



United Firefighters Union of Australia

Submission to the

Senate Inquiry into the provision of rescue, firefighting and emergency response at Australian airports

Rural and Regional Affairs and Transport References Committee

Submitted 11 March 2019

Executive Summary

Standards for Aviation Rescue and Fire Fighting (ARFF) are established by ICAO internationally and CASA domestically. However, CASA standards overrule those of ICAO, resulting in generally inferior standards for ARFF in Australia. While ICAO recommend that all certified airports are provided with a dedicated ARFF service, Australia only have ARFF provision at 26 of the 195 certified airports under CASA jurisdiction. This is due to CASA regulation requiring the establishment of a dedicated ARFF service at airports only where an international passenger air service operates, or any other aerodrome where the arbitrary figure of 350,000 passengers pass through during the previous financial year.

ARFF response requirements are categorised according to aircraft size from 1 to 10. In Australia, ARFF is only provided at those Category 6 -10 airports that meet the above threshold requirements. ARFF response in terms of personnel levels is decided by Airservices Australia, the service provider who theoretically are answerable to CASA as the regulator. There is little to no oversight over the reduction of staffing levels by Airservices, creating a situation that places airports, staff, passengers and ARFF personnel at risk on a regular basis. These risks include cross-crewing of vehicles and other cost cutting measures that compromise safety.

CASA is reluctant to investigate and act on the Airservices' continual failure to provide and maintain the advertised Category at numerous aerodromes and other breaches of ARFF regulation. This includes continually granting Airservices exemptions from having to comply with ICAO and CASA ARFF requirements. Recently, Airservices' have removed rescue power saws, used to cut through an aircraft's fuselage in an entrapment emergency, from operation. This decision was made despite CASA standards necessitating the equipping of ARFF vehicles with these power saws and was implemented without any exemption granted by CASA.

Given the importance of Australia's international and domestic aviation record, and in the context of being the foundation to Australia as a reliable tourist destination, any changes to fire staffing levels at aviation airports should be conducted through change to legislation rather than regulation or operational procedure. There is also a need to review ARFF regulations and standards to better align them with ICAO SARPs, with consideration given to the standards established in NFPA 403 as examples of best practice.

As part of more closely aligning Australian ARFF with ICAO standards, ARFF provision should be expanded to include all Category 6 and above airports, as well as coverage of the busy secondary capital city airports. Consideration could be given to establishing a Passenger Facilitation Charge levy to help fund and expand ARFF services in circumstances where there is insufficient funding from other sources.

Recommendations

Recommendation 1: that the flawed methodology of using a threshold of passenger movements per year to determine the establishment of ARFF provision be reviewed for the purpose of replacing it with a system that provides greater ARFF coverage at more Australian Airports.

Recommendation 2: that an independent review of current ARFF staffing levels be conducted to establish an appropriate minimum staffing level by Airport Category, and that this review include consideration of the NFPA 403 standard.

Recommendation 3: that minimum ARFF staffing levels at Australian airports be established through legislation rather than regulation or operational procedure. Any subordinate regulation should only address issues that do not relate to staffing levels or other critical factors.

Recommendation 4: That any review of CASR 139H Regulations or the MOS 139H be conducted by a steering committee of ARFF and firefighting experts, including the UFUA as the employee representative body for ARFF personnel.

Recommendation 5: That any Regulatory review has written into their Terms of Reference that ICAO SARPs are followed as closely as practicable, including all recommended practices.

Recommendation 6: That any review of Australian ARFF regulations should seek to adopt the proven and internationally respected standards in NFPA 403 wherever possible as ARFF best practice.

Recommendation 7: That a Passenger Facilitation Charge be considered to fund and expand ARFF services in circumstances where there is insufficient funding from other sources.

Introduction

The United Firefighters Union of Australia (“**the UFUA**”) is a registered federal union of career firefighters and other personnel employed by fire services in Australia.

The UFUA has eight branches consisting of Tasmania, South Australia, Victoria, ACT, New South Wales, Western Australia, Queensland and an Aviation sector branch. Each branch has a high level of union membership with the majority of branches averaging around 95 percent membership of the relevant workforce.

Aviation Rescue and Fire Fighting (“**ARFF**”), a highly specialised branch of Rescue and Firefighting, involves the provision of many specialist skills and services, primarily the rapid response to emergency situations and events which occur at an airport and the aircraft, buildings and other infrastructure that are present within its boundaries. This specialist category of rescue and firefighting involves primary response of incidents, hazard mitigation, evacuation and possible rescue of passengers and crew of an aircraft involved in an aerodrome (or potentially off-aerodrome) ground emergency. It also involves rapid response to aircraft incidents, such as a 2-minute response time and high rates of water/foam/dry chemical discharge to combat fires accelerated by aviation fuel

Approximately 38% of airline accidents that result in fatal injury occur on or near the ground: whilst parked, being towed or during taxiing (9%); take-off (7%); and landing (22%) (Boeing, 2018). Ground damage is an under-appreciated aviation safety hazard, as an aircraft full of fuel at the gate is akin to a bomb in a confined space (James, 1997). When an accident happens on the ground (while taxiing, take off, landing, etc), in most cases passengers survive. However, in some cases, the cabins can be overcome by fire or smoke before passengers can escape, requiring the timely intervention of ARFF personnel to ensure passenger survival.

The airport sector in Australia is highly diverse. It is characterised by around 155 airports which receive Regular Public Transport (RPT) services and more than 2000 smaller airfields and landing strips around the country. The airports are classified by size and level of activity into five groups: major, major regional, regional, remote, and federally leased secondary/metro airports. Ten airports are classified as major airports: Sydney; Melbourne; Brisbane; Perth; Adelaide; Gold Coast; Cairns; Canberra; Hobart; and Darwin. A further 30 airports were classified as major regional airports, 79 as regional airports, 58 as remote and 6 as federally leased secondary/metro airports. (Deloitte, 2018)

International regulatory framework

Australia is a member of the International Civil Aviation Organisation (“**ICAO**”), a United Nations specialised agency, founded in 1947 following ratification of the 1944 Convention on International Civil Aviation (“**Chicago Convention**”). It consists of 192 member states who elect a 36-member Council; on which Australia currently holds a seat.

