QUEENSLAND COURTS

OFFICE OF THE STATE CORONER

FINDINGS OF INQUEST

CITATION:	**Inquest into the death of Samuel John Beresford**
TITLE OF COURT:	Coroners Court
JURISDICTION:	Brisbane
FILE NO(s):	2011/943
DELIVERED ON:	5 December 2013
DELIVERED AT:	Brisbane
HEARING DATE(s):	30 August, 30 September, 1-3 October 2013
FINDINGS OF:	John Lock, Brisbane Coroner
CATCHWORDS:	Coroners: inquest, gyroplane, investigatory and regulatory responsibility

REPRESENTATION:

Counsel Assisting:	Peter De Waard, Office of the State Coroner
Counsel for Campbell Taylor:	Mr R Davies I/B Hede Byrne & Hall Lawyers
Counsel for WHSQ:	Mr S Murphy
For Mrs Carmel Beresford:	Mr J Given I/B McCowans Lawyers
For Australian Sports Rotorcraft Association:	Mr M Regan
For Civil Aviation Safety Authority:	Mr R Heap, CASA Legal Services

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Introduction

Mr Samuel John Beresford (Sam) was 21 years of age at the time of his death. He died on 17 March 2011 as a result of severe head and upper body injuries after being struck on 9 March 2011 by the propeller blades of a gyroplane.

Sam lost control of the gyroplane whilst he was attempting to start it at his parents' property, Farnham Plains near Eulo. He had only taken delivery of the newly purchased gyroplane the day before the incident, from Mr Campbell Taylor, who had also been involved in training Sam to fly gyroplanes.

The evidence suggests Sam attempted to start the gyroplane whilst standing outside the cockpit. His father heard the engine start at what sounded like full revolutions. He heard this for approximately three seconds, followed by a roar and then a bang, before the engine stopped.

Queensland Police Service (QPS) commenced an initial investigation but they handed over to Workplace Health & Safety Queensland (WHSQ) early on. The Australian Sports Rotorcraft Association (ASRA) assisted WHSQ with their investigation after being requested to do so. No investigation was conducted by the Civil Aviation Safety Authority (CASA) or the Australian Transport Safety Bureau (ATSB), although both organisations were notified about the incident.

Issues for inquest

A decision was made to hold an inquest due to uncertainty regarding the cause of the incident; the reluctance of Campbell Taylor to cooperate with the investigation; the apparent confusion of those investigating as to who was responsible for the investigation; the reluctance of the federal aviation agencies to investigate and review the incident; and the apparent regulation gaps regarding some key aspects involving gyroplanes. At a pre-inquest hearing held on 30 August 2013 the following issues for determination were established:

1. The findings required by s. 45 (2) of the *Coroners Act 2003*, namely: the identity of the deceased person; when, where and how he died; and what caused his death.

2. Whether the time taken to notify the relevant agencies of this incident such as CASA, ASRA, ATSB and WHSQ was sufficient in the circumstances.

3. Whether the action taken by the QPS, WHSQ, CASA, ASRA and ATSB as a result of this incident was adequate in the circumstances.

4. Whether the deceased's gyroplane was in an adequate mechanical condition prior to the incident. If not, what caused or contributed to the inadequate mechanical condition of the gyroplane?

5. Whether the regulation of the deceased's gyroplane in terms of construction, sale, registration, transportation, maintenance, repair, safety inspections and communication of safety messages was adequate in the circumstances.

6. Whether the deceased's pilot training and pilot certification process was adequate in the circumstances.

7. Whether any recommendations can be made to reduce the likelihood of deaths occurring in similar circumstances or otherwise contribute to public health and safety or the administration of justice.

The scope of the Coroner's inquiry and findings

An inquest is not a trial between opposing parties but an inquiry into the death. The scope of an inquest goes beyond merely establishing the medical cause of death.

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 and in appropriate cases with a view to reducing the likelihood of similar deaths.

As a result, a coroner can make preventive recommendations concerning public health or safety, the administration of justice or ways to prevent deaths from happening in similar circumstances in future.

However, a coroner must not include in the findings or any comments or recommendations, statements that a person is or maybe guilty of an offence or is or maybe civilly liable for something.

Proceedings in a coroner's court are not bound by the rules of evidence but 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 origin or source when determining what weight should be given to the information.

A coroner should apply the civil standard of proof, namely the balance of probabilities. However the more significant the issue to be determined, the more serious an allegation or the more inherently unlikely an occurrence, then the clearer and more persuasive the evidence needs to be for a coroner to be sufficiently satisfied it has been proven to the civil standard.

If, from information obtained at an inquest or during the investigation, a coroner reasonably suspects a person has committed a criminal offence, the coroner must give the information to the Director of Public Prosecutions in the case of an indictable offence.

In this case counsel for Mr Campbell Taylor advised that his client believed that evidence he gave may incriminate him. Accordingly, pursuant to section 39 Coroners Act, I required Mr Taylor to give evidence, being satisfied that it was in the public interest for him to do so. I specifically informed him that he needed to tell the truth and any incriminating evidence would not be admissible against him in any other criminal proceedings, other than a proceeding for perjury.

Description of the aircraft involved in the incident

Counsel assisting has helpfully provided in his submissions some information concerning gyroplanes.

According to section 2 of Civil Aviation Order 95.12 (which is issued by CASA), a gyroplane (also known as a gyrocopter) is a:

> *power-driven heavier-than-air aircraft supported by the reaction of the air on one or more rotors which rotate freely on substantially vertical axes.*

A gyroplane gets lift from a freely turning rotary wing (rotor blades) and derives its thrust from an engine-driven propeller.

According to information on the ASRA internet site, a gyroplane can fly more slowly than aeroplanes and will not stall. They can fly faster than helicopters but cannot hover. Since the rotor blades on the gyroplane are powered only by the air (autorotation), much like a windmill, there is no need for a tail rotor for anti-torque. The gyroplane is a stable flying platform. Due to their inherent simplicity, gyroplanes are easier to operate and less expensive to maintain than helicopters.

Gyroplanes are constructed in two distinctly different configurations. This gyroplane was in the form of a pusher configuration where the engine and propeller are located behind the pilot at the rear of the fuselage as depicted below. Most modern gyroplanes are constructed in this way and they are light and manoeuvrable.

(Photograph from p4 of Exhibit E1.1)

The incident gyroplane was identified as a Newo two seater gyroplane of pusher type configuration, registration number G241 (although the gyroplane was unregistered at the time of sale and at the time of the incident).

The gyroplane was powered by a Rotax engine similar to that found in many light aircraft. The engine drives a propeller, which provides for the forward motion of the aircraft. The propeller on the aircraft, which is what struck Sam, was a three bladed warp drive brand of a composite construction.

Summary of Regulatory Framework

Civil Aviation Safety Authority (CASA)

The *Civil Aviation Regulations 1988* (Cth) (CAR) and the *Civil Aviation Safety Regulations 1998* (Cth) (CASR), made under the *Civil Aviation Act 1988 (*CAA), provide for general regulatory controls for the safety of air navigation. The CAA and the CAR empower CASA to issue Civil Aviation Orders on detailed matters of regulation. The CAR empowers CASA to issue Manuals of Standards, which support those regulations by providing detailed technical material.

CASA regulates the operation of nine Recreational Aviation Administration Organisations (RAAOs). These RAAO operations cover approximately 75,000 participants per year. The nine organisations administer different sectors of sport aviation in Australia.

The evidence from CASA is that self-administration has been an expanded priority for CASA since 2009, with the provision of governance, assurance, risk management and Safety Management Systems training to organisations under the Sport Aviation Self-Administration Enhancement Program. This has further been enhanced by the active management and expansion of functions conducted by RAAOs through a revised Deed of Agreement which incorporates the introduction of Safety Management Systems, data reporting to the Regulator and the introduction of expanded audit schedules. Risk based auditing of the RAAOs has increased CASA's strategic oversight of the sector.

Sport aviation involves an element of personal risk. Members operate on the premise of informed participation. This means that participants are free to operate aircraft that do not have the same airworthiness requirements of regular public transport, within certain procedures as stipulated by an RAAO. The member therefore accepts the risks involved in flying a sport aircraft privately on an informed basis.

CASA is the Aviation Safety Regulator. RAAOs perform certain safety related obligations on behalf of CASA to administer their respective sector of the industry.

Australian Sport Rotorcraft Association

ASRA is an Incorporated not-for profit Association consisting of volunteers with a function to promote the safe construction and operation of sport gyroplanes. It conducts functions on behalf of CASA. ASRA currently oversees the operations of approximately 383 members and 271 aircraft.

CASA has put in place exemptions to enable the operation of gyroplanes under ASRA.

It is the pilot's responsibility to operate a gyroplane under the requirements of the relevant Civil Aviation Orders (CAO) and the ASRA Manuals which list the requirements for aircraft registration, membership and pilot certification.

Aircraft that are operated whilst not registered with ASRA are not covered by the exemptions of the relevant CAO resulting in a breach of *Civil Aviation Act 1988* 20 AA - Flying an Unregistered Aircraft.

