58th CONFERENCE OF DIRECTORS GENERAL OF CIVIL AVIATION ASIA AND PACIFIC REGIONS

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AGENDA ITEM 3: AVIATION SAFETY

DEVELOPMENT OF REGULATORY SETTINGS FOR THE OPERATION OF UNCREWED AIRCRAFT SYSTEMS (UAS) BEYOND VISUAL LINE OF SIGHT (BVLOS)

(Presented by Australia)

INFORMATION PAPER

SUMMARY

Uncrewed aircraft systems (UAS) offer significant untapped potential to contribute to our social and economic development. Principal areas of near-term potential include operations for the rapid delivery of medical supplies and other lightweight goods where other transport infrastructure is unavailable or undeveloped. The management of safety risks for UAS operated beyond visual line of sight (BVLOS) is a key regulatory challenge for the implementation of such operations. The conference is invited to note the opportunities and challenges of BVLOS operations with the view to progressing a regional collaborative approach that supports our communities.

DEVELOPMENT OF REGULATORY SETTINGS FOR THE OPERATION OF UNCREWED AIRCRAFT SYSTEMS (UAS) BEYOND VISUAL LINE OF SIGHT (BVLOS)

1. INTRODUCTION

1.1 Operators of uncrewed aircraft systems (UAS) are increasingly identifying longer range use-cases that promote positive economic and social outcomes.

1.2 In Australia, social outcomes are being pursued or proposed through fast delivery of emergency medical supplies, a reduction in carbon emissions through the replacement of motor vehicles delivery with UAS, emergency search and law enforcement operations, and the use of UAS in higher risk aviation activities such as farm stock mustering and close proximity infrastructure inspections (eg fences, solar panel arrays).

1.3 Commercial outcomes are being pursued or proposed through UAS delivery services that are lower cost than traditional delivery platforms, the use of UAS for certain activities at remote locations where in-person services are costly to provide, and commercial aviation-related services that can be more cost effectively be provided using UAS, such as aerial photography and surveying.

1.4 Australia, in collaboration with its UAS industry, has embarked on a program of activities to support UAS BVLOS operations. There are more than 80 approved commercial BVLOS operations in Australia with a further 26 in the application assessment process.

1.5 A major impediment to the broad-scale implementation of these UAS use-cases is the determination of regulatory settings to ensure the safety of UAS operations conducted beyond the visual line of sight (BVLOS) of the UAS operator.

1.6 In some cases, social acceptance (social licence) of UAS operations also acts as an impediment to the implementation of broad-scale UAS use cases.

1.7 The conference delegates are invited to discuss these impediments with the view to increased collaboration and understanding of potential solutions and the development of regional practices that support UAS-driven economic and social outcomes.

2. DISCUSSION

BVLOS risk issues

2.1 There are high risk scenarios for BVLOS operations both for other airspace users and people on the ground. The principal risk factors are:

a) the limitations of traditional see and avoid measures in a visual flight rules (VFR) environment for UAS operators and conventional aviation traffic, particularly in airspace environments where there is not universal conspicuity of airspace users

b) current limitations on the cost and effectiveness of 'detect and avoid' technologies to counteract the absence of universal conspicuity and the aforementioned limitations of see and avoid measures

c) resilience and reliability issues with command and control (C2) link technologies, particularly in areas without more advanced cellular network coverage, which risks loss of operator awareness of UAS flight

2.2 These risk factors are compounded by:

a) the increasing size of UAS, and therefore the potential harm associated with a

collision or loss of control event

b) concerns in some communities about UAS operations over populous areas, this being a 'social licence' issue.

2.3 In addition, consistent with the complex risk environment, operational assessment processes are highly technical and time consuming, which imposes burden on industry and/or government. These factors act as barriers to increased UAS BVLOS activities.

2.4 In granting BVLOS approvals, Australia uses the JARUS specific operational risk assessment (SORA) methodology and contributes to the development of the methodology through the provision of technical expertise in JARUS fora. In addition to using the SORA methodology, Australia is developing new policy and regulatory settings to support additional opportunities for BVLOS operations in low risk scenarios, either without regulatory approval or with a lighter touch approval process.

2.5 Australia is also active in supporting the development of detect and avoid technologies, and is working on an uncrewed air traffic management (UTM) system that is intended ultimately to support widespread UAS BVLOS operations without specific operational risk assessments.

Community engagement on BVLOS and UAS issues

2.6 Australia considers the engagement of civil society and industry stakeholders to be a critical element of the effective implementation of broad-scale UAS activities, including in BVLOS use-cases.

2.7 Such engagement promotes regulatory attention on the areas of greatest stakeholder demand, and therefore also promotion of the greatest social and economic (and other) benefits of UAS BVLOS operations. Australia has derived significant benefit from industry representative organisations to focus attention on stakeholder needs.

2.8 Equally important, civil society engagement promotes development of the social licence that is key to the implementation of UAS operations in Australia, particularly in Australian urban areas.

2.9 Different States will have different social licence needs. Similarly, it is recognized that different States will have different opportunities and communication channels to effect engagement with stakeholders. Ultimately, it is Australia's view that such engagement is important to secure civil society acceptance of UAS use-cases and industry acceptance of regulatory settings, which both enhance the utility and safety of UAS operations.

International collaboration opportunities

2.10 Australia supports collaboration with its regional partners to foster the implementation of BVLOS operations and the regional realization of the related social and economic outcomes.

2.11 Key opportunities exist to share UAS-related data, as well as information about the experiences of States with BVLOS operations, States' assessments of risks and mitigations, and the development, implementation and effectiveness of BVLOS regulatory settings.

2.12 Such sharing underpins a more sophisticated, and regional, understanding of BVLOS operations that is expected to support the faster and more effective implementation of BVLOS operations.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to note the information contained in this Paper.

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