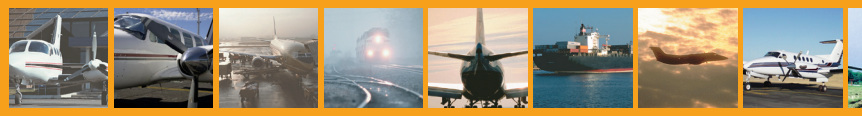
Australian Government
Australian Transport Safety Bureau

The Australian



Chief Commissioner's message

On 12 April I signed a renewed memorandum of understanding (MoU) with the President of the Australian and International Pilots Association (AIPA), Captain Barry Jackson.

Representing around 2,500 Qantas flight crew, the AIPA is the largest representative body of airline pilots in Australia. The AIPA plays a valuable role in contributing the expertise of these flight crew to the government's legislative and regulatory processes. The association also contributes resources and expertise to a broad range of local and international initiatives that significantly contribute to improving aviation safety.

This MoU strengthens our relationship with AIPA and articulates how we will work cooperatively to support aviation safety investigations. With Australian flight crew being widely regarded as the most experienced and respected in the world, the ATSB recognises the great value AIPA adds to our safety investigations.

On 20 April I had the pleasure of addressing the ninth International Symposium of the Australian Aviation Psychology Association on the topic *Safety Management Systems: Is there a role for an independent investigator?* Safety management systems (SMS) are increasingly important in aviation, with ICAO actively requiring aviation operators to implement an acceptable safety management system. The progress that Australia has made in this area is encouraging, although it will continue to present new challenges for all of us.

From the ATSB's perspective, these developments emphasise the importance of taking a systems view of safety occurrences: of looking at what we can learn to improve future safety each time something goes wrong.

While we encourage everyone in aviation to focus on learning from errors and problems, we also believe that an independent investigator brings something important to SMS arrangements: a dispassionate capability to assess and identify safety issues and learn and communicate safety lessons. To be most effective at this, we continue to rely on comprehensive reporting of safety occurrences by pilots and others. Your contribution to our knowledge of what is happening remains essential.

Martin Dolan
Chief Commissioner

Australian aviation accidents and incidents

The ATSB has just released its aviation occurrence statistics report. Each year, the ATSB receives reports on aviation accidents and incidents, collectively termed occurrences. These reports are used by the ATSB to assist with the independent investigation of occurrences and for identifying safety trends. This report, published twice a year, provides aviation occurrence data for the period 1 January 1999 to 31 December 2009.

The ATSB uses aircraft departures and hours flown to calculate accident and fatality rates. In general, high capacity aircraft departures and hours flown have increased from 1999 to 2009, and low capacity hours have decreased. The majority of departures in Australia occur in general aviation aircraft, but a decrease in these departures has been observed over the reporting period.

For commercial air transport (high capacity regular public transport [RPT], low capacity RPT and charter), although the accident rate had climbed in 2007 and 2008, the number of accidents reduced from 29 (2008) to 11 in 2009. This accident trend was mostly driven by changes in the accident rate for charter operations. There were no fatal air transport accidents in 2009. One significant accident in 2009 involved the tail scrape and runway excursion at takeoff of a foreign-registered Airbus A340-500 in Melbourne on 20 March. Most fatal accidents in commercial air transport are in charter operations, and it has a similar rate of fatal accidents to all general aviation. Charter has an accident rate that is about five times that of both low capacity and high capacity RPT.

For general aviation (aerial work, flying training, and private/business and (VH-registered] sport aviation), accidents and serious incidents have remained generally consistent since 2007. In 2009, there were 126 accidents, including 18 fatal accidents, and 95 serious incidents. Compared with flying training, aerial work data, pooled for the reporting period, has an accident rate per million hours that is two times higher, and private/business has an accident rate that is 2.5 times higher. In terms of fatal accidents per million hours flown in flying training, the fatality rate in aerial work is three times higher, and private/business is at least six times higher.

Multi-engine aircraft are involved in fewer accidents; this is true for rotary-wing and fixed-wing aircraft, even though more hours per aircraft are flown in multi-engine aircraft. Caution should be used in interpreting accidents by the number of engines. In part this may reflect the type of aircraft operation, rather than a specific engine configuration. ■

The full report is available on our website at <www.atsb.gov.au/aviation/aviation_statistics.aspx>

Aviation Safety Investigator

Airport introduces safety innovation

On 9 May 2008, a Boeing Company 737-8CX aircraft, registered PK-GEF, was being operated on a scheduled passenger service between Denpasar, Republic of Indonesia and Perth, WA. On board were two flight crew, six cabin crew and 76 passengers.

