Rural & Regional Affairs and Transport Legislation Committee

ANSWERS TO QUESTIONS ON NOTICE

Budget Estimates 2015 - 2016

Infrastructure and Regional Development

Question no.: 104

Program: n/a
Division/Agency: Airservices Australia
Topic: Loss of Separation
Proof Hansard Page: 26 (28 May 2015)

Senator Xenophon, Nick asked:

…
Senator XENOPHON: I will go back a step: can we just go to the issue that I have raised with the ATSB about the Melbourne tower and Essendon tower—that three-hour period? The ATSB has relied on Webtrack, which is publically available, which has all sorts of caveats and limitations in terms of its use. What I am trying to establish is: do the radar tapes for that three-hour period, where there was no contact—as there should have been—between Melbourne and Essendon, still exist; how long do you keep radar tapes for?
Mr Hood: Radar tapes are kept for 30 days.
Senator XENOPHON: That is it?
Mr Hood: That is it.
Senator XENOPHON: As a result of the Cirrus, were the radar tapes kept longer?
Mr Hood: I would have to take that one on notice but, in relation to your previous conversations with the ATSB and with CASA in relation to, 'why didn't the Cirrus notify a three-hour breakdown in coordination?'; Cirruses are submitted as an immediately notifiable. So we try and notify incidents that have occurred in the air traffic management system as soon as practicable, which will not have all of the details in there. So when the Cirrus was submitted, we may not necessarily have known that coordination was null and void for the three-hour period.
…
Mr Hood: What would normally happen, and where the human error was made, is that the terminal area controller would have instructed the approach controller, 'Make sure you stagger the aircraft arriving 16 with the aircraft arriving 26 at Essendon,' such that in the event of a missed approach there is separation applied. What I am saying is there was another level of defence in that set-up where, even when that human error was made, had there been a go-around—the aerodrome is 11.3 kilometres away—there would have been additional coordination.
…

Answer:

Radar data is recorded and maintained in accordance with the CASA Manual of Standards Part 172 which requires retention for a minimum of 30 days.

This incident was reported and reviewed in accordance with Airservices' normal safety management processes. The incident highlighted an opportunity for introducing improvements to documentation and procedures which were subsequently implemented.

The recording was kept for 30 days while the reviews were concluded, however other data, including some radar positions which allow the detail of the event to be reviewed, was retained.

Rural & Regional Affairs and Transport Legislation Committee

ANSWERS TO QUESTIONS ON NOTICE

Budget Estimates 2015 - 2016

Infrastructure and Regional Development

Question no.: 105

Program: n/a
Division/Agency: Airservices Australia
Topic: Aircraft on ground
Proof Hansard Page: 27 (28 May 2015)

Senator Xenophon, Nick asked:

…
Senator XENOPHON: The concern I have, which has been put to me, is that the runway was wet with a tailwind.
Mr Hood: I will take that on notice because that is not in my brief.
Senator XENOPHON: Referring to question on notice No. 149, Airservices response was that during this ground delay, air traffic controllers had the waiting aircraft in sight and on the ground radar screens at all times. What happens in fog when the controller cannot see the aircraft, and has this happened previously?
Mr Hood: I will refer this to Mr Rodwell, but we have taken action to ensure that the strip display is corrected now and will not finish as happened in the last event.
Senator XENOPHON: If you could take that on notice? Apparently for some reason, I am advised, the report was sent to my office and the chair's office but not to the secretariat. I think that is where the mix-up has been because those things would normally be sent to the entire committee.
Mr Hood: I am sure you will have questions from the report.

Answer:

As noted in the response to Question 149 from February 2015, the aircraft waiting for a parking bay for up to two hours were displayed on ground radar screens at all times, and it was only the 'flight information labels' that were automatically closed after one hour. A scenario where aircraft cannot access a parking bay for such an extended period is very rare, however the one hour parameter has now been reviewed and adjusted.

During low visibility, there are detailed procedures to ensure that movements on the airport are managed safely. Radar systems are not affected by fog or low visibility.

There has not been a reported instance of flight strips being automatically closed during a low visibility event.

Rural & Regional Affairs and Transport Legislation Committee

ANSWERS TO QUESTIONS ON NOTICE

Budget Estimates 2015 - 2016

Infrastructure and Regional Development

Question no.: 106

Program: n/a
Division/Agency: Airservices Australia
Topic: TCU Consultation at Adelaide Airport
Proof Hansard Page: 28 (28 May 2015)

Senator Gallacher, Alex asked:

…
Senator GALLACHER: Is there any public consultation? Can anybody come to it?
Ms Staib: We had quite an extensive consultation process at Adelaide Airport with the local operators.
Senator GALLACHER: So are any submissions publicly available?
Ms Staib: To my knowledge, there were no written submissions taken.
Senator GALLACHER: Do you have a list of organisations that have made submissions to you? Do you know who spoke to you about it, or which organisations have made submissions?
Ms Staib: There have been no submissions taken, but there have been people consulted. I can provide you the list of the people that we have consulted.
Senator GALLACHER: Okay, thank you…

Answer:

Extensive consultation occurred between Airservices and a range of stakeholders on the proposed integration of the Adelaide Terminal Control Units (TCU) between September 2014 and May 2015 and is ongoing. This included:

- staff;
- the air traffic control association, Civil Air;
- major domestic airlines, Qantas and Virgin Australia;
- the Regional Aviation Association of Australia;
- Adelaide flight training schools;
- Parafield Users Group meetings (which includes flying schools and charter operators);
- South Australian division of the Australian Airports Association;
- the Adelaide Airport Consultative Committee (which includes local community representatives and key government and regulatory stakeholders);
- the Adelaide Airport Planning Coordination Forum (which includes airport operators and local and federal authorities responsible for infrastructure investment);
- South Australian Regional Airspace and Procedures Advisory Committee (RAPAC);
- Department of Defence; and
- Members of Parliament including the Member for Hindmarsh whose electorate incorporates Adelaide airport.

Subsequent responses and briefings were issued both verbally and in writing to various stakeholders providing advice and assurance in relation to concerns including job security for affected staff, service delivery of local services, and safety.

Information was made publically available via the media and the Airservices website.

Rural & Regional Affairs and Transport Legislation Committee

ANSWERS TO QUESTIONS ON NOTICE

Budget Estimates 2015 - 2016

Infrastructure and Regional Development

Question no.: 107

Program: n/a
Division/Agency: Airservices Australia
Topic: TCU Business Case
Proof Hansard Page: 29 (28 May 2015)

Senator Gallacher, Alex asked:

…
Senator GALLACHER: My question is: was there an initial business case—
Ms Staib: There was a business case put to the board.
Senator GALLACHER: Was that an initial business case?
Ms Staib: No, that was the final business case.
Senator GALLACHER: And has that business case been furnished to the committee?
Ms Staib: Extracts have been provided. There are some commercial sensitivities at the moment with its relationship to our negotiations on the OneSKY program.
Senator GALLACHER: Just for clarification, was the business case final at the time of the last discussion at estimates?
Ms Staib: To my recollection, yes. I think we had an initial safety case talked about—the business case.
Senator GALLACHER: We are onto the business case now. You did say that you would be able to furnish the business case to the committee. You are now saying it is commercial-in-confidence.
Ms Staib: There is an element that is commercially sensitive because of its relationship with the OneSKY program. Once we get further into those negotiations I can table the full business case or I can do it in camera if you want.
Senator GALLACHER: It is quite common for committees to have evidence taken in camera. That is quite appropriate. Also there are redactions if you have commercial sensitivities.
Ms Staib: I think I could do it—
Senator GALLACHER: I think withholding the business case is not advancing support for your decision, so to speak. So you can now table it in camera—is that what you are telling me?
Ms Staib: Yes, or I am happy to redact the commercially sensitive piece.
CHAIR: Can I halt there for a moment. I am trying to run this so that we get finished before the 11 o'clock knock-off. We cannot take evidence in camera at estimates. There is nothing to talk about. It cannot happen.
Ms Staib: Can I please table the business case with the commercially sensitive material redacted?
Senator GALLACHER: Is that okay, Chair?
CHAIR: Yes.

Answer:

A copy of the final strategic business case from which the Board paper was prepared and informed its decision to proceed with the integration of the Adelaide and Cairns Terminal Control Units into the Melbourne and Brisbane Air Traffic Services Centres (ATSCs), is at Attachment A. Relevant commercially sensitive information has been redacted.

Attachment A

Airservices Australia

Terminal Control Unit – Strategic Business Case

May 2014

This report contains 34 pages
Version 0.2

Endorsed by the Airservices Executive Committee
20 May 2014

Executive Summary

There have been two previous unsuccessful attempts to reduce Airservices Australia's footprint of Terminal Control Units (TCUs); first in the early 1990s and most recently 2006. In January 2014 a review of TCUs was initiated to inform the OneSKY Australia Program by determining the feasibility of integrating the Adelaide, Cairns and Sydney TCUs could be into Air Traffic Services Centres (ATSCs) in Melbourne and Brisbane.

