Australian Government

Australian Transport Safety Bureau

Annual Report 2016–17

Australia's national transport safety investigator

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Australian Government
Australian Transport Safety Bureau

Chief Commissioner

13 October 2017

The Hon Darren Chester MP
Minister for Infrastructure and Transport
Parliament House
CANBERRA ACT 2600

Dear Minister

I am pleased to present the Annual Report of the Australian Transport Safety Bureau (ATSB), reporting on our operations for the year ended 30 June 2017.

This annual report has been prepared in accordance with the requirements for non-corporate Commonwealth entities under section 46 of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act) and summarises the ATSB's performance for the year.

The report includes the ATSB's financial statements as required by section 42 of the PGPA Act and an audit report on those statements in accordance with section 43 of the same Act.

In addition to fulfilling the requirements of the PGPA Act, the report satisfies section 63A of the *Transport Safety Investigation Act 2003*.

I also certify that I am satisfied that the ATSB has prepared risk assessment and fraud control plans and has in place appropriate fraud prevention, detection, investigation, reporting and data collection procedures and processes that meet the specific needs of the ATSB and comply with the Commonwealth Fraud Control Framework.

Yours sincerely

Greg Hood
Chief Commissioner/Chief Executive Officer

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Before making decisions on the basis of information contained in this report, you are advised to contact the ATSB. This report was up to date at the time of publication but details change over time due to legislative, policy and other developments.

SECTION 1

Chief Commissioner's review 2016–17

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CHIEF COMMISSIONER'S REVIEW 2016–17

Appointed Chief Commissioner on 1 July 2016, I was honoured to be provided the opportunity to lead a world-class transport safety investigation agency. As the accountable authority, I was acutely aware that the ATSB's primary function is to improve transport safety with priority given to delivering the best safety outcomes for the travelling public. Having worked in other agencies within the transport portfolio for an extended period of time, I was also cognisant of the agency's operational environment and the associated challenges. It was within this context that I determined the ATSB needed to be repositioned to face these challenges with courage and determination.

Evolving our capabilities and capacity

The ATSB has undertaken a significant transformation program designed to enable better resource allocation and utilisation across the agency. A number of change imperatives underpinned this program which provided the impetus to refine our business practices and expand our deliverables.

In demonstrating increased effectiveness, we have become more selective in how we allocate resources towards investigating those accidents and serious incidents that have the greatest potential for safety learnings and enhancement. Concurrently, we have expanded our capacity to improve transport safety outside of these traditional investigations, through safety issue investigations, greater interaction with operators and regulators, with data and other intelligence in our possession, and through amplified communications, safety education and promotion.

Key success factors

The ATSB's greatest resource continues to be "its people" and while there have been changes within our organisational structure—most notably the introduction of multi-disciplined/modal investigator teams—we are well on the way to creating an environment where our employees are empowered. Our people are provided greater

opportunities to bring to bear their collective core investigative skills, shared values, passion and drive to improve transport safety. This equally applies to our dedicated and professional operational support staff.

Through the Government's recent 2017–18 Budget measure "improving transport safety", the ATSB has been able to re-establish a sound financial position over the next four years. This increase in funding will enable the ATSB to replenish its workforce and re-profile its capital investment strategies to meet its projected needs in essential technical equipment, data warehousing requirements and core enterprise systems.

Core business

The ATSB has committed considerable resources and time to re-engineering its operational model over 2016–17. We did so whilst taking appropriate measures to ensure this did not impact our ability to conduct core business activities, as demonstrated through the range of significant and comprehensive investigations that were either commenced or completed during the financial year.

In relation to other broader functions, the ATSB has completed its transition to becoming the national rail safety investigator, as established through the Council of Australian Governments' Intergovernmental Agreement on Rail Safety Regulation and Investigation Reform. This milestone coincides with the Queensland Parliament's agreement to join the national rail safety scheme from 30 June 2017.

Internationally, we have continued an active program of regional engagement with other transport safety agencies within the Asia–Pacific region—most notably with our Indonesian and Papua New Guinean counterparts.

Aviation

During the year, we completed 39 complex aviation safety investigations and 108 short factual investigations.

This year a second interim report was released into the in-flight pitch disconnect of a Virgin Australia Regional Airlines ATR 72 aircraft that occurred about 50 km west-southwest of Sydney Airport, NSW. That report identified a safety issue concerning activation of the aircraft's pitch uncoupling mechanism with world-wide implications. The ATSB has issued safety recommendations to the aircraft manufacturer, the Civil Aviation Safety Authority (CASA) and the European Aviation Safety Agency to take action to ensure that the aircraft can safely withstand the loads resulting from a pitch disconnect.

A report was also released for an investigation involving the collision with terrain of a parachuting aircraft at Caboolture Airfield, Queensland that fatally injured the five occupants. The ATSB identified that the aircraft aerodynamically stalled at a height from

which it was too low to recover control prior to collision with terrain. As a result of that investigation, the ATSB recommended that CASA introduce risk controls to provide increased assurance of aircraft serviceability, pilot competence and adequate regulatory oversight. The ATSB also recommended that CASA work in collaboration with the Australian Parachute Federation to increase the usage of dual point passenger restraints in parachuting aircraft.

Another significant aviation investigation included a traffic management occurrence involving a Jetstar Airbus A320 and a Beech Aircraft Corporation BE-76 Duchess at Ballina/Byron Gateway Airport, NSW. That investigation identified a safety issue relating to the available traffic advisory facilities. The introduction of a certified air/ground radio service to provide weather services and traffic information at the airport in March 2017 is expected to address that safety issue.

The ATSB also released the first research report on Remotely Piloted Aircraft Systems (RPAS). This report showed that there has been a steep rise in the number of RPAS certificate holders in 2016, coinciding with a similar rise in safety occurrences. About half of the 180 occurrences from the past five years related to near encounters with manned aircraft. Of these, 60 per cent were in 2016. Fortunately, there have been no collisions in Australia between RPAS and manned aircraft. The potential consequences of a collision remain uncertain given the limited research available. However, RPAS are an emerging risk that require close monitoring as the number of these aircraft continues to grow.

Rail

During the year, the ATSB completed 16 rail safety investigations. These involved collisions, derailments and failures of safe work practices. Of significance were a level crossing collision between a freight train and a road-train truck near Narromine, NSW, (*RO-2015-016*) and the derailment of a freight train carrying dangerous goods near Julia Creek, Queensland (*RO-2015-028*).

The ATSB also continues its focus on occurrences where breaches of safe work practices may place maintenance crews and operators at risk. An investigation has commenced into a fatal collision between a track worker and passenger train near Petrie, Queensland which occurred on 29 May 2017 (*RO-2017-003*). In addition, our safety issues investigation into safe work on track is nearing completion and will go through a period of public consultation in preparation for final release before the end of 2017.

Marine

The ATSB completed five marine safety investigations in 2016–17. One significant investigation involved a crew member fatality on board the offshore support vessel *Skandi Pacific,* off the West Australia coast (*322-MO-2015-005*). The crew member was crushed while attempting to secure containers during worsening weather conditions. The investigation complements an ATSB SafetyWatch priority focusing on marine work practices and resulted in a Safety Advisory Notice being issued to highlight the risks posed by open stern vessels in the industry.

The report into the breakaway of the *Spirit of Tasmania II* from its mooring at Station Pier in Melbourne, Victoria (*MO-2016-001*) highlighted that all ships, especially those with high windage, are prone to breaking away from moorings during short-term events such as thunderstorms and squalls. The risks this presents to ships with large numbers of people on board means that weather monitoring, mooring systems and procedures need to be regularly checked and verified for changing weather conditions.

Malaysia Airlines Flight 370—international contribution

In January 2017, a Joint Communiqué issued by the Tripartite Governments (Malaysia, Australia, and the People's Republic of China) formally announced the suspension of the underwater search for missing Malaysia Airlines Flight 370 (MH370) following completion of the 120,000 km^2 search area. Should credible new information emerge that can be used to identify the specific location of the aircraft, consideration will be given to determining next steps.

Whilst search operations have been suspended, search area analysis and activities have continued, and an end of search report was released in the third quarter of 2017.

The search for MH370 has been a complex international program, the largest and most complex search for a missing aircraft in history. The effort of the dedicated ATSB and associated personnel involved in the search is a testament to their ingenuity, adaptability and resilience. Consistent with Government policy and direction, the ATSB will continue to provide a supporting role to Malaysia as the country responsible for the investigation into the disappearance of MH370.

Outlook for 2017–18

The ATSB will continue to perform its primary function of "improving transport safety" in an operating environment of continuing growth and change in the aviation, rail and marine transport industries.

In recognising these environmental challenges, the ATSB will adopt and implement a range of strategies designed to further increase its overall efficiency and effectiveness.

Selective investigations

The ATSB will refine its methodologies in selecting the accidents and incidents it investigates, recognising its finite resources, differences in jurisdiction across the modes, and its particular focus on the safety of the travelling public.

Data driven

To position the ATSB to become more proactive in its identification of safety issues, we will continue to build our capability to source data nationally on aviation, rail and marine transport safety occurrences and events, and use that data to identify and communicate safety risks and emerging trends.

We will also deliver a program of safety research and analysis that draws on the results of investigations and the interrogation of safety occurrence datasets.

Stakeholder engagement

To encourage greater safety action, the ATSB will enhance stakeholder relationships, with a particular focus on ensuring a strong culture of reporting safety matters, and through transparent arrangements for the appropriate sharing and use of safety information.

Focused communications

To ensure the targeted delivery of its safety messages, the ATSB will undertake safety communication and education with an emphasis on identifying priority areas where safety risk can be reduced.

We will also increase public awareness of the ATSB's safety activities by developing a broader range of communication and education products and pursuing their delivery to transport industries and the travelling public through media that interact with a variety of stakeholders.

Workforce capabilities

To enhance its workforce capability the ATSB will complete the implementation of its organisational change program, embedding a multi-discipline teams-based approach to investigations, with the objective of enhancing the agency's efficiency and effectiveness.

We will expand our resource base through attracting, retaining and developing professional staff as well as developing networks with skilled professionals who the ATSB can work with to fulfil its transport safety functions.

Expanding jurisdictions

While the ATSB has a broad jurisdiction in aviation, there is further work to be done as part of the national rail and marine safety reforms. The ATSB will examine how to best address some of the issues surrounding the independent investigation of serious incidents and accidents in the domestic commercial vessel (DCV) sector consistent with any direction as agreed by governments.

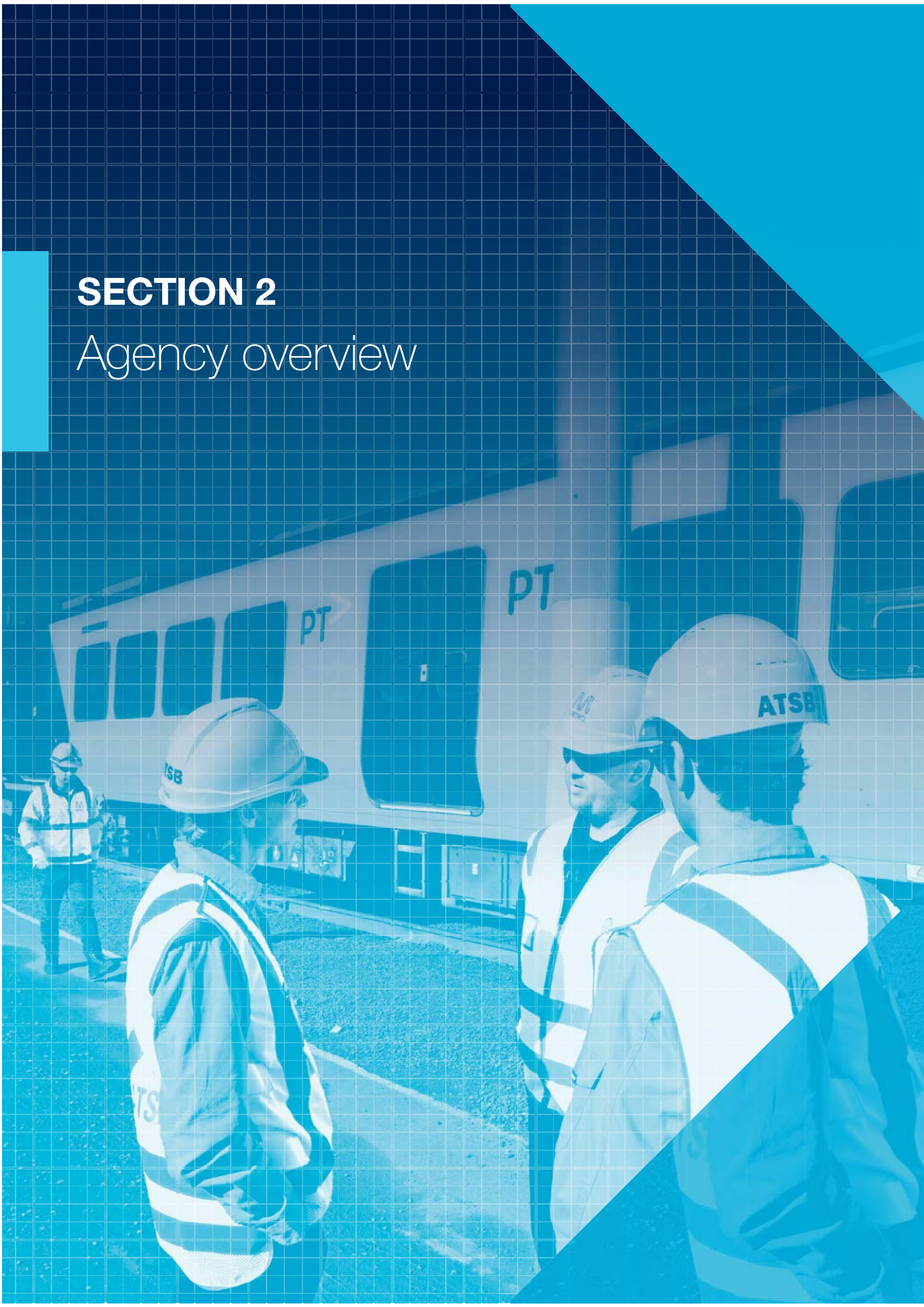
These strategies, the associated deliverables and performance indicators (specifically our commitment to improving the timeliness of our outputs), are detailed and presented in the ATSB's Corporate Plan 2017–18, published on 31 August 2017.

The 2017–18 year will be a positive and exciting period for the ATSB and I remain confident that the continued professionalism and capability of our people will ensure the ATSB remains a world-leading transport safety investigation agency.

Greg Hood
Chief Commissioner/CEO

SECTION 2

Agency overview



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AGENCY OVERVIEW

The ATSB is Australia's national transport safety investigation agency. Its primary function is to improve aviation, rail and marine safety. It does this by receiving information about accidents and other safety occurrences, analysing data, and investigating occurrences and safety issues in order to identify and communicate factors that affect, or might affect, transport safety.

The ATSB is part of the Infrastructure and Regional Development portfolio. Within the portfolio are other important transport agencies whose roles are focused on delivering an efficient, sustainable, competitive, safe and secure transport system for all transport users through regulation, financial assistance and safety investigations. These include:

- Department of Infrastructure and Regional Development
- Australian Maritime Safety Authority
- Civil Aviation Safety Authority
- National Transport Commission
- Airservices Australia.

Purpose

The ATSB is an independent statutory agency of the Australian Government. The ATSB's purpose is to improve the safety of aviation, rail and marine transport through:

- the independent investigation of transport accidents and other safety occurrences
- data recording, analysis and research
- fostering safety awareness, knowledge and action.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* (TSI Act) and, where applicable, relevant international agreements. The TSI Act makes it clear that the ATSB cannot apportion blame, assist in determining liability or, as a general rule, assist in court proceedings. Its sole focus remains the prevention of future accidents and the improvement of safety.

The ATSB maintains a national information dataset of all safety-related occurrences in aviation and of all accidents and significant safety occurrences in the rail and marine sectors. The information it holds is essential to its capacity to analyse broad safety trends and inform its investigation and safety education work.

Consistent with the Minister for Infrastructure and Transport's Statement of Expectations for the ATSB, primacy is given to investigations, research, data analysis, and communication and education in relation to operations that involve the travelling public. The ATSB participates in overseas investigations involving Australian-registered aircraft and ships, and cooperates more broadly with its overseas counterparts.

The ATSB has a specific mandate to report publicly on its analysis and investigations, and to conduct public education programs to improve transport safety.

Since 2014, the ATSB has been responsible for the search for missing Malaysia Airlines Flight 370 (MH370). At the decision of the Malaysian, Chinese and Australian Governments, the search was suspended in January 2017 pending credible new evidence becoming available indicating the specific location of the aircraft.

Our role

Consistent with the Minister's Statement of Expectations, the ATSB prioritises its work to deliver safety outcomes for the travelling public, as well as those who work in or participate in the aviation, rail and marine transport industries. We do this by:

- receiving and assessing reports of transport safety matters, including notifications of safety occurrences and confidential reporting
- independently conducting 'no-blame' investigations of accidents and other safety occurrences
- conducting research into transport statistics and technical issues
- identifying factors that contribute to accidents and other safety occurrences that affect, or have the potential to affect, transport safety
- encouraging safety action in response to safety factors by acknowledging action taken by operators, and by issuing safety recommendations and advisory notices
- raising awareness of safety issues by reporting publicly on investigations and conducting educational programs
- assisting Australia to meet its international regulatory and safety obligations, and conducting an active program of regional engagement with other transport safety agencies.

Our objectives

In fulfilling our role of improving transport safety and cooperating with others, the ATSB:

- focuses its resources in the areas that are most likely to result in safety improvements
- harnesses the expertise and information necessary to perform its safety role
- conducts impartial, systemic and timely investigations
- identifies safety issues clearly and objectively without attributing blame or liability
- ensures the significance of safety issues is clearly understood by all concerned
- promotes effective safety action.

Organisational change

During 2016–17, the ATSB undertook an organisational change program to deliver the ATSB's core functions in a more efficient and effective manner. This change program has included an organisational restructure with the establishment of multi-disciplinary teams, rather than having separate teams for the aviation, rail and marine modes of transport. The restructure came into effect in June 2017.

Cooperation with the transport industry

The ATSB works cooperatively with the aviation, rail and marine industries, as well as with transport regulators and governments at state, national and international levels to improve safety standards for all Australians.

The ATSB relies on its ability to build trust and cooperation with the transport industry, and the community, for its success in improving safety. The TSI Act requires the ATSB to cooperate with government agencies, private organisations and individuals who have transport safety functions and responsibilities, or who may be affected by our transport safety activities. The ATSB also cooperates with equivalent national bodies in other countries and international organisations with responsibilities for worldwide transport safety standards.

The ATSB actively targets communications to ensure that transport industry stakeholders understand the importance of no-blame investigations. In order to cultivate a strong reporting culture within the transport industry, the ATSB promotes an appropriate level of confidentiality and protection for sensitive safety information provided to us in the course of our work.

Notifications and reporting

The TSI Act requires any responsible person who has knowledge of any accident (or any immediately reportable matter) to report it as soon as is reasonably practicable.

While the terms of this requirement may seem broad, the Transport Safety Investigation Regulations 2003 provide a list of persons who, by the nature of their qualifications, experience or professional association, would be likely to have knowledge of an immediate or routine reportable matter for their mode of transport. In addition, responsible persons are not required to report a transport safety matter if they believe, on reasonable grounds, that another responsible person has already reported, or is in the process of reporting that matter.

The ATSB maintains a 24-hour service to receive notifications, including a toll-free telephone number (for immediately reportable matters in all modes). In aviation, a secure online notification form for written notifications is available on the ATSB website.

Every year the ATSB's Notifications team receives over 16,000 notifications of safety occurrences. These are spread over aviation, marine and rail. Inevitably, there are duplicate notifications and many of the notifications submitted concern matters not required to be reported under the TSI Act. Nevertheless, each one is reviewed and recorded.

In 2016–17, the ATSB's Notifications team received 17,046 aviation notifications in the form of telephone calls, emails, facsimiles, postal letters and website contact. From those, to date, the team has identified 5,482 individual accidents, serious incidents and incidents for the year.

While not all of the reported occurrences are investigated, the details of each occurrence are retained within the ATSB's occurrence database. These records are a valuable resource, providing a detailed portrait of transport safety in Australia. The ATSB regularly analyses the database to identify emerging trends and issues. The searchable public version of the aviation occurrence database is available on the ATSB website. It contains data from July 2003 onwards. The online database is used by industry, academics, the media and regulators to search and research past events.

Aviation

The ATSB investigates accidents and other occurrences involving civil aircraft in Australia. The ATSB also analyses data on all notified accidents and incidents. It conducts research into specific matters of concern that emerge from data analysis, and specific incidents or matters that may be referred by other organisations. It does so in a manner consistent with the Convention on International Civil Aviation (Chicago Convention 1944) Aircraft Accident and Incident Investigation (Annex 13).

The ATSB may also investigate serious accidents or incidents involving Australian-registered aircraft overseas, or assist with overseas investigations involving Australian-registered or foreign aircraft if an overseas investigating authority seeks assistance and the ATSB has suitable resources available. The ATSB may also have observer status in important overseas investigations. This provides valuable opportunities to learn from overseas organisations and to benchmark our knowledge and procedures against our counterpart organisations.

The ATSB cooperates with organisations such as CASA, Airservices Australia, the Directorate of Defence Aviation and Air Force Safety, as well as aircraft manufacturers, and operators, who are best placed to improve safety. The ATSB also works collaboratively with the Department of Infrastructure and Regional Development and other safety agencies to assist the Government in implementing transport safety initiatives.

Marine

The ATSB investigates incidents and accidents involving Australian-registered ships anywhere in the world, and foreign ships in Australian waters or en route to Australian ports.

We work cooperatively with international regulatory authorities, Australia's maritime regulator, the Australian Maritime Safety Authority (AMSA), the state and territory maritime regulatory authorities, other transport safety investigation agencies and ship owners and operators.

Our marine investigations are conducted in a manner consistent with the International Maritime Organization's Casualty Investigation Code.

We publish a range of marine transport safety reports and safety educational material, which are distributed to the international maritime community, the International Maritime Organization, educational institutions and maritime administrators in Australia and overseas.

Rail

The ATSB is the national rail safety investigator following the Council of Australian Governments' decision through the Intergovernmental Agreement on Rail Safety Regulation and Investigation Reform in 2011. The process was completed with the Queensland Government and the ATSB agreeing to terms for the ATSB to conduct investigations in Queensland from 1 July 2017. Arrangements are now in place for the ATSB to exercise the full extent of its jurisdiction in all states and territories. This includes collecting occurrence information, analysing data, and investigating rail transport safety matters on the metropolitan and regional networks.

The ATSB works cooperatively with organisations such as the Office of the National Rail Safety Regulator (ONRSR) and rail operators—all of whom share a responsibility to improve safety. The ATSB also has collaboration agreements with the New South Wales and Victorian state safety investigation organisations.

Technical analysis

The ATSB maintains an in-house technical analysis capability to examine, extract and analyse the physical and recorded evidence associated with safety occurrences from all modes of transport. Specialists in forensic engineering, failure analysis, data recovery and systems analysis work with other ATSB investigators, and external stakeholders, to provide a detailed insight into the often complex set of factors that underlie many transport safety occurrences. The team maintains a centre of excellence for rail, marine and flight data 'black box' analysis in the Asia–Pacific region—providing our international neighbours with technical advice, support and assistance in occurrence investigation and capability development.

As of June 2017, members of the Technical Analysis team were integrated with other transport safety investigation staff as part of the ATSB's multi-disciplinary teams, consistent with the agency's organisational change program.

Short investigations

In addition to its more complex investigations, the ATSB undertakes short, office-based investigations of less complex safety occurrences. Our capacity to conduct a large number of these short investigations provides us with the opportunity to deliver safety messages, and for industry participants to learn from the experience of others. Although many of these investigations examine occurrences that are common, and for which the underlying factors are well known, they also enhance the quality and completeness of the occurrence data held by the ATSB. As a result, a more extensive database expands our ability to identify situations where more detailed investigation may be warranted.

Short investigation reports detail the information gathered from individuals or organisations involved in the occurrence, the circumstances, a short safety analysis, the findings, and what safety action may have been taken or identified as a result.

As of June 2017, members of the Short Investigation team were integrated with other transport safety investigation staff as part of the ATSB's multi-disciplinary teams, consistent with the agency's organisational change program.

Confidential reporting (REPCON)

The ATSB operates the voluntary and confidential reporting scheme (REPCON) for the aviation, rail and marine industries. Any person within these industries, or member of the travelling public, may submit a REPCON report of a reportable safety concern. The scheme is designed to capture safety concerns—including unsafe practices, procedures and risk controls within an organisation, or affecting part of the industry.

Each reported safety concern is de-identified by the ATSB by removing all personal details concerning the reporter and any individual named in the report. This de-identified text is passed back to the reporter who must authorise the content before the REPCON can proceed further. The de-identified text is then forwarded to the relevant organisation that is best placed to address the safety concern. The organisation's response will then be forwarded to the relevant regulator for further action as deemed necessary.

The aim of the REPCON scheme is to ensure safety action is taken to address the reported safety concerns. This can include variations to standards, orders, practices and procedures, or an education campaign. The ATSB may use the de-identified version of the reported safety concern to issue an information brief, or an alert bulletin, to whichever person or organisation is best placed to take safety action in response to the safety concern. The ATSB publishes the outcome of each REPCON on its website.

Research and data analysis

The ATSB maintains an aviation occurrence database which is utilised for data analysis and research. The ATSB's interest is in ensuring the safety information in its possession is interrogated to identify and communicate safety issues. The work provides an opportunity to detect trends and identify safety issues across many, rather than individual, occurrences. Research and data analysis also contributes to the ATSB's decision-making about which occurrences to investigate.

The ATSB maintains a large database of occurrence information in aviation. The ATSB's dataset in marine is limited to occurrence information on accidents and serious incidents reportable to the ATSB for interstate and overseas shipping. In rail, the ATSB has not had access to the national rail occurrence database held by the ONRSR. However, the ATSB is expecting to access a copy of this dataset by late 2017.

The ATSB produces official Australian aviation occurrence statistics each year, and in-depth analysis of issues and trend monitoring of all aviation occurrences, for the benefit of government, industry and the public.

As of June 2017, the Research and Data Analysis team were integrated with other transport safety investigation staff as part of the ATSB's multi-disciplinary teams, consistent with the agency's organisational change program.

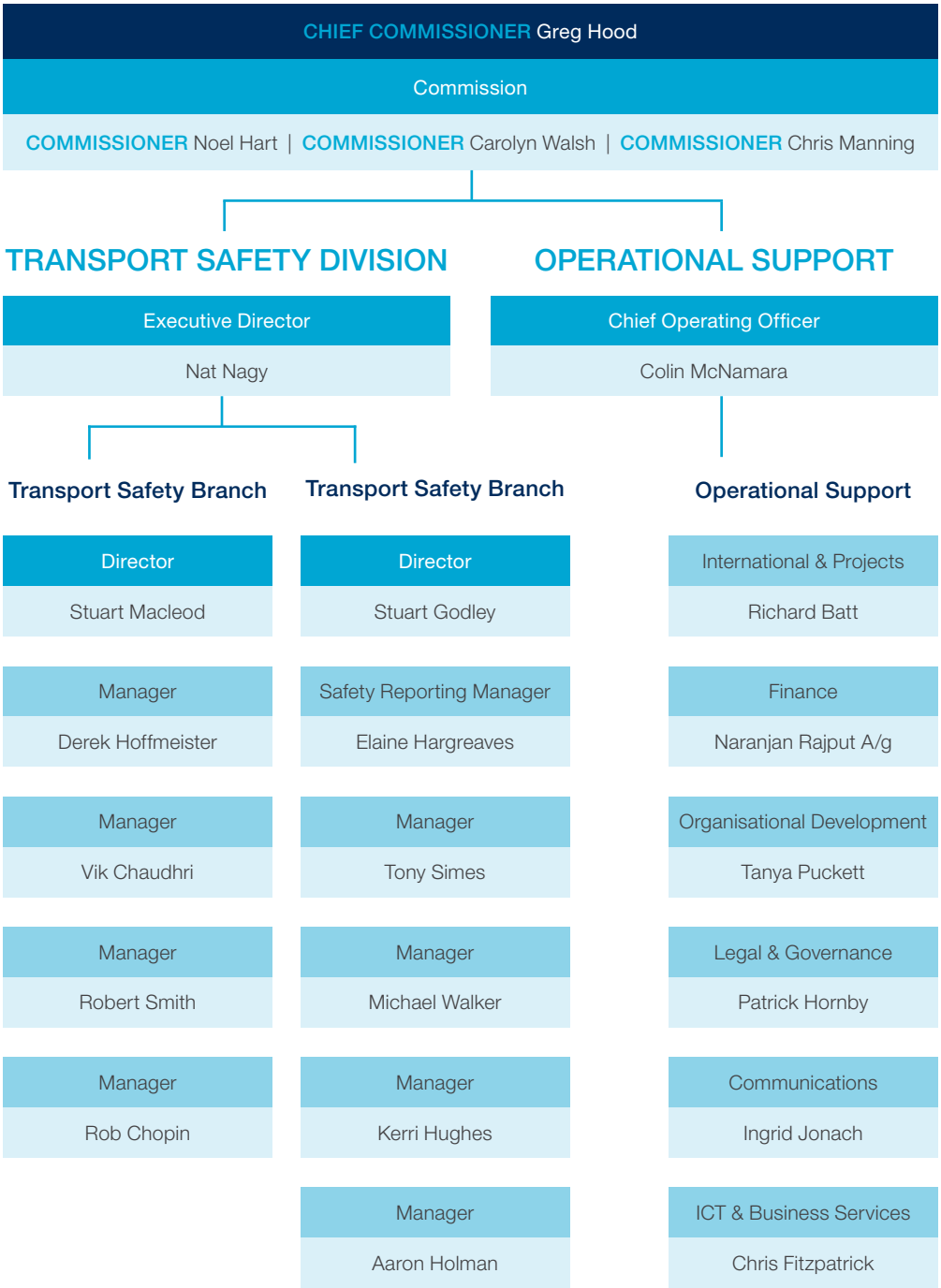
International cooperation

The ATSB is committed to promoting engagement with its international counterpart agencies and relevant multilateral organisations. It works to assist Australia's regional neighbours through international agreements and participation in intergovernmental programs. It actively supports initiatives to build aviation and marine safety investigation capability in the Asia–Pacific region.

The philosophy underpinning the ATSB's regional engagement is one of cooperation and mutual respect. The strategic intent is to improve transport safety for the benefit of our regional neighbours and the Australian travelling public.

The ATSB is actively involved in the work of the International Civil Aviation Organization (ICAO), the International Maritime Organization (IMO) and the Marine Accident Investigators Forum in Asia (MAIFA).

ATSB ORGANISATIONAL STRUCTURE



ATSB organisational structure as at October 2017

COMMISSION AND EXECUTIVE MANAGEMENT TEAM

CHIEF COMMISSIONER AND CHIEF EXECUTIVE OFFICER

Greg Hood

Greg Hood was appointed to the role of Chief Commissioner and Chief Executive Officer of the ATSB on 1 July 2016.

In his time as Chief Commissioner, Greg has overseen a number of significant transport safety investigations and report releases across the three modes of aviation, rail and marine. He has also successfully transitioned the ATSB into its new role as the single national rail safety investigator, bringing to a close a commitment to rail reform initiated by the Council of Australian Governments in 2009.

With more than 35 years of experience across a wide range of operational, training and management roles within Defence and the civil aviation industry, Greg has been well-positioned to drive an innovation agenda at the ATSB. The ATSB's 'Evolution Program' has already seen enhancements to its world-leading practices, including streamlined operations, a multi-disciplinary team approach to transport safety investigations, and the introduction of remotely piloted aircraft to capture evidence following accidents and other safety occurrences.

Prior to his commencement with the ATSB, Greg held the role of Executive General Manager, Air Traffic Control with Airservices Australia. In this position, he was responsible for the management of over 1,300 air traffic management staff, providing services for 11 per cent of the world's total airspace for more than four million flights annually from 28 air traffic control towers and facilities.

Greg began his career as an air traffic controller in the Royal Australian Air Force in 1980, serving at locations throughout Australia and in the Middle East. In 1990, he moved to the Civil Aviation Authority, a predecessor to what is now Airservices Australia. Greg worked in many locations across the country, and was also involved in the training of new controllers at the University of Tasmania, Launceston.

In 2002, Greg was appointed to lead the Airservices Australia's management team in Melbourne and then, in 2005, he led the team responsible for the provision of regional air

traffic services, including the operation of regional control towers throughout Australia. Greg has also led aspects of the implementation of major air traffic management and technology projects, such as the Australian Advanced Air Traffic System (known as TAAATS), the evolution of safety management systems, and the introduction of user-preferred routes and flex-tracks.

In 2007, Greg joined the Civil Aviation Safety Authority (CASA), where he held the positions of Group General Manager Personnel, Licensing, Education and Training, then Executive Manager Operations. He returned to Airservices Australia during 2013 to take on the role of General Manager Demand and Capacity Management and was appointed as the Executive General Manager of the Air Traffic Control Group later the same year.

Greg has served on the Business Advisory Council for World Vision, is a Fellow of the Royal Aeronautical Society, a Freeman in the Honourable Company of Air Pilots, a Life Member of the Qantas Founders Museum, and past President of Canberra Philharmonic Society. Until being appointed as ATSB's Chief Commissioner, he was also a Board Member of Safeskies Australia and internationally, Vice-Chair of the steering committee for the Civil Air Navigation Services Organisation's Operations Standing Committee.

He has a passion for the transport industry in general, and transport safety in particular. He is a glider and powered aircraft pilot.

ATSB commissioners with the executive management team

COMMISSIONER

Noel Hart

Noel Hart has over 40 years' experience in the shipping, oil and gas industries. His qualifications include a Master Mariner Class One qualification, and business administration and MBA certificates.

Mr Hart left his seagoing career to join BP Australia in 1985 and held management positions with BP Shipping in Melbourne, London and Chicago. From 2006 to 2009 he held the position of General Manager of the North West Shelf Shipping Services Company, based in Perth. In his position he was responsible for the safe shipping of liquefied natural gas from north western Australia to Asia and other global customers.

While based in London, Mr Hart was Chairman of the General Purposes Committee of both the Oil Companies International Marine Forum and the Society of International Gas Tanker and Terminal Operators. He also served as a Director of the Middle East Navigation Aids Service, and was an alternate Director of the Alaska Tanker Company and the Marine Preservation Society in the USA, and the Marine Oil Spill Response Centre in Australia.

He has also been Chairman of Maritime Industry Australia Ltd, Australia's peak maritime association, since 2008.

COMMISSIONER

Chris Manning

Chris Manning has over 40 years' experience in the aviation industry. In the early 1970s he was an air traffic controller. From 1975 until 2008 he was a pilot for Qantas.

Captain Manning flew several Boeing types, gaining a B767 command in 1989. He was a check and training captain throughout the 1990s, and was President of the Australian and International Pilots Association from 1999 until 2002.

From 2003 until his retirement from Qantas in 2008, Captain Manning was Chief Pilot and Group General Manager Flight Operations. He chaired the Australian Aviation Associations Forum from 2008 until 2015. He is a Director of Aerospace Australia Limited (Avalon Airshow), is Chairman of Airport Coordination Australia and is a founding Director of the Australian Aviation Hall of Fame.

COMMISSIONER

Carolyn Walsh

Carolyn Walsh has over 30 years' experience in policy development, regulation and safety management at both the Commonwealth and state levels. She has 15 years' experience in the transport sector, initially as Executive Director of Strategy in the NSW Office of the Coordinator General of Rail, and then as Chief Executive of the NSW Independent Transport Safety and Reliability Regulator.

In addition to her role as a Commissioner of the ATSB, Ms Walsh is currently Deputy Chair of the National Transport Commission and Vice President of Palliative Care NSW. She is also a member of the audit and risk committees for the City of Sydney, NSW Police Integrity Commission, the Aboriginal Land Council, Western Sydney Local Health District, Office of the Director of Public Prosecutions and NSW Mental Health Commission.

Ms Walsh has specialist expertise in safety (both transport and occupational health and safety), risk management and the regulatory framework governing transport operations in Australia.

Ms Walsh has a Bachelor of Economics degree and is a graduate of the Australian Institute of Company Directors.

EXECUTIVE DIRECTOR TRANSPORT SAFETY

Nat Nagy

Nat Nagy has been involved in the transport industry since 1996 in a diverse range of operational and leadership roles. He joins the ATSB following a career as a commercial pilot, air traffic controller and, more recently, has held several strategic leadership roles in Airservices Australia including General Manager Demand and Capacity Management, and Manager ATM Service Support. In these roles, he led the workforce in the National Operations Centre, Aeronautical Information Services, Strategic Initiatives Delivery and Flight Procedures Design business areas.

Most recently, Mr Nagy has been a Business Change Manager for Airservices' Accelerate Program where he delivered a program of technological, organisational and cultural change.

Mr Nagy has tertiary qualifications in Business, and is currently studying for a Master's Degree in Economics.

PROGRAM DIRECTOR OPERATIONAL SEARCH FOR MALAYSIA AIRLINES FLIGHT 370 (MH370)

Peter Foley

Peter Foley has held the position of Program Director Operational Search for MH370 since May 2014. He is responsible for the ATSB's operational search activities for missing Malaysia Airlines Flight 370.

