Current and future airport communication systems



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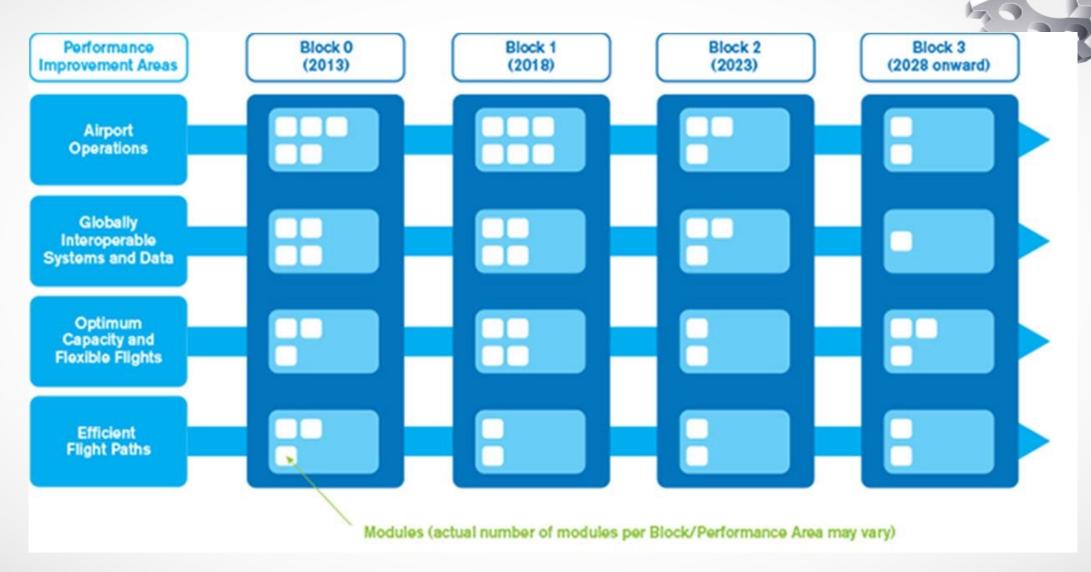
Objective

Familiarise with current and future airport communication Systems

ASBU Framework

- Evolutionary steps described in the conceptual roadmap in the GANP,
- Different concept of operations and modules described for the different areas of the air navigation system
- ASBU threads- developed within six-year timeframes ASBU Block-, starting with Block 0 in 2013 to Block 3 in 2028
- Specific operational improvements- ASBU elements with each module offering several options
- Full realization of benefits from the deployment of the operational improvements, the different components-ASBU enablers- identified and selected by Stakeholders

Aviation System Block Upgrades



Threads Block0 to Block 3

	MODULE CAPABILITY	REALIZED OPERATIONAL CONCEPT	TARGET PERFORMANCE BENEFIT	3
APTA	Airport accessibility			
WAKE	Wake turbulence separation			
RSEQ	Runway sequencing	FULL AMAN/DMAN/SMAN	AUDDODT ODERATIONS	
SURF	Surface operations	AMAN/DMAN/SMAN	AIRPORT OPERATIONS	
ACDM	Airport collaborative decision-making			
RATS	Remote ATS			
FICE	FF-ICE			
DATM	Digital ATM information	FULL FF-ICE	INTEROPERABLE	
SWIM	System-wide information management	FULL FF-ICE	INTEROPERABLE SYSTEMS & DATA	
AMET	Advanced MET information			
FRTO	Free-route operations			
NOPS	Network operations			
ASUR	Alternative surveillance			
ASEP	Airborne separation	COMPLEXITY	GLOBALLY	
OPFL	Optimum flight levels	COMPLEXITY MANAGEMENT	GLOBALLY COLLABORATIVE ATM	
ACAS	Airborne collision avoidance systems			
SNET	Safety nets			
CDO	Continuous descent			
	operations			
тво	Trajectory-based operations	FULL TRAJECTORY-BASED OPERATIONS	EFFICIENT FLIGHT PATHS	
cco	Continuous climb operations	OPERATIONS	FLIGHT PATHS	
5/20/23	Remotely piloted aircraft systems	CNS/ATM PRIDA SW		

COMMUNICATION SYSTEMS

Conventional

- VHF; HF; ATS-DS; AFTN; AIDPS; VCCS
- Future Satellite based and highly digitized:
- VHF Datalink-VDL Mode"s" II and IV
- CPDLC; AMSS; ATN- any link; AIXM (SWIM)



NAVIGATION AIDS

- Conventional:
- NDB; VOR; DME; VDF; ILS/MLS
- Future SATELLITE BASED
- GNSS- GPS, GLONASS, GALILEO, BE DOU
- WGS-84; GBAS- WAAS, EGNOS, MSAS, GAGAN
- -En-route and CAT I at Airport; CAT I; ABAS

SURVEILLANCE

- CONVENTIONAL
- PSR; SSR; MSSR; MLAT; SMR
- Future SATELLITE Based
- ADS-C: ARINC or SITA Link; Service provider and Position reports
- ADS-B Aircraft broadcast positions and other information
- Gnd stations receive and display; Separation standards
- Via satellite; ASMGCS: Sensors and links, Space based ADS-B

THREADS

- The ASBU threads have been categorized in 3 groups:
- Operational threads: ACDM, APTA, NOPS...
- Information threads: SWIM, AMET, DAIM, FICE,...
- Technology threads: COMS, COMI, NAVS, ASUR
- Higher airspace operation improvements have also been reflected as elements in other threads.
- The roadmaps have become technology threads to show the dependencies on them of the other ASBU elements.
- The Trajectory Based Operations thread has been updated based on the integrating concept, its elements are the elements from the operational threads.

ASBU implementation

- Results-oriented decision makers set priorities and determine appropriate trade-offs, Support optimum resource allocation while maintaining an acceptable level of safety performance, Promotes transparency and accountability among stakeholders.
- Globally harmonized performance management process based on six welldefined steps. Use cyclic six-steps method to identify optimum solutions based on operational requirements and performance needs so that the expectations of the aviation community can be met
- At a global level, the performance ambitions and a conceptual roadmap was the result. States and Regions should, in collaboration with Stake holders, develop national and regional air navigation plans adapted to their specific operational requirements and performance needs.
- System Performance Assessment is an automated tool to guide the user on the application of the six-steps method at a local level.

5/20/23

Conclusion

- The strategic ICAO objective of Air Navigation Capacity and Efficiency aims at ensuring that Air traffic requirements never overtake Air Navigation Capacity
- Continuous stakeholder studies ensure that systems and operations are continuously updated
- The ASBU methodology as covered by the Global Air Navigation Plan summarises current plans of developing and implementing Air Navigation Systems beyond 2030.

References

- Radio Regulations 2020
- Handbook on Radio Frequency Spectrum requirements for Civil Aviation ICAO Doc 9718
- Manual on testing of Radio Navigation Aids ICAO Doc 8071 vol 1.
- Manual on testing of Satellite based Aids ICAO Doc 8071 vol 2
- ICAO Annex 10 to the Chicago convention.
- GANP ICAO Doc 9750
- AFI ANP ICAO Doc 7474



Thank you