AIR NAVIGATION SERVICES OPERATIONAL SAFETY REPORTING AND PERFORMANCE LONG-TERM TRENDS

VERSION 2

MAY 2020

airservicesaustralia.com

Change summary

Version	Date	Change description
1	26 July 2019	First version for public release
2	May 2020	Second version incorporating data to 30 April 2020

CONTENTS

1. Executive Summary

As the provider of Air Navigation Services over 11% of the world's surface, the safety and integrity of service delivery is our most important consideration. We are committed to maintaining and enhancing our safety performance and systems.

Our air traffic controllers have access to a wide range of reporting mechanisms in our efforts to capture safety occurrences, concerns, hazards or issues. These options include confidential reporting within our organisation and to the Australian Transport Safety Bureau (ATSB).

A stable reporting trend is evident from July 2010 to February 2020, consistently exceeding our legislative reporting requirements under the Transport Safety Investigations (TSI) Act. As air traffic has reduced significantly since February 2020 due to the impact of Novel Coronavirus (COVID-19) pandemic, there has been a corresponding decrease in the number of reported safety occurrences. However the rate of occurrences attributed to air traffic services (ATS) as a function of flight hours has remained stable even during the pandemic. We maintain a strong focus on reporting culture and continue to refine our reporting process and culture, through the adoption of Just Culture principles.

We have a strong governance approach in relation to our safety performance, employing a 'three lines of defence' model. The Executive and accountable managers are immediately alerted about occurrence notifications, with a summary of our performance being distributed each day to increase the visibility and transparency.

Our approach to data collection and investigation of occurrences has been recognized as best practice by the Civil Air Navigation Service Organisation (CANSO). We have a proactive monitoring and analysis regime executed by the Air Navigation Services Group, who are accountable for service provision, and the Safety and Assurance Group, who oversights the organisation's Safety Management System. Both groups are focused on identifying trends in reporting to continually improve our service delivery. Compliance with regulatory requirements is tested by a dedicated group of specialists within the Air Navigation Services Group, our Internal Audit team and the Civil Aviation Safety Authority (CASA). A comprehensive range of lead and lag indicators are presented to a steering group of Executives charged with delivering and overseeing our services and the Safety Committee of the Airservices Board.

Whilst we use a wide range of metrics to validate our performance, the following two internationally used benchmark metrics are our key indicators of our safety performance:

- the required separation standard between aircraft or a restricted airspace volume is infringed (Loss of Separations (LOS))
- an unauthorised aircraft, vehicle or person is on a runway (Runway Incursions).

Long term monitoring of both the numbers and rates of such occurrences demonstrate a relatively stable or improving performance trend.

In Financial Year 2019-20 to 28 February 2020, the LOS rates attributed to our Tower or Enroute services decreased by 16% and 20% respectively compared to the previous year and remained at a very low level (Tower LOS rate at 0.78 occurrence per 100,000 movements and Enroute LOS rate at 0.98 occurrence per 100,000 flight hours). The LOS rate in the Terminal airspace (i.e. within 75 kilometres of a major airport) (3.05 per 100,000 movements) was slightly higher than the previous year (2.64 per 100,000 movements). As air traffic declined significantly impacted by the COVID-19 control measures since March 2020, the LOS rate has remained stable for Tower and Enroute, and decreased further in the Terminal environment.

Our recent and long-term safety performance highlights that periods of sustained increased workload drive occurrences. The higher LOS rate at a number of capital-city locations in the current financial year compared to the previous year were driven by occurrences during increased operational complexity. The risk bearing of these occurrences was consistently low, where the contributory errors were captured by the air traffic management system and collision risk was minimal. We consistently address all causal factors of occurrences and all that are attributed to our operations, including applying lessons learned broadly to strengthen the national aviation system.

When our safety performance is compared against those of Air Navigation Service Providers (ANSPs) with similar volumes of aircraft movements and flight hours, we compare exceptionally well from both an occurrence rate and risk perspective. Our air traffic controllers also report a very high proportion of occurrences in which there was only a marginal infringement of the required separation standards between aircraft, again reflecting a positive reporting culture.

We remain committed to ensuring the services that we provide in Australian administered airspace is of the highest safety standard, and will continue to invest in technological and people capability to meet this objective.

2. Australian Administered Airspace

Airservices Australia (Airservices) manages 11 per cent of the world's airspace (see **Figure 1**). Our area of operations covers the Australian Flight Information Region (FIR) which includes the nation's sovereign airspace and international airspace over the surrounding oceans including the FIR's of the Solomon Islands and Nauru. This is an area of almost 20 million sq. nautical miles (51.7 million sq. kilometres). We provide our services in accordance with the Civil Aviation Safety Regulations (CASRs) 1998.

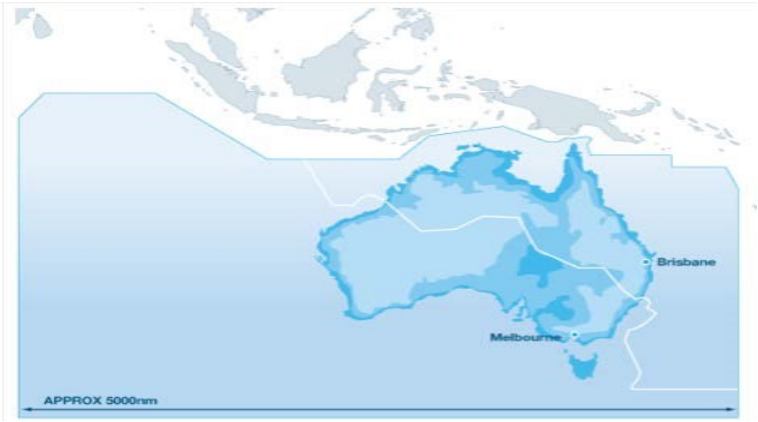


Figure 1: Australian FIR

We deliver services from:

- two air traffic services (ATS) centres located in Brisbane and Melbourne
- two terminal control units in Perth and Sydney
- 29 control towers.

Our air traffic controllers manage aircraft through all phases of flight, from terminal gate to terminal gate, providing services to those who are operating either on or in the immediate vicinity of the aerodrome (Tower control), in the approach or arrival phase of flight (Terminal control) or when the aircraft is established in cruise (Enroute) (see **Figure 2**). We also provide flight information services to aircraft**.**

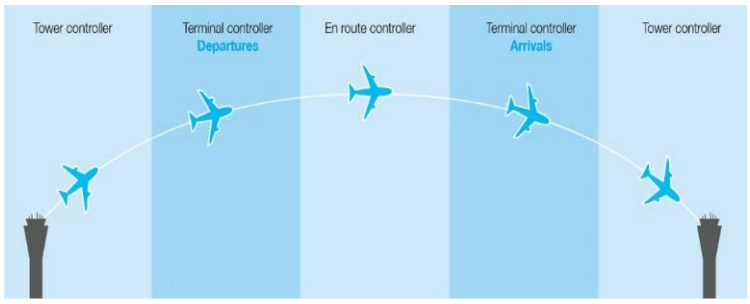


Figure 2: Types of Air Traffic Control

3. Purpose

We maintain a strong focus on fostering a positive and proactive safety culture. Building on this foundation, we actively monitor and work to continually improve our safety performance and culture. This document details our safety reporting mechanisms and long-term reporting and performance trends within the Air Navigation Services Group. The analysis is based on the safety data reported by our operational staff in Air Navigation Services Group for the period of 1 July 2010 to 30 April 2020, and as such extends the period of analysis beyond that presented in the first version of this publication.

4. Safety Reporting Mechanisms

Our staff have access to a range of reporting mechanisms, including:

- the Corporate Integrated Reporting and Risk Information System (CIRRIS) which allows staff to report, review and search hazards and occurrences, enterprise risks, assurance activities and actions on one integrated platform
- Confidential Word which provides an avenue for workers to report confidentially and anonymously on any safety concern or issue directly to the relevant members of the Executive Team
- Fatigue Hazard Reporting which is available either via our intranet or on iPads located in various and easily accessible locations in our major facilities

- workload reporting which allows our air traffic controllers to report everyday workload levels as well as periods of high workload or situations where workload was excessively low
- regular Employee Opinion Surveys and Safety Climate Surveys by which staff can anonymously provide opinions on our commitment and approach to safety.

Staff can also use REPCON, a voluntary and confidential reporting scheme managed by the Australian Transport Safety Bureau (ATSB).

The Safety and Assurance Group provides oversight of all internal reporting mechanisms to ensure their integrity and effectiveness.

5. Reporting Approach

We embrace a Just Culture approach in our efforts to enhance reporting across all facets of our organisation as shown in **Appendix 1**. Our staff are introduced to the approach during their induction to the organisation.

Regular programs are implemented to refresh staff understanding of the Just Culture principles and how they support continual improvement. In February 2019, we rolled out a leader-led program to promote team conversations and individual actions to embed Just Culture principles within the context and function of teams and individual roles. The program content has been incorporated into our corporate induction program to ensure all new employees are made aware of our Just Culture approach. An Executive Team led communication campaign has been delivered to further promote our commitment to Just Culture to our entire organisation. In October 2019, a national program ‘Be a Safety Champion’ was rolled out, promoting recognition of safety champions and encouraging staff to report and innovate for safety.

6. Governance Oversight

Our Board and Executive rely on internal functions to deliver risk management, performance monitoring and assurance functions to acquit their obligations to ensure that the risks to service delivery are effectively managed. The regulatory surveillance program undertaken by the Civil Aviation Safety Authority (CASA) supplements our internal assurance. We have adopted the 'three lines of defence' model as a means of ensuring the integrity of our assurance function (see **Table 1**) given the criticality of the risks we are managing:

- The first line of defence – functions that own and manage risk, i.e. the Air Navigation Services Group. Within the Air Navigation Services Group, an area independent of the service delivery units provides internal assurance and compliance functions.
- The second line of defence – functions that oversee or specialise in risk management and compliance and are independent of the service delivery group, i.e. the Safety & Assurance Group
- The third line of defence – functions that provide independent assurance, including internal audit and CASA surveillance.

Within the three lines of defence model, visibility and transparency of performance is delivered through mechanisms including:

- immediately alert the Executive and accountable managers to occurrences, with a summary of our performance being distributed each day to increase the visibility and transparency
- daily occurrence reviews conducted by experts from the Air Navigation Services Group and Safety and Assurance Group
- internal surveillance outputs being shared between teams in efforts to immediately identify adverse trends
- two key oversight committees, which are detailed in **Table 1**.

