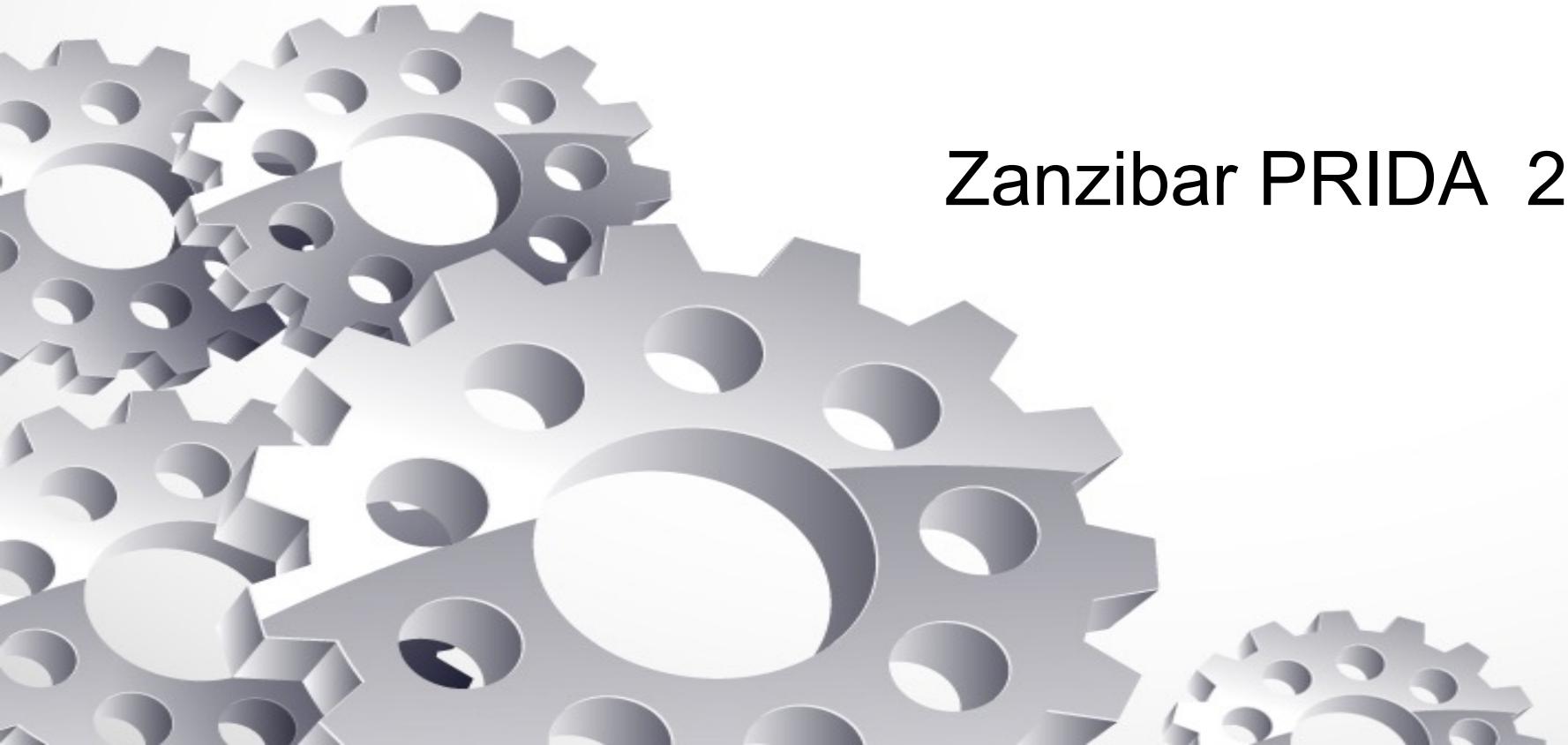
Current and future airport communication systems

Zanzibar PRIDA 25-27 April 2023



CONTENTS

- Objective
- Aviation Systems Block Upgrades
- Communications
- Navigation Aids
- Surveillance
- Threads
- ASBU implementation

