that is the price the industry must bear. Flight safety of the recreation aviation industry is not a matter of concern only to those within the industry it is a concern to whole community."

Page 88
"In the final analysis it is not possible to find exactly what happened to cause this crash. There are a number of known facts and a number of hypotheses. It is known that: Philip was a novice pilot; the recreation aviation industry is thought of as an affordable way to fly and some in the industry do not observe the highest standards of operation; the recreation aviation industry has a haphazard regulatory system; there have been concerns expressed about the Edge Micro Light weight shift aircraft; this aircraft was not airworthy; the left wing tip of Philip's aircraft broke off in flight; the aircraft crashed; Philip was a

safety conscious person and was unlikely to be “hooning”; there is no evidence to support a finding that the event was caused by pilot misadventure, recklessness, or error.”

Page 88
“Those who are charged with overseeing the safety of air flight in Australia should note that in both wing spars examined by ATSB (32-4456[Scholl] and 32-4388) the fracture occurred though the outer end of the internal re-inforcing sleeve.”

Page 88
“I order that a copy of the transcript of the proceeding be provided to CASA, ATSB, RA-AUS and HGFA to assist in understanding the serious issues which have been raised throughout the proceeding with respect to the operation of recreation aviation aircraft. As already stated, it is regrettable that these organisations having been given notice of the inquest were not represented other than when the various witnesses gave evidence. I also order that WHSQ and QPS be provided with a copy of the transcript of the evidence so that issues raised by me may be thoroughly considered.”

Page 89
“Was the death of Philip Henry SCHOLL a preventable death? Yes. Philip’s death was as a result of a conjunction of lack of; adequate training, proper maintenance, regulation of the sport of microlight flying, and enforcement of the rules and regulations. If the regulators, trainers, inspectors, sellers and aircraft operators all fulfilled their respective obligations relevant to their involvement with the aircraft and Philip, he would not I believe have died in the way that he did. They are the rusting chain of causation which now needs replacing with fresh, strong, visibly connected links to replace the out dated, uncaring, head in the sand, irresponsible attitudes that appear to be the hall mark of some in the industry. Is the regulator so blind as not to see that people will ignore safety in the pursuit of expedience until there is a regulatory regime with mandatory application that is enforced by it through an appropriate identifiable single properly funded delegated authority? There is evidence in this enquiry that the funding provided to the RAAO’s is grossly inadequate for the function they serve. Regulation is often an unwanted and unwarranted interference with the conduct of an enterprise or pursuit. However, it is implausible in such a fast growing, high risk sport were the lives of pilots, passengers, bystanders and members of the public are put at risk that there is such inadequate control, regulation and compliance. How can it be thought to be appropriate that the main regulator in Australia of civil air operations, delegates control of the recreation aviation industry to not one but two unrelated voluntarily associations? How is it a person such as Philip is able to purchase and fly an aircraft that was clearly un-airworthy? How is it that Philip was able to fly the aircraft solo when he was not licensed to do so? How is it that Mr Keogh was able to purchase the aircraft without an aircraft condition report and transfer the aircraft directly from the previous owner to Philip with only minimal supporting documentation and again without a proper aircraft condition report? How is it that Mr Keogh was able to ignore the “do not start” placard placed on the aircraft by Mr Hicks? How is it that the alarm

was not raised until about 5:00pm on the 20th October, 2005 when the anticipated flight time was less then two hours? How is it that Mr Ogle was able to issue an aircraft condition statement for the aircraft after Mr Hicks had put a "do not start" placard on it?

These questions highlight the lack of attention given by CASA to the recreation aviation industry in Australia."

HAVING CONSIDERED THE EVIDENCE I MAKE THE FOLLOWING RECOMMENDATIONS

OPERATIONS

1. CASA should endorse only one delegate to regulate weightshift aviation.

2. CASA should initiate regular compliance audits for all levels of the recreation aviation industry.

3. CASA should empower the RAAO's to suspend, and cancel certificates/licences.

4. CASA should review the operations and funding arrangements of all RAAO's to ensure the level of funding is commensurate with their activities and the responsibilities delegated to them.

5. CASA should investigate and develop an attitude and policy in respect of "trial instruction flights" particularly to determine if "trial instruction flights" are in reality a commercial activity.