Mr Foley joined the ATSB in 1999 after a career at sea as a marine engineer with Australian shipping companies—including ANL Ltd, the Commonwealth shipping line. Since joining the ATSB he has held a number of roles, most recently as General Manager Surface Safety Investigations. This role included responsibility for marine and rail safety investigations, the ATSB's work on reforms to the National Transport Regulatory framework, and the ATSB's international programs. He has been responsible for performing and managing a large number of marine and rail investigations, many of them significant. He has represented the ATSB, and Australia, at many international marine and rail industry meetings and conferences.

Mr Foley holds professional qualifications in marine engineering and transport safety investigation, degrees in marine and mechanical engineering and a Graduate Diploma in Business Management.

CHIEF OPERATING OFFICER CORPORATE SERVICES

Colin McNamara

Colin McNamara joined the Australian Public Service in October 2004. Prior to this, he served as a General Service Officer in the Australian Army and was awarded the Australian Active Service Medal in 1999.

Prior to his appointment as the ATSB's Chief Operating Officer, Mr McNamara managed a range of corporate functional areas including Human Resources, Organisational Development, Governance and Major Projects. Over the past 12 months, Mr McNamara has expanded his capabilities through leading a significant change management initiative as the appointed Program Director.

Mr McNamara holds a range of professional qualifications in personnel management and is a professional member of the Australian Human Resources Institute.

FORMER GENERAL MANAGER SURFACE SAFETY INVESTIGATIONS AND TECHNICAL ANALYSIS

Peter Robertson

Peter Robertson was the General Manager Surface Safety prior to his retirement in March 2017 after having joined the ATSB in May 2016. He was a Commonwealth public servant for over 30 years after training initially in the RAAF as a pilot.

He has worked in a range of Commonwealth departments, primarily in policy and regulatory areas affecting the aviation, marine, communications and land transport industries, including the Office of Transport Security. Before taking up the General Manager position at the ATSB he was responsible for legal, communications and environmental matters associated with the development of a second major airport for Sydney following a secondment as Deputy Coordinator in the search for missing airliner MH370. He holds the degrees of Bachelor of Arts and Master of Commerce.

FORMER GENERAL MANAGER AVIATION SAFETY INVESTIGATIONS

Ian Sangston

Ian Sangston was the General Manager Aviation before his retirement in April 2017. Mr Sangston joined the ATSB as a Senior Transport Safety Investigator (STSI) in April 2002 after 23 years' service in the Australian Defence Force. In addition to a number of pilot qualifications, he has an undergraduate degree and two master's degrees in Management Studies and Employment Relations.

Mr Sangston managed a number of high profile investigations as an STSI, and completed a Diploma of Transport Safety Investigation in June 2005. He was promoted to Team Leader, Transport Safety Investigation in mid–2006 and assumed responsibility for the Perth Regional Office. As Team Leader he oversaw more than 80 aviation safety investigations. Mr Sangston was promoted to the General Manager position in August 2009 and was instrumental in the ATSB's development of a project management approach to investigation management.


SB

OUTCOME AND PROGRAM STRUCTURE

Program 1.1 objective

The ATSB will work actively with the aviation, marine and rail industries, transport regulators and governments at a state, national and international level to improve transport safety standards for all Australians, particularly the travelling public. Investigations and related activities seek to raise awareness of identified safety issues and to encourage stakeholders to implement actions to improve future safety.

There are three core functions which arise from the ATSB's functions under the *Transport Safety Investigation Act 2003* (TSI Act):

1. Independent 'no-blame' investigation of transport accidents and other safety occurrences

Independent investigations that are selective and systemic, and which focus on future safety rather than on blame, increase stakeholder awareness and action on safety issues, and foster industry and public confidence in the transport system.

2. Safety data recording, analysis and research

Timely receipt and assessment of transport accident and other safety occurrence notifications allows the ATSB to identify and refer safety issues at the earliest opportunity. The maintenance and analysis of a body of safety information (including transport safety data and research and investigation reports) enables stakeholders and researchers to gain a better understanding of safety trends and safety issues.

3. Fostering safety awareness, knowledge and action

Awareness and understanding of transport safety issues is increased through a range of activities, including consultation, education, and the promulgation of research and investigation findings and recommendations. These contribute to the national and international body of safety knowledge and foster action for the improvement of safety systems and operations.

HOW THE ATSB REPORTS

Section 63A of the TSI Act requires that:

The annual report prepared by the Chief Executive Officer and provided to the Minister under section 46 of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act) for a period must include the following:

1. prescribed particulars of transport safety matters investigated by the ATSB during the period
2. a description of investigations conducted by the ATSB during the period that the Chief Commissioner considers raise significant issues in transport safety.

The ATSB observes and complies with *Resource Management Guide No 135–Annual reports for non-corporate Commonwealth entities* issued by the Department of Finance. This report is based on the guidance for 2016–17 published in May 2017.

This Annual Report details the ATSB's performance against the program objectives, deliverables and key performance indicators published in the *Infrastructure and Regional Development Portfolio Budget Statements 2016–17*. The ATSB annual report also includes audited financial statements in accordance with the PGPA Act.

Priorities for investigation

The ATSB's highest priority is to investigate accidents and safety occurrences that have the greatest potential to deliver improved transport safety for the travelling public.

The ATSB is not resourced to investigate every single accident or incident that is reported, but allocates priorities within the transport modes to ensure that investigation effort achieves the best outcomes for safety improvement. The ATSB recognises that there is often more to be learned from serious incidents and patterns of incidents, and gives focus to these investigations, as well as specific accident investigations.

Three ways to action

The TSI Act requires specified people and organisations to report to the ATSB on a range of safety occurrences (called 'reportable matters'). Reportable matters are defined in the Transport Safety Investigation Regulations 2003. In principle, the ATSB can investigate any of these reportable matters. In practice, they are actioned in one of three ways to contribute to the ATSB's functions:

1. A report of an occurrence that suggests a safety issue may exist will be investigated immediately. Investigations may lead to the identification/confirmation of the safety issue and evaluation of its significance. It will then set out the case for safety action to be taken in response.
2. A report of an occurrence that does not warrant full investigation may warrant additional fact gathering for future safety analysis, to identify safety issues or trends.
3. Basic details of an occurrence, based primarily on the details provided in the initial occurrence notification, can be recorded in the ATSB's occurrence database to be used in future safety analysis to identify safety issues and trends.

Note: In the third approach, the occurrence is not investigated immediately, but may be the subject of a future safety issue or research investigation.

Aviation broad hierarchy

The ATSB allocates its investigation resources consistent with the following broad hierarchy of aviation operation types:

1. passenger transport—large aircraft
2. passenger transport—small aircraft:
    a. regular public transport and charter on small aircraft
    b. humanitarian aerial work (for example, the Royal Flying Doctor Service, search and rescue flights)
3. commercial (fare-paying and recreation—for example, joy flights)
4. aerial work with participating passengers (for example, news reporters, geological surveys)
5. flying training
6. other aerial work:
    a. non-passenger carrying work (for example, agriculture, cargo)
    b. private transport or personal business
7. high-risk personal recreation/sports aviation/experimental aircraft operations.

The ATSB endeavours to investigate all fatal accidents involving VH-registered powered aircraft subject to the potential transport safety learnings and resource availability.

Marine broad hierarchy

The ATSB allocates its investigative resources consistent with the following broad hierarchy of marine operation types:

1. passenger operations
2. freight and other commercial operations
3. non-commercial operations.

Rail broad hierarchy

The ATSB allocates its investigative resources consistent with the following hierarchy of rail operation types:

1. mainline operations that impact on passenger service
2. freight and other commercial operations
3. non-commercial operations.

Level of response

The level of investigative response is determined by resource availability and factors such as those detailed below. These factors (expressed in no particular order) may vary in the degree to which they influence the ATSB's decisions to investigate and respond. Factors include:

- the anticipated safety value of an investigation, including the likelihood of furthering the understanding of the scope and impact of any safety system failures
- the likelihood of safety action arising from the investigation, particularly of national or global significance
- the existence and extent of fatalities/serious injuries and/or structural damage to transport vehicles or other infrastructure
- the obligations or recommendations under international conventions and codes
- the nature and extent of public interest—in particular, the potential impact on public confidence in the safety of the transport system
- the existence of supporting evidence, or requirements, to conduct a special investigation based on trends
- the relevance to identified and target safety programs
- the extent of resources available, and projected to be available, in the event of conflicting priorities
- the risks associated with not investigating—including consideration of whether, in the absence of an ATSB investigation, a credible safety investigation by another party is likely
- the timeliness of notification
- the training benefit for ATSB investigators.

The objective of the classification process is to quickly identify, allocate resources and appropriately manage occurrences that:

- require detailed investigation
- need to be recorded by the ATSB for future research and statistical analysis
- need to be passed to other agencies for further action
- do not contribute to transport safety.

Investigation levels

The ATSB's response to reported safety matters is classified by the level of resources and/or complexity and time they require.

The following safety investigation levels were used by the ATSB in 2016–17:

Major investigations

Investigations that are likely to involve, at times, significant ATSB and external resources for up to 24 months and are likely to require additional one-off government funding.

Level 1

Investigations that are likely to involve a large number of ATSB resources, and possibly external resources, and are of a scale and complexity that usually require up to 18 months to complete.

Level 2

Investigations involving in-the-field activity, several ATSB and possibly external resources, and are of a scale and complexity that usually require up to 12 months to complete.

Level 3

Less complex investigations that require no more than nine months to complete (some of which are 'desktop' exercises requiring no in-field activity) and involve only one or two ATSB staff members.

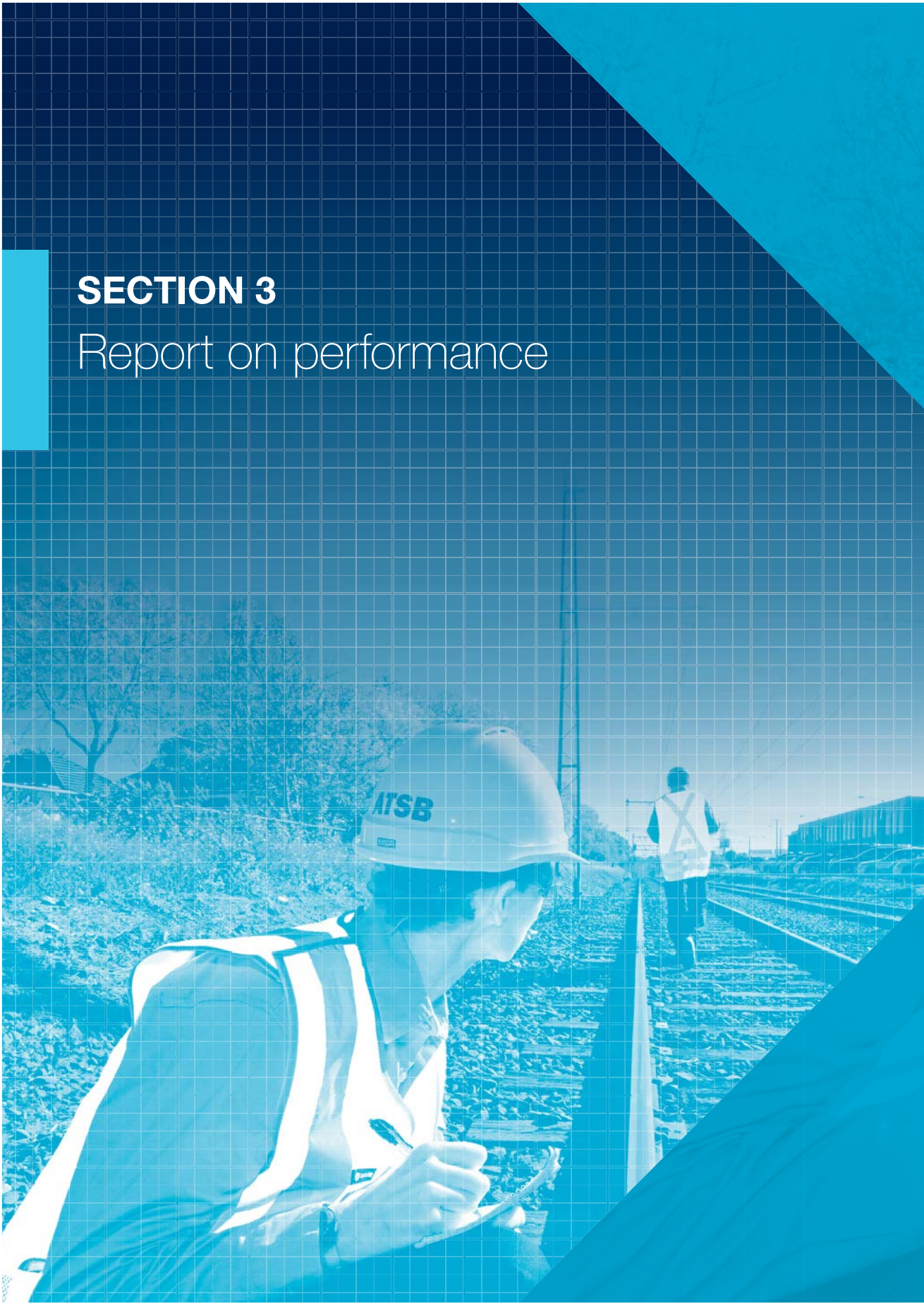
Level 4

Investigations that are less complex and require no more than five months to complete (in some cases, after initial in-the-field or other investigation activity, the investigation level may be changed or the investigation discontinued if it is determined that there is no safety value to be gained from continuing the investigation). These investigations generally involve only one or two ATSB staff members.

Level 5

Short investigations are limited-scope factual investigations that result in a short summary report of two to eight pages. Short investigations are generally completed within four months or sooner, and are usually published in a monthly bulletin. They usually require only one ATSB staff member.

SECTION 3
Report on performance



3

REPORT ON PERFORMANCE

This section reviews the ATSB's results against the performance criteria and deliverables set out in the Portfolio Budget Statements 2016–17 and the ATSB Corporate Plan 2016–17. The ATSB's effectiveness in achieving planned outcomes during 2016–17 is also reviewed here.

Annual performance statement

I, as the accountable authority of the Australian Transport Safety Bureau, present the annual performance statement of the Australian Transport Safety Bureau for the year ended 30 June 2017, as required under paragraph 39(1)(a) of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act). In my opinion, this annual performance statement is based on properly maintained records, accurately reflects the performance of the entity, and complies with subsection 39(2) of the PGPA Act.

Greg Hood
Chief Executive Officer

22 September 2017

Table 1: Results against performance criteria

Purpose
As set out in the Portfolio Budget Statements 2016–17 and the ATSB Corporate Plan 2016–17, the ATSB's purpose is to improve the safety of, and public confidence in, aviation, marine and rail transport through: > the independent 'no-blame' investigation of transport accidents and other safety occurrences > safety data recording, analysis and research > fostering safety awareness, knowledge and action.

Performance criterion	Result
Safety actions completed that address 100% of critical safety issues identified by ATSB investigation reports.	There was one critical safety issue (aviation) identified in 2016–17. At the time of publication, safety action was still pending.
Safety actions completed that address 70% of all other safety issues identified by ATSB investigation reports.	67% of all other safety issues identified by ATSB investigation reports were addressed in 2016–17.
90% of complex investigation reports are published within 12 months.	32% of complex investigation reports were published within 12 months during 2016–17.
90% of short investigation reports are completed within four months. Note: the criterion was changed from two months to four months during the 2016–17 Portfolio Additional Estimates.	88% of short investigation reports were completed within four months during 2016–17.
Stakeholder awareness of safety issues is raised as a result of investigation, research and analysis of findings; and through safety education activities as measured through a biennial survey, scoring a rating of 5 or above based on a 7-point rating scale. Note: this rating scale was revised to a 5-point scale during 2015–16 and, therefore, a new target rating of 4 or above was set.	This survey is only conducted every second year and was not done during 2016–17.
70% of safety action is taken by stakeholders to address valid safety concerns identified by confidential reports.	57% of safety action was undertaken by stakeholders to address valid safety concerns identified by confidential reports.

Analysis of performance

The ATSB operates in an environment of continuing growth and emerging trends across the aviation, rail and marine transport sectors. The Government's recent budget measure 'improving transport safety' will assist the ATSB in maintaining a sustainable resource base and addressing the changing operating environment. Prior to this budget measure taking effect, the ATSB's workforce capability was more limited.

The ATSB has continued to meet its key deliverables in terms of the number of investigation reports completed and published per year. However, it is evident the ATSB has not been able to complete these reports within the set timeframes with its workforce capability limitations. The budget measure and the ATSB's organisational change program, with its focus on enhancing the efficiency and effectiveness of investigations going forward, are expected to put the ATSB back on track with meeting its deliverable targets.

Further, the ATSB is enhancing its data-driven approach to transport safety through increasing its capacity to carefully analyse available occurrence data. This is enabling the ATSB to selectively allocate its resources towards investigating those accidents and incidents that will have the greatest potential for safety learnings and enhancement. The approach is also expanding the ATSB's capacity to identify emerging threats to transport safety.

Performance at a glance

Table 2: Performance at a glance

Deliverable	Year	Number completed[1]	Per cent completed
Complex investigations			Per cent completed within 12 months
Aviation	2016–17	39	31%
	2015–16	44	18%
	2014–15	39	41%
Marine	2016–17	5	40%
	2015–16	7	14%
	2014–15	5	60%
Rail	2016–17	15	33%
	2015–16	19	58%
	2014–15	20	40%
Short investigations			Per cent completed within 4 months
All modes	2016–17	110	88%
	2015–16	90	81%
	2014–15	98	77%

Key results

Table 3 summarises the ATSB's performance against key indicators published in the Portfolio Budget Statements 2016–17.

Table 3: ATSB performance against key indicators

	Target	Performance	Page
Key performance indicators			
Safety actions completed that address safety issues identified by ATSB investigation reports:			
> critical safety issues	100% addressed	One identified – safety action pending	
> all other safety issues.	70% addressed	63% addressed	Page 94
Complex investigation reports are published within 12 months.	90% published within 12 months.	32%	Page 40
Short investigation reports are completed within four months.	90% completed within four months.	88%	Page 40
Stakeholder awareness is raised as a result of investigation, research and analysis of findings and through safety education activities as measured through a biennial survey, scored on a 5-point rating scale.	Rating of 4 or above.	Not applicable in 2016–17. Survey conducted once every two years.	N/A
Safety action is taken by stakeholders to address valid safety concerns identified by confidential reports.	70% actioned	57%	Page 41
Deliverables			
Assess, classify and publish summaries of accident and incident occurrences received.	Details of occurrences being investigated are published within one working day.	83%	Page 41
	Summaries of aviation occurrences are published within ten working days of receipt.	26%	
Assess confidential reports for clarity, completeness and significance for transport safety and, where appropriate, advise any responsible party in a position to take action in response to the safety concerns.	A de-identified summary of the confidential report will be provided to any relevant third party within ten working days.	55%	Page 41

	Target	Performance	Page
	Within six weeks advise a responsible party in a position to take safety action in response to the safety concern.	84%	Page 41
Complete and publish investigations.	Up to 60 complex investigations.	59 complex investigation reports published.	Page 40
	Up to 120 short investigations.	110 short investigations completed.	Page 40
Complete and publish research and analysis reports, based on safety priorities and trends.	Complete and publish the annual Aviation Occurrence Statistics report and other research publications.	One statistics report plus three other research reports published.	Page 41
	Reports on aviation safety trends provided to the Minister, operators and relevant sector of the industry twice per year.	No trend monitoring report published.	
Ensure preparedness for a major accident by reviewing and testing major accident response and management capabilities through participation in exercises.	One major exercise per annum.	Participation in three exercises.	Page 45
Assist regional transport safety in the Asia–Pacific region through direct cooperation with counterpart agencies and the delivery of approved support activities, provided for by program funding agreements.	Delivery of approved projects within program funding allocation.	See detailed report.	Page 52
Assist the Malaysian Government with its investigation into the disappearance of Malaysia Airlines Flight 370 (MH370) in accordance with Annex 13 to the Convention on International Civil Aviation. Work with primary and secondary stakeholders in relation to decisions made by governments regarding the search and/or potential recovery operations of MH370.	Continue to lead the search operations to search up to 120,000 square kilometres. Continue to assist the Malaysian investigation as an Accredited Representative.	See detailed report.	Page 59

INDEPENDENT 'NO-BLAME' INVESTIGATIONS OF TRANSPORT ACCIDENTS AND OTHER SAFETY OCCURRENCES

This section describes the ATSB's performance against the deliverables relating to the ATSB's role as the independent 'no-blame' transport safety investigator, as published on page 116 of the Portfolio Budget Statements 2016–17.

Deliverables

- Assess, classify and publish summaries of accident and incident occurrences received. Details of occurrences being investigated are published within one working day. Summaries of aviation occurrences are ready to be published in the public online database within ten working days of receipt.
- Assess confidential reports for clarity, completeness and significance for transport safety and, where appropriate, advise within six weeks any responsible party in a position to take safety action in response to the safety concern.
- Complete and publish up to 60 more complex investigations and up to 120 short investigations per annum.
- Ensure preparedness for a major accident by reviewing and testing major accident response and management capabilities through participation in one major exercise per annum.
- The ATSB will continue to assist the Malaysian Government with its investigation into the disappearance of Malaysia Airlines Flight 370 (MH370) in accordance with Annex 13 to the Convention on International Civil Aviation. The ATSB will continue to work with primary and secondary stakeholders in relation to decisions made by governments regarding the search and/or potential recovery operations of MH370.

Aviation investigations

In 2016–17, the ATSB initiated 38 complex safety investigations—29 of which were occurrence investigations—from 17,046 notifications (of these notifications, 5,482 have been classified as aviation occurrences).

During this reporting period, 39 complex investigations were completed (comprising 27 occurrence investigations, 12 external investigations, three research/education investigations and 0 safety issue investigations). Of the 39 complex investigations, 12 were completed within 12 months.

As at 30 June 2017 there were 69 ongoing complex aviation investigations.

Marine investigations

In 2016–17, the ATSB initiated four complex marine transport safety investigations from a total of 136 accidents and incidents. In this time period five complex investigations were completed (four were occurrence investigations and one was assistance to an external organisation), two of which were completed within 12 months.

As at 30 June 2017, the ATSB continues to investigate six marine occurrences (as complex investigations).

Rail investigations

In 2016–17, the ATSB initiated four complex rail safety investigations (all occurrence investigations) from 374 notifications of immediately reportable matters.

The ATSB completed 15 complex rail investigations in 2016–17. Of the 15 investigations, five were completed within 12 months.

As at 30 June 2017, the ATSB continues to investigate 20 complex rail safety occurrences (complex investigations) and one safety issue investigation.

Short investigations

In 2016–17, the ATSB initiated 119 short investigations—113 in aviation, three in marine and three in rail.

During this period, 108 aviation short occurrence investigations were completed (96 within four months). Also completed were one marine and one rail short occurrence investigation.

Research and statistics

There were three educational research publications completed in 2016–17. These were:

- *Australian aviation wildlife strike statistics: 2006 to 2015*
- *A safety analysis of remotely piloted aircraft systems 2012 to 2016: A rapid growth and safety implications for traditional aviation*
- *Aerial application safety 2015–2016 year in review.*

In 2016–17, the ATSB published one aviation statistical report, the annual *Aviation Occurrence Statistics: 2006 to 2015*.

Details on the ATSB's research reports are provided on pages 46–51—Safety data recording, analysis and research.

Reporting

The ATSB's target for assessing, classifying and publishing summaries of accident and incident occurrences is:

- one day for occurrences being investigated
- ten days for summaries of other incidents.

Of 152 occurrences investigated, 126 (83 per cent) were processed with summaries published on the ATSB website within one working day of the start of the investigation.

In 2016–17, 26 per cent of aviation occurrence notifications were processed and ready for publication within ten working days. The average time for processing was 43 working days.

Confidential reporting

In the 2016–17 year, the ATSB's Confidential Reporting Scheme (REPCON) received 129 notifications (of which 43 were classified as REPCONs). Of these 129 notifications, 109 concerned aviation (34 REPCONs), 17 concerned rail (eight REPCONs) and three concerned marine (one of which was a REPCON).

Of the 44 REPCON reports completed in 2016–17, 23 (52 per cent) resulted in safety action by stakeholders.

The following summaries provide examples of safety concerns that were raised, along with the safety action taken after the concerns were reported through REPCON.

Aviation

- The reporter expressed a safety concern that a hands-on course on how to conduct an engine overhaul is being presented to association members by people without the required knowledge to teach and perform these tasks safely. As a result of this report a complete review of all training materials endorsed or perceived to be endorsed by the organisation was conducted. They also defined which courses they would deliver and are preparing a standard to assess all training courses and their approved trainers prior to delivery.

- The reporter advised that on a number of occasions they have observed Cessna 208s landing/departing with the tail stand (pogo stick) attached. The reporter advised that as this is occurring on a regular basis, there could be a systemic problem with the pre-flight (walk around) procedure. The operator advised that they checked with all C208 crews and no issues have been reported. They have a mirror installed on the left-hand wing of company C208s to allow the aircrew to physically inspect the outside of the aircraft by sight from the pilot's seat, prior to starting up. Additionally, the first component of their pre-taxi checks on their mandatory checklist states 'Pod doors, hatches, tail stand'. As a result of this report, the operator has found some additional suggestions towards several pre-flight and pre-taxing procedures that relate, not only to tail stand use, but also other areas, and has now implemented some small but useful relevant improvements to the operation, with the goal of making procedures even more robust.

- The reporter expressed a safety concern related to the missed approach procedure for the RNAV-E approach at Bunbury Airport. The reporter advised that there is an unlit mast in the vicinity. The missed approach procedure takes an aircraft in close proximity to the mast, but does not specify an altitude which an aircraft must meet by a distance from the airport to ensure separation with the mast. Airservices Australia advised that the missed approach procedure provides more than the minimum required obstacle clearance when an aircraft is overhead the mast. As a result of this report, the Civil Aviation Safety Authority (CASA) reviewed the REPCON and suggested that Airservices Australia explore a different missed approach procedure. They also advised that the tower is reported at different heights on different charts. Airservices Australia advised that the procedure is due for review in 2017 and they will consider the feedback in their revalidation and investigate the tower height discrepancies. A Notice To Airmen was published to address the issue.

Marine

> The reporter expressed a safety concern related to the time it is taking for the Port Authority to implement a Fatigue Risk Management system for pilots. The reporter advised that the current fatigue management system was designed using the InterDynamics FAID Fatigue Assessment Tool and accepted a FAID fatigue score of 80 as being safe. This score is the equivalent of a blood alcohol (BAC) reading of 0.05 [grams/100 millilitres] but the Port Authority of [de-identified] Drug and Alcohol policy now has an allowable limit of only 0.02 BAC. Early in 2015, the pilots and the Port Authority met and agreed that a new policy was required. The new fatigue management policy is now available and over October and November of 2015 all Port Authority employees received training in how to apply it. The reporter did not believe the current roster rules were sufficient to meet the requirements of the Pilotage Code. The reporter did not believe the proposed new roster rules were sufficient unless they were integrated into a proper fatigue management system.

  The operator advised that discussions commenced in late 2015 and some progress was made, including consultation, engagement of specialist consultants, pilot survey, pilot training in the area of fatigue management, and the development of a draft policy. However, as a result of change in personnel, this process stalled for a number of months. Recently, the process has been reinvigorated by both the Port Authority and the pilot group.

Rail

> The reporter advised that recently two drivers received mild electric shocks while operating the electronic ground based warning system (GBWS) within the [de-identified]. The GBWS is a system to warn of train movements without the requirement for the use of a train horn when entering and leaving the stabling yard. The GBWS control panel is located on raised metal platforms, which allow for easier and safer crew entry and exit from the crew compartment within the yard. The panel is contained within a stainless steel enclosure, which should be water tight and electrically safe. To date, the train crews have not been officially notified if there are electrically live platforms at the yard and what precautions they should be taking. The operator had contacted the Office of the National Rail Safety Regulator (ONRSR) in relation to the issues. As a result of this report, the ONRSR made further enquiries with the operator and continued to monitor the close out of outstanding actions.

> The reporter advised that drivers employed by the operator are being rostered for long hours and are not receiving the minimum breaks between shifts. The Rail Industry Safety and Standards Board (RISSB) published fatigue risk management guidelines which advise 'Recognition of the risk associated with long commutes by

both individual workers and their organisations is important, but management of the risk is best left to the individual and their immediate supervisor.' Employees who have a significant commute between their home and workplace are not having this taken into consideration in the breaks between shifts. The reporter also advised that the roster can be adjusted on a daily basis and the shifts can be changed by adjusting the start time. This does not allow the drivers the certainty required to prepare for a busy 12-hour driving shift. ONRSR has undertaken inspections of the operator's fatigue management processes, and has verified that the operator has processes in place to manage fatigue for its locomotive crews. However, the inspections have identified deficiencies within these processes. The ONRSR is monitoring the operator's corrective actions to improve its systems and processes. The ONRSR will continue to monitor the operator through inspections and audits during the year in order to ensure that the systems and processes remain effective and continue to be followed, taking into consideration the specific issues identified within the REPCON report as regulatory intelligence.

Technical analysis

The ATSB's technical analysis capability staff maintain support and readiness for the detailed examination of physical evidence and the recovery and download of recorded data from a variety of damaged and undamaged sources across the aviation, rail and marine transport modes.

In the past year, these staff continued to expend considerable resources, providing data and debris analysis in support of the ATSB's ongoing assistance to Malaysia, in the search for MH370.

Also internationally, the ATSB's recorder data experts provided technical and developmental support to the National Transportation Safety Committee of Indonesia through the Indonesia Transport Safety Assistance Package (ITSAP). Assistance was also provided to the Transport Accident Investigation Commission of New Zealand in the download of a cockpit voice recorder from an ATR72 aircraft involved in an emergency landing at Palmerston, New Zealand.

As an example of the ATSB's technical analysis capability, in the ATSB investigation AO-2017-032, involving a SAAB 340 propeller separation event, staff conducted a trajectory analysis, enabling the separated propeller to be located in bushland. This was followed by our materials failure experts identifying the source of the failure and facilitating safety action from the component manufacturer.

In addition to supporting the ATSB investigations, technical analysis staff have provided assistance to CASA, Recreational Aviation Australia, and various state coroners in transport safety-related matters.

Preparedness for a major accident

Maintenance of the ATSB's operational capability and readiness extends directly to the agency's preparedness for undertaking and managing all aspects of a major transport safety investigation. The ATSB actively engages with the transport industry to develop an awareness of the ATSB's role, and to participate in practical exercises involving hypothetical transport accidents—aimed at directly testing the effectiveness and scope of the ATSB's response arrangements.

In June 2017, the ATSB participated in Exercise Southern Cross 2017—a full-deployment accident response exercise conducted by Brisbane Airport. As part of the exercise, the ATSB deployed an Immediate Response Team to the Brisbane Airport Emergency Operations Centre and the exercise accident site. The ATSB's Accident Response Centre in Canberra was activated, as was a simulated Forward Command Centre.

The ATSB's support of the Malaysian Government's investigation into MH370 has provided an opportunity to review and evaluate the planning and response for a major accident involving an Australian-registered aircraft.

These activities have provided valuable input into the ATSB's continuous and ongoing improvement program for assuring our readiness to mount a timely and effective investigative response to a major transport accident.

Implementing the ATSB's expanded role in rail

In August 2011, the Council of Australian Governments (COAG) signed the Intergovernmental Agreement on Rail Safety Regulation and Investigation Reform, with a view to introducing consistent national regulation and investigation capabilities. Those reforms were subsequently agreed across New South Wales, Tasmania, South Australia and the Northern Territory in 2013, Victoria in 2014, and Western Australia in 2015.

In late 2015, the Queensland Government advised of its intention to participate in the national regulatory and investigation reforms. The *Rail Safety National Law (Queensland) Act 2017* covering rail safety regulation was assented to in March 2017. Arrangements were finalised for the ATSB to conduct all rail safety investigations in Queensland under the *Transport Safety Investigation Act 2003* from 1 July 2017.

Cooperation with the NSW Office of Transport Safety Investigations (OTSI) and Victoria's Chief Investigator of Transport Safety (CITS) has been strong and productive. Through an ongoing program of ATSB-provided training and refresher programs, staff from both agencies have developed a strong working knowledge, along with practical application, of the ATSB's policies, procedures and legislation.

The ATSB and Victoria's CITS have advanced the relationship further, with CITS commencing a marine investigation (MO-2017-003) in collaboration with the ATSB under the Transport Safety Investigation Act 2003.

SAFETY DATA RECORDING, ANALYSIS AND RESEARCH

The ATSB is funded to record data and conduct analysis and research into aviation matters.

This section describes the ATSB's performance against the deliverables set out on page 116 of the Portfolio Budget Statements 2016–17.

Deliverables

- Complete and publish the annual Aviation Occurrence Statistics report and other research publications, as informed by the annual research program.
- Provide reports on aviation safety trends to the Minister and safety entities twice per year.

In 2016–17, the ATSB continued to analyse occurrence data held in its aviation safety occurrence database as part of Australia's international obligation to determine if preventative safety measures are required.

In addition to these deliverables, the ATSB research and analysis staff continued to support active aviation occurrence investigations during 2016–17. Significant data analysis was completed for over 30 aviation occurrence investigations during the financial year. This work helped to determine the investigation scope, inform investigation conclusions and safety issue risk assessments, and document past occurrences of similar incidents.

The ATSB published four research investigation reports during 2016–17.

Australian aviation wildlife strike statistics: 2006 to 2015 (AR-2016-063)

Occurrences involving aircraft striking wildlife, particularly birds, are the most common aviation occurrence reported to the ATSB. Strikes with birds continue to be a potential safety risk and present a significant economic risk for aerodrome and airline operators. The aim of the ATSB's statistical report series is to provide information to pilots, aerodrome and airline operators, regulators, and other aviation industry participants to assist them with managing the risks associated with bird and animal strikes. This report updates the last edition published in 2014 with data from 2014–2015.

Between 2006 and 2015, there were 16,069 birdstrikes reported to the ATSB, most of which involved high capacity air transport aircraft. Both the number and rate of birdstrikes per 10,000 movements in high capacity operations have increased markedly in the two year period 2014–2015. In contrast, the number of birdstrikes in low capacity operations and general aviation has remained relatively consistent. In the two years between 2013 and 2015, the rates for six of the ten major airports have increased relative to ten year averages. The largest increases in the rate of birdstrikes were observed at Cairns, Canberra, Darwin, Gold Coast and Sydney.

Domestic high capacity aircraft were those most often involved in birdstrikes, and the birdstrike rate per aircraft movement for these aircraft was significantly higher than all other categories. The number of engine bird ingestions for high capacity air transport operations had been increasing until 2011, but has since decreased slightly. Still, about one in ten birdstrikes for turbofan aircraft involved a bird ingested into an engine.

The four most commonly struck types of flying animal in the 2014 to 2015 period were: bats/flying foxes, swallow/martins, kites and lapwings/plovers. Swallows and martins had the most significant increase in the number of reported birdstrikes per year in the last two years, with these species being involved in an average of 96 birdstrikes per year for 2014 and 2015 compared with 65 per year on average across the entire ten-year reporting period. Galahs were more commonly involved in birdstrikes of multiple birds, with more than 38 per cent of galah strikes involving more than one galah. However, larger birds were more likely to result in aircraft damage.

This report presents a new species mass analysis which estimates that over the ten years between 2006 and 2015, 766 kg of flying animals were struck per year by aircraft in Australia. Additionally, for every 1 kg increase in animal mass, the likelihood of a birdstrike causing damage increases by 12.5 per cent.

Compared to birdstrikes, ground-based animal strikes are relatively rare. The most common animals involved were hares and rabbits, kangaroos, wallabies, and dogs/foxes. Damaging animal strikes mostly involved kangaroos, wallabies and livestock.

The ATSB research investigation report, *Australian aviation wildlife strike statistics: 2006 to 2015* (AR-2016-063), is available from the ATSB website at www.atsb.gov.au

Aviation Occurrence Statistics: 2006 to 2015 (AR-2016-122)

Thousands of safety occurrences involving Australian-registered and foreign aircraft are reported to the ATSB every year by individuals and organisations in Australia's aviation industry, and by the public. The aim of the ATSB's statistical report series is to provide information to pilots, operators, regulators and other aviation industry participants on what accidents and incidents have occurred, how often they are happening, and what we can learn from them.

In 2015, Australia had 31 fatalities and 32 serious injuries—28 aircraft were involved in fatal accidents and a further 28 in an accident resulting in serious injuries. There was a total of 227 aircraft involved in accidents, and 185 involved in serious incidents (indicating an accident nearly occurred).

- Commercial air transport had one fatality from nine accidents.
- General aviation had 12 fatalities from 130 accidents.
- Recreational aviation had 18 fatalities from 76 accidents.

For commercial air transport, 2015 had the lowest number of accidents in the study period (2006–2015). Of the 19 fatalities (2006–2015), 17 involved aircraft conducting charter operations.

The majority of fatalities in the ten-year period occurred within general aviation. Around 20 per cent of fatal accidents resulted from a loss of control.

Growth in recreational (non-VH) flying and improving awareness of reporting requirements, led to more than a tenfold increase in the number of recreational safety incidents reported to the ATSB between 2006–2015.

