

SUBMISSION TO THE RURAL AND REGIONAL AFFAIRS AND TRANSPORT REFERENCES COMMITTEE

on

REGULATORY REQUIREMENTS THAT IMPACT ON THE SAFE USE OF REMOTELY PILOTED AIRCRAFT SYSTEMS, UNMANNED AERIAL SYSTEMS AND ASSOCIATED SYSTEMS

By

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Background

John Thynne served for 30 years in the permanent Air Force (RAAF), as a pilot flying UH-1 Iroquois helicopters, including service in South Vietnam and the Middle East and in various staff functions including Air Force Flying Safety for which he was awarded the Conspicuous Service Cross. He continued to serve in a Reserve capacity after completing full time service and was a Senior Safety Officer for the Talisman Sabre series of international exercises from 2005 to 2015.

He worked as a civilian in the Department of Defence in Information Management for several years before moving to the Civil Aviation Safety Authority (CASA) in 2010. In 2012 he was appointed as Manager, Safety Systems Office in CASA, where he was responsible for management of CASA's surveillance framework, safety analysis, interaction with the Australian Transportation Safety Board, and, from December 2013 to December 2015, the Remotely Piloted Aircraft Systems (RPAS) certificate management team.

John left CASA in June 2016 and established JT Aviation Consulting as a means of continuing his aviation safety efforts. He completed Remote Pilot training on multi-rotor aircraft in September 2016. He is also working as Manager, Aviation Solutions with RelmaTech Ltd, a UK based company developing an innovative Unmanned Aircraft Traffic Management (UTM) System.

Introduction to the Submission

Unmanned aircraft, in all their guises, must operate in the national airspace. Accordingly, for the safety of those using these skies, people on the ground beneath them and owners of property over which they fly, an appropriate level of aviation risk management must be applied. Australia, as the first nation to implement Regulations related to Unmanned Aircraft Systems, held the international high ground on this for quite some time. Recently, this lead has been supplanted by confusion, misinterpretation and changes which make little sense to those who would operate such craft commercially. This inquiry offers an opportunity to address this confusion.

There is, however, much more to the appropriate regulation of this technology than just the aviation safety aspects. There are at least seven regulatory areas, covering Federal, State and Local Government responsibilities that need to be addressed. The opportunity exists with this inquiry to set a framework in place to ensure that in Australia:

- Recreational drone users can enjoy their machines in safety and without annoying others;
- Commercial operators can develop innovative and profitable solutions for business purposes; and

- Regulators at all levels can work to a standard that is easily understood, based on sound principles and equitable for all concerned.

Initial Premise

This submission offers the concept that an effective system should be developed to include:

- A clearly stated **philosophy**, which puts all concerned on notice that the system will be regulated and will, for various reasons be limited in some shape or form. This would best be agreed by all levels of regulators, difficult as this may be to achieve.
- A set of **principles**, developed to be as fair as possible to users or operators, for each regulatory field noting that these need to be subject to review and easy amendment as technological advances are made.
- Concise and understandable **policies** for each appropriate area of regulation, ideally written in plain English and focussed, not on restricting use of technology, but supporting innovation and development while ensuring that all activities are conducted safely and without threat to any aspect of Australian life.
- Supporting implemented policies should be defined and simple **processes** for the conduct of related activities, such as considering and issuing approvals, certificates and exemptions.
- Detailed published **procedures** to ensure fair and balanced consideration of requests which ensure that users and operators understand what information is required at what time and for what purpose.
- Knowledgeable, trained **people** to deliver, maintain and implement the first five - crucial to creating and maintaining the system.

These “six Ps”, if applied, can ensure that Australia has a system which encourages innovation, ensures improved standards, addresses issues, particularly risks, holistically and regulates unmanned systems equitably at a level which will maintain, or return, it as a world leader in unmanned aviation operations.

Legislative and Similar Fields

Operation of drones in Australian airspace is subject to legislation other than the *Civil Aviation Act*. While flying safety is a focus for most participants, a number of other fields ought, or might, legislate specifically regarding drone operations, or identify clearly that current legislation applies to drones. Similarly areas such as the insurance industry have a vital interest in RPAS operations. Items c. and d. of the Inquiry specifically identify that the international elements of regulatory compliance are a consideration and that options for improving current and future regulatory compliance in a number of fields should be addressed.

The following fields can be considered to be impacted upon or have an impact on RPAS operations, both commercially and recreationally, and other fields may be identified through this inquiry.

- Aviation Safety
- Aviation operations (Airspace Management)
- Ground operations
- National security
- Hazardous materiel
- Frequency Management
- Privacy

How Best to Regulate

The Civil Aviation Safety Authority created the first set of regulations applicable to RPAS in 2002 by producing CASR Pt 101 (a world first), and a recent revision of those regulations has attempted to address the advances in technology and aviation safety thinking. While these regulations have now been enacted, they generated a significant amount of resistance and complaint, particularly from established commercial operators who had expended funds to gain certification, permissions or exemptions in some areas where restrictions were reduced. It is vital to note that restrictions were NOT abolished, merely reduced in certain, quite specific, cases. Any operator wishing to operate other than in those specific circumstances still requires certification and/or approval for those operations from CASA.