One of the major duties of the Council of ICAO is to adopt international Standards and Recommended Practices (“**SARPs**”) and to incorporate these as Annexes to the Chicago Convention. SARPs are technical specifications adopted by the Council of ICAO in accordance with Article 37 of the Chicago Convention (Adoption of international standards and procedures) in order to achieve *“the highest practicable degree of uniformity in regulations, standards, procedures and organization in relation to aircraft, personnel,*

airways and auxiliary services in all matters in which such uniformity will facilitate and improve air navigation".

SARPs are published in the form of Annexes to the Chicago Convention, but do not have the same legal binding force as the Convention itself as Annexes are not international treaties. Furthermore, member states only agree to undertake to collaborate in securing uniformity regarding the SARPs. That agreement does not necessarily extend to complying with them. This is confirmed in Article 38, where each member state may notify ICAO of any differences between SARPs and its own practices. Those differences are published in the form of Supplements to Annexes.

The requirements of the provision of ARFF at aerodromes is covered in Annex 14, Volume 1 - Aerodrome Design and Operations. In this Annex, member states are to provide ARFF services and equipment at all certified aerodromes within their jurisdiction. ARFF services and equipment should be appropriate to the aerodrome as determined by either the length or maximum fuselage width of the largest aeroplanes using the airport, whichever is greater. The reason for this is that wider aircraft may carry more fuel and passengers than narrower aircraft of the same length and therefore could require a higher Category rating to extinguish a fire.

These dimensions determine the Aerodrome Category, which determines the minimum amount of water/foam (either Class A or Class B foam), the discharge rate of produced foam required and the mandatory amount of complementary extinguishing agent - in Australia's case Dry Chemical (Table 1).

The required quantities of extinguishing agent must be available for discharge from operational fire vehicles within the response times of two minutes to the end of each runway or not exceeding three minutes to any part of the movement area. It is also implicitly demanded to have a monitor (turret) on the trucks, as no human could hold on to a nozzle and hose delivering such powerful high-pressure discharge rates.

Table 1: ICAO ARFF Category Chart

Aerodrome Category (ICAO Index)	Min Number of Rescue and Fire Fighting Vehicles	Airplane Length [m]	Max Fuselage Width [m]	Water [L]		Foam Solution Discharge Rate [L/min]		Complementary Agents [kg]
				Performance Level A	Performance Level B	Performance Level A	Performance Level B	
				1	1	0 < L < 9	<2	
2	1	9 ≤ L < 12	<2	1 000	670	800	550	90
3	1	12 ≤ L < 18	<3	1 800	1 200	1 300	900	135
4	1	18 ≤ L < 24	<4	3 600	2 400	2 600	1 800	135
5	1	24 ≤ L < 28	<4	8 100	5 400	4 500	3 000	180
6	2	28 ≤ L < 39	<5	11 800	7 900	6 000	4 000	225
7	2	39 ≤ L < 49	<5	18 200	12 100	7 900	5 300	225
8	3	49 ≤ L < 61	<7	27 300	18 200	10 800	7 200	450
9	3	61 ≤ L < 76	<7	36 400	24 300	13 500	9 000	450
10	3	76 ≤ L < 90	<8	48 200	32 300	16 600	11 200	450

(ICAO, 2013)

The methodology for rescue and firefighting at an aerodrome is based on the critical area concept developed by the Rescue and Fire Fighting Panel and adopted by ICAO via Amendment No. 30 to Annex 14 in 1976.

The concept is based on the critical area to be protected in any post-incident fire situation with the objective of creating and maintaining survivable conditions, providing egress routes for aircraft occupants and initiating the rescue of those occupants unable to make their escape without direct aid of ARFF personnel.

ICAO Document 9137-AN/898, Airport Services Manual, Part 1, Rescue and Fire Fighting provides guidance in the implementation of the Annex 14 requirements to assist in ensuring uniform application amongst the member states. The Civil Aviation Authority of each State in turn publishes corresponding regulations and guidance for their service providers.

Australian regulatory framework

The Civil Aviation Safety Authority (“**CASA**”), established under the Civil Aviation Act 1988 (Cth), is the regulatory body responsible for issuing and enforcing the Civil Aviation Safety Regulations 1998 (“**CASRs**”) in Australia. The current regulatory framework governing ARFF services is contained in CASR 139H, which sets out general standards with which an ARFF service must comply, and the associated Manual of Standards (“**MOS**”) 139H, which sets out the detailed requirements as authorised by the CASRs.

However, the commitment of CASA to meet ICAO standards, at least for ARFF standards, must be seriously questioned. According to MOS 139H 1.1.1.1:

*“The standards pertaining to the provision of Aerodrome Rescue and Fire Fighting Services (ARFFS) reflects Australia’s commitment to the International Civil Aviation Organisation (ICAO) Standards and Recommended Practices (SARPs), especially those stated in ICAO **Annex 14, Chapter 9.2.1.**”*

However, **Annex 14, Chapter 9.2.1** simply states that “*Rescue and fire fighting equipment and services shall be provided at an aerodrome.*”

CASA’s commitment to the ICAO standards is limited to this broad commitment only, as CASR 139.760, and MOS 1.1.1.2 and 1.1.3.1 all state that where there is a difference or inconsistency between a standard prescribed in Chapter 9 of Annex 14, the SARPs or other ICAO documents, and a standard prescribed in the MOS, then the MOS standard prevails. The MOS is a legislative instrument that may be unilaterally amended by CASA.