Table 1: Key Assurance Activities by Line of Defence

<table>
<tr><th></th><th>1st Line: Air Navigation Services</th><th>2nd Line: Safety & Assurance</th><th>3rd line: Other</th></tr>
<tr><td rowspan="3">Key Activities</td><td rowspan="3">• Occurrence reporting
• Routine occurrence investigations
• Daily review of occurrences
• Dedicated front line managers undertake specific safety management duties
• Air Traffic Control Proficiency Checking
• Standardisation and checking program targeted at Air Traffic Controller Proficiency and operational unit compliance with the Air Traffic Control rule set
• Monthly review of safety performance within operational units and at a group level</td><td rowspan="3">• Significant investigations
• Qualitative and quantitative assessment of safety issues and trends
• Targeted safety surveillance review
• Liaison with stakeholders including airlines
• Fatigue Safety Action Group
• Safety Climate Survey
• Cross checking of occurrences reports against ATSB and airlines
• Identification and promulgation of lead and lag safety indicators</td><td><u>Internal Audit</u> Program (who reports directly to the Chief Executive Officer)</td></tr>
<tr><td><u>External:</u> CASA annual and targeted surveillance program (20 audits per year)</td></tr>
<tr><td><u>Externally sourced:</u> Triennial review of Safety Management System</td></tr>
<tr><td>Oversight Groups</td><td colspan="3">The ATM Safety Panel reviews all assurance inputs relating to the provision of Air Traffic Management prior to presenting the material to the Service Excellence Executive Steering Group, in efforts to identify emerging issues and threats to determine any system or organisation wide improvement.
The Service Excellence Executive Steering Group reviews all assurance inputs to determine the performance of key organisational controls and management systems.</td></tr>
<tr><td colspan="3">The Board Safety Committee monitors, advises and provides assurance to the Board on operational safety, workplace health and safety (WHS), and organisational preparedness to counter identified security threats.
Full charter is available: http://www.airservicesaustralia.com/wp-content/uploads/Airservices-BSC-Charter.pdf.</td></tr>
</table>

7. Safety Reporting Trends

Figures 3 to 5 demonstrate a stable or increasing trend in the reported ATS safety occurrences from Financial Year 2010-11 to March 2020 when there was a significant retraction in aviation activity due to the COVID-19 pandemic. The long-term trend indicates that regardless of what is happening in our organisation or the external environment, we have maintained a strong, positive culture where our staff feel supported to report safety occurrences including their own mistakes without fear of retribution of punishment. The trend is presented in three perspectives:

- our staff are utilising internal reporting avenues to provide additional safety reports, consistently exceeding our legislative reporting obligations under *the Transport Safety Investigation (TSI) Act*
- the ATS attributed occurrence reporting rate as a function of flight hours remains relatively stable even during the COVID-19 pandemic
- there is a significantly higher and stable ratio, in the region of 10:1, of staff reported minor errors versus more notable occurrences (including Loss of Separation (LOS), and Runway Incursions[1]).

Appendix 2 details the safety reporting trends from a number of Air Navigation Services operational units.

[1] A Runway Incursion is defined as an occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of an aircraft.

Figure 3: ATS Occurrences as Recorded in CIRRIS by Legislative Reporting Requirements

Note: There are a number of internal and external changes in reporting requirements which have the potential to influence rates of reporting by our air traffic controllers. Information boxes reflect factors that may have changed reporting obligations or interventions to promote reporting

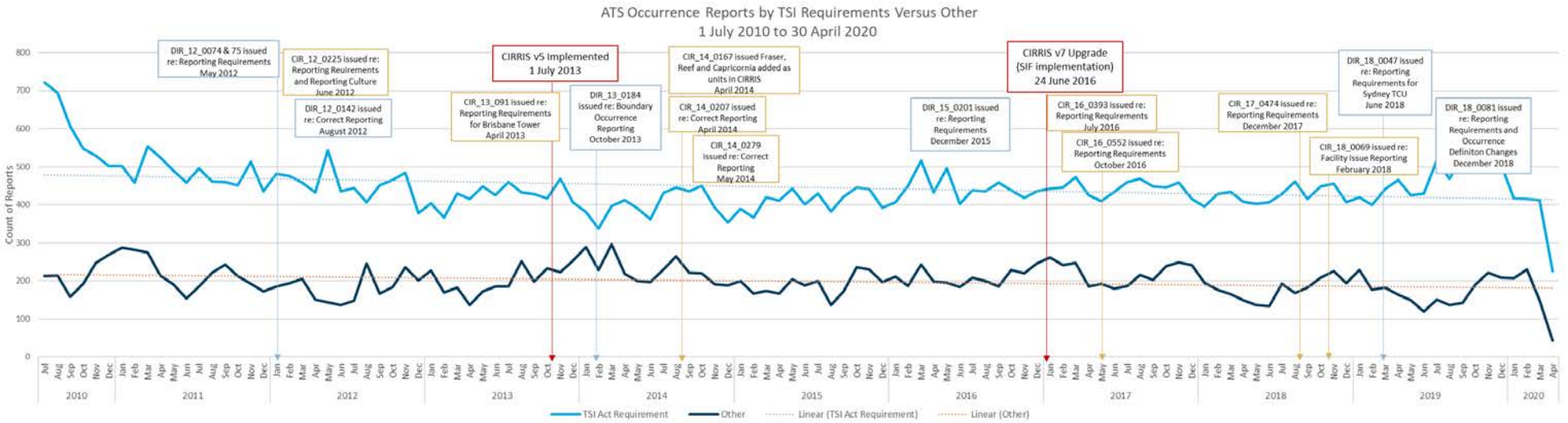


Figure 4: Rate of Airservices Attributed ATS Occurrences per 100,000 Flight Hours

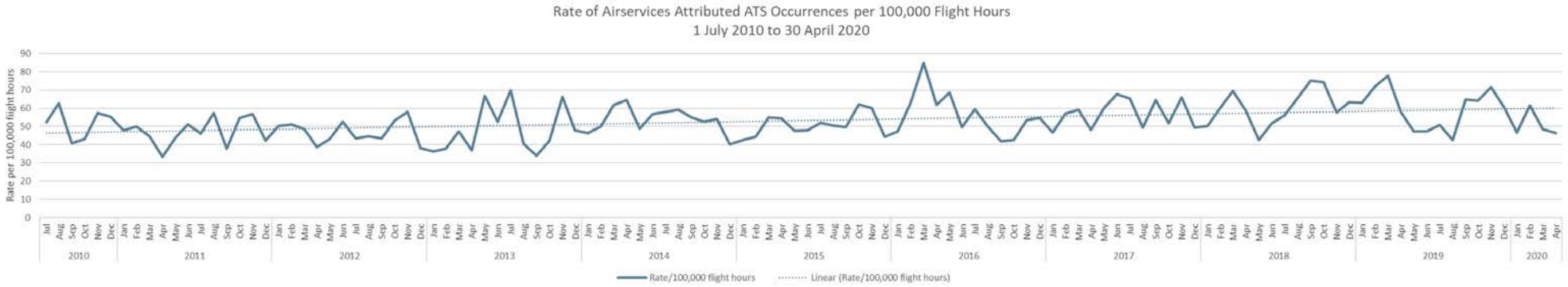
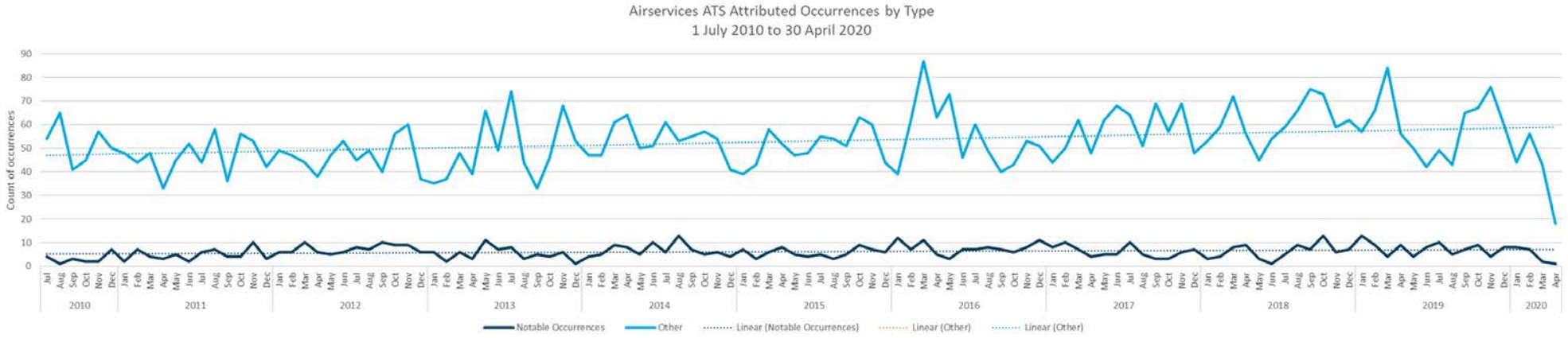


Figure 5: Airservices ATS Attributed Occurrences – Notable Occurrences (i.e. Loss of Separation, Runway Incursions and Ground Proximity events) versus Other Types



8. Other Reporting Trends

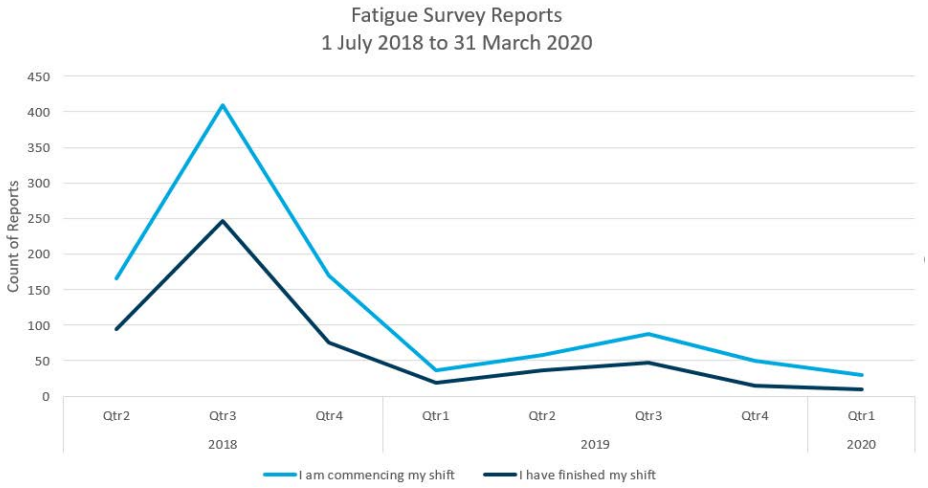
8.1 Fatigue Reporting

Airservices has a well-established Fatigue Risk Management System. We promote reporting of fatigue-related hazards as a key component our fatigue management approach. The Safety and Assurance Group provides oversight to ensure integrity of the reporting mechanism, and encourages ongoing staff commitment to reporting fatigue hazards voluntarily. All data are reviewed by the Fatigue Safety Assurance Group that combines management and staff representatives in efforts to improve our fatigue approach.

