

Chapter 7

Airspace regulation

Introduction

7.1 A number of airspace regulation issues with ADF use of UAVs were outlined during the inquiry, with air safety issues and airworthiness certification frequently mentioned topics. For example, Ms Rosalyn Turner from ASPI identified that airspace regulation for UAVs was 'something that should be addressed up-front, because it can cause delays and restrictions on the use of the platforms in-country'.¹

7.2 An information paper provided by the Civil Aviation Safety Authority (CASA) outlined some of the operational issues with UAV or 'remotely piloted aircraft' (RPA) used in civilian airspace. In particular, CASA distinguished between large UAVs operating at high altitude fitted with transponders and Automatic Dependant Surveillance-Broadcast (ADS-B) avionics (which broadcast an aircraft's position) allowing them to be identified by air traffic control and other smaller UAVs which are not fitted with these features. It noted that with the latter UAVs, positive separation and directed traffic information services cannot be provided by air traffic control as the UAVs 'are not visible to the air traffic management system'.² It noted:

Aircraft operating under the [visual flight rules] use 'see-and-avoid' as a method for preventing mid-air conflicts. [UAV] do not have the ability to 'see-and-avoid' other aircraft, therefore the majority of Area Approvals have been granted to [UAVs] operating within Visual Line of Sight (VLOS). The operator must be able to see and control the aircraft at all times. VLOS operations limits the operational area of the UAV.³

Regulatory developments

7.3 In Australia, CASA regulates unmanned aircraft through the Civil Aviation Safety Regulation (CASR) Part 101. An operating certificate and unmanned aircraft controller's certificate are required to be issued by CASA to conduct UAV operations.⁴ CASA told the committee that CASR Part 101 (promulgated in 2002) has become outdated due to technological developments and is in the process of being updated:

Under CASA Project OS 11/20, amendments have been drafted to reflect the terminology being used by [the International Civil Aviation Organisation] to clarify the requirements for remote pilot training and

1 *Committee Hansard*, 14 April 2015, p. 27.

2 CASA, 'Remotely Piloted Aircraft Systems', *Information Paper*, 2015, p. 4.

3 CASA, 'Remotely Piloted Aircraft Systems', *Information Paper*, 2015, p. 5.

4 CASA, 'Remotely Piloted Aircraft Systems', *Information Paper*, 2015, p. 2.

certification, to remove redundant requirements and to simplify the process for approval. The project also examined the establishment of a risk-based framework for regulating RPA operations by weight.⁵

7.4 Mr Peter Boyd from CASA told the committee that a draft of the update had been completed and been distributed for consultation last year. He also noted the UAV subcommittee of CASA's Standards Consultative Committee was finalising a road map of regulatory development priorities including 'whether or not we can get technology to detect and avoid and how we look at operations in a controlled airspace'.⁶

7.5 Defence has introduced a new set of regulations against which UAVs can be certified and operated. These new regulations are not based on weight or size for categorisation, but risk to third parties (other airspace users, non-mission essential personnel and critical infrastructure). Defence noted:

[This] categorisation of UAS is unique, being based on likely risk and operations, rather than purely physical characteristics. Defence has the opportunity to promote this system with allied agencies, though of course the development of recognised standards is still required.⁷

7.6 Defence stated that CASA's proposed new RPA regulations and Defence UAV regulations are not aligned as CASA maintained a weight based categorisation system. However, Defence did not have any other concerns with the methodology of CASA's regulatory development and stated that it would seek to ensure that both Defence and CASA regulations are compatible to allow required access to airspace.⁸

7.7 Internationally, CASA outlined that the International Civil Aviation Organisation (ICAO) 'supports the safe, secure and efficient integration of RPA into non-segregated airspace and aerodromes'. It noted ICAO is developing a roadmap for the integration of [UAV], guidance to States as they establish their own regulatory frameworks for UAVs and contributing to 'the development of technical specifications for detect and avoid and command and control data-links for [UAVs]'.⁹ CASA also noted it was engaged with other national air regulators through the Joint Authorities for Rulemaking on Unmanned Systems (JARUS) and other forums on the issues raised by UAVs.¹⁰ The objective of JARUS is to provide guidance material to national air authorities and recommend technical, safety and operational requirements for the certification and safe integration of UAVs in to airspace and at aerodromes.¹¹

5 CASA, 'Remotely Piloted Aircraft Systems', *Information Paper*, 2015, p. 3.

6 *Committee Hansard*, 13 May 2015, p. 4.

7 Defence, response to questions on notice no. 2, p. 2.

8 Defence, response to questions on notice no. 2, p. 3.

9 CASA, 'Remotely Piloted Aircraft Systems', *Information Paper*, 2015, p. 5.

10 Mr Peter Boyd, CASA, *Committee Hansard*, 13 May 2015, p. 3.

11 JARUS, 'Terms of reference', 1 August 2012, p. 1.

7.8 There was broad agreement that CASA had been progressive in the regulatory management of UAVs, but that further work was required. For example, Mr Anthony Patterson from Cobham Aviation Services considered that 'Australia has been very forward leaning in a regulatory sense'.¹² While Defence appeared to agree with this assessment, it also highlighted different priorities existed in relation to regulatory development:

CASA is currently more concerned with the development and enforcement of regulations to support the operations of small RPA (generally less than 7kg), with the number of applications for commercial operators increasing exponentially in the past two years. On the other hand, Defence is currently more concerned with the development and implementation of regulations to support the employment of much larger platforms such as the Heron-1 and Triton.¹³