The number of remotely piloted aircraft accidents and incidents increased significantly—from 14 occurrences within eight years (2006–2013) to 37 within the last two years of the study period (2014–2015).

From 2006 to 2014 (activity data was not available for 2015), recreational aircraft, search and rescue, private/business and sports aviation, and aerial agriculture operation types had the highest fatal accident rates (per hours flown). For all accidents, the highest accident rates occurred with recreational aeroplanes, followed by aerial agriculture, private/business and sport aviation, and recreational gyrocopters.

- Around 40 per cent of all recreational gyrocopter accidents resulted in fatalities and almost one-quarter of weight shift aircraft accidents were fatal.
- The highest general aviation accident rate in the study period was in 2014. However, that year also had the lowest fatal accident rate.
- In 2014, the flying training accident rate was more than double that of any year in the previous eight.

Aviation Occurrence Statistics: 2006 to 2015 (AR-2016-122) is available on the ATSB website at www.atsb.gov.au

Aerial application safety: 2015–2016 year in review (AR-2016-022)

Aerial application operations encounter different risks compared to other aviation sectors because these pilots work at very low levels. Working at these levels means that pilots encounter more hazards, such as powerlines, trees and poles. When working at these levels, pilots have a high workload to navigate these hazards, and have a shorter reaction time if they encounter an issue and need to respond accordingly. Recent investigations by the ATSB have also highlighted the risks during an operation if the aircraft is overloaded, such as airframe damage. This is the second report in a series of publications on aerial application (including aerial spraying, spreading and fire control). This report covered accidents and serious incidents reported to the ATSB between May 2015 and April 2016 to coincide with the previous operational year.

Between May 2015 and April 2016, there were 29 accidents and serious incidents reported to the ATSB. Of these, 16 were accidents and 13 were serious incidents (near accidents). The most prevalent occurrence was wirestrike, comprising nearly 40 per cent of all occurrences (11 occurrences). Other types of accidents and serious incidents were engine failure or malfunction (six), collision with terrain (three), controlled flight into terrain (two) and runway excursions (two). Safety factors relating to human factors were most prevalent, in particular monitoring and checking, which contributed to 35 per cent of occurrences.

Given the nature of these operations, there are strategies to lower risks. The Aerial Application Association of Australia (AAAA) has published strategies in their pilots' manual that can be applied to managing wirestrikes and engine failures. One strategy is planning. In regards to wirestrikes, planning involves knowing the location of wires in the area and organising the spraying pattern accordingly. Planning to manage the event of an engine failure includes noting potentially safe areas to land, such as open fields. Another strategy is to maintain focus during the task, such as continually reminding yourself of the presence of wires, and in the case of engine failure, focusing on following procedures will assist in avoiding further damage.

Aerial application safety: 2015–2016 year in review (AR-2016-022) is available on the ATSB website at www.atsb.gov.au

A safety analysis of remotely piloted aircraft systems 2012 to 2016: A rapid growth and safety implications for traditional aviation (AR-2017-016)

The growth in the number of remotely piloted aircraft systems (RPAS) in Australia is increasing exponentially. This presents an emerging and insufficiently understood transport safety risk.

Through this research report, the ATSB aims to better understand the implications for transport safety associated with the expected continual growth in the number of RPAS in Australia.

Although accurate assessments of the number of RPAS in Australia is not possible, using proxy data, it is clear that the number of RPAS in Australia is rapidly growing each year. Compared to 2016, there will be a possible doubling in the number of systems in Australia by the end of 2017.

In association with the level of growth, the number of RPAS-related safety occurrences reported to the ATSB has increased exponentially during the 2012 to 2016 period.

About half of the 180 occurrences from 2012 to 2016 involved near encounters with manned aircraft. Over 60 per cent of all reported RPAS near encounters (108 occurrences) occurred in 2016 (69 occurrences). Statistical models forecast a 75 per cent increase in the number of near encounters in 2017. Most occur in capital cities, Sydney in particular, and mostly above 1,000 ft above mean sea level (AMSL).

To date, there have been no reported collisions between RPAS and manned aircraft in Australia.

The next most common type of occurrence involved collisions with terrain, accounting for 52 occurrences between 2012 and 2016, 35 of which occurred in 2016. Terrain collisions were most commonly associated with a loss of control (about 40 per cent), a bird striking the RPAS (about 10 per cent), or engine failure or malfunction (10 per cent).

The consequences of collisions between RPAS and manned aircraft are not yet fully understood. Worldwide, there have been five known collisions. Three of these resulted in no damage beyond scratches. However, one collision with a sport bi-plane in the United States of America (USA) in 2010 resulted in a crushed wing. Fortunately, the aircraft landed safely. Less fortunately, a Grob G 109B motor glider had a wing broken by an RPAS collision in 1997 in Germany, resulting in fatal injury to the two people on board.

Due to the rarity of actual collisions, and very minimal actual testing, mathematical models have been used to predict damage expected from collisions between RPAS and manned aircraft. These are informed by abundant aircraft birdstrike data.

RPAS collisions with high capacity air transport aircraft can be expected to lead to an engine ingestion in about eight per cent of strikes. The proportion of ingestions expected to cause engine damage and engine shutdown will be higher than for bird ingestion (20 per cent of ingestions).

RPAS have the potential to damage a general aviation aircraft's flight surfaces (wings and tail), which could result in a loss of control. Furthermore, a collision with a general aviation aircraft's windscreen poses a high risk of penetration.

The operation of remotely piloted aircraft is an emerging risk to transport safety that requires close monitoring as the popularity of these aircraft continues to grow rapidly.

A safety analysis of remotely piloted aircraft systems 2012 to 2016: A rapid growth and safety implications for traditional aviation (AR-2017-016) is available on the ATSB website at www.atsb.gov.au

FOSTERING SAFETY AWARENESS, KNOWLEDGE AND ACTION

The ATSB conducts activities relating to its responsibilities for increasing awareness of safety issues and complying with international safety obligations. This section describes the ATSB's performance against the deliverables set out on page 116 of the Portfolio Budget Statements 2016–17.

Deliverable

> Assist regional transport safety in the international region through direct cooperation and the delivery of approved projects and other support activities provided for by program funding agreements.

Regional cooperation

The ATSB continued an active program of regional engagement with other transport safety agencies, over and above that required by its international obligations. Australia's reputation for high quality and rigorous investigations makes it uniquely placed to assist transport safety in the Asia–Pacific region. In particular, the ATSB has an ongoing involvement in the Australian Government Indonesia Transport Safety Assistance Package (ITSAP) and cooperation with Papua New Guinea consistent with the *Memorandum of Understanding on Cooperation in the Transport Sector*.

Many countries do not have a well-developed capability to investigate accidents and serious incidents. Australia will pursue opportunities to provide support in the Asia–Pacific region, including taking a leading role in the ICAO Asia Pacific Accident Investigation Group (APAC AIG) and the Marine Accident Investigators Forum in Asia (MAIFA).

Indonesia

The ATSB and the Indonesian National Transportation Safety Committee (NTSC) collaborated on a range of ITSAP activities in 2016–17, including cooperation between the ATSB and NTSC transport recorder laboratories. Activities included a 'train-the-trainer' project to develop an NTSC *Investigation Analysis* course that was successfully delivered to NTSC aviation, rail and marine investigators. This is a significant achievement, as very few investigation agencies worldwide have developed and delivered this type of training. An NTSC aviation investigator, a human factors investigator, and a recorder specialist visited the ATSB for on-the-job training and professional development. The ATSB also delivered a rail safety investigation training course to the NTSC and other Indonesian rail industry participants.

Papua New Guinea

Under the *Papua New Guinea Memorandum of Understanding on Cooperation in the Transport Sector*, the ATSB has an ongoing program of cooperation and capability building with the Papua New Guinea Accident Investigation Commission (AIC). An ATSB Senior Transport Safety Investigator (STSI) is deployed full-time to the AIC in Port Moresby to assist Papua New Guinea in developing the capability to meet the international requirements for aviation safety investigation. A key focus of the ATSB–AIC program is the development of a Papua New Guinea *Diploma of Transport Safety Investigation* that will form the framework for AIC investigator training. Through this program, AIC investigators have received training in human factors, flight recorders and other aspects of accident investigation.

Other regional engagement activities

The ATSB continued to make its expertise and resources widely available in support of regional transport safety. Representatives from Finland, New Zealand, China, Vietnam, Korea and Kiribati visited the ATSB for discussions related to transport safety. In addition, participants from Taiwan, Bangladesh, Finland, Vietnam, Indonesia, Papua New Guinea, Singapore, Saudi Arabia and New Zealand attended ATSB investigator training courses. The ATSB also delivered an investigator training course to our counterpart agency in Vietnam. This year, the ATSB hosted the 19th MAIFA attracting participation from Cambodia, the People's Republic of China, Hong Kong, Japan, the Republic of Korea, Malaysia, New Zealand, Singapore, Thailand and Vietnam.

Communication and education

As Australia's national transport safety investigator, we are committed to communicating the safety lessons from our investigation findings, research activity and occurrence reports. This information has valuable safety messages which can help improve transport safety and, ultimately, save lives.

In 2016–17, we continued to highlight, for the benefit of industry and the travelling public, emerging safety issues and trends using a range of communication channels and activities.

SafetyWatch

In 2016–17, we continued to promote our SafetyWatch initiative. SafetyWatch highlights the areas of broad safety concern identified from our investigations and the occurrence data reported to us by industry.

The initiative includes priority areas where more can be done to improve safety. These include:

- flying with reduced visual cues
- marine work practices
- safe work on rail
- data input errors
- safety around non-controlled aerodromes
- general aviation pilots
- marine pilotage
- under-reporting of occurrences
- handling approach to land.

Throughout the year, the ATSB undertook a range of communication activities (direct mail, web news items, social media and general media) to raise awareness of these issues within the transport industry.

Social media

During 2016–17, we made extensive use of our social media platforms to engage with the transport industry, the media and the travelling public.

Since launching the ATSB's Facebook page in July 2015, the ATSB has attracted around 11,500 followers to this platform. In 2016–17 this resulted in almost 140,000 referred visitors to the ATSB website.

The ATSB's Twitter account continues to be an effective channel for releasing reports and investigation updates. Through this social media platform, we can provide a short safety message along with a link to more information on our website.

By the end of June 2017, the ATSB's Twitter followers had increased to almost 7,000 people. These include journalists, members of the public and transport industry specialists.

In 2016–17, we also increased our engagement with audiences through videos, hosted on our website and the ATSB's YouTube channel.

Media

The ATSB undertakes responsive and proactive media activity to inform the transport industry, and travelling public, of our investigations and activities. During the year we worked closely with local, national and international media to raise community awareness of transport safety.

Major press conferences throughout the year include those held in relation to the search for MH370, and conferences held onsite for the following accident investigations:

- Collision with terrain involving Cessna 441, VH-XMJ near Renmark Airport, South Australia on 30 May 2017 (AO-2017-057)
- Collision with terrain involving B200 King Air, VH-ZCR at Essendon Airport, Victoria on 21 February 2017 (AO-2017-024)
- Collision with terrain involving SOCATA TB-10 Tobago, VH-YTM, near Mount Gambier Airport, South Australia on 28 June 2017 (AO-2017-069).

We also regularly contributed articles to key industry publications throughout the year.

Website

The ATSB website (www.atsb.gov.au) continues to be our principal communication channel. In 2016–17, the ATSB website received 2,664,309 page views. This equated to 884,376 sessions, which is an increase of 9.3 per cent from the previous financial year.

The launch of the ATSB Facebook page has been particularly effective in referring users to the ATSB website. In 2016–17, Facebook resulted in close to 200,000 views on the ATSB website. This made Facebook the number one referral site for the second year in a row.

Going digital

We are continually improving our website to meet audience needs and to allow for new and emerging technologies.

In 2016–17, we continued to release all of our reports in html format (along with current pdf and rich text formats).

Having our content in html format has allowed us to embed more digital content—such as video, animation and audio. It also forms part of our response to the Australian Government's 'digital first' agenda.

Online aviation database

The ATSB National Aviation Occurrence Database contains de-identified information on aviation accidents and incidents in a searchable format. The database has been designed to fulfil searches for information involving the most common requests received by the ATSB: date range, aircraft and operation type, injury level, occurrence category and type, location, and airspace type and class. Users are able to search aviation occurrence statistics from the ATSB website.

In 2016–17, the National Aviation Occurrence Database had 6,361 page views.

Industry engagement

The ATSB continued its strong record of engagement with industry in 2016–17 through: participation in consultative forums with industry and other safety agencies; representation at conferences and events; bilateral engagement with operators, associations and other stakeholders; and active involvement in safety education forums.

This included participation in the following events:

- Regional Aviation Association of Australia Convention
- Airservices Australia Waypoint
- Australian Women Pilots' Association Conference
- Aerial Application Association of Australia Convention
- Australian Airports Association National Conference
- Australian Aviation Psychology Association Symposium
- Recreational Aviation Australia Safety Summit
- Transport Safety and Security Forum (Indonesia)
- Australia–Indonesia Transport Sector Forum (Indonesia)
- International Society of Air Safety Investigators (Iceland)
- Marine Accident Investors Forum in Asia (Canberra)
- Royal Federation of Aero Clubs of Australia
- La Trobe Valley Aero Club
- Aviation Law Association of Australia and New Zealand (New Zealand)
- Directorate of Defence Aviation and Airforce Safety
- Royal Australian Air Force
- Australian Army 6th Aviation Regiment

The ATSB also welcomed a number of visitors to its office in Canberra throughout the year, providing an opportunity for representatives from the aviation, marine and rail sectors to meet key staff and tour the laboratory facilities.

FINANCIAL PERFORMANCE

This section should be read in conjunction with the ATSB's audited financial statements for 2016–17 that appear in section 7 of this report.

The ATSB operates as a separate non-corporate Commonwealth entity, having been established on 1 July 2009. The main assets of the ATSB were transferred from the (then) Department of Infrastructure and Regional Development and include plant and equipment, specialised laboratory assets and intangible software assets.

During the year, ATSB's operating environment continued to be influenced by the:

- continuing search for the missing MH370
- ongoing requirements to position the ATSB to sustainably operate within available resources.

The ATSB recorded a deficit of $6.5 million for 2016–17, compared to a deficit of $2.5 million in 2015–16. Excluding depreciation and amortisation, the ATSB realised an underlying deficit of $5.7 million which compares to a $1.6 million deficit in 2015–16.

ATSB's approved operating loss for 2016–17 after accounting for depreciation and amortisation, was $23.8 million compared to an actual operating loss of $6.5 million, mainly due to the timing differences between revenue received and related expenditure in relation to the search for MH370.

During 2016–17, the ATSB received additional appropriation revenue to assist the agency with the implementation of its budget sustainability strategy, and also additional funding in relation to the search for MH370.

During the year, the ATSB has recognised additional $19 million in contributions from other countries in relation to the search for the MH370, with the majority of the additional contributions utilised in 2016–17.

The ATSB's new capital requirements are detailed in its Departmental Capital Budget published in the Portfolio Budget Statements 2016–17. Over time, the ATSB's estimated capital injections fall short of the deficits associated with the non-funding of depreciation and amortisation. Without adequate capital injections by Government, this presents a challenge to the ATSB in maintaining its underlying equity and asset capability going forward.

The Government no longer provides appropriation funding to cover non-cash expenses of depreciation and amortisation to non-corporate Commonwealth entities. In the absence of revenue for depreciation and amortisation, the ATSB and other non-corporate entities are more likely to deliver a negative operating result or deficit, and these will accumulate. Offsetting this build-up of retained deficits requires a commitment by the Government to provide annual capital injections to meet new capital requirements.

Table 4: Summary of financial performance and position

	2016–17 $M	2015–16 $M
Revenue from Government	22.8	68.2
Other revenue	22.5	39.6
Total income	45.3	107.8
Employee expenses	16.5	15.4
Supplier expenses	34.5	94.0
Depreciation and amortisation	0.8	0.9
Total expenses	51.8	110.3
Operating surplus/(deficit)	(6.5)	(2.5)

THE SEARCH FOR MALAYSIA AIRLINES FLIGHT 370

Background

On 8 March 2014, Malaysia Airlines Flight 370 (MH370), a Boeing 777-200ER registered 9M-MRO, was travelling on a scheduled international passenger flight from Kuala Lumpur to Beijing. There were 239 people on board—12 Malaysian crew members and 227 passengers. Six of the passengers were Australian citizens.

During the transition from Malaysian airspace to Vietnamese airspace, the aircraft, for unknown reasons, lost contact with air traffic control. It also disappeared from air traffic control secondary surveillance radar.

It was later determined through review of primary radar data that, after disappearing from secondary radar, the aircraft had turned and flown back over the Malaysian peninsular prior to a further turn in a north-westerly direction to fly through the Malacca Strait. The aircraft was last detected on primary radar above the northern tip of Sumatra.

After the final detection of the aircraft on primary radar, the only available information relating to the aircraft's flight path was derived from information recorded during a series of satellite communications between the ground station and the aircraft's satellite communication system, via Inmarsat's Indian Ocean Region satellite. Analysis of this satellite data indicated that MH370 continued to fly for around six hours after radar contact was lost.

The data associated with the periodic satellite transmissions during the flight and the aircraft's performance have been extensively analysed. This analysis indicates that the aircraft entered the sea close to a long, but narrow, arc in the southern Indian Ocean.

Under agreement between Australia and Malaysia, a surface search of probable impact areas along the arc was carried out from 18 March to 28 April 2014, coordinated by the Australian Maritime Safety Authority. This included an underwater search for the flight recorders using a towed pinger locator, sonar buoys and an autonomous underwater vehicle to search the ocean floor, in the northern section of the search area, which continued until 28 May 2014.

On completion of the surface search, the ATSB became responsible for refining the search area and leading an expanded underwater search. The Search Strategy Working Group (SSWG) came together to define the most probable position of the aircraft at the time of the last satellite communication. The SSWG included specialists from the following organisations:

- Air Accidents Investigation Branch (UK)
- Boeing (USA)
- Defence Science and Technology Group (Australia)
- Department of Civil Aviation (Malaysia)
- Inmarsat (UK)
- National Transportation Safety Board (USA)
- Thales (UK)

These agencies worked, both independently and collaboratively, as the Flight Path Reconstruction Group. Using various techniques, the group undertook analysis of the satellite communication information to produce probable flight paths. The SSWG also continued to consult with the SATCOM sub-group, part of the wider Malaysian investigation group.

Continuing analysis to define the most prospective underwater search area is detailed in the following technical reports:

- In June 2014, the ATSB published *MH370—Definition of Underwater Search Areas*, describing the methods and means used to identify a priority search area of 60,000 square kilometres. In August 2014, the ATSB published an updated version of the report, which included additional explanatory material.
- In October 2014, the ATSB published *MH370—Flight Path Analysis Update* to supplement the previously released report, with refinements to the analysis indicating the search should be prioritised further south within the wide area search area.
- In December 2015, the ATSB published the update *MH370—Definition of Underwater Search Areas*, which describes the results of the Australian Defence Science and Technology Group (DST Group, formerly DSTO) comprehensive analysis of available data. DST Group produced a book titled *Bayesian methods in the search for MH370* detailing the entire analysis.

Underwater search operations led by the ATSB have involved a number of vessels and types of search equipment.

Initially the sea floor in the search area was mapped by the Fugro vessel, *Fugro Equator*, and the People's Republic of China vessel, *Zhu Kezhen*, using hull-mounted multibeam sonar systems. This work was necessary to ensure the safe operation of the sonar search systems in close proximity to the seafloor in an area of the Indian Ocean which has never been mapped in detail before.

The Malaysian-contracted vessel *GO Phoenix* commenced the high-resolution underwater search late in 2014, equipped with the 6,000 m rated SLH ProSAS-60 synthetic aperture sonar deep tow vehicle and mission crew provided by Phoenix International and Hydrospheric Solutions, Inc. *GO Phoenix* was soon joined in the search by the Fugro vessel, *Fugro Discovery*, equipped with a 6,000 m rated EdgeTech deep tow vehicle.

By January 2015, *Fugro Equator* had completed initial seafloor mapping activities and also mobilised an EdgeTech deep tow vehicle to join the underwater search operation. The deep tow search vehicles were fitted with instruments including synthetic aperture or side scan sonar and multibeam echo sounders, and were towed at an altitude of between 100 m and 200 m above the sea floor on a cable up to 9 km behind the vessel.

In the summer months of 2015 and 2016, Fugro vessels *Fugro Supporter* and *Havila Harmony* joined the underwater search with a Hugin 4500 autonomous underwater vehicle (AUV). An AUV is a free-swimming vehicle with a battery-powered propulsion system and sonar instruments similar to the deep tow vehicles. The AUV was highly manoeuvrable and therefore capable of surveying the difficult terrain in some parts of the search area more effectively than the deep tow vehicles.

In 2016, the People's Republic of China vessel *Dong Hai Jiu 101* joined the underwater search equipped with the SLH ProSAS-60 synthetic aperture sonar deep tow vehicle and mission crew once again provided by Phoenix International and Hydrospheric Solutions, Inc.

Operational challenges

By 30 June 2016, more than 110,000 square kilometres of seafloor in the southern Indian Ocean had been searched. Rough seas and strong winds continued to impact the search operation during the winter months, with sea states at times preventing the safe launch and recovery of the search vehicles from *Fugro Discovery*, *Fugro Equator* and *Dong Hai Jiu 101*. Poor weather conditions also contributed to *Fugro Discovery* sustaining some damage to a propeller shaft bearing and the tow cable, resulting in delays to search operations as vessel repairs were undertaken in the first two weeks of July 2016.

On 13 July 2016, *Fugro Equator* recorded a combined wave/swell height of 24.03 m (trough to peak), one of the largest waves ever recorded by shipborne sensors. This occurred in a 12 hour period in which four other waves over 20 m were recorded. The safety of the search vessel crews, always the first priority, meant serious consideration was given to suspending search operations over the 2016 winter months.

Winter weather conditions continued to impact search operations into August 2016, precluding the safe launch and recovery of the very large SLH ProSAS-60 vehicle from *Dong Hai Jiu 101*. Search operations on *Dong Hai Jiu 101* were suspended, with the vessel remaining at anchor off Fremantle until weather conditions improved.

Figure 1: Winter weather conditions experienced by Dong Hai Jiu 101 in 2016

Source: Phoenix International/Hydrospheric Solutions, Inc.

Debris analysis

During 2016, the ATSB continued to analyse a number of the items of aircraft debris which had been recovered from the shorelines of western Indian Ocean nations. In July a large section of wing flap, found on Pemba Island off the coast of Tanzania in June, arrived in Australia at the ATSB laboratories for identification and analysis. ATSB report *Debris examination–update No. 3*, published on 15 September 2016, confirmed that the section of wing flap was from the Malaysia Airlines aircraft operating as Flight 370 (MH370) and registered 9M-MRO.

A further two debris examination reports were issued by the ATSB in 2016–17:

- *Debris examination–update No. 4*, published on 22 September 2016, which reported findings of preliminary examinations of two items of fibreglass-honeycomb composite debris recovered near Sainte Luce, Madagascar.
- *Debris examination–update No. 5*, published on 7 October 2016, identified an item of composite debris recovered on the island of Mauritius in May 2016 as the trailing edge section MH370's left outboard wing flap.

Figure 2: Investigators examine a piece of aircraft debris, 2 July 2016

Source: ATSB

The ATSB continued to assist the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in undertaking a further study to model the drift of MH370 debris, using physical replicas of key items of debris which had been identified as originating from MH370. This work was commissioned by the ATSB in April 2016.

First Principles Review

On 2 November 2016, the Minister for Infrastructure and Transport and the ATSB Chief Commissioner released the *MH370–Search and debris examination update report* as the latest update to the MH370 search area definition described in previous ATSB reports. The report comprised of a further analysis of satellite data by DST Group, additional end-of-flight simulations, a summary of ATSB's analysis of the right outboard wing flap and preliminary results from CSIRO's debris drift modelling. The report detailed new information relating to the end-of-flight for MH370, including that the aircraft was in a steep and increasing rate of descent, and that the flap was most likely in the retracted position at the time it separated from the wing.

The Minister and Chief Commissioner also welcomed Australian and international members of the SSWG and other experts and advisors to the ATSB to participate in a First Principles Review. Convened from 2–4 November 2016, meeting participants reviewed all the available data and analysis associated with the search to that time. Representatives attended from all of the organisations participating in the SSWG, including Australia's DST Group, Boeing, Thales, Inmarsat, the National Transportation Safety Board of the US, the Air Accidents Investigation Branch of the UK and the Department of Civil Aviation, Malaysia. Representatives also attended from CSIRO, Geoscience Australia, Curtin University, Malaysia Airlines and the People's Republic of China.

Participants consisted of experts in data processing, satellite communications, accident investigation, aircraft performance, flight operations, sonar data, acoustic data and oceanography. The purpose of the meeting was to reassess and validate existing evidence and to identify any new analysis that may assist in identifying the location of the missing aircraft.

The ATSB published a report detailing the proceedings and outcomes of the First Principles Review meeting on 20 December 2016. The report concluded that the updated independent analysis of the satellite data and the drift analysis consistently identified the most likely impact location of MH370 as being close to the 7th arc (within ~25 NM) and bounded by latitudes of approximately 33 degrees to 36 degrees.

There was a high degree of confidence that the previously identified underwater area searched to that time did not contain the missing aircraft. Given the elimination of this area, the experts at the First Principles Review identified an area of approximately 25,000 square kilometres as the area with the highest probability of containing the wreckage of the aircraft. The experts concluded that, if this area were to be searched, prospective areas for locating the aircraft wreckage, based on all the analysis to date, would be exhausted.

Concurrent with the release of the ATSB First Principles Review report, CSIRO also released its *The search for MH370 and ocean surface drift* detailing the results of drift modelling of aircraft debris in the southern Indian Ocean.

The final stages

On 22 July 2016, senior Ministers from Malaysia, Australia and the People's Republic of China met to discuss the status of the search. Ministers agreed that should the aircraft not be found, the search would be suspended on completion of the 120,000 square kilometre search area agreed in April 2015.

With less than 10,000 square kilometres of search area remaining, vessels began to progressively depart the search. *Fugro Discovery* departed the search in August 2016 to undertake mandatory scheduled maintenance.

Search operations moved from deep tow operations to AUV and Remotely Operated Vehicle (ROV) operations with the onset of better weather in October 2016. The AUV and ROV operations were planned to increase overall coverage of the highest probability search area and reacquire a range of previously identified sonar contacts.

Table 5: Sonar contacts identified during the underwater search

Classification of sonar contacts	Sonar contacts identified
Classification 3 sonar contacts: of some interest as they stand out from their surroundings but have low probability of being significant to the search	More than 600
Classification 2 sonar contacts: of more interest but are still unlikely to be significant to the search	More than 40
Classification 1 sonar contacts: of high interest and warrant immediate further investigation	2 (a rock field and an old wooden shipwreck)

Fugro Equator demobilised the EdgeTech deep tow search system and mobilised the Hugin 4500 AUV to perform sonar data gap infill operations and undertake some sonar contact investigations.

The Remora III ROV was mobilised on *Dong Hai Jiu 101* and used to undertake a number of sonar contact investigations to positively identify or discount sonar contacts as MH370-related. *Dong Hai Jiu 101* departed the search in early December 2016 after undertaking video investigations of 38 contacts of interest in the search area.

In all, 82 sonar contacts were investigated using the deep tow vehicles, the AUV and ROV. All the sonar contacts investigated during the search were identified as geology, with the exception of a steel cable, oil barrel and four shipwrecks.

Figure 3: ROV images of verified man-made findings

Source: Phoenix International/ATSB

On 17 January 2017, *Fugro Equator*, as the longest serving vessel in the search, completed AUV operations and departed the search area. At this time the Tripartite governments of Malaysia, Australia and the People's Republic of China issued a Joint Communiqué announcing the formal suspension of underwater search operations with the departure of the last remaining vessel from the search area.

On the arrival of *Fugro Equator* back in Australia for demobilisation, Australian and Malaysian Ministers, accompanied by a representative of the People's Republic of China, held a Ministerial press conference alongside *Fugro Equator* on 23 January 2017. The vessel crew were thanked for their tireless efforts over the previous three years, working in some of the most remote and inhospitable ocean conditions in the world.

Malaysia also announced the creation of a response team within its Department of Civil Aviation to continue analysing information to assist in the search for MH370.

Figure 4: Ministerial visit on board Fugro Equator, January 2017

Source: ATSB

During the underwater search, the 120,000 square kilometre search area was searched to a high degree of confidence, 278,000 square kilometres of seafloor along the 7th arc was mapped, and 432,000 square kilometres of seafloor was mapped during vessel transit between port and the search area.

Search vessels completed 59 vessel swings using a range of search equipment. A swing typically consists of about 40 days at sea, as a journey from port to the search area, time spent on the search, and return journey to port.

Table 6: Underwater search vessel swings

Vessel	Multi-beam	Deep tow	AUV	ROV	Total
*Fugro Equator**	5	15	2	0	**22**
Zhu Kezhen	4	0	0	0	**4**
GO Phoenix	0	8	0	0	**8**
Fugro Discovery	0	16	0	0	**16**
*Fugro Supporter**	0	0	3	0	**3**
Havila Harmony	0	0	2	0	**2**
Dong Hai Jiu 101	0	3	0	1	**4**
	9	**42**	**7**	**1**	**59**

* *Fugro Equator* and *Fugro Supporter* also progressively acquired bathymetric survey data during deep tow operations as required.

Continuing analysis

With the suspension of search operations, the ATSB has continued with search area analysis activities, including a further review of sonar data and analysis of available satellite imagery.

Wednesday 8 March 2017 marked the third anniversary of the disappearance of MH370. The ATSB Chief Commissioner and members of the ATSB MH370 team (including personnel from Defence, Geoscience Australia and DST Group) travelled to Brisbane to join the Australian families of those on board the missing aircraft at a national memorial service. The service was a moving, solemn and appropriate tribute to the seven Australian citizens and residents, as well as the other 232 passengers and crew, on board MH370. Former Deputy Prime Minister Warren Truss attended, and Minister for Infrastructure and Transport, Darren Chester, and Sir Angus Houston were among those who addressed the congregation.

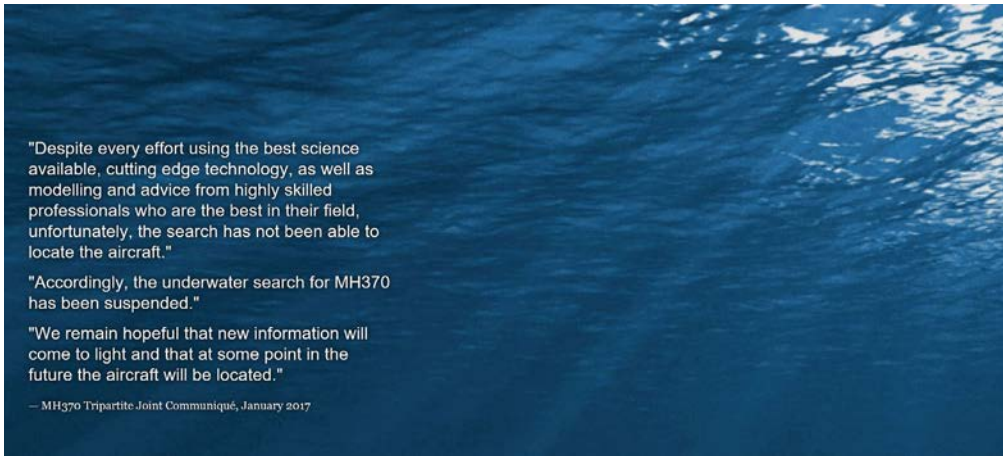
On 21 April 2017, CSIRO released *The search for MH370 and ocean surface drift–Part II* as an addendum to their previous drift modelling report released in December 2016. The report details the results of field tests conducted with a second-hand flaperon modified to be a precise facsimile of the flaperon from MH370, which washed ashore on La Réunion Island on 29 July 2015. The results largely confirm numerical predictions for relative rates and directions of drift in varying conditions of wind and waves which further refine the CSIRO drift model for MH370 debris. The results did not change the earlier estimate of the most probable location of the aircraft. The results did increase confidence in the estimated location of the search area identified and recommended in the First Principles Review report, near 35 degrees.

The final report on the Operational Search for MH370 details all relevant facets of Australia's involvement in the search for MH370 from 8 March 2014, including the surface search, the initial underwater search for the flight recorder underwater locator beacons and the underwater search. The report captures all the analysis which led to decisions in relation to the search area, the method used for the underwater search and the results of the search. It also discusses the management of the operational search program, including the significant risks associated with conducting the search in a very remote area with often adverse weather in ultra-deep water with challenging seafloor terrain. The report was released in October 2017.

Staff in the operational search team at the ATSB are working to finalise all facets of the program, including the archival and audit of program documentation, managing media and public enquiries, program finances and contractual arrangements, and continuing engagement with the Malaysian Annex 13 investigation team.

From 1 July 2017, the ATSB continued to liaise in a 'business-as-usual' manner with the Malaysian Annex 13 investigation team, assessing and responding to any requests for assistance with the analysis of debris, which may well wash ashore in any of the countries on the Indian Ocean rim in the years to come.

Figure 5: MH370 Tripartite Ministers' Joint Communique, January 2017



Source: Joint Agency Coordination Centre/Geoscience Australia

SECTION 4

Significant safety investigations

4

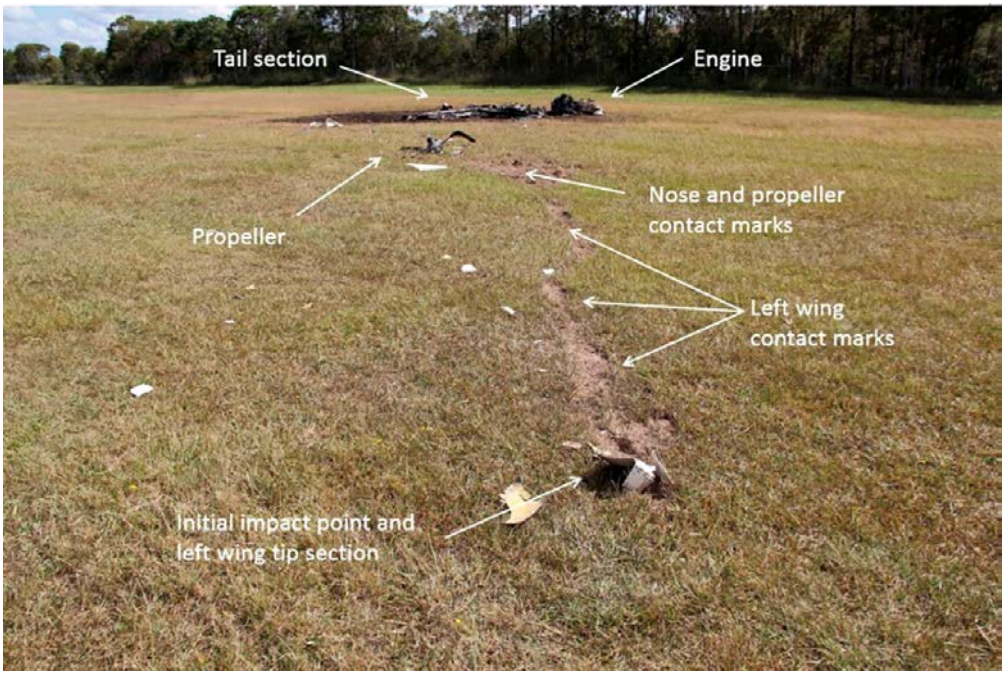
This section of the Annual Report fulfils section 63A of the *Transport Safety Investigation Act 2003*, which requires the Chief Commissioner to report investigations that were conducted during the financial year and raise significant issues about safety.

The investigations below cover a variety of operational types, including parachuting, aerial photography, charter and regular public transport.

Loss of control involving Cessna Aircraft Company U206G, VH-FRT Caboolture Airfield, Queensland, 22 March 2014 (AO-2014-053)

The accident occurred when the aircraft was conducting tandem parachuting operations from Caboolture aerodrome in Queensland. On board were the pilot, two parachuting instructors and two tandem parachutists. Shortly after take-off, the aircraft climbed to about 200 feet before aerodynamically stalling and colliding with the ground (Figure 1). Tragically, all five occupants died in the accident.

Figure 6: Accident site wreckage distribution



Source: ATSB

Extensive fire damage prevented examination and testing of most of the aircraft components. Due to that fact, a mechanical defect could not be ruled out as a contributor to the accident. Despite this, the investigation identified a number of safety issues associated with occupant restraint, modification of parachuting aircraft, and scope for improving the risk controls associated with parachuting operations.

In response to the ATSB's investigation, the Australian Parachute Federation (APF) and Australia's aviation safety regulator, CASA, undertook action to improve the safety of parachuting operations.

The APF mandated that all member clubs/operations have their own safety management system to proactively assess and mitigate risks. The APF has also enhanced their audit process and increased the number of full-time safety personnel to audit their member organisations.

CASA has increased the available information on their website about the risks associated with sports aviation. They also introduced an *Airworthiness Bulletin* to provide guidance about co-pilot side flight control modifications.

The ATSB welcomed the APF's and CASA's safety action, but considered that more could be done to improve safety for skydiving operations.