Breaches of aviation legislation are enforceable by CASA. However, CASA sees it as the responsibility of ASRA to conduct an investigation into any incident involving its members and then, if appropriate, to refer the matter to CASA for further

investigation. Planned changes to the sport aviation regulations under the Regulatory Reform Project will increase the ability of RAAOs to more effectively enforce their own policy and procedures.

On 8 December 2006, Coroner John Costello made recommendations regarding resourcing of ASRA in the inquest findings into the death of Mr Kenneth Douglas Czislowski, which involved a gyroplane accident in Charleville. Coroner Costello recommended that the reimbursement of functions carried out by ASRA on behalf of CASA under the Deed of Agreement at that time was totally inadequate to allow ASRA to properly administer the operations of gyroplanes within Australia. He remarked that a minimum of $250,000 per annum was required to administer and ultimately regulate gyroplanes in both Sport and Recreation, and Aerial Work operations. At that time the funding provided by CASA to ASRA was an annual sum of $15,000 - $20,000 by negotiated agreement. Seven years later, the funding remains virtually the same at $21,242.

Australian Transport Safety Bureau

The ATSB is an independent statutory agency of the Commonwealth established under the *Transport Safety Investigation Act 2003* (TSI Act). The ATSB's function is to improve transport safety in the aviation, marine and rail modes of transport including through independent investigation of transport accidents and other safety occurrences.

The ATSB's jurisdiction extends to aircraft such as gyroplanes in the sport and recreation sector of the industry. However, the ATSB has a limited role, as the sport and recreation sector is largely self-administering.

The ATSB initially considered that the aviation incident in question was not reportable to the ATSB as it occurred while the aircraft was being assembled.

On it being clarified that the aircraft was being started and taxied, ATSB stated that nothing changes from the ATSB's perspective. If there is a gyroplane fatality arising out of a gyroplane being started up for the purposes of taxiing the aircraft, or if the use of the gyroplane is for commercial aerial stock mustering, the ATSB would still regard this as being a matter for ASRA to investigate and to assist the police investigation.

If requested, the ATSB may provide technical assistance to an ASRA investigation. The only time ATSB would depart from its policy not to investigate these matters is where there is a wider safety issue, which is applicable to a large part of the industry. The ATSB sees the use of gyroplanes in regional areas for commercial aerial stock mustering as a regulatory matter primarily for ASRA and CASA to pursue.

Gyroplane Accident Investigations

ASRA has a procedure for the reporting of incidents and accidents in their Operations Manual. However, the reporting of accidents and incidents by the pilot is not solely the responsibility of ASRA to administer. Accidents and incidents are still required to be reported to the ATSB.

The ATSB has primary legislative responsibility for investigating aircraft accidents in Australia, in accordance with the *Transport Safety Investigation Act 2003* (Cth). ATSB has confirmed that they will not necessarily and generally do not investigate sport and recreational aviation accidents including gyroplanes, due to resource constraints.

Whilst CASA is responsible for civil aviation safety in Australia, as a general rule, CASA's position is that given its limited expertise in this field, it does not investigate aircraft accidents and incidents. CASA's position is that if an incident involves a gyroplane that is registered with ASRA and operated by an ASRA member, then ASRA should investigate the incident. However, ASRA's obligations do not extend to investigating accidents involving gyroplanes that are not registered with ASRA or operated by ASRA members.

CASA says this then becomes the jurisdiction of the State Police to work with subject matter experts to provide a report to the coroner. ASRA is considered by CASA to be the 'subject matter expert' (SME) for the QPS. ASRA is expected to provide assistance to the QPS for all incidents involving ASRA members and ASRA registered aircraft. For all other matters, it may provide assistance on a cost recovery basis.

In this case, QPS handed over the investigation to WHSQ and ASRA. At the time WHSQ considered they had jurisdiction to investigate given the workplace related aspect of the incident, but, as a result of a Federal Court decision, it considers it no longer has any jurisdiction to investigate aircraft incidents.

This case highlights some of the complexities and difficulties concerning aviation investigations, which need clarification and certainty.

Issues of Regulation Pertinent to this Case

For a person to lawfully fly a gyroplane the plane should be registered with ASRA and the pilot must hold a pilot certificate issued by ASRA. In this case just about every regulation applicable was breached by the main players.

The gyroplane Sam had been flying from his parents' property was not registered. Sam had received flying instruction from Campbell Taylor although it is plainly evident Mr Taylor did not follow the formal instruction syllabus. Sam had not completed the requisite supervised training hours; and had not completed either of the two written examinations. Sam had become a member of ASRA but his membership had lapsed at the time of the incident. The gyroplane sold by Campbell Taylor was also not registered with ASRA. It is apparent Campbell Taylor had not completed his Biannual Flight Review necessary for him to remain licensed.

Although Sam was flying extensively in his parents' gyroplane, he was unlicensed to do so. Further, at the time of his death, Sam was operating as a sole trader and provided services under contract, including aerial stock mustering, which required the utilisation of his parents' single seater gyroplane on the parents' property as well as other landowners. Campbell Taylor and Sam's uncle Eric Beresford were also flying gyroplanes for commercial mustering on other landowners' properties.

It is legal for landowners or family members to conduct mustering with gyroplanes on their own property. Commercial aerial stock mustering in a gyroplane that is not carried out on a person's own property or for family is unlawful unless the pilot has also obtained various pilot certifications through CASA. CASA told the inquest no commercial gyroplane musterer in Australia at the time of the inquest had availed themselves of this certification from CASA.

Anecdotal evidence led at the inquest indicated that commercial gyroplane mustering is a widespread practice in rural areas. It is significantly cheaper than helicopter mustering. Helicopters must go through very tight regulatory safety controls, all of which come at a cost.

The CASA representative at the inquest said CASA is willing to tackle this breach of the safety laws but has difficulties in gathering evidence and has limitations to its resources and personnel. Tackling this issue is not a high priority given the risks to the public are limited, as mustering flying is conducted in uncontrolled airspace, in largely rural areas and with largely single operators who presumably have accepted the risks.

Summary of the incident that led to Sam's death

Sam was 21 years of age. He resided at 'Farnham Plains', 30 kilometres west of the township of Eulo.

His parents, Mr Michael Beresford and Mrs Carmel Beresford, operate a family partnership on the property. Sam had in recent times provided services under contract to other properties, including aerial stock mustering, and used his parents' unregistered single seater gyroplane.

On 8 March 2011, Sam paid for and took possession of a two seater gyroplane from Campbell Taylor and transported it on a trailer from Roma to his parents' property.

On the morning of 9 March 2011, Sam's father recalls that he and Sam had a conversation, during which his son agreed he would have the gyroplane properly inspected by his uncle before flying it. His son said he was only going to start up the gyroplane and taxi it up and down the airstrip a number of times that day. He had also told his partner, Ms Garrett, that he would be doing this to get familiar with the gyroplane again as it was different to the one he had been flying.

After their conversation Sam's father walked back to the house. He had only been in the house for a couple of minutes when he heard the gyroplane's motor start at full revolutions. He says that it was going for about three seconds when he heard a roar and then a bang, followed by the engine stopping.

He thought instantly that his son was in trouble because he knew what he heard was not right. He jumped on his bike and went back to where the gyroplane was located and found his son seriously injured and the gyroplane against the Toyota utility.

Eulo Police were contacted and arrived at approx 9:08am and assisted at the scene with the commencement of first aid. Queensland Ambulance Service was also contacted and arrived at the scene a short time later. They stabilised Sam before transporting him to the Eulo airstrip, where he was flown by the Royal Flying Doctor Service to the Princess Alexandra Hospital in Brisbane for treatment.

He died eight days later on 17 March 2011 as a result of his injuries.

Autopsy results

On 18 March 2011, Dr Phillip Storey, a forensic pathologist, conducted a post mortem examination consisting of an external examination, computed tomography scan and review of the medical notes. Toxicology analysis was also performed on ante-mortem hospital admission blood.

The toxicology results show there was no alcohol in Sam's system. There were also no drugs in his system other than morphine and midazolam, which had been administered to him during resuscitation attempts and did not relate to the time of the incident.

Dr Storey found that Sam had succumbed to the cumulative effects of a severe traumatic insult, which involved severe blood loss, severe injuries to the brain, and severe trauma to the upper torso and chest regions. This resulted in multi-organ failure including renal failure, cardiac compromise, liver compromise and brain injuries. Dr Storey found that the medical management had been highly active and appropriate. There had been extensive blood loss and the evolution of renal failure. Dr Storey noted that the injuries were severe and would be expected to result in mortality, even in young, fit and healthy adults.

Dr Storey concluded that the cause of death was: severe head and upper body injuries, due to, or as a consequence of being struck by the rotor blades of a gyrocopter. More accurately they should be defined as propeller blades.

Investigations

QPS Investigation

Shortly after Sam was injured on 9 March 2011, the Eulo police station was contacted. Senior Constable David Solonec was the first officer on the scene at approx 9:08am and commenced first aid.

The incident was immediately identified as an 'aircraft incident' as defined in the QPS Operations Manual, so a Forensic Crash Unit (FCU) officer was tasked to attend the location to commence an initial investigation. ATSB were also notified at 9:40am. ATSB verbally advised QPS that they would not be investigating the incident. QPS also contacted Recreational Aviation Australia (RAA) and were advised that the relevant authority for gyroplanes was ASRA. Shortly after, ASRA was notified.

