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THIRTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 9 to 19 October 2018

REPORT OF COMMITTEE A TO THE CONFERENCE ON AGENDA ITEM 5

The attached report has been approved by Committee A for submission to the Plenary.

Alexis Brathwaite
Committee Chairperson

Note.— After removal of this covering sheet, this paper should be inserted in the appropriate place in the Report Folder[*]

[*] (15 pages)

Agenda Item 5: Emerging issues

5.1: Operations above Flight Level 600

5.1 The Committee reviewed AN-Conf/13-WP/16, presented by the Secretariat, which provided an overview of operations generally above flight level 600 including status of operations and details relevant to their safe and orderly growth. It underlined the need to develop initial guidance material to address regulatory aspects and that, beyond the near term, the global community should review the extent to which operational and technical issues need to be resolved to safely accommodate significantly higher density traffic levels. The Committee noted the suggestion that the term "higher airspace operations" be used to refer to this subject, however, concern was raised that this term "higher" could be confusing and noted the need to review the terminology in all official languages of the Organization.

5.2 The Committee reviewed AN-Conf/13-WP/41, presented by Austria on behalf of the European Union and its Member States[1], the other Member States of the European Civil Aviation Conference (ECAC)[2]; and EUROCONTROL, which highlighted some of the challenges that high-altitude, long-endurance operations could introduce into the air traffic management (ATM) system. The Committee recognized the importance of ICAO taking advantage of the considerable relevant operational experience in some States on this issue.

5.3 The Committee reviewed AN-Conf/13-WP/96, presented by the United Arab Emirates, which identified issues that should be addressed to enable efficient and harmonious space operations in cooperation with the existing ATM system. The Committee also called on ICAO to provide guidance material and to collaborate with other applicable organizations to develop a harmonized regulatory and operating environment above traditional 'airspace'.

5.4 The Committee reviewed AN-Conf/13-WP/105, presented by Kenya, and AN-Conf/13-WP/136, presented by Peru, on the practical experience related to higher airspace operations above their States. The Committee noted that the number of higher airspace operations has increased over recent years and recognized the significant experience gained by Member States and industry in that regard.

5.5 The Committee reviewed AN-Conf/13-WP/162, presented by the United States, which outlined a way for Member States and industry to create a global framework that leverages performance-based criteria and approaches to management of operations. The Committee recognized the need to establish clear responsibilities for operators and service providers, and to define the information needed to create strategic and tactical planning as well as situational awareness.

5.6 The Committee reviewed AN-Conf/13-WP/166, presented by the International Coordinating Council of Aerospace Industries Associations (ICCAIA), on some of the key principles that may be considered to help ensure the safe and orderly expansion of higher airspace operations. The Committee agreed with the need for ICAO and the global community to begin work on the development of near-term guidance material to manage the growth of the sector in a safe and orderly manner. The

[1] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

[2] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, Norway, San Marino, Serbia, Switzerland, The former Yugoslav Republic of Macedonia, Turkey and Ukraine.

Committee also noted the set of guiding principles presented in the working paper as a possible way to move forward on this shared endeavour.

5.7 The Committee reviewed AN-Conf/13-WP/173, presented by the Civil Air Navigation Services Organisation (CANSO), which provided an overview of issues experienced by CANSO member organizations in relation to higher airspace operations. It highlighted the need to address some of these in order to support the predicted growth of the sector. The Committee recognized the need to further study the impact of travel through controlled airspace for higher airspace operators as proposed.

5.8 The Committee agreed that the development of technical work in support of this sector should be consistent with the Global Air Navigation Plan (GANP). The Committee agreed that it was too early for ICAO to develop Standards and that ICAO should study the issues raised during the discussion. In that regard, the Committee highlighted the need for clarity in the scope of the work to be undertaken by ICAO on this subject and agreed that a multidisciplinary approach should be taken.

