SUMMARY ASBU PPT CAMPAIGN
14th AIR NAVIGATION CONFERENCE

1. INTRODUCTION

1.1 The future of the global air navigation system needs to be planned, in order to achieve an interoperable system, for all users during all phases of flight that meets agreed levels of safety, provides for optimum economic operations, is environmentally sustainable and meets national security requirements. To that end, the aviation community has come together to define a Global Air Navigation Plan (GANP).

1.2 The GANP, defines the way to achieve this global vision while, at the same time, serves as an instrument for all aviation stakeholders to define collaboratively air navigation implementation strategies based on specific operational requirements to advance the capabilities of their air navigation system ensuring interoperability of systems and harmonization of procedures.

1.3 The global air navigation system involves complex interactions between many stakeholders with different operational requirements and expectations, and national air navigation systems with different maturity levels and availability of resources. In addition, the global vision cannot be achieved directly, but by intermediate steps that need to be established. Therefore, in order to address these challenges, the GANP comprises a multilayer structure (see Figure 1), as follows:

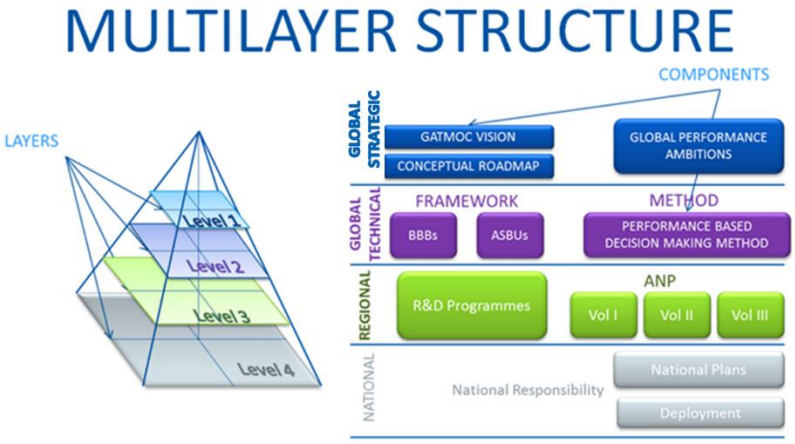

Figure 1 GANP Multilayer structure

- The Global Strategic Level is the front door for all stakeholders to ICAO. It is a document written in executive language and endorsed at the highest political level. It contains, among others, performance ambitions in the 11 key performance areas based on global traffic forecast, traffic flows, challenges and traffic characteristics and a conceptual roadmap to achieve the global vision.

- The Global Technical Level is the core of the GANP. Its key component is a performance based decision-making method to define air navigation implementation strategies within a global framework of specific operational improvements. The global framework is maintained in an information warehouse, from which reports can be derived and consists of the basic services to be provided for international civil aviation plus other specific upgrades of these services.

- The Regional Level comprises ICAO Regional Air Navigation Plans (Vol I, II and III) and other Research and Development Programmes.

- The National Level is the level where States are responsible for the development of national air navigation plans following the performance based decision-making method and its deployment.

2. GANP WORKING ARRANGEMENTS

2.1 The Thirteenth Air Navigation Conference (AN-Conf/13) agreed with the format and direction of the draft Sixth Edition of the GANP and requested ICAO to consider the establishment of a study group comprised of Member States from all regions and industry to undertake work on future editions of the GANP (AN-Conf/13 Recommendation 1.1/1 refers). The establishment of the GANP-SG was approved by the Air Navigation Commission on 12 June 2019 with the following objectives:

a) serve as a coordination point for all GANP development activities by subsuming pre-existing teams working on the GANP;

b) ensure stability and coherence within the multilayer structure of the GANP;

c) update, as necessary, the strategy embedded in the GANP in order to, based on major identified challenges, continue to provide high-level direction for a performance-driven evolution of the air navigation system;

d) update the technical content of the GANP embedded in the Aviation system block upgrade (ASBU) framework, taking into account evolving technologies and requirements as needed, following the defined maintenance process, in order to support technical managers through a safe and cost-effective modernization of the air navigation system;

e) update the performance framework through development of performance objectives and key performance indicators to support and verify the benefits achieved from the deployment of operational improvements;

f) pursue the alignment of global, regional and national air navigation planning;

g) consider air navigation planning matters within a broader aviation planning framework; and

h) strengthen the relationship with the Global Aviation Safety Plan (GASP) and Global Aviation Security Plan (GASeP).