6. CASA should review the operation of RA-AUS and HGFA to determine the extent of their respective authority and to standardise procedures.

7. CASA should investigate and prosecute regulatory breaches whenever brought to its attention.

8. CASA should conduct a review of all persons authorised to complete a UCAR assessing their continuing suitability to hold such authority.

9. CASA should review the suitability of the AirBorne Edge weight shift aircraft for registration under CAO 95.32

10. CASA and the RAAO's should review their policies in respect of design, approval, training, maintenance, inspections and enforcement proceedings for microlight aircraft and compare these policies with the policies of the British Micro Light Aircraft Association (B.M.A.A) and adopt and implement the B.M.A.A policies where those polices are superior to existing policies.

11. CASA and the RAAO's should implement and enforce an Order that every flight be recorded in an aircraft flight log book.

12. CASA and the RAAO's should require that a detailed flight plan is left with every airport, or aircraft landing area where a microlight flight commences.

13. CASA and the RAAO's should ensure that every airport, aircraft landing area and flight training facility have appropriate standard operating procedures, and all persons using those facilities be assessed as competent against those procedures.

14. CASA and the RAAO's should develop and promulgate a standard set of generic standard operating procedures (objectives based Industry Code of Practice) for adoption by all flight schools, airports and aircraft landing areas as a minimum standard.

15. CASA and the RAAO's should ensure that every airport, aircraft landing area and flight training facility conduct a hazard identification audit and develop policies and procedures with a view of risk minimisation.

16. CASA and the RAAO's should review pilot licensing with the view of introducing levels of restricted licensing to reflect individual competencies.

17. CASA and the RAAO's should review the evidence of these proceedings with a view of identifying short comings within the recreation aviation industry in the areas of pilot training, aircraft maintenance, transfer procedures, airport and aircraft landing area regulation, search and rescue procedure, inspection of aircraft, breach investigations, enforcement procedures and protocols and inter-organisational communication between the various arms of regulation within the recreation aviation industry.

18. CASA and the RAAO's should review and implement changes to the process of transfer of aircraft to include a requirement for a mandatory independently prepared aircraft condition report.

19. CASA and the RAAO's should move to eradicate from the recreation aviation industry the culture of minimal compliance wherever it may exist and develop and promote instead a culture of priority one air safety.

20. If the recreation aviation industry is to continue to have numerous delegated authorities those organisations and CASA should develop policies for pilot training, aircraft maintenance, the transfer of aircraft, the licensing of flying instructors and inspectors, the regulation of airports, aircraft landing areas, flight training facilities and all other aspects of the recreation aviation industry which are common to the

delegated authorities to ensure certainty within the sector and a high level of safety consciousness.

21. If the recreation aviation industry is to continue to have numerous delegated authorities those organisations and CASA should develop enforcement policies and procedures that do not enable people to avoid scrutiny, prosecution or enforcement by resignation from the sector and/or transfer from one organisation to another .

22. If the recreation aviation industry is to continue to have numerous delegated authorities those organisations and CASA should develop and implement a culture of inter-organisational co-operation to enhance regulatory compliance within the recreation aviation industry.

23. ATSB should investigate all aircraft crashes resulting in death.

24. WHSQ should review its commitment to the regulation of the recreation aviation industry.

25. WHSQ should review its procedures for the registration of aircraft and airfields as workplaces under the *Workplace Health and Safety Act*.

26. I repeat the recommendation made by Coroner Morahan on 28th February 2002 in the inquest held at the Coroners Court at Cessnock concerning the death of Gordon Clifton that: "*I recommend that the Civil Aviation Safety Authority of Australia and Air Transport Safety Board consider whether it is an appropriate time for their organisation to become more involved in the operation of ultra light aircraft in Australia*".

TRAINING

27. CASA should ensure that periodic training updates and reminders are sent to all maintenance authorities to ensure the highest standard of aircraft maintenance within the recreation aviation industry.

28. CASA and the RAAO's should ensure that the hazard of "tumbling" of microlight aircraft is part of the training syllabus for pilots.

29. CASA and the RAAO's should develop a module in the pilot training syllabus alerting new pilots to air worthiness issues when flying and purchasing aircraft.