In response to an identified safety issue, the ATSB recommended that CASA take safety action to increase the fitment of the Cessna secondary pilot seat stop modification. That safety issue affects all Cessna aircraft and not just those being used for parachuting operations.

In addition, the ATSB recommended that CASA introduce measures to reduce the risk associated with the aircraft serviceability, pilot competence and adequate regulatory oversight for parachuting operations.

Furthermore, the ATSB recommended CASA and the APF increase the use of dual-point restraints in parachuting aircraft due to the enhanced survivability that dual point restraints provide.

The ATSB's investigation report (AO-2014-053) is available from the ATSB's website at www.atsb.gov.au

Collision with terrain involving B200 King Air VH-ZCR at Essendon Airport, Victoria, 21 February 2017 (AO-2017-024)

The pilot was conducting a flight from Essendon Airport, Victoria, to King Island, Tasmania. On board were the pilot and four passengers.

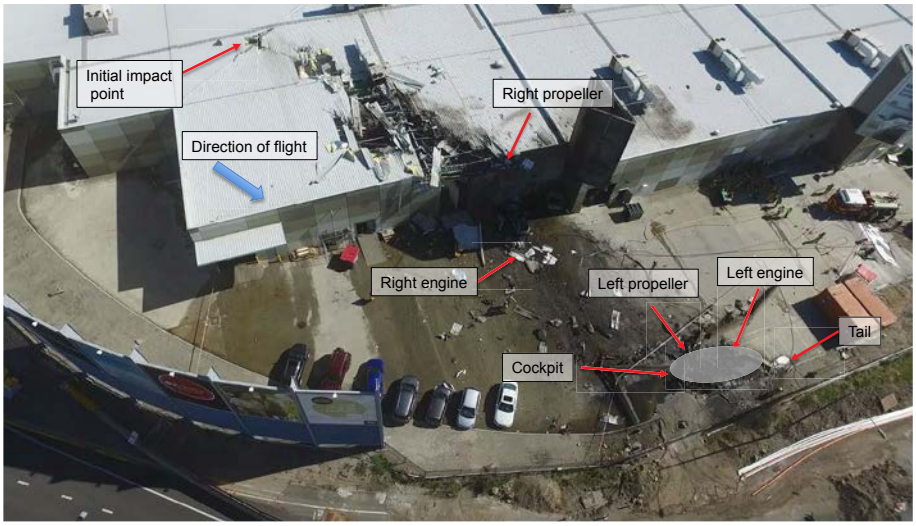
Witnesses reported that the take-off roll along the runway was longer than normal and after becoming airborne, the aircraft was observed to yaw left. Shortly after take-off, the pilot broadcast a MAYDAY call. The pilot repeated the word 'MAYDAY' seven times within that transmission. No additional information regarding the nature of the emergency was broadcast.

The aircraft reached a maximum height of approximately 160 ft above ground level while tracking in an arc to the left of the runway centreline (Figure 7). The aircraft subsequently collided with a building in the Essendon Airport retail precinct. The pilot and passengers were fatally injured and the aircraft destroyed. Additionally, a number of people on the ground received minor injuries.

Figure 7: Aircraft track from Airservices Australia ADS-B data

Source: Google Earth, modified by the ATSB
Note: All heights above ground level.

Figure 8: Accident site overview



Source: Metropolitan Fire Brigade (Melbourne), modified by the ATSB

On-site examination of the wreckage did not identify any pre-existing faults with the aircraft that could have contributed to the accident. Examination of the engines found that the cores of both were rotating and that there was no evidence of pre-impact failure of either engine's internal components. However, a number of engine components were retained for further examination and testing. The ATSB also retained the propellers, several airframe components, documents and electronic devices for further examination.

The aircraft's fire-damaged cockpit voice recorder (CVR) was recovered from the accident site and while the CVR was successfully downloaded, no audio from the accident flight was recorded. The ATSB is examining the reasons for the failure of the CVR to operate on the accident flight.

The investigation is continuing.

The ATSB's preliminary investigation report (AO-2017-024) is available from the ATSB website at www.atsb.gov.au

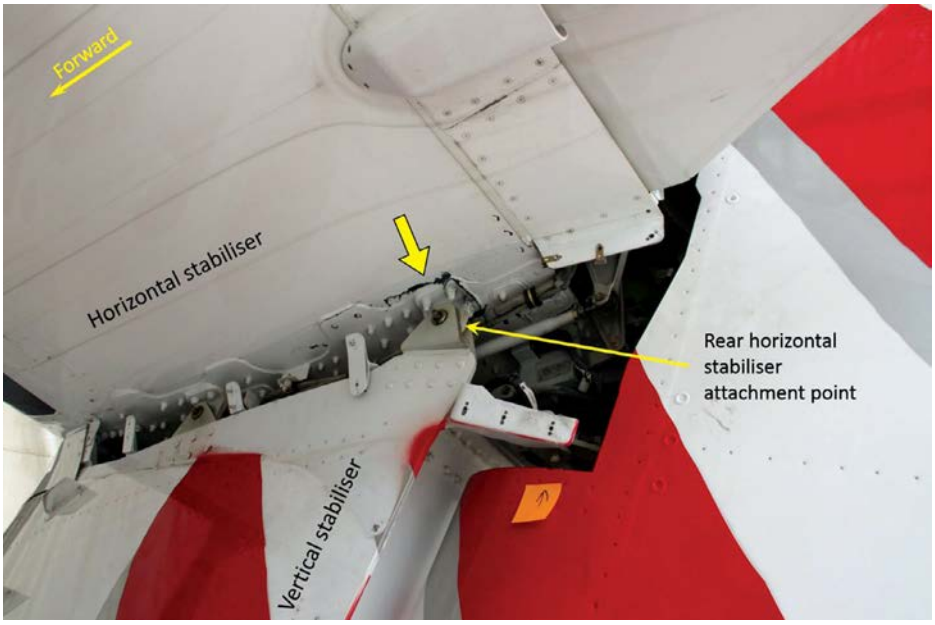
In-flight pitch disconnect involving ATR 72, registered VH-FVR, 47 km WSW of Sydney Airport, New South Wales, 20 February 2014 (AO-2014-032)

The Virgin Australia Regional Airlines ATR 72 aircraft was operating on a scheduled passenger flight from Canberra, Australian Capital Territory, to Sydney, New South Wales. While on descent into Sydney, the crew were attempting to prevent an increase in the airspeed from exceeding the maximum permitted airspeed. They inadvertently made uncoordinated dual control inputs that resulted in a pitch disconnect. The aircraft's horizontal stabiliser was significantly damaged during the occurrence.

Figure 9: CCTV image showing VH-FVR (circled) taxiing inbound at Sydney Airport on 20 February 2014 following the in-flight pitch disconnect. Note the angle of the horizontal stabiliser relative to the wings.

Source: Sydney Airport, modified by the ATSB

Figure 10: Underside of the horizontal stabiliser, with aerodynamic fairings removed. Note: the thick yellow line indicates cracking.



Source: ATSB

During the investigation, it came to the ATSB's attention that there had been a number of pitch disconnects involving ATR 42 and 72 aircraft around the world. There were various factors leading to those pitch disconnects; however, several were identified to have been a result of dual control inputs.

With the VH-FVR occurrence indicating that a pitch disconnect at high speed could potentially result in catastrophic damage to the aircraft, the ATSB determined that the number of inadvertent pitch disconnects constituted a significant risk to the continued safe operation of the ATR 42/72 fleet. As such, on 15 June 2016, the ATSB released an interim report which included the safety issue:

> *Inadvertent application of opposing pitch control inputs by flight crew can activate the pitch uncoupling mechanism which, in certain high-energy situations, can result in catastrophic damage to the aircraft structure before crews are able to react.*

As the investigation progressed, the ATSB identified that, as a result of flexibility in the system and unavoidable control column movement, transient elevator deflections occur during a pitch disconnect event which lead to aerodynamic loads. At high speeds, those loads could exceed the strength of the aircraft structure. It was also identified that the aircraft manufacturer had not accounted for those transient deflections during the design and certification of the aircraft type.

Given the potential significance of this finding, the ATSB commissioned a peer review of the evidence and analysis by the United Kingdom's Air Accidents Investigation Branch (AAIB). The peer review validated the ATSB's findings and on 5 May 2017, after notifying the manufacturer, the European Aviation Safety Agency (EASA), CASA, and the Australian operator, the ATSB released a second interim report. The second interim report contained the following safety issue:

> *The aircraft manufacturer did not account for the transient elevator deflections that occur as a result of the system flexibility and control column input during a pitch disconnect event at all speeds within the flight envelope. As such, there is no assurance that the aircraft has sufficient strength to withstand the loads resulting from a pitch disconnect.*

The aircraft manufacturer made an undertaking to conduct a detailed engineering analysis of the transient elevator loads during a pitch disconnect. The ATSB acknowledged the efforts of the aircraft manufacturer to resolve this safety issue, but retained a level of ongoing concern as to whether the aircraft has sufficient strength to withstand the loads resulting from a pitch disconnect. Consequently, as part of the second interim report, the ATSB issued recommendations to ATR, EASA and CASA to ensure that the engineering analysis is conducted as soon as possible, and if the analysis identifies that the aircraft does not have sufficient strength, immediate action be taken to ensure the ongoing safe operation of ATR 42 and 72 aircraft.

This complex investigation is ongoing and includes aspects relating to the operational and human factors of what precipitated the uncoordinated dual control inputs. Examination of the organisational factors that led to the aircraft conducting a further 13 flight sectors, before the damage from the pitch disconnect was identified, are also being examined in detail.

The ATSB's two interim reports (AO-2014-032) are available from the ATSB website at www.atsb.gov.au

Traffic management occurrence involving Airbus A320, VH-VQS and Beech Aircraft Corporation BE 76, VH-EWL at Ballina/Byron Gateway Airport, New South Wales, 14 January 2016 (AO-2016-003)

While taking-off from Ballina/Byron Gateway Airport, an Airbus A320, registered VH-VQS (VQS) and operated by Jetstar Airways, came in close proximity to Beech Aircraft Corporation BE-76 Duchess, registered VH-EWL (EWL). The Duchess was conducting navigation training in the vicinity of the runway and was noticed by the flight crew of VQS during the take-off roll and below the maximum speed from which they could stop. The take-off was continued and while manoeuvring to maintain separation from EWL, the crew of VQS received master warning/caution alerts regarding the aircraft's configuration. The crew also commenced flap retraction at low altitude and turned contrary to operator-prescribed departure procedures before departing for Melbourne. There were no injuries or damage to equipment recorded during the occurrence.

Figure 11: Jetstar A320, Beech Aircraft Corporation BE-76 Duchess and Ballina/Byron Gateway Airport

Source: Google Maps and supplied images

The ATSB found that despite an increase in passenger numbers and a mixture of traffic, Ballina/Byron Gateway Airport operated without the support of air traffic information and/or services. While recognising that a direct comparison between airports is difficult, Ballina also experienced a higher number of incidents relating to communication and separation issues compared to airports with similar traffic levels. The ATSB also found that a number of non-standard operating practices and procedures led to a breakdown of crew resource management and the ability to adequately manage the dynamic situation by the crew of VQS. Finally, the ATSB found that the level of communication between the crews of VQS and EWL was inadequate to develop a shared mental model of what each crew was intending to do to ensure separation.

Following a recommendation by CASA, the operator of Ballina/Byron Gateway Airport implemented a certified air/ground radio service (CA/GRS) to provide weather services and traffic information at the airport. This service commenced in March 2017 and operates daily between 0800 and 1800 local time. The CASA Office of Airspace Regulation planned a post-CA/GRS implementation review in mid-2017 to assess its effectiveness.

Additionally, Jetstar Airways proposed to increase their annual audit schedule of common traffic advisory frequency operations, reviewed their jump seat policy when operating in such aerodromes to assist in distraction management, and altered their training matrix to further include exercises pertaining to levels of assertion and upwards managing by first officers.

Operations at non-controlled airports remain a SafetyWatch priority for the ATSB. This occurrence highlights that traffic separation in that environment relies on a clear and shared plan between involved aircraft.

Adherence to standard operating practices and procedures promotes a shared understanding of crew's actions by making them ordered and predictable to the other pilots. As well as reducing the likelihood of task omission or duplication during times of high workload, standardised practices and procedures decrease the mental demand on flight crew when carrying out a set of complex steps, allowing for better processing of unexpected events.

The ATSB's investigation report (AO-2016-003) is available from the ATSB website at www.atsb.gov.au

RAIL INVESTIGATIONS

The two rail investigations described below identify safety concerns associated with level crossings and weather events.

Level crossing collision between freight train 8834N and road-train truck, Tullamore Rd, Narromine, New South Wales, 23 September 2015 (RO-2015-016)

On 23 September 2015, an eastbound road-train truck, hauling grain, collided into the side of Pacific National grain train 8834N (travelling on the main line between Narromine and Peak Hill) at the Tullamore–Narromine Road railway crossing, about four kilometres south-west of Narromine, in New South Wales. The railway crossing was controlled by flashing lights, an audible warning device (bell), passive warning signs installed on the road approaches and road surface markings.

Figure 12: Post collision fire, road-train truck (trailers) at Tullamore–Narromine Road railway crossing

Source: P Smith

The collision and a post-impact fire destroyed the prime mover and one of the two trailers; the truck driver was fatally injured. The crew of the train were physically unhurt. As a result of the impact, two wagons were damaged; one of which derailed. Some of the railway crossing infrastructure (flashing lights) was destroyed and required replacement.

The ATSB found that the driver of the road-train truck was probably travelling too fast for the prevailing conditions, and entered the Tullamore–Narromine Road railway crossing while it was active, and the flashing lights were operating. It was concluded that the truck driver's attention was probably focused on negotiating the sweeping right-hand curve that preceded the crossing, at a critical time when he needed to check for the activation of the crossing. It is likely that when the driver perceived that the flashing lights were operating, he was too close to the crossing to stop, and collided with the train.

The ATSB identified a number of areas of potential improvement related to road design (signage and standards associated with railway crossing traffic control) especially with respect to curved approaches, before railway crossings.

The truck owners, the Narromine Shire Council, and Standards Australia have implemented a range of initiatives to reduce the risk of a similar occurrence in the future, including:

- enhanced employee training and medical assessment initiatives
- provision of additional (road) approach passive warning signs, (W7-4) plus a review of road alignment and railway crossing road approach speeds
- a review of AS 1742.7-2016, with respect to railway crossing approaches, in particular curved approaches, and the location of signage.

The ATSB advised that although the road rules (NSW–Road Rules 2014) make motorists primarily responsible for avoiding a collision with a train at railway crossings, prudent road design and/or advance warning of a train's presence at railway crossings should be considered as a strategy to lower the risk of road and rail vehicle collisions.

The ATSB further noted that road and rail authorities should consider added measures to enhance the situational awareness of motorists approaching railway crossings, especially at locations with restricted sighting due to curved approach roads.

It is imperative that road vehicle drivers always approach railway crossings with extreme care. The level of care and attention required increases as road vehicle gross mass increases.

The ATSB's investigation report (RO-2015-016) is available from the ATSB website at www.atsb.gov.au

Derailment of freight train near Julia Creek, Queensland, 27 December 2015 (RO-2015-028)

On 26 and 27 December 2015, the rail traffic crew of trains 9E56 and 9T92 encountered wet weather as they travelled toward Julia Creek. The Bureau of Meteorology (BoM) had issued a series of localised severe thunderstorm warnings for the North West forecast district, which was normal during the wet season. The Network Control Officer (NCO) at the Queensland train control centre in Townsville was monitoring information on the BoM website and had received some information from the rail traffic crews who were travelling along the section. The NCO acted on the information available by arranging track inspections of the relevant sections of track west of Julia Creek.

As these inspections were occurring, train 9T92 continued to travel toward Julia Creek from the east. Shortly after passing through a section of track where floodwaters had previously overtopped the track and receded, the crew of train 9T92 encountered another area where floodwater had overtopped the track. At this location, however, the floodwater had scoured the ballast and compromised the integrity of the track.

The driver became aware of the washout only moments before the locomotive impacted and derailed, causing the locomotive to tip on its side. After sighting the washout, the train crew could do nothing to prevent, or lessen, the impact of the incident.

Figure 13: Derailed train 9T92

Source: Queensland Police Service

The ATSB found that scouring of the ballast and formation adjacent to the 617.190 km point by floodwater meant that the track could not support the weight of train 9T92 as it passed over the affected area. The resulting deformation in alignment of the track initiated the derailment. Reporting procedures implemented by Queensland Rail (the track manager) and Aurizon (the train operator) provided insufficient guidance to the NCO or rail traffic crew to identify and respond to potential hazards from a wet weather event.

Queensland Rail has issued Safety Alerts to improve the effectiveness of the current network rules in relation to managing hazards associated with weather events. A review of weather monitoring services and the upskilling knowledge of relevant personnel on interpreting meteorological information has also commenced. Queensland Rail has commenced a review into the feasibility of adopting the Australian Standard AS7637 *Railway Infrastructure – Hydrology and Hydraulics*.

Aurizon has introduced respiratory protection masks for train crew on trains transporting acid. Additionally Aurizon continues to reassess the emergency evacuation procedures, locomotive windscreens and secondary communication opportunities/options.

The ATSB advised that rail infrastructure managers must implement adequate operational procedures and training programs to ensure the timely identification and management of a hazard to the integrity of their rail infrastructure, such as a weather event. Rolling stock operators must ensure that their training programs include relevant operational procedures enabling consistent assessment, reporting and response by train crew to conditions that may adversely affect the integrity of rail infrastructure or trains.

The ATSB's investigation report (RO-2015-028) is available from the ATSB website at www.atsb.gov.au

MARINE INVESTIGATIONS

Of the two marine safety investigations described below, the first relates to marine work practices loading cargo. The other relates to mooring in high wind conditions.

Fatality on board *Skandi Pacific*, off the Pilbara coast, Western Australia, 14 July 2015 (322-MO-2015-005)

In the early hours of 14 July 2015, the offshore support vessel (OSV) *Skandi Pacific* was loading cargo containers from the semi-submersible oil rig Atwood Osprey at its offshore location, about 90 miles north-west off Dampier. Shortly after 0505 WST, cargo transfer was stopped due to worsening weather conditions. *Skandi Pacific* was moved 30 m away from the rig with the rough seas still on its port quarter. Two crewmembers then began securing cargo on the vessel's aft deck.

The crewmembers slackened the securing chain they had used to secure the containers on the starboard side to better secure the entire stow. At about 0523 WST, two large waves came over *Skandi Pacific*'s open stern, shifting the unsecured containers forward. One of the crewmembers was trapped between the moving containers, chains and a skip and suffered fatal crush injuries.

Figure 14: Skandi Pacific

Source: Mr Liam Hock Wu

The ATSB investigation found that the risks associated with securing the cargo in the prevailing weather conditions had not been adequately assessed. The fatally injured man was standing in a dangerous location near the unsecured cargo containers when they shifted.

The investigation identified that *Skandi Pacific*'s safety management system (SMS) procedures for working/securing cargo on deck in poor weather were inadequate, with no clearly defined weather limits. Further, there were no clearly defined limits for excessive water on deck that necessitated stopping operations. Individuals were left to make difficult, and necessarily subjective, decisions about whether or not to stop work.

The ATSB also found that *Skandi Pacific*'s managers had not adequately assessed the inherent high risks associated with seas coming over the vessel's open stern when work, including cargo handling operations, was being undertaken on its aft deck.

Proactive safety action by *Skandi Pacific*'s managers to avoid a similar accident included improved cargo handling practices across its OSV fleet. Amongst these measures are updated procedures for working in adverse weather and cargo loading, including specific weather condition limits. In addition, existing risk assessments for offloading deck cargo at installations were updated to include a section on risks associated with securing cargo.

The safety action taken by the vessel's managers adequately addressed the safety issues related to cargo handling/securing in adverse weather. The action taken partially addressed the safety issue with regard to open stern vessels. Therefore, the ATSB issued a safety recommendation to the vessel's managers to undertake further work to better address the risks associated with the use of vessels with open sterns. The ATSB also issued a safety advisory notice to shipmasters, owners, and operators of OSVs to highlight the risks posed by the open stern vessels to the industry more broadly.

Offshore support vessel operations are inherently high risk because they often occur in exposed locations in a particularly dynamic environment. Multiple factors, including weather conditions, schedule requirements, time of day, limited crew numbers, restrictions due to vessel design and systems, amongst others, add complexity to operations. Therefore, risk assessments are critical, with the weather and its impact on factors, such as an open stern, are invariably a vital consideration.

The ATSB's investigation report (322-MO-2015-005) is available from the ATSB website at www.atsb.gov.au

Breakaway of *Spirit of Tasmania II* at Station Pier, Port Melbourne, Victoria, 13 January 2016 (324-MO-2016-001)

On the afternoon of 13 January 2016, the roll-on/roll-off passenger ship *Spirit of Tasmania II* was loading cargo, vehicles and passengers at Station Pier, Melbourne. At 1752 EDST, strong wind gusts blew the ship off the wharf and all but two of the ship's mooring lines (on the bow) parted. After breaking away, the stern swung around until the ship was 90 degrees to the wharf, parallel to nearby Port Melbourne Beach and in danger of grounding. While waiting for tugs to assist, the ship's propulsion and thrusters were used to maintain its position and prevent grounding. By 1905 EDST, the ship was back alongside the wharf, assisted by two tugs.

Figure 15: Spirit of Tasmania II after the breakaway

Source: George Donikan

The ship suffered minor damage to its lower bow ramp and bow doors. Shore infrastructure suffered extensive damage to the elevated roadway and ramp arrangement on the wharf and minor damage to wharf structures. No one was injured.

During the afternoon of 13 January, a band of severe thunderstorms passed across the location of *Spirit of Tasmania II*, with little warning. As the ship's bridge was unattended throughout the port stay, none of its crew saw indicators of the approaching storm until just before the breakaway. The ship's crew responded swiftly. The bridge was manned and machinery was operational by the time the ship had turned 90 degrees to the wharf. The ship's movement was then controlled using its thrusters and main propulsion until, with tug assistance, it was returned to the wharf.

The ship's managers, TT-Line Company, implemented immediate changes to shipboard weather monitoring and notification arrangements, along with changes to heavy weather and mooring procedures. These changes included: weather triggers for increased shipboard readiness; immediate notification of weather warnings; access to the Bureau of

Meteorology (BoM) website from the bridge; changes to the wind speed alarm settings; and requiring all mooring lines to be held on the winch brakes.

TT-Line also engaged external marine consultants to complete extensive investigations and analysis into the mooring requirements and design for Station Pier. The consultants completed mathematical modelling and incident replication simulations, and further analysis is intended to define operational parameters and recommend any alterations to berthing arrangements and infrastructure. The ATSB issued one recommendation to TT-Line to complete safety action to adequately address the safety issue with respect to moorings.

The Victorian Ports Corporation's (Melbourne) action included Melbourne vessel traffic service broadcasting BoM weather warnings on VHF channel 12. All masters of ships in port waters, including at berth or anchorage, are to ensure a listening watch is maintained at all times.

The BoM verified its subscription service with the Victorian Ports Corporation (Melbourne) and continues to upgrade its marine weather services. This includes a one-stop webpage on its website for improved education, information and accessibility to marine and ocean services.

All ships, especially those with high windage, are prone to breaking away from moorings during short-term events such as thunderstorms and squalls. The risks this presents to ships with large numbers of people on board mean that weather monitoring, mooring systems and procedures need to be regularly checked and verified for changing weather conditions.

The ATSB's investigation report (324-MO-2016-001) is available from the ATSB website at www.atsb.gov.au


TARAGO


RAIL ROAD
CROSSING

SECTION 5

Formal safety issues and actions

5

This section reports on the formal safety issues and actions issued by the ATSB in 2016–17 and their current status.

FORMAL SAFETY ISSUES AND ACTIONS

ATSB investigations primarily improve transport safety by identifying and addressing safety issues. Safety issues are events or conditions that increase safety risk and:

- can reasonably be regarded as having the potential to adversely affect the safety of future operations, and
- are characteristics of an organisation or a system, rather than of a specific individual, or operational environment at a specific point in time.

Safety issues will usually refer to an organisation's risk controls, or to a variety of internal and external organisational influences that impact the effectiveness of its risk controls. They are factors for which an organisation has some level of control and responsibility and, if not addressed, will increase the risk of future accidents.

The ATSB prefers to encourage stakeholders to take proactive safety action to address safety issues identified in its reports. Nevertheless, the ATSB may use its powers under the *Transport Safety Investigation Act 2003* (TSI Act) to make a formal safety recommendation either during or at the end of an investigation—depending on the level of risk associated with a safety issue and the extent of corrective action already taken.

When safety recommendations are issued, they clearly describe the safety issue of concern—they do not provide instructions or opinions on a preferred corrective action. Like equivalent overseas organisations, the ATSB has no power to enforce the implementation of its recommendations. It is a matter for the organisation to which an ATSB recommendation is directed to assess the costs and benefits of any means of addressing a safety issue and act appropriately.

When the ATSB issues a safety recommendation to a person, organisation or agency, they must provide a written response within 90 days. That response must indicate whether they accept the recommendation, any reasons for not accepting part or all of the recommendation, and details of any proposed safety action to give effect to the recommendation.

The ATSB can also issue a safety advisory notice (SAN) suggesting that an organisation, or an industry sector, consider a safety issue and take appropriate action. There is no requirement for a formal response to a SAN.

Safety issues are broadly classified in terms of their level of risk:

- **critical safety issue**—associated with an intolerable level of risk and generally leading to the immediate issue of a safety recommendation unless corrective safety action has already been taken
- **other safety issue**—associated with a risk level regarded as unacceptable unless it is kept as low as reasonably practicable. Where there is a reasonable expectation that safety action could be taken in response to reduce risk, the ATSB will issue a safety recommendation to the appropriate agency when proactive safety action is not forthcoming.

All ATSB safety issues and associated safety actions, along with the most recent status, are published on the ATSB website for all investigation reports released since July 2010.

SAFETY ISSUES IDENTIFIED THROUGH ATSB INVESTIGATIONS

All safety issues are risk assessed by the ATSB. In 2016–17, the ATSB identified the following number of safety issues.

Table 7: Number of safety issues identified in 2016–17

Safety issue risk	Aviation	Marine	Rail	Total
Critical	1	0	0	**1**
Other	12	10	11	**33**
Total	**13**	**10**	**11**	**34**

Safety action is sought to address any safety issues when proactive safety action is not forthcoming. Once safety action has been undertaken, the ATSB conducts another risk assessment of the safety issue. When the post-action risk assessment results in either an acceptable level of risk or a risk as low as reasonably practicable, the safety issue status is categorised as 'adequately addressed'.

The Portfolio Budget Statements 2016–17 specify, as two of the ATSB's key performance indicators (KPIs), that:

- safety action is taken by stakeholders to address 100 per cent of critical safety issues identified
- safety action is taken by stakeholders to address 70 per cent of all other safety issues identified.

KPI STATUS OF SAFETY ISSUES IDENTIFIED IN 2016–17

There was one critical risk safety issue identified through ATSB investigations in 2016–17. At the time of publication, safety action was still pending.

The breakdown of other safety issues, by transport mode, is summarised in the following table:

Table 8: Status of other safety issues identified in 2016–17

Status of safety issues	Aviation	Marine	Rail	Per cent
Adequately addressed	7	8	7	67%
Partially addressed	0	1	1	6%
Not addressed	0	0	0	0%
No longer relevant	1	0	0	3%
Safety action still pending	4	1	3	24%
Total	**12**	**10**	**11**	**100%**

RESPONSES TO SAFETY ISSUES IDENTIFIED IN 2016–17

The tables below document each safety issue identified in 2016–17 and its current status assigned by the ATSB, along with the justification for that status.

Table 9: Aviation critical safety issues identified in 2016–17

Safety issue	Status	Status justification
AO-2014-032: In-flight pitch disconnect involving ATR 72 aircraft, VH-FVR, 47 km WSW of Sydney Airport, New South Wales, 20 February 2014		
AO-2014-032-SI-02: The aircraft manufacturer (ATR) did not account for the transient elevator deflections that occur as a result of the system flexibility and control column input during a pitch disconnect event at all speeds within the flight envelope. As such, there is no assurance that the aircraft has sufficient strength to withstand the loads resulting from a pitch disconnect.	Safety action pending	The ATSB acknowledges the efforts of ATR with regard to the detailed engineering analysis of the transient elevator deflections. The preliminary results have shown that the system responds in an underdamped oscillatory manner, resulting in elevator deflections greater than those identified by the static analysis previously carried out by ATR. The ATSB is encouraged by the level of detail into which ATR has developed the analysis and will continue to monitor their progress. Until such time that the analysis has satisfactorily shown that the aircraft has sufficient strength to withstand the loads resulting from a pitch disconnect, the identified safety issue will remain open.

Table 10: Aviation—Responses to other safety issues identified in 2016–17

Safety issue	Status	Status justification
AO-2013-120: Smoke event involving a Dash 8-300, VH-SBG, near Canberra Airport, Australian Capital Territory, 29 July 2013		
AO-2013-120-SI-01: At the time of the occurrence, the approved QantasLink training did not provide first officers with sufficient familiarity on the use of the oxygen mask and smoke goggles. This likely contributed to the crew's communication difficulties, including with air traffic control.	Adequately addressed	The ATSB is satisfied that the action taken by QantasLink has adequately addressed the safety issue.

Safety issue	Status	Status justification
AO-2014-053: Collision with terrain involving Cessna 206, VH-FRT, Caboolture Airfield, Queensland, 22 March 2014		
AO-2014-053-SI-01: Despite being categorised as mandatory for the pilot's seat by the aircraft manufacturer, a secondary seat stop modification designed to prevent uncommanded rearward pilot seat movement and potential loss of control was not fitted to VH-FRT, nor was it required to be under United States or Australian regulations.	Safety action pending	The ATSB recommends that Civil Aviation Safety Authority (CASA) takes action to strengthen incorporation of Cessna Single Engine Service Bulletin SEB07-5 secondary seat stop modification.
AO-2014-053-SI-02: Some Cessna 206 parachuting aircraft, including VH-FRT, had their flight control systems modified without an appropriate maintenance procedure or approval. That increased the risk of flight control obstruction.	Adequately addressed	As a result of the safety action taken by CASA and the Australian Parachute Federation, aircraft operators have increased awareness of this safety issue. Consequently, the ongoing safety risk is considered acceptable.
AO-2014-053-SI-03: Research has identified that rear-facing occupants of parachuting aircraft have a higher chance of survival when secured by dual-point restraints, rather than the standard single-point restraints that were generally fitted to Australian parachuting aircraft.	Safety action pending	The ATSB recommends that the Australian Parachute Federation, in conjunction with CASA, takes action to increase the usage of dual point restraints in parachuting aircraft that are configured for rear-facing occupants.
AO-2014-053-SI-04: It was likely that the parachutists on the accident flight, as well as those that had participated in previous flights, were not secured to the single-point restraints that were fitted to VH-FRT. While research indicates that single-point restraints provide limited protection when compared to dual-point restraints, they do reduce the risk of load shift following an in-flight upset, which can lead to aircraft controllability issues.	No longer relevant	The safety issue owner is no longer conducting parachuting operations.
AO-2014-053-SI-05: Classification of parachuting operations in the private category did not provide comparable risk controls to other similar aviation activities that involve the carriage of the general public for payment.	Safety action pending	The ATSB recommends that CASA introduce risk controls to parachuting operations that provide increased assurance of aircraft serviceability, pilot competence and adequate regulatory oversight.

Safety issue	Status	Status justification
AO-2014-096: ATC information error involving a Department of Defence Boeing CH-47 Chinook and Cessna 172S, VH-PFU, Townsville Airport, Queensland, 27 May 2014		
AO-2014-096-SI-01: Compromised separation recovery training deficiencies existed within the Department of Defence at the time of the occurrence, increasing the risk of inappropriate management of aircraft in close proximity.	Adequately addressed	The ATSB is satisfied that the action taken by the Department of Defence in response to AO-2012-131-SI-05, which was enacted after the occurrence at Townsville in 2014, also adequately addresses safety issue AO-2014-096-SI-01. Compromised separation recovery training is included in Defence air traffic controller initial and currency proficiency assessments. In addition, video and computer-based training in compromised separation recovery techniques is a pre-requisite for Defence controllers' six-monthly currency assessments. It is also included in the simulator scenarios of Defence air traffic units at all military aerodromes to which civil scheduled services operate.
AO-2014-164: Collision with terrain involving Van's RV-6A, VH-JON, 8 km south of Moorabbin Airport, Victoria, 14 October 2014		
AO-2014-164-SI-01: In-flight opening of the tip-up canopy in a number of Van's Aircraft Inc. models has resulted in varying consequences, including a significant pitch down tendency, increasing the risk of a loss of control.	Adequately addressed	The safety action taken by Van's Aircraft Inc. will, once the service letter is distributed, make builders and operators of Van's Aircraft Inc. aircraft fitted with a tip-up canopy aware of the consequences of the canopy opening in flight, and how to reduce the risk of such an event. The ATSB will monitor the release of the service letter.
AO-2015-114: Runway excursion involving Cessna 550, VH-FGK, Lismore Airport, New South Wales, 25 September 2015		
AO-2015-114-SI-01: The Citation aircraft did not have an annunciator light to show that the parking brake is engaged, and the manufacturer's before take-off checklist did not include a check to ensure the parking brake is disengaged.	Safety action pending	The ATSB recommends that Textron Aviation (Cessna) take safety action to address the fact that Citation aircraft do not have an annunciator light to show that the parking brake is engaged and the Cessna 'before take-off' checklist does not include a check to ensure the parking brake is disengaged.

Safety issue	Status	Status justification
AO-2016-003: Traffic management occurrence involving Airbus A320, VH-VQS, and Beech Aircraft Corporation, VH-EWL, at Ballina/Byron Gateway Airport, New South Wales, 14 January 2016		
AO-2016-003-SI-01: Despite a steady overall increase in passenger numbers and a mixture of types of operations, Ballina/Byron Gateway Airport did not have traffic advisory and/or air traffic control facilities capable of providing timely information to the crews of VH-EWL and VH-VQS of the impending traffic conflict. It is likely the absence of these facilities, which have been shown to provide good mitigation at other airports with similar traffic levels, increased the risk of a mid-air conflict in the Ballina area.	Adequately addressed	The ATSB is satisfied that the implementation of the CA/GRS will adequately address the potential for mid-air conflict identified in the safety issue.
AO-2016-005: Loss of separation involving Boeing 737 aircraft, VH-YFN and VH-VZV, and Robinson R44, VH-WYR, near Essendon Airport, Victoria, 26 January 2016		
AO-2016-005-SI-01: Airservices Australia did not provide procedures with associated local instructions to Melbourne air traffic controllers regarding how to coordinate runway changes at Melbourne Airport. Furthermore, an absence of system tools increased the risk of the controllers forgetting to coordinate those changes with the Essendon Aerodrome Controller.	Adequately addressed	The action by Airservices Australia minimises the risk associated with the safety issue.
AO-2016-028: Ground handling occurrence involving Airbus A330, 9M-MTB, at Melbourne Airport, Victoria, 31 March 2016		
AO-2016-028-SI-01: The procedures provided to ground and flight crews by Malaysia Airlines Berhad and the towbarless tractor operator did not provide clear guidance or instruction on coordinating activities related to pushback. In the case of the tractor operator, these were informally replaced by local procedures.	Adequately addressed	The proactive safety actions taken and planned by Malaysia Airlines Berhad and Menzies Aviation, in conjunction with the additional safety action taken by Aircraft Maintenance Services Australia (the engineering organisation), will improve crew coordination during ground operations and adequately address the safety issue.

Table 11: Marine—Responses to safety issues identified in 2016–17

Safety issue	Status	Status justification
MO-2015-002: Grounding of *Maersk Garonne*, Fremantle, Western Australia, 28 February 2015		
MO-2015-002-SI-01: Bridge resource management (BRM) was not effectively implemented on board *Maersk Garonne*. The ship's passage plan for the pilotage was inadequate, its bridge team members were not actively engaged in the pilotage and they did not effectively monitor the ship's passage.	Adequately addressed	The issues identified and safety action taken by Maersk Line Ship Management, along with planned enhancements, indicate the company's commitment to reiterating the roles and responsibilities of the master and crew during navigation with a pilot on board. The company's Nautical Excellence program will enhance bridge resource management and improve compliance with bridge procedures.
MO-2015-002-SI-02: Fremantle Pilots' publicly available information to assist ship's masters in preparing a berth-to-berth passage plan was inadequate and ineffectively implemented. The information provided consisted essentially of a list of waypoints, which was routinely not followed.	Adequately addressed	The safety actions undertaken by Fremantle Pilots should ensure that the waypoint list made available to ship's masters more closely matches the track that the pilot will follow. This will assist masters in more accurately preparing the required berth-to-berth passage plan.
MO-2015-002-SI-03: Fremantle Pilots' procedures did not include any contingency plans, including abort points, for risks identified for the pilotage.	Adequately addressed	The actions taken will ensure that pilotage into Fremantle has been adequately assessed and contingency procedures and manoeuvres have been planned and practised. Changes to pilotage passage procedures will mean that the safety margins will be increased.
MO-2015-002-SI-04: Procedures for harbour tugs to meet inbound ships and for their coordinated movement in the Fremantle pilotage area were not clearly defined. On 28 February, inadequate coordination of the tugs and ineffective communication between *Maersk Garonne's* pilot and the tug masters resulted in both tugs, the second one in particular, being significantly delayed from when they could reasonably have been expected to be on station.	Adequately addressed	The actions taken by Fremantle Ports, Fremantle Pilots and Svitzer Australia clarify the roles and responsibilities of all parties with respect to the monitoring and management of tugs during pilotage and port entry. This increases safety margins and reduces the likelihood of a similar incident occurring in the future.
MO-2015-005: Fatal injury on board *Skandi Pacific*, off the Pilbara coast, Western Australia, 14 July 2015		
MO-2015-005-SI-01: *Skandi Pacific's* safety management system (SMS) procedures for cargo handling in adverse weather conditions were inadequate. Weather limits outlining when cargo handling operations could be undertaken and trigger points for suspending operations were not defined, including limits for excessive water on deck.	Adequately addressed	The revised procedures for working in adverse weather conditions and cargo handling, and the additional safety action taken, has adequately addressed the safety issue.
MO-2015-005-SI-02: *Skandi Pacific's* SMS procedures for cargo securing were inadequate. There was no guidance for methods of securing cargo in adverse weather conditions.	Adequately addressed	The revised procedures and risk assessments for cargo handling and securing, and the additional safety action taken, has adequately addressed the safety issue.