Figure 6 demonstrates the trend of our air traffic controllers' reporting of fatigue hazards and surveys. In May 2018, we enhanced Air Navigation Services staff accessibility to the tools for the reporting of fatigue-related hazards and subjective fatigue levels. As reflected in **Section 3**, air traffic controllers have opportunities to report workload-related events in our efforts to improve management of these known precursors to occurrences.

Figure 6: Fatigue Hazard Reports

Figure 7: Fatigue Survey Reports



8.2 Audit Findings

We have a robust and independent internal audit function, which typically conducts on average 15 audits per annum on our Air Navigation Services functions. CASA also maintains an active surveillance program across our operations. Internal and external audits for the period of 1 July 2010 to 30 April 2020 did not raise any findings in relation to concerns with reporting of ATS occurrences, or more broadly our safety or organisational culture.

In January 2013, CASA finalised a review as part of its re-certification of our air traffic services under the Civil Aviation Safety Regulations (CASR) Part 172. Part 172 of CASR 1998 specifies the regulatory framework for the approval of air traffic services providers. It includes standards for air traffic facilities, safety management and the provision of ATS. The review made a series of recommendations to address areas for improvement in Airservices' safety and service performance. These recommendations were addressed via a comprehensive Action Plan which was successfully implemented during 2013 and 2014. On the basis of the review and Airservices Action Plan, CASA re-issued Airservices Provider Certificate in May 2013.

Since that time, our CASR Part 172 Provider Certificate has been reissued without conditions in 2016 and again in 2019, confirming CASA's confidence in our provision of ATS, our safety culture and management.

8.3 Confidential Word

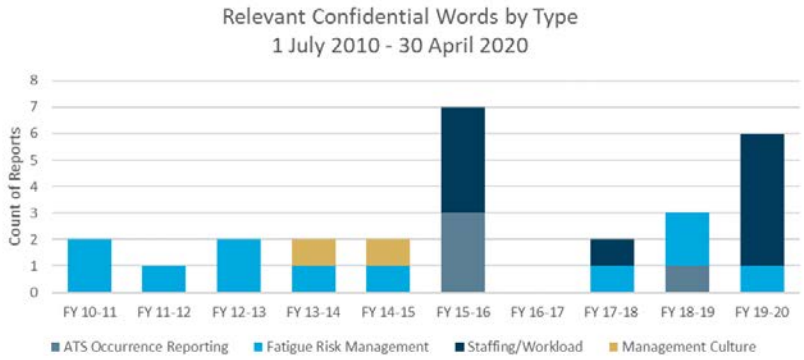
The Confidential Safety Reporting System, 'A Confidential Word,' is an internal safety reporting system available to all Airservices staff. It enables staff to confidentially report on safety issues or concerns. Additionally it enables staff to report the inadequate resolution of safety issues or concerns that have previously been reported through other reporting systems. **Figure 8** shows the long-term trend of Confidential Words relating to Air Navigation Services occurrence reporting, fatigue risk management, staffing levels, workload and management culture.

There were three Confidential Words in November 2018 in relation to the application of runway separation standards in Sydney. One of these identified an occurrence which was not reported in CIRRIS. Immediate actions were taken to validate the concerns with objective data (including simulation of the occurrence using aircraft trajectory data) and review application of relevant national procedures. A Standardisation Directive was issued to Sydney Tower staff to ensure consistent understanding of the runway separation standard between an arriving aircraft and the preceding departing aircraft.

In the Financial Year 2019-20 to 30 April 2020, there were six Confidential Words regarding concerns with staffing, workload and fatigue risk management which have all been independently assessed. Only one report was determined to be a valid safety concern. Assessments of five other reports did not identify validated safety concern, and confirmed that relevant traffic management, rostering/resourcing and fatigue management processes were implemented correctly. However they provided insights into some staff concerns with threats in their operating environment, and interpretation of procedures. Staff consultation and clarification of the application of relevant traffic and resource management processes has been conducted.

The single validated safety concern relates to service delivery with reduced staffing impacted by short notice staff unavailability in one unit. An independent review was conducted and identified opportunity to improve communication and coordination of traffic management planning and decision making in line service delivery during sustained high traffic levels. This has been addressed as part of a comprehensive action plan which also includes short, medium and long-term strategies to improve resilience of the operational capacity in the unit.

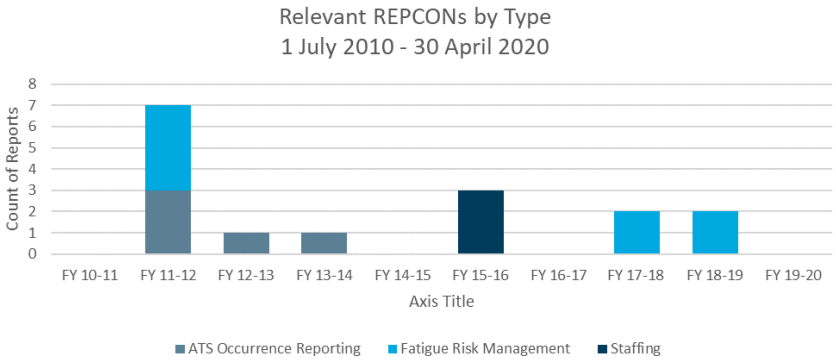
Figure 8: Relevant Confidential Words by Type



8.4 REPCON

REPCON is a voluntary and confidential reporting scheme, allowing any person who has an aviation safety concern to report it to the Australian Transport Safety Bureau (ATSB) confidentially. Protection of the reporter's identity and any individual referred to in the report is a primary element of the scheme. The number of REPCONs relating to ATS occurrence reporting, fatigue risk management and staffing levels have remained low. There has been no REPCON relating to ATS occurrence reporting in the last six years (see **Figure 9**).

Figure 9: Relevant REPCONs by Type



8.5 Safety Climate Survey

A survey was conducted in 2017 to measure our organisational safety climate. The proportion of Air Navigation Services respondents that answered favorably (i.e. in the top two ratings on a five-point scale) to the following questions regarding our Reporting Culture and Just Culture is shown in **Table 2**.

Table 2: Air Navigation Services Responses to 2017 Safety Climate Survey

Reporting Culture: 66%	**Just Culture: 53%**
I report my own mistakes which might impact on safety in the future: **76%**	I know what behaviour is acceptable and what behaviour is unacceptable at Airservices: **82%**
I am happy to share my ideas about how safety and its management can be improved with the person I report to: **70%**	Airservices differentiates between honest mistakes and reckless behaviour: **43%**
I am comfortable reporting safety concerns with no fear of punishment: **52%**	Mistakes in our business area are corrected without punishment and treated as a learning opportunity: **35%**

In response to the results, a number of organisational improvement programs were launched:

- A whole-of-organisation Just Culture refresh program, with a further program completed in 2019 as outlined in **Section 5**.
- The expansion and improvement of our reporting tools and suite of feedback mechanisms for safety issues and concerns. This includes regular upgrades to CIRRIS to enhance functionality and usability, monthly newsletters on CIRRIS reporting, incorporation of lessons learned from occurrences in Directives and Circulars, and the launch of the fatigue hazard and workload reporting systems discussed above.

Planning for our next Safety Climate Survey and associated Safety Culture focus groups is scheduled in 2020, following the completion of a broader organisational culture review. Results from the survey will allow us to gauge the effectiveness of these programs and others, and develop further improvement initiatives where required.

9. Safety Performance Trends

Figures 10-12 show the rate and relative risk severity of Airservices attributed LOS occurrences. Since the first version of this publication, the LOS rate in the Tower and Enroute environment decreased in the Financial Year 2019-20 to 28 February 2020 compared to the previous year, and remained at a very low level. The LOS rate in the Terminal environment increased slightly driven by the performance of three units as further detailed below. As traffic declined significantly during the COVID-19 pandemic, our LOS rate continued to decrease. There was no Tower LOS, one Terminal LOS and Two Enroute LOS in March and April 2020.

During November 2019 to January 2020, there were a number of LOS occurrences at Melbourne Tower highlighting increased workload demand factors. They include managing growing international traffic at Melbourne Airport (prior to the COVID-19 environment), complexity of accommodating departures that require use of runways different to published runway modes, and notable differences in aircraft take-off performance. To strengthen system defences against these threats, work is underway to identify opportunities to optimise controller taskload such as review of arrival/departure traffic sequencing approach for periods of peak traffic complexity.

The Terminal LOS rate over the period from Financial Year 2018-19 to February 2020 was driven by Sydney, Adelaide and Perth operations. The majority of the occurrences were the result of air traffic controllers not effectively adapting their separation plans to the prevailing conditions which affected actual aircraft performance different to expectations. They also highlighted workload demands in periods of increased operational complexity, such as aircraft transiting through multiple airports in close proximity and aerial survey operations.

Corrective actions have been undertaken to address the causal factors identified in occurrences and unit reviews. An external review of the Sydney Basin Safety Performance was completed in February 2020, and a working group is underway to broaden lessons learned from the review to strengthen our national systems. This includes establishing forums to increase shared risks across Tower and Terminal units, delivering targeted safety and refresher training, and embedding behavioural standards in staff performance management framework.

