



WORKING PAPER

ASSEMBLY — 40TH SESSION

EXECUTIVE COMMITTEE

Agenda Item 26: Other high-level policy issues to be considered by the Executive Committee

INNOVATION IN AVIATION

(Presented by the International Coordinating Council of Aerospace Industries Associations (ICCAIA))

EXECUTIVE SUMMARY

The emergence of new technologies such as Unmanned Aircraft Systems (UAS), UAS Traffic Management (UTM), Urban Air Mobility (UAM), blockchain and artificial intelligence present new opportunities and have the potential to revolutionize aviation across the globe. These technologies, which are all at different stages of maturity, will all require both domestic regulatory bodies and International Civil Aviation Organization (ICAO) to work with industry to develop appropriate best practices and standards to ensure their safe integration into lower and upper airspace. While many industry actors behind these technologies are already engaged with ICAO through the International Coordinating Council of Aerospace Industries Associations (ICCAIA), a separate forum which would allow industry and other stakeholders to come together and develop specific outputs to progress these technologies for ICAO to consider is necessary if ICAO is to keep up with the current pace of innovation.

Action: The Assembly is invited to:

- a) Affirm its support for the development of performance-based standards where appropriate to facilitate the development of new, emerging and yet unforeseen aviation technologies; and
- b) request the Council to explore the options for allowing industry and other stakeholders to address challenges posed by these new aviation technologies in a new arms-length body authorized by ICAO.

<i>Strategic Objectives:</i>	This working paper relates to all Strategic Objectives.
<i>Financial implications:</i>	The activities referred to in this paper will be subject to the resources available in the 2020-2022 Regular Programme Budget and/or from extra budgetary contributions.
<i>References:</i>	Doc 10115, <i>Report of the Thirteenth Air Navigation Conference</i> , Corrigenda Nos. 1 and 2, and Supplement No. 1 Doc 10075, <i>Assembly Resolutions in Force</i> (as of 6 October 2016)

¹ Arabic, Chinese, English, French, Russian and Spanish versions provided by ICCAIA.

1. INTRODUCTION

1.1 ICAO was established in 1944 to work with its member States to reach consensus on issues that support the development of international civil aviation. From the outset, to fulfil its remit, ICAO has had to respond to rapid innovation which is characteristic of the aviation sector so new technologies can be safely and efficiently accommodated within the global aviation ecosystem. The pace of innovation is increasing however and those driving these developments encompass a much wider range of players than the traditional range of aviation stakeholders. This means that the fora in which ICAO has historically dealt with issues – committees, panels and working groups – are no longer best placed to deal with all of these innovations.

1.2 There are several challenges ICAO must address to ensure the appropriate framework is in place to help these technologies flourish:

The pace and scope of innovation

1.3 In just a few years concepts such as Urbane Air Mobility (UAM) have moved from being a niche concept to a growing industry which has attracted over USD 2 billion in funding in 2018 alone. This example is illustrative of how difficult it will be for ICAO to keep with these advances in the future.

1.4 UAM is just one example of how our airspace will be utilized by new users and types of vehicle, but there is no guarantee that the type of operations now being considered are those which will eventually prevail in the market. Therefore, there is a need to ensure that any regulations which are ultimately applied to UAM are technology agnostic and flexible enough to allow as yet unforeseen scenarios.

1.5 Technology is not necessarily linear, and the scenarios currently being predicted have no guarantee of becoming a reality and ICAO does not want to promote solutions designed for one scenario which prevent a later, but ultimately optimal solution from transpiring. A move towards performance-based, rather than prescriptive standards will help ensure the best technology ultimately wins out.

The resources required to keep up with innovation

1.6 ICAO will have to consider an increasing number of new technologies and applications without a commensurate increase in its budget or staffing. At the very least this will require new ways of working to ensure work progresses at a speed that doesn't hold back these technologies and doesn't impede the on-going work of ICAO in other areas.

