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Senate Standing Committee on Rural Affairs and Transport
PO Box 6100
Parliament House ,Canberra ACT 2600
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27 October 2010

By email: rat.sen@aph.gov.au

**Pilot training and airline safety including consideration of the Transport Safety Investigation Amendment (Incident Reports) Bill 2010**

Dear Sir or Madam,

In the time available, we are unable to give a complete list of references that inform our views, but we have included a document and covering letter, not for publication, to give weight to our comments. That these comments are by way of assertions , rather than fully detailing sources is unfortunate, but unavoidable under the circumstances, and of time constraints

Other than the documents clearly annotated “Not For Publication”, documents that do not relate directly to the submission, we are happy that our submission be published.

Our submission will be an Executive Summary, followed by detailed explanations for the position we take.

**EXECUTIVE SUMMARY**

**(para. a) Logged hours by a pilot, alone, are not a conclusive proof of experience.**

A well worn question, but a valid question, that can be asked of many pilots:
*Do you have 5000 hours, or 1 hour 5000 times?*

The most crucial matter for pilot proficiency standards is the quality of initial and ongoing training.

There is no evidence that "experience", as measured by hours logged, without in-depth examination, has any necessary automatic bearing on air safety outcomes.

Equally, there is a large mass of evidence that initial and continuation training is the crucial element in achieving and maintaining satisfactory pilot standards, the bedrock of the minimisation of risk in all aviation operations.

Indeed, a pilot accumulating large numbers of hours under average General Aviation conditions is as likely to result in *consolidation of bad practices and habits, as good.*

**(para. b) There is no evidence that the US "1500" hours requirement is of any significance for a new start pilot, in terms of aviation safety outcomes.**

In the accident that gave rise to the present FAA activity, it is significant that both pilots involved were "experienced", as measured by "hours", but the training and checking they had both received was apparently seriously deficient.

**(para. c) This question should be answered in two part:**

(i) Is industry recruiting the right sort of people as pilots, and
(ii) Do the industry "pay for training" schemes have any necessary relation to air safety outcomes.

We believe the answers are as follows:
(i) Frequently, the results of industry hiring practices produce some questionable results as to who is recruited, and
(ii) The quality of training is far more important than who pays for the training.
(iii) Taken worldwide, we can find no objective evidence that pay for training has had any adverse air safety outcome.

**(para. d) Retention of experienced pilots.**

With some frequency, various well intentioned people or industry bodies make recommendations for "career paths" for instructors, or retaining "experienced" people in the regional airlines and smaller GA operators.

Most suggestions , however well intentioned, fall foul of the economics of the air transport industry, and a presumption that the traditional career path for a pilot can be re-directed.

**(para.e) Type rating and recurrent training could almost be an enquiry in itself.**

**(para.f) This question again requires a two part answer.**

(1) CASA regulated requirements for training are adequate, but how the regulations are applied, and the weight applied to different segments of training, is a completely different matter.

(2) The question of "rapid developments of new technologies" is somewhat of a well distributed furphie. The equipment developments of recent years have largely served (from the pilot's point of view) to make the job easier.

**(para g) This is a subject in itself, but recent trends in both the US and Europe are, in fact, quite disturbing.**

The FAA "immunity" is very limited. The US Department of Justice activities, of recent years, have done nothing to encourage open and accurate reporting by pilots of air traffic staff.

Trends for non-aviation agencies to prosecute pilots, as a result of incidents and accidents, are having a seriously negative effect on information exchange that is vital risk minimisation strategies.

In a number of European countries, the application of "justice" can be savage.

**(para.h) We do not wish comment further on either of the two incidents mentioned. We believe the eventual full investigation reports speak for themselves.**

**(para. i & j) We support the proposed amendment.**

We very strongly suggest that the confidential reporting to ATSB could be much improved with even greater safeguards to ensure confidentiality, and thus the confidence of those reporting that their reports will have even greater legal safeguards against disclosure.

Pilots and Licenses Aircraft Maintenance Engineers, and other industry persons have been justifiably suspicious of the maintenance of effective confidentiality.

End of Executive Summary.

**EXPANDED SUBMISSION.**

**(a) pilot experience requirements and the consequence of any reduction in flight hour requirements on safety.**

In an era of "competency based training" the general body of the *domestic* Australian aviation industry, including insurance underwriters, is still wedded to "hours" as a measure of competency.