The flight crew reported that, once established in the cruise, they reviewed their briefing material and noted that the threshold for runway 21 at Perth was displaced due to runway works.

On approach to land at Perth, the aerodrome controller issued the flight crew with the landing clearance, '... runway 21 displaced threshold, cleared to land'. When the aircraft was about 15 seconds from touchdown, the flight crew questioned the presence of cars on the runway and conducted a go-around.

On the second approach, the flight crew were again issued the landing clearance '... runway 21, displaced threshold, cleared to land'. The aerodrome controller recalled observing the aircraft on what appeared to be an approach to land on the closed section of the runway and instructed the flight crew to go around and provided information to assist the flight crew in identifying the location of the displaced threshold. The aircraft was subsequently observed to fly level over the runway works area prior to landing beyond the displaced threshold.

At the time of the incident, the permanent runway 21 threshold and touch-down markings were unobscured and clearly visible to the flight crew. The runway works area, which included the threshold and touchdown markings, was marked by 6 m closed runway crosses.

The Australian requirements for marking runway thresholds that were displaced for 30 days or less differed from those recommended by the International Civil Aviation Organization (ICAO). When compared with the likely visibility of the ICAO-recommended 36 m closed runway markings, the Australian 6 m markings, as used in this case, increased the difficulty for the crews in locating the precise location of the displaced threshold. As a result, there was an increased risk of a flight crew conducting a visual approach to the permanent threshold/touch-down area. The use of the larger–sized crosses, as specified in *ICAO Annex 14 Aerodromes,* would have been visible to the flight crew much earlier during their approach, allowing additional time for the identification of the closed runway area and displaced threshold. That would have allowed an early adjustment to their approach path, ensuring a stabilised approach and landing.

Despite an apparent awareness of the displaced threshold, the action by flight crew to conduct consecutive approaches to the runway works area suggested that the temporary markings that were used were ineffective in this instance. It was possible that, had the flight crew not noticed the vehicles on the runway during the initial landing approach, they may have landed within the runway works area.

As a result of this incident, the airport operator undertook a number of safety actions and proactively implemented the use of ICAO compliant 36 m closed runway crosses.

The logistics of deploying and retrieving the crosses in a timely manner, made from several tonnes of rubber, was overcome by the use of specially-designed trailers that were constructed by the airport operator. The trailers employed two motorised drums on a swivel base, to hold the two 36 m by 1.8 m lengths of painted rubber.

After being towed to the appropriate location, the swivel base is unlocked and the first line of the cross deployed as the trailer is drawn away. The remaining line is then positioned across the first in the same way. Retrieval is accomplished by reversing the process and is assisted by electric motors which drive the rollers. Deployment or retrieval takes about 10 minutes.

During a recent works programme to re-surface the entire length of runway 21, the 36 m crosses were successfully used to identify the closed runway sections without reported incident.

The ATSB commends the actions taken by the airport operator in proactively addressing this safety issue. ■

ATSB investigation report AO-2008-033, released on 6 June 2009, is avaliable on the website.

Investigation briefs

Ambiguous design standards

ATSB Investigation AI-2008-038

Following the construction of a new hangar adjacent to runway 28 right (28R) at Archerfield Airport, Queensland, the ATSB received a number of submissions asserting that the building infringed safety standards or reduced flight safety.

Drawing on an independent third-party review, the ATSB determined that the building does not breach obstacle limitation surfaces. The ATSB also conducted an initial examination of the instrument departure procedure from runway 28R. The ATSB found that the procedure complied with the extant instrument departure design requirements, but identified an ambiguity in the guidance for designing instrument departure procedures.

The ATSB assessed that this ambiguity could lead to inconsistent expectations about the extent of clearance from obstacles provided to aircraft when pilots were following an instrument departure procedure. This had the potential to increase the risk of a collision with an obstacle. In response, on 30 May 2008, the (then) Executive Director of the ATSB commenced a safety issue investigation.

As a result of that investigation, the Civil Aviation Safety Authority and Airservices Australia have, in consultation, reviewed their understanding of how the design standards for instrument departure procedures should apply in Australia. They have also re-examined the runway 28 instrument departure procedure at Archerfield in the light of that review and have advised that they intend to amend the requirements for instrument departures from runway 28R.