CASR 139.755 (2) stipulates that all aerodromes where an international passenger air service operates, or any other aerodrome where 350,000 passengers pass through during the previous financial year, are required to have a dedicated ARFF service established at that airport. This regulation has resulted in the establishment of ARFF at 26 airports in Australia to date (Table 2).

The Air Services Act 1995 (Cth) establishes Airservices Australia (“**Airservices**”) as both the civil air navigation and ARFF service provider. Airservices must comply with the Air Services Regulations 1995, with Part 4, Division 2 of the Regulations covering the functions of ARFF services:

4.02 Functions of the Rescue and Firefighting Service

- (1) *The functions of the Rescue and Firefighting Service are:*
- (a) *to conduct operations to rescue persons and property from an aircraft that, as the result of an incident at, or in the vicinity of, an aerodrome, has crashed or caught fire; and*
 - (b) *to conduct operations to control and extinguish, and to protect persons and property threatened by:*
 - (i) *a fire at an aerodrome, whether in an aircraft or elsewhere; or*
 - (ii) *a fire in the vicinity of an aerodrome that is in, or that started in, an aircraft.*
- (2) *In carrying out its functions under subregulation (1), AA must give priority to operations that are conducted:*
- (a) *at an aerodrome; or*
 - (b) *within 1000 metres of any boundary of an aerodrome.*

Table 2: Level of ARFF provision

Airport Category	Airports with ARFF provision
6	Avalon, Ayers Rock, Ballina, Broome, Coffs Harbour, Gladstone, Karratha, Newman, Port Hedland, Rockhampton
7	Alice Springs, Hamilton Island, Hobart, Launceston, Mackay, Sunshine Coast, Townsville
8	Cairns, Canberra, Darwin, Gold Coast
9	Adelaide, Brisbane, Perth
10	Melbourne, Sydney

(Airservices Australia, 2018) except for Brisbane (Airservices Australia, 2019a) and Perth (Airservices Australia, 2019b)

Requirements for the establishment of ARFF provision

The threshold for the provision of ARFF services should be in relation to the type of aircraft and *not* the annual number of passengers that travel through the airport in question. This is the model that should be utilised for a risk assessment of an Australian airport.

Airport “risk assessments” of this kind can meaningfully model, for example, the consequences of a crash but not the probability of that crash occurring at a specific time and place. Therefore, the current CASA method of evaluating the need for provision of ARFF services is not an adequate means of preparing for the worst possible incident that could occur with a particularly type of aircraft at an airport.

As mentioned above, the requirement for the establishment of an ARFF service at an Australian airport is any airport where an international passenger air service operates, or any other aerodrome where 350,000 passengers pass through during the previous financial year. Table 3 contains examples from other countries that also depart from ICAO standards in this area, namely Canada, New Zealand, UK and the USA. In the UK, all licenced airports have ARFF provision, while most licenced airports in the USA and New Zealand have an ARFF service established. It should be noted that each of these countries applies a more rigorous standard than does Australia. If Australia were to adopt the formula used by any of these

other nations, more Australian airports would provide ARFF services, in turn ensuring a safer airport experience for more domestic and international travellers.

Table 3: International comparison of ARFF establishment at airports

Country	Legislation	Requirements
United Kingdom	Civil Aviation Publication (CAP) 168 - Licensing of Aerodromes Article 208 of the Civil Aviation Publication (CAP) 393 Air Navigation	Chapter 8 Rescue and Fire Fighting Service Condition 2 in the Public Use and Ordinary aerodrome licences makes it mandatory for licence holders to provide a Rescue and Fire Fighting Service (RFFS) appropriate to their aerodrome and as detailed in this Chapter. Regulation requires flights in the UK by aircraft whose maximum total weight authorised exceed 2,730kg for the purpose of: <ul style="list-style-type: none"> the commercial air transport of passengers or public transport of passengers; instruction in flying or the inclusion of an aircraft rating, night rating or a night qualification in a licence; carrying out flying tests in respect of the grant of a pilot's license or the inclusion of a night rating; to take place at and aerodrome licensed under the Air Navigation Order for the take-off and landing of such aircraft or a European Aviation Safety Agency (EASA) certified aerodrome or government aerodrome.
United States of America	Federal Aviation Regulations Part 139 Airport Certification	Operators of Part 139 Airports must provide aircraft rescue and firefighting services during air carrier operations that require a Part 139 certificate. Part 139 requires FAA to issue airport operating certificates to airports that: <ul style="list-style-type: none"> serve scheduled and unscheduled air carrier aircraft with more than 30 seats; and serve scheduled air carrier operations in aircraft with more than 9 seats. This Part does not apply to airports at which air carrier passenger operations are conducted only because the airport has been designated as an alternate.
New Zealand	NZ Civil Aviation Authority, Part 139 Aerodromes-Certification, Operation and Use	An applicant for the grant of an aerodrome operating certificate for a domestic aerodrome shall provide rescue and firefighting services where it services: <ul style="list-style-type: none"> a turbojet aeroplane with a seating capacity of more than 30 passengers engaged in regular transport operations, or any non-turbojet aeroplane with a seating capacity of more than 30 passengers engaged in regular air transport operators and has more than 700 aeroplane movements in the busiest consecutive three months of the year.
Canada	Civil Aviation Regulations Part III- Aerodromes, Airports and Heliports, Subpart 3	The airport operator shall provide the aircraft fire fighting vehicles and the personnel required under Subpart 3 to respond to an aircraft emergency at the airport. A designated airport for ARFFS services is one which according to statistics, the total number of passengers that are emplaned and deplaned is more than 180,000 per year. Operator provide service 12 months after the statistics show that the airport meets the criteria for a designated airport.

(DIRD, 2015)

An arbitrary threshold figure (i.e. annual number of passengers), like the one used by CASA, has proven problematic in the Australian context, as seen with Coffs Harbour and Ballina Airports.

Prior to Coffs Harbour and Ballina Airports reaching the 350,000 passenger threshold for provision of an ARFF service, they maintained annual passenger figures above 300,000 but slightly under 350,000 for several years. These airports accepted large aircraft up to Boeing 737 and Airbus A320s on a regular basis.

