



35th Airline/ATS Safety Forum: Outcomes and Actions

Introduction

The 35th Airline/ATS Safety Forum was held on 24 and 25 May at the Sofitel in Brisbane, Queensland. The theme for this year’s forum was ‘new airspace users – managing these as an industry’.

The forum was well attended, with 87 delegates participating from a variety of organisations:

Operator	39
Airport	1
Airservices	22
ANSP - International	6
Stakeholder	19

A number of actions came out of the forum, which will be pursued by Airservices.

Forum opening address: Rob Weaver, Airservices

[Presentation Link](#)

The Executive General Manager of Safety and Assurance at Airservices officially opened the forum, welcoming attendees to Brisbane and setting the scene for the forum.

Rob gave an overview of the organisations represented at this forum, which was followed by showing images of the different types of airspace users seen around the world. To further illustrate Rob’s idea that airspace users are changing given technological improvements, Rob played a video of the recent Google Duplex launch and its capabilities. The video is available on [YouTube](#) for viewing.

Analysis of our safety performance: Elizabeth Culver, Airservices

[Presentation Link](#)

Australia’s safety performance over the past twelve months was presented, where Elizabeth Culver from Airservices highlighted that we have achieved positive safety performance and the risk bearing of safety related occurrences remains low.

Elizabeth discussed the following points:

- There were only nine loss of separation (LOS) and runway incursion (RI) ATS attributable occurrences, representing 0.00075% of flights.
- The most threats and errors seen by Airservices include increasing traffic load and complexity, aircraft deviations, weather and runway occupancy time.
- The top five safety focus areas Airservices is prioritising are:



- enroute workload management during adverse weather
- unsafe situations at Metro-D towers involving inexperienced pilots
- enhancing controller conflict detection
- training and development of recently rated controllers
- execution of contingency plans in radar towers.
- During the past year, there were 190 pilot attributed LOS and RI occurrences, of which 45 of these involved commercial aircraft.
- Airservices has seen an increase in the number of flight planning errors.
- Callsign confusion remains an issue in Australia.
- The number of operational deviations occurring on ground increase over the past year from 87 to 108m where incorrect taxiing route was the most common type of error.
- Australia has a lower RI rate than most Air Navigation Service Providers.
- The top recorded reasons for go arounds are:
 - runway occupation
 - unstable approach
 - weather.

Using data to drive improvements – runway safety and understanding the big picture: Mu Yan, Airservices

[Presentation Link](#)

Mu Yan from Airservices opened her presentation by surveying attendees about the use of data in their respective organisations.

Do you think your organisation needs to be faster and more sophisticated when it comes to safety decision making?

- Yes: 81%
- No: 19%

What best describes the current safety decision making approach in your organisation?

- Rarely data driven: 4.10%
- Somewhat data driven: 69.80%
- Highly data driven: 26.02%

What would you like your organisation's safety decision making approach to be in 2020+?

- Rarely data driven: 0%
- Somewhat data driven: 21.62%
- Highly data driven: 78.38%

What type of analysis will best inform your safety decision?

- Human judgement: 5.33%
- Computer algorithms: 0%
- A combination of a and b: 94.67%



What is the most critical safety analytics capability for your organisation?

- Describing past trends and underlying root causes: 12.33%
- Forecasting/predicting the future performance: 30.14%
- Assessing possible outcomes to provide advice on the actions to take: 57.53%

In your organisation, how often is safety analysis actioned to deliver safety improvement outcomes?

- Rarely: 2.67%
- Sometimes: 61.33%
- Always: 36.00%

Do you think a collaborative approach to safety data analysis is needed for industry to maintain its safety leadership?

- Yes: 100%
- No: 0%

What is the key factor holding/potentially holding your organisation back from making effective safety decisions?

- Technology: 0%
- Quality of data: 17.33%
- Processes: 12.00%
- Availability of resources and expertise: 44.00%
- Culture: 24.00%
- Other: 2.67%

What type of safety intelligence would be most valuable to your organisation?