The research and analysis undertaken as part of the review, summarised in this report, demonstrates that there are minimal technical or logistical impediments to the integration, and no significant safety impacts. In addition, a number of previous barriers, including infrastructure and staffing issues, have either been addressed or have shifted since the most recent review in 2006. This situation creates a unique opportunity for Airservices to:

- Provide customer benefit through more cost effective services as a result of a reduced footprint, with Adelaide and Cairns terminal charges likely to be reduced. Integration would also allow forecast increases in air traffic levels to be better managed;
- Align with the OneSKY business transformation program with the resulting increase in capability, reducing the three TCUs would result in a one-off saving of $37.5 million[1];
- Address issues associated with ageing infrastructure in each of the three locations, avoiding capital costs to replace this infrastructure of $13.4 million; and
- Provide greater opportunity for staff development while addressing attraction, retention[2] and engagement[3] concerns.

Other countries' air navigation service providers (ANSPs) that have successfully integrated air navigation services include NAV Canada, the United Kingdom's National Air Traffic Services, and Germany's Deutsche Flugsicherung.

The proposition

Three options were investigated for each of the locations, that is: no integration or 'do nothing', integration prior to the transition to the new Civil Military Air Traffic Management System (CMATS), and integration during CMATS transition.

A number of other options were not pursued as they were not feasible, they included:

- Integration of all locations simultaneously – this is considered not achievable due to the difficulties in relation to capacity to recruit and train sufficient staff in the timeframe;
- Partial integration of Sydney – while some risks would be avoided in the short-term, there is little benefit overall especially from a financial perspective; and
- Integration post-CMATS – considered too far in the future and would require the provision of an interim CMATS solution in each TCU location with the associated opportunity cost of not realising the savings associated with not having to maintain ageing infrastructure.

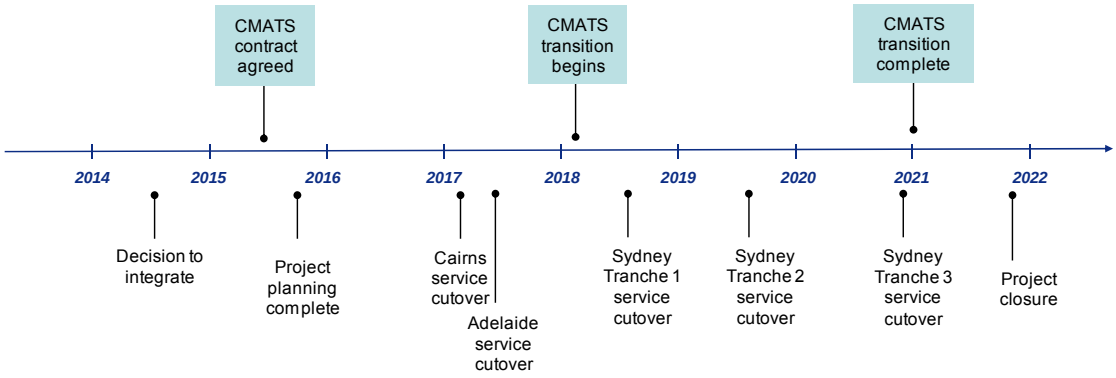
1 Through reduced CMATS supporting infrastructure, systems and components in an additional three locations
2 70% of air traffic controls in the three locations are over 45 and 21% over 55 years of age
3 The locations average scores were all below the ATC Group: five (Adelaide), 10 (Cairns) to 24 (Sydney) percentage point below the ATC Group

Recommended option and implementation timeframe

The recommended option is for Adelaide and Cairns to be integrated prior to CMATS transition, with Sydney being implemented during CMATS transition in a phased manner.

Sydney, as the location with greatest complexity, unique aspects of operation (eg. parallel runways) and largest staff numbers, is recommended to commence after Adelaide and Cairns have been implemented. This will allow the lessons learnt from the previous two TCU integrations to be applied to Sydney, it also allows a longer lead-time to ensure sufficient air traffic controllers are retrained and/or recruited.

The timeframes for the implementation are outlined below, noting that there is little room for slippage with the Sydney implementation up to 2021.



Financial analysis

The incremental net present value (NPV) is positive $19.8 million, over 15 years. That is, the 'do nothing' baseline option will cost $81.1 million whereas the recommended option will cost $61.3 million (the difference being $19.8 million). The primary reason for this positive NPV is the substantial savings expected of $125.5 million[4].

When considering the implementation cost, that is Direct Project Costs of the recommended option, this equates to $82.1 million over eight years[5].

Overall, the integration is a reasonable proposition from a financial perspective. However, this is only one factor and should be considered in unison with other matters such as the increase in operational capability.

4 Included in the $125.5 million, are the amounts outlined above of $37.5 and $13.4 million of one-off costs avoided.
5 This is the cost or outlay to implement the recommended option; it does not include any savings/expected benefits. This is the amount that will need to be approved in the forward budget process.

Key risks

While many of the barriers to previous attempts have been addressed or shifted, there will remain a set of risks to integration that must be actively managed and mitigated by Airservices:

- Industrial – there will continue to be some opposition and union representation. A workforce strategy will be developed to provide a range of flexible options for each of the 98 affected staff members, whilst recognising business need.
- Political – a proactive stakeholder management strategy will be developed to ensure key stakeholders are aware that there are no safety or technical impediments. The benefits to industry as well as Airservices will be clearly identified along with the carefully and considered management of staff issues.
- Resources – with the impending implementation of CMATS, this will take a substantial level of internal resource focus. The initial implementation planning indicated that the recommended option if achievable.

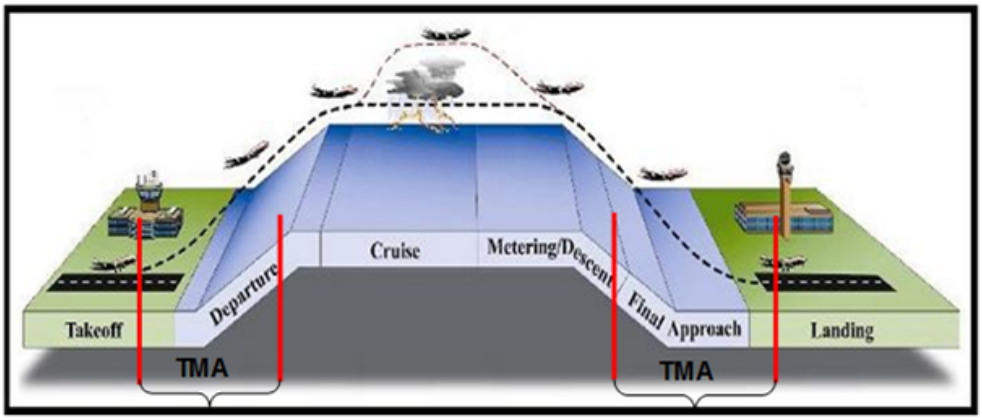
Contents

1 Context

In January 2014 a review and business case was initiated to inform the OneSKY Australia Program by considering the options associated with the integration of terminal area (TMA) operations provided by TCUs at Adelaide, Cairns and Sydney into Brisbane and Melbourne ATSCs[6]. This report provides a summary of the review.

1.1 Terminal Control Unit services

Airservices air traffic controllers provide TMA services in the approach and departure phases of flight, typically in a 30 nautical miles radius of the primary airport (see diagram below). These services are provided from control towers in smaller airports, or from a dedicated TCU or ATSC in larger airports. Advances in technology allow approach, departure and en route air traffic control to be provided from almost any location; visual observation is not required.



1.2 Previous reviews

There have been a number of reviews and initiatives to consider how Airservices can best provide TMA operations nationally. These have included:

1991	Civil Aviation Authority (CAA) developed a vision for the provision of ATC in Australia which involved all airspace services being provided from two major ATSCs
2001	Feasibility study conducted found there were no major technical or logistical issues that would preclude the integration of the remaining TCUs
2006	Decision was made not to pursue integration on the basis of marginal financial benefits i.e. positive Net Present Value of $7.5 million
2011	Airservices Board endorsed the progress of the OneSKY Australia Program tender based on a footprint of two ATSCs and one TCU (this can be adjusted but will cost more)
2014	The current assessment commenced to review, validate and update previous analysis on the locations from which radar approach air traffic control services may be provided.

The following case study demonstrates that TMA services can be provided in a safe and efficient manner from alternative locations.

6 Perth TMA operations are assumed to continue in-situ by the Perth TCU supporting a harmonised civil-military operating model and the organisations disaster recovery capacity.

