ICAO Aviation System Block Upgrade (ASBU) Approach and the need to update Training Curricula and Programs

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Regional Officer/ Communication, Navigation and Surveillance

AGENDA

- 12th Air Navigation Conference results
- 4th edition of the Global Air Navigation Plan
- Aviation System Block Upgrades
- Regional and Global reporting
- Update of regional Training Programs, Plans and Curricula

12th Air Navigation Conference
Summary of Discussions

- Common understanding for future air navigation system
- Harmonization of ATM modernization
- Formalize future of infrastructure & equipage
- Endorsement of revised ICAO Global Air Navigation Plan (GANP)
- Agreement of Aviation System Block Upgrades (ASBU)

AN-Conf/12 : Outcomes

Item 1 Strategic Issues in Support of One Sky

- Revised draft Fourth Edition of the Global Air Navigation Plan (Doc 9750, GANP)
- Associated technology roadmaps

AN-Conf/12 : Outcomes

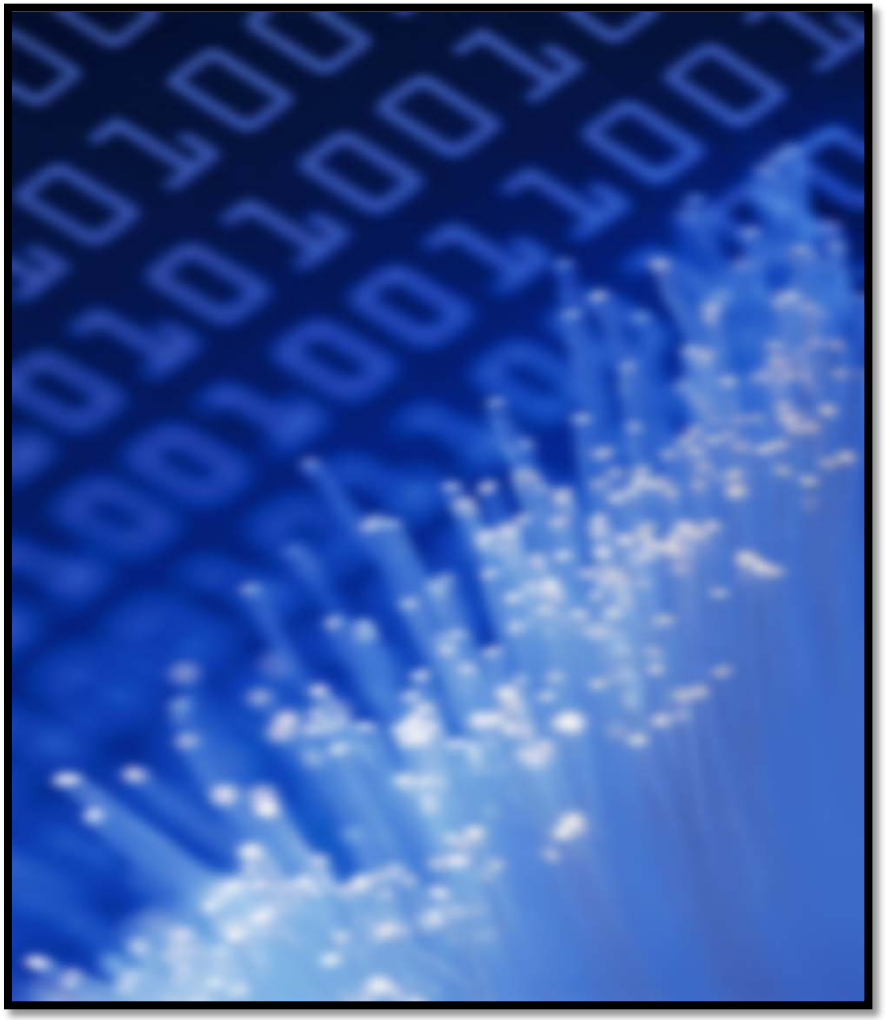
Item 2: Improving Airport Performance

- Conference supported module on:
  - Integration of arrival/departure/surface management
  - Increasing use of PBN and GBAS based instrument procedures
  - Optimized management of wake turbulence separation
  - Enhanced surface surveillance
  - Airport collaborative decision-making

AN-Conf/12 : Outcomes

Item 3: Interoperability & Data – SWIM

- Conference supported module on:
  - Application of SWIM
  - FF-ICE
  - Integration of aeronautical and ATM information



AN-Conf/12 : Outcomes

Item 4: Optimum Capacity & Efficiency

- Conference supported module on:
  - Network Operations
  - Airborne separation
  - Airborne collision avoidance systems & ground-based safety nets
  - The integration of remotely piloted aircraft into non-segregated airspace
  - Meteorological information supporting enhanced operational safety and efficiency