Safety issue	Status	Status justification
MO-2015-005-SI-03: *Skandi Pacific's* managers had not adequately assessed the risks associated with working on the aft deck of vessels with open sterns, including consideration of engineering controls to minimise water being shipped on the aft deck.	Partially addressed	The ATSB acknowledges the proactive safety taken by DOF Management following the issue of a recommendation that DOF Management undertake further action to adequately address the safety issue concerning the use of vessels with open sterns. The further proactive safety action included: bridge familiarisations for open stern vessels; amended SMS procedures specifically related to adverse weather conditions and cargo handling; risk assessments for working stern to weather; loading/offloading at installation; and securing deck cargoes. Additionally, in late 2016, DOF joined an offshore industry working group and identified areas for consideration and improvement across their industry. The areas included cargo shift, cargo securing manuals, offshore skip bins and open stern vessels. Further, DOF Management are trialling a swing type wave barrier gate. Therefore, the ATSB will continue to monitor the safety issue/action subject to receiving notice of the result and final outcome.
MO-2016-001: Breakaway of *Spirit of Tasmania II*, Station Pier, Port Melbourne, Victoria, 13 January 2016		
MO-2016-001-SI-01: The adverse weather procedures for TT-Line ships when alongside did not take into account all the necessary factors to provide effective defences against significant, short-term weather events, such as thunderstorms and squalls.	Adequately addressed	Enhancements to ship operating procedures should improve the ability to hold the ship alongside and provide for swifter response to changing weather conditions. In addition, improved analysis and notification of weather conditions, forecasts and warnings should allow ships' crew to be better informed and, hence, better prepared. The review of the mooring arrangements should further inform and complement these changes.
MO-2016-001-SI-02: The Port of Melbourne vessel traffic service (VTS) procedures for adverse weather were not comprehensive and, hence, its response on 13 January was only partially effective. One important consequence was that VTS's advance warning of storm force winds did not reach all relevant parties, including the *Spirit of Tasmania II's* master.	Adequately addressed	The notice to mariners and the port information notice clarify the responsibility of ship's masters to actively and continuously monitor weather and related vessel traffic service communications via VHF radio.
MO-2016-001-SI-03: While TT-Line Company's standard mooring line pattern for ships at Station Pier had been successfully used for many years, the breakaway indicated the risk could have been further reduced to better prepare for such unusual circumstances.	Safety action pending	In addition to the proactive action taken to date, further action by TT-Line following the completion of its mooring analysis has the potential to adequately address the safety issue.

Table 12: Rail—Responses to safety issues identified in 2016–17

Safety issue	Status	Status justification
RO-2014-016: Collision between V/Line train 8280 and Metro Trains Melbourne train 6502 at Altona, Victoria, 22 August 2014		
RO-2014-016-SI-01: The rules pertaining to passing a permissive signal at stop place sole reliance on the train driver to provide separation between trains by line-of-sight observation. In the absence of any additional risk mitigation measures, this administrative control provides the least effective defence against human error or violations.	Safety action pending	The ATSB is not satisfied that the proposed actions are sufficient to prevent a recurrence of this type of accident. Until further information is provided by MTM which satisfies the ATSB that the safety issue is adequately addressed, the ATSB will retain the status of this safety issue as 'pending'.
RO-2014-016-SI-02: The marker lights on some MTM passenger trains do not meet the requirements of the standard for Railway Rolling Stock Lighting and Rolling Stock Visibility, AS/RISSB 7531.3:2007.	Safety action pending	The ATSB accepts MTM's proposed actions on this safety recommendation. However, until the proposed actions are completed, the ATSB will retain the status of this safety issue as 'pending'.
RO-2015-009: Signals passed at danger by train 1240 at Marshall (Geelong), Victoria, 29 May 2015		
RO-2015-009-SI-01: The training and assessment of the driver did not ensure that he had an adequate understanding of the two-position signalling through Marshall.	Adequately addressed	The proactive safety action taken by V/Line should address the gap in training identified in the safety issue.
RO-2015-009-SI-02: The rule describing the required driver response to a distant signal at caution in a two-position signalling system did not fully reflect the signalling system design principles.	Adequately addressed	V/Line has amended Rule 5 Section 2 (distant signals).
RO-2015-022: Derailment of freight train 9150 at Nunga (near Ouyen), Victoria, 9 November 2015		
RO-2015-022-SI-01: Asset management systems that were used to identify problematic levels of rail creep did not evaluate or assess cumulative creep.	Adequately addressed	The proactive safety action taken addresses the monitoring of future cumulative creep. The assessment of older records, together with field validations, should identify latent cumulative creep.

Safety issue	Status	Status justification
RO-2015-022-SI-02: There was no supplementary system of inspection that was effective in identifying rail creep in jointed track. The network placed a high reliance on the asset management system to initiate closer inspection of track potentially affected by creep.	Partially addressed	The proactive safety action taken provides the methodology to be used to evaluate the stress condition of rail in instances where there is evidence of creep or incorrect stress. However, there is limited enhancement in the scope of inspection, and there continues to be a high level of reliance on asset management systems to identify rail creep in jointed track. The ATSB recognises that improvements have been made in the asset management systems, as described under safety issues RO-2015-022-SI-01 and RO-2015-022-SI-04.
RO-2015-022-SI-03: The procedures for measuring, assessing and remediating rail creep in the spring did not ensure creep defects were addressed in a timely manner and prior to the onset of hot weather. A creep defect identified by the spring measurements was not corrected before the derailment.	Adequately addressed	The proactive action taken should address the safety issue.
RO-2015-022-SI-04: Asset management systems that were used to identify problematic levels of rail creep did not correct for fixed points between creep monuments.	Adequately addressed	The proactive action taken should address the safety issue.
RO-2015-028: Derailment of Aurizon train near Julia Creek, Queensland, 27 December 2015		
RO-2015-028-SI-01: The Queensland Rail (QR) General Operational Safety Manual (MD-10-107) contained insufficient guidance for rail traffic crews to ensure the timely identification and management of a potential hazard (resulting from a weather event) that might affect the safe progress of the train.	Adequately addressed	The ATSB is satisfied that the initial actions taken by QR will address this safety issue. The ATSB encourages QR to continue working towards incorporating additional guidance to improve the effectiveness of the network rules with respect to managing weather conditions.

Safety issue	Status	Status justification
RO-2015-028-SI-02: The Queensland Rail network rules, procedures and safety manual provided insufficient guidance to identify the magnitude of the potential hazard from a weather event, or define the response when encountering water that had previously overtopped the track and receded or was pooled against the track formation or ballast.	Adequately addressed	The ATSB is satisfied that the initial actions taken by QR will address this safety issue. The ATSB encourages QR to continue working towards incorporating additional guidance to improve the effectiveness of the network rules with respect to managing weather conditions.
RO-2016-007: Derailment of freight train 9305 at Katunga, Victoria, 30 May 2016		
RO-2016-007-SI-01: The inspection regime to identify rail fractures was ineffective for the condition of this track.	Safety action pending	The ATSB accepts that the replacement of front of train inspection with hi-rail patrols will increase the opportunity to detect fractured rail. The ATSB also considers that the proposed risk review, when completed, has the potential to result in a safety action that reduces the likelihood of a derailment following a fracture. The ATSB considers that the safety issue has been partially addressed and has issued a safety recommendation. The ATSB recommends that V/Line completes the risk review and implements safety actions to reduce the likelihood of derailment following a rail fracture.

SAFETY ACTIONS

Table 13: Number of safety actions released in 2016–17

Safety action type	Aviation	Marine	Rail	Total
Proactive safety action	8	11	7	26
Safety Advisory Notice	3	1	0	4
Safety recommendation	8	2	4	14
Total	**19**	**14**	**11**	**44**

ATSB RECOMMENDATIONS CLOSED IN 2016–17

Table 14: Aviation—ATSB recommendations closed in 2016–17

Investigation	AR-2012-034: **Loss of separation between aircraft in Australian airspace: 2008 to June 2012**
Safety issue	Regulatory oversight processes for military air traffic services do not provide independent assessment and assurance as to the safety of civilian aircraft operations.
Number	AR-2012-034-SR-015
Organisation	Civil Aviation Safety Authority (CASA)
Recommendation	The ATSB recommends that CASA should review the results of this report and determine whether its current level of involvement with military air traffic services (ATS) is sufficient to assure itself that the safety of civil aircraft operations while under military ATS control is adequate.
Released	18 October 2013
Final action	30 September 2016
Final action	Since this safety recommendation was issued, CASA and Defence have been collaborating and through the Aviation Policy Group (APG) have jointly developed a policy covering the safety oversight of civil operations into joint user and military airports. The policy comprises a subordinate agreement to the primary CASA/Defence agreement on safety and airworthiness. The APG, at the 8 September 2016 meeting, endorsed the subordinate agreement and it was subsequently signed by CASA Director of Aviation Safety and the Chief of Air Force. The subordinate agreement is titled *Topic area: transparency of safety oversight of delivery of Defence ATS to civil aviation operations*, and CASA and Defence have now commenced implementation of the arrangements. The ATSB notes the scope of the agreement is: Defence continues to provide its own safety oversight of the provision of ATS to civil aviation operations. CASA will observe systems and operational assessments conducted by Defence of Defence ATS operations, and engage in Defence regulatory discussions and forums, to the degree necessary to satisfy CASA that the level of Defence safety oversight and delivery of ATS to civil aircraft is comparable to that provided under CASR Part 172.

Further, the ATSB notes activities in the agreement are:

1. Identification of specific CASA and Defence personnel/appointments to form the focal points.
2. Standing participation of CASA focal points at the periodic Defence ATM Airworthiness Boards (AWB), with access to relevant AWB documentation. CASA will provide the AWB with a general report including matters of safety interest to CASA and all CASA observations applicable to civil aircraft operations at joint user and military airports and within military administered airspace.
3. Regular participation by CASA focal points in Defence ATM Operational Evaluations (OPEVAL) and other regulatory or surveillance activities which may include coordination with applicable Defence aviation stakeholders:
    a) CASA will not formally assess Defence personnel, ATC procedures or systems and infrastructure at these events;
    b) b) CASA will raise with Defence any matters of safety interest identified by CASA in the context of CASR Part 172 as applicable to the operation of civil aircraft within Defence aviation environments;
    c) CASA will track participation in Defence OPEVAL and other regulatory activities through CASA's Sky Sentinel software application, recording any safety concerns identified to Defence as CASA 'Observations' within Sky Sentinel; and
    d) Defence will address any CASA recommendations and Observations and respond accordingly, consulting, where applicable, with aviation users in order to pursue an optimal outcome.
4. In order to enhance Defence understanding of the practical application of CASR Part 172 in the civil environment, subject to CASA coordination with, and approval by, Airservices Australia on a case-by-case basis, regular observation by Defence focal points of CASA surveillance activities at selected civil ATC locations.
5. Mutual participation in CASA and Defence regulatory discussions and forums to facilitate the transparency of safety oversight of civil operations at joint user and military airports and within military administered airspace.

Additional actions in support of the transparency of oversight agreed by the APG include that: the primary CASA/Defence Safety and Airworthiness agreement and the subordinate agreement be published on each agency website for the next two years; CASA and Defence provide regular updates to the APG on the implementation of the arrangements and activities conducted; re-evaluation of the arrangements take place after two years, involving Defence, CASA, Airservices Australia and the Department of Infrastructure and Regional Development, and the outcomes and proposed actions be reported to the APG.

As a result of the implementation of the subordinate agreement and the complementary additional actions agreed by the APG, CASA considers that Safety Recommendation AR-2012-034-SR-015 has been addressed. The ATSB welcomes this landmark agreement between CASA and Defence as a positive and transparent approach to cooperation that should ensure that CASA can assure itself of the safety of civilian aircraft in military airspace. The ATSB has closed this recommendation.

Table 15: Marine—ATSB recommendations closed in 2016–17

Investigation	**MO-2014-008: Engine room fire on board the bulk carrier *Marigold*, Port Hedland, Western Australia, 13 July 2014**
Safety issue	The emergency response plans for a ship fire in Port Hedland did not clearly define the transfer of control procedures for successive incident controllers from different organisations or contain standard checklists for their use.
Number	MO-2014-008-SR-040
Organisation	West Australian Department of Fire and Emergency Services (DFES)
Recommendation	The ATSB recommends that the DFES takes action to address the safety issue with regard to transfer of control procedures for incident controllers from different organisations.
Released	20 April 2016
Final action	12 July 2016
Final action	Whilst DFES agree that action is required to address issues regarding transfer of control procedures during marine fire incidents, DFES does not agree that it has responsibility for this action. The Hazard Management Agency (HMA) for Marine Transport Emergencies (MTEs) in Western Australia is the Department of Transport (DoT). As part of their HMA responsibilities, DoT has developed the State Hazard Plan for Marine Transport Emergency, which prescribes that: *The Port Authorities Act 1999* and relevant agreement acts require Port Authorities and private companies operating ports (Maritime Export Facility) to prepare, maintain and implement a Marine Safety Plan that is approved by the Minister for Planning and Infrastructure in the case of Port Authorities. The Director General of DoT approves such plans in the case of ports (Marine Export Facilities) operated by private companies. These plans will identify arrangements for managing Marine Transport Emergency situations within port waters. Whilst encouraging consultation and coordination in the development of Port Marine Safety Plans, DFES is of the view that ultimate responsibility for addressing the issues identified rests with Pilbara Ports and BHP Billiton. Notwithstanding the above, DFES has actively and regularly liaised with Pilbara Ports in relation to emergency management arrangements since the *MV Marigold* incident.

Investigation	MO-2014-008: Engine room fire on board the bulk carrier *Marigold*, Port Hedland, Western Australia, 13 July 2014
Safety issue	The large size and weight of the ship firefighting cache made it difficult for the duty Port Hedland volunteer firefighter to transport it to the wharf.
Number	MO-2014-008-SR-043
Organisation	West Australian Department of Fire and Emergency Services (DFES)
Recommendation	The ATSB recommends that the DFES takes action to address the safety issue with regard to transporting ship firefighting caches to wharves.
Released	20 April 2016
Final action	12 July 2016
Final action	DFES agree with this recommendation and is taking steps to break the caches down into smaller portable packages. As a general comment, DFES is disappointed to note that the risks related to the safety standards of ships operating in Western Australian ports have not been addressed from a regulatory/compliance perspective. DFES note that this is the second shipboard fire in the Pilbara in recent years where the presence of hatches that were secured open or defective have affected the performance of deluge systems and hampered fire suppression efforts. These two occurrences suggest, anecdotally at least, that this is a commonplace issue within the industry.

Table 16: Rail—ATSB recommendations closed in 2016–17

Investigation	RO-2014-005: Fatality at Heyington railway station, Toorak, Victoria, 22 February 2014
Safety issue	The train door open/close indicator on the driver's control console was inadequate as a warning device once the traction interlock had deactivated.
Number	RO-2014-005-SR-031
Organisation	Metro Trains Melbourne (MTM)
Recommendation	The ATSB recommends that MTM considers incorporating an additional warning device to heighten driver awareness that the train doors have not closed, if automatic deactivation is retained.
Released	13 August 2015
Final action	26 July 2016
Final action	Given the circuit modification and provision of a manual key-operated switch described in response to Action No–RO-2014-005-SR-030, this action is no longer applicable.

SAFETY RECOMMENDATIONS RELEASED IN 2016–17

Table 17: Aviation—Safety recommendations released in 2016–17

Investigation	AO-2014-053: **Collision with terrain involving Cessna 206, VH-FRT, Caboolture Airfield, Queensland, 22 March 2014**
Safety issue	Despite being categorised as mandatory for the pilot's seat by the aircraft manufacturer, a secondary seat stop modification designed to prevent uncommanded rearward pilot seat movement and potential loss of control was not fitted to VH-FRT, nor was it required to be under United States or Australian regulations.
Number	AO-2014-053-SR-017
Organisation	Civil Aviation Safety Authority (CASA)
Safety recommendation	The ATSB recommends that CASA takes action to strengthen incorporation of Cessna Single Engine Service Bulletin SEB07-5 secondary seat stop modification.
Released	23 June 2017

Investigation	AO-2014-053: **Collision with terrain involving Cessna 206, VH-FRT, Caboolture Airfield, Queensland, 22 March 2014**
Safety issue	Research has identified that rear facing occupants of parachuting aircraft have a higher chance of survival when secured by dual-point restraints, rather than the standard single-point restraints that were generally fitted to Australian parachuting aircraft.
Number	AO-2014-053-SR-018
Organisation	Civil Aviation Safety Authority (CASA)
Safety recommendation	The ATSB recommends that CASA, in conjunction with the Australian Parachute Federation, takes action to increase the usage of dual-point restraints in parachuting aircraft that are configured for rear facing occupants.
Released	23 June 2017

Investigation	AO-2014-053: Collision with terrain involving Cessna 206, VH-FRT, Caboolture Airfield, Queensland, 22 March 2014
Safety issue	Research has identified that rear facing occupants of parachuting aircraft have a higher chance of survival when secured by dual-point restraints, rather than the standard single-point restraints that were generally fitted to Australian parachuting aircraft.
Number	AO-2014-053-SR-019
Organisation	Australian Parachute Federation (APF)
Safety recommendation	The ATSB recommends that the APF, in conjunction with CASA, takes action to increase the usage of dual-point restraints in parachuting aircraft that are configured for rear facing occupants.
Released	23 June 2017

Investigation	AO-2014-053: Collision with terrain involving Cessna 206, VH-FRT, Caboolture Airfield, Queensland, 22 March 2014
Safety issue	Classification of parachuting operations in the private category did not provide comparable risk controls to other similar aviation activities that involve the carriage of the general public for payment.
Number	AO-2014-053-SR-020
Organisation	Civil Aviation Safety Authority (CASA)
Safety recommendation	The ATSB recommends that CASA introduce risk controls to parachuting operations that provide increased assurance of aircraft serviceability, pilot competence and adequate regulatory oversight.
Released	23 June 2017

Investigation	AO-2015-114: Runway excursion involving Cessna 550, VH-FGK, Lismore Airport, New South Wales, 25 September 2015
Safety issue	The Citation aircraft did not have an annunciator light to show that the parking brake is engaged, and the manufacturer's before take-off checklist did not include a check to ensure the parking brake is disengaged.
Number	AO-2015-114-SR-002
Organisation	Textron Aviation (Cessna)
Safety recommendation	The ATSB recommends that Textron Aviation (Cessna) take safety action to address the fact that Citation aircraft do not have an annunciator light to show that the parking brake is engaged and the Cessna 'before take-off' checklist does not include a check to ensure the parking brake is disengaged.
Released	25 July 2016

Investigation	AO-2014-032: In-flight pitch disconnect involving ATR 72 aircraft, VH-FVR, 47 km WSW of Sydney Airport, New South Wales, 20 February 2014
Safety issue	The aircraft manufacturer did not account for the transient elevator deflections that occur as a result of the system flexibility and control column input during a pitch disconnect event at all speeds within the flight envelope. As such, there is no assurance that the aircraft has sufficient strength to withstand the loads resulting from a pitch disconnect.
Number	AO-2014-032-SR-014
Organisation	ATR (aircraft manufacturer)
Safety recommendation	The ATSB recommends that ATR complete the assessment of transient elevator deflections associated with a pitch disconnect as soon as possible to determine whether the aircraft can safely withstand the loads resulting from a pitch disconnect within the entire operational envelope. In the event that the analysis identifies that the aircraft does not have sufficient strength, it is further recommended that ATR take immediate action to ensure the ongoing safe operation of ATR 42/72 aircraft.
Released	5 May 2017

Investigation	AO-2014-032: In-flight pitch disconnect involving ATR 72 aircraft, VH-FVR, 47 km WSW of Sydney Airport, New South Wales, 20 February 2014
Safety issue	The aircraft manufacturer did not account for the transient elevator deflections that occur as a result of the system flexibility and control column input during a pitch disconnect event at all speeds within the flight envelope. As such, there is no assurance that the aircraft has sufficient strength to withstand the loads resulting from a pitch disconnect.
Number	AO-2014-032-SR-015
Organisation	European Aviation Safety Agency (EASA)
Safety recommendation	The ATSB recommends that EASA monitor and review ATR's engineering assessment of transient elevator deflections associated with a pitch disconnect to determine whether the aircraft can safely withstand the loads resulting from a pitch disconnect within the entire operational envelope. In the event that the analysis identifies that the aircraft does not have sufficient strength, it is further recommended that EASA take immediate action to ensure the ongoing safe operation of ATR 42/72 aircraft.
Released	5 May 2017

Investigation	AO-2014-032: In-flight pitch disconnect involving ATR 72 aircraft, VH-FVR, 47 km WSW of Sydney Airport, New South Wales, 20 February 2014
Safety issue	The aircraft manufacturer did not account for the transient elevator deflections that occur as a result of the system flexibility and control column input during a pitch disconnect event at all speeds within the flight envelope. As such, there is no assurance that the aircraft has sufficient strength to withstand the loads resulting from a pitch disconnect.
Number	AO-2014-032-SR-016
Organisation	Civil Aviation Safety Authority (CASA)
Safety recommendation	The ATSB recommends that CASA review ATR's engineering assessment of transient elevator deflections associated with a pitch disconnect, to determine whether the aircraft can safely withstand the loads resulting from a pitch disconnect within the entire operational envelope. In the event that the analysis identifies that the aircraft does not have sufficient strength, it is further recommended that CASA take immediate action to ensure the ongoing safe operation of Australian-registered ATR 42/72 aircraft.
Released	5 May 2017

Table 18: Marine—Safety recommendations released in 2016–17

Investigation	MO-2015-005: Fatal injury on board *Skandi Pacific*
Safety issue	*Skandi Pacific*'s managers had not adequately assessed the risks associated with working on the aft deck of vessels with open sterns, including consideration of engineering controls to minimise water being shipped on the aft deck.
Number	MO-2015-005-SR-006
Organisation	DOF Management, Norway
Safety recommendation	The ATSB recommends that DOF Management take further action to adequately address the safety issue concerning the use of vessels with open sterns.
Released	23 November 2016

Investigation	MO-2016-001: Breakaway of *Spirit of Tasmania II*, Station Pier, Port Melbourne, Victoria, 13 January 2016
Safety issue	While TT-Line Company's standard mooring line pattern for ships at Station Pier had been successfully used for many years, the breakaway indicated the risk could have been further reduced to better prepare for such unusual circumstances.
Number	MO-2016-001-SR-005
Organisation	TT-Line Company
Safety recommendation	The ATSB recommends that TT-Line Company take necessary action to adequately address the safety issue following the completion of its mooring analysis.
Released	11 May 2017

Table 19: Rail—Safety recommendations released in 2016–17

Investigation	RO-2014-016: Collision between V/Line train 8280 and MTM train 6502 at Altona, Victoria, 22 August 2014
Safety issue	The rules pertaining to passing a permissive signal at stop place sole reliance on the train driver to provide separation between trains by line-of-sight observation. In the absence of any additional risk mitigation measures, this administrative control provides the least effective defence against human error or violations.
Number	RO-2014-016-SR-38
Organisation	Metro Trains Melbourne (MTM)
Safety recommendation	The ATSB recommends that MTM consider additional risk mitigation measures to maintain train separation where the safeworking system allows permissive working.
Released	6 July 2016

Investigation	RO-2014-016: Collision between V/Line train 8280 and MTM train 6502 at Altona, Victoria, 22 August 2014
Safety issue	The marker lights on some Metro Trains Melbourne passenger trains do not meet the requirements of the standard for *Railway Rolling Stock Lighting and Rolling Stock Visibility, AS/RISSB 7531.3:2007.*
Number	RO-2014-016-SR-39
Organisation	Metro Trains Melbourne (MTM)
Safety recommendation	That MTM institute measures to ensure that the luminous intensity of marker lights of all passenger trains in their fleet meet a railway industry approved and accepted standard.
Released	6 July 2016

Investigation	RO-2015-009: Signals passed at danger by train 1240 at Marshall (Geelong), Victoria, 29 May 2015
Safety issue	The rule describing the required driver response to a distant signal at caution in a two-position signalling system did not fully reflect the signalling system design principles.
Number	RO-2015-009-SR-029
Organisation	V/Line Regional Network and Access
Safety recommendation	That V/Line amends the rule for the required driver response to a distant signal at caution. The amendment should bring the rule into alignment with the signalling system design principles.
Released	12 December 2016

Investigation	RO-2016-007: Derailment of freight train 9305 at Katunga, Victoria, 30 May 2016
Safety issue	The inspection regime to identify rail fractures was ineffective for the condition of this track.
Number	RO-2016-007-SR-001
Organisation	V/Line Pty Ltd
Safety recommendation	The ATSB recommends that V/Line completes the risk review and implements safety actions to reduce the likelihood of derailment following a rail fracture.
Released	30 May 2017

Table 20: Safety advisory notices released in 2016–17

Investigation	AO-2014-164: Collision with terrain involving Van's RV-6A, VH-JON, 8 km south of Moorabbin Airport, Victoria, 14 October 2014
Safety issue	In-flight opening of the tip-up canopy in a number of Van's Aircraft Inc. models has resulted in varying consequences, including a significant pitch down tendency, increasing the risk of a loss of control.
Number	AO-2014-164-SAN-012
Organisation	Pilots operating canopy-equipped aircraft
Safety advisory notice	The consequences when an aircraft canopy opens in-flight, including other than Van's aircraft types, can vary from being relatively benign to significant, such as a sudden pitch down. In any event, in the first instance pilots should expect an element of startle and distraction. The detection of an unsecured canopy prior to take-off could prevent in-flight control issues resulting in injury or aircraft damage. The ATSB advises pilots to be vigilant and confirm the security of their aircraft's canopy prior to take-off.
Released	25 November 2016

Investigation	AO-2016-028: Ground handling occurrence involving Airbus A330, 9M-MTB, Melbourne Airport, Victoria, 31 March 2016
Safety issue	The procedures provided to ground and flight crews by Malaysia Airlines Berhad and the towbarless tractor operator did not provide clear guidance or instruction on coordinating activities related to pushback and, in the case of the tractor operator, were informally replaced by local procedures.
Number	AO-2016-028-SAN-006
Organisation	Organisations that work airside and aircraft operators
Safety advisory notice	Effective coordination and communication between airside crews can prevent or detect mistakes that could otherwise lead to damage or injury. The ATSB advises organisations that work airside and aircraft operators to ensure that ground and flight crew activities are harmonised, and to foster active communication and coordination between working crews.
Released	13 September 2016

Investigation	AO-2017-032: In-flight propeller malfunction involving SAAB 340 VH-NRX, 10NM SW of Sydney Airport, 17 March 2017
Safety issue	The propeller shaft currently has no inspection methods to detect a fatigue failure originating from the propeller side of the dowel.
Number	AO-2017-032-SAN-001
Organisation	General Electric
Safety advisory notice	The ATSB advises that those responsible for the operation and maintenance of SAAB 340 and EADS CASA CN-235 aircraft fitted with the GE Aviation CT7 engine type variants 5A2, 7A1, 9B, 9C, and 9C3 should note the facts presented in this preliminary report with a view to addressing any risks to their own operation.
Released	13 April 2017

Investigation	MO-2015-005: Fatal injury on board *Skandi Pacific*
Safety issue	*Skandi Pacific's* managers had not adequately assessed the risks associated with working on the aft deck of vessels with open sterns, including consideration of engineering controls to minimise water being shipped on the aft deck.
Number	MO-2015-005-SAN-005
Organisation	DOF Management
Safety advisory notice	The ATSB advises the masters, owners and operators of all offshore support vessels to ensure that the risks posed by the open sterns of some of these vessels are adequately assessed.
Released	23 November 2016

SECTION 6

Features of the ATSB year

6

Over the course of the year, the ATSB undertakes a number of activities that improve our work processes and our workplace culture, and diversify the means by which make our contribution to transport safety. Below are some highlights from the 2016–17 year.

Feature

AVIATION STALWART DONATES HISTORIC PROPELLER

On 26 April 2017, Australian aviation stalwart Peter Lloyd AC OBE MiD donated the propeller from a Supermarine Walrus aircraft to the ATSB.

Figure 16: Mr Peter Lloyd and ATSB Chief Commissioner Greg Hood

Source: ATSB

The Supermarine Walrus was a British single-engine amphibious biplane reconnaissance aircraft first flown in 1933. It was operated by the Fleet Air Arm and also served with the Royal Air Force, Royal Australian Air Force, Royal New Zealand Navy and Royal New Zealand Air Force.

Designed for use as a fleet spotter to be catapult launched from cruisers or battleships, the Walrus was later employed in a variety of other roles, most notably as a rescue aircraft for downed aircrew. It continued in service throughout the Second World War.

ATSB Chief Commissioner, Greg Hood, accepted the propeller on behalf of the ATSB, stating the donation was even more significant coming from Mr Lloyd.

'Peter has made an indelible contribution to aviation safety nationally and internationally for more than half a century', Mr Hood said. 'The ATSB is honoured by his donation of this significant piece of Australian aviation history'.

Mr Lloyd was assigned to the 2/6th Field Regiment during the Second World War and saw action in the Middle East and New Guinea. On 8 March 1945, he was Mentioned in Dispatches for gallant and distinguished service in the South-West Pacific.

On his return to Australia, Mr Lloyd worked as a grazier and in 1951 was elected treasurer of the Royal Aero Club of New South Wales. In 1957, he became president of the club—a position he held for ten years—and then again from 1972 to 1974. He built up the club from poor condition to the largest aviation school in the British Commonwealth.

In 1958, Mr Lloyd became president of the Federation of Australian Aero Clubs, and set about greatly increasing the federation's membership and promoting aviation sports throughout Australia.

Figure 17: Mr Peter Lloyd and the propeller from a Submarine Walrus donated to the ATSB

Source: ATSB

Mr Lloyd has been bestowed numerous prestigious awards for his services to aviation, including an Order of the British Empire in 1964, and the FAI Gold Air Medal in 1989. He has been awarded the Oswald Watt Gold Medal twice, the only person other than Sir Charles Kingsford Smith to achieve the honour. He received the award in 1969 and 2017. He was also made an Officer of the Order of Australia in 1990 for service to aviation and international relations. In 1992, he was inducted into the Sport Australia Hall of Fame.

In the 2016 Queen's Birthday Honors, Mr Lloyd was upgraded to a Companion of the Order of Australia for eminent service to the aviation industry, particularly to the advancement of air safety in Australia, through leading roles with national and international aeronautical organisations, and airport associations.

Mr Lloyd still devotes extraordinary time and energy to the industry as President Emeritus and Life Member of Safeskies, Australia's international air safety conference.

He is Patron of the Australian and International Parachute Federation and conducted parachute jumps over Canberra on his 80th, 85th, 90th and 95th birthdays.

The donated 1937 Supermarine Walrus propeller now takes pride of place in the foyer of the ATSB's Canberra office.

Feature

THE ATSB'S CONTRIBUTION TO CHARITABLE CAUSES

The ATSB made a significant contribution to many charitable causes during 2016–17, with staff participating in dragon boat racing, marathon bike rides and a sleepout on a cold Canberra winter's night to raise awareness and funds for a number of worthwhile charities.

In October 2016, the ATSB's 'Dragon Ninja's' participated in the Dragon Boat Regatta on Lake Burley Griffin. This fundraising event was in support of Dragons Abreast Australia, Palliative Care ACT and the Cancer Council. Dragons Abreast is an organisation that provides a 'face' for breast cancer statistics whilst spreading the message of breast cancer awareness through participation in the strenuous sport of dragon boat racing.

The ATSB continued its contribution to breast cancer awareness in May 2017 with staff donating to a Love Your Sister fundraising event, which secured the Guinness World Record for the longest line of five cent coins, in the shape of a love heart.

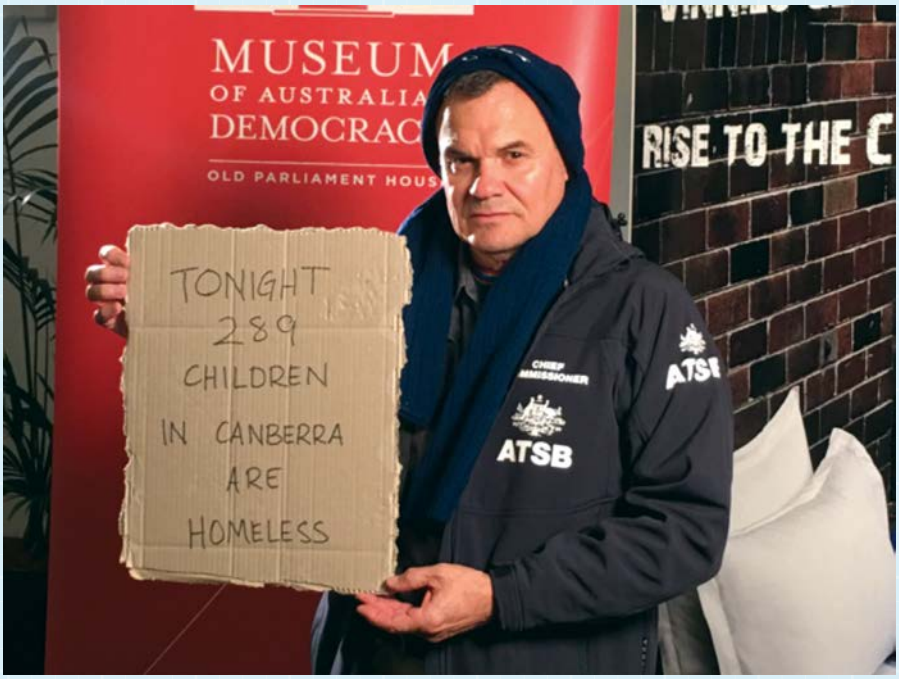
In June 2017, the ATSB offices were filled with staff wearing pink as part of the Real Men Wear Pink campaign in support of the National Breast Cancer Foundation. This included a fundraising morning tea which saw the ATSB raise over $2,500. Upon hitting this target, the ATSB Chief Commissioner kept his promise to dye his hair pink, which brought another level of colour to the ATSB.

On 5 March 2017, the ATSB's 'Propeller Heads' geared up to take on the Big Canberra Bike Ride. The rides ranged from 35 km to 120 km and raised funds for the Amy Gillette Foundation—a national organisation with a mission to reduce the incidence of serious injury and death of bike riders in Australia. One of its key messages to motor vehicle drivers is 'a metre matters'. This message, along with a couple of close encounter stories from colleagues, propelled the team to top fundraiser status for the event, raising over $1,400 for this worthy cause.

The temperature dropped into the minuses on 22 June 2017 when Chief Commissioner Greg Hood slept in the grounds of Old Parliament House to participate in the Vinnie's CEO sleepout. The sleepout is the largest source of funding for the St Vincent De Paul Society's homeless services. With the support of the ATSB and some extremely generous donors, more than $68,000 was raised for the appeal. These donations

placed the Chief Commissioner as the ACT's highest fundraiser and positioned him third nationally. An incredible effort for a very important cause.

Figure 18: ATSB Chief Commissioner Greg Hood at the St Vincent De Paul Society's CEO Sleepout



Source: ATSB

Other ATSB activities have included the annual blood drive for the Red Cross, a 35 km walk in support of the Australian Mitochondrial Disease Foundation and awareness campaigns for White Ribbon Day, Legacy Week and DonateLife Week.

The personal time and dedication that ATSB staff have given to charities has been a true testament to the character of the ATSB and its altruism, which is not unexpected for an organisation dedicated to improving the safety of the travelling public.

Feature

ATSB USE OF RPAS IN INVESTIGATIONS

During 2016–17, the ATSB acquired a DJI Phantom 4, very small remotely piloted aircraft (VSRPA), to use in its investigations on site. The ATSB had been monitoring the potential benefits of remotely piloted aircraft systems (RPAS) for a number of years, however, it was only recently that advances in technology made this a viable option. In particular, RPAS are now software-equipped and capable of high-fidelity resolution photography. These capabilities enable accident site safety assessment, and site and debris mapping that has significant advantages to traditional on-site survey techniques.

Before adopting the technology, the ATSB was aware that, in Australia, the Australian Federal Police and New South Wales and Queensland law enforcement agencies were already using VSRPA. These agencies hold operating certificates from CASA, even though they are not required because of their size.

