UNITED FIREFIGHTERS UNION OF AUSTRALIA

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Brisbane ARFFS safety review Submission

United Firefighters' Union of Australia Aviation Branch

I would like to thank the Senators that allowed this inquiry to take place and to those members that will take part. I am grateful for the opportunity to provide a submission on behalf of Brisbane ARFFS fire fighters.

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United Firefighters' Union of Australia Aviation Branch

1. Introduction

1.1 Background

Brisbane Airport is currently a Category 9 / 10 aerodrome operating 24 hours a day, seven days a week. It has both Domestic and International terminals catering to 33 airlines flying to 83 destinations, both domestic and international. It is the largest capital city airport in Australia by land size (2,700 hectares) and the third-largest airport in Australia by passenger numbers with more than 23.4 million passengers travelling through the airport in 2018. Approximately 58,400 passengers pass through Brisbane Airport every day.
Brisbane Airport currently contributes $4Billion annually to the Brisbane and Queensland economy.

Brisbane Airport is classified as a suburb with more than 425 businesses representing a range of industries including freight and aircraft handling, warehousing, transport and communications, manufacturing, research, property and infrastructure development, education and training, recreation, tourism, accommodation, leisure and retail. Within the Airport district nearly 24,000 people are employed, this number in predicted to exceed 50,000 (the size of a regional town) by 2034.

Brisbane Airport is currently constructing a new parallel runway 01L/19R that is expected to be completed by mid-2020. This runway is 2km from the current primary runway. The new runway will allow the airport to grow its capacity to 50 million passengers per year by 2035, equating to 360,000 aircraft movements.

Brisbane Airport Corporation (**BAC**) estimate that by 2041, Brisbane Airport is expected to contribute $8 billion to the Queensland economy each year and $8.7 billion to the Australian economy annually.

Airservices Australia provide Air Traffic Control and Aviation Rescue Firefighting Services(**ARFFS)** for Brisbane airport. The ARFFS provides category 9 services 24 hours a day with two periods advertised at category 10, between 06:10 am to 07:10 am and 08:15pm to 09:15 pm.

In Brisbane, the ARFFS operates from two fire stations that enable the meeting of the mandatory response times of less than three (3) minutes to the thresholds (ends of runways) and all other parts of the aerodrome with the exception of the logistics apron and Runway 14/32.

- **The main fire station** is located with direct access to the primary runway 01R /19L, and houses –
  - 3 aviation appliances
  - 1 domestic pumper and
  - 1 SEALEGS watercraft.
- **The satellite fire station** is positioned on taxiway F4 with direct access to runway 14/32, this runway and station will be decommissioned after the NPR is completed. It operates
  - a single aviation Fire appliance; and
  - 1 SEALEGS watercraft.

Prior to 2013 ,when Brisbane commenced receiving category 10 aircraft, ARFFS operated at category 9 level, with an additional Domestic Response Service (**DRS**). Between 2013 and September 2018, the category 10 staffing numbers were 17 (four (4) officers and 13 fire fighters), which gave increased staff numbers during day time operating hours whilst at category 9. Currently Brisbane ARFFS are staffed with a crew of 14 (three (3) officers and 11 firefighters) for both category 9 and category 10.

The Union would like to submit this Submission which covers the following themes for the Inquiry's consideration with regard to Brisbane ARFFS –

1. The New ARFFS Station
2. Staffing levels
3. Other Resource matters.

2 The New ARFFS Station

BAC is in the process of building New Parallel Runway (**NPR**) and ARFFS is required to ensure a station "fit for purpose".

The location of a new station is required to meet certain requirements under the:

- Civil Aviation Safety Authority (**CASA**) Regulations 2005, regulation 139H
- Manual of Standards (**MOS**) section 139H.
- International Civil Aviation Authority (**ICAO**) Standards and Recommended Practices (**SARPS**); and
- ICAO Airport Services Manual.

All of the regulations and recommendations are designed to ensure that the location of a fire station enables ARFFS to meet their safety obligations in the most effective way.

BAC announced on the 28 February 2019 that the new runway construction will be complete in six months. Airservices is yet to commence construction of the new fire station.

2.1 The Regulatory Environment

2.1.1 The CASA Regulations

CASA MOS 139H
6.1.1 *Standard: Response Time*
6.1.1.1 *Response time is defined as the time between the initial call to the ARFFS and the time when the first responding vehicle(s) is (are) in position at the aircraft or site of the incident or accident, and if required, produce foam at a rate of at least 50% of the discharge rate specified in the Table defined in Chapter 7 of this Manual.*
6.1.1.2 *All other vehicles required to deliver the amount of extinguishing agent detailed in Chapter 7, must be capable of arriving so as to provide continuous agent application at the required rate.*
6.1.1.3 *The operational directive of the ARFFS must be to achieve response times not exceeding three minutes to the end of each runway in optimum visibility and surface conditions.*

(a) the operational objective of the ARFFS is to achieve a two-minute response time to the end of each runway;
(b) the operational objective of the ARFFS is to achieve a response time not exceeding three minutes to any part of the movement area;
(c) response times for all vehicles must be documented for validation.
(Emphasis added)

CASA MOS 139H
22.1.1 *Standard: Fire Station Facility*
22.1.1.1 *Facilities must be established that are appropriate to enable the fire service to respond to airport emergencies.*
22.1.1.2 *The siting of a fire station facility must take into consideration the requirement of achieving response times as defined in Section 6.1, of this Manual.*
22.1.1.3 *New or modified fire stations at Level 1 must provide an FSCC where all landings and take-offs of air transport aircraft are observed so as not to delay response times. (Emphasis added)*

2.1.2 ICAO SARPS

ICAO ANNEX 14 SARPS
9.2.38 Recommendation. *The fire station should be located so that the access for rescue and firefighting vehicles into the runway area is direct and clear, requiring a minimum number of turns.*

2.1.3 ICAO Airport Services Manual

ICAO Airport Services Manual

9.2.1 *The location of the airport fire station is a primary factor in ensuring that recommended response times can be achieved; that is, two minutes and not more than three minutes to the end of each runway in optimum conditions of visibility and surface conditions. Other considerations, such as the need to deal with structural fires or to undertake other duties, are of secondary importance and must be subordinated to the primary requirement. At some airports it may be necessary to consider the provision of more than one fire station, each located strategically in relation to the runway pattern. Aircraft accident studies have shown that a large proportion of accidents and incidents occur on, or close to the runway/accidents in or beyond runway end safety area locations often produce the more serious consequences in terms of fire situations and casualties. (Emphasis added)*

9.2.4 *All fire stations should be located so that access to the runway area is direct, requiring the RFF vehicles to negotiate the minimum number of turns. Additionally, the location should ensure that the vehicle running distances are as short as possible in relation to the runway(s) the fire station is intended primarily to serve. The ability to reach standby positions without delay is important. The placement of the watch room, if provided, in each fire station should ensure the widest possible view of the movement area including aircraft approaches and departures. The installation of closed-circuit television (CCTV) cameras may be considered in watch rooms to enhance their view. (Emphasis added)*

2.2 Site Options and Selection

Airservices looked at four (4) proposed sites o Brisbane Airport in 2014.