In short, the real meaning of competency based training has not been accepted, with continual reliance of "hours".

One may well ask just how the RAAF operates safely, often in demanding situations, with large aircraft flown by pilots whose total hours would be insufficient to get insurance coverage in a small General Aviation twin engine aircraft.

Of course, for the RAAF and other military flying, the answer is training.

Various airlines in Australia have operated iterations of cadet pilot training schemes since the early 1960s. To this day, such schemes are derided by many "professional" pilots as not having "enough experience" because they have not, generally, spent time in GA amassing "hours of experience".

The airline of which this writer can speak is Qantas Airways Ltd (not Jetstar or Qantaslink) and cadet pilots have formed a significant proportion of the pilot strength of Qantas mainline since the 1970s. Perhaps more significantly, cadets and low time pilots (on recruitment) have eventually formed a very significant proportion of operations and training supervisory and management pilots, up to and including Director of Flight Operations and Chief Pilot.

Nobody can make a case that employing such low time (inexperienced) pilots has had any retrograde safety implications.

There is no mystery to all this, every pilot entering Qantas (regardless of pre-Qantas "experience") was subject to rigorous initial and continuation training.

Cadet pilot training schemes, with graduates with as little as 235 hours total time in an aeroplane flying as First Officers (co-pilot) of high capacity regular public transport , *has been the norm in the major UK carriers and many European carriers, since the 1960s.*

The safety records of airlines such as British Airways and Lufthansa, to name but two with large cadet pilot schemes, speak for themselves.

In the early 1980s, this writer spent a period of time working for British Midlands Airways, flying a variety of B707. Whilst there, I flew with a number of Captains on leave of absence from British Overseas Airways Corporation (BOAC) and British European Airways (BEA)( now merged as British Airways), these Captains were all graduates of the Hamble College, a cadet pilot school established jointly by BOAC and BEA.

On two occasions, we held small celebrations for two of these Captains to celebrate "cracking 2000 hours" --- achieving 2000 hours total time on all types.

Contrast this with demands for minimum hours not far short of this total, just to start an initial medium to high capacity public transport job, common in Australia

Once again, the "secret" is proper training to competency, not some fixed total of hours that suddenly designates you as "competent".

Given that the European and many western Pacific/Asian airlines have had a high proportion of cadet pilots, starting in the right hand seat with between 200 and 300 hours total time, there is absolutely nothing in the record to show that hours or lack of hours, alone, for a new recruit, has any air safety significance.

China Southern Airlines Corporation is the PRC airline with the best air safety record. Virtually all current China Southern pilots have come through a cadet scheme, either China Southern Western Australian Flying College, or its equivalent in Moncton, Canada.

China Southern's excellent record speaks for itself.

**The Multi-Crew Pilot License, MPL**

Australia played a major role in developing the MPB, but given the widespread opposition from Australian pilot groups and some operators, you would never know. That a very small group of people succeeded in putting the MPL is place, in the face of entrenched pilot and bureaucratic opposition, is a testimony to the determination of those people to prevail against all odds.

Much of the outright condemnation of the MPL in Australia is, once again, base around "hours" in an aircraft as a measure of competence, with simulated flight being disparaged.

In fact, the MPL substantially does only two things:

(1) Provides an ICAO Annex 1 framework to recognise the predominant method of initial airline pilot training in Europe and Asia since the

1960s, and allow many National Aviation Authorities (NAA) to cancel differences filed with ICAO against Annex 1, and;

(2) Allow a mix of simulated and actual flying, to put into practice much of what we have learnt in educational theory, both general theory and the results of studies of aviation education, since World War II.

Appropriate simulators, with a training program that recognises the strengths and weaknesses of both simulated and actual flight training, produce a far better prepared pilot, than "conventional" training.

The jury is in.

Because of entrenched pilot views about the value of "hours" as virtually the only measure of "experience", and a lack of acceptance of "competence" the MPL has hardly got "off the ground" in Australia.

It is of significance that aviation pilot training was the last industry sector to adopt competency standards, with CASA effectively forced by Government directives to adapt to competency based standards.

In contrast, we see graduates of the MPL system of training graduating in several European/ Scandinavian countries, with airline training staff finding the MPL graduate better prepared for initial line training than direct intake pilots, or graduates of older style cadet pilot schemes.