With the ATSB being a safety agency and seeking to ensure that it is operating under the safest possible framework, the ATSB set out to acquire its own operating certificate. The ATSB was officially presented with the RPA Operator's Certificate (ReOC) on Friday 21 July 2017.

Figure 19: ATSB investigators training to use a Remotely Piloted Aircraft System

Source: ATSB

On receiving the ReOC, the ATSB's Chief Pilot for RPAS operations, Mr Derek Hoffmeister said, 'The RPAS brings significant capability to our investigations. Investigators are now able to undertake an initial site survey to check for safety hazards before entering the site, and we can perform site mapping more quickly and with more accurate measurements. Also, comprehensive photos of an entire accident site can help investigations enormously. We can capture that imagery ourselves using RPAS–imagery that could previously only be obtained with a helicopter'.

Several ATSB investigators are now qualified to fly the DJI Phantom 4 and other RPAS up to seven kilograms. However, with the DJI Phantom 4 under the threshold for requiring an ReOC, the ATSB wants to send the message that:

> people who are flying RPAS commercially should follow the lead of the ATSB and gain their ReOC, regardless of the size of the RPAS they're using.

In addition to building its RPAS capability, the ATSB is conducting research and data analysis into this emerging technology to assess the safety risk to aircraft. There have been a number of 'encounters' between RPAS and fixed and rotary winged aircraft, which is a focus of the ATSB.

Everyone who is flying an RPAS, whether for recreational or commercial purposes, needs to make themselves aware of the regulatory requirements to perform their safety role in managing hazards and risks. Gaining an ReOC demonstrates the highest level of commitment and affords a commercial operator the flexibility and preparedness to fly any kind of drone or deal with any changes to rules or regulations.

For more information about gaining your remote pilot licence (RePL) and RPA operator's certificate (ReOC) go to CASA website at www.casa.gov.au

Feature

ATSB PRESENTATION AT THE INTERNATIONAL SOCIETY OF AIR SAFETY INVESTIGATORS

The annual International Society of Air Safety Investigators (ISASI) conference was held from 17 to 20 October 2016 in Reykjavik, Iceland. The ATSB was represented by Senior Transport Safety Investigator Heather Fitzpatrick, presenting a paper titled *Investigating linkages between an occurrence and an organisation's safety system performance*.

The paper detailed how the ATSB has used the 'fatigue and fatigue risk management system framework' in linking the performance of an organisation's systems to the events leading up to an occurrence itself. This included discussing how an organisation's safety management system performance is considered in the course of an investigation, with examples from recent ATSB investigations (AO-2014-189) and (AO-2014-192).

Approximately 320 people attended the conference, which hosted representatives from 43 countries. Overall, the presentations given throughout the conference included a number that were of interest to the ATSB's methods and approach to investigation, including presentations from the UK's Air Accidents Investigation Branch on the use of a drone and photogrammetry software to create 3D models of accident sites; the Dutch Safety Board's presentation on the MH17 investigation from the perspective of the personal challenges faced by the investigators during their on-site work; and the deputy investigator in charge of the Germanwings accident presenting on the various considerations in managing pilot mental health.

The ATSB seeks to be an active participant in forums where there is an opportunity to share knowledge and experiences. Accident investigators are best positioned to identify safety issues when they are working from the wealth of knowledge from occurrence investigations that has come before them.

Figure 20: Heather Fitzpatrick presenting at the International Society of Air Safety Investigators

Source: ATSB

Feature

THE ATSB HOSTS MARINE INVESTIGATORS FORUM

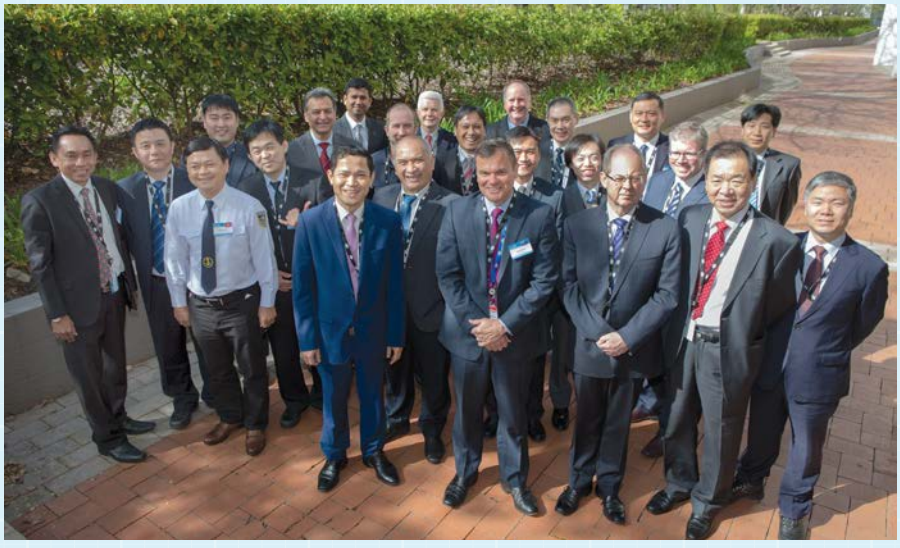
In October 2016, the ATSB hosted the 19th meeting of the Marine Accident Investigators Forum in Asia (MAIFA).

The meeting brought together experts from across the Asia–Pacific region to discuss and exchange views, ideas and information on marine safety investigations.

A number of presentations were provided by participating countries and discussions also took place on a wide range of topics, including an interesting debate on hydrographic services, chart corrections and collision avoidance stemming from a Singaporean case study.

Attendees were also provided with an insight into Australia's investigative capabilities with a tour of the ATSB's laboratories, and into the work of the Australian Maritime Safety Authority through a visit to its Joint Rescue Coordination Centre.

Figure 21: Participants at the October 2016 MAIFA Conference in Canberra



Source: ATSB

ATSB Chief Commissioner, Greg Hood, said Australia's reputation for high-quality, rigorous investigations makes us uniquely placed to assist with transport safety in the Asia–Pacific region.

'The ATSB has an active program of regional engagement with other transport safety agencies, over and above that required by our international obligations', Mr Hood said.

'In addition to investigating marine accidents and incidents in Australia, we provide technical assistance to a number of countries in our region', he continued.

Countries participating in the 19th MAIFA were Cambodia, the People's Republic of China, Hong Kong, Japan, the Republic of Korea, Malaysia, New Zealand, Singapore, Thailand, Vietnam and Australia.

A key outcome was a motion for establishing a permanent secretariat for MAIFA—a non-profit organisation dedicated to the advancement of marine safety and the prevention of marine pollution. MAIFA's purpose is to promote and improve marine accident investigation, and to foster cooperation and communication between marine accident investigators.

Feature

THE ATSB PROACTIVELY ENGAGING WITH INDUSTRY ON TRANSPORT SAFETY

The ATSB's independent investigations and world-class research and analysis produce important safety messages intended to help prevent accidents and incidents from recurring. To get safety messages to the people and organisations who can make the best use of them, the ATSB undertakes a wide variety of industry engagement activities. These include participation in consultative forums with industry and other safety agencies; representation at conferences and events; bilateral engagement with operators, associations and other stakeholders; the creation and distribution of educational materials; and active involvement in safety education forums.

In addition to its participation in a number of public forums, the ATSB works to familiarise members of industry with its operations, hosting meetings on its premises and acquainting visitors with the organisation's capabilities. This includes meeting with investigators, and providing guided tours of our technical facilities: the engineering lab, the recorder download lab, and the audio lab. These last two, where investigators access and analyse Cockpit Voice Recorder and Flight Data Recorder readouts for occurrences in Australia and overseas, are unique to the Asia–Pacific region. Australia is one of the few countries in the Asia–Pacific region to possess these types of laboratories.

In February 2017, stakeholder engagement included hosting a meeting of chief pilots from all of Australia's high-capacity carriers. The forum was established to enhance aviation safety by encouraging the ongoing, effective relationship with industry stakeholders.

Facilitated by Virgin Australia Regional Airlines, the group met at the ATSB to discuss transport safety notifications and occurrence reporting, as well as aviation regulatory matters. This provided an opportunity for Chief Commissioner Greg Hood to explain how the national transport safety investigator is evolving to meet a host of new challenges within the aviation industry. The chief pilots were also able to tour the ATSB's technical facilities.

The ATSB Chief Commissioner, Greg Hood, said that connecting with industry was vital to making a real difference to transport safety. 'We make recommendations to industry and government on an ongoing basis as part of our investigations. By establishing a relationship of mutual respect and ensuring that industry understands the importance and quality of our investigations, we're working to ensure that our safety messages lead to real action'.

Figure 22: ATSB Chief Commissioner Greg Hood with members of the Chief Pilots' Forum

Source: ATSB

Feature

ATSB SAFETY MESSAGE GOES VIRAL

Figure 23: Image showing aftermath of the battery explosion

Source: Supplied

A cautionary news article written by the ATSB on lithium ion batteries exploding inside a set of headphones mid-flight went viral in March, after being shared on the ATSB's social media channels.

On 14 March 2017, the ATSB authored an article highlighting the potential risk of explosion and fire from battery-powered devices on flights after a woman was injured by malfunctioning headphones.

The article was viewed more than 50,000 times and reached over 79,000 people through Facebook, while also receiving almost 30,000 impressions on Twitter. The story was picked up by a large number of media outlets nationally and internationally, further spreading the safety message to the travelling public and industry. An internet search for the story at the time brought up over a million search results on Google.

ATSB Chief Commissioner, Greg Hood, said the level of interest in the article, and its rapid spread across the world, highlights the importance of online engagement by the ATSB. He said, 'A key function of the ATSB is to improve safety and public confidence in the aviation, marine and rail modes of transport, and one of the ways we do this is through fostering safety awareness, knowledge and action. Our online channels, including our website, allow us to communicate our messages immediately with our stakeholders.

'In this instance, we were able to use the article to direct readers to further information on travelling safely with batteries and portable powerpacks, as well as provide details of other similar incidents for context'.

Continuing to build the ATSB's social media presence is one of the ATSB's Key Deliverables in 2017–18.

You can visit the ATSB online through our website, Twitter, Facebook, or YouTube accounts.

Feature

THE ATSB EVOLUTION PROGRAM

The 2016–17 financial year has been a year of positive and exciting change for the ATSB.

Under the direction of its Chief Commissioner, the ATSB implemented a significant transformation initiative known as the 'Evolution Program'. This program, in essence, was designed to enable better resource allocation and utilisation across the agency. It was underpinned by a number of change imperatives including:

- shifting our strategic focus towards becoming a fully capable and mature data-driven organisation—moving from being reactive to proactive to eventually, predictive
- recognising the importance/imperative of improving safety by raising industry and community safety awareness, knowledge and action through safety education and promotion
- moving from output or report focused, to outcome focused
- improving our cumbersome procedural framework
- re-establishing accredited learning and development pathways
- strengthening our recruitment, performance and talent management frameworks
- developing a culture of empowerment, performance and continuous improvement
- re-energising our workforce
- establishing greater financial assuredness and sustainability.

Ultimately, the overarching objective of the program is to create an environment where all ATSB employees work collaboratively as 'one team'. Implicitly, our staff will be empowered and given every opportunity to bring to bear their collective core skills, shared values, passion and drive to improve transport safety.

Figure 24: ATSB staff meeting

Source: ATSB

The Evolution Program has certainly lived up to its connotation. While there have been changes within our organisational structure–most notably, a streamlined senior management group and the introduction of multi-disciplined investigator teams—the program has also provided the impetus to refine our business practices and expand our deliverables.

A key success factor for the program has been the Government's recent budget measure which will enable the ATSB to increase its capabilities beyond primarily conducting independent 'no-blame' accident and incident investigations. The ATSB will have a renewed focus on data collection, analysis and research, and will raise industry and community safety awareness through increased safety education and communications. Consequently, the ATSB will be able to more selectively allocate resources to investigate accidents and incidents that have the greatest potential for improving safety for the travelling public. It will also allow the ATSB to make advances in the timeliness of completed reports.

Feature

ICAO AUDIT THE ATSB

In April 2017 the International Civil Aviation Organization (ICAO) conducted an on-site audit of the ATSB's compliance with ICAO's standards, recomme nded practices and guidance material for aircraft accident investigation. Australia sought the audit from ICAO with ATSB Chief Commissioner Greg Hood stating, 'This is an important opportunity for the ATSB to demonstrate its accident investigation capabilities against the benchmark set by ICAO. We know that we are doing well in a number of areas but the results of an audit can give us new insights into how we conduct investigations, with a view to enhancing our capacity to deliver outcomes for aviation safety'.

The audit covered core areas including:

- promulgation of aircraft accident investigation legislation
- establishment of an independent accident investigation authority
- allocation of sufficient financial resources
- qualifications and training of personnel
- availability of facilities and equipment
- establishment and implementation of investigation procedures
- the conduct of timely investigations and publication of findings.

Figure 25: ICAO Auditor Thor Thormodsson

Source: ATSB

The ICAO auditor sent to Australia was Mr Thor Thormodsson. He has a background as a commercial and instrument-rated pilot and as an accident investigator. He has conducted ICAO audits for the past eight years.

Mr Thormodsson said the following in relation to his work as an ICAO auditor, 'On the whole, my job is highly rewarding. It keeps me in touch with the outside world. I perform an audit, then go back to the country and see significant differences due to the audit findings and safety recommendations'.

Australia is fortunate that it has a relatively mature safety oversight system and expects that the audit will reflect well on Australia's conformance with ICAO's requirements for accident investigation. Where there are identified opportunities to improve, the ATSB will be working to ensure positive change.

The results of the audit will be made available through ICAO's online portal.

Feature

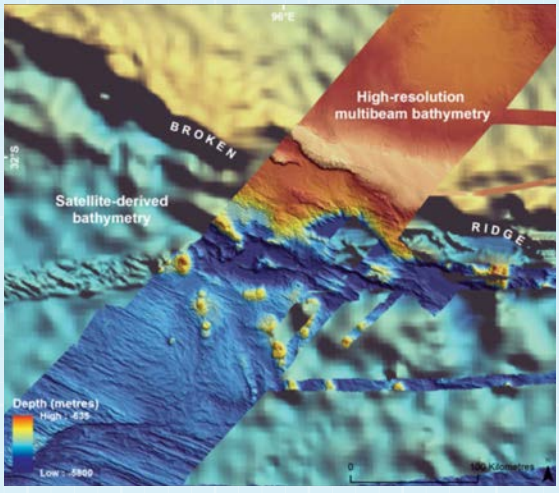
SEARCH FOR MH370—MAPPING THE SEAFLOOR IN THE SEARCH AREA

Consistent with the principles of open government, the ATSB seeks to transparently disclose information in the public domain that it acquires during the course of carrying out its functions. The search for MH370 was an extension of the ATSB's normal investigative work in which large volumes of data was acquired from surveying the seafloor. This information is now being released to the public.

The underwater search for MH370 required a phased approach, given the unknown composition and topography of the seafloor in the search area. Before the high resolution sonar search commenced, a bathymetric survey was conducted to ensure that the underwater vehicles to be used in the search could be navigated safely and efficiently close to the seafloor.

The majority of the bathymetric survey was conducted using hull-mounted multibeam sonar systems on numerous vessels from May to December 2014. Supplementary bathymetry data was intermittently acquired to expand the search area from December 2014 to February 2017.

Figure 26: The differences in resolution between multibeam and satellite-derived bathymetry data



Source: ATSB/Geoscience Australia

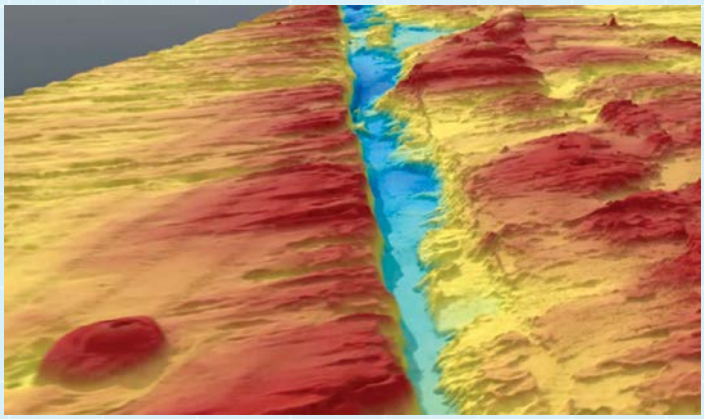
The search for MH370 collected 278,000 square kilometres of bathymetry data within the search area and 710,000 square kilometres of data in total, which includes the data acquired in transit between port and the search area.

The data gathered during the underwater search was analysed and mapped by Geoscience Australia. Previous maps of the seafloor in the search area were from satellite-derived

gravity data and only indicated the depth of the ocean at a coarse resolution of approximately 5 square kilometres per pixel. The MH370 bathymetric survey collected data at 40 square metres per pixel, allowing for safe navigation for underwater vehicles.

The underwater mapping revealed details about the seafloor that were not visible in the previous satellite-derived bathymetry, including vast seamounts 1,500 m high and kilometres wide, deep canyons and underwater landslides of sediment that travel for kilometres along the seafloor.

Figure 27: Geelvinck Fracture Zone 4,500 m below sea level, fault depth 900 m.



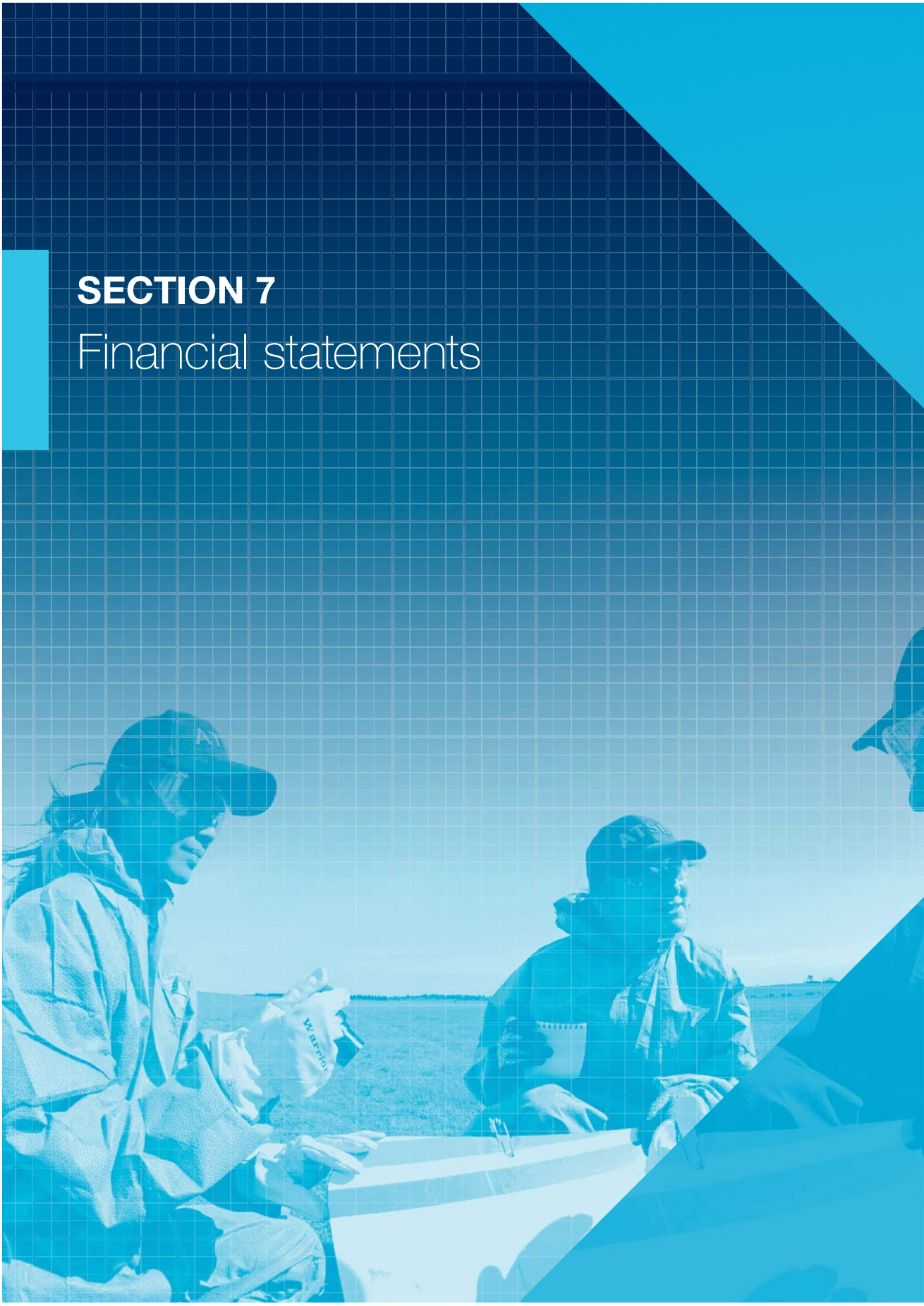
Source: ATSB/Geoscience Australia
Note: Vertical exaggeration is 3 times.

From the beginning of the underwater search for MH370, it was always intended that all seafloor data gathered would be released to the Australian and international public.

While the data was collected for the sole purpose of locating MH370, it will also be of particular interest to the scientific community, as it represents the results of the largest continuous deep-sea survey undertaken, and is some of the first high-resolution data of this area of the southern Indian Ocean.

The data collected through the first phase of the search for MH370 is now publically available from Geoscience Australia.

SECTION 7
Financial statements



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Australian National
Audit Office

Australian Government
Australian Transport Safety Bureau

STATEMENT BY THE CHIEF COMMISSIONER AND CHIEF FINANCIAL OFFICER

In our opinion, the attached financial statements for the year ended 30 June 2017 comply with subsection 42(2) of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act), and are based on properly maintained financial records as per subsection 41(2) of the PGPA Act.

In our opinion, at the date of this statement, there are reasonable grounds to believe that the Australian Transport Safety Bureau will be able to pay its debts as and when they fall due.

Greg Hood
Chief Commissioner

19 September 2017

Naranjan Rajput
Chief Financial Officer A/g

19 September 2017

Statement of Comprehensive Income
for the period ended 30 June 2017

	Notes	2017 $'000	2016 $'000	Original Budget 2017 $'000
NET COST OF SERVICES				
Expenses				
Employee Benefits	1.1A	**(16,543)**	(15,457)	(14,220)
Suppliers	1.1B	**(34,507)**	(94,001)	(7,016)
Depreciation and amortisation	2.2A	**(773)**	(834)	(1,121)
Finance Costs	1.1C	**(8)**	(8)	(2)
Write-Down and Impairment of Assets	1.1D	**(59)**	(23)	-
Total expenses		**(51,890)**	(110,323)	(22,359)
Own-Source Income				
Own-source revenue				
Sale of Goods and Rendering of Services	1.2A	**20,172**	28,856	952
Other Revenue	1.2B	**2,324**	10,758	2,117
Total own-source revenue		**22,496**	39,614	3,069
Gains				
Other Gains	1.2C	**22**	-	-
Total gains		**22**	-	-
Total own-source income		**22,518**	39,614	3,069
Net cost of services		**(29,372)**	(70,709)	(19,290)
Revenue from Government	1.2D	**22,846**	68,218	18,169
Deficit attributable to the Australian Government		**(6,526)**	(2,491)	(1,121)
OTHER COMPREHENSIVE INCOME				
Items not subject to subsequent reclassification to net cost of services				
Changes in asset revaluation surplus		**183**	-	-
Total other comprehensive income		**183**	-	-
Total comprehensive income		**(6,343)**	-	-

The above statement should be read in conjunction with the accompanying notes.

Statement of Financial Position
as at 30 June 2017

	Notes	2017 $'000	2016 $'000	Original Budget 2017 $'000
ASSETS				
Financial assets				
Cash and Cash Equivalents	2.1A	**368**	453	821
Trade and Other Receivables	2.1B	**24,375**	45,786	27,437
Accrued Revenue		**223**	111	76
Total financial assets		**24,966**	46,350	28,334
Non-financial assets				
Heritage and cultural	2.2A	**15**	-	-
Plant and equipment	2.2A	**1,268**	1,130	683
Computer Software	2.2A	**671**	857	2,975
Prepayments		**144**	155	137
Total non-financial assets		**2,098**	2,142	3,795
Total assets		**27,064**	48,492	32,129
LIABILITIES				
Payables				
Suppliers	2.3A	**(1,102)**	(17,242)	(9,602)
Other Payables	2.3B	**(622)**	(172)	(11,563)
Total payables		**(1,724)**	(17,414)	(21,165)
Interest bearing liabilities				
Leases	2.4A	**(222)**	(126)	-
Total interest bearing liabilities		**(222)**	(126)	-
Provisions				
Employee Provisions	4.1A	**(4,297)**	(4,391)	(4,549)
Other Provisions	2.5A	**(121)**	(74)	(76)
Total provisions		**(4,418)**	(4,465)	(4,625)
Total liabilities		**(6,364)**	(22,005)	(25,790)
Net assets		**20,700**	26,487	6,339
EQUITY				
Contributed equity		**13,314**	12,758	13,091
Reserves		**461**	278	3,442
Retained surplus/(Accumulated deficit)		**6,925**	13,451	(10,194)
Total equity		**20,700**	26,487	6,339

The above statement should be read in conjunction with the accompanying notes.

Statement of Changes in Equity
for the period ended 30 June 2017

	Notes	2017 $'000	2016 $'000	Original Budget 2017 $'000
CONTRIBUTED EQUITY				
Opening balance				
Balance carried forward from previous period		**12,758**	12,031	12,735
Contributions by owners				
Equity injection - Appropriations		**200**	371	-
Departmental capital budget		**356**	356	356
Total transactions with owners		**556**	727	356
Closing balance as at 30 June		**13,314**	12,758	13,091
RETAINED EARNINGS				
Opening balance				
Balance carried forward from previous period		**13,451**	15,942	(9,073)
Comprehensive income				
Deficit for the period		**(6,526)**	(2,491)	(1,121)
Total comprehensive income		**(6,526)**	(2,491)	(1,121)
Closing balance as at 30 June		**6,925**	13,451	(10,194)
ASSET REVALUATION RESERVE				
Opening balance				
Balance carried forward from previous period		**278**	278	3,442
Other Comprehensive income				
Other comprehensive income		**183**	-	-
Total other comprehensive income		**183**	-	-
Closing balance as at 30 June		**461**	278	3,442
Total Equity as at 30 June		**20,700**	26,487	6,339

The above statement should be read in conjunction with the accompanying notes.

Accounting Policy
Equity Injections
Amounts appropriated which are designated as 'equity injections' for a year (less any formal reductions) and Departmental Capital Budgets (DCBs) are recognised directly in contributed equity in that year.

Cash Flow Statement
for the period ended 30 June 2017

	Notes	2017 $'000	2016 $'000	Original Budget 2017 $'000
OPERATING ACTIVITIES				
Cash received				
Appropriations		**44,664**	73,307	18,169
Sale of goods and rendering of services		**19,723**	29,201	910
Net GST received		**773**	192	350
Other		**121**	187	-
Total cash received		**65,281**	102,887	19,429
Cash used				
Employees		**(16,038)**	(16,057)	(14,220)
Suppliers		**(49,107)**	(86,965)	(5,251)
Borrowing costs		**(6)**	(6)	-
Other		**(122)**	(187)	-
Total cash used		**(65,273)**	(103,215)	(19,471)
Net cash from/(used by) operating activities		**8**	(328)	(42)
INVESTING ACTIVITIES				
Cash received				
Proceeds from sales of property, plant and equipment		**7**	-	-
Total cash received		**7**	-	-
Cash used				
Purchase of property, plant and equipment		**(243)**	(100)	(211)
Purchase of software		**(215)**	(196)	(145)
Total cash used		**(458)**	(296)	(356)
Net cash used by investing activities		**(451)**	(296)	(356)
FINANCING ACTIVITIES				
Cash received				
Contributed equity		**403**	279	356
Total cash received		**403**	279	356
Cash used				
Repayment of finance leases		**(45)**	(23)	-
Total cash used		**(45)**	(23)	-
Net cash from financing activities		**358**	256	356
Net decrease in cash held		**(85)**	(368)	(42)
Cash and cash equivalents at the beginning of the reporting period		**453**	821	863
Cash and cash equivalents at the end of the reporting period	2.1A	**368**	453	821

The above statement should be read in conjunction with the accompanying notes.

Budget Variances Commentary

The explanations provide a comparison of the original budget as presented in the 2016-17 Portfolio Budget Statements (PBS) to the 2016-17 final outcome as presented in accordance with Australian Accounting Standards for the Australian Transport Safety Bureau (ATSB). The Budget is not audited.

Variances are considered to be 'major' based on the following criteria:
- the variance between budget and actual is greater than 10%: and
- the variance between budget and actual is greater than 2% of total expenses or total own source revenues: or
- the variance between budget and actual is below this threshold but is considered important for the reader's understanding or is relevant to an assessment of the discharge of accountability and to an analysis of performance of the agency.

In some instances, a budget has not been provided for in the PBS, for example non-cash items such as asset revaluations and sale of assets adjustments. Unless the variance is considered to be 'major' no explanation has been provided.

Explanations of major variances	Affected line items (and statement)
Search for Missing Malaysia Airlines Flight 370 (MH370) Variances between the budget contained within the PBS and the actual outcome for the 2016-2017 financial year are primarily due to decisions in relation to the search for the missing Malaysia Airlines Flight 370 (MH370) that had been made by the involved Governments after the time the PBS was published. Factors primarily contributing to the variances include: 1. During the year the ATSB received an additional $15 million in contributions from the Malaysian Government and $3.0 million in Appropriation Revenue from the Australian Government through the MYEFO. 2. Finalisation of payments to a majority of suppliers in relation to the search resulting in a drop in trade and other receivables and suppliers and other payables.	Statement of Comprehensive Income: - Employee Benefits - Suppliers - Sale of Goods and Rendering of Services - Other Revenue - Revenue from Government Statement of Financial Position - Trade and Other Receivables - Suppliers - Other Payables - Retained surplus/(Accumulated deficit) Cash Flow Statement - Operating cash received - Appropriations - Operating cash received - Sale of goods and rendering of services - Operating cash used - Employees - Operating cash used - Suppliers
Value of Intangibles and Depreciation and Amortisation During Original Budget Process An adjustment made to the value of Intangible Assets in the order of $3 million was reversed post the publication of the PBS. As a result of this adjustment projected depreciation expense was based on a higher amounts of assets during the financial year.	Statement of Comprehensive Income: - Depreciation and amortisation Statement of Financial Position - Property, plant and equipment - Intangibles - Reserves
Cash Used - Investing Activities The ATSB undertakes a conservative approach to its management of capital requirements that relate to emerging trends and its corporate strategy. The primary driver for the increase in capital purchases is investment in upgrades to infrastructure plant and equipment and software in relation to the ATSB's investigation function.	Cash Flow Statement - Investing cash used - Purchase of property, plant and equipment - Investing cash used - Purchase of software - Investing cash received - Contributed equity

Overview

The Basis of Preparation

The financial statements are general purpose financial statements and are required by section 42 of the Public Governance, Performance and Accountability Act 2013.

The financial statements have been prepared in accordance with:

a) *Public Governance, Performance and Accountability (Financial Reporting) Rule 2015* (FRR) for reporting periods ending on or after 1 July 2015; and

b) Australian Accounting Standards and Interpretations – Reduced Disclosure Requirements issued by the Australian Accounting Standards Board (AASB) that apply for the reporting period.

The financial statements have been prepared on an accrual basis and in accordance with the historical cost convention, except for certain assets and liabilities at fair value. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position. The financial statements are presented in Australian dollars.

New Accounting Standards

No new, revised, amending standards or interpretations that were issued prior to the sign-off date and are applicable to the current reporting period had a material effect on the entity's financial statements.

Taxation

The ATSB is exempt from all forms of taxation except Fringe Benefits Tax (FBT) and the Goods and Services Tax (GST).

Events After the Reporting Period

There were no events subsequent to 30 June 2017 that had the potential to significantly effect the ongoing structure and financial activities of the ATSB.

Financial Performance

This section analyses the financial performance of the Australian Transport Safety Bureau for the year ended 30 June 2017.

1.1 Expenses

	2017 $'000	2016 $'000
1.1A: Employee Benefits		
Wages and salaries	**(12,041)**	(11,668)
Superannuation		
Defined contribution plans	**(1,026)**	(847)
Defined benefit plans	**(1,255)**	(1,390)
Leave and other entitlements	**(1,398)**	(1,260)
Separation and redundancies	**(701)**	(207)
Other employee expenses	**(122)**	(85)
Total employee benefits	**(16,543)**	(15,457)

Accounting Policy
Accounting policies for employee related expenses are contained in the People and relationships section.

1.1B: Suppliers		
Goods and services supplied or rendered		
Investigation services	**(28,261)**	(87,747)
Office rent[1]	**(1,554)**	(1,764)
Information technology	**(1,381)**	(1,435)
Travel	**(711)**	(769)
Contracted Services	**(374)**	(465)
Services from the Department of Infrastructure and Regional Development	**(763)**	(668)
Training and conferences	**(173)**	(221)
Communications	**(226)**	(204)
Publications and printing	**(117)**	(94)
Legal	**(16)**	(68)
Consultants	**(284)**	(16)
Audit fees	**(49)**	(49)
Other	**(298)**	(301)
Total goods and services supplied or rendered	**(34,207)**	(93,801)
Goods supplied	**(81)**	(92)
Services rendered	**(34,126)**	(93,709)
Total goods and services supplied or rendered	**(34,207)**	(93,801)
Other suppliers		
Workers compensation expenses	**(300)**	(200)
Total other suppliers	**(300)**	(200)
Total suppliers	**(34,507)**	(94,001)

[1] The DOIRD leases all premises that the ATSB occupies, therefore the ATSB does not have any lease commitments

1.1C: Finance Costs		
Finance leases	**(6)**	(6)
Unwinding of discount	**(2)**	(2)
Total finance costs	**(8)**	(8)

Accounting Policy
All borrowing costs are expensed as incurred.

1.1 Expenses continued

	2017 $'000	2016 $'000
1.1D: Write-Down and Impairment of Assets		
Impairment of property, plant and equipment	**(59)**	(23)
Total write-down and impairment of assets	**(59)**	(23)

1.2 Own-Source Revenue and gains

	2017 $'000	2016 $'000
Own-Source Revenue		
1.2A: Sale of Goods and Rendering of Services		
Rendering of services	**20,172**	28,856
Total sale of goods and rendering of services	**20,172**	28,856

Accounting Policy

Revenue from the sale of goods is recognised when:

a) the risks and rewards of ownership have been transferred to the buyer;
b) the entity retains no managerial involvement or effective control over the goods;
c) the revenue and transaction costs incurred can be reliably measured; and
d) it is probable that the economic benefits associated with the transaction will flow to the ATSB.

Revenue from rendering of services is recognised by reference to the stage of completion of contracts at the reporting date. The revenue is recognised when:

a) the amount of revenue, stage of completion and transaction costs incurred can be reliably measured; and
b) the probable economic benefits associated with the transaction will flow to the ATSB.

The stage of completion of contracts at the reporting date is determined by reference to the proportion that costs incurred to date bear to the estimated total costs of the transaction.
Receivables for goods and services, which have 30 day terms, are recognised at the nominal amounts due less any impairment allowance account. Collectability of debts is reviewed at the end of the reporting period. Allowances are made when collectability of the debt is no longer probable.

1.2B: Other Revenue		
Resources received free of charge		
Remuneration of auditors[1]	**49**	48
Other[2]	**2,275**	10,710
Total other revenue	**2,324**	10,758

[1] The ANAO does not provide any other services other than audit of Financial Statements.

[2] Other revenue in 2015-16 primarily comprised of resources received free of charge in support of the search for MH370.

Gains

1.2C: Other Gains		
Resources received free of charge - Donated Heritage & Cultural Asset	**15**	-
Other	**7**	-
Total other gains	**22**	-

Accounting Policy

Resources Received Free of Charge
Resources received free of charge are recognised as revenue when, and only when, a fair value can be reliably determined and the services would have been purchased if they had not been donated. Use of those resources is recognised as an expense. Resources received free of charge are recorded as either revenue or gains depending on their nature.
Contributions of assets at no cost of acquisition or for nominal consideration are recognised as gains at their fair value when the asset qualifies for recognition, unless received from another non-corporate or corporate Commonwealth entity as a consequence of a restructuring of administrative arrangements.

1.2 Own-Source Revenue and gains - continued		
	2017	2016
	$'000	$'000
1.2D: Revenue from Government		
Appropriations		
Departmental appropriations	**22,846**	68,218
Total revenue from Government	**22,846**	68,218

Accounting Policy

Revenue from Government
Amounts appropriated for departmental appropriations for the year (adjusted for any formal additions and reductions) are recognised as Revenue from Government when the ATSB gains control of the appropriation. Appropriations receivable are recognised at their nominal amounts.

Financial Position

This section analyses the Australian Transport Safety Bureau's assets used to conduct its operations and the operating liabilities incurred as a result. Employee related information is disclosed in the People and Relationships section.