The potential for inconsistent interpretation of the instrument departure procedure design requirements has also been notified to the International Civil Aviation Organization instrument flight procedures panel, which monitors the international standards for the design of instrument procedures. ■

Taxiway takeoff

ATSB Investigation AO-2007-064

On 25 November 2007, a Gulfstream Aerospace Corporation G-IV aircraft, registered HB-IKR, with two pilots, a cabin attendant and five passengers was being operated on a charter flight from Brisbane Airport, Queensland to Sydney, New South Wales.

At about 2215 Eastern Standard Time (EST), the crew was issued with an air traffic control (ATC) clearance to taxi via taxiway Foxtrot 2, to the east, then right onto taxiway Bravo for an intersection departure on runway 01 at Alpha 7. An intersection departure had earlier been offered to, and accepted by the pilot in command (PIC). The PIC taxied the aircraft while the co-pilot conducted the taxi checks and conducted the radio communication with ATC. At about 2225 EST, the PIC of the aircraft commenced the take-off run while on taxiway Alpha, which was adjacent to the active runway 01. The aerodrome controller (ADC) instructed the crew to cancel the take-off clearance. The crew stopped the takeoff and the ADC instructed them to taxi to the end of the runway for a takeoff using the full runway length.

There were no injuries, or damage to the aircraft or airport infrastructure. The investigation found that a combination of a cockpit equipment failure, inadequate pilot rest, deficient cockpit resource management practices and unfamiliarity with the airport layout were likely factors that led to the occurrence. The time of the flight and the PIC's reported tiredness, possible jetlag and interrupted sleep patterns may have impacted on his ability to make effective decisions. The PIC did not use the available means to assist in guiding the aircraft during the taxi. ■

Flight instrument reliability

ATSB Investigation AO-2007-047

During the early evening of 17 October 2007, the pilot of a Cessna Aircraft Company C210M, registration VH-WXC, was fatally injured when his aircraft impacted terrain during a flight from Warburton to Kalgoorlie, Western Australia. That flight was being conducted at night under the visual flight rules and the pilot was the sole aircraft occupant.

The aircraft was seriously damaged by impact forces. There was evidence that the engine was producing significant power at that time. The aircraft was inverted when it collided with terrain, which was consistent with an in-flight loss of control. The accident was not survivable.

Examination of the aircraft wreckage found evidence that the aircraft's suction-powered gyroscopic flight instruments were in a low energy state. That was most probably because the vacuum relief valve was at a low suction setting. There was no lockwire fitted to the associated lock nut that would have ensured the security of the vacuum relief valve's adjustment spindle. The design of the valve was such that any in-service loss of friction on the lock nut could allow the spindle to move to a lower suction setting. In consequence, the aircraft's flight instruments may not have been providing reliable indications to the pilot.

The pilot was appropriately qualified to conduct the flight. However, dark night conditions probably prevailed in the vicinity of the accident site which meant that the pilot would have had few external visual cues. In such conditions, the pilot was reliant on the indications from the aircraft's flight instruments to maintain control of the aircraft. The pilot would have had limited time to identify and react to any unreliable indications from the suction-powered flight instruments. ■

Oxygen masks deployed

ATSB Investigation AO-2007-062

On 17 November 2007 a Boeing Company 737-7Q8 aircraft, registered VH-VBC, with two flight crew, four cabin crew and 145 passengers was being operated on a scheduled passenger service from Coolangatta, Queensland to Melbourne, Victoria. During the takeoff, the Master Caution system activated and the right BLEED TRIP OFF light illuminated. The pilot in command elected to continue the takeoff. Once airborne the Bleed Trip Off non-normal checklist was actioned. The right engine bleed could not be reset with the result that, when above flight level (FL) 170 (17,000 ft above mean sea level), only the left engine bleed air was available for airconditioning and cabin pressurisation.

At FL318 during the climb, the flight crew observed the left PACK TRIP OFF light illuminate, followed by a rapid loss in cabin pressure and the cabin rate of climb indicator showing a rate of climb of about 2,000 ft/min. The crew fitted their emergency oxygen masks, commenced the Emergency Descent checklist and began a rapid descent to 10,000 ft. During the descent, the cabin altitude exceeded 14,000 ft, at which time the passenger oxygen masks deployed automatically. The aircraft was diverted to Brisbane for landing. There were no reported injuries to passengers or crew and no damage to the aircraft.

