Australian Government
Civil Aviation Safety Authority

Sector Risk Profile

for the small aeroplane transport sector

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The Civil Aviation Safety Authority thanks the following sector participants in working actively with the Authority to develop a risk profile for the small aeroplane transport sector:

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Abbreviations and terms

ADS-B Automatic Dependent Surveillance - Broadcast

ALARP As Low As Reasonably Practicable

AOC Air Operators Certificate

ARO Aerodrome Reporting Officer

ATC Air traffic control

ATM Air Traffic Mangement

ATSB Australian Transport Safety Bureau

BoM Bureau of Meteorology

BITRE Bureau of Infrastructure, Transport and Regional Economics

CAMO Continuing Airworthiness Management Organisation

CAO Civil Aviation Order

CAR Civil Aviation Regulations

CASA Civil Aviation Safety Authority

CASR Civil Aviation Safety Regulations

CNS Communications, Navigation and Surveillance

CPL Commercial Pilot Licence

DIRD Department of Infrastructure and Regional Development

GDP Gross Domestic Product

HF Human Factors

IFR Instrument Flight Rules

MRO Maintenance, Repair and Overhaul

MTOW Maximum Take-off Weight

NOTAM Notice to Airmen

NTS Non-technical Skills

OAR Office of Airspace Regulation

RAAA Regional Aviation Association of Australia

RFDS Royal Flying Doctor Service

RPA Remotely Piloted Aircraft

RPAS Remotely Piloted Aircraft Systems

SAT Small Aeroplane Transport

SDR Service Difficulty Report

SMS Safety Management System

SOP Standard Operating Procedure

SRP Sector Risk Profile

TAWS Terrain Awareness and Warning System

VFR Visual Flight Rules

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About the Civil Aviation Safety Authority

The Civil Aviation Safety Authority (CASA) was established on 6 July 1995 as an independent statutory authority under section 8 of the Civil Aviation Act 1988 (the Act). The object of the Act is 'to establish a regulatory framework for maintaining, enhancing and promoting the safety of civil aviation with particular emphasis on preventing aviation accidents and incidents' (section 3A). Section 9 of the Act lists CASA's functions and safety–related functions. In particular, subsection 9(1)(g) of the Act empowers CASA to conduct regular reviews of the system of civil aviation safety in order to monitor the safety performance of the aviation industry. CASA identifies safety-related trends and risk factors and promotes the development and improvement of the system.

About the Small Aeroplane Transport Sector Risk Profile

This sector risk profile (SRP) for the Small Aeroplane Transport (SAT) sector presents a picture of the key risks facing the sector at a specific point in time. The SRP provides a definition of the sector, the context used to develop the risk profile, identification of risks, risk ratings, identification of stakeholders in the sector who have ownership for the risks and proposed risk treatments, and an ongoing plan for monitoring implementation of risk treatments and evaluating their effectiveness.

Sector risk profiling identifies sector specific risks and develops a good understanding of the impacts of risks that sector participants must address in order to maximise their aviation safety performance. Effective risk management also makes a significant contribution to an operator achieving its commercial objectives. The sector risk profiling process adopts the CASA Risk Management Framework, which is based on AS/NZS ISO 31000:2009 Risk Management – Principles and guidelines, to identify, assess and treat the risks that must be managed by sector participants. A sector risk profile provides the sector participants and CASA with an opportunity to understand the effects of aviation related risks on the sector and how the level of risks can be reduced and managed utilising an approach that monitors the implementation of risk treatments by sector stakeholders, including CASA, as well as evaluating the effectiveness of the risk treatments through a set of safety performance indicators. The sector risk profile also provides an opportunity for stakeholders in a sector to manage the effects of risks listed in the sector's risk register.