5.9 The Committee recognized that the sector was still in its early stages and developing rapidly, and that a significant amount of the technical experience and knowledge was held by the industry. To that end, the Committee encouraged States and ICAO to work closely with those States directly involved in higher airspace operations and with industry to ensure the validity of any guidance material.

5.10 The Committee noted that States that have relevant experience in higher airspace operations should be encouraged to provide draft guidance material to ICAO in order to validate it through established processes to ensure consistency with ICAO provisions with a view to finalizing and publishing it as ICAO guidance material.

5.11 The Committee agreed that higher airspace operations should not have disproportionate impact on the existing traffic, and comply with applicable environmental Standards. An objection by the United States noted that an environmental matter had been discussed in a technical meeting that had not explicitly listed environment in its agenda.

5.12 As a result of the discussion, the Committee agreed on the following recommendation:

Recommendation 5.1/1 — Operations above flight level 600

That States:

a) with relevant experience in higher airspace operations, share, through ICAO where appropriate, their experience and expertise with other States and provide assistance to other States on the regulatory aspects of these operations;

b) expected to benefit from higher airspace operations, agree to consider risk-based operational trials in their airspace;

That ICAO:

c) support ongoing higher airspace operations by providing guidance and, as necessary, other provisions on the regulatory aspects of these operations;

d) work with States and industry to share information on current and forecasted needs for higher airspace operations, to identify issues affecting the global air navigation system and to proactively address harmonization for these operations;

e) consider establishing a multidisciplinary group of experts to consider needed criteria, operational issues, and operator and provider responsibilities for operations in higher airspace; and

f) develop a performance-based global framework for higher airspace operations considering current and future work in emerging technologies, for example, in the areas of information management and sharing, strategic planning, separation and environmental Standards, situational awareness and security; and

g) ensure that the framework includes flights transitioning through controlled airspace and to and through airspace above FL600, as necessary.

Agenda Item 5: Emerging issues
5.2: Operations below 1000 feet

5.13 The Committee reviewed AN-Conf/13-WP/5, presented by the Secretariat, outlining the opportunities and challenges related to the emergence of a range of aviation activities in very low altitude airspace, typically at 1 000 feet above ground level (AGL) and below, in particular in urban or suburban environments. These activities include the operation of small unmanned aircraft (UA), commonly referred to as “drones”, as well as new developments referred to as “flying taxis”.

5.14 The Committee expressed broad support for ICAO’s activities regarding the formulation and implementation of technical and regulatory solutions for unmanned aircraft systems (UAS) operations that remain outside of the international instrument flight rules (IFR) framework. The Committee urged ICAO to continue its efforts towards the safe and coordinated development of aviation activities at very low altitudes, including in the vicinity of, and into, aerodromes.

5.15 The Committee in particular outlined ICAO’s key role as a forum and facilitator for the definition and development of the UAS traffic management (UTM) system, bringing together States and industry stakeholders, at both the global and regional levels. The Committee agreed on the need for States, academia, regional organizations and industry stakeholders to proactively cooperate for the deployment of necessary UTM infrastructure.

5.16 AN-Conf/13-WP/88, presented by Brazil on UTM and autonomous operations, and AN-Conf/13-WP/97, presented by the United Arab Emirates, on tactical risk management of unauthorized unmanned aerial vehicle (UAV) intrusions, highlighted the need for ICAO to continue facilitating the exchange of knowledge and best practices between States, with the active participation of UAS industry stakeholders. The Committee acknowledged that sufficient time should be given to States and regions to test and validate UTM concepts and solutions before developing SARPs. The Committee also expressed wide support for ICAO’s awareness and education activities, as well as for the continuous enhancement of its tools for information exchange, in particular on States’ UAS regulations.

5.17 AN-Conf/13-WP/170, presented by the Civil Air Navigation Services Organisation (CANSO), highlighted the importance of ensuring interoperability of UTM systems with existing air traffic management (ATM). The Committee urged States to ensure that approved UTM systems are interoperable with existing ATM infrastructure.

