

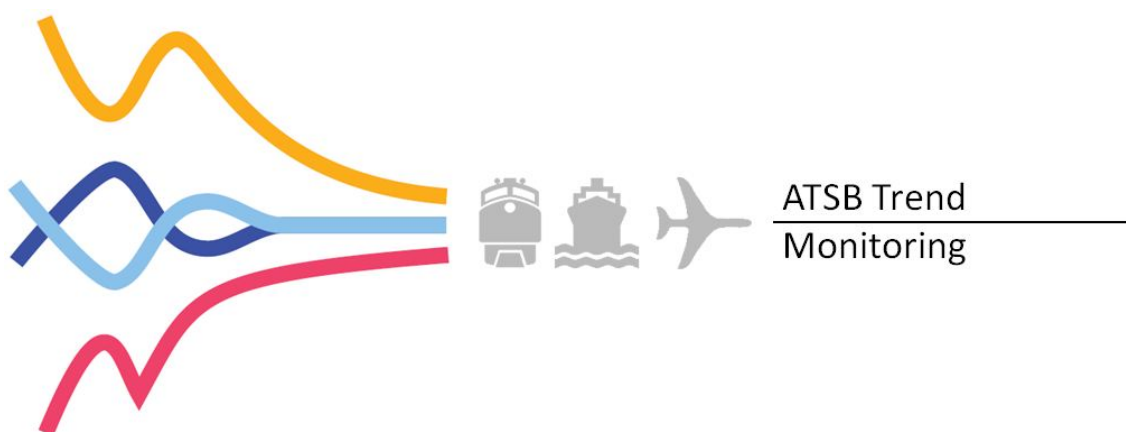


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Emerging trends in Australian aviation safety

January – June 2014



ATSB Transport Safety Report

Aviation trend monitoring

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Addendum

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Emerging trends in Australian aviation safety: January – June 2014

Introduction

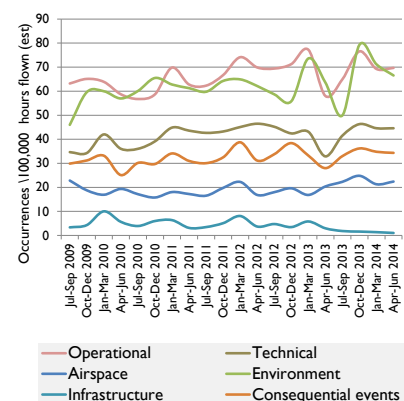
When aviation safety incidents and accidents happen, they are reported to the ATSB. The most serious of these are investigated, but most reports are used to help the ATSB build a picture of how prevalent certain types of occurrences are in different types of aviation operations.

The ATSB uses this data to proactively look for emerging safety trends. By monitoring trends, issues of concern can be communicated and action taken to prevent accidents.

Proactive trend monitoring is a data-driven process, reviewing all occurrences to see if there are subtle changes that may point to a larger issue. Potential issues are then monitored by the ATSB, and shared with industry and other government agencies. Safety actions can then be taken by the most appropriate people to prevent these issues resulting in accidents. These trends can also point to the need for the ATSB to target particular types of occurrences for investigation.

This report summarises significant trends in Australian aviation from January to June 2014, and resultant safety action being taken to address these trends.

Safety occurrence reporting across all types of Australian aviation – last 5 years



Proactive trend monitoring methods

ATSB trend monitoring reviews the rate of reported aviation occurrences (per 100,000 departures or hours flown) biennially, and compares it to the 5 year average. The ATSB performs this assessment independently for every type of occurrence involving high capacity regular public transport (RPT) and charter, low capacity RPT and charter, general aviation, and recreational aviation.

Further analysis can show what aircraft models, operators, or locations account for most of the difference, and whether this has been a long term trend or just a spike. When a single operator accounts for most of the difference, the ATSB contacts them for information and comment. Sometimes increases are solely due to a good reporting culture, sometimes because of changes to operations, aircraft, or regulations, and sometimes there is no apparent explanation.

In almost all cases, a significantly different occurrence rate to normal is due to something explainable, and something that does not pose an imminent risk to the safety of aircraft operators, passengers, or the public.

The ATSB continues to monitor all trends for several months to see if they return to normal.