Of these 4 sites, **Proposed site 2** stood out and met the obligations of all safety criteria both nationally and internationally for the NPR, as per the AirBiz Brisbane Airport ARFF assessment June 2014:

- 138 seconds (2 minutes, 18 seconds) to Runway 19R;
- 141 seconds (2 minutes and 21 seconds) to Runway 01L;
- the most unobstructed access to the NPR out of all four potential sites; and
- has an un-obstructed view from the FCC (fire control centre) over the entire NPR.

It is noted that while these times are outside the operational objective, they are within the operational directive as specified in the CASA MOS 139H 6.1.1.3 (as above).

Airservices instead selected **Proposed site 3** which opens onto major taxiways that link the two runways. The Union submit that **Proposed site 3**, fails to meet the location requirements in that –

- The taxiways will be congested with air traffic moving in both directions.
- It increases the number of turns required by fire vehicles responding to the NPR ; and

- It does not have an unimpeded view of the NPR.

The predicted response times for this site (as determined by the AirBiz assessment) state it will be 158 seconds (2 minutes, 38 seconds) to Runway 01L and162 seconds (2 minutes, 42 seconds) to Runway 19R. These times, leave only an 18 second window for the predicted times to meet the operational directive.

Brisbane operational staff are concerned that the predicted response times were determined without adequate account for using shared taxiways and additional vehicle turns necessary to access the runways. For example, vehicles dispatched from **Proposed site 3** will have to slow down on taxiway Z (Zulu) and re-accelerate, they will be required to make at least two turns to access the runways. Further, where incidents occur in busy periods, taxiway Z may not be available for use due to increased aircraft movements. It is for these reasons that operational staff consider that ARFFS will fail to meet the minimum response times (within 3 minutes) from a new station at **Proposed site 3.** It should also be noted that ARFFS should aiming to reduce this time to 2 minutes in accordance with the operational objective.

2.2.1 Response time assessment process

In assessing response times, there are two key components. The Aviation Fire Fighting Manual (**AFFM**) identifies these components as –

- Response Preparedness Checks (**RPC**) - is the time firefighters take to get to the fire appliances from around the station; and
- Vehicle Response Time Tests (**VRTT**) - is the time from when the driver starts the vehicle to the arrival at the runway threshold (end).

In 2013, Airservices Australia engaged AirBiz to conduct an assessment on the four proposed sites and determine the likely response times to incidents from each of the locations. AirBiz used the below assumptions in making these initial assessments.

The performance standards and assumptions *used by AirBiz for the Brisbane Airport ARFF assessment were as follows:*

- *Response preparedness time (time from raising alarm until the first vehicle leaves the facility) –45 seconds*
- *Time for vehicles to accelerate to 80 km/h –30 seconds*
- *Continue acceleration at the same rate until cruise speed of 110 km/h reached*
- *Decelerate from cruise speed to stop at scene of incident –10 seconds*

Note: The vehicle performance standards and assumptions used in this report were advised by Airservices Australia on 1 November 2013.

The AFFM 004, identifies that the objective range for RPCs is 45-70 seconds . The performance standards and assumptions used by AirBiz for the same task uses the absolute minimum of that guideline as the standard (45 seconds).

In May 2018, the 'ARFFS response time calculator' was updated to include a formula to include adjustments to factor in time for vehicle turns. The formula has been provided to AirBiz for future assessments. A review of the 2015 recommendation of Proposed **Site 3** has not occurred using the revised calculator.

Should the new calculator be applied to Proposed Site 3, the Union submit the location would result in ARFFS falling well short of meeting the operational directives around response times as mandated in the CASA regulations.

New performance assumptions given to AirBiz in 2018

- *Vehicle – Rosenbauer Panther Mk 8 Ultra Large Fire Vehicle*
- *Data Source – Test runs performed in Canberra*
- *Cruise Speed Max. – Vehicle Data*
  - *120 km/h*
- *Acceleration – Four acceleration rates*
  - *0 km/h – 80 km/h - 0.741 m/s²*
  - *80 km/h – 100 km/h - 0.309 m/s²*
  - *100 km/h – 110 km/h - 0.231 m/s²*
  - *110 km/h – 120 km/h - 0.185 m/s²*
- *Deceleration – Single rate of deceleration*
  - *120 km/h – 0 km/h - 2.845 m/s²*
- *Cornering Speed Max. – Equation*
  - *y = 23.343 ln(x) – 39.605*
  - *y = maximum cornering speed*

NOTE: The update to the calculator above would not have the same impact on **Proposed Site 2** given it has a more direct access route to the runway, due to better siting. (As per NFPA A.9.1.2 and ICAO SARPS 9.2.38 and the ICAO Airport Services manual 9.2.1 above).

2.2.2 Airservices Recommendations

In May 2015, following the AirBiz assessment, Airservices released an options paper which included their recommendation relating to the new Brisbane Fire Station. It was within this paper that Airservices determined that **Proposed Site 3** was the preferred site option.

Despite recommending **Proposed Site 3** as the preferred option, Airservices in their own paper they acknowledge the difficulties the site will have in meeting the operational directives with regard to response times.

Further, Airservices acknowledge that **Proposed Site 3** does not minimise the number of turns as per ARFFS obligations, and as such places ARFFS at great risk of not meeting its response times. Airservices has also not taken into consideration the impact of placing the station at taxiway Zulu, the main crossing taxiway between the parallel runways which provides access to the terminals. It is expected that this will carry a heavy traffic load.

