



## **THIRTEENTH AIR NAVIGATION CONFERENCE**

**Montréal, Canada, 9 to 19 October 2018**

### **REPORT OF COMMITTEE A TO THE CONFERENCE ON AGENDA ITEM 1**

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

Alexis Brathwaite  
Committee Chairperson

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\* (11 pages)







**Agenda Item 1: Air navigation global strategy****1.1: Vision and overview of the sixth edition of the GANP****1.2: Air navigation performance improvement and measurement through the aviation system block upgrades (ASBUs) and basic building blocks (BBBs) framework**

1.1 This agenda item introduced the draft Sixth Edition of the *Global Air Navigation Plan* (Doc 9750, GANP). To provide participants with a better overview and to facilitate discussion, Agenda Items 1.1 and 1.2 were addressed together. The Committee discussed and agreed with the proposed multilayer structure of the GANP, presented in AN-Conf/13-WP/18 by the Secretariat, which highlighted the importance of global, regional and national air navigation planning alignment through four different levels: a global strategic level, a global technical level, a regional level and a national level, which can be viewed on the web-based platform at <https://www4.icao.int/ganpportal> (GANP Portal).

1.2 New forms of demand, emerging technologies and innovative ways of doing business, together with human talent, were restoring a sense of wonder and excitement to aviation. Moreover, these aspects were bringing new opportunities for a transformation of the air navigation system, to boost social well-being worldwide. To steer and nurture this transformation, the Committee agreed that the global strategic level of the GANP was crucial to the evolution of the global air navigation system and should therefore provide strategic guidelines, as highlighted in AN-Conf/13-WP/35, presented by Austria on behalf of the European Union and its Member States<sup>1</sup>, the other Member States of the European Civil Aviation Conference (ECAC)<sup>2</sup> and by the European Organisation for the Safety of Air Navigation (EUROCONTROL). The Committee therefore welcomed the vision, performance ambitions and conceptual roadmap presented in AN-Conf/13-WP/18. Furthermore, the Committee requested the amendment of the vision, performance ambitions and conceptual roadmap to reflect that commercial airspace vehicles are not aircraft.

1.3 Within this transformational context, special emphasis was placed on the conceptual roadmap as the solution to the need for a common transition strategy, identified in AN-Conf/13-WP/102 presented by Japan. In this regard, the Committee agreed that the conceptual roadmap should be the reference for the technical concepts within the GANP and that the global technical level should be mapped to the global strategic level within the GANP, through a conceptual roadmap with added detail. Furthermore, the Committee highlighted the importance of readability, transparency and stability of the web-based GANP and the ASBUs, as outlined in AN-Conf/13-WP/235, presented by the Republic of Korea. Regarding the relationship between the GANP and other relevant ICAO documentation, including regional documentation the Committee was informed that such work would be addressed as part of the completion of the global strategic level.

1.4 The Committee agreed to incorporate emerging air navigation concepts such as unmanned aircraft systems (UAS), UAS traffic management (UTM), global aeronautical distress and safety systems (GADSS), big data and a global aviation internet network into future versions of the GANP as proposed in AN-Conf/13-WP/265 presented by Saudi Arabia, AN-Conf/13-WP/92 presented by the United Arab Emirates, and AN-Conf/13-WP/64 presented by the United States. The Committee also agreed that the civil-military dimension would also be included in the GANP.

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<sup>1</sup> 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.

<sup>2</sup> 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.

1.5 The Committee was informed that due to the importance of the human role in the system, human factors considerations were already reflected in the ongoing work of future editions of the GANP. Likewise, work on the human role in any man-machine interaction was ongoing within ICAO and that a generic automation model would be considered as part of this work.

1.6 Two global frameworks were presented by the Secretariat as part of the global technical level in AN-Conf/13-WP/19: a revised draft of the aviation system block upgrades (ASBU) and the basic building blocks (BBB) frameworks. The Committee noted the process and guiding principles behind the ASBU framework update, in particular its relationship with the conceptual roadmap and future research and development activities. The Committee also noted the benefits of regional and national cooperation, supported by ICAO, for modernization programmes and encouraged the conduct of trials, as proposed in AN-Conf/13-WP/102, to improve the development and facilitate the implementation of the new air navigation concepts outlined in the ASBU framework, following a performance-based approach. In this regard, the Committee emphasized the importance of identifying qualitative and, when possible, quantitative benefits derived from the implementation of the operational improvements outlined in the ASBU framework and why substantial investments should be tied to their associated costs and benefits. The Committee also highlighted the importance to distinguish responsibilities and accountabilities among the different stakeholders when implementing the ASBUs, as well as the importance to monitor the progress on the implementation of the elements within the ASBU framework.