5.18 Following its review of AN-Conf/13-WP/168, presented by the International Coordinating Council of Aerospace Industries Associations (ICCAIA), International Federation of Air Traffic Controllers' Associations (IFATCA) and International Federation of Air Line Pilots' Associations (IFALPA) outlining some foundational issues to be examined to enable UAS integration, the Committee agreed that integration of UAS into national airspace systems would be facilitated by the definition and implementation of core airspace management services.

5.19 The Committee noted the value of a digital interface to facilitate the exchange of information between national aircraft registries to support identification of UAS. However, concerns were expressed by several States regarding the potential impact of such interface on the sovereignty of national registration systems. ICAO clarified that the aircraft registration network (ARN) being developed would allow connectivity between national registries on a voluntary basis within parameters set by each participating State regarding data to be shared and with whom it may be shared.

5.20 Following its review of AN-Conf/13-WP/54, presented by the United States, the Committee acknowledged the significant work already accomplished by ICAO, and requested that consideration be given to incorporating the material on the UTM framework into the Global Air Navigation Plan (GANP). Broad support was expressed for developing future work through the GANP process and it was agreed that ongoing work should continue with redefined terms of reference on future activities.

5.21 AN-Conf/13-WP/56, presented by the United States, highlighted the need for ICAO to address increasing operations conducted over the high seas by non-certificated UAS involved in commercial activities such as fish spotting, atmospheric research and oil platform inspections; as well as in government operations including in situ weather measurement, fishery compliance, search and rescue, and security. The Committee requested ICAO to develop a solution to enable States to authorize operations of non-certificated UAS over the high seas, using parameters to be developed in a transparent manner, including investigating the maximum altitude at which these operations would be allowed.

5.22 Information papers provided by Austria on behalf of the European Union and its Member States[3], the other Member States of ECAC[4]; and EUROCONTROL (AN-Conf/13-WP/51), Canada (AN-Conf/13-WP/118) and the United States (AN-Conf/13-WP/181) were noted.

5.23 As a result of the discussion, the Committee agreed on the following recommendation:

[3] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

[4] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, Norway, San Marino, Serbia, Switzerland, The former Yugoslav Republic of Macedonia, Turkey and Ukraine.

Recommendation 5.2/1 — Very low altitude operations

That States:

a) collect and share information regarding very low altitude operations, including on unmanned aircraft systems traffic management (UTM) systems, autonomous operations initiatives and tactical risk assessment models;

b) ensure that UTM systems are interoperable with existing air traffic management (ATM) systems;

That ICAO:

c) contribute to the development of operational solutions and guidance, including on UTM systems, autonomous operations and tactical risk assessment models, to support the safe and coordinated implementation of aviation activities at very low altitude, particularly in urban and suburban environments, including in the vicinity of, and into, aerodromes;

d) continue serving as the global and regional facilitator and forum for States, industry, academia and other interested stakeholders in the development of UTM systems, including developing guidance for the identification, structuring and implementation of necessary financing mechanisms such as public-private partnerships (PPPs);

e) continue developing provisions and guidance material for the development, harmonization and implementation of UAS regulations, consistent with the key policy principles set forth in the Global Air Navigation Plan (GANP);

f) develop a solution to enable States to authorize operations of non-certificated UAS over the high seas, using parameters to be defined in a transparent manner, including investigating the maximum altitude at which these operations would be allowed;

g) develop Standards and Recommended Practices (SARPs), guidance or "best practices" related to UTM, including autonomous operations, after States and regions have had sufficient time to test and validate concepts;

h) encourage UTM providers to implement the highest level of cyber security standards that are consistent with aviation community expectations and guidelines for very low altitude airspace operations;

i) support and coordinate the implementation of core airspace management services including, but not limited to, geofencing and geo-referencing, as well as ensuring ATM and UTM interfaces;

j) actively cooperate with States at the regional level for the development and implementation of UTM;

k) continue the development of a global aircraft registration network (ARN); and

l) continue conducting awareness and educational activities amongst users, and facilitate the exchange of information amongst States regarding their UAS regulations.