Brisbane New Fire Station Options Paper WBS TAS/0248, page 24

"3.4.4 Operational Safety Assessment

This option poses a broadly tolerable level of risk, comparable, yet slightly elevated to the current risk profile for Brisbane aerodrome. It is similar to option 3, with the expectation of increased response time to 19R. ***It also results in 01L and 19R becoming very close to maximum acceptable requirements.***

*As such, consequence associated with this option would be consistent with moderate – given that for one threshold, nearly 3 minutes can be achieved before agent application can commence. The frequency of hazard would remain consistent with 5 to 50 years. This option results in a C class classification*1*." (emphasis added)*

Brisbane New Fire Station Options Paper WBS TAS/0248, page 37

"The response times presented in the AirBiz report are theoretical and the actual response times achieved may vary. The actual times shown in the table above demonstrate an ability to beat the theoretical response time however there is a risk that this may not always be the case. The above situation is an environment where the number of 90-degree corners on the vehicle's response path have been minimised by the fire station location. Due to the runway layout and possible sites available at Brisbane ***the number of corners that need to be negotiated by responding vehicles increases the risk that the theoretical time is not met in practice****." (Emphasis added)*

The requirement of the vehicles dispatching from **Proposed Site 3** to use the taxiway, in addition to requiring more turns, is contrary to the standards in the NFPA 403 Standards for Aircraft Rescue and Fire Fighting Services 2018 **– which warn against the use of shared infrastructure with other vehicular traffic.**

NFPA 403 Standards for Aircraft Rescue and Fire Fighting Services 2018

*"****A.9.1.2*** *The geographical center of an airport might not be the best location for siting the airport fire station. Locating the airport fire station for structural fire-fighting utility should be of secondary importance. Before selecting the actual location, time trials should be run to determine the optimum location that would ensure the quickest response to all potential accident sites. Also, an evaluation should be placed on present and future usage of the airport movement areas to ensure proper selection of the fire station site. [See Figure A.9.1.2(a) nd Figure A.9.1.2(b).]*

2.2.3 Financial considerations

Airservices proposes to cover all ARFFS obligations from two locations within the existing staff base and fleet. The runways are two (2) kilometres apart, the greatest distance of any two runways in Australia. It is submitted that these distances mean that both stations should be capable of providing their own category level, and that failure to do so may have dire consequences. Continuous application of agent will not be maintained without additional resources, and the end result will likely be the loss of control of an event and unnecessary loss of life.

Most operational staff believe that the proposed Airservices model is based on three things:

- ARFFS do not currently have sufficient numbers of fire vehicles because of the premature postponing the Vehicle Replacement Program (**FVR5**);
- Reluctance to increase numbers of operational staff; and
- Focus on budgets rather than ensuring safety.

The first two issues are related to the third – and depict a continuing trend in decision making by Airservices motivated by fiscal outcomes rather than achieving better than minimum standard of safety. This is additionally evident from the extensive number of exemptions Airservices seeks from CASA to justify lower safety standards.

The Airservices options paper identifies the significant cost difference between proposed fire station locations –

- The Airservices preferred **Proposed Site 3** is estimated to be $14.39 million excluding risk and contingency;
- The more operationally effective **Proposed Site 2** is estimated at $26.83 million excluding risk and contingency.

The significantly higher cost of **Proposed Site 2** can be attributed to the surcharge of sand required that was not accounted for at the foundation phase of the second runway preparations. Had Airservices considered site options earlier, in conjunction with the NPR, the preparations could have been made at the same time and been a far cheaper undertaking. The NPR runway project is part of a 20-year plan, so there was ample time for Airservices to prepare.

2.2.4 Fire Station Control Centre (FSCC)

Following the release of Airservices options paper, it was identified that **Proposed Site 3** could not meet the FCC obligations under the CASA 139H and the ICAO SARPS (see below). Airservices then proposed that cameras would be installed to alternatively fulfil this obligation at an additional cost of approximately $4million, which increases the cost of **Proposed Site 3** to $18million.

This is acknowledged in the Airservices 'Options Paper' 3.4.2 Disadvantages (of **Proposed Site 3**)

1) *"It will not meet the line of sight requirements for the FCC in the future without the introduction and approval of up to two remote runway viewing cameras."*

Airservices is now undertaking safety risk assessments to determine whether they are able to remove the FCC component of the ARFFS and transfer it to Air Traffic Control (**ATC**). The Union submits that the CASA Regulations cannot be read so as to permit such a move. (See FCC removal SCARD 2019).

CASA MOS 139H
"22.1.1.3 New or modified fire stations at Level 1 must provide an FSCC *where all landings and take-offs of air transport aircraft are observed so as not to delay response times. (Emphasis added)*
22.1.2 FSCC Requirements
22.1.2.1 *Where a new FSCC is provided* ***the control cabin must provide clear vision of the runway and 'short final' approaches****. This may require the elevation of the FSCC cabin. (Emphasis added)*

22.1.2.7 *All aircraft landings and take-off of air transport* ***must be observed by the FSCC operator or designated officer."*** *(Emphasis added)*

It is doubtful that the Brisbane ATC would have capacity to undertake the FSCC obligations. Brisbane ATC ground controllers can have up to 20 aircraft and vehicles moving around the taxiways and movement areas at any one time, and aircraft taking off and landing every 60-90 seconds during peak times. This is only going to become an increasing demand with the opening of the second parallel runway.

Removing the FCC from the ARFFS also poses other complications for ATC, because the ARFFS FSCC has always been the redundancy option if the ATC suffered a critical failure. This would not be possible if an ARFFS FSCC did not exist. This was identified in the planning stages of a new station during a meeting in 16 January 2015, held between ARFFS and ATC. ATC also recommended stations to be positioned to eliminate runway crossing delays, of which the Airservices recommended **Proposed Site 3** does not comply with it.

2.3 Conclusion

The selection of Airservices **Proposed Site 3** as the location for the new station, clearly presents many risks for ARFFS in that they will fail to meet minimum standards of safety for the travelling public. When these minimum standards fail to be reached, there is no clear current contingency plan. There are only two options then available:

1) CASA grants a dispensation from the regulations for the response time.
    a. This option is completely unacceptable, unsafe and has never occurred before; or
2) Build a third station to permit Brisbane ARFFS to meet National and International obligations.
    a. This option will negate any cost saving and most likely result in a massive financial impost on Airservices.

The other issue facing Airservices is that they are relying on CASA to provide exemptions for the FSCC not having adequate visual of the runways. This will be sought in two forms:

- an exemption from providing this at all (a breach of the 139H);
- an exemption that allowed for cameras.

Neither option is guaranteed and both would amount to a serious reduction in safety.