Figure 10: Airservices Attributed LOS Occurrence Rate

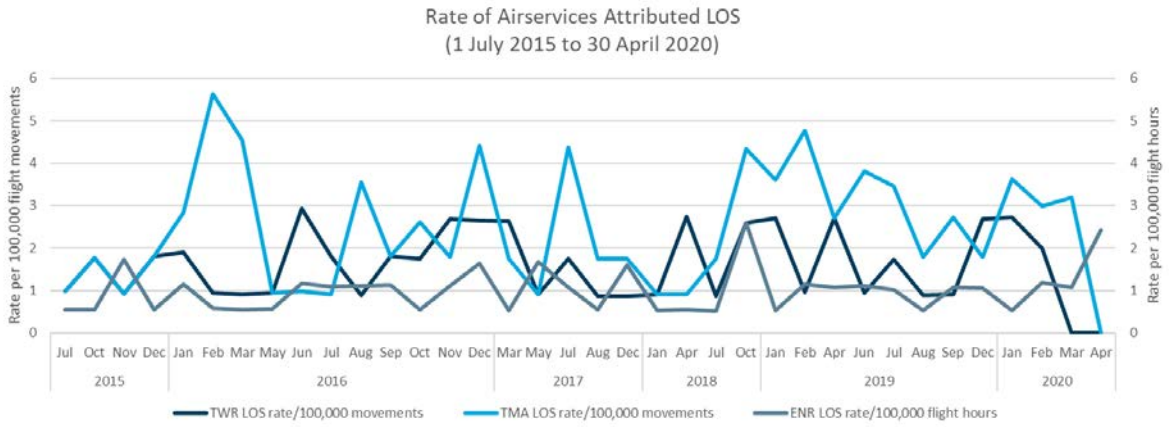


Figure 11: Airservices Attributed LOS by Risk Severity

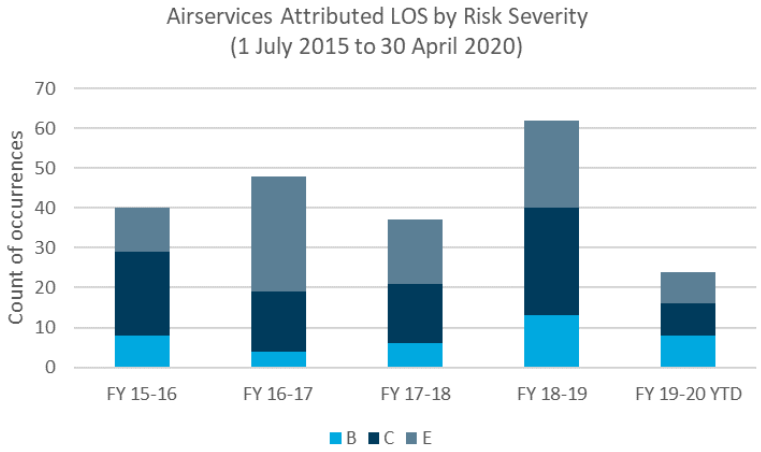
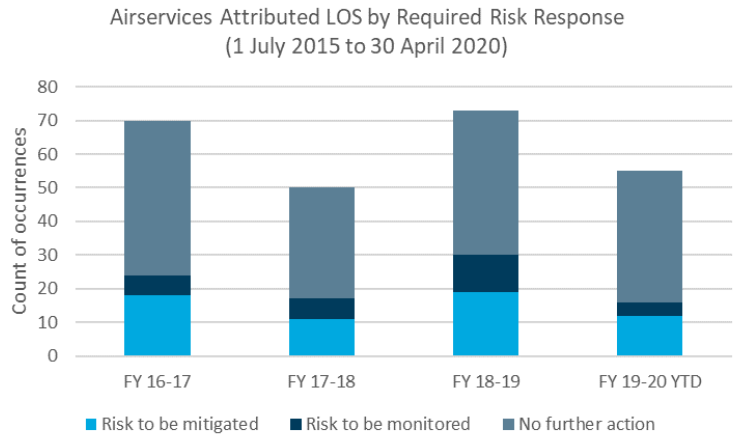


Figure 12: Airservices Attributed LOS by Required Risk Response



Figures 13 and 14 present long term trends relating to Runway Incursions. As demonstrated, the vast proportion of Runway Incursions are attributed to other parties than Airservices. The severity of occurrences attributed to Airservices when classified by the International Civil Aviation Organisation (ICAO) assessment scheme are low.

Figure 13: Airservices Attributed Runway Incursions by Attribution

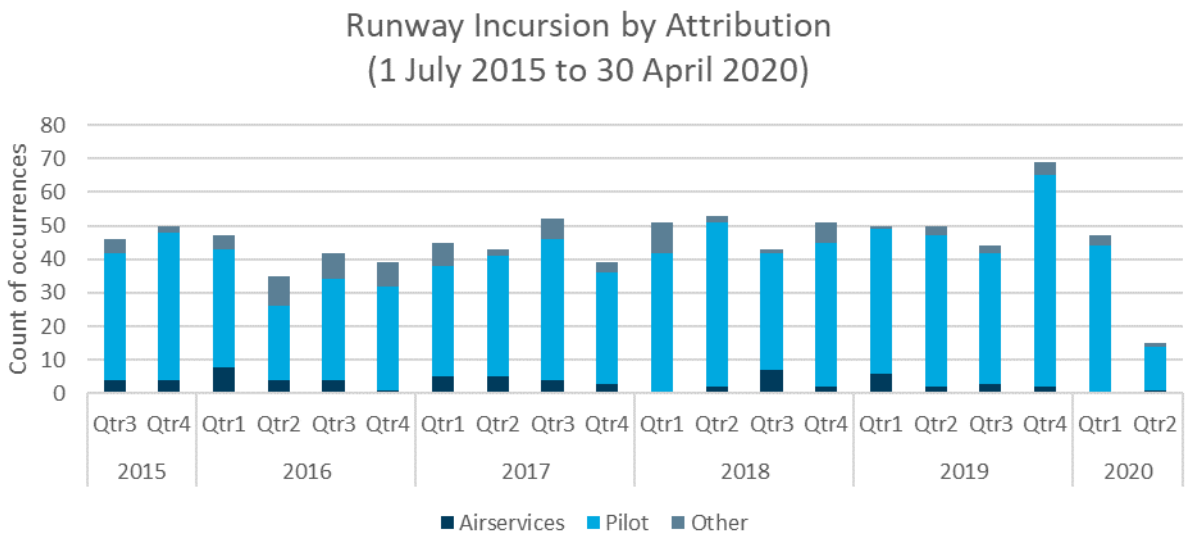
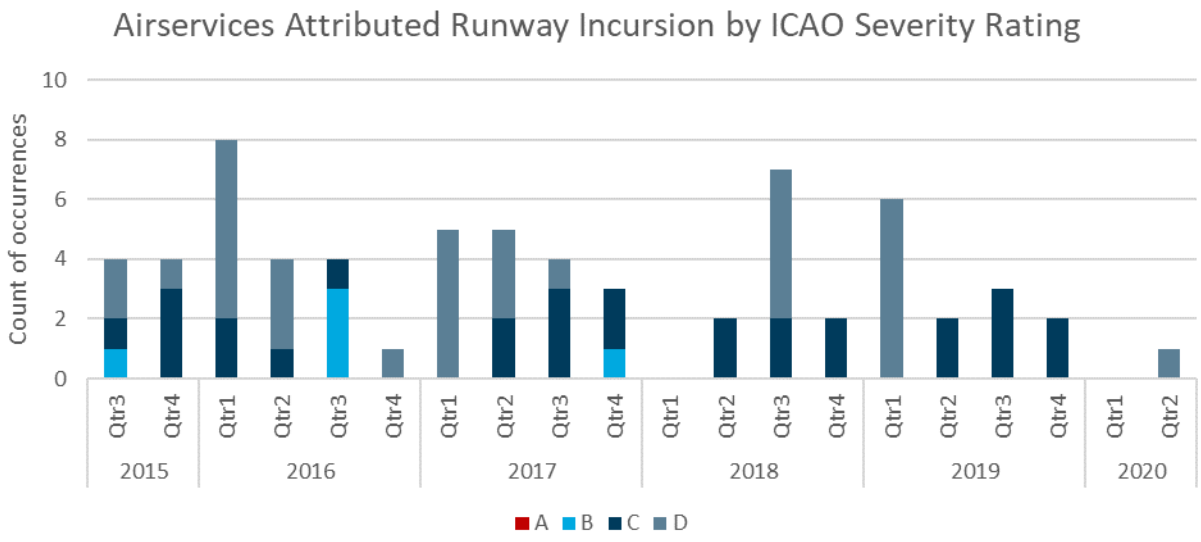


Figure 14: Airservices Attributed Runway Incursions by ICAO Severity Rating



10. Cross Validation of Performance

We have strong safety connections with our customers and stakeholders, particularly the large number of airlines and aviation organisations with whom we have Letters of Agreement in relation to safety data. Through these channels, our customers and stakeholders would inform us of circumstances where they were to report an occurrence to the ATSB that identified contributing issues related to our service delivery. Equally, the ATSB shares with us occurrence reports for which there is no comparable Airservices submitted report.

11. International Safety Benchmarking

Airservices participates in an annual global safety performance benchmarking coordinated by the Civil Air Navigation Services Organisation on behalf of ANSPs. To ensure appropriate comparisons, ANSPs are grouped into comparable clusters based on their airspace volume and traffic.

The latest benchmarking report released in 2019 (using data one year in arrears) reflects that Airservices performs well against our peers on the basis of LOS which is a key safety performance indicator. In comparison to similar ANSPs, a higher proportion of LOS occurrences reported by our air traffic controllers only involved minimal separation infringement between aircraft (e.g. less than 20%). This shows that along with positive performance outcomes, we have a robust reporting culture given that the majority of occurrences would not have been evident to either pilots or other air traffic controllers given the small erosion of the separation standard being reported.

Appendix 1 - Airservices Just Culture Approach

OUR JUST CULTURE

airservices

WHAT IS JUST CULTURE?

PRINCIPLE ONE
Just Culture supports our Code of Conduct and is key to enabling a positive workplace culture at Airservices.

PRINCIPLE TWO
We acknowledge that systems are flawed and that people make mistakes. We must learn from these gaps and mistakes to continuously improve. We must also acknowledge that people need to make positive behavioural choices.

PRINCIPLE THREE
Having a Just Culture allows for open and honest reporting when things go wrong by assuring consistent, transparent and just treatment, through objective and open investigation.