Foreword

The SAT sector conducts passenger transport and freight operations in fixed wing aircraft with a maximum take-off weight (MTOW) not exceeding 8,618 kg, and a passenger seating capacity of 9 or less. The SAT sector performs a vital task for the Australian economy through the connectivity it provides for enhancing the economic, cultural and social well-being of regional and remote communities in Australia. The sector consists of two subsectors, scheduled and non-scheduled services, with an annual average of 37,681 hours flown for scheduled services, and annual average of 318,509 hours flown for non-scheduled services between 2006 and 2013. The average annual number of passengers carried by the SAT sector during this period is about 1.3 million with an estimated 2.3 passengers per flight, and a flight having an average duration of 38 minutes. Clearly this is not a sector without its challenges and some of these challenges have taken a toll on the sector over the last 20 years. The importance of serving small scattered population centres makes aviation an essential service but also denies the sector economies of scale that are available in other advanced economies. To derive economies of scale, the sector has been undergoing an enormous amount of consolidation with Industry expressing the view that emerging larger companies see little value in servicing 'thin' routes. Despite the steady decline, some services offered by the sector are likely to increase in the coming years as a result of growth in tourism and infrastructure development programmes in Northern Australia.

Despite its challenges, the sector provides opportunities for entry level pilots to embark on a career but finds it difficult to retain flying operations and maintenance personnel as they are attracted to larger domestic and international airlines.

Over the period 2006 to 2013 the accident rate for the SAT sector was 33.7 accidents per million hours, with 3.3 for scheduled services, and 37.3 for non-scheduled services. This considerable disparity in the accident rates with the non-scheduled rate 11 times that of scheduled services needs to be addressed. Analysis of available data, inspectorate and sector participant survey responses and workshop proceedings with SAT industry participants suggests that despite constraints in operating conditions, viability of business models, diversity in organisation and fleet sizes and widely fluctuating market conditions, there is an increasing awareness and focus on safety across the sector. Key risk areas for the SAT sector include: inexperienced personnel; low staff retention rates; inadequate pilot training and supervision with lack of emphasis on human factors and non-technical skills; inadequate organisation structures for managing safety; inadequate maintenance systems leading to improper maintenance; low frequency of surveillance compared to the Large Aeroplane sector; poor state of aerodromes and aircraft landing areas; and inadequate communication by aerodrome reporting officers. While CASA's relationship with the sector is improving, considerable work needs to be done to have effective communication of change, shifting from compliance based surveillance to system based surveillance and induction of just culture in the relationship with CASA.

As Australia's aviation safety regulator, CASA has the function, among others, of conducting regular reviews of the system of civil aviation safety to monitor the safety performance of the aviation industry, to identify safety-related trends and risk factors and to promote the development and improvement of the safety system. In order to identify safety-related trends and risk factors, CASA developed a methodology that examines risk factors associated with each sector of the Australian aviation industry.

The successful development of a sector risk profile relies on industry participation in identifying hazards, associated risks and developing treatments which are not only feasible but also effective in delivering safe outcomes. It is in this regard that I would like to thank the principal contributors from the small aeroplane sector for giving up their valuable time to attend workshops, provide commentary on documentation and demonstrating a commendable dedication to building a risk profile for the sector.

Safe Flying

Shane Carmody
Acting Chief Executive Officer and
Director of Aviation Safety

INTRODUCTION

About the Small Aeroplane Transport Sector

Scheduled and non-scheduled transport of passengers and freight using small aeroplanes is essential to the social, economic and cultural sustainability of Australia's remote and regional communities. According to the Regional Aviation Association of Australia (RAAA), over 4 million Australians rely on regional air services across the country. Regional industries such as tourism, mining and manufacturing, which have a significant impact on employment prospects and resilience of rural, regional and remote communities, are also dependent on reliable air services.

The contemporary environment for remote and regional air transport is subject to contextual and environmental challenges. Air transport for rural and regional communities is dependent on a resilient network of airports and airlines. Local governments, which are most frequently responsible for the provision and servicing of rural and regional airports, do not always have funding, knowledge or skills required for the long-term management of their airports, and development and maintenance of the airport is often overlooked for other council issues. The lack of passenger demand for these airports creates capacity concerns for providers of air transport with respect to the selection of appropriate aircraft, and for the level of investment in servicing remote communities.