Safety action is appropriate when a concerning trend has been identified, and can include:

- contacting an operator or industry association for more information
- reporting the trend to the regulator (Civil Aviation Safety Authority) or to the air navigation services provider (Airservices Australia and/or Department of Defence) for further monitoring
- targeting occurrences for new ATSB investigations or research
- having ATSB investigators closely monitor new reports of similar occurrences to gather more information.

Increasing trends

This section refers to trends where the rate of a particular type of occurrence was significantly above the 5 year average in the January to March 2014 quarter and showed a further increase in the April to June 2014 quarter.

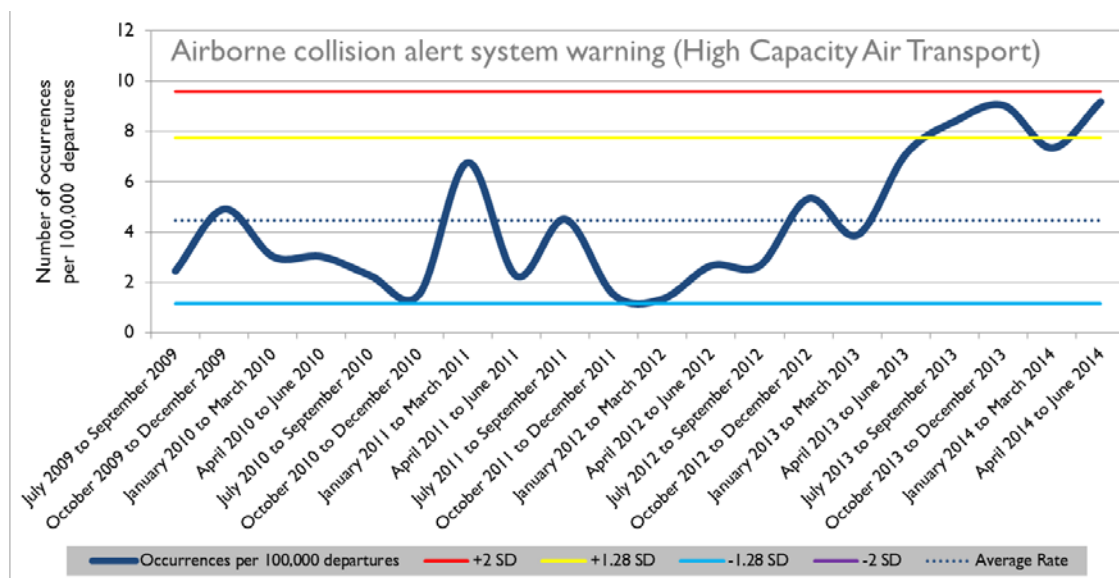
In the January to July 2014 period, there were no significant increasing trends of note.

Steady but significant trends

This section refers to trends where the rate of a particular type of occurrence was significantly above the 5 year average in the January to March 2014 quarter, and continued to be above average in April to June 2014 quarter.

Airborne collision alert warnings – High capacity air transport

The rate of *Airborne collision alert system warnings* reported in high capacity air transport operations has been significantly above average in the last few quarters, and showed a slight increase in Apr-Jun 2014.



The most common location for these occurrences was Sydney, with TCAS-RA alerts on approach to that airport making up 12 of the 28 occurrences in the last 6 months. All of those occurrences happened during independent visual approaches (IVAs). The majority of occurrences involving an IVA involved runway 34L/R approaches (only two occurred on runway 16L/R approaches). Further investigation by the ATSB has found that IVAs at Sydney Airport have contributed to most of the rise seen in this type of occurrence over the last 2 years.

No particular operators or aircraft types stood out, and most were routine alerts that were not associated with a separation loss. None resulted in a missed approach or go-around.

The ATSB is conducting an investigation into IVA's at Sydney Airport (AO-2013-095) which will be completed in late 2014.