1.7 A second resource related issue is that future technologies may incorporate other technologies which ICAO does not have experience in or any mandate to regulate. One example is Artificial Intelligence (AI), which while it will be used in or on aviation platforms, it is not an aviation technology. ICAO's role will be to ensure that these technologies operate safely when used in aviation. Actual or any best practices for AI will require wider societal discussions involving a wide range of stakeholders including academics, civil society groups, governments and developers of this technology which will all happen outside of ICAO.

Initial applications of these technologies will not be for international civil aviation

1.8 Users of many of these technologies, for instance those using UAS for power line inspection, may not consider themselves as part of the aviation sector nor recognize the need or benefit of engaging with ICAO. On the other hand, manufacturers and operators of these technologies will desire interoperability and harmonization as they seek to serve as many markets as possible with their products and services, and States will also benefit from being able to share knowledge and experience of regulating these technologies which will expedite the approval of them in different jurisdictions.

1.9 In facing the challenges posed by these new technologies, ICAO will be required to find the right balance between setting appropriate regulations and Standards And Recommended Practices (SARPS) – which will allow these technologies to operate safely and deliver the harmonization and interoperability so manufacturers can supply users in different markets – and not hindering or stifling these innovations through an overly cautious approach.

2. DEFINING ICAO'S ROLE

2.1 In order to strike this balance, ICAO should focus on the problems it is uniquely situated to address – chiefly in bringing together States and regulators to ensure best practice is shared and that technologies are addressed similarly in different jurisdictions as far as possible. ICAO can support this by ensuring that these technologies are defined consistently and should also encourage member States to recognize national regulations for individual manufacturers or operators when no equivalent domestic standards are in place.

3. PROPOSAL FOR ARM'S-LENGTH BODY TO ADVISE ICAO

3.1 One way to assist ICAO in facilitating a global environment which allows new aviation technologies to flourish would be to set up a new forum, outside the administrative structure of ICAO, where industry, subject matter experts and other stakeholders as needed could consider some of the challenges posed by these new technologies.

3.2 This approach has precedent in other United Nations bodies. For instance, the International Telecommunications Union (ITU) employs a variety of Focus Groups to undertake additional work for expeditious development of standards in defined areas. These bodies are ultimately responsible to a specific area of ITU, but have a high degree of freedom in determining appropriate working methods, types of outputs, membership, financing, and administration. A Focus Group can be requested by any ITU member and is only agreed after appropriate objectives and other aspects of its work and relationship to the parent body are defined in a charter agreed by ITU.

3.3 Methods that allow for a similar relationship are allowed under ICAO article 65 – The Council on behalf of the Organization, may enter into arrangements with other international bodies for the maintenance of common services and for common arrangements concerning personnel, and with the approval of the Assembly, may enter into such other arrangements as may facilitate the work of the Organization.

3.4 A framework such as ITU's Focus Groups could serve as a forum for assembling appropriate members of industry and other relevant stakeholders to address issues which ICAO may not have the necessary resource or expertise to do by itself. Using the ITU Focus Group model, different types of output would depend on the nature of the issues being considered and could range from stand-alone reports or best practice to be issued to wider industry, or Technical Specifications and Technical Reports which could be provided to relevant areas of ICAO as a basis for future Standard and Recommended Practices (SARP) development. This type of structure would not abrogate the essential Standards making role of ICAO but could serve to speed the pace of the development of such Standards. The normal processes of vetting and of adopting such Standards would remain within the remit of ICAO.

4. CONCLUSION

4.1 The framework proposed above would provide a more flexible approach to addressing the rapid pace of innovation in aviation. This approach would prevent ICAO from dedicating resources to issues which industry and other stakeholders are better placed to address while ensuring ICAO can still exercise a role in terms of promoting best practice and on any decisions that supports safe, efficient, secure, economically sustainable and environmentally responsible international civil aviation. This type of framework would promote the development of these technologies at a faster pace than would otherwise be available and allow the benefits they offer to be realized sooner.

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