In the initial establishment of CASR Pt101, weight or mass of the vehicle was used as the determining factor in what (and to some degree how) regulations would apply to RPAS. While this was appropriate at the time, technology has advanced at an incredible rate and the types and capabilities of RPAS now operating were certainly not considered in the initial Australian regulations.

The Australian Defence Force (ADF) adopted a different approach to regulation of RPAS operations, where it applied a number of risk factors, derived a classification system (Classes I – IV), and determined requirements dependant on class. This approach was safety focussed, as was CASR Pt101, but the type of operation was identified as a key to classification.

If Australia is to maintain or extend its leading position regarding non-military RPAS operations, an effective, inclusive method of legislation covering all three levels of Australian Government - Federal, State and Local – must be identified, agreed and implemented.

This can be achieved. What is necessary is to draw on the ADF concept, but expand it to ensure that all or any legislative body can build effective rules which meet its requirements, but which link to, or fall into line with, superior, peer or subordinate levels of governance. To do this requires a framework which can clearly identify the legislative (or governance) field, the characteristics of the RPAS which require regulation in that field and accord some level of priority to the characteristic IN that field. This will enable identification of those items which require legislation and whether there is a parallel, superior or subordinate claim for regulation by any other field.

Characteristics

The characteristics of RPAs fall into a number of categories. These include:

- The aircraft and its capabilities
- The operation to be conducted
- The air environment for the operation
- The ground environment for launch and recovery
- The ground environment over which the operation will be conducted
- The control system(s) used
- The qualifications and skills of crew

Each of these categories will contain a number of characteristics which can be scored in importance on a scale (say 1 – 5) and the assigned (agreed) value will identify whether regulation is required, desirable, not needed, or superfluous due to other regulatory areas being required to address the matter.

A table of characteristics (not necessarily complete or correct) which gives an example of this concept is attached as an Annex.

Implementation

In introducing this concept, it is acknowledged that unanimity of scoring or importance will be unlikely, but, in the manner in which Sector Risk Profiling was introduced while John Thynne was Manager Safety Systems Office in CASA, discussion can be held and an agreed outcome can be produced. Each Regulatory Area will still retain its enacted responsibilities, but the overall outcome will be considered and cohesive. The picture developed can then be offered to other Governments, National Aviation Authorities, or International Bodies should they wish to adopt it.

Conclusion

The outcome of this inquiry depends on ensuring that an effective framework can be applied to ALL regulatory fields that are impacted by, or have an impact on, RPA systems in any commercial or recreational guise. In the absence of such a framework, the proposal in this submission provides a framework within which to progress.

JT Aviation is available to support any development or consideration of the proposal.

Table of Characteristics

Regulatory Area	Aviation Safety	Aviation Operations	Ground Operations	National Security	Hazardous Materiel	Privacy	Frequency Management	Insurance
<i>Aircraft</i>	(example score)							
Construction	(4)							
Mass	(4)							
Power	(4)							
Frangibility	(3)							
Redundancy	(4)							
<i>Control System</i>								
VLOS	(3)							
EVLOS	(4)							
BVLOS	(5)							
Mission programing	(4)							
RTL functionality	(5)							
Manual over-ride	(3)							
Redundancy	(5)							
<i>Operation</i>								
Survey	(3)							
Photography	(3)							
Agricultural	(2)							
Delivery	(3)							
R&D	(3)							
Training	(5)							

Regulatory Area	Aviation Safety	Aviation Operations	Ground Operations	National Security	Hazardous Materiel	Privacy	Frequency Management	Insurance
<i>L&R area</i>								
Controlled	(4)							
Secured	(2)							
Populous	(5)							
<i>Air Environment</i>								
Controlled airspace	(5)							
PRD Area	(5)							
<400'	(3)							
>400'	(5)							
<5km of aerodrome	(5)							
<i>Ground Environment</i>								
Populous area	(3)		(5)					
<30m from people	(4)		(4)					
Restricted	(2)		(5)					
Emergency area	(2)		(5)					
<i>Qualifications</i>								
UOC	(5)							
RePL	(5)							
Observers	(5)							
Experience in op	(3)							
Medical	(4)							

SCORING		
5	Vitally important	Appropriate regulation must exist or be developed
4	Significant interest	Appropriate regulation should exist or be developed
3	Moderate Interest	Appropriate regulation could be applied
2	Mild interest	Regulation not required unless this area is highest scorer
1	Not significant	Regulation not required
0	Of no interest	Area is not concerned with this characteristic in any way