The air traffic control (ATC) provider at Sydney, Airservices Australia, reported that they have been working with the Civil Aviation Safety Authority since late 2013 to identify and implement a number of measures to strengthen the identified risk mitigations. They include:

- increasing operator's awareness of IVA procedures through:
 - safety bulletins
 - Automatic Terminal Information Service (C-ATIS) advice reminding pilots to avoid crossing the centreline during IVA operations

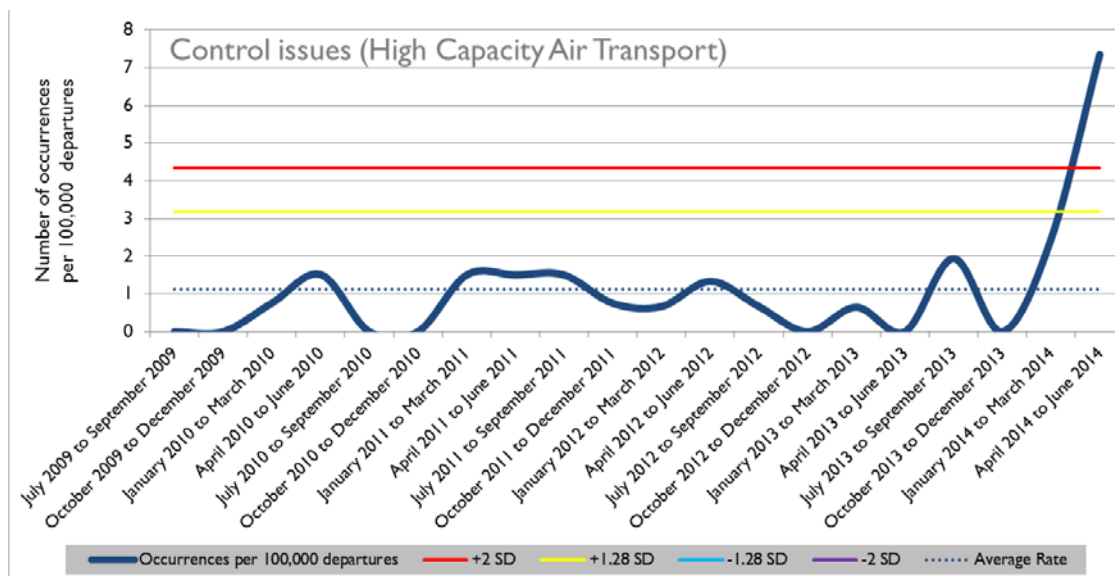
- Departure and Approach Procedures (DAP) User Guide
- delivery of road shows with key airlines' pilot check and training staff.
- directed traffic information by ATC to aid pilot situational awareness
- improved IVA phraseology for publication in the Aeronautical Information Package (AIP) to clearly distinguish between IVA and visual approach.

Airservices has organised a post-implementation review (PIR) of the above improvement measures by the end of the year to assess the impact on industry conformance to TCAS RA procedures.

Furthermore, Airservices introduced (Standard Terminal Area Arrival Speeds STAAS) at Sydney in May 2014 with the intention of reducing aircraft speed as they approached the centreline. This is to reduce the likelihood of aircraft passing through the centreline with the added benefit of reduced TCAS RA's. Improvements to the application of speed control from both pilot and ATC viewpoints are on-going.

Control issues – High capacity air transport

Control issues involving high capacity air transport aircraft are a low frequency occurrence type, but there was a significant increase in occurrences in January to June 2014.



A large proportion of these occurrences were reported by one airline (10 of 16 occurrences), and the Fokker 100 was overrepresented when considering the fleet size and activity (5 occurrences).

Occurrences involving Fokker 100 aircraft were uncommanded pitch down events during cruise or descent, or uncommanded forward and aft movement of the control column while the autopilot was engaged. In most of these cases, the flight crew disengaged the autopilot entirely, or deselected and reselected the secondary autopilot system. In three cases, engineers replaced the affected system autopilot servos and in one case, replaced an elevator trim servo following the occurrence.