Case study: Canberra and Gold Coast integration

The delivery of terminal air traffic services to Canberra and Gold Coast airports was integrated in 1994 into the Brisbane and Melbourne ATSCs leading up to the transition to TAAATS in the late 1990s.

Canberra and Gold Coast services are delivered as a part of the local (Melbourne or Brisbane) terminal area rating mix and serve as introduction points for newly qualified approach controllers to gain experience before progressing to the busier primary airport work environments.

For more than two decades, terminal air traffic services have been delivered in a safe and efficient manner from ATSCs to distant aerodromes, establishing the efficacy of this model of service delivery and breaking the geographic nexus that has historically existed between TCU and airport.

When a weighted rating is applied based on the number of movements, passenger transport movements and passengers, both Adelaide and Cairns rate closely in profile to the Gold Coast.

1.3 Proposal

Options analysis on future locations for provision of air traffic services was undertaken by a review commissioned by Airservices in 2011[7]. From the recommendations proposed in that report, the Airservices Board committed to retaining two major ATSCs, a joint user TCU in Perth, and the possible integration of remaining terminal operations into these centres. The current review was tasked to consider the agreed model, which was the integration of the functions currently performed across five locations into two. The locations considered for integration were:

- Adelaide (into the Melbourne ATSC)
- Cairns (into the Brisbane ATSC)
- Sydney (into the Melbourne ATSC).

1.4 Assumptions

The Review made three key assumptions about the project for planning and modelling purposes, these include:

- ATSC facilities - there is sufficient space within the Brisbane and Melbourne ATSCs to accommodate the additional Eurocat consoles required for integration. Engineering advice is that supporting services such as heating, ventilation and air-conditioning (HVAC), uninterruptible power supply (UPS), staff amenities etc are adequate but will require some upgrade works.
- Learning Academy - the delivery of TMA training courses is labour intensive, particularly in the simulation phase. The Learning Academy ATS School has advised that approach courses are most effectively delivered to a group of four to six candidates to ensure adequate contact between instructors and candidates. The ATS School is able to accommodate the additional training demand in a timely manner, recognising that this may require them to secure additional resources for course delivery and simulation.
- Operational environment - it is assumed that TCU airspace and procedures will not be materially changed in the initial, co-location stages of transition. In progressing to the desired end state of fully integrated operations there may be opportunities to pursue changes to airspace and procedures to maximise the efficiency of integrated operations.

7 October 2011, ATC Future Systems Program, Strategic Options Paper, Deloitte Touche Tohmatsu

2 Current environment: barriers and opportunities

2.1 External environment

The traffic growth predicted in Australia and South East Asia will have a significant impact on the current Air Traffic Management (ATM) systems and the service provision against available airport infrastructure. Australian air traffic volume is projected to increase, indicators include:

- an increase of 14% in passenger movements between 2007-08 and 2011-12
- projected growth in the number of air passenger movements through Australian airports by 50% over the next 20 years
- exceeded growth forecasts in 2012-13 in international traffic operations.[8]

Airport owners are responding to this increase by investing in large scale infrastructure upgrades, such as additional runways to enhance capacity; airlines are investing in fleet upgrades with next generation avionics; and major domestic carriers are increasing the volumes of air traffic between the major capital city hubs.

Future implementation of performance based navigation in terminal airspace is seen as a key enabler to support the customer's investments.

2.2 Internal barriers and opportunities

Internally, Airservices is constrained in its ability to meet this growth due to its ageing facilities and workforce. Under the current operating model, these factors are also not conducive to staff attraction and engagement. This does not allow for efficient operations but also creates a number of problems.

2.2.1 Operational capability and resilience across multiple locations

Increased competition between airlines will mean that cost advantage and cost savings will be fiercely sought. Airlines are investing in new aircraft with more sophisticated technology to manage the rate of effort in flight. This investment is coupled with an expectation that Airservices will seek to deliver value through efficient processes and service deliver to minimise their cost to the industry.

Service capability

The current configuration of ATSCs and TCUs requires multiple points of co-ordination to manage an aircraft through the air space. An increase in the number of sectors to manage demand presents an increase in both the complexity of sector coordination across multiple ATSCs and TCUs, as well as the cost to operate in Australian airspace. As an example, the need to manage and negotiate across a number of sectors increases the likelihood of an inefficient route being chosen, increasing the cost of operations to the customer in terms of additional fuel load carried, which is a significant cost driver for airlines.

Integration of TMA operations would reduce the number of sectors that require management and negotiation as multiple sectors would be managed within the one ATSC. This would also contribute towards the standardisation of service delivery across the TCUs and ATSCs. Currently there are variations across the processes followed and services offered at TCUs. For example, auto-release[9] is utilised at Brisbane, Melbourne and Sydney airports; the introduction

8 Airservices Australia Corporate Plan 2013-18
9 An Air Traffic Control procedure where responsibility for a departing aircraft is assigned from the Tower to the TMA controller without verbal coordination

of auto-release in Adelaide and Cairns would improve efficiency by reducing both tower and TMA workloads.

Service resilience

The ability to recover from service interruption is reduced with a dispersed workforce. Modelling undertaken in 2011[10] to determine the amount of time needed to resume operations after a natural disaster or deliberate attack found that the factors influencing the business continuity response capability include:

- controller staff availability in the covering centre
- availability of controller staff in the affected area following an event
- time frames for relocating staff from affected areas to the covering centres.

As the employee base is greater in a two centre model there is a greater ability to deploy latent staff ahead of relocating staff from the affected centre to the covering centre. Any delay in the recovery after a service interruption has a significant impact on Airports and Airlines in terms of diversions or passenger compensation.

Workforce productivity

The controller workload varies considerably between the TCUs and ATSCs. The table below shows that controllers at the ATSCs handle greater numbers of operations than their counterparts in the TCUs. This indicates that, along with increased resilience, there are possible opportunities to increase productivity if the workforce was consolidated into fewer locations and the movements shared more evenly.

Location	Number of annual airport movements	Number of approach controllers	Annual airport movements per controller
Melbourne[11]	279,840	36	7,773
Brisbane[12]	318,178	34	9,358
Sydney	326,686	57	5,731
Adelaide	121,552	19	6,397
Cairns	92,866	15	5,804

Opportunities created through integration: increased customer value

- The terminal navigation charge ($ per tonne) for Adelaide and Cairns is reduced in the order of 5-10 per cent
- Operational improvement is delivered in a timely and efficient manner from centralised operations
- Integrated TMA operations offer a greater assurance of service continuity financial benefit to Airservice's customers.

10 October 2011, ATC Future Systems Program, Strategic Options Paper, Deloitte Touche Tohmatsu
11 Includes Canberra
12 Includes Coolangatta

2.2.2 Ageing facilities

An independent assessment of TCU buildings made in 2011[13] found that the TCU facilities in Sydney, Adelaide and Cairns were near the end of their useful life and require replacement or refurbishment. Additionally, it has been noted by the review that:

- the return on any investment at either the Sydney and Adelaide sites would be minimal as the respective airport Master Plans indicate the land has, or may be rezoned.
- expansion at the current facilities without renovation, extension or rebuild would not be possible as there is only one additional seat available in Cairns in the current configuration, and no additional consoles available in either Sydney or Adelaide.
- renovation of the buildings would be impacted by the need to retrofit for modern standards and conditions. For example, the CMATS platform installation requires that buildings must be configured to have information technology (IT) equipment installed and removed without disruption. The infrastructure currently in place in the TCUs does not meet this requirement. Significant upgrades of the operation of the electrical and mechanical services would be required to bring the current facilities up to this standard.

The report also noted that any significant facility overhaul would need to be accomplished while the facility remains operational. This requirement is expected to considerably increase the cost of facility modernisation.

Opportunities created through integration: operate more efficiently

Integrating the TCU functions at the Sydney, Adelaide and Cairns sites presents an opportunity to contain the capital expenditure spend currently required to keep these facilities operational or to extend their life. Based on current projections, integration could avoid a $13.4 million outlay for the planned replacement or refurbishment of infrastructure and facilities.

Additionally, integration could avoid costs of $37.5 million attributed to the site specific, facility and infrastructure costs associated with the implementation of CMATS.

Integration across the three locations would avoid a total of $50.9 million in planned capital expenditure over the next 15 years.