In the last ten years the challenges faced by SAT operators have been masked by the health of resource industry related fly-in-fly-out operations. Vast distances and small scattered population centres make aviation an essential service but also deny it economies of scale across much of the continent. With the consolidation taking place in the sector there is a downside that larger companies emerging from the process see no value in servicing thin routes. According to Industry participants, events such as declining mining activity and reduction in government spending lead to a drop in passenger numbers resulting in a negative impact on the sector. The small aircraft operating on regional networks are becoming significantly more expensive to maintain as airframes age, difficulty in obtaining Original Equipment Manufacturer (OEM) or OEM equivalent components, shortage of licensed personnel including engineers and specialists such as welders, diminishing pool of suppliers as owners of organisations age without succession plans in place and are unsure to commit to the progression of a maintenance organisation that is compliant with CASR Part 145. Industry has indicated that some organisations have felt that the selective roll out of Part 145 certification has created an uneven playing field resulting in a major cost imposition for those taking up Part 145. Adding to the regulatory burden are aerodrome costs which includes rents and landing charges.

CASA sector risk profiling process

The CASA sector risk profiling process consists of developing a picture of sector–specific risks in two phases. In Phase 1, information is sourced from databases maintained by the Australian Transport Safety Bureau (ATSB), CASA and the Bureau of Infrastructure, Transport and Regional Economics (BITRE) and supplemented with surveys from air operators certificate (AOC) holders and the CASA inspectorate, and workshops with CASA and industry sector participants. This data is analysed and the results compiled into a series of outputs.

Phase 1 delivers three reports that together provide information on the state of the sector, document hazards and associated risks, and list data sources. Phase 2 delivers a risk register and a risk profile.

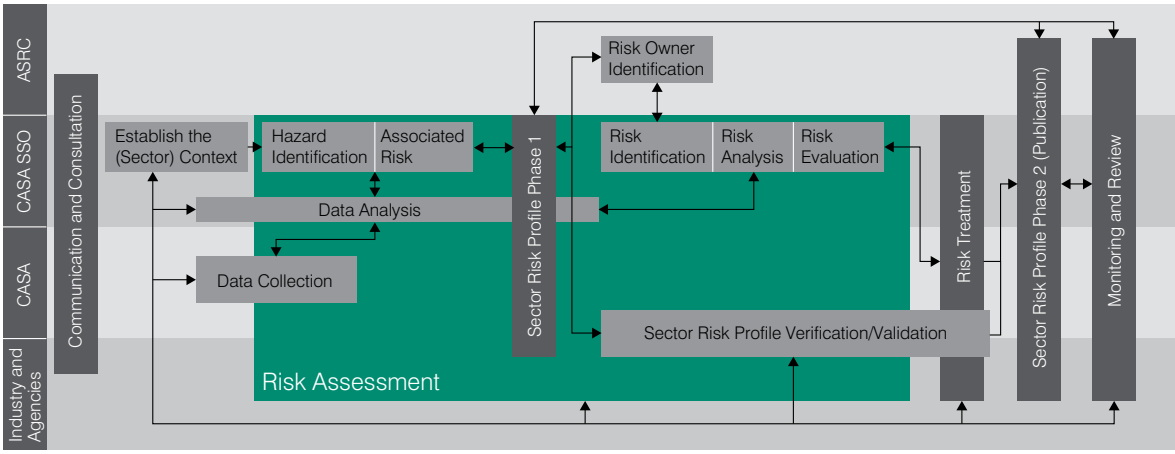
Using the sector risk profile

The purpose of the SAT sector risk profile is to present a picture of the key risks and impacts arising from the operations of the sector's fleet of aircraft at a defined point in time.

CASA and selected industry sector participants developed the sector risk profile through a process in which risks were jointly identified, assessed and evaluated for treatment. When fully implemented, any additional risk treatments identified become controls and thus reduce the risk level of the sector. The responsibility for implementation of the treatment measures for which industry has accountability rests with authorisation holders, operators and pilots.

The sector risk profile is dynamic and will change over time to reflect changes in the sector and the environment. The risk treatments are subject to a monitoring plan that measures change in safety performance following implementation of the risk reduction measures. An evaluation plan evaluates the effectiveness of the risk reduction measures.

Sector risk profile process



Assumptions

» Flights that take off from and land at the same aerodrome and are conducted under VFR during day, repetitively, over well-known and established routes are excluded.

» Ambulance, flight training, testing and maintenance flights are excluded.

