Agenda

• Background information
• GANP 2019
  – Global Strategic level
  – Global Technical level
  • BBB and ASBU framework
Global Air Navigation Planning

BACKGROUND INFORMATION
The future ATM system

To achieve an interoperable global air traffic management 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.
ATM System Requirements

- Key Performance Areas
- Information management and services
- System design and engineering
- System components
Global Air Navigation Planning: an evolution

2002

Global Air Navigation Plan for CNS/ATM Systems

2007

Global Air Navigation Plan

2013

ICAO CAPACITY AND EFFICIENCY

2016

ICAO CAPACITY & EFFICIENCY
GANP 2013

“Increase the capacity and improve the efficiency of the global civil aviation system”

• Through the GANP, offer a long-term vision to assist all aviation stakeholders, and ensure continuity and harmonization among modernization programmes

• Through the Aviation System Block Upgrades (ASBUs), provide a consensus-driven modernization framework for integrated planning based on performance
GANP 2016

• **Objectives**
  – International and overarching framework of a global investment plan: make it more usable towards implementation
  – Keep it **stable** while making the necessary updates/additions
  – Adjust the **periodicity** to the Assembly and ICAO editing cycles

• **A Planning Document for Implementation**
  – GANP should serve as a comprehensive planning tool to **support the development and implementation** of a harmonized global air navigation system
Main Goals of the 2019 GANP

• Useful for all Stakeholders

• Evolution of the global air navigation system
  – Promote investment in innovation through research and development activities
  – Align Regional Research and Development Programmes

• Support implementation
  – ASBU framework
  – Alignment global, regional and national planning
  – Performance-based decision making method
  – Optimize allocation and use of resources for air navigation

• ICAO provisions and future standards
Global Air Navigation Planning

GANP 2019
MULTILAYER STRUCTURE

- Web based application: reports
- Global Frameworks: BBBs & ASBUs
- Performance-based Approach
- Performance-based decision making method for defining implementation strategies
- KPIs Catalogue
- Front door for all stakeholders to ICAO
- Document endorsed at highest political level
- Written in executive language
- Contents derived from underlying levels
- Global Performance Ambitions
- ICAO Regional Air Navigation Plans
- Online tool for PfAs

DRAFT GANP 2019

https://www4.icao.int/ganpportal
Global Air Navigation Planning

GLOBAL STRATEGIC LEVEL
GLOBAL STRATEGIC LEVEL

• Background
• Vision
• Performance Ambitions
• Conceptual roadmap
• Implementation
A NEW ERA IN AVIATION

Demand, including new entrants
An exciting future full of opportunities

- **Upper atmosphere**
  - Balloons, RPAS, space activities
  - Single homogenous region

- **Low density areas**
  - Different type of aircraft
  - Different missions

- **High density areas**
  - Traffic will continue to increase
  - Same or enhanced level of performance expected
Manned vs. unmanned traffic

- + 362,000 aircraft
- 23,000 airliners
- Growth of 750 /year

- + 4,000,000 drones
- Expected 400k commercial
- Growth of 150,000 /year
A NEW ERA IN AVIATION

• Technology and information
  – Autonomous systems
  – Artificial intelligence
A NEW ERA IN AVIATION

• Technology and information
  – Full connectivity

“ANYTHING THAT CAN BE CONNECTED, WILL BE CONNECTED”
A NEW ERA IN AVIATION

- Humans
A NEW ERA IN AVIATION

• Business Models
SOCIAL WELLBEING ALL PEOPLES OF THE WORLD

• More quiet
• Cleaner
• Safer
• More resilient
• More profitable
### A high-performing Air Navigation System

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global interoperability</td>
<td>Ensure global interoperability</td>
</tr>
<tr>
<td>Access and equity</td>
<td>Access and equity to all airspace users</td>
</tr>
<tr>
<td>Capacity</td>
<td>Capacity to accommodate forecast demand</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Increase efficiency of air operations</td>
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<tr>
<td>Flexibility and predictability</td>
<td>Enable flexibility to meet arrival times</td>
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<tr>
<td>Sustainability</td>
<td>Secure air navigation system sustainability</td>
</tr>
<tr>
<td>Resilience</td>
<td>Resilience to cope with system disruptions</td>
</tr>
</tbody>
</table>
In a time of change...