1.7 The Committee discussed the ASBU framework update and change management process in order to improve agility as proposed in AN-Conf/13-WP/19. The Committee also discussed the need to provide a more simplified construct of the change management process and agreed to its implementation as soon as possible, provided that transparency and stability are ensured. The Committee also reviewed the rationale presented in the working paper, for the development of the BBB framework and considered its initial version. The Committee discussed the proposed BBB framework concept and it was further informed that the services outlined in the proposed BBB framework were derived from the Standards and mandatory procedures for the provision of air navigation services, as specified in ICAO provisions, representing a baseline level of air navigation services. The Committee agreed that the relationship between ASBUs and proposed BBBs and their impact on the regional plans should be clear within the GANP. The Committee also agreed that ICAO should develop online training and organize regional events for the familiarization of all stakeholders with the Sixth Edition of the GANP.

1.8 As highlighted in the conceptual roadmap presented in AN-Conf/13-WP/18 and supported by AN-Conf/13-WP/102 and AN-Conf/13-WP/92, the Committee recognized that information management is a key enabler for the future of the air navigation system and, therefore, for important concepts within the ASBU framework such as trajectory-based operations (TBO), flight and flow information for a collaborative environment (FF-ICE) and airport collaborative decision-making (A-CDM). The Committee agreed that lacking automation and shortcomings in information exchange could limit the efficient use of capacity and capability within the system. In addition, the Committee highlighted the need for consensus on international policy regarding the ownership and use of data.

1.9 The Committee acknowledged the proposals in AN-Conf/13-WP/265 to maximize the potential of the GANP Portal regarding the broad sharing of relevant information related to the development and deployment of the GANP. The Committee then agreed that ICAO should enable, within the GANP Portal, the capability to share research results, developments and validations related to operational and technological matters, information on deployment and lessons learnt regarding the ASBU elements at the regional, State and industry levels. The Committee was informed that the listing of the Standards and technical specifications used in the definition, design and deployment of the ASBUs, as well as the supporting implementation guidance and operational approval, was part of the ongoing work related to the ASBU enablers for the GANP. The Committee

acknowledged that, in addition to the web portal, a concise, executive summary (printable) version of the GANP, which outlined its key policies, priorities and strategies, was needed to ensure that the GANP was easily accessible to all States and key decision makers.

1.10 The Committee highlighted the importance of strengthening the relationship between the GANP and the *Global Aviation Safety Plan* (Doc 10004, GASP) and recognized that the GASP supports the implementation of the GANP by promoting the effective implementation of safety oversight and a safety management approach to oversight, including safety risk management, to permit the evolution of the air navigation system in a safety-managed way.

1.11 The Committee requested that consideration be given to the establishment of a GANP Study Group (GSG) and suggested that nominations be sought from Member States from all regions, international organizations, and including some members from the GANP Multidisciplinary Vision Team and the ASBU Panel Project Team (PPT), to progress the work on future versions of the GANP. The Committee was informed that the ASBU PPT was a group composed of experts from relevant Air Navigation Commission panels, as advised by the respective panel Chairperson together with the Secretariat. This group consisted of experts from all regions.

1.12 Information papers provided by Japan (AN-Conf/13-WP/252), the United States and the European Union (AN-Conf/13-WP/273), the United States (AN-Conf/13-WP/274) and ICAO (AN-Conf/13-WP/34), were noted.

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

**Recommendation 1.1/1 – Vision and overview of the Sixth Edition of the *Global Air Navigation Plan* (Doc 9750, GANP)**

That States:

- a) agree that the future *Global Air Navigation Plan* (Doc 9750, GANP), based on the outcome of the Thirteenth Air Navigation Conference (AN-Conf/13), be available as a web-based platform, including a concise, executive summary (printable) which outlined its key policies, priorities and strategies to ensure that the GANP was easily accessible to all States and key decision makers;
- b) agree with the proposed multilayer structure for the Sixth Edition of the GANP;
- c) welcome the proposed vision, performance ambitions and conceptual roadmap for the Sixth Edition of the GANP, with the inclusion of the civil-military dimension;
- d) recognize the importance of a separate but aligned GANP and *Global Aviation Safety Plan* (Doc 10004, GASP);