Integration savings (compared to do not integrate)	Sydney $m	Adelaide $m	Cairns $m	Total $m
Cost avoided due to replacement or refurbishment of ageing Infrastructure & Facilities	4.4#	6.9*	2.1^	13.4
Cost avoided due to reducing CMATS costs (CMATS site specific costs as well as facility and infrastructure)	13.0	12.7	11.8	37.5
Estimated Integration Savings	**17.4**	**19.6**	**13.9**	**50.9**

Notes:
The TCU building (#117) will accommodate FMS staff who vacate building 116
^The vacated TCU area will accommodate FMS staff who vacate their current premises
 # Some refurbishment will be required to maintain the current building (237) pending alternate arrangements

2.2.3

13 Peddle Thorpe Architects August 2011 Architectural and Engineering condition report

2.2.4 Ageing and engagement of the workforce

Based on the current age profile and using historical patterns of labour turnover and retirements, Airservices is likely to lose up to a third of its workforce across the organisation over the next five years. This trend is reflected in the controller workforce, and is magnified in the Sydney where 72% of controllers are over the age of 45; and in Adelaide and Cairns where 37and 19 per cent respectively are over the age of 55. This varies significantly from the ATC Group average as outlined in the table below.

Age	Adelaide	Cairns	Sydney	ATC Group
<35	1 (5%)	1 (7%)	6 (9%)	19%
35>45	4 (21%)	4 (27%)	12 (19%)	30%
45>55	7 (37%)	7 (47%)	35 (55%)	36%
>55	7 (37%)	2 (12%)	11 (17%)	15%
>65	-	1 (7%)	-	7%
Total ATCs	19	15	64	-

The current age profile across the Sydney, Adelaide and Cairns TCUs identifies the probability of high turnover at these locations in the coming years.

In addition to the ageing workforce, the level of staff engagement is lower than the national average at the Adelaide and Cairns TCUs and significantly lower at the Sydney TCU. Recent discussions with staff within the Sydney TCU suggest that there is a high degree of resistance to the prospect of integrating TCU operations and relocating to another centre. With this in mind, it is reasonable to expect that the likelihood of change resistance is greater in Sydney than in other locations.

Levels of engagement and variance to the national ATC Group are illustrated in the table below.

Location	Positive	Variance to ATC group
ATC Group	72%	-
Sydney TCU	48%	(24)
Adelaide TCU	67%	(5)
Cairns TCU	62%	(10)

Smaller TCUs are already experiencing difficulties attracting and recruiting air traffic controllers and have begun employing alternative recruitment tactics. These tactics include short term transfers or overseas recruitment; however, these alternative means of recruitment are unpredictable as they rely on staff willingness to commute or move temporarily and place Airservices in competition with overseas air navigation service providers.

Opportunities created through integration: create greater opportunities for staff

Integrating the Adelaide, Cairns and Sydney TCUs will provide greater opportunity to our staff while addressing attraction, retention and engagement concerns.

Integrating the Sydney, Adelaide and Cairns TCUs, will create a larger pool of skilled employees that can be drawn on for scheduling and training purposes. Functionally integrating the TCUs will also provide a greater scope of duties and will also present controllers with opportunities to gain new ratings and skills.

3 Options: What could be done?

The following section outlines the options identified and investigated as part of the review. All options were assessed in terms of the cost, schedule and dependencies of implementation, the benefits of pursuing each option, and the impact each option would have on the workforce and stakeholders.

3.1 Options identified

Throughout the review six options were identified and assessed, see table below. Options that could not be implemented due to the organisations capacity or where the benefits were not realised were not pursued for further assessment[14].

Option	Impact to business as usual	Implementation and training schedule	Stakeholder complexity	Benefits realised
No integration	NA	NA	Low	No
Integrate prior to CMATS implementation	Sustainable	Achievable at two locations	Medium	Yes
Integrate during the CMATS implementation	Sustainable with restrictions	Achievable	Medium	Yes
Simultaneous integration	Unsustainable	Unachievable	High	Yes
Partial Integration of Sydney TCU	Sustainable	Achievable	High	No
Integration post CMATS implementation	Sustainable	Achievable	Medium	No

Although the options not pursued were not examined in the current circumstances, should the environment change, they may be worth further investigation. A description of each of the options not pursued is at Appendix A.

3.2 Options pursued

Three options were assessed by the review team:

- No integration (to develop a baseline)
- Integration prior to CMATS implementation
- Integration during CMATS implementation.

14 Although 'No integration' did not meet the assessment criteria, it was pursued as a baseline comparator.

3.2.1 No integration

In this option Adelaide, Cairns and Sydney TCUs would remain in situ and would continue to operate as standalone units in a Eurocat environment. All TCUs would require transition to CMATS during the national roll out. An overview on the likely impact of the option is below.

	Sydney	Adelaide	Cairns
Net Present Value by location	$43.0 million	$22.8 million	$15.4 million
Overall risk rating	TOLERABLE	TOLERABLE	TOLERABLE
Achievability of the Implementation and Training Schedule	N/A	N/A	N/A
Stakeholder complexity rating	LOW	LOW	LOW

Advantages

A decision to not integrate will allow employees and their families to remain in their current location, in their current role, with current support arrangements; and therefore, would avoid the possible industrial action and government interest that is associated with Options Two and Three.

Disadvantages

The failure to mitigate and remedy the problems presented in Section 2 - Current environment would have a significant financial impact and may compromise Airservices ability to deliver operations into the future.

The financial cost of inaction is in the order of $81.2 million across the three locations. The costs relate to the need for significant capital outlay to bring the current facilities up to standard for the CMATS implementation and for the additional consoles, configuration, etc to implement CMATS at TCU locations in addition to the ATSCs.

What cannot be quantified in these costs is the ongoing need to mitigate staff retention issues at the TCUs through short term transfers and overseas recruitment, the impact of poor employee opinions about future career prospects, and the lost opportunity to improve operational effectiveness through the lack of standardisation.

Ultimately, the cost of inaction is borne by the customer in increased service costs. In the current competitive environment, international and domestic airlines are seeking cost advantages in all areas of operations. The ability of Airservices to meet this expectation would be hindered by the acceptance of Option One.

3.2.2 Integration prior to CMATS implementation

In this option, Cairns, Adelaide and Sydney TCUs would be integrated into an ATSC prior to the implementation of CMATS, scheduled to begin from January 2018. Initially the TCUs would be

co-located[15] at the location operating on the Eurocat system. Gradually, each TCU's operations would be distributed[16] until both en route and TMA services are provided by one operational group. On transition to CMATS, this integrated group would operate from the CMATS environment. An overview on the likely impact of the option is below.

	Sydney	Adelaide	Cairns
Net Present Value by location	$43.0 million[17]	$14.0 million	$7.2 million
Overall risk rating	UNDESIRABLE	TOLERABLE	TOLERABLE
Achievability of the Implementation and Training Schedule	UNLIKELY	ACHIEVABLE	ACHIEVABLE
Stakeholder complexity rating	MEDIUM	MEDIUM	MEDIUM

Achievability

Analysis undertaken by the Review demonstrated that it was unlikely that Sydney could be integrated prior to CMATS implementation. This is primarily due to the volume of air traffic controller staff and the additional functions currently performed at the Sydney TCU. These functions will need to be identified and either transferred or cease to be offered before the TCU can be integrated.

The integration of both Adelaide and Cairns prior to CMATS was considered achievable based on workforce and schedule analysis. The integration of both TCUs is considered less complex and would carry a lower risk than the integration of Sydney TCU.

Advantages of option

There are a number of incentives to integrating the Adelaide and Cairns TCUs prior to CMATS implementation and ahead of the Sydney TCU, the two most prominent advantages are:

- The opportunity to embed the integration prior to a major systems change creates the time and opportunity to influence and manage the complexity of the change. For example, the ability to train controllers firstly in the location and then the system, rather than requiring them to learn both at the same point at integration, reduces the likelihood of the controller being overwhelmed by quick successive changes and the requirement to perform in a different environment.
- That gradual integration would allow the two locations to review current processes and identify elements of better practice to be adopted by both units. The existing processes could then be rationalised and standardised prior to implementing the new processes to support the operation of the CMATS environment.

Disadvantages of option

While noting the incentives to this approach, it is not without disadvantage. Most significant is the impact on business as usual activities of the organisation. The compressed timeframe would create a greater training burden on the Learning Academy and on the job training instructors (OJTIs) to train controllers for new endorsements. However, undertaking this training now is

15 Co-location – operation of the TCU as a standalone unit located within the ATSC (Defined by Integration Models for the Delivery of TCU Services from an ATSC, ATM_ML 1-1035681)
16 Distributed – delivery of the TCU functions from within the associated en route group by a single group of ATCs (Defined by Integration Models for the Delivery of TCU Services from an ATSC, ATM_ML 1-1035681)
17 The calculation for these figures are provided in Appendix C.1.

preferable to undertaking these activities across three TCUs concurrently with the CMATS implementation and associated training requirements.

3.2.3 Integration during CMATS implementation

In this option, locations would be integrated into an ATSC during the implementation of CMATS. The TCUs would remain in situ until CMATS roll out when operations would be switched across to new system within the ATSC.

On the delivery of CMATS by 2021, ATM and en route services would be provided from the CMATS environment under a distributed model[18]. An overview on the option implementation is provided in the table below.