However, as these airports were under the 350,000 passenger threshold, they did not have a dedicated ARFF service established. They relied on the State fire service intervention, despite local brigade response times being too long for an effective intervention at aviation fires (due to these brigades being located too far away from the airport). The local fire brigades also carry minimal water and foam supplies on board their vehicles and generally have small hand operated foam branches to fight these fires, making them inappropriate for ARFF operations.

However, upon reaching the 350,000 threshold, these airports suddenly went from having no dedicated ARFF service to the establishment of a Category 6 ARFF service. This approach leaves airports, staff and passengers at risk until they meet the arbitrary target for ARFF provision, despite the same risk of an incident occurring having existed before and after they reached the 350,000 threshold.

Additionally, there is no dedicated ARFF provision at Bankstown (Sydney) or Moorabin (Melbourne) Airports, despite there being 269,646 and 265,586 aircraft movements respectively during 2018. By way of comparison, there were 245,766 aircraft movements at Melbourne Airport the same year. Parafield (Adelaide) had 239,510 aircraft movements and Jandakot (Perth) 206,966 during 2018, but neither have ARFF provision. For comparison, Brisbane Airport had 212,006 over the same period. The question needs to be asked as to whether these busy airports, surrounded by residential suburban housing, should have ARFF provision established at them. Under the current threshold based on passenger movements they do not qualify, but as four of the busiest seven airports in Australia is their non-provision an anomaly that needs redressing?

Recommendation 1: that the flawed methodology of using a threshold of passenger movements per year to determine the establishment of ARFF provision be reviewed for the purpose of replacing it with a system that provides greater ARFF coverage at more Australian Airports.

ARFF crewing

The minimum number of ARFF personnel required to effectively and safely respond to an incident at an airport is therefore dependent on the size or the largest aircraft using that airport. ICAO Annex 14 does not specifically mandate the number of firefighters required other than what is implied with the number of vehicles (see Table 1). Annex 14, 9.2.44 states:

*“During flight operations, sufficient trained and competent personnel should be designated to be readily available to ride the rescue and fire fighting vehicles and to **operate the equipment at maximum capacity**. These personnel should be deployed in a way that ensures that minimum response times can be achieved and that continuous agent application at the appropriate rate can be*

fully maintained. Consideration should also be given for personnel to use hand lines, ladders and other rescue and fire fighting equipment normally associated with aircraft rescue and fire fighting operations.”

(ICAO, 2013)

Neither the CASRs nor the MOS provide any minimum number of ARFF personnel required to be on duty at Australian airports. The number of ARFF personnel required at Australian airports by Category is therefore a decision left for Airservices to determine and is contained in the Airservices Operational Procedure Ops-005 (Service Provision for Temporary Change to Category).

The National Fire Prevention Association (“**NFPA**”) is a global, non-profit organisation that promotes safety standards, education, training, and advocacy on fire and electrical-related hazards. The NFPA develops and promotes scientifically-based consensus codes and standards, research, and education for fire and related safety issues. Its codes and standards are generally recognised as a major source of firefighting best practice by industry professionals. NFPA 403 (Standard for Aircraft and Fire-Fighting Services at Airports) contain standards for ARFF operations, including the minimum number of vehicles and personnel required by Airport Category.

Table 4: Minimum crew and vehicle comparison: Airservices Ops-005 and NFPA 403

Airport Category	Minimum ARFF personnel		No. of ARFF vehicles	
	Airservices Ops 005	NFPA 403	Airservices Ops 005	NFPA 403
1	-	2	-	1
2	-	2	-	1
3	-	2	-	1
4	-	3	-	1
5	3	6	1	2
6	5	9	2	2
7	5	12	2	2
8	8	12	3	3
9	10	15	3	4
10	14	15	4	4

(Airservices Australia, 2017; NFPA 403)

Table 4 compares the quantum of ARFF personnel and vehicles contained in Airservices Ops-005 against those NFPA 403. This table clearly demonstrates that NFPA standards

exceed those of Airservices. NFPA response strategy is designed to have sufficient ARFF personnel on duty to respond to the fire and commence not only fire suppression but also aid in rescue operations simultaneously. Both NFPA 403 and ICOA Annex 14 clearly state that ARFF response is not only for firefighting, but, more importantly also for passenger and crew rescue.

As stated above, the role of ARFF is also to respond to structure fires at airports. There is considerable national and international research regarding safe firefighting practices in the context of structure fires. Both the NFPA 1710 and the National Institute of Standards and Technology (NIST) state that for safety and efficiency, firefighting vehicles should be crewed with a minimum of four firefighters. Additionally, a basic safety requirement under the US Occupational Safety and Health Administration (OSHA) policy 29 CFR 1910.134(g)(4) (Procedures for interior structural firefighting) is that no firefighters may enter a burning building unless four firefighters are "on-scene". This is known as the "two-in, two-out" principle. The "two-in, two-out" principle recognises the limitations of Personal Protective Equipment, such as Breathing Apparatus, as well as the importance of having firefighters outside the hazard area ready to initiate a rescue of firefighting inside, should they require assistance.

At the four largest airports with ARFF provision (Sydney, Melbourne, Brisbane and Perth), Airservices also provides a Domestic Response Vehicle ("DRV"). The role of the DRV is to protect the airport, passengers, visitors and employees by responding to all non-aviation incidents around the airport such as Emergency Medical Response (heart attacks, injuries, etc), structure fires in buildings on and around the airport, non-aircraft fires, fuel spillages, hazardous material events, motor vehicle accidents and alarms.

Airservices, however, only crew their DRV with 1 Officer and 2 Firefighters, which among the incidents it responds to are structure fires in buildings on the airport. This means that the "two-in, two-out" principle cannot be adhered to until back-up from surrounding suburban stations arrive, which may be too late as every minute counts in the course of combatting a structure fire. This puts the safety of the public, airport employees and the firefighters at risk. Conversely, while the DRV is responding to the aviation incident there is no rescue appliance or crew on site to attend to any medical emergencies, structure fires or alarms at the airport.