That ICAO:

- e) consider the establishment of a GANP Study Group comprised of Member States from all regions and industry to undertake work on future editions of the GANP;
- f) make available the GANP global strategic level (printable) in the six ICAO languages;

- g) develop online training and organize regional seminars in conjunction with the planning and implementation regional groups (PIRGs), where possible, for the familiarization of the Sixth Edition of the GANP and support the deployment and implementation of regional and national air navigation plans;
- h) develop a national air navigation plan template available for voluntary use by States, as part of the Sixth Edition of the GANP, aligned with the global and regional air navigation plans and support States in developing their national air navigation plans while taking into consideration neighbouring requirements;
- i) strengthen the relationship between the GASP, the GANP and the newly developed Global Aviation Security Plan (GASeP); and
- j) continue to work with States, international organizations, air traffic management (ATM) modernization programmes and other stakeholders on the development of the Sixth Edition of the GANP, as required for subsequent endorsement at the 40th Session of the ICAO Assembly.

**Recommendation 1.2/1 — Global technical level of the Sixth Edition of the *Global Air Navigation Plan* (Doc 9750, GANP)**

That States:

- a) agree with the proposed change management process to maintain an up-to-date aviation system block upgrade (ASBU) framework with the formal involvement of the ASBU Panel Project Team (ASBU PPT) to improve transparency, consistency and stability;
- b) agree, in principle, with the updated ASBU framework and consider the initial version of the basic building block (BBB) framework;

That ICAO:

- c) map the global technical level of the *Global Air Navigation Plan* (Doc 9750, GANP) with the strategic level;
- d) make available the ASBU and BBB frameworks in an interactive and simplified format, as part of the web-based GANP Portal, emphasizing the relationship between both frameworks, and between the frameworks and the regional air navigation plan (ANP) elements;
- e) enable the capability, within the GANP Portal, to upload relevant information related to the development and deployment of the ASBU and proposed BBB frameworks in order to allow States, regions and industry to share information;
- f) incorporate a flexible framework for emerging air navigation concepts such as unmanned aircraft systems (UAS), UAS traffic management (UTM), Big Data and the aviation Internet, into future editions of the GANP;



- g) include a Global Aeronautical Distress and Safety System (GADSS) thread in the Sixth Edition of the GANP in line with ICAO provisions;
- h) design a thread for a Global Aviation Internet Network in the GANP, in coordination with aviation and non-aviation-related industries;
- i) emphasize and enhance a human-centric approach to system design and processes for change management;
- j) support the conduct of trials for new air navigation concepts as outlined in the ASBU framework within the GANP; and
- k) continue to work with States, international organizations, air traffic management (ATM) modernization programmes and other stakeholders on the development of the global technical level of the Sixth Edition of the GANP for subsequent endorsement at the 40th Session of the ICAO Assembly.

## **Agenda Item 1: Air navigation global strategy**

### **1.3: Air navigation roadmaps**

1.14 The Committee reviewed AN-Conf/13-WP/26, presented by the Secretariat, which proposed a new approach to the development of the roadmaps provided in the GANP. This approach would maintain the original objective of the roadmaps: to assist States and stakeholders in their planning and investment decisions. The new approach would also allow the civil aviation community to accommodate new classes of airspace users and to embrace and integrate new technology when it becomes available. The benefits of the new approach were recognized and agreed by the Committee. However, the Committee recognized the need to define the performance requirements for each ASBU element as early as possible as they are the basic input required to develop all operational, technical and regulatory provisions, as well as the need to maintain references to compliant technologies within this new approach.

1.15 The Committee then reviewed AN-Conf/13-WP/55, presented by ARINC, EUROCAE, RTCA and SAE International and AN-Conf/13-WP/172 presented by the Civil Air Navigation Services Organisation (CANSO). These working papers reiterated the principles supporting AN-Conf/12 Recommendation 6/13, *Development of Standards and Recommended Practices, procedures and guidance material* and Assembly Resolution A39-22, *Formulation and implementation of Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS) and notification of differences* and therefore encouraged ICAO to continue its efforts to place more reliance on industry standards to complement ICAO provisions. Incorporating industry standards by reference would allow better use of available resources and expertise with improvements in the quality and efficiency of the development and implementation of ICAO provisions. The Committee was informed that ICAO was already working closely with industry standards-making organizations in support of Assembly Resolution A39-22. Regarding the use of industry standards, the Committee highlighted the need for both a suitable validation and verification process and to ensure interoperability.