AN-Conf/12 : Outcomes

Item 5: Efficient Flight Paths – through TBO

- Conference supported module on:
  - Improved flexibility and efficiency in descent profiles
  - Improved flexibility and efficiency in climb profiles
  - Data link surveillance and communications supporting TBO
  - TBO– 4D TRAD

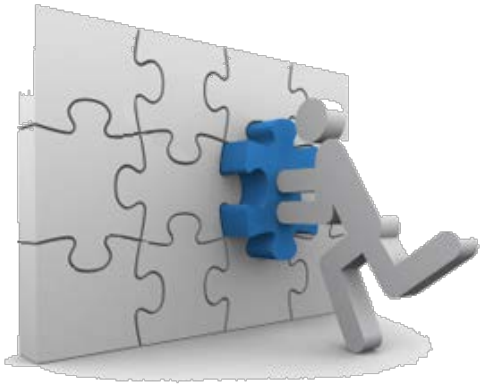
AN-Conf/12 : Outcomes
Item 6: Future Direction

- ***Conference recommendations on:***
  - Way forward in implementing updated GANP by PIRGs and States
  - Development of Regional eANP
  - In human performance context, determined where there may be need for global standardization or future emphasis
  - Multi-party approaches to standards development that take advantage of coordination and collaboration within the ICAO/State relationship, and between ICAO and s bodies

Next Steps coming from AN-Conf/12

Environmental & Operational Assessments

- ✓ ***Committee on Aviation Environmental Protection (CAEP)*** modeling environmental benefits of ASBU Block 0 modules.
- ✓ ***IATA*** assessing the operational benefits



• Technical Work

- ✓ Air Navigation Information Management (IM) Divisional Meeting
- ✓ Aviation Data Link Symposium: Now and Tomorrow
- ✓ Four priority areas (CDM/ATFM/Continuous Operations (CCO)/ Continuous Descent Operations (CDO))
- ✓ Use of the ICAO Fuel Savings Estimation Tool (IFSET)
- ✓ An end-to-end system demonstration of new air traffic management concepts

Next Steps by PIRGs and States

Recommendation 6/1 – Regional performance framework – planning methodologies and tools

That States and PIRGs:

a) finalize the alignment of regional air navigation plans with the Fourth Edition of the *Global Air Navigation Plan* (Doc 9750, GANP) by May 2014;

b) focus on implementing aviation system block upgrade Block 0 Modules according to their operational needs, recognizing that these modules are ready for deployment;

c) use the eANPs as the primary tool to assist in the implementation of the agreed regional planning framework for air navigation services and facilities;

d) involve **regulatory and industry personnel** during all stages of planning and implementation of aviation system block upgrade modules;

e) develop action plans to address the identified impediments to air traffic management modernization as part of aviation system block upgrade planning and implementation activities;

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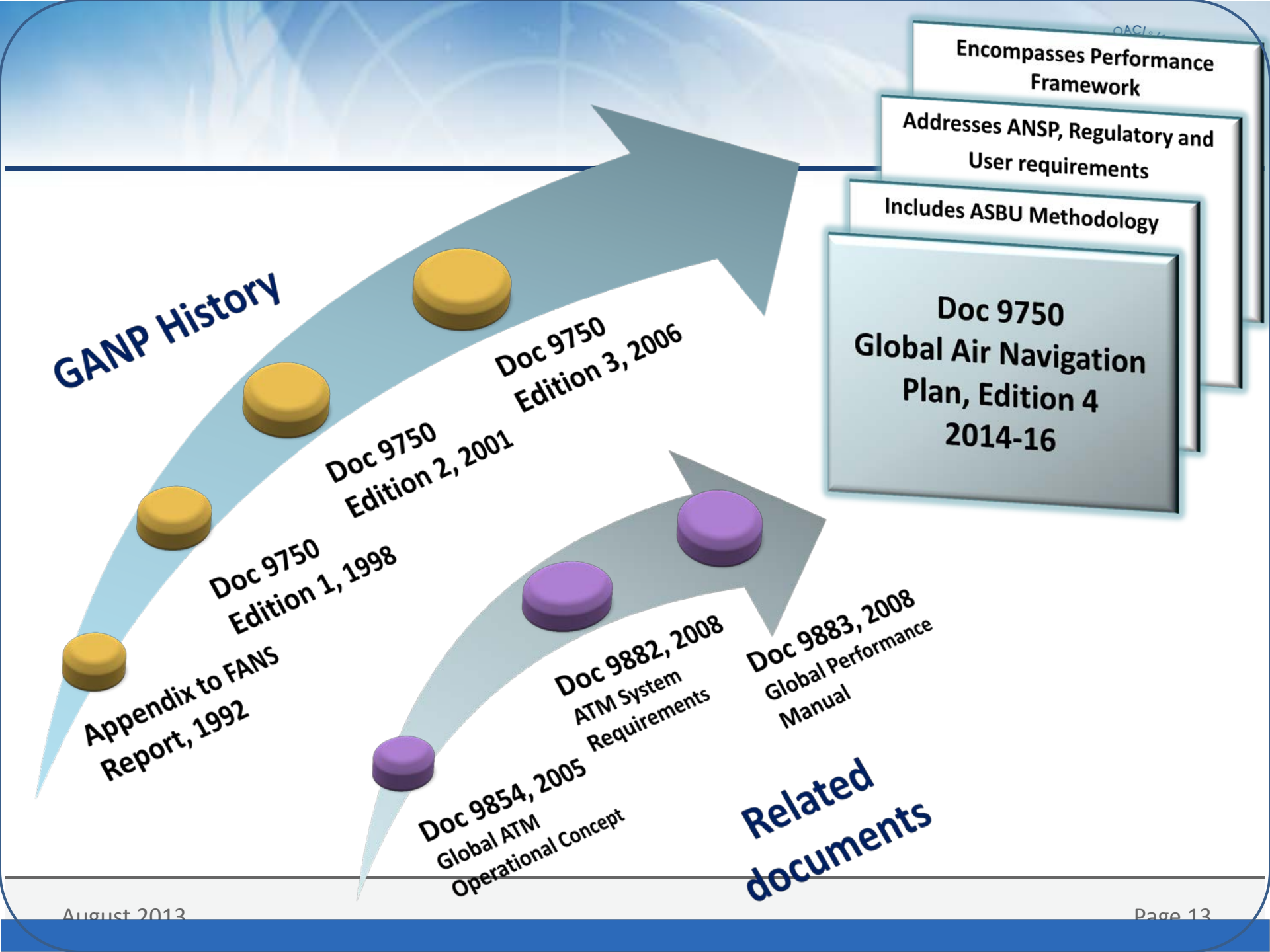