Although the timeline to the completion of the NPR is short (6 months), the fact that Airservices has not commenced construction of the new Station, means there is still the opportunity to locate the station at **Proposed Site 2**, the only site that meets all of the regulatory obligations. It therefore, appears that the only safe and effective options are to either re-locate back to **Proposed Site 2** or be prepared to invest in a third station.

3 Staffing Issues at Brisbane ARFFS

Brisbane Airport is Australia's third biggest airport. However, its size has not deterred Airservices from attempting to implement staffing and resource models that compromise the ability of Brisbane ARFFS to meet safety standards and adequately protect the travelling public. This submission will cover the Union's concerns regarding Airservices attempts to rationalise staffing models for financial benefit, in Brisbane (which actions also have impacted Perth and potentially Adelaide)

Australian regulations around staffing numbers are ambiguous and do not provide any real guidance.

> ***CASA Regulations 139.835***
> *"Number of operating personnel*
> *(1) During any period announced in ERSA as a period during which ARFFS is available at an aerodrome, there must be enough trained personnel available at the aerodrome to operate the equipment and vehicles required to provide the service at full capacity. "*

However, the ICAO SARPS provide a model/guideline to be applied to justify and determine appropriate staffing numbers. These guidelines are called a Task Resource Analysis (**TRA**) which has been adopted from the National Fire Protection Authority (**NFPA**). Australia has committed to uphold these standards as part of being a signatory to the International Convention of Civil Aviation, 1944.

> **ICAO SARPS**
> *"*
> *9.2.44 Recommendation. — During flight operations,* ***sufficient trained and competent personnel should be designated to be readily available*** *to ride the rescue and firefighting 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 firefighting equipment normally associated with aircraft rescue and firefighting operations.*
>
> *9.2.45 Recommendation. — In determining the minimum number of rescue and firefighting personnel required,* ***a task resource analysis should be completed and the level of staffing documented in the Aerodrome Manual.****" [Emphasis added]*

Note. — Guidance on the use of a task resource analysis can be found in the Airport Services Manual (Doc 9137), Part 1.

In 2004, a Safety Case 'ARFF Category 10 service provision' identified that staffing requirements of 3 officers and 11 firefighters were required. These numbers are not in dispute. The concern however, is the practice of including the DRS resources within these minimum Category 10 staff numbers. The Union maintains that Category 10

minimum staff numbers in addition to DRS resources are required for RPT movements even when stations did not meet the 700 movements per quarter, due to significant increases in risk associated with fuel, passenger numbers and aircraft size on Category 10 aircraft.

In 2013, a Safety Case Action Determination (**SCARD**) was conducted on Brisbane Airport, and due to emerging risk, the results deemed it appropriate to move Brisbane to Category 10 provision without embedding. This increase in category was signed off by the current Chief Fire Officer in July 2013.

ARFFS operated at all Category 10 locations in Sydney, Melbourne, Perth and Brisbane, (since 2008) with the Category 10 staffing requirements in addition to the DRS. This demonstrates that ARFFS acknowledged that the intent of the Category 10 staffing requirements were to exclude the DRS. Further, the NFPA (who developed the TRA) concluded that these numbers should be 15, independent of a DRS service as indicated in Table 1 below. Section 3.3 of this Submission considers the DRS in further detail.

Table 1. Minimum Required ARFF Personnel at Airports

Δ Table 8.1.2.1 Minimum Required ARFF Personnel at Airports

Airport Category	ARFF Personnel
1	2
2	2
3	2
4	3
5	6
6	9
7	9
8	12
9	15
10	15

Note: See also Annex D.

ARFFS are currently operating Category 10 service in Brisbane based on a modified Category 9 model. The difference in category 10 staffing between Airservices and the NFPA as can be seen in the above, vary by 1 firefighter, however, the same numbers are required for category 9. Therefore, based on the above numbers and current DRS staffing of 3 (which itself is unsafe) there should be a minimum 18 staff. The Union suggest that safe DRS numbers should account for 2 in 2 out Self-Contained Breathing Apparatus (**SBCA**) operations, ultimately bringing the total to **19 staff.**

Staff in Brisbane do not believe that they can deal with a Category 10 emergency within the current resourcing models.

3.1 The September 2018 SCARD process

In September 2018 ARFFS rushed through a reduced staffing model that was implemented for Brisbane in (ARFFS had implemented a similar model earlier in Perth) based on SCARD that was completed only days prior. This SCARD resulted in the adoption of the modified Category 9 model. The Union submit that this SCARD process was inherently flawed and disregarded experienced operational staff considerations in the recommendations of the September 2018 report. With the recommendations being signed off by ARFFS personnel with significantly inferior experience as officers in charge.

Seven (7) operational staff were included in the consultation process through participation in a working group, but their views were discarded once it became apparent to the Safety Specialist that operational staff raised concerns regarding Brisbane ARFFS using:

- Misleading descriptors
- Omissions of legislation
- Under weighing of risk scores
- Over weighing of mitigators
- All scores were pre-determined by before the working group had met.

The seven (7) operational staff that participated in the workshops between them had a total of 176 years' experience and 2,238 jobs as officers in charge of incidents, the average per officer being 319 each.

In comparison the operation experience from the Managers as Officer in Charge of an Incident that signed off on the SCARD and safety statement;

Local Operations Manager (**LOM**)	159
Regional Operations Manager (**ROM**)	62
Safety Specialist	0
Chief Fire Officer	3

. It is of concern that those with extensive experience are being ignored and discounted in decisions about the operational structure of ARFFS in Brisbane.

> ***NOTE:*** *The CFO (chief Fire Officer) is the highest position for ARFFS and has overall responsibility for the service. He is also our service expert at the highest level. What is concerning is that he has only 3 operational jobs as an officer since (data only recorded from 1997).*
> *In comparison with the operational staff –*
> - *66 Officers have over 400 jobs as officers in charge:*
> - *45 Officers have over 600 jobs as officers in charge; and*
> - *19 Officers have over 1000 jobs as officers in charge.*

The consultation process for the September 2018 SCARD was tokenistic at best. The Working Group was established and then disbanded within thirteen (13) days, within which there had only been less than three (3) hours of total meetings. This leads the Union (and Brisbane Operational Staff) to the conclusion that Management had already

determined the outcome of the SCARD and the consultation was a farcical attempt at appearing to include operational staff in the process.