- Foresight
- Shared data
- Data from external organisation, data mining opportunities
- Accurate and informed reporting
- Data and culture
- Timely reports from line crew
- Predictive analytics on safety trends
- Frontline staff feedback
- Shared framework of analysis would be a good step forward across all parties
- Agile safety intelligence
- Improved capability for comparative analysis
- Data sharing
- Collaboration of data sharing with all airlines and ATC
- Data driven insight and foresight capability
- Incident analysis from current professionals on the field of the incident
- Key global issues, key industry issues, root cause analysis
- Causal factors
- Industry SMS – relies on all parties to willingly share
- Understanding the perspectives from all aviation participants
- Better data analytics



- Collaboration on operational data from industry to better inform strategic decisions
- Best practice
- Data
- Open and honest military – industry communication and data sharing
- Data driven analysis of uncontrolled airspace using non-traditional tools and machine learning
- The human behind the machine
- Shared risk information in smaller sized organisations, both domestically and internationally
- Joint-use system of safety analysis and reports across all sectors of aviation
- Data sharing
- Shared de-identified occurrence information and data across the airline industry
- Untapped big data
- Pilot deviations
- Assessment of planned operations and their potential safety implications
- Data that gives us all a complete picture
- Shared data so that a shared understanding can be reached and collaborative action can be taken to reduce risk
- A view point from all parties involved
- Other operator's incident/accident reports, causal factors etc
- Personal report
- Shared analysis with other operators
- Intelligence not data, i.e. what is it actually telling us
- Structured modelling
- Frequency of occurrences
- Analysing past occurrence while looking through the current technology pyramid at what could happen in the future
- Informed and regular sharing of outcomes
- False positive feedback
- Shared perspective and understanding
- Predictive analysis
- A model to enable capture of predictive indicators
- A proactive and predictive approach
- More conferences
- Timely data relevant to events
- Better reporting
- Assessing incremental change
- Efficient data capture mechanism which is easily adjustable and autonomous
- Predictive in areas where events may occur but also enhanced information on where the best performing areas are
- Aligned processes for data collection and analysis across the industry
- More detailed HF analysis at granular level
- Holistic industry risk information and common controls that are identified as most effective



- Shared responsibility
- Alignment of occurrence categories
- More RAT knowledge
- Understanding risk appetite vs risk actual
- Pre-implementation consultation across the entire industry, not just notification
- Performance of controls
- All intel is valuable, relative value is often only apparent in hindsight
- Reporting culture
- Educating the front line on value of reports and feedback to line crew
- Communication within organisation
- An understanding of what the data actually indicates
- Accurate and informed incident reporting by all
- Industry safety database with de-identified information that could be used to assess the health of the industry through knowledge sharing
- Culture: all person should take part in the safety management base on SMS system
- Common understanding in each facet of each other's operation
- Artificial intelligence

After conducting this survey, Yan spoke about some examples where the use of data has driven safety improvements:

- Using ADS-B data for RVSM airspace safety monitoring
- Understanding trends better to drive focus areas (e.g. runway incursions)
- Metrics
- National Runway Safety Enhancement Group
- Local Runway Safety Teams.

Moving forward, Yan is committed to working with industry standardise safety taxonomy, routinely share occurrences and risk information and integrate the industry's risk management approach.

Remotely Piloted Aircraft Systems (RPAS) – What does the information show us: Sarah Fien, Australian Transport Safety Bureau (ATSB)

[Presentation Link](#)

Sarah Fien from the ATSB spoke about the trends that the ATSB is seeing from reporting. The highlights are:

- 10 RPAS occurrence investigations
- New occurrence types have been created, including collisions, near encounters and sightings (event)
- The number of reported RPAS-related occurrences is increasing
- RPAS are now equal second in the number of reported accidents to the ATSB
- Most occurrences are encounters – no actual collisions in Australia
- The 2018 near encounters forecast is around 200



- 85% of reported near encounters are 400ft or above
- Sydney represents the most common location of near encounters
- Terrain collisions is the second most common RPAS-related occurrence type, usually due to loss of control followed by datalink issues
- The ATSB acknowledges that RPAS is an emerging and insufficiently understood transport safety risk and will continue to closely monitor RPAS-related occurrences.

RPAS Operational Risks – an air traffic controller perspective: Neil Roduner, Airservices

[Presentation Link](#)

The main risk posed by RPAS in the air traffic services environment is the operation of RPAS within controlled airspace, which is comprised of two main elements:

- Assessment of the risk posed by the approval process
- Ongoing management of that assessed risk by the ATC holding the microphone because they are the person who ultimately accepts that risk.

Neil went on to describe that the vast majority of requests are visual line of sight operations within 3nm and below 400ft, however with technological advancement, increases in requests are expected.