GANP History
Appendix to FANS Report, 1992
Doc 9750 Edition 1, 1998
Doc 9750 Edition 2, 2001
Doc 9750 Edition 3, 2006
Encompasses Performance Framework
Addresses ANSP, Regulatory and User requirements
Includes ASBU Methodology
Doc 9750 Global Air Navigation Plan, Edition 4 2014-16
Doc 9854, 2005 Global ATM Operational Concept
Doc 9882, 2008 ATM System Requirements
Doc 9883, 2008 Global Performance Manual
Related documents

GANP- Contents (DOC 9750)

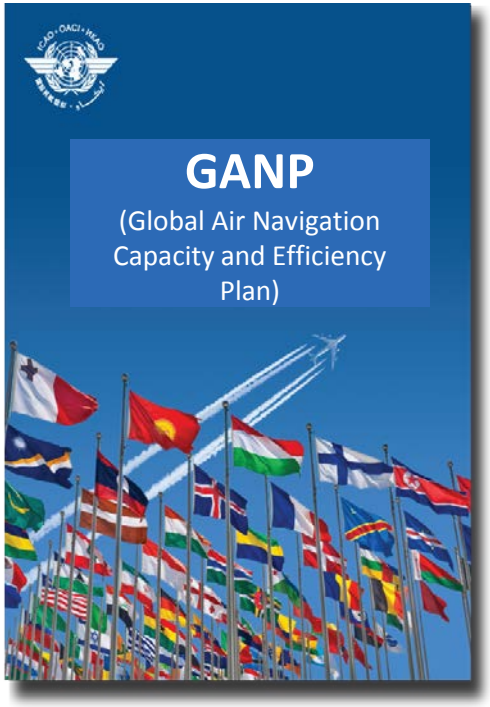
Strategic Objective: Capacity and Efficiency

Executive summary

Introduction: Presentation of GANP
Chapter 1: ICAO's Ten Key Air Navigation Policy Principles
Chapter 2: Implementation
Chapter 3: Aviation System Performance

Appendices:

Appendix 1 Global Air Navigation Plan Evolution and Governance
Appendix 2 Aviation System Block Upgrades
Appendix 3 Hyperlinked Online Support Documentation
Appendix 4 Frequency Spectrum Considerations
Appendix 5 Technology Roadmaps
Appendix 6 Module Dependencies
Appendix 7 Acronym Glossary