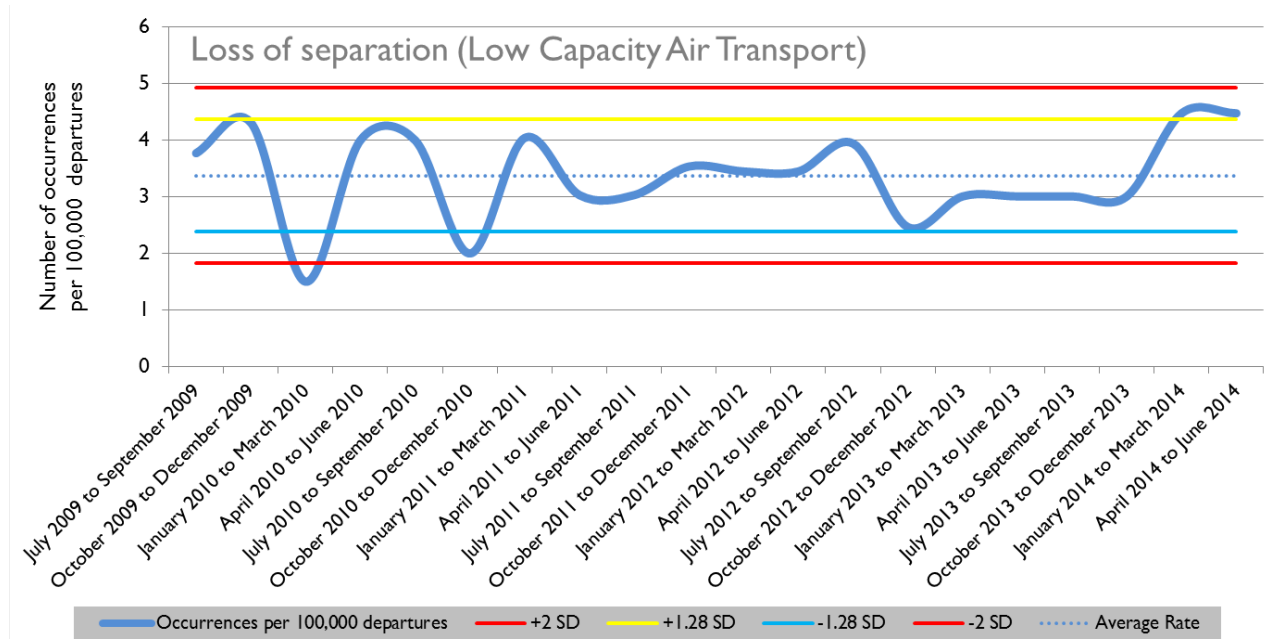
The ATSB investigated a control issue involving a Fokker 100 in March 2014, which was caused by a failed elevator servo and a failed thrust servo. This investigation did not find any systemic issues (AO-2014-045).

The ATSB will contact all Fokker 100 operators in Australia to advise them of this trend.

Most other *Control issues* were isolated events resulting in incorrect aircraft configuration warnings, with two occurrences resulting in cabin injuries (the most serious of which was an accident involving an ATR 72 which is being investigated by the ATSB – AO-2014-032).

Loss of separation – Low capacity air transport

The rate of Loss of separation (LOS) occurrences involving low capacity RPT and charter aircraft was above average across the January to June 2014 period. Most of the 18 occurrences over the last 6 months were low risk occurrences, although there was one high risk LOS which involved a Cessna 206 and a military Boeing 737 in close proximity near Darwin Airport. Air traffic control was most often alerted to the LOS by a Short Term Conflict Alert (STCA), or there was no alert. Occurrences while aircraft were under radar control (10 of 18 occurrences) were most common.



No particular operators or aircraft types stood out. Darwin/Northern Territory (NT) were the most common locations for occurrences in the 6 months (three occurrences close to Darwin, four occurrences elsewhere in northern NT).

Actions by ATC (61 per cent of occurrences) were the most common reason for the LOS, such as issuing of incorrect vectors, clearing an aircraft to approach/land on a runway that was already in use by another aircraft, or issuing inappropriate climb/descend instructions. In the remaining occurrences where a pilot action was the reason for the LOS, deviations from track, airspace infringement, entering a runway without a clearance, and climbing through an assigned level were the most common issues.

The ATSB recently published an in-depth analysis of losses of separation across Australia in the research report *Loss of separation between aircraft in Australian airspace: 2008 to June 2012* (AR-2012-034).