2.2 Recognizing the need for ICAO to expedite the work on performance related to the GANP, AN-Conf/13 also recommended ICAO to consider establishing a group of performance experts under the new GANP Study Group (AN-Conf/13 Recommendation 4.3/1 refers).

2.3 Based on the above, the first meeting of the GANP-SG agreed to work under the structure presented in Figure 2.

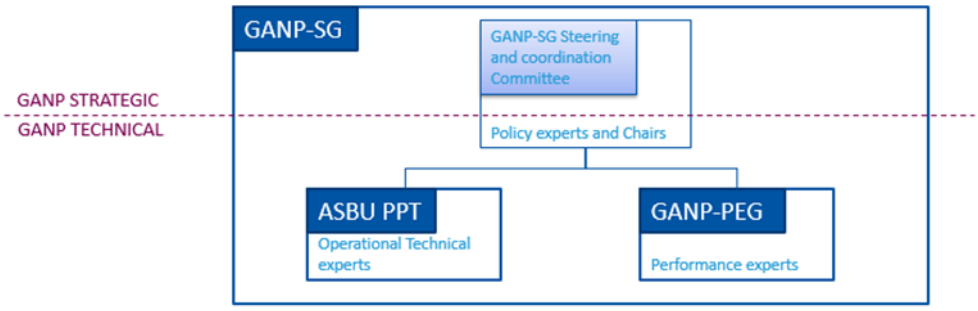

Figure 2 GANP Working Structure

3. GANP TIMELINES AND EVENTS

3.1 The 39th session of the ICAO Assembly agreed to expand the GANP lifecycle through three-year minor and six-year major updates as relevant. In addition, in order to maximize the input from the aviation community, the GANP is updated following ICAO's global air navigation events schedule. According to this schedule there would be a High Level Safety Conference, with an air navigation stream, before a minor update of the GANP and a High Level Air Navigation Conference before a major update of the GANP. The High Level Conferences would take place between two ICAO Assembly sessions (see Figure 3).

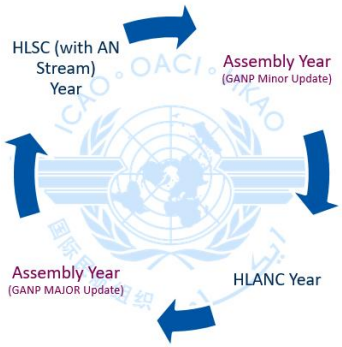

Figure 3 ICAO Air Navigation Global Events schedule

3.2 Based on these timelines, the GANP-SG meets face to face every year except in Assembly years around October or June depending if the peer review is for an Assembly or a Conference (see Figure 4). These meetings would serve as peer review mechanism towards the next editions of the GANP.