7.9 In this context, the ACUO argued that 'civil aviation regulators are under-resourced to be meet extant civil as well as emergent Defence specific requirements'.¹⁴

7.10 The lack of consistent regulatory frameworks for UAVs was identified as an obstacle to increased UAV use in civilian airspace.¹⁵ Defence considered that '[a]chieving a common understanding/agreed method to categorise unmanned aircraft, and hence apply a common or agreed set of regulations and standards, should be the first priority of the international aviation community'. It explained there was no agreed categorisation system for UAV across allied nations. Defence considered that this was 'an area deserving of further consideration, in order to support the consistent certification of future platforms'.¹⁶ It noted:

In the civilian sense, there is a common understanding of the design requirements for sports aircraft, general aviation aircraft, light commuter airlines all the way up to large commercial airlines....This is not the case for unmanned aircraft, as no standard currently exists. This situation is made more acute by the fact that the various states and agencies have yet to agree on the scheme by which unmanned aircraft are categorised and therefore where the various design requirements should be applied.¹⁷

7.11 Similarly, the Australian Research Centre for Aerospace Automation (ARCAA) commented:

There is a need to move towards a framework of airworthiness certification based on an appropriate set of standards for the platform and operational scenario, and the development of requirements for the appropriate

12 Mr Anthony Patterson, Cobham Aviation, *Committee Hansard*, 4 May 2015, p. 6.

13 Department of Defence, response to questions on notice no. 2. p. 5.

14 *Submission 11*, p. 2.

15 For example, Northrop Grumman, *Submission 12*, p. 9.

16 *Submission 23*, p. 16.

17 Department of Defence, responses to question on notice no. 2, p. 4.

technologies and procedures to maintain aircraft separation and deal with aircraft emergencies such as engine failure.¹⁸

7.12 Mr Anthony Patterson from Cobham Aviation Services also considered that a certification standard was the 'real piece missing' from civil regulatory activity:

One does not exist internationally, so it is difficult to get type certification because no standard exists against which to get type certification. That is the real challenge... I think from a regulatory point of view we will catch up, but, because the regulatory environment—or particularly the certification environment—is dependent on Australia being harmonised with the rest of the world, Australia is in advance of the rest of the world and so we are waiting for what the rest of the world is going to do. That is the conundrum.¹⁹

Defence UAVs in civilian airspace

7.13 Air Vice-Marshal Gavin Davies stated that, at the moment, Defence currently only had limited opportunities to fly the Heron UAV outside of military controlled airspace. However, he foreshadowed an expanded future role for the Heron and other ADF UAVs:

Our intention is to work with our civil agencies, and indeed with other government departments, to understand that operating in this case a Heron but any modern remotely piloted aircraft is not a dangerous situation, that there are proper rules and engineering applications...When we get through those gates, it will be outside of military airspace but not over built-up areas. Then it will be further expanded.²⁰

7.14 The ADF's Heron UAV is expected to operate outside restricted military airspace in Australia for the first time (flying from Rockhampton Airport in Queensland) in mid-2015 as part of the joint Australia/US military training exercise Talisman Sabre.²¹

7.15 Despite general concerns with the reliability of UAVs, a high degree of confidence was expressed in relation to the ADF's ability to safely operate UAVs in civilian airspace. For example, the Australian Association for Unmanned Systems stated:

Risks associated with the use of unmanned platforms include collision with other aircraft, people and property. From our perspective, the ADF has successfully and safely integrated unmanned systems into Defence controlled airspace during Iraq and Afghanistan deployments using a

18 *Submission 21*, p. 4.

19 *Committee Hansard*, 4 May 2015, p. 6.

20 *Committee Hansard*, 14 April 2015, p. 45.

21 Royal Australian Air Force, 'Airservices Australia and the Royal Australian Air Force strengthen collaboration on unmanned aircraft systems', *Media release*, 29 May 2015.

sensible risk based approach. We hope that our civil regulator and industry can benefit from lessons learned and processes adopted in order to progress regulations for RPAs operations in Australian civil airspace.²²

7.16 On 29 May 2015, Airservices Australia and the RAAF entered into a Memorandum of Agreement (MoA) regarding the operation of the Heron in Australian civil airspace. The MoA sets out procedures to facilitate the initial operation and integration of UAVs into civilian airspace, based on the RAAF's airworthiness and aviation safety system.²³

7.17 Currently CASA deals with Defence use of UAVs on a 'case-by-case basis' where under certain circumstances temporary restricted areas and permanent or temporary danger areas to cover activities will be put in place.²⁴ In terms of regulators facilitating further use of civilian airspace by UAVs, Mr Peter Cromarty from CASA observed:

I come to this with an open mind, but I also come to it with a mind that I am the regulator, and I need to be convinced that it is adequately safe, because otherwise I am going to be in front of the senators trying to argue why I allowed something that crashed on somebody's head.²⁵

22 *Submission 17*, pp 3-4.

23 Royal Australian Air Force, 'Airservices Australia and the Royal Australian Air Force strengthen collaboration on unmanned aircraft systems', *Media release*, 29 May 2015.

24 Mr Peter Cromarty, CASA, *Committee Hansard*, 13 May 2015, p. 4.

25 *Committee Hansard*, 13 May 2015, p. 5.