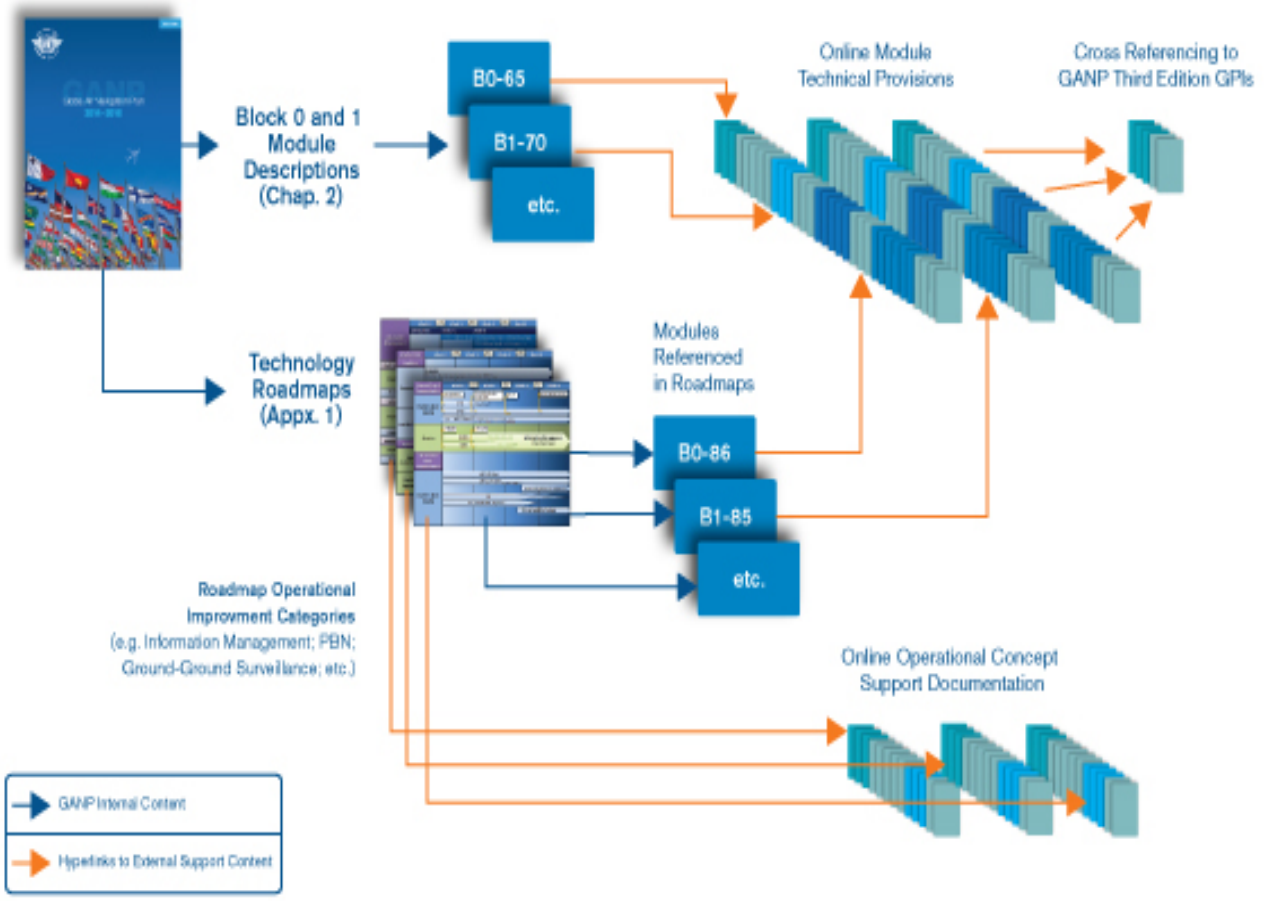
GANP Policy Principles

1. Commitment to the Implementation of ICAO's Strategic Objectives and KPAs
2. Aviation Safety is the highest priority
3. Tiered Approach to Air Navigation Planning
4. Global Air Traffic Management Operational Concept (GATMOC)
5. Global Air Navigation Priorities
6. Regional and State Air Navigation Priorities
7. Aviation System Block Upgrades (ASBUs), Modules and Roadmaps
8. Use of ASBU Blocks and Modules
9. Cost Benefit and Financial issues
10. Review and Evaluation of Air Navigation Planning

Mapping of the hyperlinked documents

New GANP characteristics

- Scope extends to airspace users and regulators
- E (electronic)–based
- Separate technology roadmaps for C, N, S, IM and avionics
- Implementation is based on near, medium and long terms through Blocks 0, 1, 2 and 3 timeframes
- Supported by web based Regional ANPs, called eANPs
- ICAO Fuel Savings Estimation Tool (IFSET) will be a part of the revised global plan