Agenda Item 5: Emerging issues
5.3: Remotely piloted aircraft system (RPAS)

5.24 AN-Conf/13-WP/6, presented by the Secretariat, outlined the opportunities and challenges related to the operation of remotely piloted aircraft systems (RPAS) and described ICAO's activities in the development of the regulatory framework to support the integration of remotely piloted aircraft (RPA) into non-segregated airspace and aerodromes. The Committee expressed broad support for these activities. To support the development of RPAS-related provisions, the Committee agreed on the need for collection of technical and operational data, in particular on detect and avoid (DAA) and C2 Link, and encouraged States to invite industry stakeholders to provide such data to ICAO.

5.25 The Committee noted that although the current focus of work underway is on SARPs, PANS and guidance material related to airworthiness, C2 Link, flight operations, DAA and ATM, it is expected that RPAS-related provisions will ultimately be required in all ICAO Annexes. In this context, the Committee agreed, as suggested in AN-Conf/13-WP/61 Revision No. 1, presented by the United States, on the need for States to support the cross-disciplinary development of RPAS-related SARPs and guidance material across all relevant ICAO technical expert groups. There was also support for the development by ICAO of additional training activities and guidance material to assist States in implementing RPAS-related SARPs.

5.26 The Committee reviewed AN-Conf/13-WP/41, presented by Spain on behalf of the European Union and its Member States[5], the other Member States of ECAC[6]; and EUROCONTROL and acknowledged the importance of standardizing DAA capabilities.

5.27 The Committee reviewed AN-Conf/13-WP/177, presented by CANSO, which requested ICAO to establish secondary surveillance radar (SSR) code 7400 for lost C2 Link events within appropriate Annexes, PANS, regional air navigation plans and other relevant documents. While the need for a specific code was broadly recognized by the Committee, it was agreed that ICAO should review the potential ramifications of the establishment of code 7400, or other alternative code, including for military stakeholders, as the dedicated SSR code for lost C2 Link events prior to progressing this matter.

5.28 AN-Conf/13-WP/121, presented by Canada, requested that ICAO reconsider the use of the term "unmanned" to describe aviation without an on-board crew and its replacement by gender-neutral terminology. Broad support was expressed for AN-Conf/13-WP/121 and the Committee requested ICAO to consider the use of gender-neutral RPAS-related terminology, following appropriate research.

5.29 Information papers provided by Brazil (AN-Conf/13-WP/192), the United Arab Emirates (AN-Conf/13-WP/258 and Indonesia (AN-Conf/13-WP/276) were noted.

5.30 As a result of the discussions, the Committee agreed on the following recommendation:

[5] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

[6] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, Norway, San Marino, Serbia, Switzerland, The former Yugoslav Republic of Macedonia, Turkey and Ukraine.

Recommendation 5.3/1 — Remotely piloted aircraft systems (RPAS)

That States:

a) collect and share information on remotely piloted aircraft systems (RPAS) operations;

b) actively engage industry stakeholders to collect and provide technical data to ICAO on RPAS operations needed to support the development of SARPs for RPAS, including data required for detect and avoid (DAA) and C2 Link;

c) support the cross-disciplinary development of RPAS-related SARPs and guidance material across expert groups of ICAO;

That ICAO:

d) continue development of the regulatory framework necessary to support the integration of RPAS into non-segregated airspace and aerodromes, and facilitate related implementation roll-out activities;

e) continue developing guidance material to support safe RPAS operations, to facilitate implementation through regional training activities, to conduct awareness and educational activities amongst users, and to facilitate the collection and sharing of information amongst States regarding their RPAS operations and regulations;

f) assess the work underway in its expert groups and identify additional activities required to implement RPAS-related SARPs and guidance such as DAA and C2 Link;

g) provide an update on a fully integrated approach for ICAO's RPAS-related work programme to the 40th Session of the Assembly in 2019;

h) in coordination with States and military stakeholders, propose the best selection for the establishment of a secondary surveillance radar (SSR) code for lost C2 Link events within appropriate Annexes, Procedures for Air Navigation Services (PANS), regional air navigation plans and other relevant documents; and

i) consider the use of gender-neutral RPAS-related terminology, following appropriate research.

