Little Ripper LifeSAVER©
...to the rescue

Submission to

Senate Rural and Regional Affairs and Transport References Committee

Inquiry into

Regulatory requirements that impact on the safe use of Remotely Piloted Aircraft Systems, Unmanned Aerial Systems and associated systems.

Submitted by Little Ripper Lifesaver Pty Ltd (LRL)
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1. Introduction:

1.1. Little Ripper Lifesaver is a subsidiary of The Ripper Group Pty Ltd and has been specifically established to deploy state of the art Unmanned Aerial Vehicle (UAV) technology and related vision sensing and payload technologies to materially enhance and broaden existing search and rescue (SAR) services in the saving of lives. Westpac is sponsoring this UAV based search and rescue venture in addition to their 43 year sponsorship of the iconic Westpac Rescue Helicopter service.

1.2. Little Ripper Lifesaver holds a UAS (Unmanned Aerial System) Operator's Certificate (UOC) issued by the Civil Aviation Safety Authority (CASA) and has undertaken extensive testing of advanced military-grade single rotor unmanned helicopters and advanced commercial grade multi-rotor UAVs for SAR.

1.3. The Company has researched and developed deployable Rescue Pods© containing both land and water based lifesaving devices such as defibrillators, floatation devices, electronic shark deterrents and personal survival kits. It is also partnering with the University of Technology, Sydney, to develop best practice aerial detection of sharks utilising real-time sensor and pattern recognition algorithms and decision support processes. The Rescue Pods are world first technology for the saving of life in ocean, bush, and snow environments.

1.4. Little Ripper Lifesaver, because of its experience in both UAV operations and in interfacing with the various stakeholders, is in a somewhat unique position to input into this important inquiry.

2. The potential recreational and commercial uses of RPAS, including agriculture, mining, infrastructure assessment, search and rescue, fire and policing operations, aerial mapping and scientific research

2.3. This submission focuses principally on the use of UAVs for search and rescue, emergency services and disaster response and the regulatory and other issues related to these applications.

2.4. In relation to search and rescue, emergency services and disaster response RPAS operations, there are several public interest considerations for operations that must be taken into account:

2.4.1. Beaches and parks etc., are public places that often are highly populated, especially at weekends.

2.4.2. Public safety and privacy must be upheld in all operations.

2.4.3. These SAR, emergency services and disaster response operations must be conducted without interference from recreational or other random drones flown by unregistered operators.

2.4.4. Video footage captured during missions must be appropriately controlled.

2.5. To accomplish this, there are several regulatory measures that should be considered:

2.5.1. RPAS operations over beaches and the accompanying surf/ocean areas should be designated by CASA as special areas.

2.5.2. A specific transponder code should be issued by Airservices to the SAR and emergency services operators, and every related UAV should carry that transponder.

2.5.3. UAV operators conducting any SAR, emergency services or disaster response operations must hold a UOC issued by a CASA approved training academy.

2.5.4. A full list of all CASA approved training academies, including for what classes of UAVs they have CASA approval, should be readily accessible on the CASA website.

2.5.5. Any danger areas for UAV operations should be promulgated on all aviation charts.

2.5.6. Appropriate signage should be used around operations to inform the public that UAV operations are underway.

2.5.7. Areas subject to regular UAV surveillance patrols, such as beach areas, should be designated special areas and notified to manned aircraft operators as danger areas on all aviation charts just like parachuting drop areas.

2.5.8. All UAV operations should be limited to 400 feet maximum altitude.

2.5.9. All operations must be notified on the local CTAF frequencies.

2.5.10. All SAR, emergency services and disaster response UAVs should ideally be fitted with TCAS.

2.6. As these services mature, and beyond visual line of sight operations (BVLOS) are sanctioned, there are additional regulatory requirements that need to be met:

2.6.1. All SAR, emergency services and disaster response UAVs should carry an ADS-B transponder.

2.6.2. Sense and avoid technology must be incorporated into BVLOS UAVs.

2.6.3. The precise location of UAVs must be known at all times.

2.6.4. An automatic 'return to home base' capability must be incorporated into SAR UAVs in case any of the above safety considerations become degraded.