WHO DOES IT APPLY TO?

Our Just Culture applies to everyone at Airservices.

WHAT IS OUR APPROACH?

In the event of a deviation from expectations or service levels (an occurrence), we apply a three-tiered approach.

HUMAN ERROR
Inadvertent actions, like mistakes and lapses in attention that may lead to unintended outcomes.

Response: Supporting the individual and improving the system that allowed the error.

AT-RISK BEHAVIOUR
Choice of behaviour that unjustifiably increases risk, due to failing to appreciate the risk or believing it to be justified.

Response: Coaching the individual to increase appreciation of risk.

RECKLESS BEHAVIOUR
Conscious disregard of unjustifiable risk.

Response: Appropriate and proportionate disciplinary action, in accordance with our Code of Conduct.

WHAT IS MY ROLE?

- **REPORT** occurrences through appropriate channels
- **LEAD** by example to encourage reporting, team work and learning lessons from occurrences
- **SUPPORT** those around me when error occurs
- **FOSTER** an understanding of the risk within your area of responsibility
- **PROMOTE** the need to take accountability for positive behavioural choices
- **CONTRIBUTE** to improving the robustness and resilience of our systems and processes
- **UNDERSTAND** why occurrences happen, focussing on systemic factors
- **SHARE** learnings throughout your team and across the organisation
- **RESPOND** to occurrences in a considered and informed manner

A Just Culture supports our values, enables shared understanding of expectations and facilitates trust

We are proud of our people and our contribution | We build relationships on trust and respect | We innovate for customer value | We achieve more together | We are authentic in our actions

Appendix 2 - Examples of Air Navigation Services Reporting Rates

Figure A2.1: ATS Occurrence Reports – Adelaide Terminal Unit

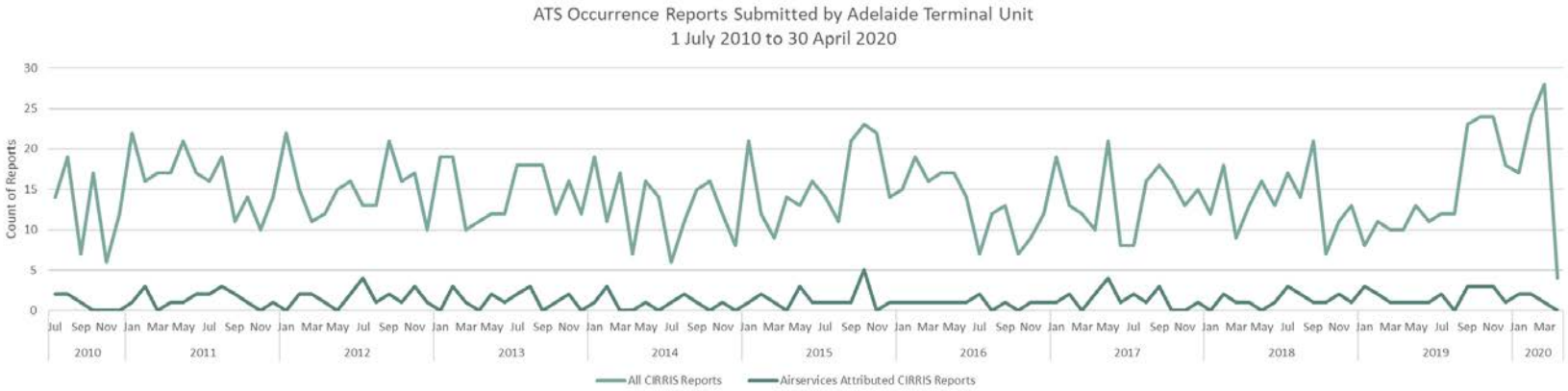


Figure A2.2: Monthly Average Rate of Airservices Attributed LOS Occurrences – Adelaide Terminal Unit

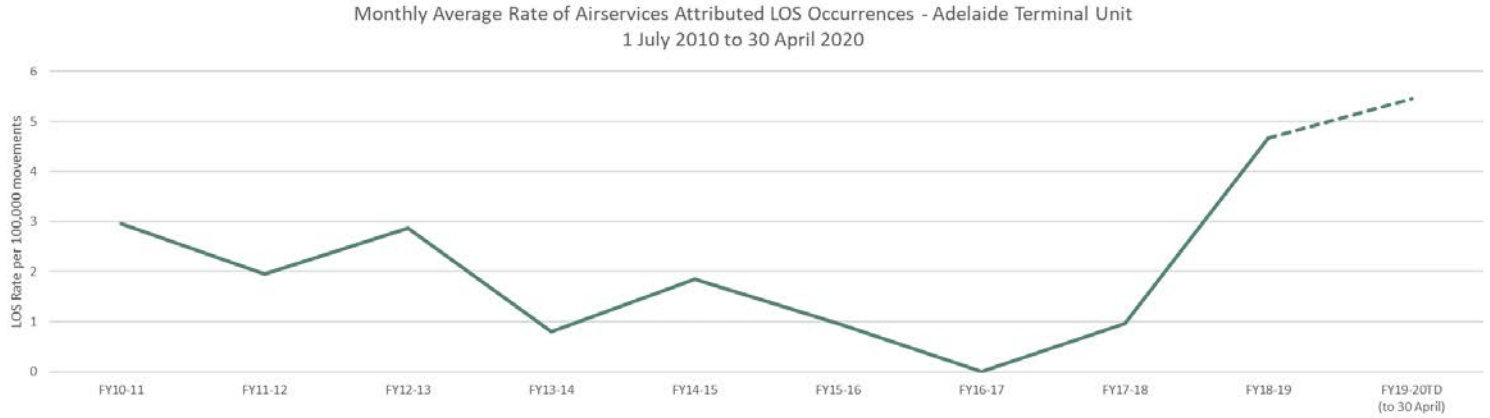


Figure A2.3: ATS Occurrence Reports – Adelaide Tower

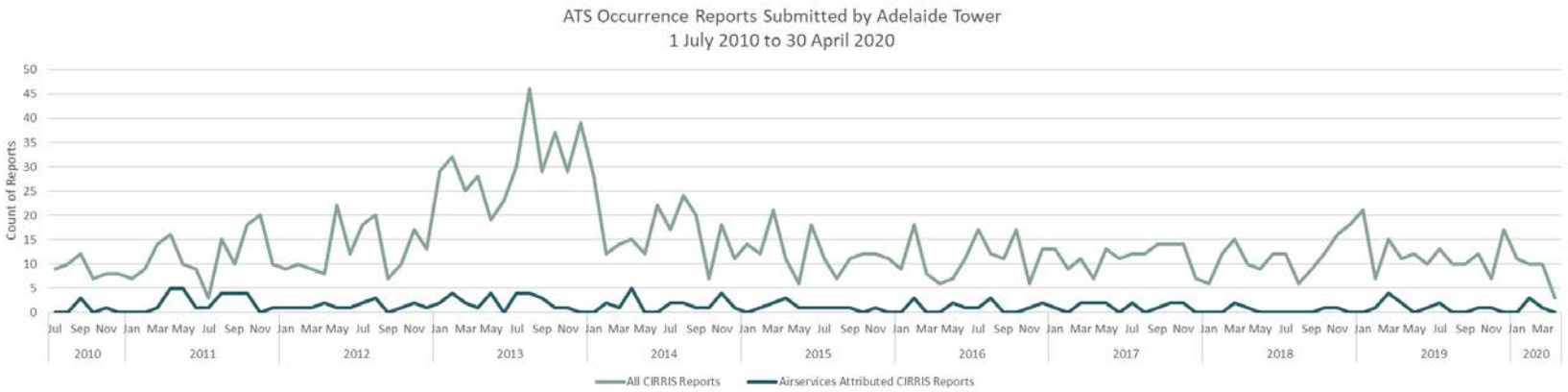


Figure A2.4: Monthly Average Rate of Airservices Attributed LOS Occurrences – Adelaide Tower