Indeed, it was later uncovered that the reduced staffing model for Brisbane fire station was approved and signed off on 31 July 2018: CMA-OPS-YBBN-18-0013, Reintroduction of Category 10 Staffing (Brisbane ARFFS). This was **three months** before the completion of the safety work. It brings into question the legitimacy of the SCARD process as an outcome.

Within days of implementing the reduced staffing model, operational staff were so incensed at management and in the process, that they instigated "a vote of no confidence". I have personally never seen this done in my 28 years as a career firefighter.

> **Motion 1:** ***Vote of No Confidence in Local Operations Manager [redacted] and Regional Operations Manager [redacted]***
>
> *The listed managers have failed in their duty of care to make fire fighter and passenger safety a priority. Brisbane ARFF staff no longer feels (sic) that they can trust the listed managers in regards to the reduction in safe staffing numbers during Category 10 operations. Staff now believes (sic) management have created a situation in which a Category 10 incident occurs that it will result in unacceptable increased loss of life, and endangering responding staff. A successful outcome under this staffing model is unrealistic and unachievable.*

This vote was conducted cross all four crews between 4 - 7 September 2018. Brisbane stations support for the vote was 98%. The LOM departed the station on the 8 September 2018 and never returned. The manager was transferred to Townsville ARFFS.

Operational staff that participated in the "working group" requested that their names be removed from the final SCARD document as it could be perceived that they had agreed or contributed to the reduced staffing model outcome. This request was refused by management even though it was Airservices, through the Safety Specialist, that ceased the meetings thereby disbanding the Working Group.

Subsequently, the Working Group participants prepared a **'SCARD Joint Participants Statement'**. This was sent to:

- CASA, as the safety regulator;
- COMCARE, as the regulator for government employees' safety; and
- the Airservices Board.

As at the date of this submission, there has been no evidence of further investigation by any recipient.

3.2 United Fire Fighters Union of Australia Aviation Branch (UFUVA)Commissioned Task resource Analysis

Due to UFUVA concerns with the possibility of ARFFS amending safety standards that will affect Brisbane, they undertook an independent TRA in 2017 for Brisbane at Category 10.

3.2.1 The TRA Process

The UFUAV adopted the current recommended model recognised by ICAO Standards and Recommended Practices (**SARPS**). See Below

ICAO SARPS. — Guidance on the use of a task resource analysis can be found in the Airport Services Manual (Doc 9137), Part 1. *See Below;*

10.5 TASK RESOURCE ANALYSIS

10.5.1 *Introduction. The following guidance describes the stages that should be considered by an airport operator in carrying out a Task Resource Analysis (TRA) to establish justification as to the minimum number of qualified/competent personnel required to deliver an effective airport RFF service (RFFS) to deal with an aircraft incident/accident. If an airport operator requires the RFFS to attend structural incidents and road traffic accidents in addition to aircraft incidents/accidents, due regard must be given to the inability of not meeting required response times and robust procedures should be introduced accordingly.*

10.5.2 *Purpose. By using a qualitative risk based approach, which focuses upon probable and credible worst case scenarios a task and resource analysis should be done to identify the minimum number of personnel required to undertake identified tasks in real time before supporting external services are able to effectively assist RFFS (see Table 10-1).*

10.5.2.1 *Consideration should also be given to the types of aircraft using the aerodrome, as well as the need for personnel to use self-contained breathing apparatus, handlines, ladders and other RFF equipment provided at the aerodrome associated with aircraft RFF operations. The importance of an agreed framework for incident command should form a primary part of the considerations.*

> ***10.5.3*** *General information. The airport operator should first establish the minimum requirements including: minimum number of RFFS vehicles and equipment required for the delivery of the extinguishing agents at the required discharge rate for the specified RFF category of the airport.*
>
> ***10.5.4*** *Task analysis/risk assessment. A task analysis should primarily consist of a qualitative analysis of the RFFS response to a realistic, worst-case, aircraft accident scenario. The purpose should be to review the current and future staffing levels of the RFFS deployed at the aerodrome. The qualitative analysis could be supported by a quantitative risk assessment to estimate the reduction in risk. This risk assessment could be related to the reduction in risk to passengers and aircrew from deploying additional personnel. One of the most important elements is to assess the impact of any critical tasks or pinch points identified by the qualitative analysis.*
>
> ***10.5.5*** *Qualitative approach. The task analysis including a workload assessment aims to identify the effectiveness of the current staffing level and to identify the level of improvement resulting from additional staffing. A credible worst-case accident scenario should be analysed to assess the relative effectiveness of at least two levels of RFFS staffing.*

3.2.1.1 The Working Group

The UFUAV assembled a Working Group comprising current serving and recently retired ARFFS experts with over a combined 299 years of ARFFS operations experience. Current serving members held roles from Leading Firefighter to Deputy Chief Fire Officer. The Working Group also included several professional ARFFS training experts, and previous Fire Station Managers responsible for managing Category 10 ARFFS stations.

3.2.2 The TRA Findings

The Working Group considered the different staffing models available to ARFFS for the Brisbane Station in order to determine the optimal staffing structure for Brisbane. As part of these considerations the Working Group considered the NFPA requirements.

Following the completion of the TRA, in early 2018 Airservices introduced its own sanctioned safe Compressed Air Breathing Apparatus (**CABA**) procedures for internal operations staff. This new safe CABA procedural model would have brought ARFFS in line with all State Fire Brigades, however it was pulled in late 2018 when it became apparent that ARFF current staffing levels (generally) would not be sufficient to implement the model. CABA specified that the minimum numbers required to conduct internal rescue and or firefighting operations should be:

- six (6) staff;
- two (2) Breathing Apparatus operators;
- an entry control officer;

- Rapid Intervention Team (**RIT**) of two (2) ;and
- an Incident Control System (**ICS**) officer.

Following these considerations, it was concluded that the following represented optimal staffing structures to meet Brisbane requirements –

- A total of 6 Officers/ 13 Firefighters (meeting minimum of 15 as per the NFPA)
- Incident Control System (**ICS**);
- Rapid Intervention Team (**RIT**); and
- Dedicated watch room attendant.

Should the TRA be completed again, with the CABA model – it would likely result in an additional entry control officer.