FCU officer, Sergeant Sean Relf from the Cunnamulla police station and Scenes of Crime Officer, Mr Adam Pearson, attended the incident site at approximately 10:30am and commenced an initial investigation.

Sergeant Relf has an ultra-light pilot certificate and he is a member of Recreation Aviation Australia (RAA). At the time of the incident, he had completed about 150 flying hours and had owned his aircraft for about a year. He had completed his FCU training but this was not focussed on aviation incidents. He has since applied to do an ATSB investigation course a couple of times but he has not been selected to do

so. He has now investigated approximately seven aviation incidents in the Western Queensland area, most of which have been aerial stock mustering related.

Sergeant Relf and Mr Pearson took a series of photographs of the scene and located a number of parts of the propeller, human tissue, blood and clothing from Mr Beresford.

A photograph of the scene is depicted below.

(Photo 1016, Exhibit 1.3)

In oral evidence, Sergeant Relf advised that he determined that the gyroplane would have been pointing towards the shed on the property when it was started. The Toyota utility and trailer used to tow the gyroplane to the property was approximately 16 metres ahead to the left of where the gyroplane was started (when looking from behind the gyroplane). A bob cat, which was used to assist in re-attaching the rotor blades to the gyroplane before it was started, was about 5 – 8 metres adjacent to the gyroplane to the left hand side (when looking from behind the gyroplane).

Based on the drag marks made by the path the gyroplane took, the throttle control lever being on the left hand side of the cockpit, and the blood and tissue also found on the left hand side of the rudder and boom section of the gyroplane, Sergeant Relf determined that Sam would have been standing outside the cockpit on the left hand side of the aircraft when he started the gyroplane.

Sam's father, Mr Michael Beresford, did not see the incident but he heard it from inside the house about 150 metres away. In his witness statement dated 13 April 2011, he stated that he heard the motor start at full revolutions. He estimated that it

was going for about three seconds. He heard the roar and then he heard a bang. As soon as he heard the bang, the engine stopped.

Based on this evidence and his observations of the scene, Sergeant Relf determined that the engine must have gone to a high power upon Sam starting it, causing the gyroplane to move forward. He thought it would appear that Sam attempted to maintain a grip of the aircraft to bring it back under control. The gyroplane would normally have been expected to veer right slightly due to the torque force caused by the propeller blades rotating in an anti-clockwise direction. In this case, the gyroplane veered left, but Sergeant Relf concluded that this must have occurred due to the force Sam was applying to the left hand side of the aircraft when attempting to bring it under control from outside the cockpit

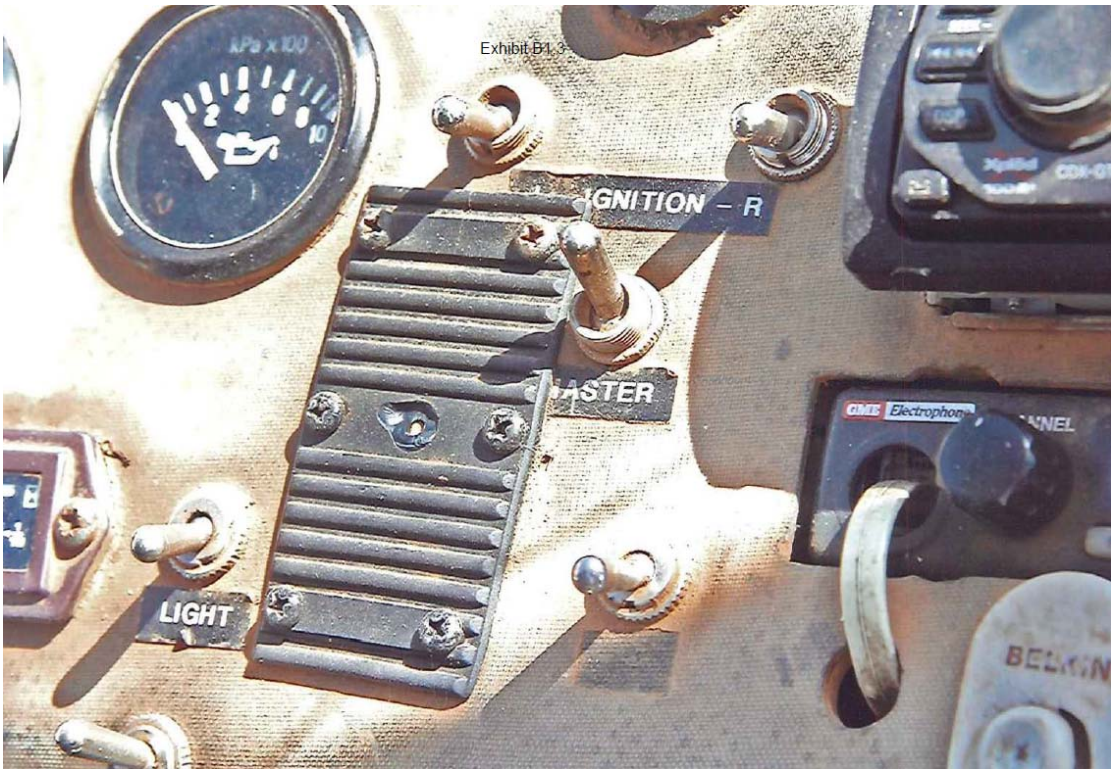
After either losing grip or being dragged along with the gyroplane, it moved forward of Sam's position and the propeller blades struck his head, upper right section of his shoulders and torso, causing severe injuries to him. Sam was located on the ground, metres behind where the gyroplane came to a stop. The gyroplane had continued its path until it hit the right back corner of the Toyota utility. Sam's father estimated the time between him hearing the high revolutions of the engine and the sudden bang and stopping of the engine to be about three seconds. In such circumstances, Sergeant Relf concluded that Sam would not have had much time, if any, to react to what was happening.

Sergeant Relf did not feel that he had the relevant expertise to conduct a thorough technical inspection of the aircraft but he did make a number of general observations and was able to draw on his experience as a light aircraft pilot when making those observations.

Sergeant Relf noted that the front lower section of the gyroplane was extensively damaged and the gyroplane's propeller was fractured with sections of the propeller blades located on the ground.

An initial check of the scene by the police officers did not locate any chocks or other items that could have been used to chock the wheels of the gyroplane on the ground or in the vicinity of where the gyroplane was believed to have been started. An inspection of the main landing gear and wheel assembly also identified that there were no braking devices fitted on any of the wheels of the gyroplane. There was no evidence that the gyroplane had in any way been anchored or tethered.

The police officers observed that the throttle position of the gyroplane was in a 'closed' state, the two magneto (ignition) switches were in the 'on' position and the master switch was in the 'on' position. The photograph below shows the ignition switches in the 'off' position, however Sergeant Relf had moved them down for safety reasons.



(Photo 1044, Exhibit B1.3)

Following the preliminary police inspection of the gyroplane, Sergeant Relf pushed the gyroplane into a nearby shed. The shed was secured with crime scene tape and the blades on the gyroplane were secured to the fuselage with a piece of rope to prevent them from moving around so that it would still be in its original state.

On 14 March 2011, Sergeant Relf identified that the incident had occurred within a workplace due to Sam's self employment as an aerial stock musterer and WHSQ was advised of the incident. On 16 March 2011, the matter had been allocated by WHSQ to a Principal Investigator, Ms Allison Cummings, and she notified Sergeant Relf that WHSQ was commencing an investigation.

Sam died as a result of his injuries on 17 March 2011.

The Form 1 – 'Police Report of Death to a Coroner' noted that no further enquiries were to be conducted by the police as they had *'*handed the matter over to ASRA and WHSQ for follow up investigation*'.*

Sergeant Relf had at the time of handing over the matter to WHSQ (and ASRA) requested WHSQ to provide him with information regarding the outcome of their investigation but no such information was provided to him. Sergeant Relf only became aware their investigation had been completed after a copy of the WHSQ report was provided to him by the Office of the State Coroner.

Mr Eric Beresford's inspection of the scene

Sam's uncle, Mr Eric Beresford, has held an ASRA gyroplane pilot's certificate for about 9 years. He has also held a helicopter and fixed wing pilot's licence since about 1984. Eric Beresford used his gyroplane in contract mustering. He was aware

Sam had also been flying the gyroplane on his parents' property and elsewhere for contract mustering for over 350 hours and considered Sam to be a competent pilot.

When he heard about the incident on 9 March 2011, he flew into Eulo on the same day. He was told the wheels of the gyroplane had not been chocked. Eric Beresford found this hard to believe because he says he knew Sam was always safe when around a gyroplane.

The next day Eric took a drive to the incident scene. He found two lengths of timber approximately 30 metres to the south of where the impact had occurred. He thought it was important enough to take photographs and he later produced them to WHSQ.

Eric had seen the gyroplane the afternoon before the incident when Sam stopped on his way through. He thought the gyroplane looked a bit rough and tired and commented to Sam he had paid a lot of money for something not new. He said it did not look unsafe. He told Sam he would come and have a look at it if he had time the next day. He had not told Sam not to fly it.