Despite the importance of preparedness for potentially catastrophic events, in recent years there has been a reduction in crewing from 17 to 14 at both Brisbane and Perth Airports. Brisbane and Perth Airports were rated as Category 10¹, but have since been reduced to Category 9 in their ERSA² despite Category 10 aircraft such as the A380 Airbus still using these airports. Airservices claim that Brisbane and Perth ARFF services are staffed to accommodate a Category 10 aircraft incident. However, maintaining the Category 10 level of response can only be "achieved" through Airservices cross-crewing their DRV and ARFF

¹ Both Brisbane and Perth are still listed as Category 10 airports on the Airservices webpage: "ARFF levels of service", which was last updated on 28 April 2018.

² En Route Supplement Australia, an Airservices publication containing information for pilots using Australian airports, including the level of ARFF provision. These are published for each airport and updated every 12 weeks.

vehicles, meaning that the same crew can respond *either* to a DRV or ARFF incident, but not both simultaneously.

As a result, when firefighters are required to turn out in the DRV, the level of staffing remaining at the station is insufficient to maintain a Category 10 response (the level required when an A380 Airbus utilises the airport) and to respond to any major incident. Maintaining crewing and vehicle numbers appropriate to the Airport Category is crucial to the safety of airport passengers, staff and visitors. The below incidents are recent examples that highlight the unfortunate compromise to firefighter and public safety:

1. Brisbane Airport

- On 5 November 2018 at Brisbane, ARFF responded to a fire alarm during a Category 10 service phase. ARFF responded a DRV with crew of 1 officer and 2 firefighters, leaving the station with 2 Officers and 9 firefighters.
- On arrival there was smoke emitting from the facility. As such, a Breathing Apparatus (“BA”) team was established Stage 1 (Note: a back-up team is to be established immediately at this point by either ARFF or the Queensland Fire Service).
- An ARFF back-up was not sent due to a Category 10 movement (an A380 Airbus was on the taxiway). The nearest Queensland Fire station did not have an available crew or firefighting vehicle due to another emergency. Another crew was sent from a station further away.
- The BA team was left for 23 minutes without the safety net required. This is a direct result of the staffing model reducing from 17 to 14. The level of service provision on the airfield was not Category 10, but this was not advised to Air Traffic Control, the Airline nor recorded by Airservices in the NOTAM (Notice to Airmen) system.
- The reliance on another Fire Service (as per Airservices Safety Case Determination) failed. The ARFF back-up that should have been released was not done so until after the Category 10 level had been reduced, seriously compromising safe working practices of the fire service SOP 23 (Standard Operating Procedure) “BA Operations”.

2. Perth Airport

- Incident 1: On 13 November 2018 there was a fire alarm to which the DRV was required to turn out. During the period these crews were not available as crewing at the station was down to only 8 firefighters. In this time a A380 took off, meaning a Category 10 Aircraft departed the runway without the necessary number of crew had an incident occurred.
- Incident 2: On 14 November 2018 there was a First Aid Call where again the DRV was required to respond to the patient. As a result of this incident, crewing levels were not maintained in a sufficient manner for a Category 10 response.

There are many of these types of incidents that occur regularly in both Perth and Brisbane due to the staffing model introduced by Airservices. This reduction in available ARFF crew leaves only 11 staff at the fire station to respond to an incident such as an A380 crashing on take-off or landing.

Task and Resource Analysis (“TRA”) is the best method for establishing minimum staffing levels that would be required at an airport during a specific incident. By using a qualitative risk-based approach which focuses on **probable and credible worst-case scenarios**, a

task and resource analysis seeks to identify the minimum number of personnel required to undertake identified tasks in real time before supporting external services are able to effectively assist ARFF personnel. Both ICAO Annex 14 and NFPA 403 endorse the use of TRA in determining the minimum level of ARFF personnel required at an airport. NFPA 403 additionally specifies that the purpose of TRA should be used to determine **additional** staffing requirements, that this analysis be documented and under no circumstances should the minimum required fall below the NFPA staffing minimums contained in Table 4 of this submission.

Given the above decisions of Airservices regarding ARFF staffing and the failure of CASA to act decisively in ensuring that minimum staffing levels at the appropriate Airport Category are maintained, given the primary importance of ARFF staffing numbers on the safety and efficiency of ARFF operations, it is beyond belief that the only reference to ARFF staffing level occur in an Airservices Operational Procedures document (Ops-005).

Given the importance of Australia's international and domestic aviation record and reputation, and in the context of being the foundation to Australia as a reliable tourist destination, that ARFF staffing levels at airports be established through legislation rather than regulation or operational procedure is vital. Any subordinate regulation should address issues that do not relate to critical factors such as the ability to reduce staffing levels.

It should be noted that changes to regulations and operational procedures do not require and seldom involve public scrutiny, inclusive of scrutiny from interested parties and industries. Therefore, the accountability of unintended consequences due to reduction in staffing is not a paramount consideration in a process of changing regulations or operational procedures. This is in stark contrast to the rigorous process of examination and investigation that would occur with any proposed changes to ARFF staffing or Airport Category levels if these were enshrined in legislation.

Recommendation 2: that an independent review of current ARFF staffing levels be conducted to establish an appropriate minimum staffing level by Airport Category, and that this review include consideration of the NFPA 403 standard.

Recommendation 3: that minimum ARFF staffing levels at Australian airports be established through legislation rather than regulation or operational procedure. Any subordinate regulation should only address issues that do not relate to staffing levels or other critical factors.

The effectiveness of the Regulator

When CASR 139H was established, caveats were placed on the development of the regulations. Specifically, CASR 139H were the absolute minimum requirements, could not place any additional cost on industry and had to reflect current standards and practices. As a result, Australia has fallen well behind other nations and does not reflect ICAO SARPS for the provision of ARFF service at all certified airports.