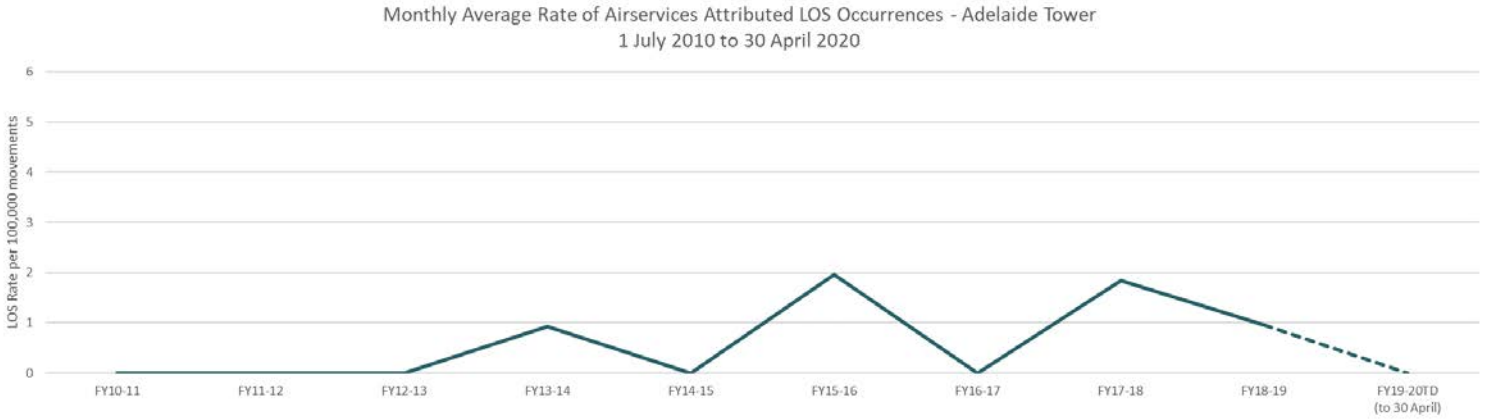


Figure A2.5: ATS Occurrence Reports – Brisbane Terminal Unit

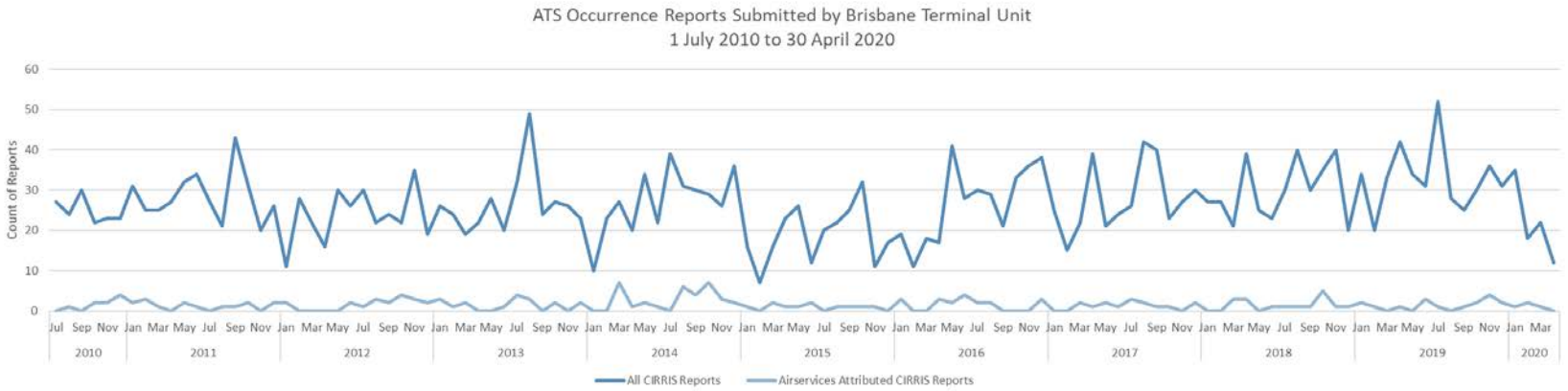


Figure A2.6: Monthly Average Rate of Airservices Attributed LOS Occurrences – Brisbane Terminal Unit

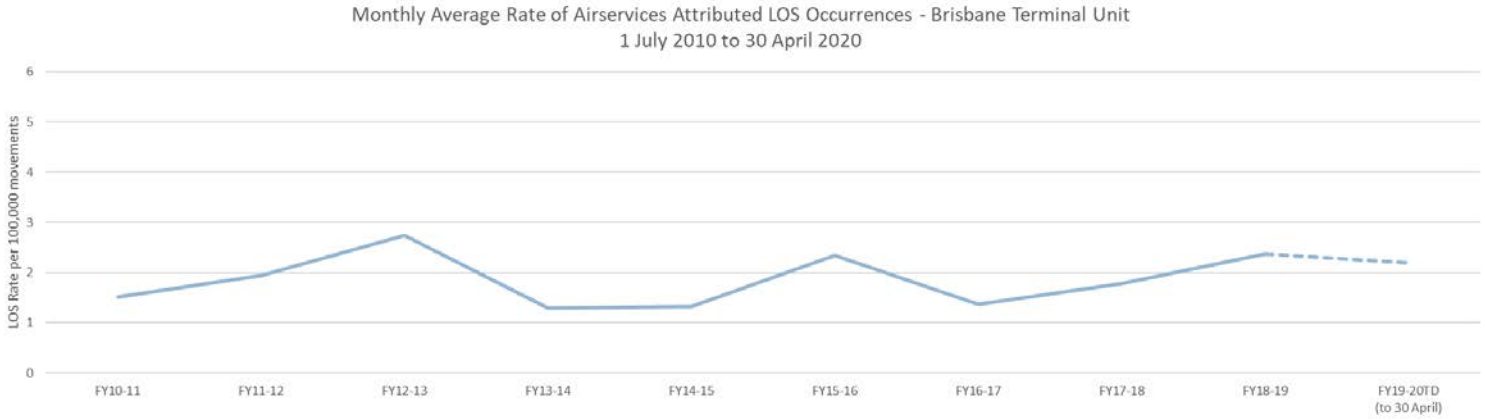


Figure A2.7: ATS Occurrence Reports – Brisbane Tower

Note: the increase in the reported occurrences at Brisbane Tower in 2020 was driven by false stop bar alarms. It is expected that that occurrence trend will decrease following a software upgrade to a relevant system in late April 2020.

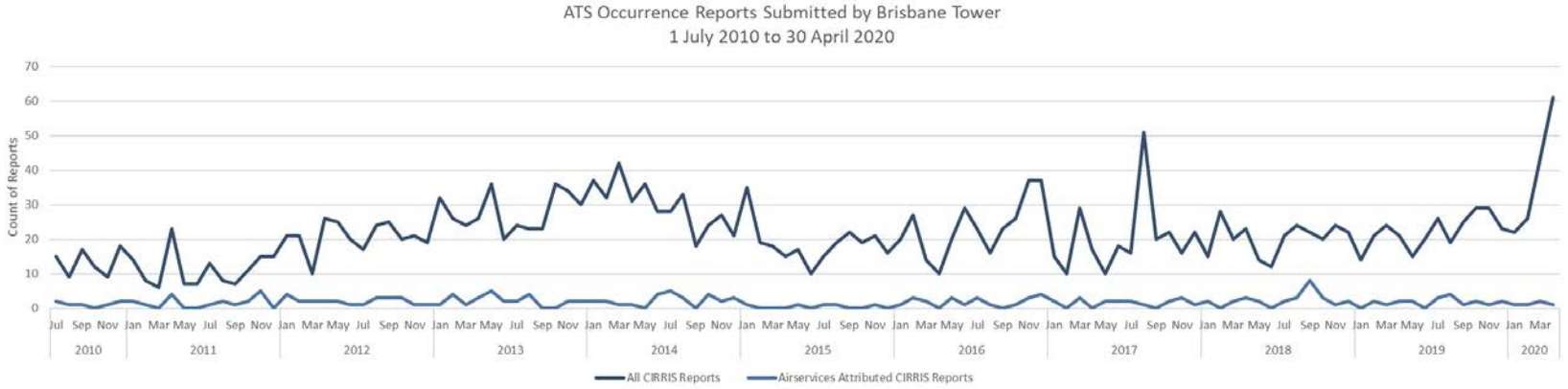


Figure A2.8: Monthly Average Rate of Airservices Attributed LOS Occurrences – Brisbane Tower

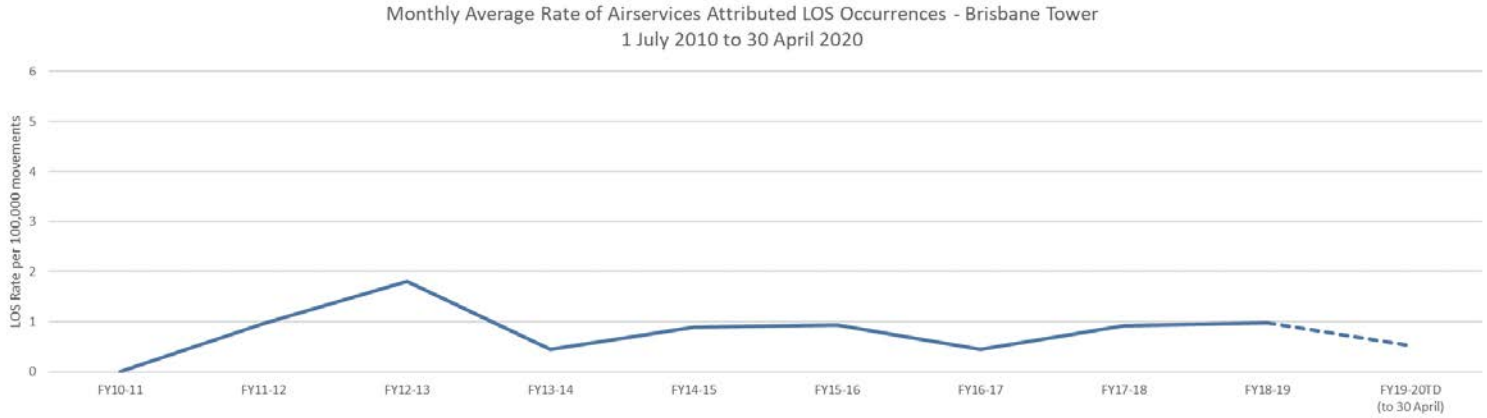


Figure A2.9: ATS Occurrence Reports – Melbourne and Canberra Terminal Unit

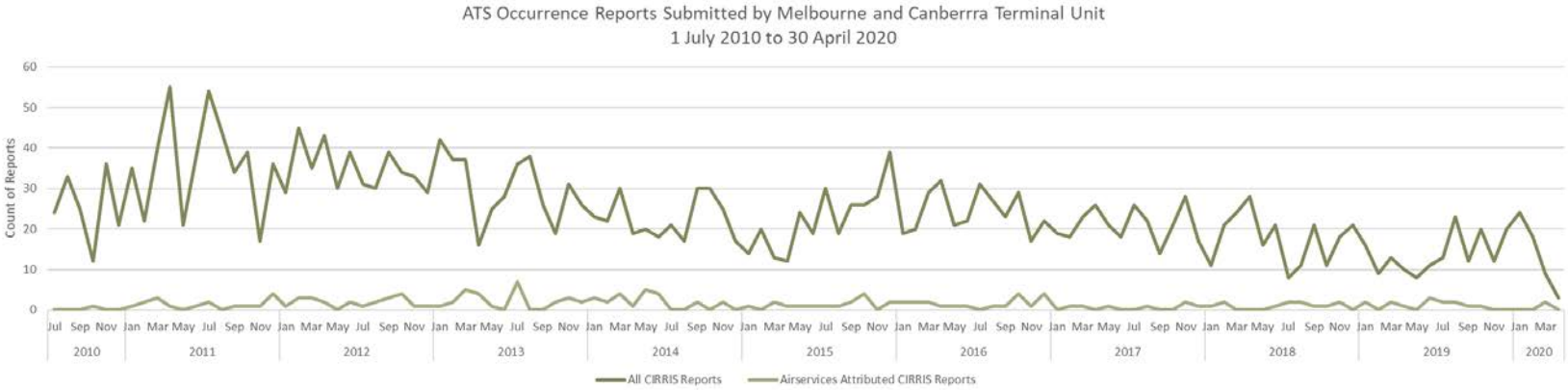


Figure A2.10: Monthly Average Rate of Airservices Attributed LOS Occurrences – Melbourne and Canberra Terminal Unit