30. CASA and the RAAO's should develop and implement systems of training of microlight pilots to ensure competencies in flight operation, emergency response to unscheduled events, and aircraft maintenance.

31. The recreation aviation industry should implement a single standard training syllabus.

32. Pilot licences should be issued only after a practical assessment of the student by a suitably endorsed independent person.

33. All aircraft crash investigators should receive standardised training and qualification to be recognised across the recreation aviation industry.

MAINTENANCE

34. CASA should implement a system of maintenance release forms as used in the general aviation industry.

35. CASA and the RAAO's should implement a system of mandatory recorded annual pass/fail Bettsometer tests in respect of microlight weight shift aircraft.

36. CASA and the RAAO's should review current requirements for the keeping of aircraft maintenance records and develop and promulgate an objectives based Industry Code of Practice to ensure aircraft maintenance is properly undertaken, recorded and the record kept available for inspection.

37. CASA and the RAAO's should review the situation where a Level One maintenance authority is regarded as competent to carry out personal aircraft maintenance.

38. Aircraft manufacturers should include a Bettsometer as part of the essential tools provided at point of sale of the aircraft.

39. Aircraft manuals and maintenance procedures should refer to the use of the Bettsometer for the testing of degradation of wing fabric and publish a weight below which the fabric must be condemned.

40. Maintenance schedules should have sequential unique numbering, and should include the date maintenance was performed.

41. Maintenance authorities should be required to interrogate the aircraft maintenance log when preparing an aircraft condition report or aircraft condition statement.

42. Aircraft log books and maintenance schedules should be designed to ensure that sufficient information is reordered to provide an honest and accurate history of the aircraft use and maintenance.

43. Aircraft log books and maintenance schedules should be designed to ensure that there is provision to allow for additional notations to be made by the person completing the log.

44. Level Two maintenance authorities, trainers and pilots should be reminded of the necessity to adhere strictly to either the aircraft manufacturer's maintenance and parts replacement procedures and schedules or the RA-AUS technical manual.

45. Aircraft condition reports should be completed only by persons who maintain competency to carry out such functions as assessed on a biennial basis by CASA.

46. All microlight and ultralight aircraft should be subject to mandatory recorded biennial inspection by an unrelated independent Level Two maintenance authority and an aircraft condition report should be completed after each such inspection, one copy to be retained by the owner in the maintenance log book, and another to be lodged with HGFA or RA-AUS.

SAFETY

47. CASA should review the endorsement of any aircraft type were evidence of a tumbling event has been found.

48. CASA should require that VHF radios be mandatory in all aircraft and that a placard be positioned near the radio recording all local and emergency frequencies.

49. CASA should require that an E.P.I.R.B device with GPS positioning be mandatory in all aircraft.

50. CASA and the RAAO'S should bring the risk tumbling to the knowledge of all registered owners and pilots of microlight aircraft.

51. Wing manufacturers should research and develop a tumble resistant wing.

52. CASA and the RAAO's should ensure that every airport, aircraft landing area and flight training facility have in place an appropriate safety and health management plan .

53. CASA and the RAAO's should develop and promulgate a standard generic safety and health management plan (objectives based Industry Code of Practice) for adoption by all airports, aircraft landing areas and flight training facilities as a minimum standard.

54. Level Two maintenance authorities should be given clear authority to ground aircraft.

55. CASA and the ATSB should investigate all known AirBorne Edge microlight crashes to determine whether there is an engineering or design fault in the wing and if thought necessary to require the

manufacturer to recall all of the airframes still in use for inspection and alteration.

SEARCH, RESCUE AND INVESTIGATION

56. CASA and the RAAO's should ensure that every airport, aircraft landing area and flight training facility has an appropriate emergency response plan to be understood and implemented by all persons using the facility.

57. CASA should develop and promulgate a standard generic emergency response plan (objectives based Industry Code of Practice) for adoption by all airports, aircraft landing areas and flight training facilities as a minimum standard.

58. Incident sites should be treated as a crime scene and should be isolated and guarded to protect the scene from possible outside interference and the integrity of all relevant evidence including documentation, aircraft wreckage, and fuel.

This inquest is closed.

Thomas Braes
Coroner
Mareeba
27th January, 2009