	Sydney	Adelaide	Cairns
Net Present Value by location	$36.7 million	$10.4 million[19]	$5.8 million[20]
Overall risk rating	UNDESIRABLE	UNDESIRABLE	UNDESIRABLE
Implementation and Training Schedule	ACHIEVABLE	ACHIEVABLE	ACHIEVABLE
Stakeholder complexity rating	MEDIUM	MEDIUM	MEDIUM

Achievability

Given the longer lead time, this option was found to be achievable in all locations.

Advantages

The additional four years to implementation would allow the project office time for greater stakeholder and workforce management. This would be of particular benefit at the Sydney TCU where there are a greater number of employees that may require consultations, negotiations and assistance relocating to either a new location or a new position.

Disadvantages

The delay of integration from 2018 to 2021 would create a need to invest in the maintenance of the current facilities. This investment is estimated to be in the order of $4.4 million. Under this option the return on this investment may not be realised before the facilities are eventually vacated by 2021.

Delaying the project until the implementation of CMATS would not allow the opportunity to gradually adapt to a distributed model, forcing a hard switch over date. While this may be preferable from a planning perspective, controllers would be expected to make a significant cultural and technical change in a short period of time.

18 Distributed – delivery of the TCU functions from within the associated en route group by a single group of ATCs (Defined by Integration Models for the Delivery of TCU Services from an ATSC, ATM_ML 1-1035681)
19 The calculations for this figure are provided in Appendix C.1.
20 The calculations for this figure are provided in Appendix C.1.

Risk reduction through phased integration

While additional project lead time would not greatly advantage Adelaide and Cairns (and may introduce more risk), Sydney TCU may benefit from the pursuit of this option. The additional lead time would allow a slower draw down and distribution of functions at the Sydney TCU which may help manage the functional and workforce considerations raised below (Section 4.2). A phased implementation strategy would first identify the operations and services that could be absorbed by other locations and transfer them, leaving the more difficult functions the focus of integration. This strategy would reduce the scope of integration in stages and assist the project to be managed within its resources, without competing with CMATS.

The particular sectors making up the tranches and the timing of cutovers will be developed in project planning but based on current planning, might include:

- Tranche 1 (completed by late 2018): transfer of 30 per cent of functions which may include Sydney Radar, Approach and Departure West.
- Tranche 2 (completed by late 2019): transfer of 20 per cent of functions which may include North and South Departures and Precision Runway Management (PRM).
- Tranche 3 (completed by late 2021): transfer remaining 50 per cent of functions which may include Sydney Flow, Final East and West and Approach North and South.

Within each tranche a core and mature air traffic controller requirement will be developed during project planning. These will drive the training plan and timing of individual tranche cutovers.

4 Recommendation: What should be done?

An examination of the options was undertaken against each of the three TCU locations. On assessment of the available options and unique location profiles, it is recommended that a combined strategy is developed for the integration of all TCUs into the ATSCs, see below.

	Adelaide	Cairns	Sydney
Option 1	No integration	No integration	No integration
Option 2	**Integrate prior to CMATS implementation**	**Integrate prior to CMATS implementation**	Integrate prior to CMATS implementation
Option 3	Integrate during CMATS implementation	Integrate during CMATS implementation	**Integrate during CMATS implementation**

4.1 Adelaide and Cairns

For the purposes of integration, both Adelaide and Cairns present similarly against the proposed options and were considered together. Both of these TCUs perform similar operations from ageing facilities with a similar number and age profile of controllers. Consideration of the options identifies Option Two: Integrate prior to CMATS implementation, as the preferred option for both Adelaide and Cairns.

This recommendation is driven by the additional complexity introduced by the concurrent implementation of CMATS. CMATS is a significant program of work and if integration is undertaken during its implementation a number of factors are moved outside of the integration project's control. For example any schedule delay in the OneSKY Australia Program may result in a requirement for a life extension and Eurocat systems would need to be upgraded and maintained at an additional cost to the integration project.

Option Two would allow controllers from Cairns and Adelaide to first relocate to the ATSC and standardise practices before moving to a distributed model on CMATS. This would be of particular benefit to Adelaide and Cairns TCU that currently have slight differences in their current operating processes.

In comparison with Option Three, Option Two would also require a greater number of replacement controllers in a shorter period of time however, based on current planning this is achievable with an adjustment of controller resourcing priorities.

4.2 Sydney

Sydney varies significantly from Adelaide and Cairns in terms of the scope of operations undertaken by Sydney TCU and the size of the controller workforce. Both of these factors increase the issues associated with removal, relocation and integration. There is also a greater capital investment required to maintain the current facilities at Sydney. For these reasons, Sydney was assessed to be more complex than Adelaide or Cairns and to require a different approach to manage this complexity. Option Three: Integration during CMATS implementation provides the project additional lead time to allow for risk mitigation. The key advantages of Option Three are that it would allow:

- lessons learned from the Adelaide and Cairns integration to be identified and applied to Sydney integration
- time to identify, transfer or retire operations from Sydney TCU, for example reducing the airspace design and rolling the PRM function over to CMATS

- time for additional training and alternative methods of recruitment to be pursued if required - Sydney is expected to have the lowest number of transferees, but has one the largest numbers of controllers, creating a large demand for replacement controllers.

Although this option would see integration occur during CMATS implementation, preparations would begin as soon as practical to reduce the complexity and build experience before integrating Sydney TCU.

4.3 Net present value

The financial implications of any significant business change are a crucial consideration. Financial analysis has been undertaken to determine the NPV[21] to the organisation, if they pursued the recommended option suite. As outlined in the following table the incremental NPV calculations, indicate that the recommended option results in an overall saving of $19.8 million over the life of the integration. While this is a financially positive outcome, broader business considerations such as enhanced capability and capacity should be considered to determine the value of the project to the organisation.

Do Nothing costs over 15 years					Integration costs over 15 years					
	Adelaide	Cairns	Sydney	Total	Adelaide	Cairns	Sydney	Project Management	Total	Difference (Savings/ (costs))
Replacement of aging infrastructure & Facilities	7.8	3.8	17.5	**29.0**	0.9	1.7	13.1	-	**15.6**	**13.4**
Costs of Implementing CMATS and supporting facility & Infrastructure										
Training costs to address age profile issues	7.3	6.1	22.9	**36.3**	-	0.6	-	-	**0.6**	**35.7**
Staffing Efficiencies				-	- 7.9	- 7.9	- 18.5	-	- **34.3**	**34.3**
Ongoing property costs	2.6	2.6	10.1	**15.3**	2.2	1.9	7.2	-	**11.3**	**4.0**
Integration costs (including recruitment)	-	-	-	-	16.8	9.1	50.5	5.7	**82.1**	- **82.1**
Total costs over 15 years										
NPV	- 22.8	- 15.4	- 43.0	- **81.1**	- 14.0	- 7.2	- 36.7	- 3.5	- **61.3**	**19.8**

Notes:

- *This does not include any industry associated benefits.*
- *Costs associated with providing approach services with a second Sydney airport.*
- *Weighted Average Cost of Capital (WACC) – 8.6%, tax rate – 30%.*
- *Annual cost escalation 4%for internal labour, 2.5% for other non-labour costs.*

The NPV recognises expected savings as a result of the integration of $125.5 million, made up of:

- one-off costs avoided of $13.4 million due to the replacement or refurbishment of ageing infrastructure and facilities, plus $37.5 million due to reducing CMATS costs
- avoided training costs to address ageing staff profile issues of $36.3 million
- ongoing reductions of $34.3 million in staffing requirements as well as $4.0 million of property costs.

Further details are provided at Appendix C.3.

21 The NPV takes into account the outgoing, but also any savings or incoming cash flows. These future incomings and outgoings are discounted to bring the amount back to present dollar terms.

4.4 Previous barriers

While integration of TCUs has been previously considered and some progress achieved, there have been a number of barriers that have arisen. These barriers included:

- A strong financial case – previous studies indicated that there were marginal financial benefits associated with integration. However, since then there is a demonstrated[22] need to substantially refurbish or replace facilities in each of the three locations, costing $20.4 million (see Do nothing costs for Adelaide and Sydney in Appendix C.2). In addition, broader operational capability benefits should be considered jointly.
- Safety concerns – a review conducted in 2001[23] confirmed that TCU integration is both safe and technically feasible. This is supported by the experience of overseas ANSPs (see Case Study below). Technical work has been completed to allow Adelaide TMA services to be provided from Melbourne at night.
- Staff and union resistance – there is evidence that employee resistance to relocating may have softened due to a number of factors including that 70% of air traffic controllers in the three locations are over 45 and 21% over 55, thus a higher proportion are nearing retirement. There is also the realisation by staff that there are limited career opportunities outside the major ATSCs.
- Political concerns – while there has been public debate regarding TCU integration previously, the issues relate primarily to potential job losses in local economies along with broader safety concerns regarding remote service provision (which has been addressed above). While it is likely that some staff will relocate from the Sydney, Adelaide and Cairns TCUs there will be only a modest staff reduction. As with all service delivery functions, providing cost effective and high quality services requires review, re-engineering and/or consolidation at regular points to remain relevant to customers.