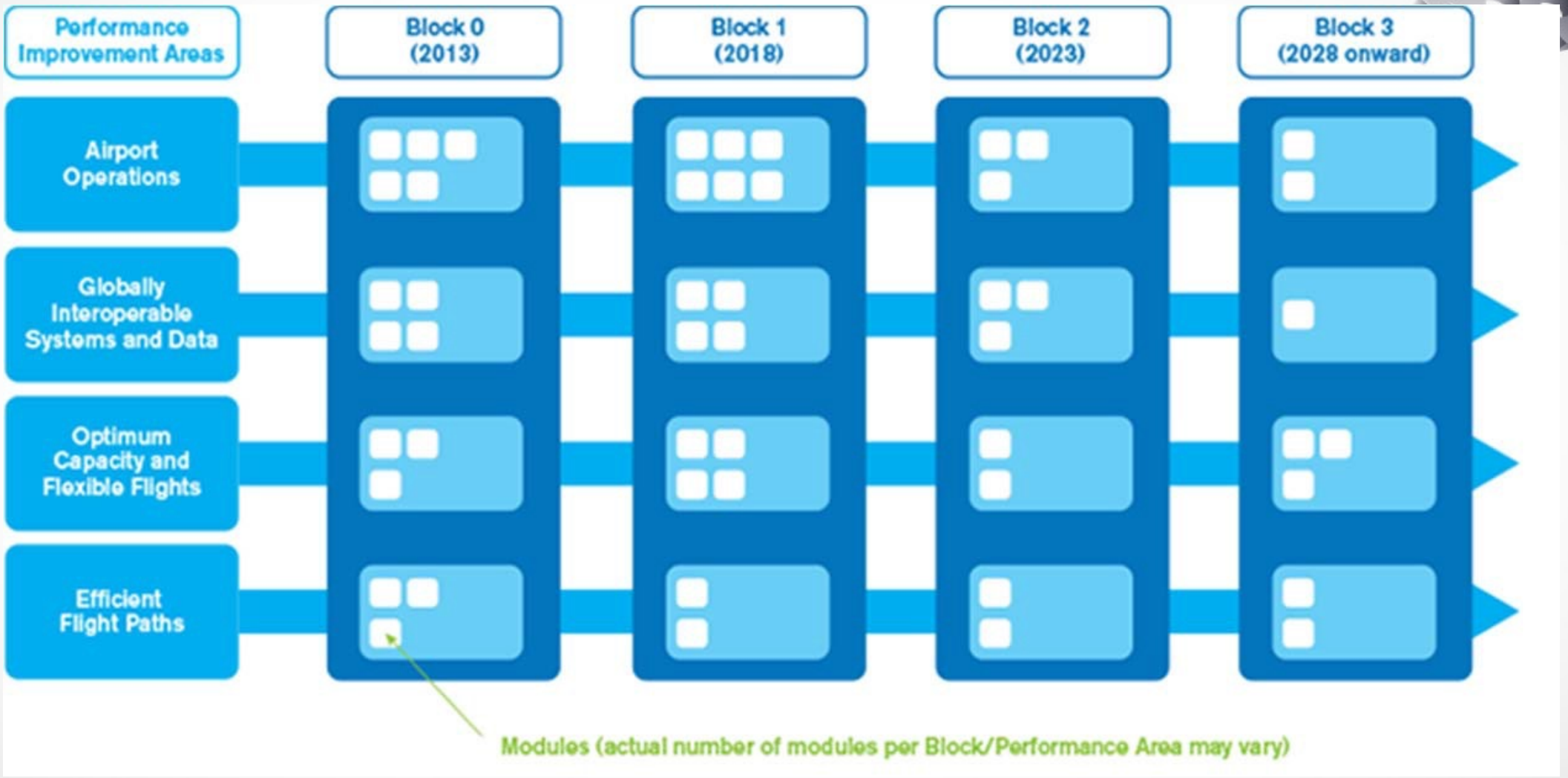
Objective

Familiarise with current and future airport communication Systems

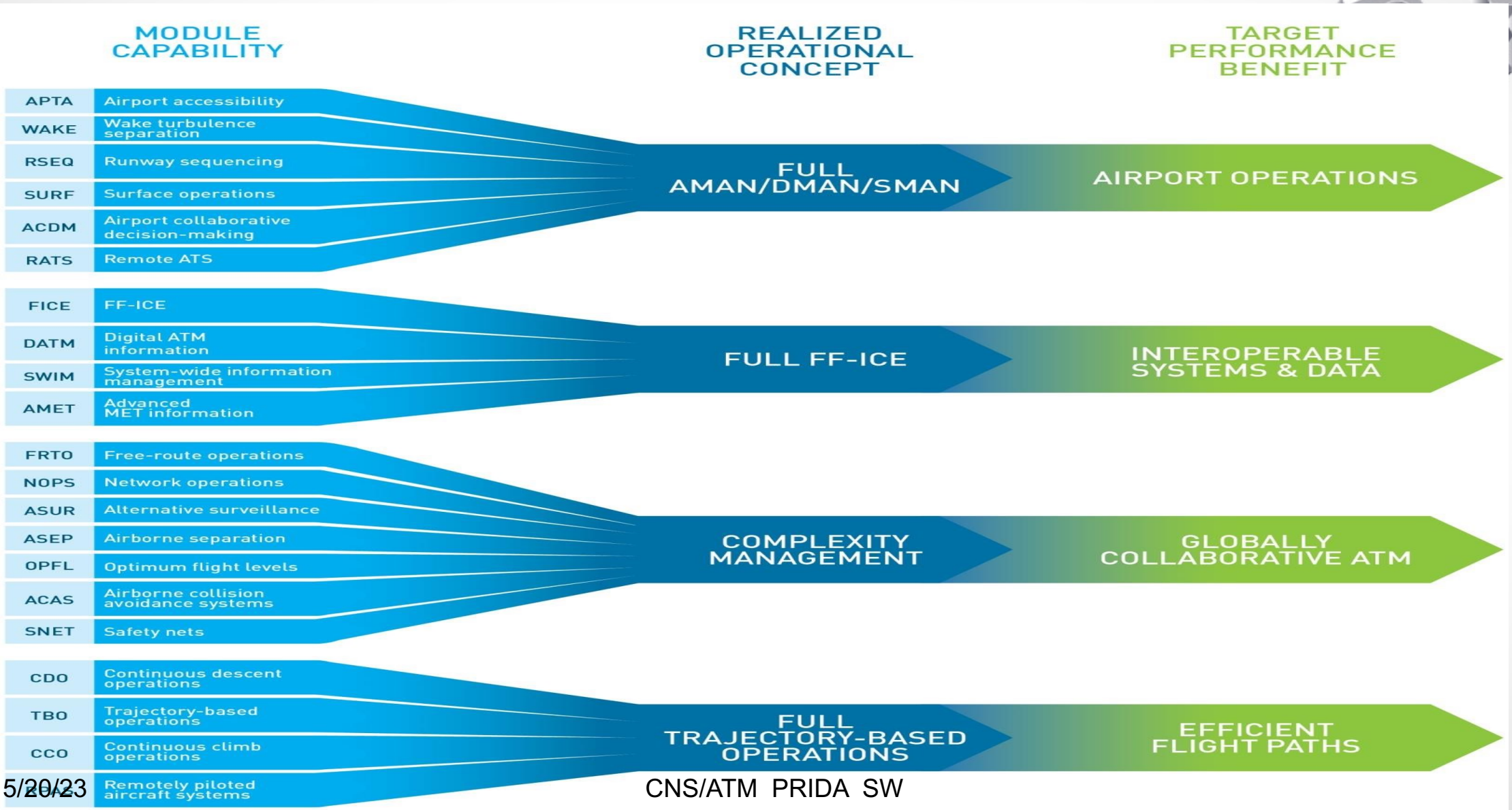
ASBU Framework

- 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



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 well-defined 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.

Conclusion

- The strategic ICAO objecctive 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