A Shared Vision for the Future

- **Working Strategically**
  - **Annual reports on the Strategic Objectives**

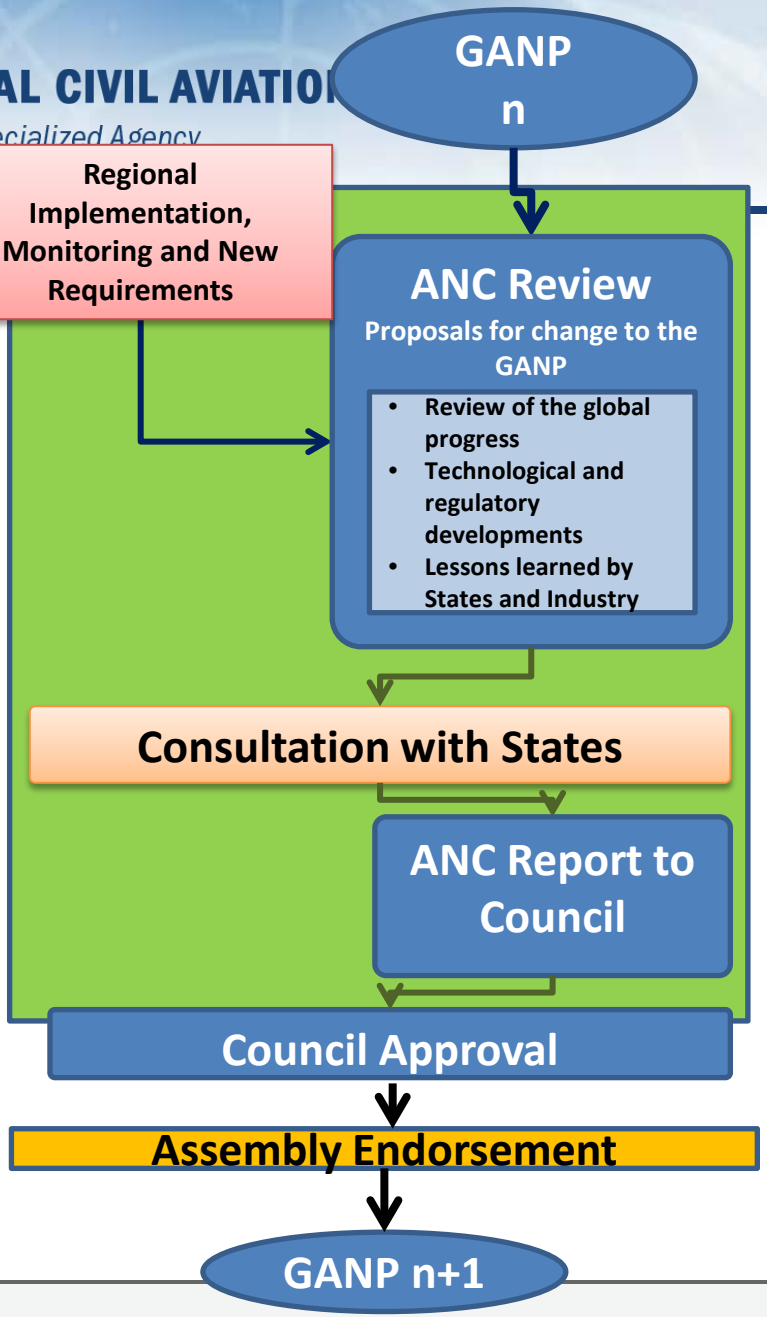
Draft Developed in collaboration with industry partners -completed

ANC Review Spring 2013-completed

Council Approval Spring 2013-completed

Assembly Endorsement Due in Nov 2013

GANP Update Process



Following Recommendation 1/1 b) of the 12th Air Navigation Conference, the GANP will be submitted to States before approval.

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- 12th Air Navigation Conference results
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- Conclusions

ASBU: New National/Regional Plans - interoperability challenges

- Air traffic growth expands rapidly every 15 years
- Growth can be a double-edged sword. Challenge is how to achieve both safety and operational improvements
- The 37th session of ICAO General Assembly advised to redouble our efforts with focus on ensuring interoperability of systems while at the same time maintaining or enhancing aviation safety.

Many Regional and National ATM modernization programmes are being developed worldwide

- They are following ICAO's Global Air Navigation Plan and Operational Concept, but nevertheless they are different in their own way
- thus resulting in interoperability challenges

ASBU: Global Harmonized Framework

Global framework is needed to ensure:

- Safety is maintained and enhanced
- ATM improvement programs are harmonized
- Barriers to future efficiency and environmental gains are removed, at reasonable cost

- Initial NextGen/SESAR Symposium (2008)
- Convened Standards Organization Roundtable (2009)
- Established working agreements with Standards Organizations on shared work programmes (2010)

What is the Basis for Block Upgrades?

- Foundation of blocks originates from existing, near term implementation plans and extracted from (examples):

SESAR

CARATS
Collaborative Actions for Renovation of Air Traffic Systems

- Aligned with ICAO ATM Operational Concept
- Block upgrades will allow structured approach to meet regional and local needs , while considering associated business cases
- They reflect recognition that all modules are not required in all airspaces

ASBU methodology

Current methodology

- Scope covers only ground equipment for ANSPs
- Planning based on short and medium term
- Implementation process is through GPIs