2.1 Financial Assets

	2017 $'000	2016 $'000
2.1A: Cash and Cash Equivalents		
Cash on hand or on deposit	**368**	453
Total cash and cash equivalents	**368**	453

Accounting Policy
Cash is recognised at its nominal amount. Cash and cash equivalents includes:
a) cash on hand; and
b) demand deposits in bank accounts with an original maturity of 3 months or less that are readily convertible to known amounts of cash and subject to insignificant risk of changes in value.

2.1B: Trade and Other Receivables		
Goods and services receivables		
Goods and services	**352**	59
Total goods and services receivables	**352**	59
Appropriations receivables		
Appropriation receivable	**23,982**	45,648
Total appropriations receivables	**23,982**	45,648
Other receivables		
Statutory receivables	**41**	79
Total other receivables	**41**	79
Total trade and other receivables (gross)	**24,375**	45,786
Total trade and other receivables (net)	**24,375**	45,786

Trade and other receivables have been assessed for impairment and none was identified.

Accounting Policy
Receivables
Trade receivables and other receivables that have fixed or determinable payments that are not quoted in an active market are classified as 'loans and receivables'. Loans and Receivables are measured at amortised cost using the effective interest method less impairment. Interest is recognised by applying the effective interest rate.

2.2 Non-Financial Assets

2.2A: Reconciliation of the Opening and Closing Balances of Non-Financial Assets

Reconciliation of the opening and closing balances of Non-Financial assets

	Heritage and Cultural[1] $'000	Plant and equipment $'000	Computer Software[2] $'000	Total $'000
As at 1 July 2016				
Gross book value	-	2,398	6,182	8,580
Accumulated depreciation, amortisation and impairment	-	(1,268)	(5,325)	(6,593)
Total as at 1 July 2016	-	1,130	857	1,987
Additions				
Purchase	-	243	-	243
Internally developed	-	-	215	215
Finance lease	-	142	-	142
Donation/Gift	15	-	-	15
Revaluations and impairments recognised in other comprehensive income	-	184	-	184
Impairments recognised in net cost of services	-	(3)	(56)	(59)
Depreciation and amortisation	-	(428)	(345)	(773)
Total as at 30 June 2017	15	1,268	671	1,954
Total as at 30 June 2017 represented by				
Gross book value	15	1,357	5,716	7,088
Accumulated depreciation, amortisation and impairment	-	(89)	(5,045)	(5,134)
Total as at 30 June 2017	15	1,268	671	1,954

1. The ATSB received a donation of a Pegasus Mark II Propeller from a Supermarine Walrus plane. The Supermarine Walrus was a British single-engine amphibious biplane reconnaissance aircraft first flown in 1933.

2. The carrying amount of computer software included $217,000 purchased software and $454,000 internally generated software.

No indicators of impairment were found for any non-financial assets.

Revaluations of non-financial assets

All revaluations were conducted in accordance with the revaluation policy stated in the Note 5.3. An independent valuer, Australian Valuation Solution revalued all non-financial assets as at 30 June 2017.

Accounting Policy
Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken. Financial assets are initially measured at their fair value plus transaction costs where appropriate.

Donated assets, assets acquired at no cost or for nominal consideration, are initially recognised as assets and income at their fair value at the date of acquisition. The ATSB received one donated asset. Please refer to the Heritage and Cultural Assets section in this accounting policy note.

Asset Recognition Threshold
Purchases of property, plant and equipment are recognised initially at cost in the statement of financial position, except for purchases costing less than $5,000 excluding GST, which are expensed in the year of acquisition (other than where they form part of a group of similar items which are significant in total).

The initial cost of an asset includes an estimate of the cost of dismantling and removing the item and restoring the site on which it is located. This is particularly relevant to 'make good' provisions in relation to property leases taken up by the Department of Infrastructure and Regional Development (DOIRD) properties and occupied by the ATSB where an obligation exists to restore the property to its original condition. As the property leases are held by the DOIRD, these costs are included in the value of the ATSB's Property, Plant and Equipment asset class with a corresponding provision for the 'make good' recognised.

Depreciation
Depreciable property, plant and equipment assets are written-off to their estimated residual values over their estimated useful lives to the ATSB using, in all cases, the straight-line method of depreciation.

Depreciation rates (useful lives), residual values and methods are reviewed at each reporting date and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate.

Depreciation rates applying to each class of depreciable asset are based on the following useful lives:

	2017	2016
Plant and Equipment	3 to 10 Years	3 to 10 Years
Computer Equipment	4 Years	4 Years
Office Equipment	3 to 10 Years	3 to 10 Years
Heritage & Cultural	100 Years	-

Impairment
All assets were assessed for impairment as at 30 June 2017. Where indications of impairment exist the assets's recoverable amount is estimated and an impairment adjustment is made if the asset's recoverable amount is less than its carrying amount.

The recoverable amount of an asset is the higher of its fair value less costs of disposal and its value in use. Value in use is the present value of the future cash flows expected to be derived from the asset. Where the future economic benefit of an asset is not primarily dependent on the asset's ability to generate future cash flows, and the asset would be replaced if the entity were deprived of the asset, its value in use is taken to be its depreciated replacement cost.

Derecognition
An item of property, plant and equipment is derecognised upon disposal or when no further future economic benefits are expected from its use or disposal.

Heritage and Cultural Assets
The ATSB received a donation of a Pegasus Mark II Propeller from a Supermarine Walrus plane. The Supermarine Walrus was a British single-engine amphibious biplane reconnaissance aircraft first flown in 1933.

The ATSB has classified this item as heritage and cultural asset as it is primarily used for purpose which relates to its heritage and cultural significance.

Intangibles
The ATSB's intangibles comprise of internally developed software for internal use and purchased software. These assets are carried at cost less accumulated amortisation and accumulated impairment losses. Intangibles are amortised on a straight line basis over their anticipated useful life and the default useful life is five years.
All intangibles were assessed for indications of impairment as at 30 June 2017.

2.3 Payables

	2017 $'000	2016 $'000
2.3A: Suppliers		
Accrued expenses	**(839)**	(13,326)
Trade creditors	**(263)**	(3,916)
Total suppliers	**(1,102)**	(17,242)

Settlement was usually made within 30 days.

2.3B: Other Payables		
Wages and salaries	**(212)**	(82)
Superannuation	**(16)**	(8)
Separations and redundancies	**(384)**	-
Unearned income	**(10)**	(82)
Total other payables	**(622)**	(172)

Accounting Policy
Supplier and other payables are recognised at amortised cost. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).

2.4 Interest Bearing Liabilities

	2017 $'000	2016 $'000
2.4A: Leases		
Finance Leases	**(222)**	(126)
Total leases	**(222)**	(126)
Leases expected to be settled		
Within 1 year		
Minimum lease payments	**(97)**	(92)
Future finance charges	**6**	3
Between 1 to 5 years		
Minimum lease payments	**(139)**	(39)
Future finance charges	**8**	2
Total leases	**(222)**	(126)

In 2017, finance leases existed in relation to office pool vehicles. The leases were non-cancellable and for fixed terms averaging 2.5 years, with a maximum of 3 years. The interest rate implicit in the vehicle leases averaged 4.44% (2016: 4.46%). The lease assets secured the lease liabilities. The ATSB guaranteed the residual values of all assets leased. There were no contingent rentals.

Accounting Policy
A distinction is made between finance leases and operating leases. Finance leases effectively transfer from the lessor to the lessee substantially all the risks and rewards incidental to ownership of leased assets. An operating lease is a lease that is not a finance lease. In operating leases, the lessor effectively retains substantially all such risks and benefits.
Where an asset is acquired by means of a finance lease, the asset is capitalised at either the fair value of the lease property or, if lower, the present value of minimum lease payments at the inception of the contract and a liability is recognised at the same time and for the same amount. The discount rate used is the interest rate implicit in the lease. Leased assets are amortised over the period of the lease. Lease payments are allocated between the principal component and the interest expense.

2.5 Other Provisions

2.5A: Other Provisions

	Provision for restoration $'000	Total $'000
As at 1 July 2016	**(74)**	**(74)**
Additional provisions made	**(47)**	**(47)**
Total as at 30 June 2017	**(121)**	**(121)**

The DOIRD leases all premises that the ATSB occupies. The ATSB reimburses DOIRD for its portion of lease costs. There is currently 1 agreement (2016: 1 agreement) for the leasing of premises which have provisions requiring the ATSB (through DOIRD) to restore the premises to their original condition at the conclusion of the lease. The ATSB has made a provision to reflect the present value of this obligation.

Funding

This section identifies the Australian Transport Safety Bureau's funding structure.

3.1 Appropriations

3.1A: Annual Appropriations ('Recoverable GST exclusive')

Annual Appropriations for 2017

	Annual Appropriation[1] $'000	Adjustments to appropriation $'000	Total appropriation $'000	Appropriation applied in 2017 (current and prior years) $'000	Variance[2] $'000
Departmental					
Ordinary annual services	**21,169**	**19,851**	**41,020**	**(65,373)**	**(24,353)**
Capital Budget[3]	**356**	**-**	**356**	**(203)**	**153**
Other services					
Equity Injections	**200**	**-**	**200**	**(200)**	**-**
Total departmental	**21,725**	**19,851**	**41,576**	**(65,776)**	**(24,200)**

1. Excludes $1.677 million in departmental supplementation appropriations provided to the ATSB during the 2017-18 budget process.
2. A large portion of the $24.353 million variance is directly related to the search for the MH370 and uncontrollable variables, such as weather. Other expenses in relation to the search for the missing aircraft have been slightly delayed, however the funds will be fully utilised in 2017-18.
3. Departmental Capital Budgets are appropriated through Appropriation Acts (No.1,3,5). They form part of ordinary annual services, and are not separately identified in the Appropriation Acts.

Annual Appropriations for 2016

	Annual Appropriation[1] $'000	Adjustments to appropriation $'000	Total appropriation $'000	Appropriation applied in 2016 (current and prior years) $'000	Variance[2] $'000
Departmental					
Ordinary annual services	68,223	39,160	107,383	(102,421)	4,962
Capital Budget[3]	356	-	356	-	356
Other services					
Equity	371	-	371	(279)	92
Total departmental	68,950	39,160	108,110	(102,700)	5,410

1. In 2015-16, an amount of $5,376 was quarantined as a result of the PSSAP Admin Fees, under section 51 of the PGPA Act.
2. A large portion of the $4.962 million variance is directly related to the search for missing Malaysia Airlines Flight 370 (MH370) and uncontrollable variables, such as weather. Other expenses in relation to the search for the missing aircraft have been slightly delayed, however the funds will be fully utilised in 2016-17.
3. Departmental Capital Budgets are appropriated through Appropriation Acts (No.1,3,5). They form part of ordinary annual services, and are not separately identified in the Appropriation Acts.

3.1B: Unspent Annual Appropriations ('Recoverable GST exclusive')

	2017 $'000	2016 $'000
Departmental		
Appropriation Act (No. 2) 2013-14	**459**	459
Appropriation Act (No. 1) 2014-15	**262**	262
Appropriation Act (No. 2) 2014-15	**555**	555
Appropriation Act (No. 1) 2015-16	**356**	44,280
Appropriation Act (No. 2) 2015-16	**92**	92
Appropriation Act (No. 1) 2016-17	**17,581**	-
Appropriation Act (No. 3) 2016-17	**3,000**	-
Cash at Bank - 30 June	**368**	453
Total departmental	**22,673**	46,101

Reconciliation to appropriations receivables

The above unspent appropriations balance does not include additional funding received under the new budget measure during the 2017-18 budget process as a prior year output. In order to reconcile closing appropriations receivables balance, this amount has been adjusted in the table below.

	2017 $'000	2016 $'000
Total unspent appropriations	**22,673**	46,101
Less Cash at Bank - 30 June	**(368)**	(453)
	22,305	45,648
Adjustments:		
Other Adjustments		
Appropriation Act (No. 1) 2016-17	**1,677**	-
Closing appropriations receivable balance	**23,982**	45,648

3.2 Net Cash Appropriation Arrangements

	2017 $'000	2016 $'000
Total comprehensive income /(loss) less depreciation/amortisation expenses previously funded through revenue appropriations	**(5,570)**	(1,657)
Plus: depreciation/amortisation expenses previously funded through revenue appropriation	**(773)**	(834)
Total comprehensive income - as per the Statement of Comprehensive Income	**(6,343)**	(2,491)

People and relationships

This section describes a range of employment and post employment benefits provided to our people and our relationships with other key people.

4.1 Employee Provisions

	2017 $'000	2016 $'000
4.1A: Employee Provisions		
Leave	**(4,297)**	(4,391)
Total employee provisions	**(4,297)**	(4,391)

Accounting Policy

Liabilities for 'short-term employee benefits' (as defined in AASB 119 *Employee Benefits*) and termination benefits due within twelve months of the end of reporting period are measured at their nominal amounts.

The nominal amount is calculated with regard to the rates expected to be paid on settlement of the liability.

Other long-term employee benefits are measured as a net total of the present value of the defined benefit obligation at the end of the reporting period minus the fair value at the end of the reporting period of plan assets (if any) out of which the obligations are to be settled directly.

Leave

The liability for employee benefits includes provision for annual leave and long service leave. No provision has been made for sick leave as all sick leave is non-vesting and the average sick leave taken in future years by employees of the ATSB is estimated to be less than the annual entitlement for sick leave.

The leave liabilities are calculated on the basis of employees' remuneration at the estimated salary rates that will be applied at the time the leave is taken, including the ATSB's employer superannuation contribution rates to the extent that the leave is likely to be taken during service rather than paid out on termination.

The liability for long service leave has been determined by reference to the Australian Government Shorthand Method outlined in the FRR for reporting periods ending on or after 1 July 2015. The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

Superannuation

The ATSB's staff are members of the Commonwealth Superannuation Scheme (CSS), the Public Sector Superannuation Scheme (PSS) or the PSS accumulation plan (PSSap).

The CSS and PSS are defined benefit schemes for the Australian Government. The PSSap is a defined contribution scheme.

The liability for defined benefits is recognised in the financial statements of the Australian Government and is settled by the Australian Government in due course. This liability is reported in the Department of Finance administered schedules and notes.

The ATSB makes employer contributions to the employees' superannuation scheme at rates determined by an actuary to be sufficient to meet the current cost to the Government. The ATSB accounts for the contributions as if they were contributions to defined contribution plans.

The liability for superannuation recognised as at 30 June 2017 represents outstanding contributions for the final fortnight of the year.

4.2: Key Management Personnel Remuneration

Key management personnel are those persons having authority and responsibility for planning, directing and controlling the activities of the ATSB, directly or indirectly.

Key management personnel of the ATSB include the Portfolio Minister, Chief Commissioner, Commissioners and other senior executive who the Chief Executive considers to be a KMP because of their responsibilities or nature of their work. Key management personnel remuneration is reported in the table below:

	2017	2016
	$	$
Short-term employee benefits	**(1,546,830)**	(1,612,514)
Post-employment benefits	**(250,133)**	(276,822)
Other long-term employee benefits	**(135,106)**	(141,385)
Termination benefits	**(271,217)**	(107,809)
Total key management personnel remuneration expenses[1,2]	**(2,203,286)**	(2,138,530)

The total number of key management personnel that are included in the above table is 12 individuals (2016: 11 individuals).

1. The above key management personnel remuneration excludes the remuneration and other benefits of the Portfolio Minister. The Portfolio Minister's remuneration and other benefits are set by the Remuneration Tribunal and are not paid by the ATSB.

2. KMP Remuneration for 2015-16 has retrospectively been updated to be consistent with the requirements of AASB 124.

4.3: Related Party Transactions

Related party relationships:

The ATSB is an Australian Government controlled entity. Related parties to the ATSB are the Key Management Personnel (KMP) identified at Note 4.2, their close family members, the Executives, bodies controlled by the KMP or their close family members, and other Australian Government entities.

Transactions with related parties:

Given the breadth of Government activities, related parties may transact with the government sector in the same capacity as ordinary citizens. Such transactions include the payment or refund of taxes, and higher education loans. These transactions have not been separately disclosed in this note.

No material transactions with related parties occurred during the financial year.

Managing uncertainties

This section analyses how the ATSB manages financial risks within its operating environment.

5.1 Contingent Assets and Liabilities

Quantifiable Contingencies

There are no quantifiable contingencies.

Unquantifiable Contingencies

At 30 June 2017, the ATSB is the respondent in a matter before the Court in relation to a claim for payment from a supplier which ATSB disputes that it contracted for or that it is liable to pay for such work . Due to uncertainty in the outcome of legal matters, the contingent asset or liabilities which may arise from the matter are unquantifiable.

There are no other unquantifiable contingencies.

Accounting Policy

Contingent liabilities and contingent assets are not recognised in the statement of financial position but are reported in the notes. They may arise from uncertainty as to the existence of a liability or asset or represent an asset or liability in respect of which the amount cannot be reliably measured. Contingent assets are disclosed when settlement is probable but not virtually certain and contingent liabilities are disclosed when settlement is greater than remote.

5.2: Financial Instruments

	2017 $'000	2016 $'000
5.2A: Categories of Financial Instruments		
Financial Assets		
Loans and receivables		
Cash and cash equivalents	**368**	453
Trade and other receivables	**352**	59
Total loans and receivables	**720**	512
Total financial assets	**720**	512
Financial Liabilities		
Financial liabilities measured at amortised cost		
Trade creditors	**(263)**	(3,916)
Finance leases	**(222)**	(126)
Total financial liabilities measured at amortised cost	**(485)**	(4,042)
Total financial liabilities	**(485)**	(4,042)
5.2B: Net Loss on Financial Liabilities		
Financial liabilities measured at amortised cost		
Interest expense	**(6)**	(6)
Net loss on financial liabilities measured at amortised cost	**(6)**	(6)
Net loss on financial liabilities	**(6)**	(6)

5.3 Fair Value Measurement

Accounting Policy
The ATSB has Heritage & Cultural and Property plant and equipment assets and the fair value for each asset is measured at market selling price, or depreciated replacement cost in isolated instances where no market prices or indicators are available for specialised, diagnostic equipment.

Following initial recognition at cost, property, plant and equipment are carried at fair value. Valuations are conducted with sufficient frequency to ensure that the carrying amounts of assets do not differ materially from the asset's fair value as at the reporting date. The regularity of independent valuations depends on the volatility of movements in market values for the relevant assets.

The ATSB engaged Australian Valuation Solutions (AVS) in 2016-17 to undertake a revaluation of all plant and equipment assets as at 30 June 2017 and confirm that the models developed comply with AASB 13.

Revaluation adjustments were made on a class basis. Any revaluation increment was credited to equity under the heading of asset revaluation reserve except to the extent that it reversed a previous revaluation decrement of the same asset class that was previously recognised in the surplus/deficit. Revaluation decrements for a class of assets were recognised directly in the surplus/deficit except to the extent that they reversed a previous revaluation increment for that class.

Any accumulated depreciation as at the revaluation date was eliminated against the gross carrying amount of the asset and the asset was restated to the revalued amount.

Fair Value Measurements

	Fair value measurements at the end of the reporting	
	2017	2016
	$'000	$'000
Non-financial assets		
Heritage and cultural	**15**	-
Property, plant and equipment	**1,268**	1,130
Total non-financial assets	**1,283**	1,130

SECTION 8

Management and accountability

8

MANAGEMENT AND ACCOUNTABILITY

The Commission

The ATSB is governed by a Commission, comprising a Chief Commissioner and three part-time Commissioners.

The Commission provides guidance on the selection of accidents and other safety incidents to be investigated. It also supports the ATSB in encouraging safety action ahead of final reports, thus reducing the need to issue safety recommendations.

The Commission operates within the corporate governance framework of the ATSB Commission Governance Manual. The manual sets out the Commission's legislative requirements, parliamentary and ministerial accountability, membership and functions, administrative policies and procedures, and reporting obligations.

The Commission meets face-to-face at least four times a year and manages ATSB business through regular teleconferences and electronic communications in accordance with its obligations under the TSI Act and its agreed policies.

All Commissioners participated in three Commission meetings during 2016–17. The Commissioners also attended the annual joint Papua New Guinea Accident Investigation Commission and Australian Transport Safety Bureau Commissioners' Meeting in April 2017.

Commissioner Chris Manning attended the May 2017 Senate Estimates hearing before the Rural and Regional Affairs and Transport Legislation Committee. Commissioner Manning attended in his capacity as the Commission spokesperson for the ATSB's reopened investigation into the ditching of Israel Aircraft Westwind 1124A aircraft, VH-NGA, 5 km SW of Norfolk Island Airport on 18 November 2009 (AO-2009-072).

Executive management

The ATSB Executive meets weekly to discuss strategic management issues and priorities. Prior to the organisational restructure taking effect in June 2017, the ATSB Executive consisted of the Chief Commissioner, the General Managers of Aviation Safety Investigations, Surface Safety Investigations and Strategic Capability, and the Program Director, Operational Search for MH370.

Following the organisational restructure, the ATSB Executive consists of the Chief Commissioner, the Executive Director Transport Safety, the Chief Operating Officer and the Program Director, Operational Search for MH370.

Audit Committee

The Audit Committee provides independent assurance and advice to the Chief Commissioner on the ATSB's risk management, internal controls, financial statements and legislative compliance. The Audit Committee consists of an independent chair, an independent member and an ATSB management nominee. The Committee's quarterly meetings were held in September and December 2016, and March and June 2017.

The core work of the Committee during the year was to oversee and advise on:

- the annual Internal Audit Program for 2016–17
- the ATSB's Risk Management, Fraud Control and Business Continuity Plans
- the ATSB's Financial Statement preparations
- implementation of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act) and the associated Rule
- the internal audit governance framework—including Audit Committee Charter, Internal Audit Charter and Internal Audit Strategic Plan 2014–17.

The Committee is also taking a key role in advising on the governance and financial management of the search for MH370.

The audit program for 2016–17 focused on assuring the ATSB's legislative compliance and performance against its core functions. The program included the following internal audits:

- International Civil Aviation Organization audit to determine Australia's compliance with international standards, recommended practices and guidance for aircraft accident investigation
- internal audit of payroll
- implementation of *Public Governance, Performance and Accountability Act 2013* requirements for performance reporting
- MH370 Program Closure Review.

Change Management advisory team

During 2016–17, a program of organisational change called the 'Evolution Program' was developed and implemented in the ATSB. The purpose of the Evolution Program was to improve the ATSB's efficiency and effectiveness. The objectives included becoming more data driven and adopting a multi-disciplinary approach that broke down any entrenched barriers which may have been an inhibitor to broader organisational collaboration.

A Change Management team was established to define the process and expected outcomes. The team consisted of eight employees representing different areas of the organisation. The team met regularly throughout 2016–17, focussing on the following work streams:

- the ATSB's deliverables and key performance indicators
- the ATSB's organisational structure
- resource allocation and workload tracking
- data capability
- safety communication and education
- human resources framework.

Business planning and reporting

Each year, the ATSB develops an Annual Plan—consistent with the strategic direction provided through its Corporate Plan, which is published on the ATSB website. The Annual Plan incorporates the operational priorities, activities, deliverables and key performance indicators for the financial year.

The *ATSB Annual Plan 2016–17* gave priority to:

- focused safety data recording, research and analysis
- undertaking and completing investigations of transport accidents, serious incidents and other safety occurrences
- maintaining our operational capabilities and readiness, including preparedness for a major accident
- actively participating in transport safety reforms
- fostering safety awareness, knowledge and action, including through the SafetyWatch priorities
- maintaining stakeholder relationships (including regional and international engagement)
- actioning key operational projects, including continuing the search for MH370.

Performance reporting for the Annual Plan is contained in Section 3 of this annual report.

Risk management

Consistent with the PGPA Act, the ATSB's Risk Management Framework is an integral element of its governance, planning and management framework. Risk assessment and mitigation have been integrated into ATSB business practices, planning and performance reporting—at both corporate and business unit levels.

The ATSB is committed to a comprehensive, coordinated and systematic approach to the management of risk—directed towards supporting managers at all levels to anticipate and plan for risk, and to respond appropriately. For 2016–17, the ATSB concentrated its risk focus on the areas of service delivery, health and safety, security, financial/economic, compliance and reputation.

The ATSB Enterprise Risk Register and Management Plan and Risk Policy are reviewed regularly by the Commission, the Executive and the Audit Committee. Ongoing review of risk management planning ensures the ATSB is well-placed to achieve the objectives of its risk management policy and that risk management is consistently practiced across the agency.

Business Continuity Plan

The ATSB's Business Continuity Plan provides a framework to ensure the ATSB is well-placed to manage a business disruption, implement recovery processes and build business resilience.

In 2016–17, the ATSB continued to review and test its operational risk management processes and responses, which mitigate the impact of non-routine business disruptions. The Audit Committee regularly reviews the ATSB's business continuity operations.

Fraud control

In accordance with the PGPA Act, the ATSB has in place the *ATSB Fraud Control Plan 2016–18*.

The ATSB's fraud risk register is monitored to minimise the incidence of fraud. This process is assisted through the development, implementation and regular assessment of its fraud prevention, detection and response strategies.

The introduction of the *Public Interest Disclosure Act 2013* in January 2014, and the development of the ATSB policy and procedure for making a disclosure under the scheme, has complemented the ATSB's fraud management strategies. The ATSB's staff awareness program incorporates activities for existing and new staff.

The Audit Committee and Commission receive regular reports on fraud risks and the implementation of controls and treatments. The Committee and the Commission review the Fraud Control Plan to ensure the ATSB has appropriate processes and systems in place to capture, and effectively investigate, fraud-related information.

There were no allegations, or instances, of fraud reported within the ATSB during 2016–17.

Ethical standards

During the reporting period, the ATSB continued to demonstrate its commitment to the APS Values, Employment Principles and Code of Conduct by:

- highlighting the APS Values, Employment Principles and Code of Conduct in all selection criteria and recruitment processes for all ATSB positions
- including briefing information on the APS Values, Employment Principles and Code of Conduct in induction packages and training sessions
- promoting the APS Values, Employment Principles and Code of Conduct through individual performance management plans
- ensuring employees are able to access information on ethical standards via the ATSB's intranet and the Australian Public Service Commission's (APSC) website
- having Public Interest Disclosure policy and procedures in place
- embedding the APS Values in the Corporate Plan
- ensuring that the ATSB's fraud control policy, allegations and investigations are dealt with in accordance with the Values and Code of Conduct, which confirms procedural fairness and natural justice.

Management of human resources

The ATSB recognises the essential contribution that its people make to achieving our purpose, and the importance of investing in staff capability. Over the past year, the Organisational Development team has invested significant time and effort into supporting the ATSB's Evolution Program.

This year has presented the Organisational Development team with a unique opportunity to redefine the ATSB's human resources and learning and development frameworks. The Organisational Development team worked closely with the Evolution Program's leadership team, managers and staff across the ATSB to design new frameworks and implement a range of new initiatives, positioning the team to better manage, monitor and support our evolving workforce.

The work and activities undertaken by the Organisational Development team include:

- completion of a comprehensive review of the ATSB's learning and development framework
- revitalisation and enhancements to the ATSB's training material and resources
- establishment of a new approach to managing performance and development opportunities
- introduction of new workforce metrics to effectively monitor resourcing requirements and develop the skills and competencies necessary to function as a modern transport safety agency
- proactive support and advice to managers and staff on employment matters, and ongoing commitment to ensure a safe and healthy workplace
- championing the Evolution Program and the transition to a new organisational structure
- creation of a bespoke ATSB leadership and cultural change program
- greater awareness and improved recruitment processes targeting diversity groups
- new partnerships with cross-portfolio agencies to increase development and inter-agency opportunities
- building and maintaining close relationships with business partners to effectively manage day-to-day operational requirements.

Over this reporting period, there has been a particular focus on developing our people to address any workforce risks resulting from the Evolution Program and regularly analysing the agency's ongoing capacity to maintain its primary objective, key functions and broader portfolio responsibilities.

Staffing profile

In accordance with our workforce planning projections, the ATSB's staffing profile has remained relatively stable, from 102 at the end of June 2016 to 107 by the end of June 2017. The associated staff turnover rate was approximately 15 per cent. Table 21 displays the ATSB staff numbers, by classification, as of 30 June 2017.

Table 21: The ATSB's staffing profile at 30 June 2017

Substantive classification	Gender x (full time)	Female (full time)	Female (part time)	Male (full time)	Male (part time)	Non-ongoing	Total
Statutory Office Holders			1	1	2		**4**
Senior Executive Service Band 1				2			**2**
EL 2		7	1	44	1	1	**54**
EL 1	1	9		14		3	**27**
APS 6		1	1	3			**5**
APS 5		9	1	2		1	**13**
APS 4		1		1			**2**
Total	**1**	**27**	**4**	**67**	**3**	**5**	**107**

This total is comprised of the following employment arrangements:

- 101 staff (representing all non-SES employees) covered by the enterprise agreement
- two SES employees covered by section 24(1) determinations, established in accordance with the ATSB's SES remuneration policy
- four Statutory Office Holders (representing the Commissioners) determined by the Remuneration Tribunal.

There are no other employment arrangements in place and there is no provision for performance pay.

This total comprises 86 staff based in Canberra, ten based in Brisbane, five based in Adelaide, three based in Perth, one based in Sydney and one based overseas in Port Moresby.

Non-salary benefits provided to employees under the enterprise agreement include:

- options for home-based work
- ability to work part-time
- flexible working arrangements
- access to different leave types
- influenza vaccinations
- access to the Employee Assistance Program.

Indigenous employees

At 30 June 2017, the ATSB had one ongoing employee who identified as Indigenous. The ATSB participates in the portfolio-wide indigenous network run by the Department of Infrastructure and Regional Development.

Salary rates

Table 22 displays the salary rates supporting the above employment arrangements at 30 June 2017.

Table 22: The ATSB's salary rates at 30 June 2017

Substantive classification	Lower ($)	Upper ($)
Statutory Office Holders	As determined by the Remuneration Tribunal	
SES1	200,860	225,000
EL 2	113,919	140,012*
EL 1	95,862	110,578
APS 6	76,254	88,983
APS 5	68,992	74,494
APS 4	61,799	67,153

* Maximums include Transport Safety Investigator and respective supervisor's salaries, representing a $1,953–$9,989 increase on standard APS6–EL2 rates.

Organisational culture

2016–17 presented new challenges for the ATSB with the development and implementation of the Evolution Program. The ATSB has refined its organisational hierarchy, enabling us to better focus on our organisational objectives and improve our efficiency and effectiveness.

This is the first time our managers and staff have embarked on a significant program of change since becoming an independent agency. Our enduring organisational culture, and underlying morale, has enabled our workforce to work collaboratively and maintain focus on achieving our objectives into the future.

When taking into account our agency's wellbeing indicators, derived from the 2017 staff census results, it is pleasing to see that our staff remain positive in terms of their jobs, attachment to the purpose of the agency, feelings of personal accomplishment and workplace safety—as evidenced by these census results:

- 88% of staff are proud to work in the ATSB
- 75% of staff think the ATSB supports employees who are injured or become ill due to work
- 79% of staff say that the ATSB is committed to creating a diverse workforce
- 96% of staff are happy to go the 'extra mile' at work when required
- 88% of staff believe we are committed to workplace safety
- 84% of staff feel that people in the workgroup treat each other with respect
- 88% of staff believe there is a strong culture of using data and evidence in our work
- 92% of staff believe their immediate workgroup act in accordance with the APS values.

Conversely, we have a number of results (trends) that have been identified as new or ongoing challenges which have been captured and will be addressed in the year ahead. They are as follows:

- *I'm satisfied with the non-monetary employment conditions*—down to 74% positive
- *I have choice in deciding how I do work*—down to 64% positive
- *My immediate supervisor encourages me*—down to 63% positive
- *My supervisor openly demonstrates commitment to performance management*—down to 56%.

Training and development

During 2016–17, the ATSB completed a detailed learning and development review of all its internal and external training requirements, training resources and delivery methods. The ATSB Executive agreed to all 26 recommendations made. These recommendations provided a good opportunity to reform our approach to learning and development, including developing e-Learning solutions for suitable courses into the future. To date, the ATSB has successfully implemented five recommendations and work will continue on the successful implementation of the remaining recommendations.

In June 2017, the ATSB completed an approach to market to source a suitable partner, who is a Registered Training Organisation (RTO), to work closely with the ATSB to recommence the delivery of ATSB's accredited Diploma of Transport Safety Investigation. The ATSB is pleased to be able to once again provide this formal qualification to our Transport Safety Investigators.

Throughout 2016–17, the ATSB refreshed and updated training resources, in tandem with the Evolution Program. As a result, new cross-modal training resources were developed and delivered to Transport Safety Investigators.

In 2016–17, the ATSB continued to provide training opportunities for a broad range of industry-based personnel, through its highly regarded Human Factors and Aircraft Accident Investigation Fundamentals courses. Other training delivered to ATSB personnel included:

- Critical Incident Stress and Operational Management
- Bloodborne Pathogens
- Work Health Safety and On-site Safety
- Cognitive Interviewing
- *Transport Safety Act 2003*
- Fraud Control
- Records Management and Travel
- ICT Security
- Media Awareness
- Workplace Harassment Contact Officer
- Safety Investigation Quality System
- Overview of Investigation Analysis and Safety Investigation Information Management System
- Cross-modal (Rail, Marine and Aviation).

By recruiting personnel with workplace coaching qualifications, the ATSB has been able to establish and offer both formal and informal coaching development opportunities to managers and staff throughout the year.

Purchasing

The ATSB purchases goods and services in accordance with the Commonwealth Procurement Rules (CPRs). These rules are applied through the Accountable Authority Instructions. The ATSB's procurement policies and processes have been developed to ensure that:

- it undertakes competitive, non-discriminatory procurements
- it uses resources efficiently, effectively, economically and ethically
- it makes all procurement decisions in an accountable and transparent manner.

Consultants

The ATSB engages consultants when it lacks specialist expertise, or when independent research, review or assessment is required. Consultants are typically engaged to:

- investigate or diagnose a defined issue or problem
- carry out defined reviews or evaluations
- provide independent advice, information or creative solutions to assist in the ATSB's decision making.

The ATSB policies on selection and engagement of consultants are in accordance with the CPRs. Before engaging consultants, the ATSB takes into account the skills and resources required for the task, the skills available internally and the cost effectiveness of engaging an external contractor.

During 2016–17, three new consultancy contracts were entered into involving total actual expenditure of $242,609. There were no ongoing consultancy contracts carried over from the 2015–16 year.

Annual reports contain information about actual expenditure on contracts for consultancies. Information on the value of contracts and consultancies is available from the AusTender website at www.tenders.gov.au

Australian National Audit Office access clauses

There were no contracts that did not provide for the Auditor-General to have access to the contractors' premises during 2016–17.

Exempt contracts

No contracts were exempted, on public interest grounds, from publication with AusTender during 2016–17.

Procurement initiatives to support small business

The ATSB supports small business participation in the Commonwealth Government procurement market. Small and Medium Enterprises (SME) and Small Enterprise participation statistics are available on the Department of Finance's website at www.finance.gov.au

The ATSB seeks to support SMEs, consistent with paragraph 5.4 of the Commonwealth Procurement Rules. It ensures that its communications are expressed in clear and simple language. Its finance system is set up to ensure prompt payments to all contractors and suppliers and it makes use of credit cards.

Legal services and expenditure

Paragraph 11.1(a) of the Legal Services Directions 2017, issued by the Attorney General under the *Judiciary Act 1903*, requires chief executives of departments and agencies to ensure that legal services expenditure is appropriately recorded and monitored. Chief executives must also ensure that their agencies make records of their legal services expenditure for the previous financial year available by 30 October in the following financial year. The following amounts are exclusive of GST.

The ATSB's expenditure on legal services for 2016–17 was $256,658.45, comprising:

- $15,473.50 on external legal services
- $241,184.95 on internal legal services.

External scrutiny and participation

Coronial inquests

The ATSB was required to participate in one coronial inquest in 2016–17.

In-flight break-up involving PZL Mielec M18A Dromader aircraft, VH-TZJ, 37 km west of Ulladulla, New South Wales, 24 October 2013

On 13 March 2017, New South Wales Deputy State Coroner, Derek Lee, made findings following an inquest for an in-flight break-up involving PZL Mielec M18A Dromader aircraft, VH-TZJ, 37 km west of Ulladulla, New South Wales on 24 October 2013. The aircraft had been conducting a firebombing mission when, on approach to the target position, the left wings separated. The aircraft impacted the terrain and was destroyed, with the pilot being fatally injured.

The ATSB's investigation found that the left wing separated because it had been weakened by a fatigue crack in the left wing lower attachment fitting. The fatigue crack originated at the attachment lugs. The pits formed stress concentrations that accelerated the initiation of fatigue cracks.

The ATSB also found that, although required to be removed by the aircraft manufacturer's instructions, the corrosion pits were not completely removed during previous maintenance. During that maintenance, the wing fittings were inspected using an eddy current inspection method. This inspection method was not approved for that particular inspection and may not have been effective at detecting the crack.

Data from a series of previous flights indicated that the manner in which the aircraft was flown during its life probably accelerated the initiation and growth of the fatigue crack.

Finally, the ATSB also found a number of other factors which, although they did not contribute to the accident, had potential to reduce the safety of operation of PZL M18 and other aircraft. These included the incorrect calculation of the flight time of M18 aircraft and a lack of robust requirements for the approval of non-destructive inspection procedures.

The ATSB released its findings on 15 February 2016. The inquest was held 27 February to 1 March 2017 and 6 March 2017 at the New South Wales State Coroner's Court in Glebe. The Coroner agreed with the ATSB's findings.