2.7. Apart from these immediately applicable considerations there are other items in the terms of reference that require comment.

3. Local design and manufacture of RPAS and associated systems

3.1. Little Ripper Lifesaver has designed a UAV specifically for beach and other SAR operations. It has a megaphone speaker system to warn people in danger or those in distress, a shark detection smart algorithm, and deployable rescue pods. It is therefore crucial that the Intellectual Property of such breakthrough technologies be kept in Australia in the national interest.

3.2. It is also desirable that there be appropriate government support so that such UAV technologies and innovations could be manufactured in Australia at comparative prices, or cheaper, than overseas similar models.

4. Importation of RPAS and associated systems

4.1. Part of the difficulty with imported RPAS systems is that they have no built-in regulatory controls such as geo-fencing. As the number of RPAS vehicles grows in Australia – it is estimated that the number will exceed one million within a relatively short time – then regulatory based requirements for built-in geo-fencing may be necessitated to avoid major disruptions such as drone incursions on flight paths to airports, etc.

5. ***Current and future options for improving regulatory compliance, public safety and national security through education, professional standards, training, insurance and enforcement***

5.1. It is almost certain that education, training and licencing will become mandatory as the number of UAV operators grows enormously. This will be akin to having a driver's licence if you want to go on the roads.

5.2. As such it is essential that only state of the art highest standards are accepted in the training academies approved by CASA, and that CASA ensures that these high standards are maintained.

5.3. For specific operations, such as beach surveillance, it is essential that a designated operator be authorised to conduct operations. Little Ripper Lifesaver has a formal agreement with NSW Surf Lifesaving to do just that – controlling where we operate and obtaining the agreement of relevant local government authorities. This ensures that the public is supportive and know that their safety and privacy will not be undermined.

5.4. For recreational drone users, safe flying areas should be designated by the appropriate authorities.

6. ***Insurance requirements of both private and commercial users/operators, including consideration of the suitability of existing data protection, liability and insurance regimes, and whether these are sufficient to meet growing use of RPAS***

6.1. This is a difficult issue, but some guidance can be obtained from the automobile industry. Not only must operators be licensed but they must also carry a level of insurance, viz. third party.

6.2. It is the insurance environment that at least partially impacts the 'self-regulation' of drivers and cars on the road, and perhaps the same can be achieved with operators and drones in the air.

7. The use of current and emerging RPAS and other aviation technologies to enhance aviation safety

7.1. As the number of UAVs rises exponentially and especially when they are operated out of line of sight, either intentionally or by accident, there will be an absolute necessity to have them integrated into the national airspace.

7.2. This integration will require three stages:

1. Operators knowing where their UAVs are at all times and having an active transponder to tell others where they are.
2. UAVs (and operators) having the automated capability for obstacle avoidance, detecting manned aircraft transponders and avoiding all controlled airspace.
3. UAVs being fully integrated into the national airspace

7.3. There are several companies around the world, including the CSIRO, that are in the throes of developing smart sense and avoid technologies and flight control systems that will eventually be able to be integrated into the national airspace.

7.4. The implementation of this will require connectivity into a standardised flight control platform This may indeed necessitate the use of cellular networks to compile UAV location data and to transmit data relating to known obstacles and no-go zones, with such information having a "handshake" in real time with the Airservices 'One Sky' aircraft traffic management system.

8. ***The existing industry and likely future social and economic impact of RPAS technology***

8.1. It is already evident that RPAS technology will change the face of many commercial activities, let alone leisure time activities.

8.2. It is but one facet of the robotic revolution that is being powered by artificial intelligence, nano sensors, the Internet of Things, big data, and computers.

8.3. As such, it should be considered by government as an area that can not only have a large impact, but also the potential to increase Australia's prosperity and indeed its overseas balance of trade. Hence specific and targeted development grants should also be considered.

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