Air services provided by the sector include both scheduled and non-scheduled services for passenger carrying and freight as well as freight only services. SAT operations are currently conducted under CAOs 82.1 and 82.3. The anticipated transition to Part 135 of the Civil Aviation Safety Regulations (CASR) in 2018 is expected to reduce differences in safety standards across the sector and improve the safety performance.

SECTOR RISK PROFILE CONTEXT

Sector definition

A small aeroplane has a maximum take-off weight (MTOW) not exceeding 8,618 kg, and is fitted with a passenger seating configuration of not more than 9 passengers.

The small aeroplane sector is defined as:

"Group of individuals and organisations holding permissions to use fixed wing aircraft (MTOW ≤ 8,618kg) for hire or reward to fly from a location to another location with up to 9 passengers and/ or carrying freight cargo".

Sector stakeholders

Sector objectives

» Maintain safe and efficient operation of aircraft for commercial air transportation.

» Encourage and promote the use of people who are trained and competent in the safe operation and regular maintenance of aircraft and associated equipment.

» Promote the identification and reporting of hazards, and analysis of incidents.

» Improve the efficiency, responsiveness and objectivity of the regulatory system in a cost effective manner.

» Encourage the development and implementation of a safety culture.

» Sector engagement through risk management systems that are respected and relevant.

» Establish a collaborative and cooperative relationship between sector participants and CASA

Operating environment

SAT services are vital to the financial and social well-being of regional, rural and remote Australia. Although the industry is dynamic and responsive it needs a broader economic mix to adjust to inevitable cycles in economic activity. The longstanding challenges facing SAT operations include a lack of economies of scale on a network of thin routes, cost of replacing ageing aircraft and availability of replacement aircraft that are appropriate and fuel-efficient for the diversified and competitive nature of the sector's operations, all of which combine together to place considerable pressures on the margins of the operators.

As at January 2014, air transport in small aeroplanes was provided by 182 authorisation holders with Queensland accounting for 27% of the total number of operators, followed by Victoria (20%), New South Wales (18%), Western Australia (16%) and the remaining located in other states and territories.

Demographics for the sector are shown in Table 1:

Table 1. Sector Demographics

No. of Authorisation Holders	182
No. of aircraft	763
Average age of fleet (years)	31
No. of pilots	1544
Hours flown (average 2006-2013)	356,190
Accidents per million hours (average 2006-2013) for scheduled operations	3.3
Accidents per million hours (average 2006-2013) for non-scheduled operations	37.6

The economic performance of small aeroplane operations is influenced by a number of factors including consumer and business confidence, Australian dollar, mining activity, fuel prices and government spending, airport charges, deteriorating state of aerodrome and landing areas, difficulties in attracting people to work in rural and remote locations, potential oversupply of organisations intensifying price competition, reduction in movements of government personnel and serving destinations with low passenger traffic.

The strengths of the sector, which include low initial cost and good internal communication, have been outweighed by a number of weaknesses which provide challenges for operators and regulators. These weaknesses include smaller companies (37% of authorisation holders only have 1 to 5 total staff), ageing aircraft (average fleet age being 31 years old) and shortage of pilots. Principal threats facing the sector as identified by Industry participants include difficulty in obtaining spare parts, maintaining a spare aircraft, increasing regulatory burden, increasing costs of air navigation services, fuel, wages, information technology systems and insurance.

Operational

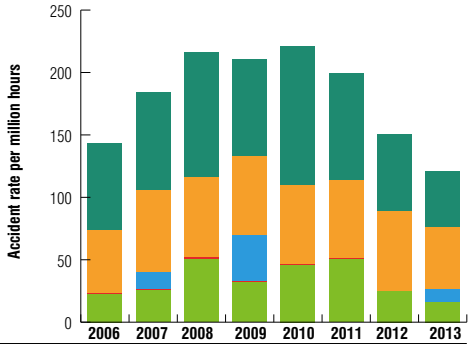
Legislative mandates governing technical and operational requirements for provision of scheduled and non-scheduled air services differ, with the scheduled category requiring a training and checking system for pilots, the application of a safety management system, and Part 145 maintenance organisation. The substantially higher accident rate for non-scheduled services which is eleven times that for scheduled services, suggests the safety benefit of these additional risk mitigation measures.