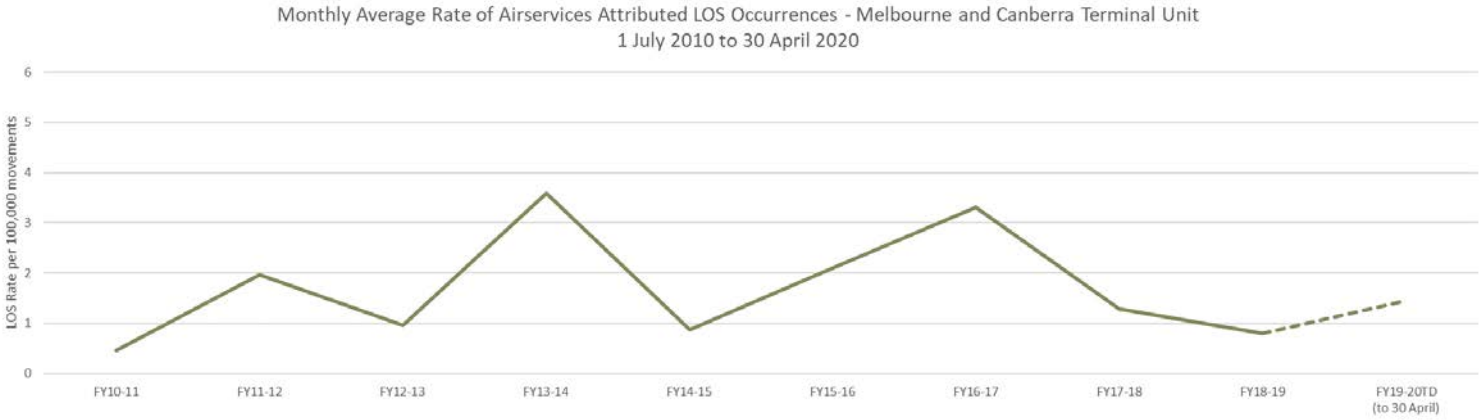


Figure A2.11: ATS Occurrence Reports – Melbourne Tower

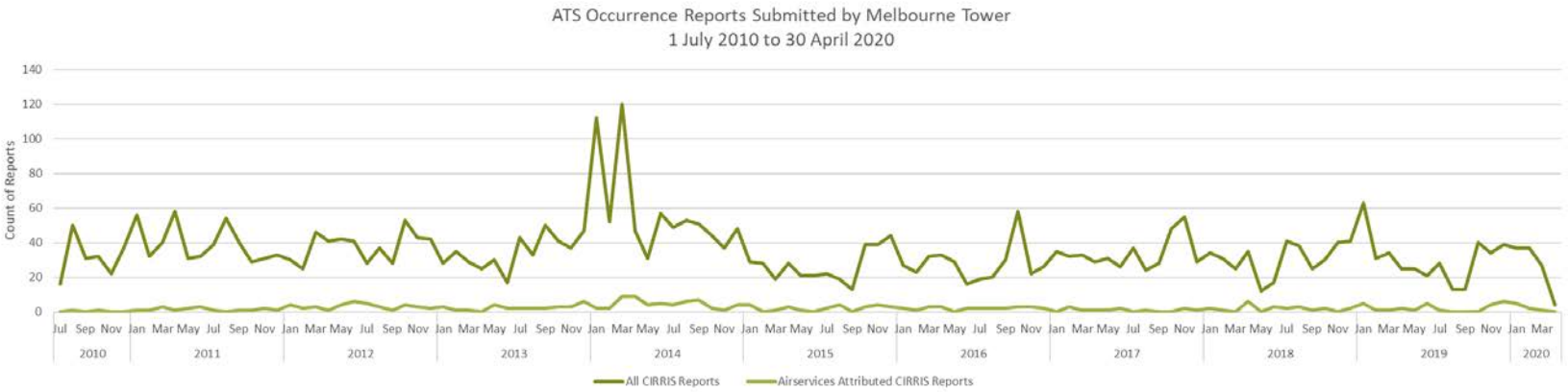


Figure A2.12: Monthly Average Rate of Airservices Attributed LOS Occurrences – Melbourne Tower

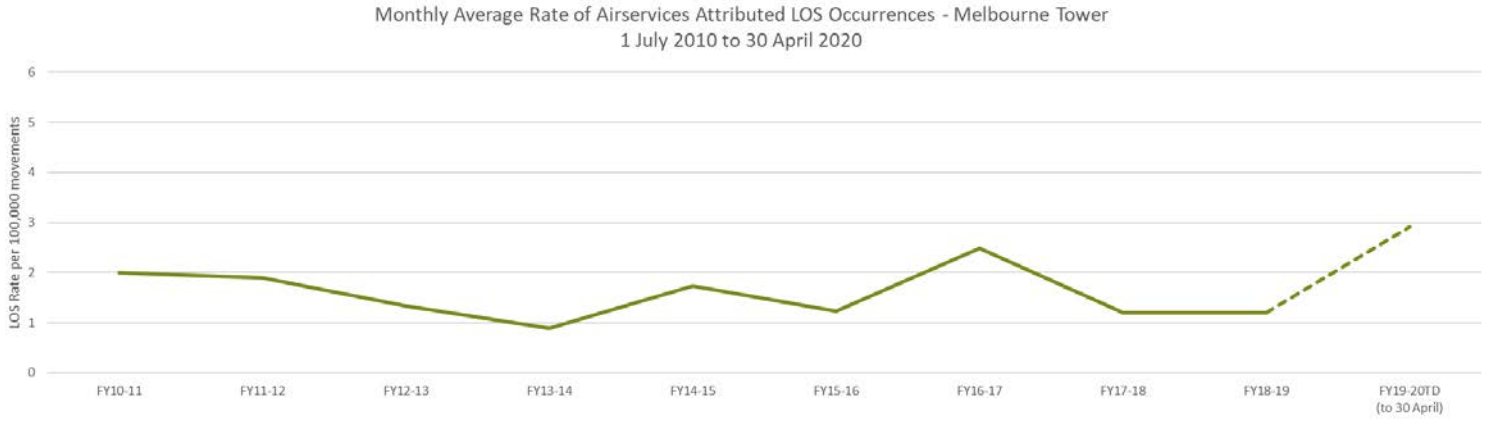


Figure A2.13: ATS Occurrence Reports – Sydney Terminal Unit

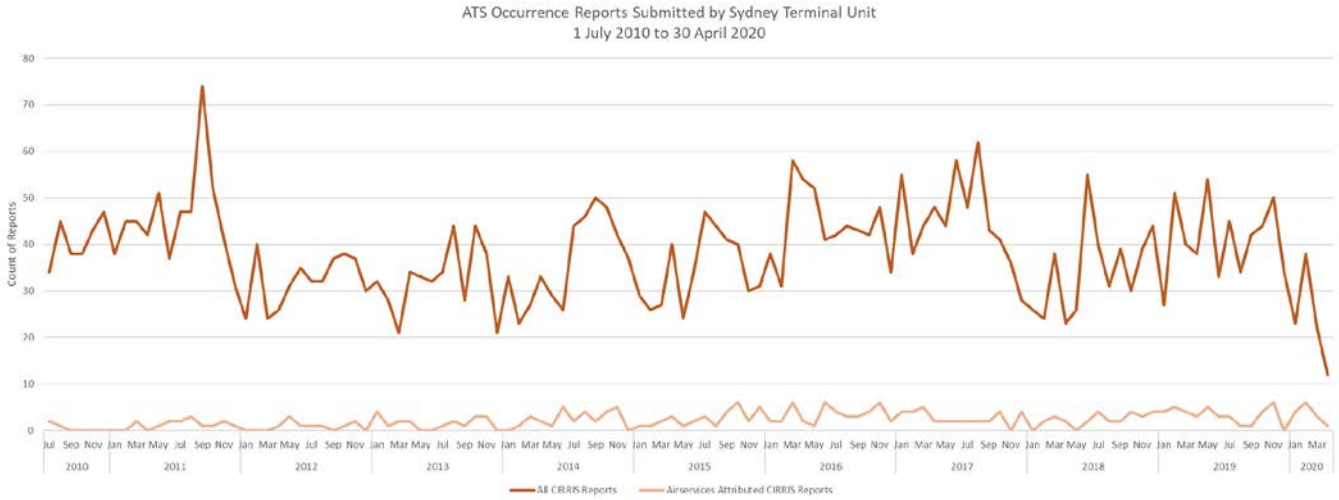


Figure A2.14: Monthly Average Rate of Airservices Attributed LOS Occurrences – Sydney Terminal Unit