Given Sergeant Relf's evidence about the scene, I consider it unlikely that the pieces of wood found were utilised as chocks. If they had been used they were clearly unsuitable for that purpose and would have provided little resistance in the event of a high revolution start.

The carburettors were loose in the manifold mountings. Eric considered they had come off during impact and placed them loosely in the manifold mountings to avoid dust contamination.

Workplace Health and Safety Investigation

WHSQ determined that it had a responsibility to investigate the circumstances of the death in accordance with their internal policy at the time entitled *'Dealing with Complaints Where Aircraft are Involved'*. This procedure provided guidance about primacy of jurisdiction between ATSB and WHSQ but did not provide guidance about the jurisdiction overlap between WHSQ and QPS or about liaison and communication between the two agencies for aircraft investigations.

Ms Cummings (a former police detective) conducted the WHSQ investigation with initial assistance from Principal Inspector (Investigations), Mr Scott Munro, and Principal Inspector (Industrial), Mr Brent Rushbrook.

It is noted at page 14 of the WHSQ report that at the time WHSQ was notified of the incident, their inspectors were unable to conduct an initial assessment of the incident scene and the gyroplane due to significant flooding in and around Farnham Plains. This resulted in their first inspection of the site and of the gyroplane not being until 8 April 2011 (one month after the incident).

During their first inspection of the scene and aircraft on 8 April 2011, WHSQ inspectors and advisors were accompanied by Sergeant Relf and Senior Constable Soloneck of QPS, and ASRA representatives Mr Murray Barker and Dr Paul Campbell. WHSQ Principal Advisor (Construction Engineering), Mr Stuart Davis, conducted a technical inspection of the aircraft, in location, that day.

On 8 April 2011, WHSQ Inspector, Mr Munro, issued Sam's parents a prohibition notice regarding the use of their single seat gyroplane, which was located on site, until it had been inspected and registered with ASRA.

WHSQ later arranged for the gyroplane involved in the incident to be transported some eight hours to the Caboolture Airport to be stored in an ASRA hangar for further inspections.

A further WHSQ technical inspection of the gyroplane was carried out at the Caboolture Airport on 18 May 2011 by Principal Advisor (Mechanical), Mr Terry O'Sullivan because it was determined that he had more relevant mechanical experience.

During the course of the WHSQ investigation, WHSQ inspectors took photographic evidence of the incident scene and gyroplanes; seized and examined the gyroplane; obtained technical inspection reports from the WHSQ technical unit and ASRA; obtained witness statements from 15 persons; obtained and analysed documentation from the manufacturer, seller, repairer and purchaser of the gyroplane; and sourced relevant legislation, codes of practice and standards.

On 8 February 2012, the WHSQ investigation report was completed. WHSQ has decided not to commence prosecution against any duty holder in this matter. In addition, the WHSQ Investigations Governance Group had reviewed the outcome of the investigation and concluded that no issues were identified from the investigation to suggest a broad workplace health and safety issue, which required a specific organisational response.

On 24 September 2012, WHSQ advised that due to the Federal Court decision in *Heli-Aust Pty Limited v Cahill* (May 2011), WHSQ no longer considered that it had jurisdiction over aviation incidents that involve the operation of an aircraft such as this matter, even if the incident involves work, a worker or a workplace.

In *Heli-Aust Pty Limited v Cahill*, the Full Bench of the Federal Court ruled that Commonwealth aviation laws 'cover the field' of safety in civil aviation in Australia to the exclusion of state law. The court further found that the Commonwealth regime is comprehensive and exclusive and is not supplementary to state law. Therefore, a direct conflict exists between the operation of the Commonwealth regime and any state laws dealing with safety in civil aviation. As such, state law on this issue is considered invalid to the extent of any overlap.

CASA Investigation

CASA was initially notified of the incident by ASRA on 11 April 2011 and at no stage did ASRA inform them that they would not be investigating due to a lack of resources. CASA understands that ASRA stated to WHSQ that, due to the fact that the deceased pilot was not a member of ASRA and the gyroplane was not registered with ASRA, it did not propose to conduct an investigation. However, CASA further understood that when WHSQ requested assistance from ASRA and offered to transport its investigators to the scene, ASRA became involved in the investigation.

CASA requested to be advised of the outcome of the WHSQ investigation, however for whatever reason, this did not occur.

CASA also did not follow up with ASRA in terms of the outcome of their part in the investigation.

It was only after further information was sought for the purpose of the inquest that CASA considered if any breaches of regulations had occurred and commenced an investigation.

Technical inspections of the gyroplane

The gyroplane has been the subject of a number of post incident technical inspections. Of particular significance is that no-one with a formal mechanical background in aviation completed an inspection. As well the inspections were carried out at different sites and the transport of the gyrocopter from Farnham Downs to Caboolture Airport potentially created its own problems relating to continuity of evidence and impacted on identifying if any mechanical deficiencies were causal or contributory.

The various inspections were as follows:

a. Dr Stuart Davis, WHSQ Principal Advisor (Construction Engineering), at the incident site at Farnham Plains on 8 April 2011;
b. Mr Terry O'Sullivan, WHSQ Principal Advisor (Mechanical) at the Caboolture Airport on 18 May 2011, 2 September 2011 and 13 October 2011;
c. Mr Murray Barker, ASRA President at the time (now ASRA Operations Manager) and ASRA 'Principal Investigation Officer', at the incident site at Farnham Plains on 8 April 2011 and at the Caboolture Airport on 18 May 2011; and
d. Mr Mark Robertson, ASRA Registrar at the time (now ASRA Documents Manager) and Instrument Technician, at the Caboolture Airport on 18 May 2011, 2 September 2011, and 13 October 2011.

Photograph 1. Front damage to the body of the Gyrocopter.

WHSQ Inspections

Both Mr Stuart Davis and Mr Terry O'Sullivan have degrees in mechanical engineering and are no doubt well qualified. Without in any way being critical of their involvement, until this incident, neither had previously inspected an aircraft and neither had an aviation background. They explained their approach was from a general construction safety and mechanical engineering perspective.

Mr Davis attended Farnham Plains and inspected the gyroplane on 8 April 2011. He was accompanied by WHSQ Inspector Scott Munro, WHSQ Inspector Brent Rushbrook, Mr Murray Barker (ASRA President), Dr Paul Campbell and a number of QPS officers.

Mr O'Sullivan attended inspections of the gyroplane at the ASRA hangar at the Caboolture Airport on 18 May 2011, 2 September 2011 and 13 October 2011. He was utilised by WHSQ to complete inspections on the throttle system of the gyroplane due to his mechanical trade background.

Mr Davis noted a number of concerns but made concessions in his evidence which indicated that many of these did not contribute to the incident occurring. He was unable to come to a conclusion as to why the engine went to high revolutions.

One of the problems in the inspections was the number of people who interfered with the machine impacting on the findings of the experts.

For instance both Mr Davis and Mr O'Sullivan noted the condition of the throttle cables as being worn and damaged and on the left carburettor the end of the cable sheath was able to be snagged on the screw adjustment device as the cable sheath was damaged. Neither were aware the cable sheath was actually snagged for the purposes of photographs by other inspectors, and both conceded that this meant that he could not say whether the cable sheath actually snagged prior to the incident but even if it did, it would have had the effect of lowering the engine RPM rather than increasing the RPM and did not contribute to the incident.

Mr Davis noted the two horizontal seat cushions in the cockpit interfered with the central lever on the throttle control when the throttle was pulled back and Mr O'Sullivan noted the throttle lever did not always ensure that the throttle linkage at the carburettors was fully back to the idle stops. To get the linkages back to the idle stops, a high force was required to be applied to the throttle lever. Mr Davis conceded that he did not look underneath the seats during his inspection to determine the effect that the damage to the undercarriage of the cockpit had on the throttle lever. He also conceded that the impact damage to the left hand side of the aircraft had probably bent the cable shaft out of place (photographs show this), which resulted in the throttle lever issues that he discovered.

Mr Davis noted the engine speed fluctuated greatly from a moderate idle to a very fast idle but he could not determine the cause of this problem, nor whether it would have existed at the time of the incident, as there were too many variables.

Mr O'Sullivan said the overall condition of the unit was fair. He was unable to state if the gyroplane was airworthy prior to the incident because this was beyond his area of expertise.

He also said the throttle linkages and springs at the carburettors were set up in the opposite orientation to the linkages and springs on the parents' gyroplane. If a visual inspection was conducted it is possible that this would not be readily identified if the two methods of setting up the throttles were not known by the person conducting the inspection but as the throttle cable did not break it was not contributory.

Mr O'Sullivan also said the carburettors were loose in the manifold mountings. He was not aware that the carburettors were placed loosely in the manifold mountings by Eric Beresford and conceded that this was therefore a non-issue in terms of the cause of the incident.

Mr O'Sullivan considered the road conditions, speed and the method used to secure the gyroplane to the trailer would be factors that may have affected the likelihood of damage to the gyroplane during transport but given this equally could have occurred when transported from Farnham Plains to Caboolture post incident or as a result of the incident, he was unable to make any conclusions.

ASRA Inspections

Neither Murray Barker nor Mark Robertson had formal aviation mechanical qualifications but were nonetheless very experienced.