Airservices must adhere to the CASRs unless an exemption is applied for by Airservices and granted by CASA. Though Australia is generally compliant with international aviation standards as set out in the annexes of the Chicago Convention, currently CASR 139H falls significantly short of the international standard in relation to providing ARFF services at airports. In 2008, Australia gave an undertaking to review its non-compliance following an

ICAO audit, however, this only led to the provision of exemptions by CASA to Airservices, some of which are listed below:

- Exemption not to hold Incident Control Systems and resource evaluation modules when the Fire Station Manager is not available as Incident Controller;
- Exemption to allow inexperienced Sub Station Officers with certificate 4 qualifications to act in place of Station Officers who are required by CASA to hold a Diploma in order to be in charge of a crew;
- Exemption to reduce the frequency of foam application training, so that firefighters can only apply foam through a monitor (turret) every 180 days instead of the previous 90 days;
- Exemption to respond to non-aviation buildings off airport without a DRV and crew, resulting in insufficient personnel to maintain the airport's advertised Category.

In addition to the above, as recently as 2016, Airservices proposed to widen the extent of non-compliance by attempting to increase the requirement for the provision of an ARFF service from 350,000 passengers per year to 500,000, which would have resulted in the disestablishment of ARFF from 7 airports without adequate local brigade support. This move was supported by CASA.

CASA is reluctant to investigate and act on the Airservices' continual failure to provide and maintain the advertised Category at numerous aerodromes. This failure is a result of utilising part of an operational ARFF crew (which are required to maintain Category at an aerodrome), to respond off airport to domestic calls or performing non-operational extraneous duties subsequent to reduced staffing availability, due to the lack of forward planning. In this respect, CASA has failed in its role as a regulator, at least in terms of ARFF.

Airservices are seemingly able to request exemptions from CASRs and other ICAO requirements easily. The following examples demonstrate the nature of these exemptions and highlight the potentially dire consequences for Australian air travellers. They also raise serious questions about CASA's probity in its dealings with Airservices Australia:

- CASA exemption granted to provide Category 6 resources for 737 800 series aircraft, which should be rated as Category 7, and which carries between 160 and 180 people. The effect was the previous Category 7 staffing of 2 officers and 5 firefighters was reduced to the Category 6 level of 1 officer and 4 firefighters.
- To further exacerbate this situation the Fire Station Manager (FSM), who would normally act as an incident controller, was placed on shift, thereby replacing a Fire Commander and reducing the number of responders available at an aircraft incident. This means that Category 6 ARFF aerodromes respond to an aviation incident with 5 operational firefighters, as compared with the international benchmark (NFPA 403) of 9 firefighters.

Rescue Saws

At the 18 February 2019 Senate Estimates committee hearing, Airservices' Chief Fire Officer, Glenn Wood, informed the Committee of Airservices' decision to remove rescue power saws, used to cut through an aircraft's fuselage in an entrapment emergency, from operation.

This decision was made despite MOS 139H 13.1.1.3 compliance necessitating that among the operational equipment required for operational use are power saws. The power saws were removed from operations in September 2018, but still have no exemption from CASA to do so. This action was also carried out without any consultation with the Union.

At the hearing, CFO Wood stated, “We’ve...got arrangements in place with the local fire service to bring their rescue saw” (Senate Estimates, 2019: p134) which provides little to no comfort for ARFF or the public.

Taking CFO Wood’s words into consideration, picture a scenario where an aircraft has experienced an on-ground collision, resulting in passengers trapped within the fuselage which is filling up with smoke. The ARFF arrives within 2 minutes but the responding vehicle does not have rescue saws to cut into the fuselage. Relying on the local suburban fire brigade to respond to the call (assuming they have the capacity to respond), they arrive at the airport, wait to be admitted to the runway and escorted to the scene of the incident. all in order to provide a power saw, resulting in a delay of 10 minutes or more. In this scenario, it is entirely possible that by the time the fuselage is cut open, most if not all passengers on board could have perished by asphyxiation. The death toll would only be limited to the amount of people aboard the aircraft.

In the above scenario, there would understandably be public outrage in the event that an injury, or death, were to occur as a result of ARFF vehicles not containing important rescue equipment such as rescue saws, and in particular towards the regulator and any Government that has failed to intervene and maintain necessary standards for maximising passenger safety and survival.

In recent years, when CASA or Airservices seek to alter ARFF standards, this has been done without consultation with the Union, despite the Union being the employee representative body for ARFF operational personnel. These reviews appear to be more focussed on cost cutting rather than improving safety.

The UFUA supports a review of the current regulations as an opportunity to better align the CASRs and MOS with international best practice and current ICAO standards. However, it is questionable whether CASA have the expertise to conduct a review of ARFF services effectively. This would be better achieved by appointing an independent ARFF expert for the purposes of reviewing any proposed changes, ensuring alignment with ICAO standards and instituting NFPA 403 standards as best practice. Any such review should also include the UFUA as the employee representative body for ARFF.

Recommendation 4: That any review of CASR 139H Regulations or the MOS 139H be conducted by a steering committee of ARFF and firefighting experts, including the UFUA as the employee representative body for ARFF personnel.

Recommendation 5: That any Regulatory review has written into their Terms of Reference that ICAO SARPs are followed as closely as practicable, including all recommended practices.

Recommendation 6: That any review of Australian ARFF regulations should seek to adopt the proven and internationally respected standards in NFPA 403 wherever possible as ARFF best practice.

Economic importance of the Aviation sector

One very important reason for the provision of ARFF, which is not established in the standards or regulations, is the importance of most airports as a centre of business. Airports are more than just a ground location for airplanes, they are generally very large, complex and secure facilities and buildings with offices, food service, storage of goods and hazardous materials, freight, vehicle traffic and people (passengers, employees and other members of the public).. While ARFF services are provided for fighting fires and rescue operations for passengers and crew, they also provide initial response for all-risk hazards that exist at airports. While commerce is not the primary reason for ARFF, there is a monetary benefit to the ARFF service beyond the cost of a life.