Table 2. 2017 UFUAV TRA Findings on Staffing models

Staffing Model	Officers	Firefighters	ULFVs	DRVs	Result
Category 10 Aviation only	3	11	4	-	**FAILED**
Perth/Brisbane Hybrid Model Staffing **(Post Sept 18 model)**	3	11	4	1	**FAILED**
Brisbane ARFFS Staffing (**pre-Sept 18)**	4	13	4	1	**PARTIAL**
TRA Supported Effective Staffing (**recommended)**	6	13	4	1	**APPROVED**
	NFPA 15 minimum (Aviation) then TRA including effective ICS component, Rapid Intervention & CABA teams. (6+13) and a dedicated Watch room Attendant. TOTAL 19 Staff.				

3.3 Domestic Response Service (DRS) and embedding

Up until recently ARFFS have always resourced the DRS separate to Category crewing. The purpose of this has always been to reduce the risk of a domestic response (non-aviation) degrading the category coverage.

Brisbane Airport contains over 430 buildings, and a network of public roads for which Brisbane ARFFS must provide coverage to.

Non-aviation responses include:

- Structural fire or fire alarm (terminals, hangars, surrounding industries and businesses, shopping centres and hotels).
- Fuel spills (aircraft or otherwise)
- Motor vehicle accidents (**MVA**)
- First aid calls (terminals, aircraft, surrounding business and industry)
- HAZMAT

- Mutual Aid (other emergency services)
- Special Service (as required)

DRS resources were implemented at Australia's four largest airports to service non-aviation incidents and has also been an effective way to maintain category at airports with over 12 million passenger movements per year. Having the DRS surplus to category also provided additional resources to category when available.

As discussed in section 3 of this submission, staffing reduced in Brisbane in September 2018 and in Perth on April 2015 as part of an introduced hybrid model only allowing for only 14 staff (previously 17 staff). Now, when ARFFS respond to a non-aviation incident it leaves only 11 Staff to turn out to aviation emergencies.

Table 3. Station Emergency Responses 2017

Station Emergency Responses (SERs) 2017			
Location	SERs	Category	Passenger Numbers
Newman	8	6	285,633
Ayers Rock	12	6	365,964
Hamilton Island	17	7	423,551
Ballina	18	6	501 631
Coffs Harbour	22	6	415,768
Mackay	23	7	750 921
Gladstone	27	6	281,834
Karratha	27	6	439,047
Port Headland	29	6	354,297
Rockhampton	36	6	566 984
Broome	49	6	388,516
Launceston	54	7	466 997
Alice Springs	59	7	619 095
Sunshine Coast	61	7	1 057 079
Avalon	61	6	
Hobart	79	7	2 434 067
Adelaide	185	9	7 985 313
Townsville	170	7	1 531 407
Canberra	211	8	2 990 436
Coolangatta	240	8	6,479,083
Darwin	257	8	2 093 021
Cairns	272	8	4 900 695
Perth	771	9 and 10	12 457 650
Brisbane	766	9 and 10	22 610 871
Melbourne	1403	10	34 798 250
Sydney	1977	10	42 450 373

3.4 Failure to advise Industry

CASA require ARFFS to advise of changes to category through the Notice To all Airmen (**NOTAM**) system and to directly communicate with the ATC, as the air crew of a plane have the right to decide whether the level of ground service is suitable to their needs. Since the implementation of this system in September 2018, most category drops have not been recorded, reported or advised to ATC in accordance with the requirements. The Union assert that operational officers have failed to meet their obligations due to management providing mis-information, applying coercive tactics to discourage reporting, and on occasion outright bullying. On some occasions, domestic (non-aviation) responses have been delayed in order to maintain category on the aviation side until an ultra large aircraft has taken off.

> MOS Part 139H—Standards Applicable to the Provision of Aerodrome Rescue and Fire Fighting Services
> 25.1.3.1 If there is a need to temporarily reduce the category of the ARFFS provision due to an unforeseen circumstance affecting impending aircraft movements, all affected parties shall be notified immediately by NOTAM.

The Union submits that Airservices/ARFFS KPI's on service continuity are not an accurate reflection of category service provision and provides false data. The Union recommends that a full and independent audit is required on this issue, to include cross referencing of incident reports with FCC logs and notified hours of operation.

3.5 Failure to test staffing model (practical scaled exercises)

It is difficult to accept that ARFFS management are not aware that the current staffing models for category 10 and category 10 hybrid are insufficient and compromises safety. Workshops began in Melbourne when the new training facility opened to trial the staffing levels against simulated Category 9 and 10 incidents. This was the first time ARFFS conducted exercises at a category 9 and 10 level, despite it being after the implementation of the untested reduced staffing model.

As the ***PHASE 1 WORKSHOP*** clearly identified, ARFF staff would be overwhelmed with the scale of a Category 10 incident if numbers were reduced anything below 17 (including of DRS), all exercises completed at this level gave the first clear view on the ARFF shortcomings with events on this scale. Such deficiencies included:

- Access and height issues;
- shortage of Breathing Apparatus (**BA**) support;
- difficulty maintaining team change overs (this is with hot cylinder changes /limited recovery time) in controlled conditions;
- Span of control stretched to the limit.

The workload at this size was unprecedented in a training scenario and generally run a duration of 2-4 hours.

It is accepted that additional resources would be available within this time frame, in actual incidents, but access to any external support in reality, would still be between 20 and 30 minutes. As ARFFS would be the combat authority, we will be responsible for every emergency worker within our combat zone / fire ground. Therefore, at a minimum there must be staff available to brief external agencies and manage entry at the control point.

On 15 November 2018, the UFUA Aviation Branch sent a formal written request for the undertaking of Category 10 exercises using the staffing levels in place at Brisbane and in Perth, to the People Capability Manager, at the time of this submission, we have yet to receive a formal reply. There have been further repeated requests by operational staff for the ARFSS Training School to conduct exercises on a category 10 incident with

- 14 staff - the number the CFO deems adequate.
- 11 staff, the numbers available when the DRS is at another incident.

All requests to date have been denied on the grounds that such an exercise would be "unsafe". The question must be asked, if it is unsafe for training how can it be safe operationally?