The ATSB's investigation report (AO-2013-187) is available on the ATSB website at www.atsb.gov.au

Other coronial matters

Inquest into the disappearance and suspected death of Cesar Llanto and inquest into the death of Hector Collado

On 31 May 2017, New South Wales Deputy State Coroner, Sharon Freund, made findings in relation to the suspected death of Cesar Llanto and the death of Hector Collado. The Deputy State Coroner found that Cesar Llanto died on 30 August 2012 as a result of foul play, namely, that Mr Llanto was either thrown overboard or killed on the *MV Sage Sagittarius* and his body disposed of at a later time, by a person or persons unknown. The Coroner made an open finding in relation to the cause of death.

The Deputy State Coroner found that Hector Collado died on 14 September 2012 in Newcastle Harbour aboard the *MV Sage Sagittarius*. The cause of his death was multiple injuries which the Coroner was satisfied he sustained as a result of being struck over the head by some kind of weapon or instrument by a person or persons unknown and then he was either thrown over the handrail outside the storeroom on the second deck or fell over the handrail to his death.

The ATSB was notified in both cases but did not investigate due to the circumstances indicating the deaths were the result of deliberate actions. As it is not a function of the ATSB to apportion blame or provide the means to determine liability, the ATSB primarily investigates accidents involving transport vehicles.

The Coroner had evidence that audio was missing from the vessel's Voyage Data Recorder (VDR) on the critical dates. The evidence concerning the missing audio precedes a recommendation by the Coroner that the New South Wales Police Force, the Australian Federal Police, the Australian Maritime Safety Authority and the Australian Transport Safety Bureau give consideration to establishing a standing group for investigations of deaths or suspicious deaths on board, or disappearance from, an international vessel in or bound for Australian waters. Recommendations included making the group responsible for providing all available expertise and assistance to ensure the proper downloading, seizure and storage of any VDR system on board the vessel.

The ATSB is liaising with the other authorities in response to the Coroners' recommendations. In formulating a response, the ATSB will need to take into account that it must avoid apportioning blame or providing the means to determine liability.

In-flight break-up involving de Havilland DH82A Tiger Moth, VH-TSG 300 m east of South Stradbroke Island, Queensland, 16 December 2013

On 24 November 2016, South Eastern Queensland Coroner, James McDougall, made findings without an inquest into an accident involving a de Havilland DH82A (Tiger Moth) aircraft, registered VH-TSG, which took off from the operator's airstrip at Pimpama, Queensland, with a pilot and passenger on board. The purpose of the flight was to conduct a commercial joy flight in the Gold Coast area. At about 1224, one minute after the pilot commenced aerobatics, the left wings failed and the aircraft descended steeply; impacting the water about 300 m from the eastern shoreline of South Stradbroke Island. The aircraft was destroyed and the two occupants were fatally injured.

The ATSB found that both of the aircraft's fuselage lateral tie rods, which assist in transferring flight loads through the fuselage, had fractured. The location of the fracture coincided with areas of pre-existing fatigue cracking in the threaded sections of the rods, near the join with the left wing. The tie rods fractured during an aerobatic manoeuvre, resulting in the left lower wing separating from the aircraft and subsequent in-flight break-up. The ATSB also found that the tie rods were aftermarket parts manufactured under an Australian Parts Manufacturer Approval (APMA). In this respect, safety issues were identified in areas of the tie rods' design and manufacture, as well as in the supporting regulatory approval processes. Safety issues were also identified in the maintenance and operation of the aircraft.

The ATSB consulted with the Type Design Organisation, regulators and investigation authorities from Australia, New Zealand and the United Kingdom about the failure of the APMA tie rods, which occurred well before the published retirement life for Tiger Moth tie rods. In response, the United Kingdom Civil Aviation Authority issued an airworthiness directive on 21 March 2014 that mandated the removal from service of all tie rods produced by the same Australian manufacturer. The airworthiness directive was subsequently also mandated by the Australian Civil Aviation Safety Authority and the New Zealand Civil Aviation Authority. Significant additional safety action is proposed by the Type Design Organisation to further enhance the safety of all Tiger Moth operations. In addition, the ATSB issued a safety recommendation to CASA to take action to provide assurance that over 1,000 other parts approved for APMA at about the same time as the tie rods were appropriately considered before approval.

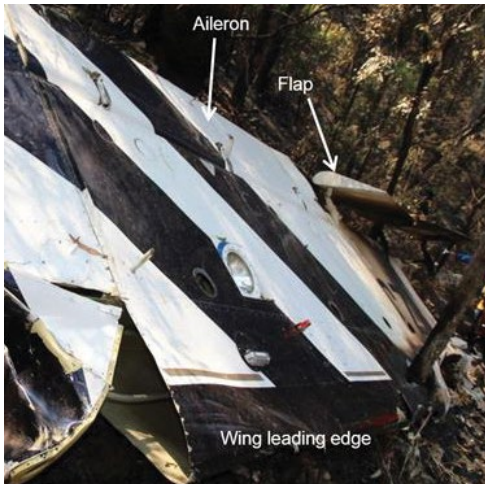
The ATSB released its findings on 21 January 2016. The Coroner agreed with the ATSB's findings.

The ATSB's investigation report (*AO-2013-226*) is available on the ATSB website at www.atsb.gov.au

Figure 28: Main wreckage from in-flight break-up involving PZL Mielec M18A Dromader aircraft (AO-2013-187)

Source: ATSB

Figure 29: Left outboard wing, looking from the wingtip inboard and showing the lower surface of the wing from in-flight break-up involving PZL Mielec M18A Dromader aircraft (AO-2013-187)



Source: ATSB

Figure 30: VH-TSG after recovery: In flight break-up involving de Havilland DH82A Tiger Moth (AO-2013-226)

Source: Supplied

SECTION 9
Appendices

9

APPENDIX A: OTHER MANDATORY INFORMATION

Work health and safety

The ATSB ensures employees have a healthy and safe workplace. There are a number of aspects that the ATSB has been working on while supporting the Evolution Program including:

- effective management of the Work Health and Safety Committee which met six times over the year
- providing ongoing support and advice to meet individual needs and educating managers on their work health and safety responsibilities
- introduction of a strong early intervention program for staff
- effective case management of compensation claims, contributing to a reduction in the ATSB's Comcare premium
- a successful compliance audit of the rehabilitation management system where Comcare recognised and congratulated the ATSB on its performance in comparison with other federal employers and licensee groups
- reinvigorating the workplace health and safety representatives network
- a dedicated resource to provide ongoing individualised support to our Transport Safety Investigators undertaking field work.

There are no new compensation claims to report during the 2016–17 year and no reportable incidents under the *Work Health and Safety Act 2011*.

Advertising and market research

The ATSB did not conduct any advertising campaigns during 2016–17 and did not incur any expenses with advertising, market research, polling, direct mail or media advertising agencies.

Ecologically sustainable development and environmental performance reporting

Section 516A of the *Environment Protection and Biodiversity Conservation Act 1999*

The ATSB is fully committed to the principles of ecologically sustainable development. The nature of its work as Australia's national transport safety investigator—with a focus on the investigation of transport accidents, research into transport safety and dissemination of safety information—means that the ATSB's commitment is expressed through its day-to-day activities within its offices.

The ATSB operates under the Energy Efficiency in Government Operations (EEGO) policy and through its sub-lease office accommodation arrangements with the Department of Infrastructure and Regional Development, the ATSB's environmental management system complies with ISO 14001:2004—the international standard for environmental management systems. The system is focused on the ATSB's office-based activities in Canberra. Initiatives are applied at regional office premises, where appropriate.

The ATSB has contracted out its data centres to private providers, with the result that servers and information and communication technology (ICT) infrastructure are located outside the ATSB premises. This produced a significant saving in energy use. The ATSB has limited its energy use through various initiatives that focus on improving the energy efficiency of the property portfolio, for example:

- operating a virtualised IT server environment
- ensuring that desktop IT equipment uses energy-saving policies, such as automatic turn-off for monitors and hard drives after periods of inactivity
- reducing the number of printers in the network
- setting each printer default to mono (black) and double-sided printing
- using photocopy paper containing 60 per cent recycled paper for internal use
- actively recycling paper waste
- promoting the separation of general waste into recyclable and non-recyclable items before disposal
- promoting video conferencing as an alternative to travel, where practicable
- using motion-sensor lighting in offices
- reducing the effect of direct sunlight on air conditioning systems by installing blinds or tinting, where appropriate.

Grant programs

The ATSB did not administer any grant programs during 2016–17.

Changes to disability reporting in annual reports

Since 1994, non-corporate Commonwealth entities have reported on their performance as policy adviser, purchaser, employer, regulator and provider under the Commonwealth Disability Strategy. In 2007–08, reporting on the employer role was transferred to the Australian Public Service Commission's State of the Service report and the APS Statistical Bulletin. These reports are available on APSC's website at www.apsc.gov.au. From 2010–11, entities have no longer been required to report on these functions.

The Commonwealth Disability Strategy has been overtaken by the National Disability Strategy 2010–2020, which sets out a ten-year national policy framework to improve the lives of people with disability, promote participation and create a more inclusive society. A high level two-yearly report will track progress against each of the six outcome areas of the strategy and present a picture of how people with disability are faring. The first of these progress reports was published in late 2014 and presented to COAG in December 2015. It can be found at www.dss.gov.au

Freedom of Information

The following information explains how to request access to documents held by the ATSB under the *Freedom of Information Act 1982* (FOI Act). It also explains what records the ATSB holds, and what arrangements the ATSB has in place for outside participation.

Entities to the FOI Act are required to publish information to the public as part of the Information Publication Scheme (IPS). This requirement is in Part II of the FOI Act and has replaced the former requirement to publish a Section 8 statement in an annual report. Each agency must display, on its website, a plan showing what information it publishes in accordance with the IPS requirements.

Detailed information about the FOI Act is available via the Office of the Australian Information Commissioner website at www.oaic.gov.au and the Federal Register of Legislation website at www.legislation.gov.au

How to lodge a request for information

Information about how to make an application under the FOI Act can be found on the ATSB's website at www.atsb.gov.au

A request for access to documents made under the FOI Act must:

- be in writing
- state that the request is an application for the purposes of the FOI Act
- provide enough information to enable the document(s) sought to be identified
- give details of how notices under the FOI Act may be sent (for example, by providing an electronic address).

Submission of FOI requests, or enquiries about access, should be directed to:

Freedom of Information Coordinator
Australian Transport Safety Bureau
PO Box 967 CIVIC SQUARE ACT 2608

Phone: +61 2 6274 6488
Fax: +61 2 6247 3117
Email: FOI-ATSB@atsb.gov.au

Charges

There are no application fees payable to lodge an FOI request. The ATSB may impose a charge for the work involved in providing access to document(s) required through a request under the FOI Act. These charges are imposed in accordance with the FOI Act and the *Freedom of Information (Charges) Regulations 1982*. These charges may relate to the time spent searching for and retrieving relevant document(s), decision-making time, photocopying and other costs. The FOI Act also provides that the first five hours of decision-making time is waived. The applicant will be notified as soon as possible with an estimate of the charges associated with the processing of the request. The request will not be processed until the applicant responds to such notification.

In some circumstances, charges associated with the processing of the request may be remitted. Should the applicant wish to seek remission of the charges, the criteria considered by the ATSB include whether:

- payment of the charges, or part of the charges, would cause financial hardship to the applicant or a person on whose behalf the application was made
- giving access to document(s) is in the general public interest, or in the interest of a substantial section of the public.

The applicant would need to contact the ATSB in writing, or by email, to explain why they meet the criteria, or to inform the agency of overall circumstances which justify non-payment of charges. Requests for the remission of the charges should be forwarded to the Freedom of Information Coordinator.

It may not be possible to obtain access to all the documents sought in an FOI request. Access is limited by exemptions, such as Section 38—secrecy provisions of the FOI Act.

It is important to note that the ATSB is required to perform its functions under Section 12AA of the TSI Act. A significant amount of information gathered by the ATSB during the course of its investigations is defined as restricted information under Section 3 of the TSI Act, and access to such information is exempt from release under subparagraph 38(1)(b)(i) of the FOI Act.

Freedom of Information activity in 2016–17

The ATSB received 29 new requests for access to documents under the FOI Act in 2016–17. Table 23 provides details of the ATSB's Freedom of Information activity for 2016–17.

Table 23: Freedom of Information activity[1]

2016–2017	Numbers
Requests	
On hand at 1 July 2016 (A)	4
New requests received (B)	29
Requests withdrawn (C)	9
Requests transferred in full to another agency (D)	3
Requests on hand at 30 June 2017 (E)	2
Total requests completed at 30 June 2017 (A+B-C-D-E)	19
Action on requests	
Access in full	0
Access in part	11
Access refused	8
Access transferred in full	3
Request withdrawn	9

1 These statistics cannot be compared directly with the deadlines set in the *Freedom of Information Act 1982*, as the FOI Act provides for extensions of time to allow for consultation with third parties, negotiation of charges and other issues.

2016–2017	Numbers
Response times (excluding withdrawn)[1]	
0–30 days	18
31–60 days	1
61–90 days	0
90+ days	0
Internal review	
Requests received	1
Decision affirmed	1
Decision amended	0
Request withdrawn	0
Review by Office of the Australian Information Commissioner	
Applications received	0
Administrative Appeals Tribunal (AAT) review of FOI decisions	
Applications received	0

Records the ATSB holds

The ATSB holds records such as:

- human and financial resource management records
- briefing papers and submissions prepared for ministers, parliamentary secretaries, parliamentary committees, the Cabinet and the Executive Council (most of these are classified documents)
- business papers, briefing notes and meeting records for committees, and conferences, in which the ATSB services or participates
- documents prepared by international agencies
- documents relating to the development of legislation
- internal administration documents
- internal treaties, memoranda of understanding and international conventions
- legal documents, including legislation, contracts, leases and court documents
- maps and other geographical information
- ministerial responses to parliamentary questions, interdepartmental and general correspondence and papers
- policy documents, recommendations and decisions
- registers of documents, agreements and approvals
- statistics and databases
- technical standards, guidelines, specifications, charts, photographs, drawings and manuals
- accident and incident investigation and notification records.

To view a list of manuals and other documents the ATSB uses when making decisions or recommendations that affect the public, visit the ATSB website at www.atsb.gov.au

Under 8C of the FOI Act, exempt matter is not required to be published. The ATSB reserves the right to delete exempt matter from its information prior to providing access.

To find out more about the types of personal information the ATSB holds, please refer to the ATSB Privacy Policy on the ATSB website at www.atsb.gov.au

For further information, please contact the ATSB either by telephone on 1800 020 616 or by email at atsbinfo@atsb.gov.au

Functions and decision-making powers

The ATSB's functions are detailed in Section 12AA of the *Transport Safety Investigation Act 2003* and are further described throughout this report.

Certain officers exercise decision-making powers under portfolio legislation and other matters. These responsibilities are set out in the Administrative Arrangements Order (AAO) for the Commonwealth of Australia and relate to transport safety, including investigations.

For a complete and up-to-date copy of the AAO, visit www.legislation.gov.au

To assist ATSB employees in exercising their powers appropriately, and enable access to their decision-making authorities, the ATSB uses an intranet site which allows employees to view delegations online. It also allows employees to check information about the powers and authorities assigned under the legislation set out in the AAO, and by laws such as the *Public Governance, Performance and Accountability Act 2013* and the *Public Service Act 1999*. Powers delegated under the TSI Act are recorded on the back of identity cards for all investigators.

Arrangements for outside participation

The ATSB consults widely to gain the views of its stakeholders and clients about future policy directions and program delivery. This includes consulting with other Australian state and territory government departments and agencies, as appropriate, and with foreign governments—particularly in the context of transport safety investigations. For particular policy issues, the ATSB may also contact a very broad range of stakeholders.

APPENDIX B: ENTITY RESOURCE STATEMENT 2016–17

	Actual available appropriation for 2016–17 $'000 (a)	Payments made 2016–17 $'000 (b)	Balance remaining 2016–17 $'000 (a) – (b)
Ordinary Annual Services[1]			
Departmental appropriation[2]	89,927	65,576	24,351
Total	**89,927**	**65,576**	**24,351**
Total ordinary annual services A	**89,927**	**65,576**	
Other services[3]			
Departmental non-operating			
Equity injections	200	200	–
Total	**200**	**200**	
Total other services B	**200**	**200**	
Total net resourcing and payments for the Australian Transport Safety Bureau	**90,127**	**65,776**	

1 Appropriation Act (No.1) 2016–17 and Appropriation Act (No. 5) 2016–17. This includes prior year departmental appropriation and section 74 Retained Revenue Receipts.

2 Includes an amount of $0.356m in 2016–17 for the Departmental Capital Budget. For accounting purposes this amount has been designated as 'contributions by owners'.

3 Appropriation Act (No.2) 2016–17.

Expenses for Outcome 1

Outcome 1: Improved transport safety in Australia including through: independent 'no blame' investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; and fostering safety awareness, knowledge and action.

	Budget* 2016–17 $'000 (a)	Actual Expenses 2016–17 $'000 (b)	Variation 2016–17 $'000 (a) – (b)
Programme 1.1: Australian Transport Safety Bureau			
Departmental expenses			
Departmental appropriation[1]	38,977	42,260	(3,283)
Expenses not requiring appropriation in the Budget year	26,343	9,630	16,713
Total for Programme 1.1	**65,320**	**51,890**	**13,430**
Total expenses for Outcome 1			

* Full year budget, including any subsequent adjustment made to the 2016–17 Budget at Additional Estimates.

1 Departmental Appropriation combines Ordinary annual services (Appropriation Act Nos. 1 and 5) and Retained Revenue Receipts under section 74 of the PGPA Act 2013.

	2015–16	2016–17
Average Staffing Level (number)	106	107

APPENDIX C: GLOSSARY

Accident	An investigable matter involving a transport vehicle occurs when: > a person dies, or suffers serious injury, as a result of an occurrence associated with the operation of the vehicle > the vehicle is destroyed, or seriously damaged, as a result of an occurrence associated with the operation of the vehicle > any property is destroyed, or seriously damaged, as a result of an occurrence associated with the operation of the vehicle.
Accident Investigation Commission (AIC)	The Papua New Guinea Government institution responsible for the investigation of safety deficiencies in aviation transport.
Aerial work	Aircraft operations—including ambulance and emergency medical services, agriculture, mustering, search and rescue, fire control, surveying, and photography.
Agricultural operations	Operations involving the carriage and/or spreading of chemicals, seed, fertiliser or other substances for agricultural purposes—including the purposes for pest and disease control.
Airworthiness directive	A notification to owners, and operators, of certified aircraft that a known safety deficiency with a particular model of aircraft, engine, avionics or other system exists and must be corrected. If a certified aircraft has outstanding airworthiness directives that have not been complied with, the aircraft is not considered airworthy.
Amateur-built aircraft	Aircraft not built in a factory but for the user's personal use or recreation. May include ultra-light, original design, plans built, kit built or experimental aircraft.
AMSA	Australian Maritime Safety Authority
ARTC	Australian Rail Track Corporation
ATSB safety action	Formal activities conducted by the ATSB to initiate safety action by relevant organisations to address a safety issue. Includes safety recommendations and safety advisory notices.
AUV	Autonomous underwater vehicle
Australian Accredited Representative	An Australian representative who is appointed in the case of safety occurrences involving Australian-registered aircraft outside Australian territory, normally an ATSB investigator.
Blood-borne pathogen	A blood-borne agent causing disease that can be spread by blood contamination.
CASA	Civil Aviation Safety Authority
Catastrophic accident	A sudden disastrous investigable matter involving a transport vehicle.

Charter	Operations that involve the carriage of cargo or passengers, but do not involve scheduled flights. The lack of scheduled flights, and fixed departure and arrival points, distinguishes charter operations from Regular Public Transport operations.
Collective	The collective pitch control, or collective lever, changes the pitch angle of all the main rotor blades at the same time, independent of their position. Therefore, if a collective input is made, all the blades change equally. The result is that the helicopter increases or decreases its total lift derived from the rotor.
Commercial air transport	High capacity regular public transport (RPT) flights, low capacity RPT flights, charter flights and medical transport.
Complex investigations	Investigations rated at level 1, 2, or 3 in accordance with the ATSB's rating system.
Contributing safety factor	A safety factor that, if it had not occurred or existed at the relevant time, then: > the occurrence would probably not have occurred > adverse consequences associated with the occurrence would probably not have occurred or have been as serious > another contributing safety factor would probably not have occurred or existed.
COAG	Council of Australian Governments
DCV	Domestic Commercial Vessel as defined by the *Marine Safety (Domestic Commercial Vessel) National Law Act 2012*
Critical safety issue	Associated with an intolerable level of risk and generally leading to the immediate issue of a safety recommendation, unless corrective safety action has already been taken.
CVR (black box)	Cockpit voice recorder
Defined Interstate Rail Network (DIRN)	The DIRN comprises over 10,000 route kilometres of standard gauge interstate track linking the capital cities of mainland Australia.
Directly Involved Party (DIP)	Those individuals or organisations that were directly involved in a transport safety occurrence or may have influenced the circumstances that led to an occurrence. This also includes those whose reputations are likely to be affected following the release of the investigation report.
ETOPS	Extended twin operations—a rule that allows twin-engine airliners to fly long-distance routes that were previously off-limits to twin-engine aircraft. There are different levels of ETOPS certification. Each one allows aircraft to fly on routes that have a certain amount of flying time from the nearest suitable airport.
Fatal accident	A transport accident in which at least one fatality results within 30 days of the accident.
Fatality/Fatal injury	Any injury acquired by a person involved in a transport accident which results in death within 30 days of the accident.
Flight data recorder (black box)	A recorder placed in an aircraft for the purpose of facilitating the investigation of an aircraft accident or incident.

Flying training	Flying under instruction for the issue or renewal of a licence, rating, aircraft type endorsement or any other type of flying aimed at upgrading an individual's flight qualification—including solo navigation exercises conducted as part of a course of applied flying training, or check and training operations conducted by RPT operators.
General aviation (GA)	General aviation covers: > aerial work operations (including aerial agriculture, aerial mustering, search and rescue, and aerial survey) > flying training > private aviation > business and sports (including gliding) aviation—VH, or foreign-registered.
Hours flown	Calculated from the time the wheels start, with the intention of flight, to the time the wheels stop after completion of the flight.
Human factors	Human factors is the multi-disciplinary science that applies knowledge about the capabilities and limitations of human performance to all aspects of the design, operation and maintenance of products and systems. It considers the effects of physical, psychological and environmental factors on human performance in different task environments—including the role of human operators in complex systems.
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
Immediately reportable matter	A serious transport safety matter that covers occurrences such as: > accidents involving death > serious injury > destruction or serious damage of vehicles or property > when an accident nearly occurs.
Incident	An occurrence, other than an accident, associated with the operation of a transport vehicle that affects, or could affect, the safety of operation.
ITSAP	The Australian Government's Indonesia Transport Safety Assistance Package
JACC	Joint Agency Coordination Centre
LSA	Light sport aircraft
LOSA	Loss of separation assurance
Less complex investigations	Those rated at level 4 or level 5 under the ATSB's rating scheme.
MAIFA	Marine Accident Investigators Forum in Asia
Minor injury	An injury sustained by a person, in an accident, that was not fatal or serious and does not require hospitalisation.
Multi-modal	Across the three modes of transport covered by the ATSB: aviation, marine and rail.

National Transportation Safety Committee (NTSC)	An Indonesian Government institution responsible for the investigation of safety deficiencies in aviation, maritime and land transport.
Occurrences—accidents and incidents	Occurrences are reportable matters—either an immediately reportable matter (IRM) or routine reportable matter (RRM). They comprise accidents, serious incidents and incidents.
ONRSR	Office of the National Rail Safety Regulator
Other aerial work	Other aerial work includes: > operations conducted for the purposes of aerial work other than 'flying training' and 'agricultural operations' > operations classified as other aerial work—including aerial surveying and photography, spotting, aerial stock mustering, search and rescue, ambulance, towing (including glider, target and banner towing), advertising, cloud seeding, firefighting, parachute dropping and coastal surveillance.
Other safety issue	Associated with a risk level regarded as unacceptable unless it is kept as low as reasonably practicable. Where there is a reasonable expectation that safety action could be taken in response to reduce risk, the ATSB will issue a safety recommendation to the appropriate agency when proactive safety action is not forthcoming.
PIF	Post-impact fire
Pilotage	Use of licensed coastal pilots to guide ships through designated areas.
Portfolio Budget Statements (PBS)	These statements explain the provisions of the appropriation bills (budget bills); that is, where the appropriate funds are going to be spent.
Private/business	Private flying is conducted for recreational or personal transport. Business flying refers to the use of aircraft as a means of transport to support a business, or profession, without the aircraft revenue directly.
PGPA Act	*Public Governance, Performance and Accountability Act 2013*
RAAus	Recreational Aviation Australia
Recreational aviation	Aircraft being used for recreational flying that are registered by a recreational aviation administration organisation.
REEFVTS	Great Barrier Reef and Torres Strait Vessel Traffic Service. A coastal vessel traffic service which has been put in place by the Australian and Queensland Governments to improve safety and efficiency of vessel traffic, as well as to protect the environment.
Regular public transport (RPT)	Refers to aircraft that transport passengers, and/or cargo, according to fixed schedules and fixed departure/arrival points, in exchange for monetary reward. These services can be further divided into low and high capacity aircraft: > low capacity RPT—an RPT aircraft that provides a maximum of 38 passenger seats, or a maximum payload no greater than 4,200 kg > high capacity RPT—an RPT aircraft that provides more than 38 passenger seats, or a maximum payload greater than 4,200 kg.

REPCON	The aviation confidential reporting scheme.
REPCON Marine	The marine confidential reporting scheme.
Reportable safety concern	Any matter that endangers or could endanger a transport vehicle.
Safety action	The things that organisations and individuals do, in response to the identification of safety issues, in order to prevent accidents and incidents. There are two main types: > ATSB safety action > Non-ATSB safety action.
Safety advisory notice	Formal advice by the ATSB to an organisation, or relevant parts of the aviation industry, that it should consider the safety issue and take action where it believes it is appropriate. A safety advisory notice is a 'softer' output than a safety recommendation and is used for less significant safety issues—when the available evidence is more limited or when the target audience is not a specific organisation.
Safety factor	An event or condition that increases safety risk—something that increases the likelihood of an occurrence and/or the severity of the adverse consequences associated with an occurrence.
Safety issues	A safety factor which can reasonably be regarded as having the potential to adversely affect the safety of future operations and: > is a characteristic of an organisation or a system, rather than a characteristic of a specific individual, or > is characteristic of an operational environment at a specific point in time.
Safety recommendation	ATSB safety recommendations are formal recommendations from the ATSB to an organisation for it to address a specific safety issue. They focus on stating the problem (i.e. the description of the safety issue.) They do not identify specific solutions for reducing risk.
SAR	Search and rescue
SATCOM	Satellite communication
Serious incident	An incident involving circumstances indicating an accident nearly occurred.
Serious injury	An injury which is sustained by a person in an accident and involves one or more of the following: > requires hospitalisation for more than 48 hours, commencing within seven days from the date the injury was received > results in a fracture of any bone (except simple fractures of fingers, toes or nose) > involves lacerations which cause severe haemorrhage, nerve, muscle or tendon damage > involves injury to any internal organ > involves second or third degree burns, or any burns affecting more than five per cent of the body surface > involves verified exposure to infectious substances or injurious radiation.

Short investigation	Short, factual, office-based investigations, of less complex safety occurrences rated at level 5 under the ATSB's rating scheme.
SIIMS	Safety investigation information management system
SOLAS	Safety of life at sea
SPAD	Signal passed at danger
Spectral analysis	Detailed analysis of the pilot's radio transmissions, background engine sounds and warnings.
Sports aviation	Aircraft excluded from the RPT, GA or military aircraft categories—including ultralights, glider, hang gliders, rotorcraft and balloon aviation. Most, if not all, sport aviation craft are registered with various sporting bodies rather than with the Civil Aviation Safety Authority (CASA), although exceptions to this rule occur. Sports aviation also includes parachute operations and acrobatics. Sports aviation in this report does not include Australian non-VH registered aircraft.
STAR	Standard arrival route
Statutory agency	A body, or group of persons, declared by an Act to be a statutory agency for the purposes of the *Public Service Act 1999*.
Systemic failure	A breakdown in the system as a whole.
Transport safety matter	As defined by the *Transport Safety Investigation Act 2003*, these matters consist of occurrences in which: > the transport vehicle is destroyed > the transport vehicle is damaged > the transport vehicle is abandoned, disabled, stranded or missing in operation > a person dies as a result of an occurrence associated with the operation of the transport vehicle > a person is injured or incapacitated as a result of an occurrence associated with the operation of the transport vehicle > any property is damaged as a result of an occurrence associated with the operation of the transport vehicle > the transport vehicle is involved in a near accident > the transport vehicle is involved in an occurrence that affected, or could have affected, the safety of the operation of the transport vehicle > something occurred that affected, is affecting, or might affect transport safety.
TSI Act	*Transport Safety Investigation Act 2003*
ULB	Underwater locator beacon

APPENDIX D: LIST OF REQUIREMENTS

PGPA rule ref	Description	Requirement	Page
17AI	Letter of transmittal	Mandatory	v
17AJ(a)	Table of contents	Mandatory	vi–vii
17AJ(b)	Alphabetical index	Mandatory	209–213
17AJ(c)	Glossary of abbreviations and acronyms	Mandatory	198–203
17AJ(d)	List of requirements	Mandatory	204–208
17AJ(e)	Details of contact officer	Mandatory	xi
17AJ(f)	Entity's website address	Mandatory	xi
17AJ(g)	Electronic address of report	Mandatory	xi
Review by Accountable Authority			
17AD(a)	A review by the accountable authority of the entity	Mandatory	2
	Summary of significant issues and developments	Suggested	2–5
	Overview of the entity's performance and financial results	Suggested	2–5
	Outlook for the next reporting period	Suggested	6
	Significant issues and developments for the portfolio	Suggested for portfolio agencies	N/A
Overview of the entity			
17AE(1)(a)(i)	A description of the role and functions of the entity.	Mandatory	10–17
17AE(1)(a)(ii)	A description of the organisational structure of the entity.	Mandatory	18–24
17AE(1)(a)(iii)	A description of the outcomes and programmes administered by the entity.	Mandatory	26
17AE(1)(a)(iv)	A description of the purposes of the entity as included in corporate plan.	Mandatory	10–11
17AE(1)(b)	An outline of the structure of the portfolio of the entity.	Portfolio departments – mandatory	N/A
17AE(2)	Differences in the outcomes and programmes from any Portfolio Budget Statement, Portfolio Additional Estimates Statement or other portfolio estimates statement.	If applicable, mandatory	N/A
Report on the performance of the entity			
17AD(c)(i); 16F	Annual performance statement in accordance with paragraph 39(1)(b) of the Act and section 16F of the Rule.	Mandatory	34–38

PGPA rule ref	Description	Requirement	Page
17AF(1)(a)	A discussion and analysis of the entity's financial performance.	Mandatory	57
17AF(1)(b)	A table summarising the total resources and total payments of the entity.	Mandatory	58
17AF(2)	Discussion of any significant changes in financial results, the cause of any operating loss, response to and actions taken in relation to the loss; and any matter that may have a significant impact on the entity's future operation or financial results.	If applicable, mandatory	57
Management and Accountability			
Corporate governance			
17AG(2)(a)	Information on compliance with section 10 (fraud systems).	Mandatory	173–174
17AG(2)(b)(i)	A certification by accountable authority that fraud risk assessments and fraud control plans have been prepared.	Mandatory	v
17AG(2)(b)(ii)	A certification by accountable authority that appropriate mechanisms for preventing, detecting incidents of, investigating or otherwise dealing with, and recording or reporting fraud that meet the specific needs of the entity are in place.	Mandatory	v
17AG(2)(b)(iii)	A certification by accountable authority that all reasonable measures have been taken to deal appropriately with fraud relating to the entity.	Mandatory	v
17AG(2)(c)	An outline of structures and processes in place for the entity to implement principles and objectives of corporate governance.	Mandatory	170
17AG(2)(d)–(e)	A statement of significant issues reported to the Minister under paragraph 19(1)(e) of the Act that relates to non-compliance with Finance law and action taken to remedy non-compliance.	If applicable, mandatory	N/A
External scrutiny			
17AG(3)	Information on the most significant developments in external scrutiny and the entity's response to the scrutiny.	Mandatory	182–185
17AG(3)(a)	Information on judicial decisions and decisions of administrative tribunals and by the Australian Information Commissioner that may have a significant effect on the operations of the entity.	If applicable, mandatory	N/A
17AG(3)(b)	Information on any reports on operations of the entity by the Auditor-General (other than report under section 43 of the Act), a Parliamentary Committee, or the Commonwealth Ombudsman.	If applicable, mandatory	N/A

PGPA rule ref	Description	Requirement	Page
17AG(3)(c)	Information on any capability reviews on the entity that were released during the period.	If applicable, mandatory	N/A
Management of human resources			
17AG(4)(a)	An assessment of the entity's effectiveness in managing and developing employees to achieve entity objectives.	Mandatory	174–175
17AG(4)(b)	Statistics on staffing.	Mandatory	176–177
17AG(4)(c)	Information on any enterprise agreements, individual flexibility arrangements, Australian workplace agreements, common law contracts and determinations under subsection 24(1) of the *Public Service Act 1999.*	Mandatory	176–177
17AG(4)(c)(i)	Information on the number of SES and non-SES employees covered by agreements etc identified in paragraph 17AG(4)(c).	Mandatory	176–177
17AG(4)(c)(ii)	The salary ranges available for APS employees by classification level.	Mandatory	177
17AG(4)(c)(iii)	A description of non-salary benefits provided to employees.	Mandatory	176
17AG(4)(d)(i)	Information on the number of employees at each classification level who received performance pay.	If applicable, mandatory	176
17AG(4)(d)(ii)	Information on aggregate amounts of performance pay at each classification level.	If applicable, mandatory	176
17AG(4)(d)(iii)	Information on the average amount of performance payment, and range of such payments, at each classification level.	If applicable, mandatory	176
17AG(4)(d)(iv)	Information on aggregate amount of performance payments.	If applicable, mandatory	176
Assets management			
17AG(5)	An assessment of effectiveness of assets management where asset management is a significant part of the entity's activities.	If applicable, mandatory	N/A
Purchasing			
17AG(6)	An assessment of entity performance against the *Commonwealth Procurement Rules.*	Mandatory	179–180

PGPA rule ref	Description	Requirement	Page
Consultants			
17AG(7)(a)	A summary statement detailing the number of new contracts engaging consultants entered into during the period; the total actual expenditure on all new consultancy contracts entered into during the period (inclusive of GST); the number of ongoing consultancy contracts that were entered into during a previous reporting period; and the total actual expenditure in the reporting year on the ongoing consultancy contracts (inclusive of GST).	Mandatory	180
17AG(7)(b)	A statement that "*During [reporting period], [specified number] new consultancy contracts were entered into involving total actual expenditure of $[specified million]. In addition, [specified number] ongoing consultancy contracts were active during the period, involving total actual expenditure of $[specified million]*".	Mandatory	180
17AG(7)(c)	A summary of the policies and procedures for selecting and engaging consultants and the main categories of purposes for which consultants were selected and engaged.	Mandatory	180
17AG(7)(d)	A statement that "*Annual reports contain information about actual expenditure on contracts for consultancies. Information on the value of contracts and consultancies is available on the AusTender website*".	Mandatory	180
Australian National Audit Office access clauses			
17AG(8)	Absence of provisions in contracts allowing access by the Auditor-General.	If applicable, mandatory	N/A
Exempt contracts			
17AG(9)	Contracts exempted from publication on AusTender.	If applicable, mandatory	181
Small business			
17AG(10)(a)	A statement that "*[Name of entity] supports small business participation in the Commonwealth Government procurement market. Small and Medium Enterprises (SME) and Small Enterprise participation statistics are available on the Department of Finance's website*".	Mandatory	181
17AG(10)(b)	An outline of the ways in which the procurement practices of the entity support small and medium enterprises.	Mandatory	181

PGPA rule ref	Description	Requirement	Page
17AG(10)(c)	If the entity is considered by the Department administered by the Finance Minister as material in nature—a statement that "*[Name of entity] recognises the importance of ensuring that small businesses are paid on time. The results of the Survey of Australian Government Payments to Small Business are available on the Treasury's website*".	If applicable, mandatory	N/A
Financial statements			
17AD(e)	Inclusion of the annual financial statements in accordance with subsection 43(4) of the Act.	Mandatory	140–167
Other mandatory information			
17AH(1)(a)(i) and 17AH(1)(a)(ii)	Statement regarding the conduct of advertising campaigns during the reporting period.	If applicable, mandatory	188
17AH(1)(b)	Grant programs.	If applicable, mandatory	190
17AH(1)(c)	Outline of mechanisms of disability reporting, including reference to website for further information.	Mandatory	190
17AH(1)(d)	Website reference to where the entity's Information Publication Scheme statement pursuant to Part II of FOI Act can be found.	Mandatory	190–191
17AH(1)(e)	Correction of material errors in previous annual report.	If applicable, mandatory	N/A
17AH(2)	Information required by other legislation.	Mandatory	188–195

SUBJECT INDEX

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