The investigation found that a combination of technical faults contributed to the loss of pressurisation and identified a number of safety factors relating to operational procedures and cabin crew knowledge of the passenger oxygen system.

The operator conducted an internal investigation of the incident and carried out a number of safety actions. Those actions included the enhancement of a number of the operator's manuals and the amendment of the operator's cabin safety recurrent training. In addition, the operator's passenger oxygen use in-cabin brief was enhanced to include advice that oxygen would flow to passengers' masks even if the associated bag was not inflated. ■

Bad data represents safety risk

ATSB Investigation AO-2009-013

On 7 April 2009, at about 1210 EST, the flight crew of a Boeing 737-800 aircraft, registered VH-VYL, received an enhanced ground proximity warning system alert while passing through 129 ft above ground level during an autoland approach and landing at Sydney Airport, NSW. At the same time, the left radio altimeter (RA) display reduced in altitude to minus 7 ft, the autopilot disconnected and the engine thrust levers moved toward the idle position. The pilot in command, who was the handling pilot, immediately re-positioned the thrust levers and conducted an uneventful landing.

The investigation determined that spurious data from the left radio altimeter (RA) provided an indicated altitude of minus 7 ft, resulting in the autopilot disconnecting and the thrust lever movement. An examination found that the left RA receive antenna displayed rubbing wear adjacent to the attachment screw inserts. A bonding check of the antenna indicated that its resistance was outside the aircraft manufacturer's limits.

The antenna was replaced and the aircraft was returned to service.

The maintenance history for the aircraft operator's fleet of 38 Boeing 737-800's revealed that, over the previous 12 months, the operator had removed and replaced 24 RA antennas. The replacements (including for this event) were as a result of 11 antennas having failed bonding checks, and 12 antennas exhibiting RA system faults or alerts.

Three months after the occurrence, a further RA warning flag event was experienced by another crew in this aircraft. As a result, the left and right RA transceivers were removed and tested with internal faults found on the left unit. ■

Inaugural Level 5 Bulletin

ATSB Investigation AB-2010-020

The ATSB receives around 15,000 aviation occurrence notifications each year, equating to about 8,000 reportable matters. The Bureau, however, is only resourced to undertake a certain number of investigations each year, and while professional judgment is required in making decisions about which are investigated, there are a significant number of occurrences that are only entered into the ATSB's data base for future statistical analysis and trend monitoring.

There are times, however, when more detailed information about the circumstances of the occurrence would have allowed the ATSB to make a more informed decision both about whether to investigate at all and, if so, what necessary resources were required. In addition, further publicly available information on accidents and serious incidents should increase safety awareness in the industry and enable improved research activities and analysis of safety trends, leading to more targeted safety education.

To enable this, the ATSB established a small team to manage and process short, factual investigations, the 'Level 5 Investigation Team'. The Team has recently released its first quarterly bulletin of level 5 investigations, providing a set of professional-level examinations of occurrences that would not traditionally have been investigated.

The summary reports in the bulletin were compiled from information provided to the ATSB by individuals or organisations involved in an accident or serious incident between the period 1 December 2009 and 30 March 2010.

The bulletin covers a range of occurrences, examining the circumstances surrounding a pilot incapacitation, a ground handling event, an instance of total power loss, a depressurisation, a situation in which aircraft control was lost, and an in-flight fire.

The bulletin, with details of the investigations, can be found on the ATSB's website at <www.atsb.gov.au> ■

REPCON briefs

Australia's voluntary confidential aviation reporting scheme

REPCON allows any person who has an aviation safety concern to report it to the ATSB confidentially. Unless permission is provided by the person that personal information is about (either the reporter or any person referred to in the report) that information will remain confidential.

The desired outcomes of the scheme are to increase awareness of safety issues and to encourage safety action by those who are best placed to respond to safety concerns.

Before submitting a REPCON report, take a little time to consider whether you have other available and potentially suitable options to report your safety concern. In some cases, your own organisation may have a confidential reporting system that can assist you with assessing your safety concern and taking relevant timely safety action. You may also wish to consider reporting directly to the Civil Aviation Safety Authority (CASA) if you are concerned about deliberate breaches of the safety regulations, particularly those that have the potential to pose a serious and imminent risk to life or health. REPCON staff may be able to assist you in making these decisions, so please don't hesitate to contact our staff to discuss your options.