Agenda Item 5: Emerging issues
5.4: Cyber resilience

5.31 AN-Conf/13-WP/27, presented by the Secretariat, highlighted the need for a globally coordinated trust framework for successfully managing cyber resilience and ensuring interoperability in an increasingly connected aviation system. The Committee recognized the importance of a globally coordinated aviation trust framework, reflected in AN-Conf/13-WP/67 presented by the United States, AN-Conf/13-WP/83 presented by Brazil, AN-Conf/13-WP/187 presented by Airports Council International (ACI) and AN-Conf/13-WP/169 presented by CANSO, ICCAIA, IFATCA and IFALPA.

5.32 The Committee agreed on the urgent need for the development of a trust framework for a digitally connected and interoperable aviation system and that this work should be pursued in full transparency by ICAO through a group of experts. The Committee agreed that coordination with both aviation stakeholders and non-aviation technical experts, particularly the internet governing bodies, is necessary for the development of this trust framework to address risks and ensure the cyber resilience and interoperability of the aviation system. Furthermore, the Committee recognized that the trust framework should be included as a subject in the Global Air Navigation Plan (GANP) to improve its visibility, and that the expert group should examine how this could be accomplished. The Committee also recognized the recommendation of AN-Conf/13-WP/187 that the expert group should develop a trust framework that should be practical, efficient, flexible and effective for all parties.

5.33 The Committee reviewed AN-Conf/13-WP/270, presented by Canada, Austria on behalf of the European Union and its Member States[7], and the other Member States of ECAC[8], and EUROCONTROL, and Singapore, and co-sponsored by Australia and New Zealand, on the system-of-systems notion of cybersecurity in aviation and AN-Conf/13-WP/171 presented by CANSO on cyber resilience in the system-wide information management (SWIM) concept.

5.34 The Committee recognized the topic of cyber resilience as a multi-disciplinary, cross-cutting issue that affects all aviation stakeholders, and that aviation systems are becoming increasingly connected and mutually dependent for the exchange of digital data and information. This requires globally harmonized policies and requirements recognizing the diverse levels of maturity in the global aviation system. The Committee recognized that this complex system of systems requires collaboration and coordination amongst different stakeholders when developing, integrating, operating and maintaining subsystems that should be secured by design as referenced in AN-Conf/13-WP/270, and supported by AN-Conf/13-WP/171.

5.35 The Committee considered the need for high-level management frameworks and associated policies at the State level as discussed in AN-Conf/13-WP/42 presented by Austria on behalf of the European Union and its Member States[7], and the other Member States of ECAC[8], and EUROCONTROL on strengthening concepts for cybersecurity in aviation and AN-Conf/13-WP/270 and supported by AN-Conf/13-WP/279, presented by Member States of Corporación Centroamericana de Servicios de Navegación Aérea (COCESNA)[9], and AN-Conf/13-WP/282, presented by the Agency for

[7] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

[8] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, Norway, San Marino, Serbia, Switzerland, The former Yugoslav Republic of Macedonia, Turkey and Ukraine.

[9] Belize, Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua.

Air Navigation Safety in Africa and Madagascar (ASECNA). The Committee highlighted that ICAO should develop and promote policies and frameworks related to cyber resilience, and that these should be evaluated in the context of existing management systems and be considerate of international industry standards. The Committee reflected on the need for future SARPs to address cyber resiliency and agreed that a discussion on cyber resilience SARPs should be pursued in the future by ICAO technical expert groups along with development of guidance material on the subject. The Committee underscored the need for the aviation community to be prepared for cyber events and that effective cyber incident response plans were required for continued resilience, and took note of actions put in place by some States to face the challenges of protecting aviation systems against cyber threats.