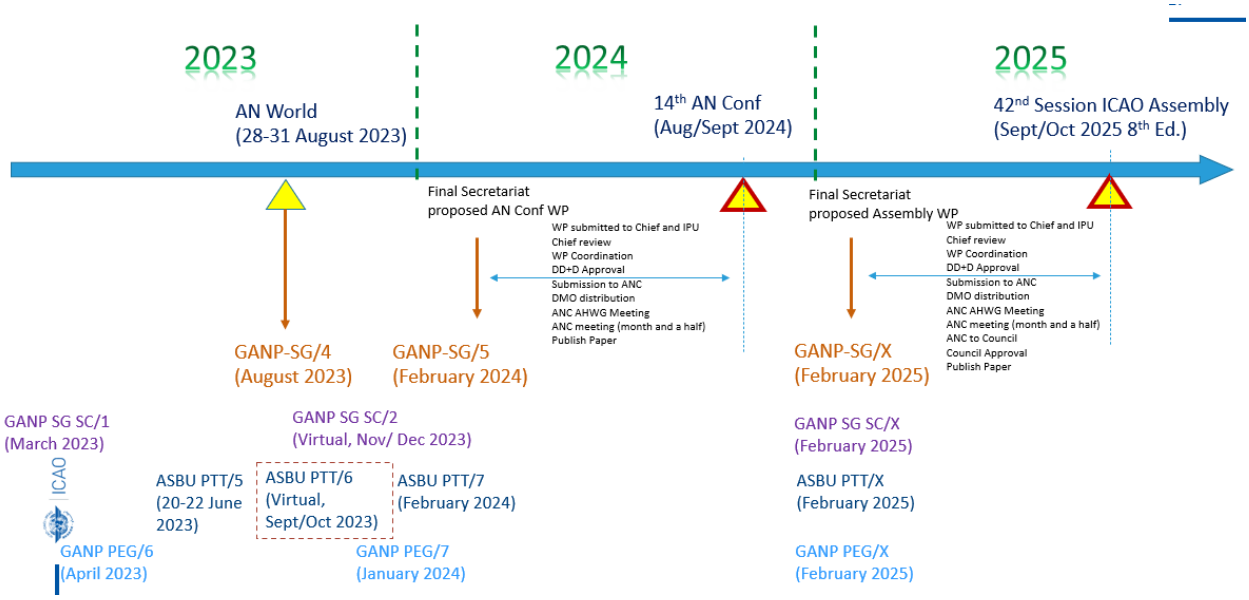

Figure 4 Next proposed peer review

3.3 The ASBU PPT schedules its meetings and plan its deliverables and future work based on the GANP-SG coordination/peer review mechanism.

3.4 The main goal of the ASBU PPT is to review the ASBUs framework to make it more comprehensive, coherent and useful for implementation. In addition, this review should incorporate the most recent developments regarding the evolution of the air navigation system.

4. ASBU FRAMEWORK MAINTENANCE PROCESS

4.1 The 39th session of the ICAO Assembly agreed on the expansion of the GANP lifecycle through three-year minor and six-year major updates, as relevant, to provide for stability. The seventh edition of the GANP, endorsed by the ICAO Assembly at its 41st session, constituted a minor update of the GANP, therefore, the eighth edition of the GANP, to be endorsed by the ICAO Assembly during its 42nd session, should be a major update.

4.2 The 40th session of the ICAO Assembly approved the ASBU Framework Maintenance Process available in under the tab "Change request" available at ASBU Elements - ICAO GANP Portal. As part of this process the ASBU Framework would be updated in three-year cycles (synchronized with Assembly years) and the next update and subject of this report would be a major update.

5. MAJOR UPDATE

5.1 The scope of the major update is to:

- Update of ASBU Framework content from a factual perspective e.g. processing of delays, change in descriptions; numbering of ASBU elements; maturity level;
- Review of consistency, completeness and understanding;

- Reflect the themes for the eighth edition of the GANP;
- Reflect the approach for new entrants in the strategy;
- Address the use of artificial intelligence;
- Provide a mapping to the strategic level; and
- Define new elements in future blocks.

6. CAMPAIGN RESULTS

6.1 The update was organized through a campaign with the ASBU PPT as working arrangement. The major update of the ASBU Framework resulted in:

- 99 change requests (97 to existing ASBU threads and elements and 2 for new ASBU elements) submitted and accepted for initial assessment

After reviewed by the ASBU PPT, these change requests resulted in:

- 388 change requests (370 to existing ASBU threads and elements and 18 for new ASBU elements) for final assessment

6.2 Of these 388 change requests:

- 388 change requests were accepted and agreed to be implemented; and
- 0 change requests were rejected.

6.3 A summary of the main changes to the ASBU framework is available in the **Appendix** to this document.

7. A MID MILESTONE FOR THE EIGHTH EDITION OF THE GANP

7.1 The 14th Air Navigation Conference is the mid-milestone for the update of the ASBU framework for the eighth edition of the GANP, which is qualified as a "major" update following the GANP update lifecycle agreed by the ICAO Assembly at its 39th session. This implies that the eighth edition will include also structural improvements as compared to a "minor" update which is limited to "corrections". This mi-update of the ASBU framework addressed the following themes:

Development of the link between the GANP Strategic Level and the ASBU Framework. The GANP Strategic Level includes the Conceptual Roadmap which describes, at an executive level, the evolution of the ATM through time. The objective of the campaign for the eighth edition is to link the conceptual roadmap to Threads/Elements in the ASBU Framework. A proposed approach to address this mapping is presented to the Conference under agenda item 3.3. This approach proposes to move the evolution of the concepts of operations of the threads to the strategic level, to review them in line with the conceptual roadmap steps and to provide a mapping of the ASBU elements to these reviewed concepts of operations.

The final text for the evolution of the concepts of operations within the ASBU threads, as well as the mapping will be presented to the 42nd session of the ICAO Assembly.

Integrate innovation opportunities in the ASBU Framework. A new proposed approach to the new entrants as well as some principles for the use of artificial intelligence will be discussed during the conference under agenda item 3.3. This mid-update of the ASBU framework reflects the proposed approach to new entrants through the inclusion of new ASBU elements. It also includes new ASBU elements that use Artificial Intelligence.