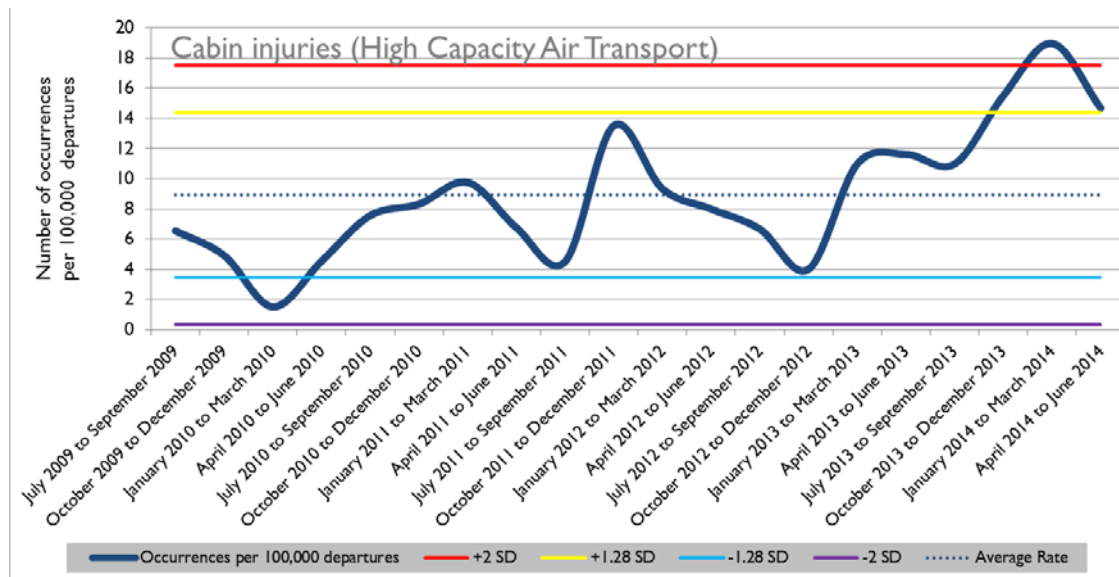
Decreasing trends

This section refers to trends where the rate of a particular type of occurrence was significantly above the 5-year average in the January to March 2014 quarter and showed a reduction in the April to June 2014 quarter, while still remaining above the 5 year average.

Cabin injuries – High capacity air transport

The rate of *Cabin injury* occurrences in high capacity air transport spiked in the January to April 2014 quarter, but has since been decreasing.

Almost all reported *Cabin injuries* (95 per cent) involved injuries to cabin crew, particularly on domestically-operated aircraft types. Minor bruises and sprains were the most common types of injury. Most involved some sort of turbulence or aircraft disturbance, with 22 per cent occurring in severe turbulence.



Further investigation by the ATSB did not find any safety-related trends relating to these injuries, but did find that reporting of occurrences is significantly skewed by operator with one airline reporting almost 60 per cent of these incidents. Discussions within industry suggests that this may be because this airline has a system where all injuries to cabin crew, including work health and safety (WH&S) injuries, are reported to their operational safety department, where many are later identified as being related to operational safety matters. The ATSB believes all airlines should have systems in place where all cabin injuries reported internally (including those reported through WH&S systems) can be assessed to determine whether they are related to an operational matter and therefore reportable to the ATSB as transport safety matters.

High risk occurrences not investigated

All occurrences reported to the ATSB are risk rated using the ARMS Event Risk Classification (ERC) framework. Using ERC can determine whether an occurrence could pose a low, medium, high, or very high risk to the safety of people, property and aircraft. The risk that is credibly posed by an occurrence is determined by answering two questions:

- “If this event had escalated into an accident, what would have been the most credible accident outcome?” (severity)
- “What was the effectiveness of the remaining barriers between this event and the most credible accident outcome?” (likelihood)

Most occurrences reported to the ATSB are unlikely to result in any type of accident. Those posing a high risk, even if they did not result in an accident, are usually investigated by the ATSB.

In the January – June 2014 period, the ATSB started 90 investigations into aviation occurrences, covering most high risk occurrences, accidents and serious incidents.

In the same 6-month period, there were three high risk occurrences reported to the ATSB involving general aviation aircraft that were not investigated.

VH-Registered general aviation

- A Bell 412 was passing 400 ft on final approach to runway 29 at Toowoomba Airport, Qld when the pilot observed a Piper PA-38 cross in front at close proximity (50 to 100 m). The 412 crew advised the PA-38 crew that they had cut them off and the PA-38 conducted a missed approach. The ATSB considered that an investigation into this occurrence was unlikely to reveal broader systemic safety issues and did not warrant diversion of resources when compared with workloads and priorities at the time (201403594).
- During the final approach to land near Onslow, WA, the Robinson R44 helicopter's tail rotor struck a previously unseen wire fence and the pilot was unable to regain control. The helicopter subsequently landed hard and rolled onto its left side resulting in substantial damage. The ATSB considered that the circumstances of the accident were unlikely to reveal any broader systemic safety issues. The ATSB decided not to investigate this serious incident due to resource constraints, and due to the helicopter being in the landing phase there was likely to be limited safety benefit (201404192).
- During cruise at 2,500 ft near Moorabbin Airport, Vic., the crew of the Piper PA-28 observed a shadow pass overhead and subsequently observed a Cessna 172 above and behind them on a reciprocal track. The crew of the 172 reported that at the time of passing they were climbing from 2,500 ft to 3,500 ft and did not see the PA-28. The proximity between the aircraft was reported to have reduced to 100 m horizontally and 100 ft vertically. The ATSB considered that the occurrence was unlikely to reveal broader systemic safety issues and further investigation did not warrant diversion of resources when compared with workloads and priorities at the time. (201405166).