Once again, despite the resistance to change in this sector in Australia, the results of the MPL approach to training ( as opposed to conventional training with an "MPL makeover") speaks for itself.

**(b) the United States of America's Federal Aviation Administration Extension Act of 2010 which requires a minimum of 1 500 flight hours before a pilot is able to operate on regular public transport services and whether a similar mandatory requirement should be applied in Australia;**

This issue is effectively dealt with in (a) but the following is added:

*(1)* The accident[1] that gave rise to present discussions in US was NOT an aircraft crewed by low time pilots, and the NTSB clearly points to *deficiencies in initial and/or recurrent training as a major contributor to the errors made by both pilots.*

[1] Colgan Air, Inc. Flight 3407, Bombardier DHC8-400, N200WQ
Clarence Center, New York, February 12, 2009

(2) 1500 hours is the total of all hours to be granted an FAA Air Transport Rating (ATR) and is the ICAO requirement for such a license, however called, by various NAAs. It is far from clear how imposing this as a new recruit starting point for air transport flying is based on any appropriate risk assessment.

*In our view, this is a matter of being seen to be "doing something", a political reaction that has certain industrial support, with "safety" gloss.*

(3) Little attention is given to whether pre-airline "experience" has anything to do with the attributes that make a good airline pilot recruit.

A common example would be a crop spraying pilot, very skilled in a very narrow area of competency, does such a pilot have, say, 5000 hours, or 1 hour, 5000 times.

In cases such as this, taking a daylight, single engine, visual flight rules single pilot operation pilot, and turning him or her into a competent multi crew, multi engine, instrument flight rules pilot is an interesting exercise, and often requires far more de-training/re-training than a graduate of a cadet pilot scheme, particularly an MPL type course.

In summary, there is simply no defined pilot training and competency issue, to which imposing a 1500 minimum is the answer.

**(c) current industry practices to recruit pilots, including pay-for-training schemes and the impact such schemes may have on safety;**

Firstly, we have a general view that "Human Resources" departments play and excessive role in pilot recruitment, compared to Flight Operations departments.

Given that, generally, HR people have little understanding of the attributes required of a pilot, and greatly depend on various testing methods that are probably more suited to hiring ground staff, the results are often curious.

Indeed, the desirable attributes of a pilot are not only not the same as office or counter staff, but those attributes desirable in a pilot result in many pilots being "marked down" in psychological testing.[2]

[2] Some years ago, a major Australian airline was having many pilot candidates rejected by HR testing. As a "control" on the effectiveness of the "psych" tests uses, about 10 very long standing pilots from the airline's training department were asked to take the test. The completed tests were forwarded for assessment. Without exception, all were judged to be "not suitable for employment as a pilot". Many had significant military experience, prior to a minimum of 20 years as an airline pilot, as of the date of the "tests".

As to "pay for training", something that is now common in a number of countries, we are not aware of any objective studies that can demonstrated a link between "pay for training" and air safety outcomes.

However, subjectively, training for all recruits at many airlines, but particularly so called "Low Cost Carriers" (LCC) has been cut to a bare minimum standard, *"excellence" is not a concept popular with accountants*.

***In our opinion, the major threat to safety in this area comes from airline managements strong on "financial engineering", but largely ignorant of "aeronautical engineering".***

We would go so far as to say that many senior airline managers exhibit an attitude bordering on contempt for engineering and operational skills.

***In fact, it seems to us that many airline managements have moved from regarding Flight Operations and Maintenance personnel as an asset to the company, to regarding them as a liability to be minimised or outsourced.***

All too often, in recent years, I have listened serious discussions about doing a trade-off study of the costs of training or maintenance versus the cost of losing the occasional aircraft and several hundred passengers.

Sadly most of these cost/benefit theoreticians have little or no knowledge of the aviation industry, let alone the real results of a major airline accident.

All too often if you lose an aircraft, you lose the airline. This all without regard to the immorality of regarding passenger lives as a tradable commodity.

**(d) retention of experienced pilots;**

Pilots should not be denied a career path, and allied with the economics of the GA industry, and Regional airlines, there is no answer to the desire of most pilots to move on to flying larger aircraft, and moving to remuneration packages that are beyond un-realistic at the smaller end of the industry.