5.36 The Committee noted the need for cyber-related information sharing, specifically highlighted in AN-Conf/13-WP/62, presented by the United States, and AN-Conf/13-WP/90, presented by the United Arab Emirates. Both papers expressed the need for sharing of cyber-related threat information through appropriate channels, and the Committee encouraged States and international organizations to facilitate information sharing through appropriately designated channels. The Committee noted the importance of tabletop exercises to increase awareness of cyber threats and vulnerabilities and acknowledged the need for ICAO to maintain a repository of scenarios and lessons learned to aid in the development of tabletop exercises.

5.37 The Committee acknowledged the importance of a transparent, coordinated and balanced approach to cyber resilience in civil aviation at the global level, including the urgent need for the trust framework, and that successfully managing cyber resilience in an increasingly interconnected aviation system requires a globally harmonized approach amongst all stakeholders to reduce the vulnerabilities potentially introduced by connecting systems. The Committee recognized the need for a multidisciplinary approach to this work and the adoption of secure-by-design principles, especially recognizing the diverse needs of current and future aviation system participants including system-wide information management (SWIM) users (civil and military) and new entrants to the aviation system such as RPAS.

5.38 Information papers provided by Austria on behalf of the European Union and its Member States[10], and the other Member States of ECAC[11] and EUROCONTROL (AN-Conf/13-WP/160) and the United Arab Emirates (AN-Conf/13-WP/262) were noted.

5.39 As a result of the discussion, the Committee agreed on the following recommendation:

[10] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

[11] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, Norway, San Marino, Serbia, Switzerland, The former Yugoslav Republic of Macedonia, Turkey and Ukraine

Recommendation 5.4/1 – Cyber resilience

That States:

a) in coordination with stakeholders, provide the necessary support for ICAO to evolve the global trust framework as an enabler of flight operations in a digitally connected environment;

b) recognize that the cyber resilience of the aviation system depends on continued coordination amongst all relevant aviation and non-aviation stakeholders;

c) recognize the need to be prepared to respond to cyber events;

d) in coordination with industry and international organizations, work with ICAO to increase awareness of cyber threats and system resilience processes, and coordinate cyber-related incident information sharing and training activities;

e) recognize the need to share information related to cyber events with other States and international organizations through appropriately designated channels;

That ICAO:

f) establish a formal project involving States, international organizations and relevant stakeholders for the urgent and transparent development of a globally harmonized aviation trust framework through a group of experts. Priority should be given to governance principles;

g) coordinate with both aviation and non-aviation technical experts in the development of the trust framework, and in particular with the governing bodies of the Internet;

h) incorporate the trust framework into the *Global Air Navigation Plan* (Doc 9750) in an appropriate manner to highlight its urgent need, its importance and to improve its visibility;

i) develop, as a matter of priority, and promote high-level policies and management frameworks for cyber resilience to help mitigate cyber threats and risks to civil aviation based on international industry standards and preferably aligned or integrated with existing management systems;

j) recognize the need for the aviation community to be prepared for and be able to respond to cyber events;

k) encourage States and international organizations to facilitate information sharing through appropriately designated channels at the global and regional levels;

l) promote multidisciplinary State and relevant aviation and non-aviation stakeholders collaboration on cyber information sharing;

m) promote tabletop exercises and maintain a repository of lessons learned and scenarios available to Member States; and

n) promote a unified framework for an integrated risk management approach to cyber resilience, taking into account all hazards and threats to the air navigation system.

Agenda Item 5: Emerging issues

5.5: Other emerging issues impacting the global air navigation system including unmanned aircraft systems (drones), and supersonic and commercial space operations

5.40 AN-Conf/13-WP/13, presented by the Secretariat, provided an overview of emerging issues that may impact the global air navigation system. It highlighted details on two new types of operations: commercial space transport (CST); and the reintroduction of supersonic transport (SST) for civil use. The Committee noted that while they are not yet fully operational, it is important to consider and monitor their development as these operations may become regular before the next Air Navigation Conference.