Gliders and recreational aircraft

There were also several high risk occurrences that involved recreational aircraft registered with a recreational aviation administration organisation (RAAO), such as Recreational Aviation Australia (RA-Aus), the Australian Sport Rotorcraft Association (ASRA), or the Hang Gliding Federation of Australia (HGFA). The ATSB is currently not resourced to investigate most (non-VH) recreational aviation accidents and sports aviation accidents involving VH-registered gliders or balloons, but ensures that in every accident the appropriate recreational aviation association is informed if they wish to conduct an independent investigation. The ATSB also uses the information from these reports to undertake trend analysis (such as in this report) and to form the basis of research and other analyses.

- On a flight near Hughenden, Qld, the Xenon gyrocopter lost speed and subsequently collided with trees. The aircraft was substantially damaged (201400006).
- During the approach to runway 34 at Stonefield (ALA), SA, the pilot of an Astir glider misjudged the approach due to changing wind conditions and attempted to land on runway 11. While turning onto runway heading, the right wingtip struck the ground and the glider landed hard resulting in substantial damage (201400784).
- During the final approach to Wangaratta, Vic., the Jabiru J230 struck an embankment and veered left of the airstrip. The pilot attempted to conduct a missed approach but stalled the aircraft and landed hard. The aircraft sustained substantial damage to the nose landing gear, propeller, engine compartment and left wing. The pilot suffered minor injuries (201400888).
- During the landing on runway 18 at Penfield (ALA), SA, the Storch ballooned and the pilot struck his head and became unconscious for short time. The aircraft subsequently collided with ground and come to rest inverted. The aircraft was substantially damaged and the pilot suffered minor injuries (201401534).
- During the approach to Townsville Airport, the Sonex encountered a wind gust. The pilot conducted a missed approach during which, the aircraft stalled and subsequently collided with terrain. The pilot suffered serious injuries (201402053).
- The Advanced Kinetics gyrocopter collided with terrain near Nowra, NSW resulting in fatal injuries to the pilot (201402770).
- The Eurofox collided with terrain near Hay, NSW and the pilot was fatally injured (201403230).
- During approach to land at Ayr (ALA), Qld, the Virus aircraft encountered a wind gust and the pilot attempted a go-around. Due to the wind conditions, the aircraft was unable to climb, and collided with terrain. The aircraft was substantially damaged, and both the pilot and passenger received minor injuries (201404358).
- It was reported that the Xenon gyrocopter pitched nose forward after takeoff from Atherton (ALA), Qld, resulting in a collision with terrain. The pilot was injured during the collision (201404532).
- During cruise, weather conditions deteriorated rapidly and the pilot of the Jabiru LSA attempted to divert to Tocumwal, NSW. While turning to divert, the aircraft entered cloud. The pilot descended clear of cloud and attempted a precautionary landing in a paddock. During the attempted landing, the aircraft struck an irrigation bank, causing the right main landing gear to detach. The aircraft regained height, and the pilot subsequently landed in another paddock resulting in substantial damage (201404943).
- During landing on a beach near Mackay, Qld, the Eurofox sank into a patch of soft sand. The nose landing gear collapsed and the aircraft came to rest inverted. The aircraft sustained minor damage and both occupants suffered minor injuries (201405986).

In addition, the ATSB did not investigate an accident at Krondorf, SA where an RA-Aus registered Tecnam P96 Golf collided with terrain, fatally injuring both occupants. The ATSB did provide assistance to RA-Aus with its investigation into this accident by retrieving data from an on-board GPS unit, and conducting an engineering examination of some structural components of the aircraft (AE-2014-132).

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; and fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.