Between 2006 and 2013 there were seven fatal accidents resulting in nine fatalities, with two accidents from non-scheduled passenger flights and five from freight services. These seven fatal accidents involved a single aircraft with a single pilot in Class G airspace. The estimated rate of fatal accidents for the sector is 2.04 per million flight hours, and the average accident rate during 2006 to 2013 was estimated to be 33.7 per million flight hours. The average annual cost of accidents and fatalities was estimated to be about $15.3 million (based on BITRE estimates).

In terms of accidents reported, the majority (84%) were collision with terrain (22.1%), wheels-up landing (17.7%), runway excursions (12.4%), landing gear/indication (10.6 %), forced/precautionary landing (9.7%), taxiing collision / near collision (7.1%), and hard landing (4.4%).

Figure 1 shows accident rates for small aeroplane transport compared to other commercial operations, and general aviation.

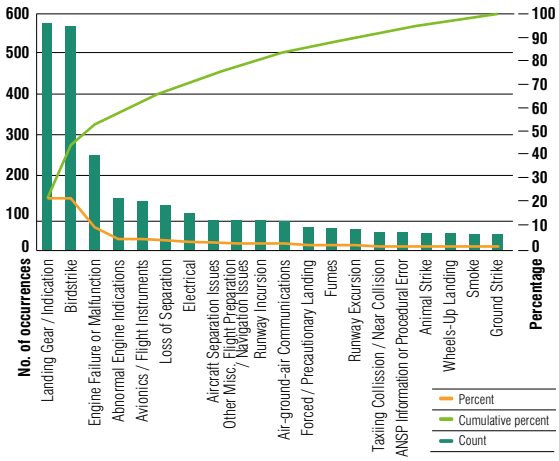
Figure 1. Accident rates for selected operations



	2006	2007	2008	2009	2010	2011	2012	2013
Aerial work	69.6	78.4	99.4	76.9	110.8	85.5	61.6	44.4
General aviation	50.3	65.3	64.4	63.6	63.7	62.3	63.4	49.5
Medical transport	0	13.4	0	36.8	0	0	0	10
Large aeroplane transport	0.8	0.76	1.41	1.46	0.66	0.63	0.58	0.6
Small aeroplane transport	22.6	26.2	51.1	31.9	45.9	51	25	16.1

As shown in Figure 2, the majority of occurrences (accidents, serious incidents and incidents) relate to landing gear indications, birdstrikes, engine failure, avionics and loss of separation.

Figure 2. Top 20 occurrences for the small aeroplane transport sector



The ATSB defines a safety factor as 'an event or condition that increases safety risk. In other words, it is something that, if it occurred in the future, would increase the likelihood of an occurrence, and/or the severity of the adverse consequences associated with an occurrence'.

The top 5 safety factors contributing to occurrences in the SAT sector were monitoring and checking, assessing and planning, communicating/coordinating, pre-flight inspection, and aircraft handling. Pilot training, supervision and mentoring play a critical role in developing pilot skills for managing high frequency occurrence types.

SECTOR RISK REGISTER

The following pages present a short-form version of the sector's risk register. The risk register provides information on the risks, current rating of risks and proposed strategies for treating the risks, treatment owner and the residual risk rating once treatments have been implemented. The short form risk register does not contain risk cause/source, impacts, stakeholders and likelihood/consequence ratings. For the full report version refer to 'Small Aeroplane Transport Sector Risk Register, Civil Aviation Safety Authority, 2016'.

The risk ratings before and after treatment should be considered in conjunction with the sector risk matrix below.