While there are potential barriers to any significant change such as this, each of the issues previously raised have been addressed in some way or have shifted, especially since the last substantial review in 2006. These factors, along with the alignment with the OneSKY Program implementation, presents a unique opportunity to provide benefits to Airservices people, realise efficiencies for the organisation and the customer based upon a reduced footprint and the ability to contain capital expenditure costs.

The following case study outlines experience in other jurisdictions and barriers that have arisen. It will be important to learn from and address these issues in the current consideration of options.

22 An external condition review assessed the facilities at Sydney, Adelaide and Cairns as being 'near end of life'. October 2011, ATC Future Systems Program Strategic Options Paper, Deloitte Touche Tohmatsu.
23 Outcome of Feasibility Study conducted in 2001 of the Consolidation of Terminal Control Units (TCUs)

Case Study: International experience of integration

Throughout Europe and the Americas, ANSPs are facing the similar challenge of maintaining the safe delivery of services in the most cost effective manner against a background of rapid technological improvement.

Similar consolidations or multiple Area Control Centres and TCUs have been successfully achieved by NAV Canada, the United Kingdom's NATS, and Germany's Deutsche Flugsicherung and, to a lesser degree, the United States' Federal Aviation Authority (FAA).

While facility consolidation is accepted as strategically beneficial, the reality of implementing significant change to legacy structures is not without challenges. Common threats to achieving facility consolidation appear in the international experience. These may be summarised as Political and Industrial.

The industrial threat is illustrated in the case of the Norwegian ANSP Avinor whose consolidation program was justified primarily on the basis of staffing reductions in the order of 700 across the company. Controller response was vigorous and escalated in time to industrial action; the resulting disruption and public outcry forcing a major re-scoping of the program.

Political intervention has been prevalent in the United States' FAA facility consolidation program. While the program has achieved some of its scheduled consolidations, many have failed to eventuate as individual representatives of the Congress have intervened and negotiated to keep facilities and jobs located in their constituencies.

4.5 Key risks

While many of the previous barriers have been address or shifted, there will remain a set of risks to integration that must be actively managed and mitigated by Airservices:

- Industrial – there will continue to be some opposition and potential industrial involvement. A workforce strategy will be developed to provide a range of flexible options for each of the 98 affected staff members, whilst recognising business need.
- Government – a proactive stakeholder management strategy will be developed to ensure key stakeholders including members of the Government, are aware that there are no safety or technical impediments. The benefits to industry as well as Airservices will be clearly identified along with the carefully and considered management of staff issues.
- Resources – with the impending implementation of CMATS, this will take a substantial level of internal resource focus. Again, the initial implementation planning indicated that the recommended option is achievable.

A preliminary risk assessment and risk comparison activity was undertaken by the Review team. Assessments against each option are at Appendix D.

5 Implementation: How will it be done?

This section outlines the method, timing and constraints of implementing the recommended option. This section also identifies the stakeholders that are able to influence the project and will need to be managed to ensure they remain supportive of integration.

Although research and analysis supports the information in this section, it should be reviewed and revised as part of the detailed planning phase, once the recommended option has been approved.

5.1 Direct project cost

The direct project costs associated with the recommended option are outlined below. The $82.1 million would be the amount that would need to be approved as part of forward budget processes and in line with Airservices forward budgeting processes is calculated over eight years.

Cost categories	Adelaide $m	Cairns $m	Sydney $m	Project M'ment $m	Total $m
Project Management Cost (incl Travel)				5.7	**5.7**
Permanent relocation and temp transfer costs	1.9	0.9	10.3	-	**13.1**
Capex - Technical, Engineering and Communication equipment costs (system reconfiguration, Refit, New Service assets)[1]	4.3	3.5	-	-	**7.8**
Opex - Equipment relocation, demolition and make good [2]	0.4	0.1	4.0	-	**4.5**
Staff Assistance/ Change management [3]	0.6	0.5	1.9	-	**2.9**
Total Project funding [4]	**7.2**	**4.9**	**16.2**	**5.7**	**34.1**
Training Costs - Meeting Transition Requirements (these costs will not be charged to the project (Abinitio training and cross training))	6.5	3.0	20.8	-	**30.2**
Early Termination Payments	3.1	1.2	13.4	-	**17.8**
Funded via Cost centre Budgets	**9.6**	**4.2**	**34.2**	**-**	**48.0**
TCU integration direct project costs over 8 years	**16.8**	**9.1**	**50.5**	**5.7**	**82.1**

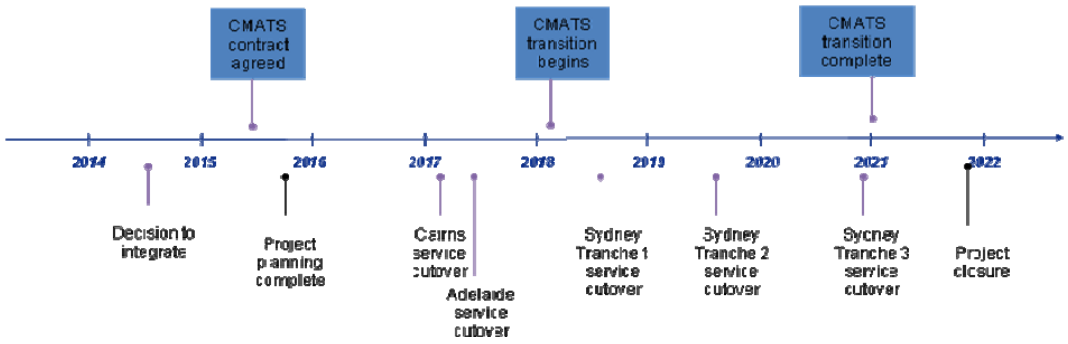
Notes:

1. *Sydney transition is planned to directly into the CMATS environment, with OneSKY providing all the equipment and communication needs.*
2. *Demolition of Adelaide building 116, Cairns make good costs prior to FMS centralisation, Sydney costs* [redacted]
3. *Based on $30,000 per ATC staff.*
4. *Project funding does not include Risk and Contingency amounts.*

The direct project cost calculations have also been provided in greater detail, by location and over a 15 year timeframe at Appendix C.2. This additional analysis specifically addresses issues associated with building replacement or refurbishment in each location and while calculated using a different basis use the same underlying figures as the NPV calculations.

5.2 Schedule and milestones

Below is an initial summary view of key milestones for the program. On current planning the training would begin immediately after a decision was made to pursue an option and would be completed[24] by August 2021. The three Sydney tranches assume a phased integration, discussed in Section 3 Options.



5.2.1 Organisational capacity an constraints

Airservices has the internal capability to deliver this project; however, it will require a high priority to ensure appropriate resource allocation. This is particularly important noting the opportunity to complete TCU integration is time constrained by the transition to the new ATM platform, CMATS.

As there are two discrete work streams; technical and operational. It is suggested that both a technical and operational lead be embedded in the project team.

5.3 People and change

Successful integration will rely heavily on the thoughtful planning and management of both the internal Airservices workforce and the project's internal and external stakeholders. Effort invested in these activities will ensure that parties are informed, supportive or accepting of the change. A suite of people planning documents will support the change management program. These are discussed below.

5.3.1 Workforce strategy

Based on current planning, the recommended option is anticipated to generate an additional requirement (ie above the do nothing baseline) of approximately 60 TMA qualified controllers over the period from financial year 2015 until financial year 2022. This is not a net increase in controller requirement but a one off replacement of the TCU controllers who choose not to relocate to the ATSC sites. Initial advice from ATC Group Workforce Strategy unit and Learning Academy ATS School is that this is achievable but will require an adjustment of priorities.

TCU integration will have a significant impact on controllers and other staff currently involved in the delivery of TCU services. With this in mind, and in keeping with Airservices commitment to 'People First ', it is expected that a Workforce Program will be developed to provide options to staff involved with respect to their futures. Each TCU staff member will have the opportunity to discuss their preferences with management, which will be considered along with business need. Tailored arrangements will be developed for each team member. Some of the strategies identified that can be utilised to support staff as part of the integrated TCUs include:

24 All functions transferred and TCUs decommissioned

Short-term strategies

- Redundancies
- Retraining – TCU/Tower job exchange, en route conversion to TCU, extended retirement
- Relocation – Fly-in fly-out; Term Transfer

Long-term strategies

- Directed transfer
- Extending retirement with an offer of redundancy

5.3.2 Stakeholder impact, engagement and communications

A large number of stakeholders with diverse interests in the program implementation have been identified. It will be important to approach communication with the program stakeholders in a strategic and planned way to ensure that those stakeholders with high influence understand and remain supportive of the TCU integration project. The key project stakeholders have been identified in an initial consultation and communications framework, held by the review team.