ARFF CAT 10 Service Review HazID / Risk Assessment Workshop
Record of Discussion v1.2

Hazard No.	2	Hazard Status	Active

Hazard Title	Reduced ability to maintain conditions for survivability and supporting activities, including rescue, for large aircraft accident/incident involving A380

Description

Assuming CAT 9 service provided at Brisbane and Perth during A380 movements.
Resourcing Levels: as per table in Attachment C including no IAV available
NOTAM CAT 9 service provided

Worst Plausible Case for accident scenario:

- Fully involved A380 aircraft fire, located at threshold, normal POB
- Fire has now been controlled

Subsequent activities include:

- Deploy handlines to protect, maintain foam blankets
- Establish BA teams
- Prepare and gain access
- Internal fire and rescue
- Using ancillary equipment
- Casualty clearance/triage/rescue
- Incident management

Cause/Initiating Events

Aircraft incident/accident involving A380 has occurred and response (post-fire control) is required with CAT 9 level of resources

Business Units Affected

ARFF Brisbane and Perth

ARFFS reductions in staffing numbers have a direct correlation to a loss in capability. Having less firefighters in place creates an expectation from management that more things can be achieved with less resources – which is why the "remission factor" is so often implemented. The ratios of firefighters versus fuel and passengers provide a clear difference in expectations. It also includes the variations where ARFFS use remission factors to reduce costs.

See table below;

Table 4. Ratios of Firefighters to fuel and passenger numbers by Category

Category	Aircraft types	Passengers	Average	Firefighter Numbers	Ratio Passengers to Fire fighters
6	Dash 8/ ATR/E190/A320	50/68/180	84	5 (1+4)	17 passengers per fire fighter
7	737 (800)	174	174	6 (2+4)	29 passengers per fire fighter
8 (rem, 7 Staff)	A330 (200)	275	275	6 (2+4)	45 passengers per fire fighter
8	A330 (200)	275	275	7 (2+5)	39 passengers per fire fighter
9 (rem, 8 Staff)	777/787/A330 (300)	339/236/ 297	291	7 (2+5)	42 passengers per fire fighter
9	777/787/A330 (300)	339/236/ 297	291	9 (2+8)	29 passengers per fire fighter
10 + DRS	A380	484	484	17 (4+13)	28 passengers per fire fighter
10	A380	484	484	14 (3+11)	35 passengers per fire fighter
10 reduced DRS ops	A380	484	484	11 (2+9)	44 passengers per fire fighter

Extremely High Risk / Failure to meet objectives / Significant loss of life immediate assessment req
High Risk / Task Resource Analysis required to review as priority
Moderate risk /Acceptable / Task Resource Analysis required to review
Low Risk / Task Resource Analysis review lowest priority

In February 2005 ARFFS wrote to CASA requesting clarification on the application of the 'Remission Factor' (staffing and resources one category below required).

Remission factors still apply at many airports around the country today.

3.6 Impact on staff and resources with the new Brisbane Station as part of the NPR

ARFFS have been attempting to create a model that supports the airport expansion in Brisbane by maintaining current resource levels. In 2017, ARFFS finalised a 'Concept of Operations' paper which considered the staffing and other operational requirements to meet minimum standards of safety. The paper considered a number of case studies and scenarios in its assessment to determine adequate operational requirements. The paper concluded that the existing staffing levels were adequate.

Concept of Operations'
4.2 Assumptions and constraints

The assumptions related to the production of this report are as follows:

- *The current Certificate Category 9/10 requirements will not change,*
- *Personnel numbers will not change,*
- *The number of vehicles required to meet category will not change.*

1	**Category 10 Full Turnout**	**Position of two ULFV's at each fire station ensures compliant initial response and continuous application.**
2	Category 9 Full Turnout	Positioning two ULFV's at each fire station ensures compliant initial response and continuous application.

The Union submit that this work is now irrelevant as the staffing levels have since been reduced following the implementation of the reduced staffing model in September 2018 (refer to section 3.1 of this Submission). The concept paper's conclusion that current staffing levels were adequate were made on the basis of staffing levels pre-September 2018. The current staff in Brisbane is now only 14 staff. In the 21 Cases studies used in the concept paper, the Union consider the impact of lower staff numbers need to be highlighted. Specifically, we consider the following cases are no longer viable:

- **Case 1:** Responding to a Category 10 incident.
- **Case 2:** Responding to a Category 9 incident.
- **Case 8:** Cert IV and Diploma development exercise training.
- **Case 9:** Category 9 exercise training.
- **Case 10:** Category 10 exercise training
- **Case 11:** WRS (water rescue service) training.
- **Case 12:** Off Airport driver training.

- **Case 18:** Aircraft Observations (FCC)

Now that the staffing numbers have been reduced all assumptions in the Concept paper need to be reviewed.

4 Resourcing (Vehicles)

Airservices vehicle fleet has been recently exhausted, with no spare vehicles for stations. The cessation of the Fire vehicle replacement program (**FVR4** project), (see table 5 below); postponement of the Fire vehicle replacement program (**FVR5**), removal of the MK 7 fleet and the suspension of ordering MK 8s in 2013 has all resulted in the situation where ARFFS cannot resource each station with the minimum vehicle requirements.

In 2013, Airservices ceased ordering MK 8 Panthers despite the fact that five (5) new stations would need to be resourced under the current 350,000 passenger trigger guidelines in the next few years. At the time they did not have sufficient resources to fulfil the ARFFS obligations to open the all of the stations proposed in 2014, and decided to bring the MK7 Mill Tui out of retirement to service the Sunshine coast and Gladstone stations.

There have been many issues with the older MK 7 models which led to their original retirement. One of the returned MK 7's was involved in a roll-over in a training exercise in Brisbane on 23 March 2017. This was the second roll-over incident involving a MK 7 vehicle. All MK 7s have been since removed again from the fleet due to the instability of the vehicle. See; ARFFS MK7 rollover; System Assurance Investigation Report 2017.

The continued purchasing of vehicles FVR4 did not continue beyond 2014.
See table below from 2011 Vehicle program.