Murray Barker was the 'ASRA Principal Investigator', the ASRA President and assistant Operations Manager at the time the ASRA inspections of the aircraft took place. Mr Barker has been a gyroplane pilot for over 20 years, a certified gyroplane instructor for 16 years, a Chief Flying Instructor for 12 years, an ASRA Technical Advisor for 17 years, and he has constructed approximately eight gyroplanes. Prior to the incident, he had completed aviation investigation training with Recreational Aviation Australia.

Mark Robertson is an ex-Royal Australian Air Force Avionics Technician and had the responsibility of fault recognition and repairs to aircraft for a period of six years. He has been employed in the Aviation, Medical and Industrial electrical/electronics areas. He is an ASRA Technical Advisor.

There were two significant findings. Firstly, the engine tended to start at high revolutions and secondly, the magneto switches were faulty.

Mr Barker inspected the gyroplane at Farnham Plains on 8 April 2011 and at the Caboolture Airport on 18 May 2011.

Based on a test run only he considered the overall condition of the engine was poor.

When the engine was test started the first time with the load of the propeller removed and the throttle handle closed, the engine raced to 5,000 revolutions per minute (RPM). Redline for this engine is 5,800 RPM. He noted that had the engine started with the propeller attached and the engine raced to 5,000 RPM, it would have been impossible for one person to prevent the aircraft from moving. He agreed the absence of the propeller would have affected the RPM but not for all of it.

Further, the engine did not idle consistently each time it was test started. At various times, the engine speed on start up ranged from idle to high RPM (around 3,000 RPM). The engine started and went to a high power setting with the throttle control lever positioned to the normally closed position, but Mr Barker noted that the actual

throttle position at the carburettor at the time Sam started the gyroplane was unknown.

The carburettors on the engine were still on the original factory configuration and were not modified to automatically close in the event of a throttle cable breakage. Therefore, in the event of a throttle cable breakage, the engine would go to full power. He agreed this was a non-issue in this case as the throttle cable did not break. The throttle cable condition was poor but consistent with the evidence of the WHSQ inspectors Mr Barker agreed it was not a contributing factor to the incident.

He also noted both carburettors were loose on their respective mounting spigots but agreed this became a non issue once he heard of the actions of Eric Beresford.

With the throttle handle set in the off position, both carburettor stops were approximately 5 millimetres off the fully closed position. Mr Barker conceded that this could have been due to the impact damage to the left side and underneath the aircraft that bent the throttle shaft as a result of the incident itself.

During the initial test starting of the engine, the ignition switches worked erratically. At the final test start, the engine was unable to be turned off at the ignition switches and the engine had to be stopped by removing the carburettors.

Mr Robertson found the right magneto switch functioned correctly but the left switch continued to fail and only after continual activation was he able to intermittently get the switch to work. If someone had tried to turn the engine off, it would not have turned off. He estimated that they worked one in every ten times during his testing. Dust inside the mechanism was not an issue.

He thought the switch may have been old and/or the damage may have been caused by prolonged vibration, such as the aircraft being relocated by road. Given the gyrocopter started and was stopped by Mr Taylor the day before, he conceded that the switches may have actually worked for Mr Campbell prior to the hand over as they were intermittent (i.e. operated some times and not others). Mr Robertson was not of the view that the damage was likely to be a result of extensive vibration for a short period of time caused by the incident itself but he could not discount it. He was of the view that vibration over an extended period of time (such as during transportation from Roma to Farnham Plains or from Farnham Plains to Eulo) was more likely to have caused the problem).

Mr Barker concluded that:

a. The throttle position may not have been checked prior to starting the engine.
b. The throttle cable or cables may have been seized in the outer sheath resulting in a high power setting at the carburettor, although there is significant doubt about this.
c. The magneto switch may have been activated when the engine went to high power but failed to turn the engine off.

Sam's association with ASRA

ASRA membership and gyroplane registration status

Sam became a member of ASRA in February 2010 and was sent various ASRA documents including the ASRA Operations Manual, Gyroplane Pilot Logbook, Pilot Training Logbook, and Radio Handbook.

Sam's ASRA membership expired on 1 January 2011 and he had not renewed his membership by the time of the incident. This apparently is not unusual as up to half of all members fail to renew their membership until after they are reminded to do so by ASRA.

No gyroplane associated with Sam, his parents or Campbell Taylor was registered with ASRA at the time of the incident.

Sam's flying experience

From an examination of invoices from 2 July 2010 to 11 February 2011, it is evident Sam did approximately 91.5 aerial stock mustering flying hours in the Eulo area for a fee of $130 per hour. This flying was conducted in his parents' unregistered single seat gyroplane.

Sam was reported to have accrued approximately 400 flying hours in his parents' gyroplane, although he did not record entries in the logbook provided for that purpose and as required by the ASRA Operations Manual.

There is evidence from a number of sources that Sam was competent as a pilot and loved what he did.

Sam's flying instruction lessons

About two years prior to his death, Sam's uncle recommended that he obtain flying instruction from Mr Rob Patroney in Bundaberg. However, the evidence is that this was limited to two short flights. They used Mr Patroney's two seater gyroplane. Mr Patroney had the appropriate qualifications to provide flying instruction.

In Mr Taylor's record of interview with WHSQ, Mr Taylor said that Sam had completed roughly 20 hours flying instruction with him in gyroplane G241 in 2009 and 2010.

In fact it is difficult to know what Mr Taylor did in relation to flying instruction for Sam. His record keeping, if you could call it such, was grossly inadequate. An ASRA Pilot Training Booklet, which was found in Sam's possessions after his death, did not have any entries in it by Sam or his instructor/s.

Due to the lack of records kept by both Mr Taylor and Sam in relation to pilot training, it is impossible to conclude with any level of certainty whether the pilot training conducted by Mr Taylor was adequate.

I formed a very clear impression that Mr Taylor's evidence in this area, as with other parts of his evidence, was very concerning and untruthful. There were many parts of his evidence, including the very late production of a Gyroplane Logbook, a document

that has every sign of having been produced retrospectively, which makes whatever he says unreliable.

In terms of Mr Taylor's experience and qualifications to provide flying instruction it seems he was qualified at some point, but this had lapsed by the time he was training Sam as he had not completed a Biannual Flight Review required by ASRA in order to maintain his own valid pilot's certificate.

ASRA's records should have reflected this but it is apparent his flying instructor rating remained valid until his membership lapsed on 31 December 2010. Gyroplane G241 was registered to Mr Taylor with ASRA until the expiry of his membership on 31 December 2010.

Mr Taylor has stated in a letter provided by his lawyers dated 19 August 2013 that as part of the tuition received by Sam during flight instruction training with Mr Taylor in 2009 and 2010, he instructed Sam that he should be seated in the cockpit of the gyroplane with seatbelt fastened prior to starting the gyroplane engine. Mr Taylor says that he instructed Mr Beresford that he should never attempt to start the gyroplane from outside the cockpit unless the machine was dually secured by both chocking its wheels and also by affixing its tail to an immovable object to anchor it.

For the reasons stated I cannot be confident this statement is true, although it is apparent that at least chocks were present when Mr Taylor started the gyroplane outside the cockpit the day he delivered possession to Sam.

It appears Sam was under the impression that Mr Taylor was arranging for the issue of his pilot certificate after he had completed the requisite flying training hours with Mr Taylor.

According to Ms Garrett, Mr Taylor advised Sam on the day he took possession of the aircraft that his wife (Ms Adrienne Taylor) had called ASRA about his pilot certification and they said the paperwork had been lost. According to Ms Garrett, Mr Taylor then said to Sam words to the effect 'don't worry because out where you are, no one's going to check on it'.

I have substantial difficulties with the evidence of Mr Taylor and his wife Adrienne Taylor that an Advice to Registrar certificate and accompanying letter, which has not been located by ASRA, was in fact sent.

Sam's purchase of gyroplane G241

In late 2010, Sam decided to purchase his own gyroplane and fixed his attention on Mr Taylor's Gyroplane G241 in which he had earlier flown with Mr Taylor.

Sam paid an initial deposit of $25,000 on 21 January 2011 with an agreed total of $55,000.

Sam's parents believed that the $25,000 was to be used by Mr Taylor to make repairs to the gyroplane prior to Sam taking ownership. His mother and Ms Garrett both told him they thought the deposit of $25,000 was excessive. Sam informed them that he was paying that amount of money to Mr Taylor to have the gyroplane repaired for the sale.

There is also some documentary evidence to suggest that Sam had a belief that the gyroplane would be 'rebuilt' prior to the hand over. In an e-mail Sam sent to Mrs Taylor on 21 February 2011, he asked when they were expecting to get the two seater 'rebuilt'. In Mrs Taylor's e-mail response on the same day, she did not correct him. She advised Sam that the gyroplane was all done and they only had to sand and paint it.

Mr Taylor says that the extent of their agreement was that the masts, control rod ends and cables on the gyroplane would be replaced and routine basic servicing would be completed. He says that he told Sam the machine would be in sound operating order when he collected it. Mr Taylor says that he performed all of this work himself prior to Sam collecting the gyroplane. Invoices for $400 were produced as evidence of the work performed.