Update of information and evolution of the system. This mid-update campaign include updates/corrections of information through Change Requests as well as new elements for future Block to reflect the evolution of the system.

The work on the ASBU framework for the eighth edition of the GANP should continue and will be addressed through another campaign. This campaign will focus on:

Improvement of performance perspective. The main objective of elements in the ASBU Framework is to deliver performance benefits. Implementation decisions are often taken based on the expected performance improvements. The objective for eighth edition is to improve the performance assessments of the elements by reviewing/updating the assessment criteria and, where, possible, refer to evidence for a performance assessment (e.g. validation results).

Appendix

Summary of the main updated to the ASBU Framework

ACAS → Information and timelines have been updated.

ASUR → ASUR-B2/2 has been moved to Block 3 and renamed to reflect the approach to new entrants proposed in the strategy of the GANP. ASUR-B3/1 has been reviewed to reflect the approach to new entrants. A new element has been added to Block 3 to reflect the approach to the new entrant proposed in the GANP strategy. This has resulted in three elements in Block 3: Performance-based Surveillance Requirements for the lowest airspace; Performance-based Surveillance Requirements for middle levels; Performance-based Surveillance Requirements for higher airspace.

ACDM → Two new elements have been added, to reflect the evolution of ACDM, in Block 3 and Block 4: Advanced TAM and Extension of Advanced TAM to integrate new airspace users. ACDM-B3/1 - Full integration of ACDM and TAM in TBO has been moved to Block 4 as ACDM-B4/1.

AMET → AMET-B4/3 has been removed and the description of the rest of elements in Block 4 has been completed.

APTA → APTA-B2/2 has been removed and new elements have been added to reflect the needs of future airspace users. One in Block 3: Approach procedures to vertiports for crewed VTOL aircraft and two in Block 4: Approach procedures to vertiports for uncrewed VTOL aircraft and Approach procedures to vertiports for uncrewed VTOL aircraft. APTA- B1/1 and APTA-B1/2 have been moved to Block 2 since the enablers would not be ready until 2024. APTA-B1/4 and APTA-B1/5 have been moved to Block 2 since they were ready for implementation by 2022. APTA-B2/4 has been moved to Block 3.

COMI → Three new elements have been added to Block 3 to reflect the approach to new entrants proposed in the GANP strategy: Performance-based Link Requirements for lowest airspace; Performance-based Link Requirements for middle levels; Performance-based Link Requirements for higher airspace. One new element has been added to Block 4: Transmission and Reception of VHF signals between Satellite and aircraft. Existing aeronautical air-ground communications have the potential to benefit from recent and emerging advances in satellite and general communications technologies, as industry and research institutions have begun to study ways to improve and enhance air-ground communications. Introduction of a satellite-based VHF existing elements for VHF technologies that includes enhancement of existing VHF technology. This may include the Satellite communication technology to relay VHF communication over satellite (space-based aeronautical VHF). Expected benefits of these new Satellite based VHF aeronautical communication technologies include improvements in communication capability and performance in oceanic and remote airspace. These technologies may also increase communication performance and available bandwidth (or channel capacity) for aircraft, airlines and ATM operations. These future VHF technologies will be designed to complement existing terrestrial VHF voice/datalink services and should be fully interoperable with existing VHF infrastructures and avionics. COMI-B1/3 has been moved to Block 2. INMARSAT SBB-S using OSI is being used/or will be used Domestically in EUROPE now; however, this is referring to Class B based on IPS and that is just finishing up Standardization and likely will not be available until Block 2. COMI-B2/1 has been moved to Block 3. VDL Mode 2 will be the first user of IPS. Unless there are further delays, in which SATCOM Class B

will bed offered. The expected dates for implementation in Aircraft of VDL-Mode 2 using IPS is approx.. 2027/2028 with dataComm infrastructure in place to support these A/C in 2029/2030. COMI-B3/2 has been moved to Block 4 because Application/Message Set 3 has not been defined yet.

COMS→ COMS-B1/3 has been removed and relevant content has been moved to Blocks 2 and 3. The Satellite Voice Operations Manual (SVOM) Edition 1 is listed as an enabler, however this manual is to be published by end 2025. COMS-B3/1 and COMS-B3/2 have been moved to Block 4 since the enablers will not be ready until 2035.