5.3.3 Change Management

A high level assessment of the TCU integration project found that integration of multiple TCUs is very complex. Factors contributing to this complexity include:

- a high number of both internal and external stakeholders
- a significant degree of cultural change required to make the change
- a discrete timeframe for implementation.

The limited timeframe could be viewed as a positive contributor as it will be easier to sustain enthusiasm and interest for the change over a shorter period. However, given that the timeframe is being driven by the implementation of another project involving change, the inability to change, then consolidate change may be viewed in this project as an additional layer of complexity.

As a whole, the TCUs are not currently demonstrating a readiness or appetite for change. Dedicated and detailed planning will be required to understand how to capture and motivate the units to achieve the desired change.

Change Management processes will be embedded in the project management activities.

5.4 Project dependencies

Airservices is committed to a wide range of activities over the opportunity period for this initiative to be completed, each of which could possibly impact on the timing of the delivery and realisation of the benefits. There are four key dependencies that could have a significant impact on the integration of TCU operations in Sydney, Adelaide and Cairns, these are:

- The future air traffic management platform CMATS
- The capital works pipeline and infrastructure program, including:
  - The Eurocat hardware upgrade
  - The Eurocat console hardware and VSCS procurement.

The dependencies have been considered in the context of the development of the Transition outline and will continue to be monitored to ensure their management. An outline of the possible impact these dependencies could have on TCU integration are at Appendix B.

6 References

Author, date	Title	Number
Deloitte Touche Tohmatsu October 2011	Airservices Australia ATC Future Systems Program Strategic Options Paper Final Version 1	ATM_ML1-1051311
Airservices Australia Board August 2003	Board Determination Meeting No. 168 Item 8 Terminal Control Unit (TCU) Integration (f) and (g)	ATM_ML1-1051320
Airservices Australia Board January 2001	Outcome of Feasibility Study conducted in 2001 of the Consolidation of Terminal Control Units (TCUs)	ATM_ML1-1059476
EGM, ATC 2014	Terms of Reference TCU Review (Signed)	ATM_ML1-1051312
Airservices Australia Chairman, June 2013	Airservices Australia Corporate Plan 2013-18	ATM_ML1-1051317
Airservices Australia CEO, September 2006	Memo to All Staff Board decision on TCU consolidation	ATM_ML1-1051315
Corporate Affairs, September 2006	Brief for [redacted] Chief of Staff The Office of the Minister for Transport and Regional Services	ATM_ML1-1051316
Peddle Thorp Architects, August 2011	Architectural and Engineering Condition Report Adelaide, Perth, Sydney and Cairns TCUs	ATM_ML1-1051318
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TCU Review Team, April 2014	Co-location – operation of the TCU as a standalone unit located within the ATSC Distributed – delivery of the TCU functions from within the associated en-route group by a single group of controllers	ATM_ML1-1051314
Airservices Australia CEO 2012	'Our People, Our Future' – Airservices Culture Program	People First
Airservices Australia CEO, July 2013	Management Instruction M1-1006	ATM_ML1-1055610
Airservices Australia 2012	Clause 18 Hours of Work of the Airservices Australia (Air Traffic Control and Supporting Air Traffic Services) Enterprise Agreement 2012-2015.	ATM_ML1-1055672

7 Definitions

Acronym	Term
ANSP	air navigation service provider
ATC	Air Traffic Control
ATM	Air Traffic Management
ATS	Air Traffic Services
ATSC	Air Traffic Services Centre
CMATS	Civil Military Air Traffic Management System
HVAC	heating, ventilation and air-conditioning
NPV	net present value
OJTI	on the job training instructor
PRM	Precision Runway Management
TAAATS	The Australian Advanced Air Traffic System
TCU	Terminal Control Unit
TMA	terminal area
UPS	uninterruptible power supply

A Options identified but not pursued

Throughout the review three options were identified but for reasons of scope or viability, were not pursued. Although these options were not examined in the current circumstances, should the environment change, these options may be worth further investigation. The options not pursued are discussed briefly below.

Simultaneous integration

The possibility of integrating Sydney, Adelaide and Cairns TCUs simultaneously was considered but dismissed by the review team. This option was dismissed on the basis of the impact this approach would have on Airservices ability to deliver business as usual operations while implementing the project. In particular, the strain on the Learning Academy, competition for resources and possible impact on operations were not thought to be sustainable. On this basis, this option was not thought to be viable and further investigation was not pursued.

Partial integration (Sydney TCU)

Conscious of the risks and sensitivities associated with a full integration of Sydney; the partial integration of TCU services was considered.

Sydney TMA operations are organised around the independent operation of two cells, 'Approach' and 'Departures'. A partial integration proposes retaining the Approach cell functions in a CMATS facility located in the Sydney basin, while integrating some or all the functions of the Departures cell into the normal operations of the adjacent en-route sector groups at the ATSCs.

A partial integration would introduce additional costs of $13 million to establish a CMATS environment outside of the current planned activities which would be in addition to the integration costs for the Departures functions.

Integration post CMATS

The possibility of integrating the TCUs after the implementation of CMATS was considered but not pursued by the review team. Although delaying integration until after CMATS implementation would remove elements of the risk and uncertainty associated with the CMATS dependency, it would also introduce significant project cost. This option would require both the current infrastructure and Capital Works plans to be actioned to maintain the life of the facilities to 2021. In addition to maintaining the current life of the facilities, additional capital works expenditure would be needed to support the temporary implementation of CMATS into the locations for a short period before the decommissioning of the facilities and the transfer of operations to the ATSCs.

This option would also present the additional disincentive that it would allow locations to develop their own operating procedures prior to integration, possibly reducing the uptake of a single standardised process.

B Dependencies

There are four key dependencies that will need to be managed for the successful integration of the TCUs.

The future air traffic management platform CMATS	Current planning for the Airservices CMATS platform is based on implementation in Brisbane, Melbourne and Perth. Additional negotiations would need to be undertaken to include Sydney, Adelaide and Cairns into the project delivery. Additionally, any slippage in the implementation of CMATS would extend the need to remain in current facilities and may then warrant capital expenditure to extend the life of the current facilities.
The capital works pipeline and infrastructure program	There are 9 projects included in the capital expenditure program whose scope is likely to be affected by a decision to integrate Adelaide, Cairns and Sydney TCU operations. The affected projects in the 2014-2018 capex program are: • Adelaide TCU main switchboard replacement [redacted] • Eurocat hardware upgrade • Eurocat console, hardware and VSCS procurement • ARDDS replacement • Sydney tower life extension or new Sydney tower The projects in the proposed 2015-2019 capex program are: • Building 237 Sydney replacement or refurbishment [redacted] • Chiller upgrade and replacement – Sydney [redacted] • Chiller upgrade and replacement – Adelaide [redacted] • Cairns FMS accommodation/control tower life extension [redacted]
The Eurocat hardware upgrade	A decision to pursue TCU integration may also affect the scope of the Eurocat Hardware Upgrade project. That is, there may be a need to upgrade the Cairns and Adelaide Eurocat hardware or expand the scale of ATSC upgrades to accommodate the integrated services.
The Eurocat console hardware and VSCS procurement	Integration of the Adelaide and Cairns TCU service delivery will require the establishment of three fully fitted Eurocat consoles within the Brisbane ATSC and four fully equipped consoles in the Melbourne ATSC. As no consoles are currently available, the final cutover of Adelaide and Cairns TCU services into the Brisbane and Melbourne ATSCs will be dependent on the timely delivery of Eurocat consoles by this project.

C Additional financial analysis

C.1 Net Present Value calculations

The following table provide greater detail of the calculations supporting information in Section 3 of this report, that is, the options that were not recommended (Sydney - Prior to CMATS implementation and Adelaide and Cairns - During CMATS implementation). They are provided for completeness, as background information.