• Transformational change is needed
  – Information Management
    • Digital data MET, AI, FICE,...
    • Information exchange over IP
  – Management by trajectory
    • Time based management
    • Synchronization
    • Automation
Global Air Navigation Planning

GLOBAL TECHNICAL LEVEL
GLOBAL TECHNICAL LEVEL

• Performance-based decision making method
• ASBUs key concepts
• Digital ASBU framework
  – ASBUs within the portal
• ASBUs Performance
  – Catalogue of performance objectives
  – List of KPIs
• ASBUs vs. BBBs
ASBU Framework key concepts

- **ASBU Element**: a specific change in operations designed to improve the performance of the air navigation system under specified operational conditions.
- **ASBU Enabler**: component (standards, procedures, training, technology, etc) required to implement an element.
- **ASBU Thread**: key feature area of the air navigation system that needs improvement in order to achieve the vision outlined in the Global ATM Operational Concept.
- **ASBU Block**: a six year timeframe whose starting date defines a deadline for an element to be available for implementation.
- **ASBU Module**: a group of elements from a thread that, according to the enablers’ roadmap, will be available for implementation within the defined deadline established by the ASBU Block.
Which Block? Block 2

Which Block? Block 1

Which Block? Block 2
Digital ASBU framework

• ASBU Element
  – The main concept of the updated ASBU framework.
  – The ASBU elements were defined in previous versions of the GANP in an inconsistent manner. With the digitalization of the framework, they have become the core concept and they have been defined in a harmonized manner.
  – An ASBU element is a specific change in operations designed to improve the performance of the air navigation system under specified operational conditions.
Digital ASBU framework

• ASBU Thread
  – Another key concept in the updated framework.
  – The ASBU threads already existed in previous versions of the GANP and they were key feature areas of the air navigation system where improvements are needed in order to achieve the vision outlined in the Global ATM Operational Concept.
  – The ASBU threads are been categorized in 3 groups:
    • Operational threads: ACDM, APTA, NOPS...
    • Information threads: SWIM, AMET, DAIM, FICE,...
    • Technology threads: COMS, COMI, NAVS, ASUR (previous roadmaps)
ASBU STRUCTURE

OPERATIONS/APPLICATION, PROCEDURES, ...

ENABLERS/SERVICES
- TBO
- ACDM
- NOPS
- FRTO
- RSEQ

SUPPORTING NETWORK/INFRASTRUCTURE

AVIONICS:
- COM
- SUR
- NAV
- Fuel
- Flight control
- Flight management
- Power plant
- Electric
- Hydraulic
- Others

GROUND INFRASTRUCTURE:
- COM
- SUR
- NAV
- MET SENSORS
- Others

SPACE INFRASTRUCTURE:
- COM
- SUR
- NAV
- Others
Digital ASBU framework

• ASBU Thread
  – This updated version of the GANP presents the following major changes regarding the threads:
    • The CCO and the CDO threads have been merged into the APTA thread, which has expanded its scope to cover terminal and approach operations.
    • Some elements in the OPFL thread have been moved to FRTO, so FRTO will from now on cover horizontal and vertical en-route flight efficiency. However, in order to respect stability, elements in Block 0 and one element in Block 1 have been left in OPFL.
    • The RPAS thread is TBD, however, the lower airspace operations improvements have been reflected as elements in other threads.
Digital ASBU framework

• ASBU Thread
  - (Continuation):
    • Higher airspace operations improvements have also been reflected as elements in other threads.
    • There is a new thread for global tracking: GADS.
    • The roadmaps have become technology threads in order to show the dependencies on them of the other ASBU elements.
    • The TBO thread has been updated based on the TBO concept and as an integrating concept, its elements are the elements from the operational threads. The communication elements in the previous versions of the TBO thread are now in the COMS (communication services) thread.
Digital ASBU framework

• ASBU Enabler
  – Another key concept in the updated framework.
  – The ASBU enablers are a new concept in the updated ASBU framework.
  – They are the components (standards, procedures, training, technology, etc) required to implement an element.
  – Their goal is to identify the stakeholders involved in the implementation of an ASBU element as well as all the necessary requirements, in order to ensure an effective implementation. Some of the enablers can be elements in other threads, for instance: avionics or ground systems in the technology threads.
Digital ASBU framework