Sadly, one of the factors that is now very obvious, given the almost poverty level wages in GA, and many airline jobs, is the calibre of pilot offering for a pilot position. This comes under the rather derogatory banner of: *"If you pay peanuts, you get monkeys"*, but unfortunately there is more than a grain of truth in this saying.

One issue that CASA has always refused to countenance is change to the medical standards for advanced instruction.

FAA has some provision worth exploring, whereby once a pilot/student has a basic qualification on an aircraft, certain advanced instruction can be given by

a pilot who can no longer hold a first class medical, or no longer wish to go through the hassles of a first class medical.

A proper implementation of a scheme similar to FAA would potentially make available a large pool of retired airline pilots for advanced instructional duties.

Indeed, the whole trend of medical standards should be re-visited, there is little relation between the medical standards and the risks of an in-flight event.

**(e) type rating and recurrent training for pilots;**

We do not believe there is a problem if training is conducted by airline operated training departments, but we have substantial reservations about some "outsourced" training.

The big ticket item missing in outsourced or third party training is the complete absence of a "company culture" in the training, and it is in training, particularly initial type ratings and other training prior to line operations , where the start of "company (safety) culture" indoctrination can be the most effective.

There are many other matters that impinge on this area, including but not limited to:

(a) Third party trainers with less than adequate knowledge of the procedures of individual customer airlines, and;

(b) The standards of the actual persons and equipment used, and;

(c) Whether CASA adequately polices simulator and flight training device standards, to ensure that the standards of CASR 60 are achieved.

Lack of type specific fidelity in flight simulation can and does have very serious negative effects on the quality of output on type ratings and recurrent training, including "simulator techniques" ( all simulators, to at least a limited degree require some adaption by a pilot) that are unacceptable in the aircraft.

Particularly at the initial type rating stage, if simulators are to be used, they must be genuinely up to the task. This is clearly not always the case, with some very old technology devices still in service.

**(f) the capacity of the Civil Aviation Safety Authority to appropriately oversee and update safety regulations given the ongoing and rapid development of new technologies and skills shortages in the aviation sector;**

The core of the regulatory issue is not lack of adequate regulation, or the need for new core regulation, but the inflexibility of Australian regulation, including how it is generally administered by CASA, combine with very inconsistent and contradictory interpretations of legislative and guidance material by individual officers of CASA.

It is all too common for small organisations to find themselves facing demands for wholesale changes in procedures, consequent only on a change of Flying Operations Inspector (FOI), or to find two operators of identical aircraft being obliged to operate to clearly different procedures and checklists.

CASA is not immune from the problems of lack of genuine experience, competence and/ or inadequate training that besets sectors of the aviation industry.

We would suggest that considerable effort needs to be made by CASA on internal training and standardisation of Flying Operations Inspectors, including but not limited to a proper knowledge of the law, as it is in the statute books, rather than an "interpretation of an interpretation".

**New Technology**

This writer has a broad range of experience over some 40 years, from the Douglas DC-3, through to the B747-400 series.

"New Technology" is vastly overblown, the "problems" are perceptions of a problem, not real problems.

I can make this statement with some authority: " Been there, done that".

The first "jet" aircraft saw the light of day around World War II.

We have had "jet" airline aircraft in service in Australia since the early 1960s, and "executive" jets since the mid-1960s, but "jets" are still treated as "new technology", with a vastly more restrictive approach by CASA, compared to piston engine aircraft and turbo-props.

The fact is that a modern "jet" is far more simple to operate than a turbo-prop or an aircraft with a high horsepower piston engine, or a early generation jet airliner.

By comparison, some of the turbo-prop and super/turbo charged piston engine aircraft require considerable knowledge and finesse, not required with a modern "jet", to operate safely.

Although "jet" and turbo-prop engines appeared in the civil airline business in the late 1940, at about the same time, "jets" are still regarded as "new". How many years have to elapse before a "jet" is no longer "new technology", 50, 60,70 years???

There have been some significant developments in aircraft electronics in the last 30 years.

They all have one thing in common;

1. they make life easier for the (smaller) crews to do a better job more effectively, and;

2. They have greatly increased aircrew productivity.

"Gee Wizz" marketing hype, as reported in the popular media should not be taken at face value. Indeed, the introduction of "new technology" has been a slow and steady progression. *One should not equate aircraft electronics development with the undoubted explosive development of consumer electronics, modern mobile phones and the like.*

Indeed, much publicity has been given to the adoption of ADS-B, whose "benefits to air safety" have been thoroughly over hyped in Australia.