5.41 AN-Conf/13-WP/178, presented by CANSO, outlined the case for inclusion of commercial space and near space operators within the scope of Amendment 1 to Annex 19 — *Safety Management* in a manner similar to RPAS. The Committee recognized, however, that the commercial space sector was not yet mature enough to be considered under Annex 19.

5.42 However, the Committee acknowledged that relevant safety management principles may be applicable to the transition of sub-orbital flights through airspace. To raise awareness of these principles, the Committee recognized the need to enhance efforts to bring the space and aviation communities together.

5.43 AN-Conf/13-WP/299, presented by IATA, IFALPA and IFATCA, highlighted issues related to the impact on civil aviation of the emergence of commercial space. It identified the need for ICAO to begin developing guidance material related to the safe and orderly operation of spacecraft transiting airspace.

5.44 The Committee noted the developments in the commercial space and supersonic transport sectors. The Committee recognized the impact that these developments can potentially have on existing airspace users.

5.45 The Committee agreed that SST operations should comply with applicable environmental Standards. An objection by the United States noted that an environmental matter had been discussed in a technical meeting that had not explicitly listed environment in its agenda.

5.46 AN-Conf/13-WP/232, presented by Singapore, highlighted the potential of digital technologies such as artificial intelligence (AI) to accelerate achievement of the ATM enhancement goals of the GANP.

5.47 The Committee agreed with the potential positive impact of new digital technologies for the global air navigation system. The Committee noted that some sectors were already engaging AI to support the work of aviation professionals and recognized the need to closely monitor these developments.

5.48 The Committee noted the intention of ICAO to provide a means to facilitate the sharing of information and research by the aviation community.

5.49 The Committee recognized the need to enhance the Standard-making processes to keep up with the rapid pace of technological developments.

5.50 Information papers provided by Brazil (AN-Conf/13-WP/192), Austria on behalf of the European Union and its Member States[12], and the other Member States of ECAC[13], and EUROCONTROL (AN-Conf/13-WP/211) were noted.

5.51 As a result of the discussion, the Committee agreed on the following recommendations:

Recommendation 5.5/1 — Supersonic transport (SST)

That States:

a) monitor the developments related to the re-emergence of the supersonic transport (SST) sector and, when necessary, engage their regulatory mechanisms to ensure that the necessary policies are in place before supersonic operations become routine;

That ICAO:

b) note the developments related to the re-emergence of the SST sector, including the work related to Appendix G of Assembly Resolution A39-1, *Consolidated statement of continuing ICAO policies and practices related to environmental protection — General provisions, noise and local air quality*; and

c) monitor the developments and, when necessary, engage regulatory mechanisms to ensure that the necessary policies are in place before supersonic operations become routine.

Recommendation 5.5/2 — Commercial space transport (CST)

In recognizing the issues related to commercial space transport (CST) operations potentially affecting international civil aviation, including the safe accommodation of CST operations in airspace and the joint use of aerodromes and other aviation infrastructure:

That States

a) and industry support ICAO activities in the CST field through the sharing of relevant expertise;

b) share guidance material, best practices and national provisions related to commercial space operations through controlled airspace, including risk models and the application of relevant safety management principles;

[12] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

[13] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, Norway, San Marino, Serbia, Switzerland, The former Yugoslav Republic of Macedonia, Turkey and Ukraine.

That ICAO:

c) coordinate its work related to CST operations with the United Nations Office for Outer Space Affairs; and

d) establish a means to facilitate the sharing of information as applicable to the interaction between aviation and commercial space transport.

Recommendation 5.5/3 — Standard-making processes

ICAO should review and enhance its Standard-making processes in order to meet the requirements of the rapid pace of technological developments.

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