• ASBU Block
  – Another key concept in the updated framework.
  – The ASBU blocks already existed in previous versions of the GANP and they introduced the “time” dimension to the framework.
  – An ASBU Block is a date that defines a deadline for an element to be available for implementation. This implies, that the element and all the enablers associated to it, need to be available for implementation by the ASBU block year.
  – ASBU Blocks years: 2013, 2019, 2025, 2031....
Digital ASBU framework

• ASBU Module
  – The last key concept in the updated framework.
  – The ASBU modules already existed in previous versions of the GANP and they are the crossing point between the threads and the blocks. Therefore, an ASBU module is the group of elements from a thread that, according to the enablers’ roadmap, will be available for implementation within the defined deadline established by the ASBU Block.
  – As such, if in the digital ASBU framework we select in the filter one ASBU thread and one Block, we will obtain the elements that constitute the module.
QUIZ
GANP 2019: ASBU Framework

- Template:
  - **PART 1:**
    - Concept of operations in different Blocks
  - **PART 2:**
    - List of operational improvements in that ASBU thread
GANP 2019: ASBU Framework

- **Template:**
  - **PART 3:**
    - For each element listed in PART 2: description, dependencies, scope,...
  - **PART 4:**
    - Enablers for each element
GANP 2019: ASBU Framework

- **Template:**
  - **PART 5:**
    - Applicability
    - Performance impact
  - **PART 6:**
    - Performance objectives
ASBUs Performance

• Performance assessment
  – In the previous editions of the ASBU framework, the performance assessment was only done qualitatively, at a key performance area level (capacity, efficiency, predictability...) and by module.
  – In the digital edition of the ASBU framework, the performance assessment is done with more detail:
    • At a level of performance objective within each KPA
    • Qualitatively, however, the performance objectives are linked to key performance indicators (in order to facilitate the implementation of a quantitative approach)
    • By element, operational improvement by operational improvement.
ASBUs Performance

- Catalogue of performance objectives
  - New in the digital ASBU framework!
  - The catalogue of performance objectives was developed to fulfil the gap between the KPAs list and the list of potential KPIs, already available in previous editions of the GANP.
  - The catalogue serves to qualitatively identify the benefits expected from the implementation of each operational improvement outlined in the ASBU framework.
ASBUs Performance

- List of Key Potential Indicators
  - Already available in previous editions of the GANP.
  - Three new KPIs have been added to the list of 16 KPIs.
  - The KPI list is now available in the GANP Portal, together with the catalogue of performance objectives and the definition of the ASBUs.
The frameworks: BBBs vs ASBU's

• Aviation System Block Upgrade (ASBU) Framework
  – Group of operational improvements to advance air navigation capabilities and improve the performance of their air navigation system in a cost effective way
  – Evolution global air navigation system
  – ASBU threads, elements, blocks and modules
The frameworks: BBBs vs ASBUs

- Basic Building Block (BBBs) Framework
  - Backbone of any robust air navigation system
  - Nothing new: Basic services according to ICAO SARPs
  - Aerodrome operations, CNS, air traffic management, meteorology, search and rescue, and aeronautical information
The frameworks: BBBs vs ASBUs

MET BASIC MODULES AND ELEMENTS

- Flight Briefing Service
- Met. Observation and Reports Service
- Aero. Met. Forecast Service
- Aero. Met. Warnings Service
- Aero. Climatological Information Service
- SIGMET Service
- AIRMET Service
- GAMET Service
- AIREP
- WAFS Service
- IAVW Service
- TCAC Service
- RMM Service

AERODROME METEOROLOGICAL OFFICE

METEOROLOGICAL WATCH OFFICE

GLOBAL/REGIONAL CENTRES
The frameworks: BBBs vs ASBUUs
The frameworks: BBBs vs ASBUs

MET BASIC ELEMENTS/REFERENCES

ICAO SARPs
The frameworks: BBBs vs ASBU's
State impact

• BBBs: Compliance with ICAO SARPs

• ASBUs:
  – More comprehensive framework
  – More useful
  – Oriented to support implementation