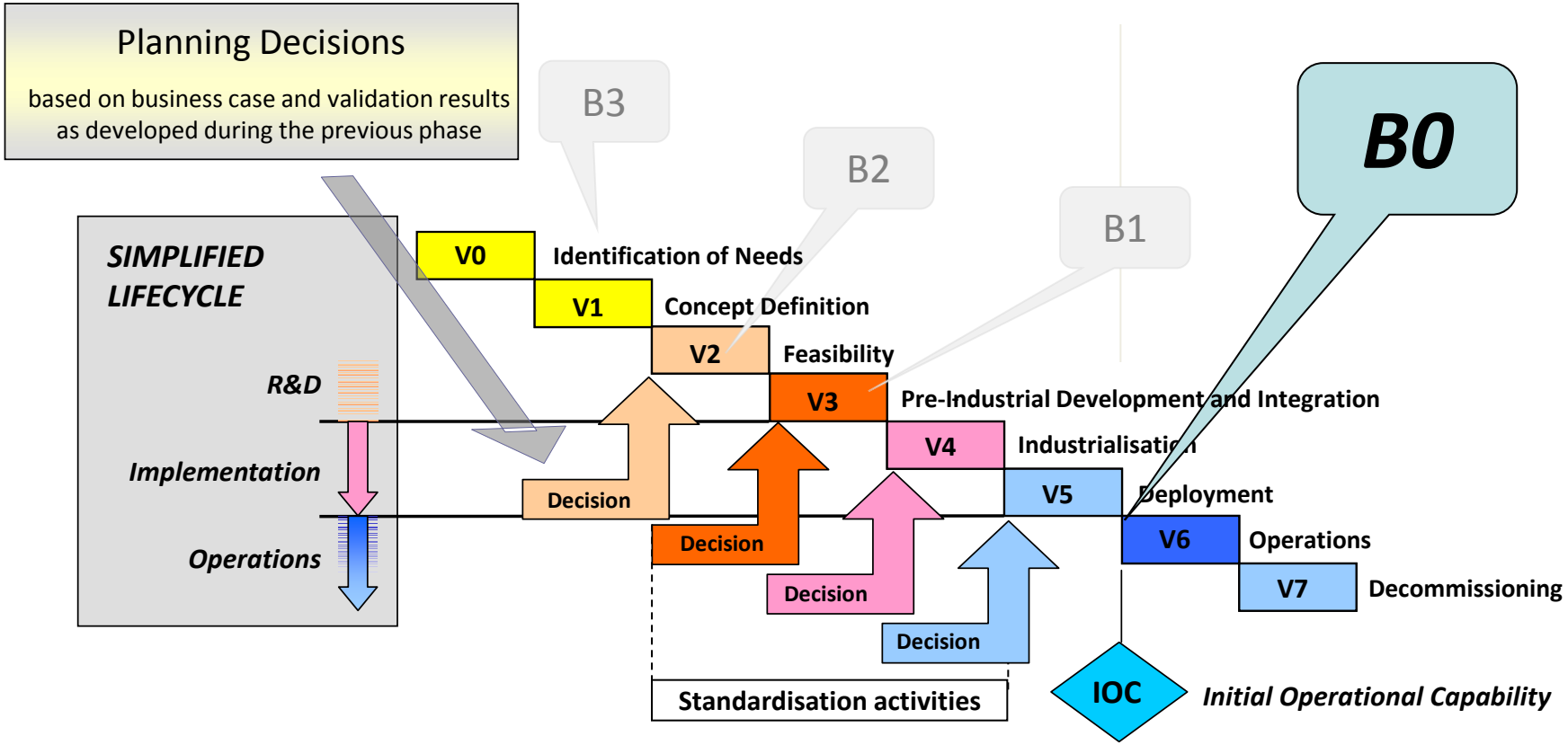
ASBU methodology

- Scope extends to airspace users and regulators
- Planning based on short, medium and long terms
- Implementation process is through Blocks and corresponding modules

ASBU Advantages

- Takes into account all related issues such as air/ground Systems, air/ground procedures, air/ground regulatory requirements and business case formulation,
- One stop planning at the same time flexible and scalable
- Modules provide a series of measurable, operational performance improvements, which could be introduced as needed

ASBU: Block Maturity Lifecycle



B0: Capabilities available in 2013

Aviation System Block Upgrades – Definition

Each Module is defined as follows:

- Intended *Operational Improvement/Metric* to determine success
- Necessary *Procedures*/Air and Ground
- Necessary *Technology*/Air and Ground
- Positive *Business Case* per Upgrade
- *Regulatory Approval* Plan/Air and Ground
- *Well understood* by a Global Demonstration Trial
  - All synchronized to allow initial implementation
  - Won't matter ***when or where*** implemented

ASBU: PIAs

- 4 Main Performance improvement areas (B0)
  - Airport Operations (5 modules)
  - Globally interoperable systems & data (3 modules)
  - Optimum capacity & flexible flights (7 modules)
  - Efficient flight path (3 modules)

- Block 0 will serve as the enabler and foundation for the envisioned future aviation systems.