REPCON would like to hear from you if you have experienced a 'close call' and think others may benefit from the lessons you have learnt. These reports can serve as a powerful reminder that, despite the best of intentions, well-trained and well-meaning people are still capable of making mistakes. The stories arising from these reports may serve to reinforce the message that we must remain vigilant to ensure the ongoing safety of ourselves and others.

If you wish to obtain advice or further information, please contact REPCON on 1800 020 505.

Unsafe practices at an aerodrome

R200900006

Report narrative:

The reporter expressed safety concerns that incidents/accidents are increasing and operating procedures appear to be deteriorating at the named aerodrome. Occurrences and deteriorating operating procedures include; not restraining aircraft when unattended, collisions with other aircraft and structures, dangerous hand starting procedures, unconventional circuits being flown, and non standard radio calls.

Action taken by REPCON:

REPCON supplied CASA with the de-identified report and CASA advised that it was aware of increased activity at the aerodrome as a result of aircraft operating from Parafield Aerodrome. CASA has recently conducted surveillance activity on operations in the vicinity of the aerodrome and is satisfied that aircraft operators are meeting their safety obligations in accordance with the applicable civil aviation legislation. Further surveillance activity is planned. Without more specific information, CASA is unable to action or comment further on the issues raised in the REPCON.

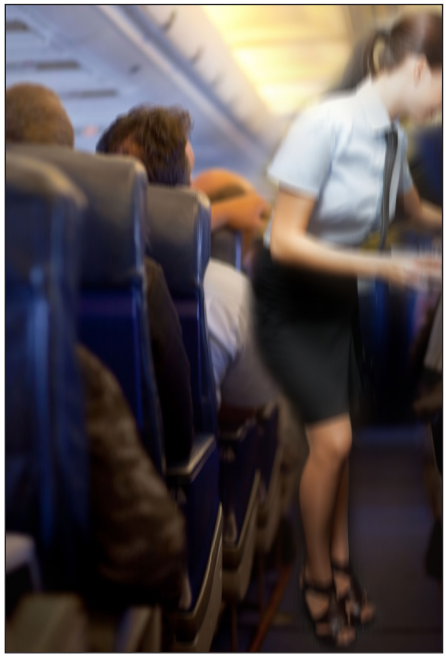
Safety of cabin crew in turbulence

R200900075

Report narrative:

The reporter expressed safety concerns about cabin crew not being seated with seatbelts secured during turbulence when the seat belt sign illuminated. The reporter estimated that over the last 7 years flying with the operator, with an estimated 300 to 400 sectors, that only once were cabin crew observed to resume their seats in turbulence. This occurred when the turbulence was so severe that crew found it extremely difficult to stand. During the flights where the crew did not resume their seats in turbulence, the food service was continued and cabin crew moved through the cabin with hot liquids and food.

The reporter believes that CAO (Civil Aviation Order) 20.16.3 requires all passengers and crew to occupy a seat during turbulent conditions. On other airlines that the reporter has flown with, whenever the seat belt sign is illuminated due to turbulence, both passengers and crew are instructed to be seated and fasten seatbelts.



Action taken by REPCON:

REPCON supplied the operator with the de-identified report and the operator advised that CAO 20.16.3 states:

3.1 Each crew member and each passenger shall occupy a seat of an approved type:

(a) during take-off and landing; and

(b) during an instrument approach; and

(c) when the aircraft is flying at a height less than 1000 feet above the terrain; and

(d) in turbulent conditions:

The operator advised that the CAO does not define the level of severity of the

turbulence at which crew and passengers must be seated. The operator ensures that passengers are seated at a lesser level of turbulence than for cabin crew and this is stated in their procedure manual. Contained therein are procedures for dealing with the levels of severity of turbulence and also included is the following note:

> NOTE: Crew should be seated immediately if they feel their safety is in jeopardy at any stage.

The operator also noted that CAO 20.16.3 and Civil Aviation Regulations (1988) 251 lists duties for cabin crew that require certain actions if turbulence is encountered. The operator believes that assumes cabin crew are to perform functions other than immediately assume their seat in all cases of turbulence encounters. The operator therefore, in keeping with the drafting of the relevant CAO, published procedures that detail duties of cabin crew in turbulence as long as the overriding embodied intent is to ensure the safety of both passengers and crew.