Is the required data link of choice an example of modern broadband technology? --- which is available for aviation use? In fact, the answer has been to adapt a "technology" available since the early 1970's, whose origin is IFF (Identification Friend or Foe) from World War 11.

***In short, a seriously restricted narrow band solution is the choice, when broadband solutions were and are available, certified and flying.***

As another example, when this writer first started flying, a standard crew was a Captain, First Officer, Second Officer, Flight Engineer and Navigator. Radio Operators had only just been dropped.

In steps and stages, the Navigator and the Flight Engineer disappeared from the flight deck, and a Second Officer is only carried where Flight Time Limitations demand.

Despite all this, I am of the view that the job of a present two man crew is less demanding and fatiguing than in the days of a five man crew. Further (and this is illustrated in the accident statistics) accident rates have reduced.

The widespread and increasing use of GNSS navigation procedure is further enabling the crew of an aircraft to minimise the inherent risks of an aircraft operation.

The "rate of change" of technology in aviation is, in fact, quite slow.

*As far as Australian pilots are involved, further slowed by the inclination of Australian domestic pilots to reject change.*

The much "hyped" so called glass cockpit made its first appearance in Australian airline service about 25 years ago. The first GPS signal feeds to navigation computers followed several years later. The "inertial navigation systems" at the heart of most modern airline navigation packages first appeared at the end of World War 11. The glowing valves have been replaced with (initially) transistors, and now "solid state" electronics, but the basic technology is not new.

*The current generation of aircraft are only steady developments and refinements of now well tried and proven concepts.*

None of the changes are a burden for a pilot, quite the opposite. None of the airline standard technologies are difficult to learn or use, the degree of "computerisation" is largely transparent to the aircrew.

**Skills Shortages**

CASA is an aviation safety regulations administration, skills shortages are not a CASA issue per se.

However, CASA obviously has a certain impact where it comes to examination and licensing of both pilots and maintenance persons, and there is considerable scope for change in how CASA carries out these tasks.

However, that is a major subject on its own, and far too complicated for a cursory and inadequate treatment in this paper.

Suffice to say, Australia needs a regulatory framework that is:

(a) ICAO compliant, and;

(b) harmonised with our major aviation trading partners, and;

(c) does not place Australians at a competitive disadvantage on the world market, and;

(d) does not discourage industry participation by extending criminal law sanctions to virtually every facet of "committing aviation".

The application of criminal law sanctions for even the most minor infractions is a serious inhibitor, and this writer would argue that Australian aviation regulation, acknowledged as complex, at times contradictory and subject to a wide variety of official interpretations, creates *"inadvertent criminals"*[3].

This is an abrogation of the basic principle of criminal law, that the wrongdoer must have "intent" to commit a criminal act.

There are very good business reasons why Qantas is basing increasing number of aircraft in Singapore and New Zealand. Apparently Qantas is intending to base the new B787 in Singapore.

On present indications, there will be no B787 maintenance facility in Australia. This is despite the number of B787expected to be in the Qantas/Jetstar fleet, making it the most common aircraft.

By contrast, we expect to see Air New Zealand set up a major B787 maintenance organisation in New Zealand.

**(g) the need to provide legislative immunity to pilots and other flight crew who report on safety matters and whether the United States and European approaches would be appropriate in the Australian aviation environment;**

The core issue here is to promote a "just culture", and ensure aviation industry personnel, particularly pilots and maintenance engineers, can freely report errors, incidents and other potential risk management issues without fear of victimisation and/or prosecution.

Criminal law, particularly as enshrined in Australia aviation legislation, is a very blunt instrument, and a serious inhibitor to the free exchange of data that is the core of effective Safety Management Systems.

Enforcement action by CASA is not the only concern, other civil or criminal action, initiated by State police[4] or private prosecutions, are significant.

Effectively, worldwide, there is an increasing propensity for non-aviation law enforcement agencies to get involved in aircraft accidents and incidents, not the least because of the "positive media exposure" for such agencies, being seen to protect "the public" from aircraft.

[3] The concept of an "inadvertent criminal" as a result of the complexity of aviation law and interpretation was (to the knowledge of this writer) first raised in the " Lane" Report, a report on Australian aviation legislation and published in the mid-1980s.