ASBU: Global Readiness Checklist

Global Readiness Checklist		Status (ready or date)
	Standards Readiness	√
	Avionics Availability	√
	Infrastructure Availability	√
	Ground Automation Availability	√
	Procedures Available	√
	Operations Approvals	√

- Each Module is evaluated for its readiness
- If any component is not found to be ready it moves to a future Block for implementation
- Those Modules that are not specifically ready at a Block release are noted as “dates of readiness”

All Block 0 Modules Have Met the Readiness Criteria

ASBU – Checklist

Performance Improvement Area 2:
Globally Interoperable Systems and Data – Through Globally Interoperable System Wide Information Management

<table>
<tr><td colspan="6"><u>Title of the Module:</u>
B0-FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration</td></tr>
<tr><td colspan="2"><u>Elements:</u>
1. AIDC
2. (Not included in the Module but added here as they are closely linked to this Module) AMHS/IPS</td><td colspan="2"><u>Equipage/Air</u>
- Nil</td><td colspan="2"><u>Equipage/Ground</u>
- A set of AIDC messages in FDPS
- AFTN (AMHS/IPS)</td></tr>
<tr><td colspan="6">Implementation monitoring and intended performance impact</td></tr>
<tr><td rowspan="2"><u>Implementation progress</u></td><td colspan="5">Qualitative performance benefits associated with five main KPAs only</td></tr>
<tr><td><u>KPA-Access/Equity</u>
Not Applicable</td><td><u>KPA-Capacity</u>
Reduced controller workload and increased data integrity supporting reduced separations translating directly to cross sector or boundary capacity flow increases.</td><td><u>KPA-Efficiency</u>
The reduced separation can also be used to more frequently offer aircraft flight levels closer to the optimum; in certain cases, this also translates into reduced en-route holding.</td><td><u>KPA-Environment</u>
Not Applicable</td><td><u>KPA-Safety</u>
Better knowledge of more accurate flight plan information.

.</td></tr>
<tr><td>1. Indicator:
Percentage of ATS units with AIDC

2. Indicator:
States implementing AMHS/IPS</td><td></td><td></td><td></td><td></td><td></td></tr>
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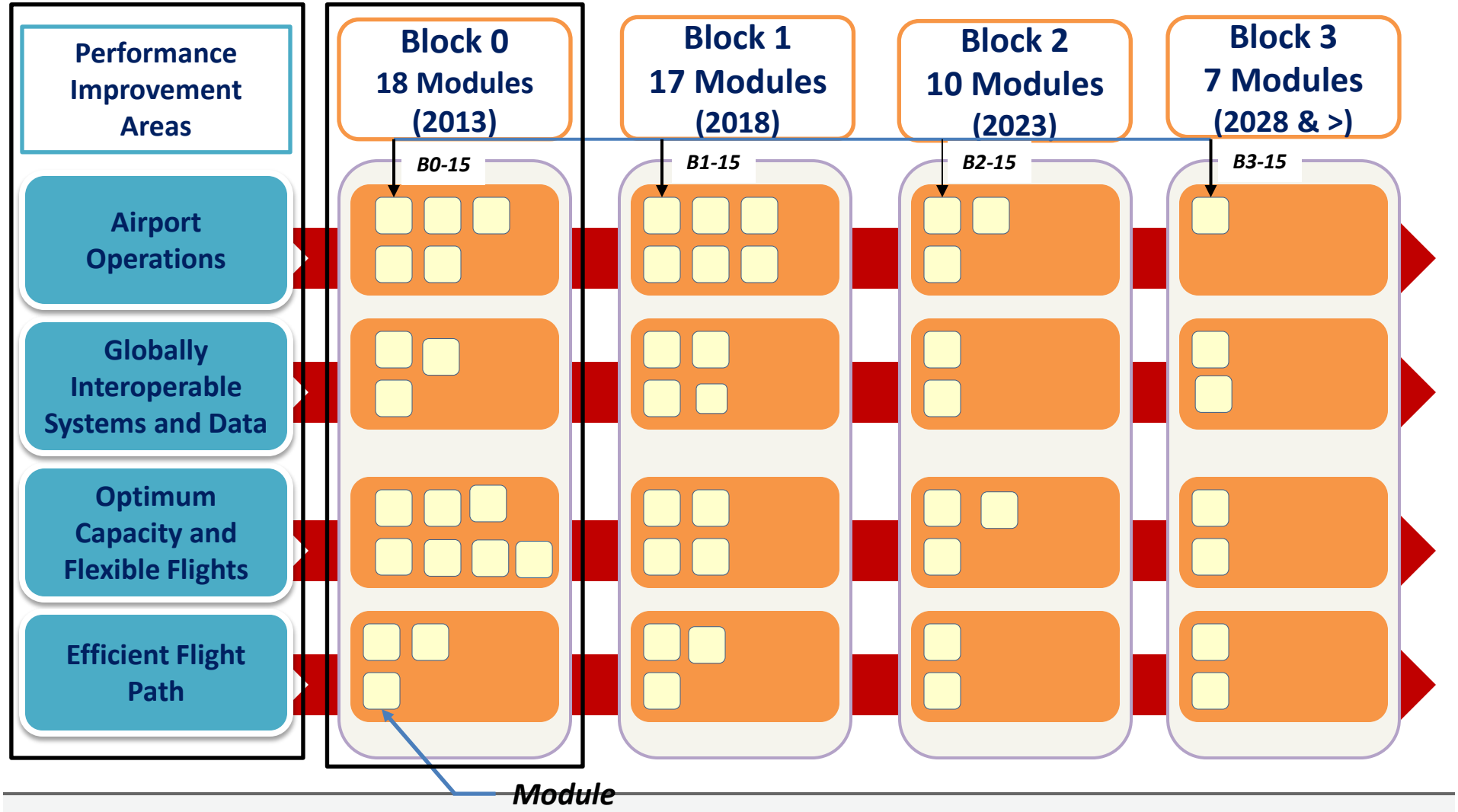
ASBU: Understanding the Relationships