1.16 The Committee noted that AN-Conf/13-WP/26, AN-Conf/13-WP/55 and AN-Conf/13-WP/172 were complementary as they each supported the performance-based approach to the development of ICAO provisions and the need to define acceptable means of compliance through which interoperability and adherence to ICAO provisions can be assessed.

1.17 AN-Conf/13-WP/103, presented by Japan, proposed the development of a data link/internet protocol suite standardization roadmap to promote harmonization and overcome problems from a proliferation of data link standards and specifications. This development would be needed to support the effective implementation of key initiatives described in the GANP. The Committee was informed that this work was being progressed by the appropriate ICAO expert groups with the development of a Global Data Link Implementation Strategy and that the work would also benefit from the approaches outlined in AN-Conf/13-WP/26 and AN-Conf/13-WP/55. This working paper also proposed that ICAO conduct a data link/Internet Protocol Suite (IPS) seminar/symposium. The merits of this were accepted by the Committee and it was referred to ICAO for further consideration on the timing and content of this event.

1.18 An information paper provided by the United Arab Emirates (AN-Conf/13-WP/260) was noted.

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

**Recommendation 1.3/1 — Air navigation roadmaps**

That States:

- a) provide ICAO with timely information on their modernization plans and the equipage plans of airspace users;

That States and ICAO:

- b) work collaboratively to adopt a performance-based approach for developing performance requirements and acceptable means of compliance to support the implementation of the *Global Air Navigation Plan* (Doc 9750, GANP) while considering the need for global interoperability;

That ICAO:

- c) provide air navigation roadmaps, linked to the aviation system block upgrade (ASBU) elements, within the GANP which support:
  - 1) new airspace users and emerging technologies;
  - 2) greater flexibility where possible in the choice of technologies, based on performance needs; and
  - 3) earlier adoption of new technologies and operational capabilities as they emerge, linked to the performance needs;
- d) continue to explore practical means to make use of international standards, in particular through the Standards Roundtable work with recognized standards-making organizations, to expedite the efficient development of ICAO provisions; and
- e) expedite the work on the Global Data Link Implementation Strategy and develop harmonized solutions to support air-ground data link communications.

**Agenda Item 1: Air navigation global strategy****1.4: Air navigation business cases**

1.20 Under this item, the Committee discussed the importance of a cost-benefit analysis (CBA) during the decision-making process of air navigation improvements. A simplified CBA checklist to support the development of the air navigation infrastructure through the ASBU framework and to assist in securing funding and financing for asset deployment was provided in AN-Conf/13-WP/22 presented by the Secretariat. The Committee agreed on the importance of considering the cost and benefit aspects, as well as airspace user requirements and operational impacts, in any decision-making process. The Committee highlighted the importance of performing a full impact assessment that included human, social and environmental dimensions among others when defining optimum solutions for improvements in the performance of the air navigation system through the use of the ASBU framework. The Committee noted the information provided by the African Civil Aviation Commission (AFCAC)<sup>3</sup> in AN-Conf/13-WP/222 related to a study on the development of satellite-based augmentation system (SBAS)/global navigation satellite system (GNSS) in Africa, including an independent CBA and impact assessment for both aviation and non-aviation use. In this regard, the Committee encouraged ICAO and the Africa-Indian Ocean (AFI) States to support AFCAC in the evaluation of the deliverables associated with the study.

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

**Recommendation 1.4/1 – Cost-benefit analysis (CBA) in support of assets deployment**

That States:

- a) perform a cost-benefit analysis (CBA) as part of all required impact assessments, in coordination with air navigation services providers (ANSPs) and among other relevant stakeholders, when defining optimum solutions for improvements in the performance of the air navigation system through the use of the aviation system block upgrades (ASBU) framework;
- b) use a simplified mechanism, if they do not have a process already in place, such as the checklist available on the Global Air Navigation Plan (GANP) Portal, for CBA of air navigation infrastructure investment projects to support improvements as described in the ASBU framework; and

That ICAO:

- c) support the implementation of applicable CBA methodologies through dedicated workshops.

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<sup>3</sup> Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cap Verde, Central African Republic, Chad, Comoros, Congo, Cote D'Ivoire, Democratic Republic of The Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Republic of Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome And Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Togo, Tunisia, Uganda, United Republic Of Tanzania, Zambia, Zimbabwe.