When approving requests for RPAS operations within controlled airspace, there are three methods of facilitation:

- Segregated: operations which would normally impact on ATC, but the characteristics of the location mean that direct interaction with ATC is not required and ATC and work independently around the RPAS operation.
- Coordinated: operations where interaction with ATC is required as determined through assessment of the location and equipment levels and capability of the RPAS.
- Integrated: operations where the equipment levels and capability of the RPAS are highly reflective of conventionally piloted aircraft and can be largely managed through pre-existent systems and processes.

With Neil's work, he is seeing a number of trends, including:

- an appetite for facilitation changing
- additional segregation methods
- long term approvals.

Neil concluded his presentation by highlighting the next steps, including:

- streamlining of the application process with CASA and Airservices coordination
- technology for enhance surveillance
- potential service based on airspace classification
- additional segregation methods.



[ATSB Investigation into loss of control involving RPAS: Sarah Fien, ATSB Presentation Link](#)

The ATSB investigated an occurrence where a Pulse Aerospace Vapor 55 took off, tracked for about seven minutes and then lost signal with its controls and entered home mode. The aircraft was never found.

The ATSB found:

- incorrect georeferencing was used, where the northern hemisphere was selected, resulting in incorrect waypoints and home points
- the data-link signal to the ground station was lost.

Safety findings from this investigation included:

- Manufacturer - an audit of training curriculum and advice to pilots to use 'hold' or 'manual' commands.
- Operator – include verification of data inputs and flight plans in pre-launch checklists, fitting of GPS to devices and update risk assessment form to include location of external broadcast stations.

[Panel Discussion: The future of manned and unmanned aircraft: Andrew Duggan, Insitu Pacific; Sarah Druce, Airways NZ; Adam Welsh, DJI; Claire Marrison, Airservices](#)

This panel discussion focused on what the future of manned and unmanned aircraft are, including what needs to change to accommodate new entrants. Topics included in the panel discussion were:

- assurance of safety in an evolving environment which see the number of airspace users and demands increasing
- convincing the public and existing airspace users that we can adapt to address new entrants
- in our current environment, the industry and new entrants are effectively self-regulating, given lack of regulations
- we (as an industry) need to integrate unmanned aircraft into the existing system, rather than the ATM system adapting to the new entrants
- as an industry we need to provide the 'case for safety'.



Workshop - Building the wider risk picture: Will Kerr, Airservices

[Presentation Link](#)

Attendees were split into groups, to look at the themes that came out of the pre-forum survey. Groups were asked to unpack the four themes:

- What is the issue?
- What is the impact?
- What do you think Airservices is missing?
- What would you like to see?

Theme 1: Pre-Departure Clearances (PDC's)

- Australian PDC practices is inconsistent with international practices
- There is a lack of level read backs
- Standard paper-stop levels
- Results in incorrect level setting and increased workload
- Airservices is not allowing the pilot the opportunity to correct the issue
- Need to keep PDC's, but standardise paper-stop levels, update the PDC system to allow clearance amendments

Theme 2: Track shortening/Being taken off the STAR

- Leading to a number of technical faults and loss of safety assurance
- There are language barriers with international carriers
- Question was asked if track shortening is always good
- Airservices is missing terminology for re-joining a STAR and asking pilots if they can accept track shortening
- SID/STAR phraseology is causing concern and increasing workload in the terminal area
- Delegates would like to see more collaboration on these at forums, developing shared perspectives, improve the visual layout of plates/speeds/alternates
- Deliver earlier STAR clearances

Theme 3: High speed descents

- There is a lack of understanding from ATC around increased workload and the aircraft performance profile when issuing high speed descents
- Information needs to be issued timely and accurately
- Each operators profile is different
- Delegates would like to see more flight deck familiarisations and a mutual understanding between ATC and the pilot, also understanding when a high speed descent is appropriate

Theme 4: Visual approaches to RWY34 YMML over waypoint SHEED

- The issue is that the SHEED waypoint is a complex approach to fly, resulting in higher workload for pilots and an increased risk of unstable approaches and go-arounds
- Airservices is not provided customers with the right level of information about the approach:
 - What are the figures on go-arounds for this approach



- What is the rationale behind why some aircraft are excluded from the approach

[The next five years in Air Traffic Management: Stephen Angus, Airservices Presentation Link](#)

The Executive General Manager of Air Navigation Services (ANS) provided delegates with an update on recent projects and initiatives that will affect our customers.

Stephen set the context of his presentation by reinforcing that safety is in our DNA and that we must remain relevant, change our mindsets and be masters of our own destiny. The safety, efficiency and overall performance of the Australian aviation industry is underpinned by the air traffic management system, however there is potential for further improvement.