According to Ms Garrett, at the time of pick up, Mr Taylor mentioned that work had been done to the gyroplane and that it had been painted. He never specifically said what had been done to the gyroplane. Sam's father recalls questioning Sam about the lack of work done to the gyroplane and Sam acknowledged that it was not what he paid for and said he would sort it out with Mr Taylor later.

Technical inspections post incident suggest that the gyroplane did have a minimum of new masts and control rod ends replaced and the fuselage painted. The inspectors seem to agree that the aircraft was otherwise in poor to average condition with a number of components worn due to use and age.

Eric Beresford saw the gyroplane the day before the accident and says that he thought the gyroplane looked a little rough but it was okay and he could not see any issues with it. He did not carry out a detailed inspection of the gyroplane.

There was some evidence the price being paid by Sam was at the very upper range in value. Sam clearly wanted to buy this two seater gyroplane. Although this is largely a contractual matter, I accept the documentary evidence and statements of Sam to his family, that he was expecting a rebuild of the aircraft.

Again for the reasons I have given, I do not accept Mr Taylor's evidence on this issue.

However, the technical evidence about the condition of the gyroplane is equivocal as to how contributory it was to how the incident occurred.

Documentation for gyroplane G241

Mr Taylor said in his record of interview with WHSQ that he never had an Operator's Manual or Gyroplane Logbook so he did not give these documents to Sam. In oral evidence, he also admitted to having the Rotax engine manuals and not supplying them to Sam.

In his record of interview with WHSQ, Mr Taylor said that he did not have any maintenance records, just records of the parts he bought from Mr Dull and the engines he purchased (and engine servicing) from Mr Eacott .

However, Mrs Adrienne Taylor said in a letter to counsel assisting dated 16 August 2013 that Mr Taylor always kept a daily diary for each year the gyroplane was in their possession and he also had a logbook. She believed they were located with Mr

Taylor's solicitor. In oral evidence, Mrs Taylor was not sure whether they were still with Mr Taylor's solicitor or in his possession. Mrs Taylor denied having any actual knowledge as to where they were. Mr Taylor said his wife had possession of the records.

ASRA advised that Mr Taylor would have been issued with a Pilot Logbook, Gyroplane Logbook and ASRA Operations Manual when he became a member. They said that the logbooks were issued to him with his student pilot pack upon commencing pilot training.

Mr Taylor admitted to not providing Sam with any documentation (including engine Manufacturer's Manuals or a Gyroplane Logbook) upon sale. He confirmed in oral evidence that he understood the importance of providing such information.

Just prior to the inquest Mr Taylor provided what he says is his Gyroplane Logbook for gyroplane G241. This logbook appears to record flying hours and maintenance. Mr Taylor says he did not maintain a separate Pilot Logbook. The first entry in the Gyroplane Logbook supplied by Mr Taylor begins on 5 January 2010 with flying hours and maintenance details from 5 January 2010 until 4 March 2011.

Mr Taylor was required to produce all original Gyroplane Logbooks on the first day of the inquest. He provided what he says is his original logbook from 2010 onwards, claiming that he did not have any other logbooks.

In oral evidence, Mr Taylor admitted to lying to the WHSQ inspector when saying he did not keep a record of maintenance on gyroplane G241. He said that he had only produced a logbook from 2010 onwards because that is when he started keeping logbook records. He had invoice receipts for maintenance conducted.

In terms of his flying hour records, Mr Taylor said in oral evidence that he did not keep a logbook except from 2010. He did, however, keep a diary for every year which recorded his flying. He said that those diaries were with his ex-wife, Mrs Adrienne Taylor, and that she took them with her in a filing cabinet, when she moved out of their home in early 2013.

Mr Taylor says that 'basic servicing' of the machine was undertaken by him. The basic servicing constituted: changing the engine oil after every 50 hours of use; changing all filters after every 100 hours of use; and replacing all cables after every 200 hours of use.

Mr Taylor says that 'major services' on the gyroplane were carried out at 2,000 hour intervals. The major services involved the gyroplane being stripped down and checked and any worn component was replaced (e.g. pedals, front wheel braces, props, rotor blades, etc). Conveniently he records that he conducted a 'major overhaul' himself in his Gyroplane Logbook in the days before handing the gyroplane

over to Sam. He did not complete a 'major overhaul' in anyone's language.

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Date	Total Airframe Hours	Total Engine Hours	Flight Details / Work Done	Pilot / Work Done By
			Totals Brought Forward	
28.11	6127.0	1361.2	2 hours 100 hourly Changed oil + oil FILTER, Changed AIR FILTERS (2) Changed RADIATOR FLUID, Changed spark plugs (8) PUT NEW STARTER MOTOR IN.	
2.11	6133.1	1357.3	6.1 FT.	
3.11	61420	1366.1	8.8 FT	
4.11	6153.6	1377.7	11.6 FT	
6.11	6161.5	13856	7.9 FT	
7.11	6165	1389.1	3.5 FT	
8.11	61725	1396.6	7.5 FT	
9.11	61842	1408.3	11.7 FT 50 hourly Changed oil	
10.11	6192	1416.1	7.8 FT	
11.11	6197.3	1421.4	5.3 FT.	
14.11	6204.7	1428.7	7.3 FT	
15.11	62135	1438.4	9.7 FT	
16.11	6218	1442.9	4.5 FT	
17.11	62241	1448.5	5.6 FT	
18.11	6228.3	1452.7	4.2 FT	
19.11	6229.7	1454.1	1.4 FT	
21.11	6233.3	1457.7	3.6 100 hourly. Changed oil + oil FILTER. Cleaned AIR FILTERS (2).	
22.11	6245	1469.4	11.7 FT	
23.11	62507	1475.1	5.7 FT	
25.11	6252.8	1477.2	2.1 FT	
26.11	6259.2	1483.6	6.4 FT	
27.11	8266.1	1490.5	6.9 FT	
28.11	6270.7	1495.0	4.5 FT	
4.1.11	6275.7	1500	5 FT MAJOR OVERHAUL New Mast, New head bearings, Compression Test on cylinder heads all 4 heads were 100%, New THROTTLE CABLES, New TAIL Rudder CABLES; (8) New spark plugs (2) New air FILTERS, Changed RADIATOR FLUID, Changed oil + oil FILTER, Did spring Test on gear box was 95.8	
			MOTOR HAD 1535 hours on it	
MARCH 4.11			TEST FLEW TIL SAM pick GYRO up.	

Post inquest, I issued search warrants to be executed on the premises of Mr Taylor, Mrs Taylor and Mr Taylor's lawyers. A large volume of material was obtained. I do not intend to delay the finalisation of the inquest whilst that material is analysed. That may result in a re-opening of the inquest at some point; or that material and the evidence from this inquest, including Mr Taylor's evidence, being considered by others.

Maintenance history of gyroplane G241

Airframe maintenance

The gyroplane airframe had been maintained by Mr Taylor, Mr Owen Dull and Mr Robert Patroney. The evidence suggests adequate maintenance was carried out.

Originally the gyroplane was fitted with brakes. Mr Dull stated that in 2006 the axle and brake assemblies were removed and replaced with a new axle and improved brake assembly during maintenance work. Both sets of brakes were operated from inside the cockpit with a bicycle type brake handle.

In Mr Taylor's record of interview with WHSQ, he stated that he never fixed or worked on any of the brakes because the gyroplane never had brakes. In oral evidence, Mr Taylor admitted that he was lying about this during his WHSQ interview and that the aircraft did actually have brakes and had been fitted with new brakes as outlined in Mr Dull's evidence.

In his record of interview with WHSQ, Mr Taylor said that he had never fixed or worked on any of the cables. This is contradicted by the second last entry in Mr Taylor's newly found Gyroplane Logbook but more particularly in the parts supplied by Mr Dull in an invoice dated 25 January 2011 which lists that he replaced the rudder cables; and rudder cables appear to have been supplied by Mr Dull to Mr Taylor regularly. Mr Taylor explained in oral evidence that he may have misunderstood the question in the WHSQ interview.

The log book notes new throttle cables were installed at the last service before handover. The last time Mr Taylor appears to have been supplied with throttle cables (inner and outer cables) was on 25 May 2007 by Mr Dull. They have not been noted in any of the records as having been replaced since then, consistent with the evidence of the technical inspection reports noting them as being worn.

There is evidence of two major services at 2000 hours and 4000 hours. It is noted that although the gyroplane had done 6,278.6 hours at the time of sale, there had been no 'major service' conducted at or around the 6,000 hour mark. Mr Taylor records very conveniently in his newly found logbook, that he conducted a 'major overhaul' himself, in the days before handing the gyroplane over to Sam.

Engine installations and maintenance

The Rotax engine sold to Sam had been installed by Mr Taylor and maintained by him and Mr Richard Eacott, a Rotax engine service technician.

In Mr Taylor's letter through his lawyers, he stated that after its original installation, the third engine was never removed from the machine and therefore, it was never re-installed. This is at odds with the written and oral evidence and Mr Taylor admits he had been lying about this and he had in fact re-fitted the third engine himself on one occasion.