Not recommended options costs over 15 years

NPV category	Sydney $m Pre CMATS	Adelaide $m During CMATS	Cairns $m During CMATS
Replacement or refurbishment of ageing infrastructure & facilities	5.5	2.8	2.6
Costs of implementing CMATS and supporting facility & Infrastructure			
Training costs to address age profile issues	-	-	-
Staffing efficiencies	(21.2)	(6.0)	(7.4)
Ongoing property costs	16.4	2.3	2.1
Integration costs (including recruitment)	69.1	10.2	4.0
Total costs over 15 years			
NPV	**(43.0)**	**(10.4)**	**(5.8)**

C.2 Direct project cost calculation, by location, over 15 years

Adelaide

	Do Nothing $m	TCU Integration $m	Difference $m
Replacement or refurbishment of ageing infrastructure & facilities	**7.8**	**0.9**	**6.9**
Refurbish Building 117			
Chillers in Adelaide building			
TCU Main Switchboard in Adelaide building			
Eurocat Hardware Upgrade			
Costs of implementing CMATS and supporting facility & Infrastructure			
Tier 3 Infrastructure			
CMATS Implementation			
Training costs to address age profile issues	**7.3**	**-**	**7.3**
Recruitment - Abinitio training and cross training	6.5	-	6.5
Relocation costs	0.8	-	0.8
Staffing Efficiencies	**-**	**(7.9)**	**7.9**
Supervisory efficiency	-	(3.7)	3.7
Rostering Efficiency	-	(4.2)	4.2
Ongoing property costs	**2.6**	**2.2**	**0.4**
Integration - Direct costs	**-**	**16.8**	**(16.8)**
Total direct project costs over 15 years			

Cairns

	Do Nothing $m	TCU Integration $m	Difference $m
Replacement or refurbishment of ageing infrastructure & facilities	**3.8**	**1.7**	**2.1**
FMS centralisation			
Eurocat Hardware Upgrade			
Costs of implementing CMATS and supporting facility & Infrastructure			
Tier 3 Infrastructure			
CMATS Implementation			
Training costs to address age profile issues	**6.1**	**0.6**	**5.5**
Recruitment - Abinitio training and cross training	5.5	0.6	4.9
Relocation costs	0.6	-	0.6
Staffing Efficiencies	**-**	**(7.9)**	**7.9**
Supervisory efficiency	-	(3.7)	3.7
Rostering Efficiency	-	(4.2)	4.2
Ongoing property costs	**2.6**	**1.9**	**0.7**
Integration - Direct costs	**-**	**9.1**	**(9.1)**
Total direct project costs over 15 years			

Sydney

	Do Nothing $m	TCU Integration $m	Difference $m
Replacement or refurbishment of ageing infrastructure & facilities	**17.5**	**13.1**	**4.4**
Refurbish Building 237			
Chillers in Sydney building			
Eurocat Hardware Upgrade			
Costs of implementing CMATS and supporting facility & Infrastructure			
Tier 3 Infrastructure			
CMATS Implementation			
Training costs to address age profile issues	**22.9**	**-**	**22.9**
Recruitment - Abinitio training and cross training	20.5	-	20.5
Relocation costs	2.4	-	2.4
Staffing Efficiencies	**-**	**(18.5)**	**18.5**
Rostering Efficiency	-	(3.3)	3.3
Support Area Efficiency	-	(15.2)	15.2
Ongoing property costs	**10.1**	**7.2**	**2.9**
Integration - Direct costs	**-**	**50.5**	**(50.5)**
Total direct project costs over 15 years			

C.3 Overall integration savings calculations

Integration savings *(compared to do not integrate)*	Adelaide $m	Cairns $m	Sydney $m	Total $m
Cost avoided due to replacement of ageing Infrastructure & Facilities	6.9	2.1	4.4	13.4
Cost avoided due to reducing CMATS costs (CMATS site specific costs as well as facility and infrastructure)				
Avoided training costs to address aging staff profile issues	7.3	6.1	22.9	36.3
Reduction in staffing requirement for approach services	7.9	7.9	18.5	34.3
Reduced Property costs	0.4	0.7	2.9	4.0
Estimated Integration Savings				

D Risk Comparison

For the purposes of options comparison, risks associated with TCU Integration have been summarised in the following major risk categories:

- Government - The likelihood of government intervention that restricts the realisation of the benefits of TCU integration.
- Industrial - The impact of employee representative bodies on the organisations ability to provide a continuous, safe, and reliable ATM system.
- Resources - The ability for the organisation to assure appropriately qualified staff are available in the necessary place and time to maintain a resilient service
- Financial - Financial risk associated with replacement or refurbishment of existing infrastructure, staff costs, training, relocation, or redundancy.
- Service Delivery - The ability for the organisation to provide a safe and continuous Air Traffic Management Service.

Risk matrix

This following matrix is the Airservices Risk Management Standard AA-NOS-RISK-0001. Each of the risks associated with the TCU integration has been assessed utilising this standard to consider the risk acceptability, action required and minimum acceptance authority.

	Acceptability	Actions Required	Minimum Acceptance Authority
A	Unacceptable	Risk intolerable and cannot be justified on any grounds	Cannot be authorised or accepted on any grounds
B	Undesirable	Risk shall be reduced unless the cost of reducing the risk is disproportional to the improvement gained	Accountable Executive General Manager
C	Tolerable	Risk shall be reduced unless further risk reduction is impracticable	Accountable General Manager or Branch/Service Delivery Line Manager
D	Acceptable	Risk is broadly acceptable. Maintain current systems, monitor and review. Further reduction only if cost is insignificant	Accountable Unit Manager/ATC Line Manager/Fire Station Manager

Notes:

1. For the purpose of comparison, operational safety risks from the 2005 safety case (ATM_ML1-1057333) were considered in the Service Delivery risks (refer risk definitions above).
2. The project risk log can be found at ATM_ML1-1040566

Options based risk analysis

An options based risk analysis has been conducted and is summarised in the following table:

Location	Adelaide			Cairns			Sydney		
Option*	1	2	3	1	2	3	1	2	3
Government	D	C	C	D	C	C	D	C	C
Industrial	D	C	C	D	C	C	D	C	C
Resources	C	C	C	C	C	C	D	B	B
Financial	B	C	D	B	C	D	B	B	C
Service Delivery	D	C	B	D	C	B	D	B	B

*Option 1 – do nothing; Option 2 – integrate pre-CMATS transition; Option 3 – integrate during CMATS transition

Narrative

It can be seen that option 1 "do nothing" has the least overall risk however this option carries a large strategic and financial opportunity cost. The preferred integration option is to complete Adelaide and Cairns pre-CMATS and Sydney to in three phase's during the CMATS transition. This sequence mitigates the compounded resource and service delivery risk if all three occur simultaneously pre-CMATS.

Government - The risk during and prior to CMATS integration is higher in comparison to the do nothing option for all locations. This assessment is based on an increased likelihood of local and national political attention and associated risk of government intervention during and prior to CMATS integration. This has the potential to restrict or constrain the realisation of TCU Integration benefits. This is attributable to the complexities and political sensitivities surrounding the introduction of a TCU integration capability in addition to an already complex and challenging period associated with the delivery of the CMATS capability.

Industrial - The risk prior to and during CMATS integration is higher in comparison to the do nothing option for all locations. This is due to increased likelihood of employee resistance supported by representative bodies impacting on the organisations ability to provide a continuous, safe, and reliable ATM system. [redacted] in addition to an already complex and challenging environment such as CMATS integration. TCU Integration prior to or during CMATS integration is therefore considered to be a greater Industrial risk to Airservices then the do nothing option.

Resources - In terms of resources, TCU integration prior to and/or during a CMATS integration is considered higher than the do nothing option. The do nothing option in the short term, is supported by the availability of appropriately qualified staff to maintain a safe, continuous service. The Resource risk associated with TCU prior to or during CMATS is higher due to a greater impact on resources due to the allocation of specialist staff to the CMATS transition and other critical work programs.

The resources risk in Sydney during a CMATS transition is higher that Adelaide and Cairns exacerbated by operational complexities surrounding the Sydney TCU, including the: introduction of a second Sydney airport; an ageing infrastructure impacting on the ability to support increased capacity; and the requirement to maintain resilience of people, processes and equipment.

Financial - The financial risk associated with refurbishing or replacing existing infrastructure, staff costs, training, relocation, and/or redundancy has been assessed higher in the do nothing option due to building replacement or refurbishment costs.

The comparative financial risk for Adelaide and Cairns is higher for the preferred option when considered against integration during CMATS as the costs of integrating to the current (Eurocat) system would be written off at CMATS transition.

The comparative financial risk for Sydney is lower for the preferred option when considered against integration prior to CMATS because there will be no interim system or facility.

Service Delivery - There is a low service delivery risk for the do nothing option in all locations based primarily on minimal changes required to continue to provide the existing TCU service. Support for ageing infrastructure impacting on the ability to support increased capacity and maintaining resilience was considered a financial risk and not isolated to a service delivery risk.

The service delivery risk for Adelaide and Cairns increases with delayed implementation due to the potential for service interruptions during transition, technical risk with implementation of the proposed TCU solutions in the current (Eurocat) environment and potential for human factors errors associated with the proposed service options. TCU integration during CMATS has the high cost and complexity of running duplicated systems during transition and increases the risk to a smooth transition. These risks which have a direct or indirect impact on service delivery in Sydney are exacerbated by the complexities associated with TCU integration during CMATS which is an already complex, and challenging environment from a service delivery perspective.