Figure 4: Risk ratings matrix

	Insignificant	Minor	Moderate	Major	Severe	Catastrophic
Almost certain	7a	8a	9a	10a	11a	12
likely	6a	7b	8b	9b	10b	11b
Possible	5a	6b	7c	8c	9c	10c
Unlikely	4a	5b	6c	7d	8d	9d
Rare	3a	4b	5c	6d	7e	8e
Extremely Rare	2	3b	4c	5d	6e	7f

Short form version of the sector's risk register

Risk #	Risk	Risk Owner - Primary	Current Controls	Current Rating	
1	Shortage of skilled industry personnel: Pilots Engineers Safety managers Quality managers Maintenance controllers Training and checking pilots	Aircraft operator	Organisation offering incentives to personnel Tax incentives for remote areas Access to funding for students Red-tape reduction (processing approvals for key personnel)	High 9b	
2	Organisation systems compromise safety issue management	Aircraft operator CAMO MRO CASA	CASA oversight CASA current educational practice Aircraft operator's management meetings	High 9b	
3	Collision with wildlife in flight	Aircraft operator	Aerodrome wildlife management plan Aerodrome reporting to operators Flight crew training	Medium 7c	
4	Failure of/ damage to aircraft structure or mechanical systems	Aircraft operator Pilot	Maintenance organisation SOPs Adequate maintenance program Audits of maintenance organisation Aircraft operator SOPs (defect reporting) Manufacturer Inspection program Ageing aircraft programs Schedule maintenance when engineers available Education and awareness	Medium 7c	
5	Maintenance practices compromise continuing airworthiness	Aircraft operator Maintenance controller	Maintenance control CASA audits Operator SMS Ageing aircraft programs Schedule operations around maintenance Maintenance organisation SMS, SOPs Mandatory reporting of major defects Organisation culture CAR 37 Communication with Part145/CAR30 holders External audits Ongoing professional development Awareness of Human Factors	Medium 7c	

Treatment Description	Treatment Owner	Residual Risk Rating	Risk Review date
Support for and collaboration on education reforms	Dept of Education / Dept of Infrastructure / Industry association / State Government / CASA / Aircraft operator	Medium 7c	2017
Adding roles to shortage of skills list	Industry association / Aircraft operator / CASA		
Develop syllabus, guidance material and online training module for assessment of key personnel by CASA	CASA		
Establish relationship between operators and flying schools	Aircraft operator / flying school operator		
Establish relationship between aircraft operators and airlines	Aircraft operator / Airlines		
Manage student pilot expectations	Flying school operator		
Increase availability of TAFE training for engineers	Dept of Infrastructure / Dept of Education / Industry association / CASA		
Greater emphasis on red-tape reduction for Part 66 licences	CASA		
Review CASA HF assessment in CPL flight test requirements (Part 61)	CASA	Low 5c	2017
Encourage uptake of relevant elements of SMS tailored to operation	CASA / Industry		
Develop syllabus, guidance material and online training module for assessment of key personnel by CASA	CASA		
Organisation succession planning	Aircraft operator / MRO		
Improve communication between CASA , Aircraft operators and/or MRO	CASA / Aircraft operator / MRO		
CASA to implement just culture policy in accordance with regulatory philosophy	CASA		
Improve reporting from ARO through effective Wildlife Management Plan	Aerodrome owner	Medium 6c	2017
Improve reporting from aircraft operator to ARO	Aircraft operator		
Develop whole-of-government approach towards aerodrome hazards	CASA/ Dept of Infrastructure / Airservices Australia		
Encourage takeup of recommended practices for wildlife management developed by Australian Aviation Wildlife Hazard Group	CASA / Aircraft operator / Aerodrome operator		
Encourage reporting of SDRs with new reporting system	CASA	Medium 7c	2017
Regular review of aircraft maintenance program	Aircraft operator		
Improve safety culture message at regional forums	Industry association / CASA	Medium 7c	2017
Encourage transition from CAR42B to CAR42A, CAR42C or Part 145	Industry association / CASA		

Short form version of the sector's risk register (continued)