Table 5. FVR4 Capital Works Program

Table 1 – Capital Works plan 2012 - 2016

Project Description	2011/12 ($m)	2012/13 ($m)	2013/14 ($m)	2014/15 ($m)	2015/16 ($m)	5 Year Total ($m)
Fire Vehicle Replacement - Stage 4	8.8	8.9	10.4	8.3	8.5	44.9
Total	8.8	8.9	10.4	8.3	8.5	44.9

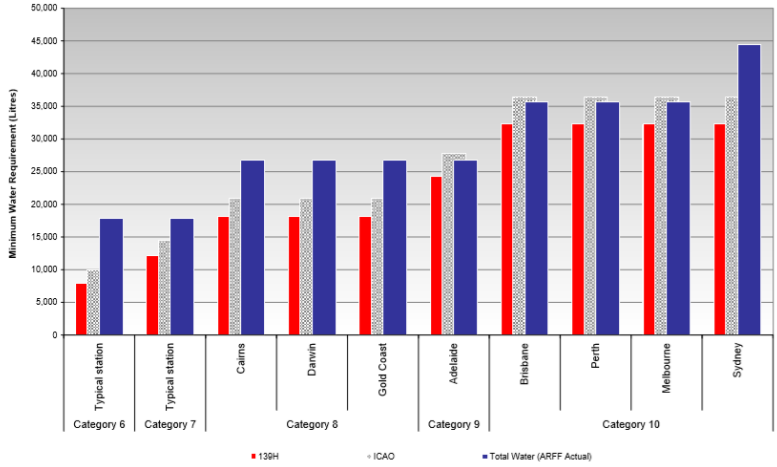
As ARFFS is no longer able to provide spare vehicles to each station, it has embarked on a spare vehicle sharing program in smaller locations. This places category provision and access to spare agent at risk. Additionally, there are no vehicles available for the new station in Proserpine or to service the expansion at Brisbane Airport.

The graph below (extract from the FVR5 vehicle replacement program) demonstrates that Airservices set the standard at the lowest permissible level when determining vehicle allocations.

4.4. Recent changes to ICAO extinguishing agent requirements

In November 2013 ICAO announced changes to the determination of minimum extinguishing agent amounts, aligning the required extinguishing agent (water) capacity with the largest aircraft in each category level rather than the current 'average' aircraft type within each category range. Under these changes, to take effect from 1 January 2015, the recommended extinguishing agent (water) capacities could increase[13] above MoS 139H requirements when based on the (theoretical) largest overall length of an aeroplane, and are anticipated to be more closely aligned with the NFPA Q1 + Q2 requirements (see *Figure 3* below).

Figure 3: ICAO extinguishing agent requirements



The chart demonstrates that ARFFS does not meet the level or water required under ICAO in four of our biggest eight stations.

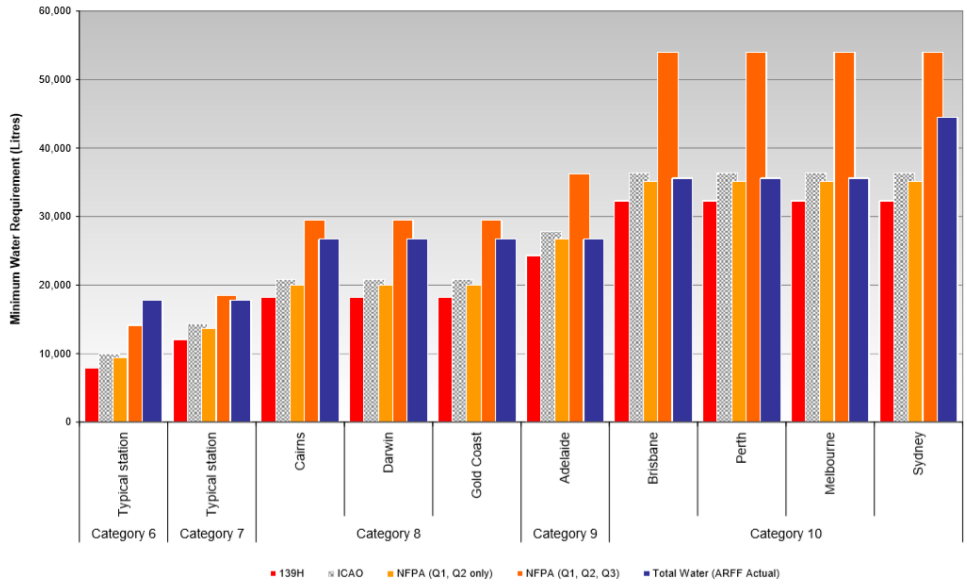
The NFPA set the standard that most countries aim for this is the allowance for all three Q factors.

- Q1 agent required for Initial knockdown of the fire
- Q2 enough agent to continue to control or extinguish the fire
- Q3 The agent required to conduct internal rescue and firefighting operations.

Although Airservices is fully aware of these best practice standards as can be seen in the extract from FVR5 Strategy Paper 2014, they elect to aim low.

Combined, Q1 and Q2 are equivalent to MoS 139H and ICAO "***Performance Level B***" requirements in terms of **function**.

Figure 4: MoS 139H, ICAO and NFPA Comparison



The chart above plainly demonstrates that all ARFFS stations above category 7, do not meet the NFPA (first world standard) in agent capacity. It must also be noted that most Category 6 stations operate by applying the remission factor, ensuring they will not hit the target benchmark either.

Brisbane will require six (6) aviation fire vehicles to make the model for the NPR compliant, in doing so it will increase the water to meet the NFPA benchmark. ARFFS need to accept that they cannot make their proposed model work for the expansion of Brisbane. This will be blatantly apparent when the new station is built and the ARFFS fails its response times.

5 Summary

Airservices, once upon a time, before the Accelerate Program (the rationalisation program for Airservices) used to use a Mission Statement titled 'World's Best Practice'. Sadly, this is no longer the case and this operationally based concept was replaced with a business model. The service the ARFF provides has been in steady decline ever since. If ARFFS were to chase 'World's Best Practice', and follow many other first world countries, they need to stop looking for ways to cut the service. As eventually, any financial efficiencies gained will be lost when something goes wrong.

The big questions that exist for the Brisbane Station are:

1. Where are the fire vehicles going to come from?
2. What is plan 'B' when the response times fail?
3. Is Airservices going to spend tens of millions of dollars building a third fire station?
4. Are they going to be allowed to abrogate their FCC regulatory obligations?
5. Are they going to implement a staffing model that can affect a positive outcome for a major incident?
6. Do they ever plan to operate at the recommended standard of a first world country again?

It is a sad indictment that firefighters are spending more energy on trying to maintain the standard and level of service than the leadership team. Firefighters are a proud group and vigorously defend any attack on service provision, this is not out of self-interest. Firefighters as individuals gain nothing by holding the line, it must be acknowledged that we are defending the flying public. This includes all Australians, and our international visitors. Our international reputation is currently at risk as is our business, tourism, and economy, which would also suffer in the event of a catastrophic event.

We the Aviation firefighters of Australia hope that this inquiry has the impetus to effect change in our organisation, taking us back to a path of operational priority and safety over finance. Our fire service over the past decade has been tainted and shamed by the financially driven decision-making practices of Airservices. We wish to see it reset and again become a proud and effective fire service.

Thank you for the opportunity to lodge a submission.

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