In Mr Taylor's Gyroplane Logbook, he records at the time of sale to Sam, that in the 22 months since the third engine had been purchased, the engine had done 1535 hours. There is no Gyroplane Logbook prior to 2010 to verify this claim.

The evidence of servicing records from Mr Eacott and other information could suggest the engine had done considerably more hours than claimed but this remains unclear.

The time before overhaul (TBO) for the third engine was listed in the relevant Rotax Maintenance Manual as '1,500 hours or 12 years, whichever comes first'.

The evidence from a number of witnesses suggested the TBO hours was regarded as a recommendation and some participants go higher, consistent with some of the latitude expected in this sports aviation activity. However ASRA would support following the manufacturer's maintenance schedule as a minimum.

Findings on the Issues

Whether the time taken to notify the relevant agencies about this incident and the communication between those agencies was sufficient in the circumstances

All relevant agencies were notified within a reasonable period of time of this incident occurring.

It is evident there could have better communication between QPS, WHSQ, ASRA and CASA. QPS and CASA requested notifications of outcome from WHSQ at the conclusion of their investigation but received no notification. When no notification was received, QPS and CASA did not follow up with WHSQ. Noting that CASA requested WHSQ and ASRA to inform them of the outcome of their investigations once complete, and they did not, CASA could still have followed up with WHSQ and ASRA much earlier.

Whether the action taken by QPS, CASA, ASRA and ATSB as a result of this incident was adequate in the circumstances

A number of decisions were made by those investigating this incident at various times which have impacted on the reliability of the evidence as to causation. This has made it difficult to come to a conclusion. This case has highlighted the importance of having investigators with aviation accident investigation training.

Failure of QPS to maintain the lead in the investigation

The QPS Operational Procedures Manual (OPM) and other memoranda make it clear the QPS are to remain the lead agency in aircraft incidents and particularly in coronial investigations. They should of course liaise with other agencies.

Sergeant Relf stated that the QPS relies heavily on external agencies to assist in these investigations and in this instance WHSQ & ASRA were called upon to assist in the examination of the airframe and engine, along with providing the specialist information relating to the training and operating procedures applying to this incident. It is for these reasons the main investigation was handled by WHSQ and ASRA.

Sergeant Relf was not aware that neither the WHSQ principal investigator nor the WHSQ technical inspectors had any aviation investigation training or experience.

Sergeant Relf agreed that in hindsight, QPS should have maintained the lead role in the investigation and allowed ASRA and WHSQ to assist and supplement their investigation. Sergeant Relf said that he had learnt from this incident.

Inadequate security of the incident site and wreckage

The QPS OPM references the *Civil and Military Aircraft Accident Procedures for Police Officers and Emergency Services Personnel* and provides that all accident sites must be secured to prevent unauthorised persons from entering the area.

The ASRA Operations Manual provides that when an incident occurs, the gyroplane immediately comes into the custody of the local police and it must not be removed or otherwise interfered with except with the permission of a responsible officer of the police.

There are no secure storage facilities in Cunnamulla and I accept Sergeant Relf did what he could in difficult circumstances to secure the aircraft, and provided instructions to the Beresford's not to touch the aircraft. What happened is Eric Beresford attended, and quite innocently loosely replaced the two carburettor mounting boots into the intake manifold, although he had passed this information on to WHSQ.

This later puzzled the technical inspectors because they were unaware of why they were loose and WHSQ did not tell them what Eric Beresford had said. The WHSQ principal investigator, Ms Cummings, conceded that she did not understand the significance of this information, even after reading the comments about the carburettors by the technical inspectors in their reports.

Decision to release gyroplane to WHSQ and to transport the gyroplane to Caboolture Airport

Possession of the gyroplane was handed to WHSQ. Discussions should have been had with the Coroner's Office regarding the aircraft although it is unlikely there would have been any objection to this occurring.

WHSQ then arranged for the transport of the gyroplane from Farnham Plains to the Caboolture Airport where the aircraft was to be stored in an ASRA hangar. This created its own problems as it was identified during the initial technical inspections at Farnham Plains that the transportation of the gyroplane between Roma and Farnham Plains over a rough road could cause mechanical faults in the gyroplane. It would have been preferable to conclude all technical inspections prior to any transportation. It cannot be now determined one way or the other what mechanical impact the earlier transport or later transport had caused, if any.

Failure to share relevant safety information with ASRA

Information obtained by CASA in relation to aviation breaches by Mr Taylor in relation to his ownership and operation of a helicopter between April and June 2011 could have been shared with ASRA as it was relevant to his continued fitness to hold a gyroplane pilot's certificate and pilot instruction training rating.

Quality of the inspection reports

It is recognised that ASRA is a volunteer organisation and Mr Barker and Mr Robertson volunteered their time to provide technical inspection reports to WHSQ.

The case highlights how difficult these investigations can be if people are untrained in investigation techniques and methodology. ASRA indicated there is no reluctance on

its part to have people attend and be paid for the investigator's expenses. The difficulties only arise because investigators have their own work commitments and mobilising is operationally difficult.

The current ASRA president, Dr Campbell, who was present during some of the inspections, has identified that next time they will have a separate note taker for record keeping as the inspectors are too hands on to focus on this.

Mr Barker and Mr Robertson have also indicated that they have learnt from the inquest experience. Mr Barker has since completed ATSB aviation investigation training and has found the training useful.

Whether the deceased's gyroplane was in an adequate mechanical condition prior to the incident and if not, what caused or contributed to the inadequate mechanical condition of the gyroplane

The airframe had completed 6278.6 hours and it was due for a major service at the time of sale. I have found there is sufficient evidence to conclude that the Taylors had an agreement with Sam Beresford to 'rebuild' the aircraft prior to handing it over to him and that the minor repairs carried out by Mr Taylor fell short of Sam's expectations at the time.

The evidence supports there had been regular servicing and maintenance of the airframe by Mr Taylor and qualified professionals. Critical parts for the aircraft also appear to have been regularly replaced by Mr Taylor up until the time of hand over, except for the throttle cables and the magneto switches.

Even though the throttle cables had not been replaced in some time, there is no evidence to suggest that this contributed to the incident.

The magneto switches were aged and running intermittently when tested. Whether this was the condition they were in at the time of handover is unlikely. There was no suggestion from Ms Garrett that there was a problem when it was started and stopped at handover. They are relatively cheap items to replace.

They may have become intermittent as a result of the vibrations during transportation. There is also a possibility though, that they became intermittent as a result of the violent vibration that would have taken place during the incident itself due to the propeller instability.

Had the magneto switches not have been functioning properly at the time of the incident, Sam would not have been able to turn the aircraft engine off when he lost control of the aircraft after the engine went to a high RPM setting. This could have clearly contributed to the incident.

Both switches were found in the on (up) position after the incident, suggesting that they had not been altered from the position they were in when the engine was started and that Sam did not try to shut them down or did not have time to.

It is unclear if the aircraft's engine had done flying hours in excess of the manufacturer's mandated 'Time Before Overhaul' but it had not been serviced by a

qualified professional in nine months. There is evidence that suggests transportation is unlikely to have caused problems to cause the engine to race.

The engine ran at high revolutions when started by Sam. It ran similarly when tested by ASRA. At that ASRA inspection the throttle handle when set in the off position both carburettors stops were 5 mm off the fully closed position, although damage from the crash may have contributed to this difficulty. Sam may not have checked the throttle cables or its idle position.

What is clear is the engine was heard to go to high revolutions. It travelled uncontrollably in a manner consistent with high revolutions. When tested by ASRA the engine started intermittently at high revolutions even with the throttle in a closed position. Whether Sam knocked the throttle lever forward whilst leaning in and causing it to go to even higher revolutions has been postulated but is unknown.

Some mechanical issue must have caused it to run at high revolutions. The later inspections combined with damage caused have resulted in this rather vital issue being undetermined.

Whether the regulation of the deceased's gyroplane in terms of construction, sale, registration, transportation, maintenance, repair, safety inspections and communication of safety messages was adequate in the circumstances

Counsel assisting has detailed a number of areas where improvements to ASRA's material and in particular its Operations Manual could be made and ASRA should deliberate and consider those matters.

Ultimately, I am not convinced they contributed to this incident occurring in the manner it did. Whatever may have been placed in manuals or other material about the issues referred to, would have in my view either been ignored or not adhered to. Mr Taylor took a cavalier attitude to such regulatory issues and this sale was outside the ASRA process.

Whether the deceased's pilot training and pilot certification process was adequate in the circumstances

ASRA's failure to ensure Mr Taylor completed his Biannual Flight Review or alternatively suspend his flight instruction rating was not optimal, but I accept resource issues are partly to blame.

A question for this inquest is whether Sam had been taught by Mr Taylor that it was acceptable to stand outside the cockpit whilst starting up his gyroplane.

I have found that due to the lack of records kept by both Mr Taylor and Sam in relation to pilot training, and my view that any evidence of Mr Taylor on this and other issues is either unreliable or untruthful, it is impossible to conclude with any level of certainty that the pilot training conducted by Mr Taylor was adequate. The distinct impression is it was inadequate.

The ASRA Operations Manual, which Sam was provided with, sets out a generalised pre-flight inspection list and a periodic inspection checklist. What is uncertain is the extent to which Mr Taylor brought those matters to the attention of Sam in the training.