Risk #	Risk	Risk Owner - Primary	Current Controls	Current Rating	
6	Collision with wildlife on ground	Aircraft operator	Fence inspection and maintenance Aerodrome wildlife management plan Aerodrome reporting to operators Flight crew training Wildlife procedures Runway inspections	Medium 7d	
7	Loss of control on landing or taxiing due to surface conditions	Aerodrome operator Aircraft operator Pilot	Aerodrome strip reports, ground assessments Weather reporting Aircraft operator SOPs Instrument approach Runway lighting/markings, sealed surface (where available) Aircraft operator SMS Flight crew training	Medium 7d	
8	Fuel starvation or exhaustion	Aircraft operator Pilot	Fuel management requirements Refuelling procedures Availability and storage procedures Safety promotion SOPs	Medium 7d	
9	Collision with terrain	Pilot Aircraft operator	Continuing airworthiness Fuel management Weather reporting Cargo restraint ratings, aircraft loading compartments SOPs Training and checking Fatigue management Medical checks Supervision and mentoring Company culture, safety promotion Aircraft technology where fitted (e.g. TAWS) ATC, navaids CASA Safety promotion	Medium 7e	
10	Pilot error compromises safety of flight	Pilot Aircraft operator	SOPs Pilot training Organisation culture Appointment of suitable key personnel Supervision and mentoring Organisation change management Recurrency checking and training	Medium 7e	

Treatment Description	Treatment Owner	Residual Risk Rating	Risk Review date
Improve reporting from ARO through effective Wildlife Management Plan	Aerodrome owner	Medium 6d	2017
Improve aerodrome fencing	Aerodrome operator		
Improve reporting from aircraft operator to ARO	Aircraft operator		
Improvements in wildlife detection equipment	Aircraft operator		
Request government funding for aerodrome improvement (Remote Aviation Infrastructure Fund program)	Aircraft operator / Aerodrome operator		
Develop whole-of-government approach towards aerodrome hazards	CASA / Dept of Infrastructure / Airservices Australia		
Improve education/training of AROs and reporting from ARO to aircraft operator	Aerodrome operator	Medium 6d	2017
Request government funding for aerodrome improvement (Remote Aviation Infrastructure Fund program)	Aircraft operator / Aerodrome operator		
Develop whole-of-government approach towards aerodrome hazards	CASA / Dept of Infrastructure / Airservices Australia		
Develop safety promotion for aerodrome including reporting guidelines	CASA / Dept of Infrastructure		
Safety promotion campaign	CASA	Medium 6d	2017
Amendment to CAR 234 and improve guidance in CAAP 234	CASA		
Amendment to Part 91	CASA		
Review of training and checking/supervision and mentoring requirements	Aircraft operator / CASA	Medium 6e	2017
Promote company safety culture	Aircraft operator		
Review CASA HF assessment in CPL flight test requirements (Part 141)	CASA		
Encourage uptake of relevant elements of SMS tailored to operation	CASA / Industry		
Encourage uptake of relevant elements of HF and NTS training tailored to operation	CASA / Industry		
Encourage fitment of terrain awareness equipment e.g. TAWS	CASA / Industry		
Update Human Factors for Pilots kit	CASA		
Improve initial pilot training	Flying school operator	Medium 6e	2017
Review CASA HF assessment in CPL flight test requirements (Part 141)	CASA		
Encourage uptake of relevant elements of HF and NTS training tailored to operation	CASA / Industry		
Update Human Factors for Pilots kit	CASA		

Short form version of the sector's risk register (continued)

Risk #	Risk	Risk Owner - Primary	Current Controls	Current Rating	
11	Mid-air collision	Aircraft operator Pilot Air Traffic Control	Pilot training Technology Adequate separation service Pilot medical standards Effective communication/ Alerted see and avoid ATC Fatigue Risk Management System ATC training OAR aeronautical studies Coordination between operators	Medium 7f	
12	Low frequency and quality of surveillance	CASA Aircraft Operator	Prioritisation of CASA audits CASA internal procedures and processes 3rd party audits Operator internal audits	Medium 6b	
13	New pilot does not meet sector expectations	Aircraft operator Pilot Flying school CASA	Part 61 and Manual of Standards CASA surveillance Training and Assessment syllabus	Medium 6b	
14	Deviation from intended flight path	Pilot Aircraft operator Air Traffic Control	Pilot training and recency Weather reporting SOPs Aircraft technology ATC NOTAMS Standard routes Flight plan Coordination between operators Maintenance requirements	Medium 6b	
15	Collision with obstacles	Aircraft operator	Aerodrome report to operators Aerodrome markings/lighting/signage NOTAMs Cargo restraint ratings, aircraft loading compartments SOPs Weather reports Training and checking Fatigue management, medical checks Supervision and mentoring Aircraft technology where fitted (e.g. TAWS)	Medium 6c	