In the past 10 years, the Australian airport sector has been supported by strong growth in passenger movements, increasing by an average of 3% annually over the last decade from 112 million in 2006-07 to 156 million in 2016-17. This strong growth has been driven by an increasing demand for both domestic and international air travel. Since 2006-07, revenue per passenger grew by 16% at Sydney Airport, 30.9% at Melbourne Airport, 42.9% at Perth Airport and 65.5% at Brisbane Airport in real terms. (Deloitte, 2018)

The contribution to Australian airports to the economy, both directly and through flow-on effects to other sectors, is enormous:

- In 2016-17, the Australian airport sector facilitated almost **118 million domestic passenger movements and almost 39 million international passenger movements**. Over the last five years to 2016-17, total passenger movements grew by 14%. Domestic passenger movements grew by 9%, while international passenger movements grew by 34%.
- This growth has seen the **total value added of airport core activities increase to \$4.9 billion**, up from **\$3.2 billion** in 2011.
- The sector is currently supporting employment of over **8,700 Full Time Equivalent (FTE) jobs**.
- Outside the core activities of airports themselves, **airports support a much wider ambit of economic activity within their precincts** including retail, office spaces, logistics and broader aviation sector activity.
- Combining both core and precinct, **the value added of airports was estimated at \$34.6 billion, or around 2% of Australia's GDP**. The contribution of airports and their broader precinct to employment (both direct and indirect) was estimated to be **206,400 FTEs**. This is significantly larger than the aviation sector itself reflecting the degree of non-aeronautical activities undertaken on airport precincts including: retail and tourism services; airline operations, general aviation and aircraft maintenance; transport; activities by government agencies and broader non-aeronautical commercial activities.
- The airport sector also has a vital role in transporting time critical goods within Australia and between Australia and the rest of the world. In 2016-17, the airport sector supported the transportation of 450,000 cargo tonnes domestically and over a million tonnes internationally. The majority of the goods were low density, high value and time critical, such as eCommerce parcels, perishable food, and medical items.
- While air freight only accounted for 0.1% of freight transported between Australia and the rest of the world by volume, it accounted for **21% of freight by value**.
- The airport sector also plays an important role in facilitating international tourist arrivals. **In 2016-17, the aviation sector facilitated 8 million international tourist trips** to Australia and \$27 billion of international tourism expenditure.

- The international tourism activity facilitated by the Australian airport sector contributed **\$21.6 billion in total value added**, equivalent to 1.3% of the national economy and **supported 218,500 jobs**, equivalent to 1.8% of the total employment in Australia.
- The airport sector also plays an important role in supporting domestic tourism activity. Domestic tourism activity facilitated by the Australian airport sector was estimated to contribute **\$10.6 billion in total value added** and **supported 121,200 jobs**.

(Deloitte, 2018)

The presence of the ARFF service is key to safeguarding the safety and security at major metropolitan and regional airports around the country, which is critical for international and domestic tourism. Any adverse impact on the reputation of Australia's national and international aviation industry, particularly those associated negatively with passengers' safety and/or the seamless movement of both passengers and goods, therefore has the potential to cause massive economic loss to the economy. Depending on the level and type of reputational damage, including the quantum of fatalities, the affects could last for many years.

If a significant downturn in aviation travel occurred due to an incident involving massive loss of life, particularly if it was revealed that this could have been avoided through compliance with standards that already exist internationally, the ARFF provider, regulator and ultimately the Government who are blamed for not addressing the cause of the incident earlier, would be held in public contempt and potentially exposed legally, politically and internationally.

Expanded ARFF provision

Past reviews have highlighted how ARFF funding arrangements have prompted resistance to their establishment by airline companies. This has limited the expansion of ARFF provision to more airports as a result of cost rather than safety concerns. With deregulation and airport privatisation, increased competition has forced greater cost rationalisation to enable lower fares to be offered which has significantly increased passenger volumes.

Deregulation was accompanied by moves to make the provision of aviation safety services fully cost recoverable, which has created an incentive for some in the industry to seek their minimisation. For example, when an excise tax was placed on aviation fuel to cover the costs of the Civil Aviation Authority in the late 1980s, the general aviation sector successfully lobbied for the removal of aviation rescue firefighting services from secondary capital city airports (Archerfield, Bankstown, Essendon, Moorabbin, Parafield and Jandakot) in 1991. Excise of aviation fuel was accordingly reduced from 27.395 cents per litre to 27.074 cents, less than one third of a cent (Button, 1991: p. 3567).

Nevertheless, the statement that safety is the number one priority precedes every government and industry comment on aviation safety matters: however, this is tempered by the degree of risk that one is prepared to accept. While CASA, Airservices and industry bodies may be prepared to accept a degree of risk by relying on the relative scarcity of a serious incident occurring, what should be considered is what degree of risk passengers and the public at large are prepared to accept:

“Aviation safety is particularly important to countries such as Australia which are so dependent on air travel. In judging what risks are acceptable, it is

therefore vital that the customers' perceptions are considered. This does not just mean the airlines as customers to Airservices Australia as a service provider, or CASA as the air safety regulator, but rather the passengers and society at large."

(Braithwaite, 2001: p. 117)

In his study, Braithwaite (2001) surveyed public perceptions of how many licenced airports had ARFF provision. The single highest answer was that 32.4% of respondents believed a dedicated ARFF was provided at all licensed aerodromes, while 91.3% overestimated actual ARFF coverage at Australian airports. One wonders what the public reaction would be if the true state of ARFF coverage were known, particularly after a fatal incident occurred at an airport with no ARFF coverage.