There appeared to be some disagreement amongst the witnesses about the nature and extent of mechanical damage that can be caused to gyroplanes as a result of road transportation. However, there was acceptance about the need to conduct a thorough check of a gyroplane before starting it up after road transportation, as a precaution.

What happened in this case is that Sam had not conducted anything like a pre-flight inspection. Soon after his father left him he started the engine. Whether any pre-flight inspection would have prevented the engine from starting at a high revolution is uncertain, given multiple inspections had not found a cause other than some issues with the throttle lever and cables.

Sam is not without some responsibility. It is difficult to see though how Sam could have thought that he was entitled to a pilot certificate given that he had not completed his written exams or received a final practical assessment by a different flight instructor. He had available to him the Operations Manual including the pre-flight inspection list, which does not appear to have been considered.

To an outsider it does sound incredulous that anyone would start an engine like this outside the cockpit. Was this how he was taught or was he taught anything meaningful? Inadequate and probably inappropriate instruction is a major contributing factor, together with the uncertain issues as to why the engine started at high revolutions. I accept brakes would not have made much of an impression. I suspect chocks were not used, but even if the pieces of wood Eric found were used they were clearly inadequate.

Findings required by s. 45

A coroner is required to find, as far as is possible, the medical cause of death, who the deceased person was and when, where and how he came by his death.

Identity of the deceased: The deceased person was Mr Samuel John Beresford.

How he died : Sam died as a result of losing control of his gyroplane when he attempted to start it from outside the cockpit on 9 March 2011. The engine went to high revolutions, dragging him in the direction of travel before moving forward of his position, resulting in the propeller blades striking his head and upper body. He had previously received practical flight instruction training in the same gyroplane, from the seller of the gyroplane. He also had extensive experience flying a different model unregistered gyroplane as part of his business, which included aerial stock mustering. He did not hold a gyroplane pilot certificate. The gyroplane was unregistered and had not been inspected by an ASRA Technical Advisor prior to start up. The gyroplane was not chocked or at least adequately chocked, had no brakes installed, and had not been tethered to a fixed object. Sam had only purchased and taken delivery of the gyroplane the day before the incident. The gyroplane had been transported a significant distance by road. The magneto switches may have been faulty at the time of the incident as a result of age and/or transportation, which would have made it impossible to

turn off the engine. There is no evidence to suggest Sam tried to turn off the magneto switches due to them being found in the on position, although he may not have had time to do so. The airframe was aged but adequately maintained. There was no evidence to suggest engine failure contributed to the incident. The engine appears to have gone to a high RPM setting upon start. The reasons for this remain uncertain. Sam may have mistakenly believed the throttle lever was all the way back to the idle stop when it was not, or he deliberately or accidentally pushed the throttle lever forward for whatever reason. The fact there may have been an issue with the engine or throttle cable, which was causing it to run intermittently at high revolutions, is unable to be determined with certainty on the evidence available.

Place of death: He died at the Princess Alexandra Hospital, Brisbane, Queensland.

Date of death: The date of death is 17 March 2011.

Cause of Death: The medical cause of death was severe head and upper body injuries, due to, or as a consequence of being struck by the propeller blades of a gyroplane.

Comments and recommendations

Section 46, insofar as it is relevant to this matter, provides that a coroner may comment on anything connected with a death that relates to public health or safety, the administration of justice or ways to prevent deaths from happening in similar circumstances in the future.

QPS

QPS are likely to be the lead agency and conduct higher volumes of recreational light aircraft incident investigations whilst CASA and the ATSB are reluctant to investigate such incidents. I therefore make the following recommendations:

1. Whether there should be appropriate secure vehicle holding-yard facilities in the Cunnamulla area is a matter that should be considered by QPS.

2. Sergeant Relf has advised that there have been a number of aviation fatalities in the area in recent years. He should be permitted to undertake an ATSB aviation accident investigation training course when the next course vacancy is available.

3. QPS should identify and ensure there is a trained pool of officers to specialise in aviation accident investigations. Such officers could then be available to provide initial advice to on-scene investigating officers and could be assigned as the primary investigator for aviation incidents wherever possible.

4. QPS should review section 8.5.12 of the QPS OPM entitled ‘Aircraft incidents resulting in death’ to remove any ambiguity relating to release of aircraft procedures where the incident is not being investigated by the ATSB.

WHSQ

1. WHSQ should review its procedures to ensure that relevant agencies are notified about the outcome of their investigations at the conclusion of their investigations.

2. WHSQ should ensure machinery is not released or disposed of without the coroner’s permission where the investigation relates to a ‘reportable death’ under the Coroners Act.

CASA

1. CASA should review its expectations of what ASRA can achieve within the limited resources provided to them, with a view to either increasing their resources or taking back some of the responsibilities.

2. If resources are increased the Federal Government should ensure CASA is funded so that ASRA’s funding can be increased by not decreasing the funding to other RAAOs.

3. ASRA and CASA should determine how best to regulate aerial stock mustering by gyroplane. Dr Campbell said this has apparently been the subject of lobbying for some years. Although CASA considers the evidence about the numbers participating is largely anecdotal, those on the ground and ASRA estimate the unregistered gyroplanes conducting stock mustering is well into the many hundreds. ASRA considers it would be in everyone’s interests if they were registered and the process of registration became simplified.

4. Given the disturbing evidence of the inadequate training of Sam and that Mr Taylor may have trained other persons; CASA should contact other students to ascertain the level and quality of training provided. It is noted CASA was intending to do so. CASA should also conduct an audit of current flight instructors to confirm their currency and to check their record keeping in relation to students trained during the last two years.

ASRA

It is evident Mr Taylor should not be allowed to obtain a gyroplane flight instructor rating in the future.

Counsel Assisting has made submissions regarding a number of recommendations. I appreciate the volunteer nature of the organisation could make it difficult to consider these quickly and ASRA may need to look to CASA or the ATSB as well as its members for advice.

Mr Barker and Dr Campbell have already indicated improvements are being considered in relation to the assistance provided by it in investigations and agreed there was room for improvement.

Dr Campbell gave evidence that many of the issues raised in the proposed recommendations are already under consideration. They have a new database. ASRA is in the process of drafting separate Administration, Technical and Operations manual. The Technical manual will include more detailed maintenance schedules. In general, ASRA takes the view owners should follow the manufacturer's guidelines but ASRA will provide a minimum standard.

Hence my comments are general in nature and not prescriptive. ASRA is best able to focus on what it can or cannot do. Dr Campbell also noted the sport has changed dramatically from a historically high accident risk sport to a more safety focussed approach.

1. ASRA should look at accident investigations and the methodology of approach. Dr Campbell noted it has been a highly reactive process in the past and not pre-ordained or documented. There should be consideration, as submitted by counsel assisting to ensure that proper records are kept by investigators during their inspections and included in their investigation reports. Information such as the dates, times and places the investigators carried out their inspections, the witnesses present, and detail as to the methodology of testing completed should be recorded.

2. ASRA should include information in safety messages, the Operations Manual and training syllabus about gyroplane start up procedures that specifically state that unless it is an operational requirement to start up a gyroplane from outside the cockpit, pilots must be seated in the cockpit. It should be clarified that unregistered gyroplanes must not be 'started up' (rather than using the term 'flown').

3. ASRA should introduce a section in the ASRA Operations Manual which specifically deals with the sale and transfer of gyroplanes with requirements for sellers of aircraft to list the airframe hours, engine TBO and engine hours, as well as other technical information considered appropriate and to provide all gyroplane and engine manuals to purchasers at the time of sale, regardless of whether the gyroplane is registered. New gyroplane owners should acknowledge in the transfer/registration form, as a condition of registration that all relevant manuals for the airframe and engine were provided to them by the seller.

4. The Operations Manual should require gyroplane homebuilders and manufacturers to produce a Manufacturer's/Owner's Manual for all gyroplanes constructed. Such a manual should outline key safety issues, maintenance advice and minimum servicing schedules for the aircraft. In the alternative, generic guidance of this nature should be provided in the ASRA Operations Manual.

5. ASRA should consider whether there is evidence of problems associated with transportation of gyroplanes by road, and include any recommendations alleviating those concerns or problems in the appropriate part of the manual.

6. ASRA should continue with the drafting and implementation of the Technical Manual relating to maintenance, repairs and servicing including more specific guidance regarding minimum servicing schedules in the absence of a Manufacturer's/Owner's Manual. It should consider the issue of whether the fitting of appropriate brakes onto gyroplanes should be mandated. This case noted the different configurations of carburettors and actions of throttle cables on some gyroplanes which may be worthwhile highlighting in the Technical Manual.

7. ASRA should consider the logistics and appropriateness of mandating safety inspections for gyroplanes by Technical Advisors at a defined period.

8. ASRA ensures its current registration system and database will alert ASRA when flight instructors have failed to maintain their currency and are notified of their suspension in writing and warned not to continue training students until this is rectified. The status of an instructor should be able to be checked by a student by looking on the ASRA website.

I close this inquest. I express my condolences to Sam Beresford's family and friends.

John Lock
Brisbane Coroner
5 December 2013