The Civil-Military Air Traffic System (CMATS) has the potential to deliver safety, more flexible and adaptable services and will transform the way in which we access data and collaborate with industry to provide safe and efficient services. The new system will see air traffic controllers use advanced technology and real-time prediction tools.

Stephen spoke about the five year ATM services plan, which will transform aerodrome, information and airspace services. This plan will deliver a number of safety benefits, including:

- Increased ADS-B
- UAV integration
- Enhanced inflight data
- Improved MET products
- Satellite CNS
- Digital Aerodrome Services
- System Wide Information System.

[Airspace users in the next ten years – what can we expect: Reece Clothier, Australian Association for Unmanned Systems Presentation Link](#)

Rhys began his presentation by explaining the 'now' with regards to RPAS, where they aren't an emerging airspace user sector, they are how now, and they place unique demands on the aviation system. There have been a number of commercial operator certificates issued to RPAS and conventional aircraft, with over 1200 certified commercial operator certificates issued by CASA.

In the next decade, we can expect to see more services, such as Amazon and Alphabet operating at low altitudes and the introduction of high altitude pseudo satellites for communication relay services or high speed internet.



Urban Air Mobility (UAMs) vehicles are here with a number of prototypes already airborne and certification plans well advanced. By 2025, we can expect more of these in the market, operating below 3,000ft.

Conventionally piloted aircraft concepts will see innovation from supersonic airlines to business jets, flying at 60,000ft.

Lastly, Personal Air Mobility vehicles include hoverboards and jetpacks will become realities.

ATC-Pilot Miscommunication: Brett Molesworth, UNSW

[Presentation Link](#)

Research has been conducted by the University of NSW on the issue of air traffic controller and pilot miscommunication. The study was broken down into general aviation and commercial aviation.

The general aviation research found:

- Native English pilots committed fewer communication errors than non-native pilots.
- Pilots with a CPL or higher licence qualification committed fewer communication errors than pilots with a PPL or lower.
- Fewer communication errors were present in flight condition with 3 or less, than in flight with 4 or more items (i.e. number of items in a transmission).
- Fewer communication errors were present in the low workload flight compared to the high workload flight.
- Pauses in transmissions improve communication.
- Pilots are good at ignoring irrelevant communication.

The commercial aviation research found:

- Native English sounding pilots encountered fewer communication errors, compared to accented pilots.
- Mistakes are made predominately with numbers.

Workshop – Developing a shared mental model: Greg McLean and Claire Marrison, Airservices

[Presentation Link](#)

A shared mental model is a team's shared view of the world and a common understanding of tasks to be completed, procedures in place and individual and team goals to be achieved. This presentation aims to make sense of aviation in Australia.



There is a need for Airservices to work on:

- Use of terminology surrounding speed control and providing reasons to build common understanding

- Miscommunication in expectations, resulting in:
 - Expectation bias
 - Loss/failure of situational awareness
 - Common terminology – speed lateral/vertical
 - Provide complete instructions (... (speed) ... (until) ...”
- Pilot situational awareness vs air traffic control situational awareness
- Give more complete clearances
 - Instead of maintain max speed, given maintain ‘knots’ until (distance)
- Better use of information to ensure more efficient clearances and sequences
- Trying to be helpful but other party doesn’t think so
- Non-standard phraseology across countries
- Develop standard phraseologies
- Enable both sides to communicate if they are not able to comply

Glide Path Interference at Sydney: Ron Hard, Airservices

[Presentation Link](#)

There has been a number of occurrences in Sydney where there has been interference with the ILS where aircraft are on approach to RWY16R, triggering a MSAW alert. Following a significant increase in A380 traffic, an increase in IFR arrivals to RWY16R, no ILS protection outside 4NM, an A380 can cause interference which causes the capture of false guidance, which can last between 14-18 seconds.

Summary of forum: Mu Yan, Airservices

[Presentation Link](#)

From the forum, Airservices has heard:

- Collaboration
 - Integrated SMS, shared responsibility for optimising the balance of safety and efficiency
 - Networking
 - Understanding risk from each other’s perspective (win-win)
- More data-driven approach
 - Leverage available data, resources and expertise
 - Foresight and insight
- Technology / innovation is here, and will continue to accelerate
 - Our regulatory framework, risk management and change management approach needs to catch up
 - Understanding the value of technology
 - Human-machine collaboration
- Practical solutions to operational issues
- Long range flow management



- Shared mental model between ATS and pilots – understanding each others' intent and increasing common situational awareness