If safety rather than cost is the prime motivator for ARFF establishment, the Australian Government should embark on a long-term program to progressively establish ICAO-compliant ARFF services at most if not all certified airports, progressively moving down the Airport Category scale from largest to smallest with an immediate goal of achieving coverage of all Category 6 and above airports, as well as coverage of the busy secondary capital city airports. Once this is achieved, ARFF provision at all Category 5 airports could be considered, and so on. This may be a long-term program, but the direction and rate of progression should be clearly enunciated and adhered to.

Braithwaite (2001) also conducted a survey on how much extra passengers were prepared to pay on their airline ticket to ensure that ARFF coverage was provided at the airport where they took off from and landed. The results showed that around 84% were prepared to pay something: 7% were prepared to pay up to \$2.00, 21% up to \$5.00 and 18% up to \$10.00, while the majority at 38% were prepared to pay whatever was necessary.

Therefore, should the Government not be prepared to fully fund ARFF from existing revenue, these services could be primarily or partially funded from a national levy on air travellers, a "Passenger Facilitation Charge" ("PFC"). A PFC of only \$1.00 per revenue paying passenger would therefore raise over \$161.25 million based on 2017-18 financial year passenger movement figures at Australian airports (DIRDC, 2019), while a \$2.00 levy would raise over \$322.5 million and so on. The rate could be set to either subsidise or fully cover the cost of current ARFF provision as well as allowing for the initial expansion of ARFF services at all Category 6 airports and secondary capital city airports. In addition to this source, the Commonwealth should provide supplemental assistance for the establishment of new services and facilities, reflecting the broader economic and strategic benefits the community derives from moving progressively toward safety compliance with the international standard.

The introduction of a PFC should be considered to alleviate any argument regarding costs of maintaining vital ARFF services at designated airports. The UFUA submits the introduction of a PFC should be viewed as an alternative in the event that this Committee considers that the cost/benefit analysis of the damage to Australia's reputational damage and potential for loss of life as a result of an incident at an Australian airport is not sufficient enough to warrant full funding.

Recommendation 7: That a Passenger Facilitation Charge be considered to fund and expand ARFF services in circumstances where there is insufficient funding from other sources.

Conclusion

The UFUA would like to thank the Senate Rural and Regional Affairs and Transport Legislation Committee for the opportunity to participate in this Inquiry. We trust you will find our submission of value in your deliberations and would like to express our willingness to participate in any further consultations arising from this Inquiry. Our concern is and remains the safety of firefighters, staff, passengers and the public at Australian airports.

References

- Airservices Australia (2017) Service Provision for Temporary Change to Category. Operational Procedure Ops-005
- Airservices Australia (2018) ARFF levels of service. (updated 24 April 2018)
<<http://www.airservicesaustralia.com/services/about-our-aviation-fire-service/arff-levels-of-service/> (accessed 05/03/2019)
- Airservices Australia (2019a) AIP Australia, Brisbane Airport, 28 Feb 2019.
<https://www.airservicesaustralia.com/aip/current/ersa/FAC_YBBN_28FEB2019.pdf> (accessed 03/03/2019)
- Airservices Australia (2019b) AIP Australia, Perth Airport, 28 Feb 2019
<https://www.airservicesaustralia.com/aip/current/ersa/FAC_YPPH_28FEB2019.pdf> (accessed 03/03/2019)
- Boeing (2018) Statistical Summary of Commercial Jet Airplane Accidents, Worldwide Operations 1959 – 2017. Boeing: Seattle.
- Braithwaite, G. (2001) Aviation rescue and firefighting in Australia - is it protecting the customer? Journal of Air Transport Management, 7, pp. 111-118.
- Button, J. (1991) Excise Tariff Amendment Bill 1991, Second Reading Speech, Senator John Button, Minister for Industry, Technology and Commerce, Senate Hansard 28/11/1991.
- CASA (2005) MOS Part 139H—Standards Applicable to the Provision of Aerodrome Rescue and Fire Fighting Services. Version 1.2, January 2005
<<https://www.legislation.gov.au/Details/F2008C00128> > (accessed 15/02/2019)
- CASA (2018) CASR Part 139 – Aerodromes.
<https://www.legislation.gov.au/Details/F2018C00621/Html/Volume_4 > (accessed 15/02/2019)
- DIRD (2015) Aviation Rescue and Fire Fighting Services Regulatory Policy Review Public Consultation Paper. Department of Infrastructure and Regional Development, Commonwealth of Australia: Canberra.
- DIRDC (2019) Airport traffic data <<https://bitre.gov.au/publications/index.aspx>> (accessed 15/02/2019)
- Deloitte (2018) Connecting Australia: The economic and social contribution of Australia's airports, report prepared for the Australian Airports Association, Deloitte Access Economics: Canberra.
- ICAO (2013) Annex 14 to the Convention on International Civil Aviation (ICAO 7300) - Aerodromes - Volume 1: Aerodrome Design and Operations
- ICAO (2014) Airport Services Manual Part 1: Rescue and Fire Fighting, Fourth Edition - 2014, International Civil Aviation Organization, DOC 9137-AN/989, Montreal, Canada.

James, M.L. (1997) Airspace Safety: Air Traffic Control and Airline Operations in Australia. (Background Paper No. 10 97-98). Information and Research Service, Department of the Parliamentary Library, Parliament of Australia: Canberra.
<https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Publications_Archive/Background_Papers/bp9798/98BP10#REF> (accessed 15/02/2019)

NFPA 403: Standard for Aircraft Rescue and Fire-Fighting Services at Airports. 2014 Edition.

NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, 2016 Edition.

OSHA 1910.134. Occupational Safety and Health Standards, Personal Protective Equipment, Respiratory Protection. <[https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134#1910.134\(g\)\(4\)](https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134#1910.134(g)(4))> (Accessed 26/02/2019)

Senate Estimates. Rural and Regional Affairs and Transport Legislation Committee, Parliament of Australia, 18 Feb 2019.