Treatment Description	Treatment Owner	Residual Risk Rating	Risk Review date
ADS-B implementation for IFR aircraft	Aircraft operator	Medium 7f	2017
Update CNS/ATM kit	CASA		
Improvements to CASA surveillance framework	CASA	Low 4b	2017
Internal training for CASA Inspectors	CASA		
Increase industry understanding of surveillance principles	CASA		
Consideration of 3rd party audits and lessons from 3rd party audits	CASA		
Establish relationship between operators, flying schools and flight test examiners	Aircraft operator / flying school operator	Low 5b	2017
Review of training and checking/supervision and mentoring requirements	Aircraft operator / CASA		
Encourage regular and/or ad-hoc Line Checks	Aircraft operator		
Ongoing professional development and assessment of Flight Test Examiners	Flight Test Examiners		
Pilot induction, recurrency checking and training	Aircraft operator	Low 5b	2017
Transition to Performance Based Navigation	Airservices Australia		
Aircraft technology	Aircraft operator		
Increased Airservices safety promotion	Airservices Australia		
Update CNS/ATM kit	CASA		
Review of training and checking/supervision and mentoring requirements	Aircraft operator / CASA	Low 5c	2017
Review CASA HF assessment in CPL flight test requirements (Part 141)	CASA		
Encourage uptake of relevant elements of SMS tailored to operation	CASA / Industry		
Encourage uptake of relevant elements of HF and NTS training tailored to operation	CASA / Industry		
Update Human Factors for Pilots kit	CASA		

Short form version of the sector's risk register (continued)

Risk #	Risk	Risk Owner - Primary	Current Controls	Current Rating	
16	Propulsion system failure/ partial power loss	Aircraft operator Pilot	SOPs Maintenance control Adequate maintenance program Maintenance organisation SOPs Audits of maintenance organisations Pilot training and experience Fuel management Trend monitoring/oil analysis Aerodrome Foreign Object Debris management	Medium 6d (single engine) Low 5c (Partial failure / multi engine)	
17	Communication/Surveillance failure	Aircraft operator Pilot Airservices Australia	Equipment inspection and maintenance ATC Service manage frequency Use of Area frequency, Aeronautical Information Publication Broadcast Area frequency Data checks, aerodromes updating data NOTAMs SOPs Pilot training	Low 4b	
18	Airside incident involving personnel, vehicles or other non-aircraft equipment	Aircraft operator	SOPs Passenger briefings Aerodrome SOPs Barriers/markings/signage	Low 4c	
19	Safety sensitive personnel operating under influence of drugs and/or alcohol	Pilot Aircraft operator MRO CAMO	Drug and Alcohol Management Plan Testing CASA E-learning	Low 4c	
20	Collision with RPAS operating in contravention of regulations	RPAS operator	Integration of RPAS into Air Traffic Management System Entry control (RPA Operator's Certificate) RPAS training schools Part 101 CASA safety promotion	Pending outcome of studies into RPA activity	

PC-12 landing © Pilatus Aircraft Ltd

Treatment Description	Treatment Owner	Residual Risk Rating	Risk Review date
Encourage reporting of SDRs with new reporting system	CASA	Medium 6d	2017
Regular review of aircraft maintenance program	Aircraft operator	Low 5c	
Retained - refer to full report version		Low 4b	2019
Retained - refer to full report version		Low 4c	2019
Retained - refer to full report version		Low 4c	2019
Retained - refer to full report version		Pending outcome of studies into RPA activity	2019

Further reading

Small Aeroplane Transport- State of Sector Report, Civil Aviation Safety Authority, 2016

Small Aeroplane Transport - Sector Risk Profile Report, Civil Aviation Safety Authority, 2016 (full report)

Small Aeroplane Transport Data Sources Report, Civil Aviation Safety Authority, 2016

Small Aeroplane Transport Sector Risk Register, Civil Aviation Safety Authority, 2016

If you would like a copy of the above documents, please send your request to Manager, Safety Systems Branch, Civil Aviation Safety Authority, GPO Box 2005 Canberra ACT 2601, or email **safetysystems@casa.gov.au**