[4] In recent years, the Queensland Criminal Code was amended to include "aircraft" on the definition of a vehicle, resulting in state police cutting across activities of both CASA and ATSB.

Whilst the FAA operates a system of limited immunity for pilots who report apparent violations, as required by the scheme, this is no protection from other state of federal agencies.

In the US, and many European countries, the confidentiality of accident information, including Flight Data Recorder (FDR/DFDR) and Cockpit Voice Recorder (VCR) required by ICAO Annex 13[5] is under increasing attack by courts and (as an example) the US Department of Justice.

In particular, any asserted right of an aircraft crew member from immunity from prosecution from any matters revealed by an accident investigation is increasingly heavily disputed.

We most certainly support the principle of limited immunity from prosecution, so that data vital to investigation of particular accident is unimpeded.

We also believe such immunity is necessary for ongoing management of "routine" safety data, such as derived from pilot or other reporting sources, including Quick Access Flight Recorders.

It is less than clear that Australian aviation law in reality supports these vital safety systems. Indeed, it may be reasonably said that Safety Management Systems operate in spite of the law, not because of it.

This author has had two "discussions" with CASA officers, who were demanding Safety Management System (SMS) raw data, to "check for offences". This sort of approach is anathema to a workable SMS, no normal person will volunteer often vital information, if it means self-incrimination.

***We do not support immunity where any element of reckless and negligent operation of an aircraft is revealed in an investigation by CASA.***

We are of the view that there need to be substantial legislative amendment if SMS are to achieve their full potential, as a tool to reduce risk in aviation operations.

It is not clear to us that, taken as a whole, either US or any European country presents a useful model, available "nominal" immunities have limited value, and are not proof against court ordered disclosures.

It may be reasonably be said that law and justice frameworks all too often work against achieving the potential risk reductions that will lead to the best

[5] ICAO Annex 13, Aircraft Accident and Incident Investigation.

safety outcomes, and this is not limited to aviation, but applies to industry generally.[6]

In summary, without major legislative change, and a different approach by CASA, the Australian aviation community will not achieve the risk reductions inherent in a properly working SMS environment.

**(h) reporting of incidents to aviation authorities by pilots, crew and operators and the handling of those reports by the authorities, including the following incidents:**

**(i) the Jetstar incident at Melbourne airport on 21 June 2007, and**

**(ii) the Tiger Airways incident, en route from Mackay to Melbourne, on 18 May 2009;**

**and;**

**(i) how reporting processes can be strengthened to improve safety and related training, including consideration of the Transport Safety Investigation Amendment (Incident Reports) Bill 2010; and;**

**(j) any other related matters.**

In combining our comments on (h), (i) and (j) do not wish to comment on the two individual incidents, we believe that the final reports speak for themselves.

In general terms, the understanding of the legal obligations of those subject to the Transport Safety Investigation Act 2003 (TSI Act) are not well understood, even amongst pilots. Many aviation sector employees would not even have a passing knowledge of the provisions and to whom they applied.

Further, the improvements brought about by amendments in more recent years, and the greater independence of the ATSB consequent on the Miller report,[7] are even less understood, if understood at all.

Early versions of the legislation made provision for a "Confidential" reporting system that was anything but confidential, compared to systems in use in US and UK. As a result, this early approach was seriously flawed, the only thing that was confidential was the identity of the reporter, and the process was thoroughly discredited.

Consequently, this early system became a "dobbers charter", rather than a source of useful information that could be used for accident prevention.

[6] NSW Occupation Health and Safety laws, in general, do not support workable SMS, particularly given the reverse onus of proof for any alleged violation.

[7] ATSB/CASA Review 2007 Miller Report on Aviation Safety Agency Relations, Summary of Recommendations

In our view, two actions should be considered:

1. Institute a thorough campaign of education into the terms of the legislation and the legal obligation of persons under the TSI Act, and;

2. In addition to the TSI Amendment (Incident Reports) Bill 2010, consideration should be given to further amendment to the provisions of confidential incident reporting provisions, to emulate the US arrangements.

We support the Transport Safety Investigation Amendment (Incident Reports) Bill 2010, as introduced as a Private Member's Bill, as introduced by Senator Nick Xenophon of SA, but emphasise the need for thorough dissemination of the intent of the TSO Act as is or as amended.

For Glenalmond Engineering,

(Captain) W.J.R.Hamilton, MAIAA.