CSEP→ Information, timelines and terminology related to the new entrants approach have been updated (i.e. use of higher airspace, middle levels and lowest airspace). CSEP-B3/1 has been moved to Block 4. Although hooks are in place in new DATACOM Minimum Operating Performance Standards, the expected timeline for deployment of such equipment falls within Block 4. CSEP-B2/1, CSEP-B2/2 and CSEP-B2/3 have been moved to Block 3 to reflect the expected timeline of the enablers.

DAIM→ Information, timelines and terminology related to the new entrants approach have been updated (i.e. use of higher airspace, middle levels and lowest airspace). DAIM/B2-3, DAIM/B2-4 and DAIM/B2-5 has been moved to Block 4 due to the maturity of its operations.

DATS → One new element has been added to Block 3: AFIS for multiple aerodromes. Plans are on-going in at least two regions (including Sweden, Norway, Canada and Brazil) to implement "multiple-mode" AFIS using DATS technology. It seems likely that implementation will be mature enough to support others using the technology, training and procedures in a similar fashion within the Block 3 timeframe. Another new element has been added to Block 4: Aerodrome control for multiple aerodromes. Plans are on-going in at least two regions (including Sweden, Norway, Canada and Brazil) to implement "multiple-mode" aerodrome control using DATS technology. It seems feasible that implementation will be mature enough to support others using the technology, training and procedures in a similar fashion within the Block 4 timeframe.

FICE → FICE-2/8 has been removed. FICE-2/7 has been moved to Block 3, as FICE-B3/2, due to delay in the provisions. All FFICE services for designated airspace (lowest airspace, middle levels and higher airspace) have been concentrated in FICE-B3/2 since no differentiation in terms of services is expected. FICE-2/9 has been moved to Block 3 due to delay in the provisions. FICE-B4/2 has been moved to Block 5 and would be refined.

FRTO → FRTO-B1/7 has been removed from the FRTO thread and moved to the NOSP thread, element NOPS-B1/10 Collaborative Trajectory Options Program (CTOP).

GADS → Information has been updated.

NOPS → NOPS-B0/3 has been removed. One new element has been added to Block 4: Dynamic allocation of en-route ATS to reflect future operations under NOPS. NOPS-B0/3 and NOPS-B0/5 have been moved to Block 1 since the ICAO Doc 9971 was published in 2014. NOPS-B0/4 has been moved to Block 1 since the first edition of Doc 9971 referring to Airport CDM procedure (3rd edition) was not published until 2018. NOPS-B0/4 has been moved to Block 1 since the enablers were not available until 2018. NOPS-B1/1, NOPS-B1/2, NOPS-B1/4, NOPS-B1/5, NOPS-B1/6, NOPS-B1/9, NOPS-B2/1, NOPS-B2/2, NOPS-B2/4, NOPS-B2/5 and NOPS-B2/6 have been moved to Block 3 due to enablers availability. NOPS-B1/7 has been moved to Block 2 due to a dependency need on SWIM-B2/1. NOPS-B2/7, NOPS-B2/8, NOPS-B3/1, NOPS-B3/2 and NOPS-B3/3 have been moved to Block 4 since they are in a concept stage.

RSEQ → Information and timelines have been updated. RSEQ-B3/3 has been moved to Block 4 since it would not be implemented in two Regions until 2027. RSEQ-B3/4 has been moved to Block 4 since it is still in a concept status. RSEQ-B4/1 has been moved to Block 3 since it is expected to be implemented in two Regions by 2028.

SNET → New element has been added to Block 4: Ground Safety Net for Higher airspace operations (HAO)

SURF → One new element has been added to Block 3: Optimized surface guidance for pilots and vehicle drivers and another one to Block 4: Automated surface guidance for aircraft, integrating new entrants. SURF-B1/5 has been moved to Block 4 since it is still in a concept status.

SWIM → Information and timelines have been updated. SWIM-B2/4 and SWIM-B2/5 have been moved to Block 3 due to the delay on the availability of provisions. SWIM B3/1 has been moved to Block 4.

WAKE → WAKE-B3/2, WAKE-B3/5, WAKE-B3/7 and WAKE-B3/8 have been removed. No provisions further expected to be developed, due to lack of mature elements. New element has been added to Block 3: Reduced time-based wake minima for departure from intermediate part of the runway, using closely spaced runway entries. WAKE-B4/1 has been updated to include the use of AL/ML (e.g. traffic trajectory prediction). WAKE-B4/2 has been moved to Block 5 due to the maturity of the element.

— END —