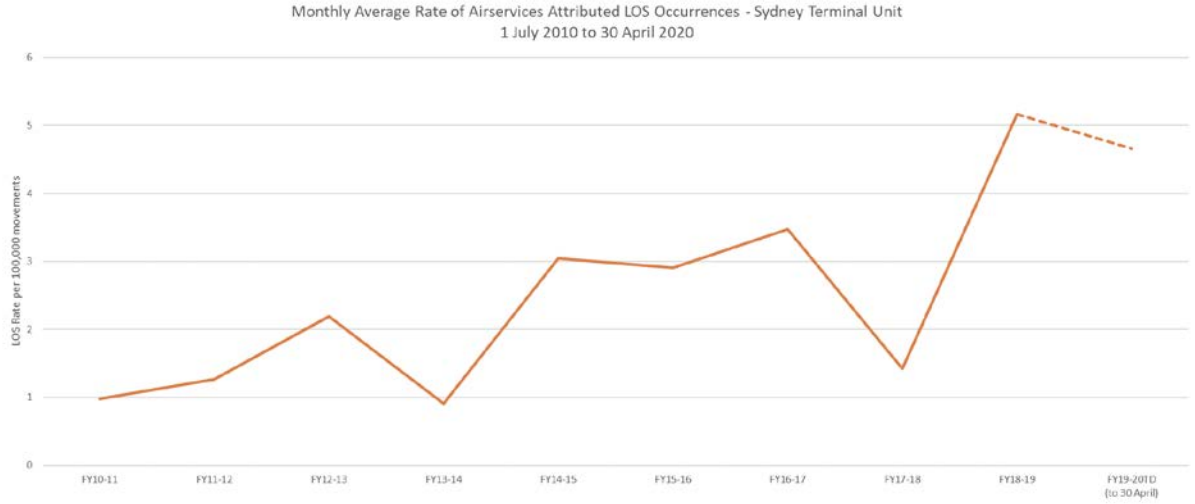


Figure A2.15: ATS Occurrence Reports – Sydney Tower

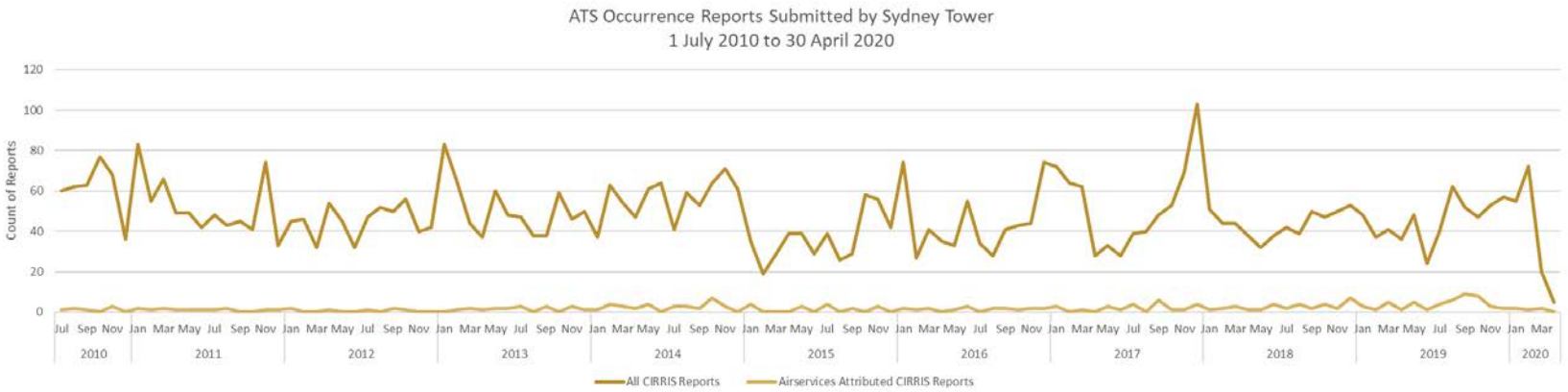


Figure A2.16: Monthly Average Rate of Airservices Attributed LOS Occurrences – Sydney Tower

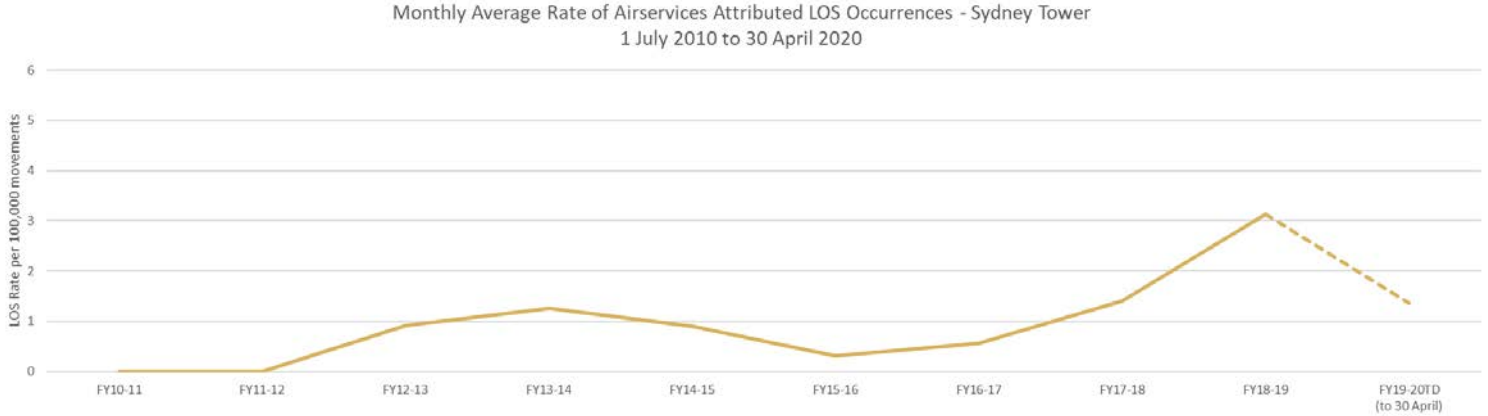


Figure A2.17: ATS Occurrence Reports – Perth Terminal Unit

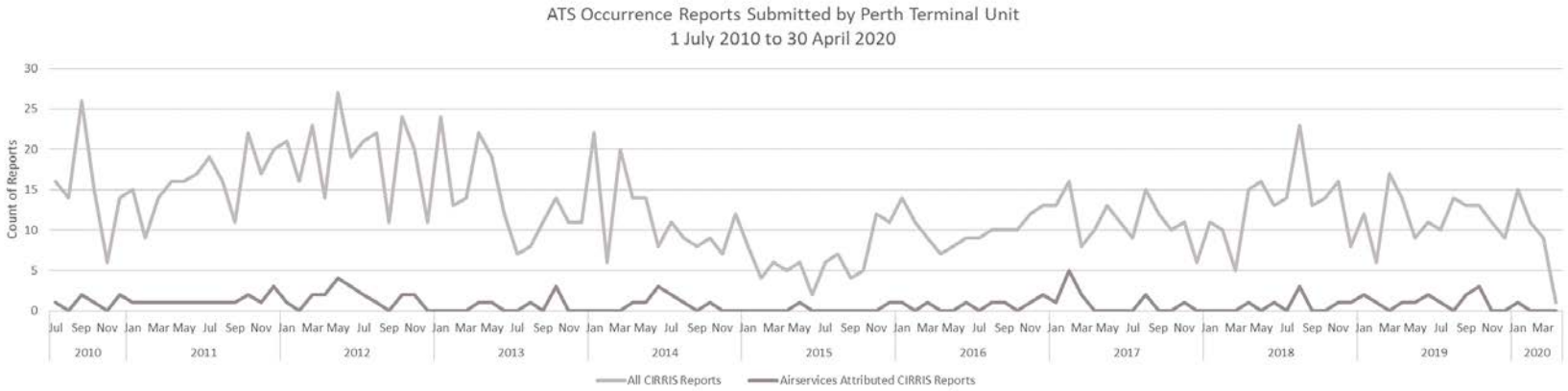


Figure A2.18: Monthly Average Rate of Airservices Attributed LOS Occurrences – Perth Terminal Unit

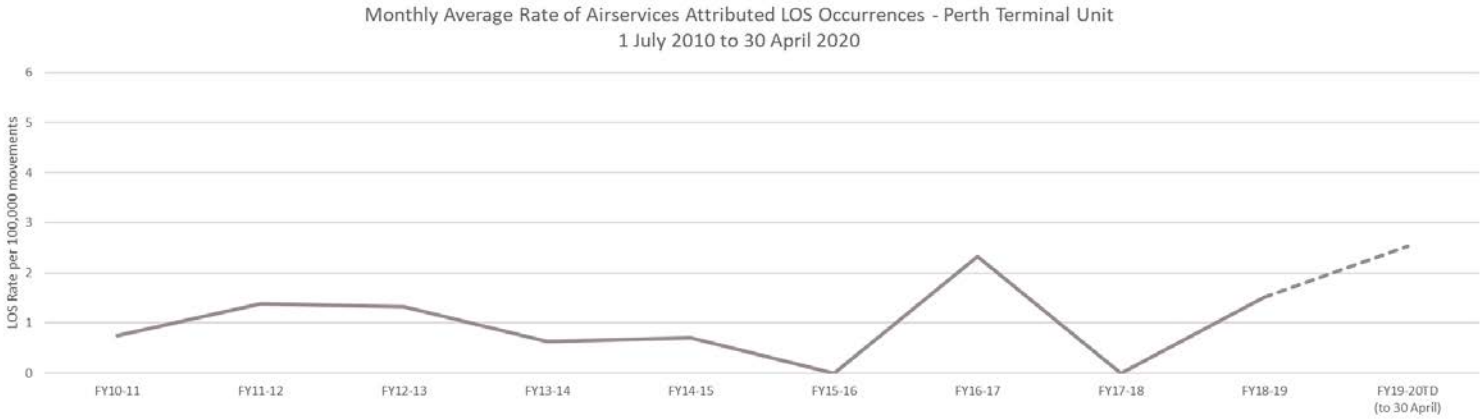


Figure A2.19: ATS Occurrence Reports – Perth Tower

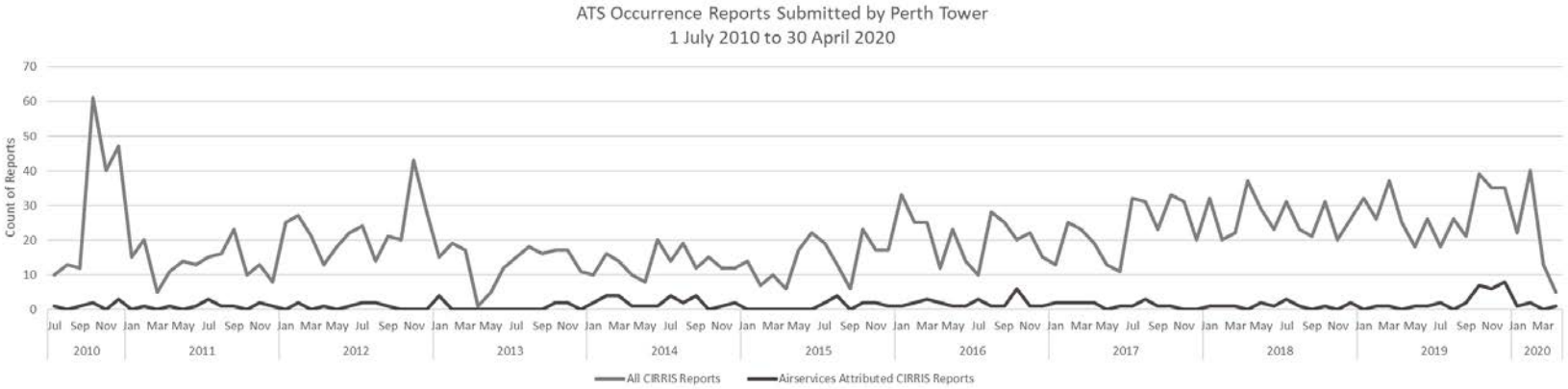


Figure A2.20: Monthly Average Rate of Airservices Attributed LOS Occurrences – Perth Tower