REPCON supplied CASA with the de-identified report and a version of the operator's response. CASA provided the following response:

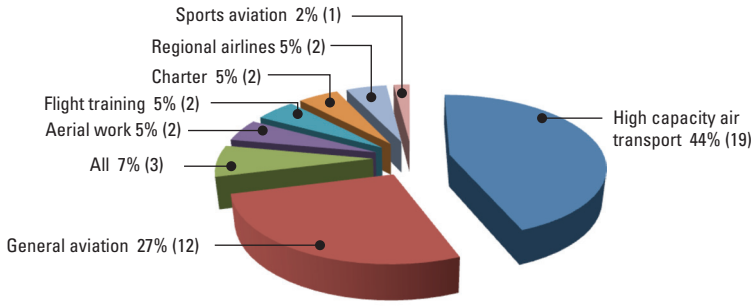
> CASA has reviewed the report and will request that the operator review their turbulence procedures in accordance with Civil Aviation Regulation 251 s1(d).

The operator has subsequently advised that they are in the process of revising their turbulence procedures.

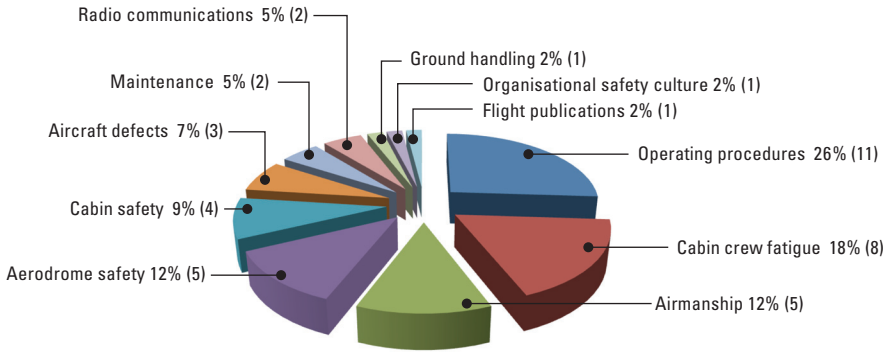
REPCON reports received	
Total 2007	117
Total 2008	121
Total 2009	118
Total 2010[a]	55

a. as of 30 April 2010

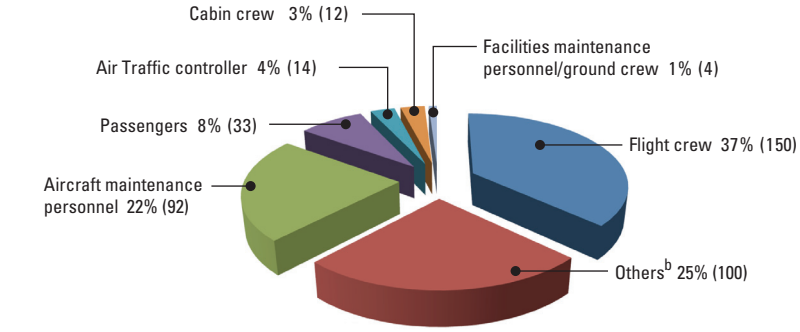
REPCON Operation types First quarter 2010



Reported issues First quarter 2010



Who is reporting to REPCON?[a]



a. 29 January 2007 to 30 April 2010
b. examples include residents, property owners, general public.

What is not a reportable safety concern?

To avoid doubt, the following matters are not reportable safety concerns and are not guaranteed confidentiality:

(a) matters showing a serious and imminent threat to a person's health or life;
(b) acts of unlawful interference with an aircraft;
(c) industrial relations matters;
(d) conduct that may constitute a serious crime.

Note 1: REPCON is not an alternative to complying with reporting obligations under the Transport Safety Investigation Regulations 2003 (see <www.atsb.gov.au>).

Note 2: Submission of a report known by the reporter to be false or misleading is an offence under section 137.1 of the Criminal Code.

How can I report to REPCON?

Reporters can submit a REPCON report online via the ATSB website.
Reporters can also submit via a dedicated REPCON telephone number: 1800 020 505
by email: repcon@atsb.gov.au
by facsimile: 02 6274 6461
or by mail: Freepost 600, PO Box 600, Civic Square ACT 2608

How do I get further information on REPCON?

If you wish to obtain advice or further information on REPCON, please visit the ATSB website at <www.atsb.gov.au> or call REPCON on 1800 020 505.