Threads Between Modules… and Across Blocks

Airport Operations

Block 0	Block 1	Block 2	Block 3
Improved Traffic Flow through Runway Metering	Improved Approach & Departure Management through Integration	Linked AMAN/ DMAN	Integrated AMAN/ DMAN/ SMAN
Available Now	2018	2023	2028>

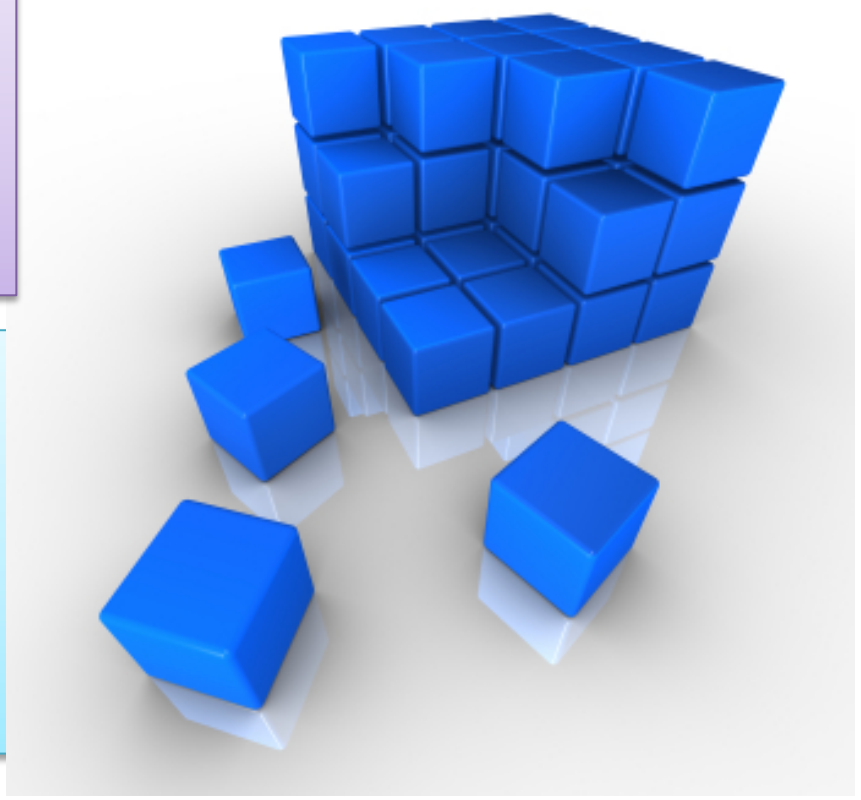
New ASBU Modules Identifiers: Number vrs acronym

Old ASBU Modules Numbering System	New ASBU Modules Identifiers	
65	APTA	Airport Accessibility
70	WAKE	Wake Turbulence Separation
15	RSEQ	Runway Sequencing
75	SURF	Surface Operations
80	ACDM	Airport Collaborative Decision Making
81	RATS	Remote Air Traffic Services
25	FICE	FF/ICE
30	DAIM	Digital Aeronautical Management
31	SWIM	System Wide Information Management
105	AMET	Advanced Meteorological Information
10	FRTO	Free Route Operations
35	NOPS	Network Operations
84	ASUR	Alternative Surveillance
85	ASEP	Airborne Separation
86	OPFL	Optimum Flight Levels
101	ACAS	Airborne Collision Avoidance Systems
102	SNET	Ground-Based Safety Nets
05	CDO	Continuous Descent Operations
40	TBO	Trajectory-Based Operations
20	CCO	Continuous Climb Operations
90	RPAS	Remotely Piloted Aircraft Systems

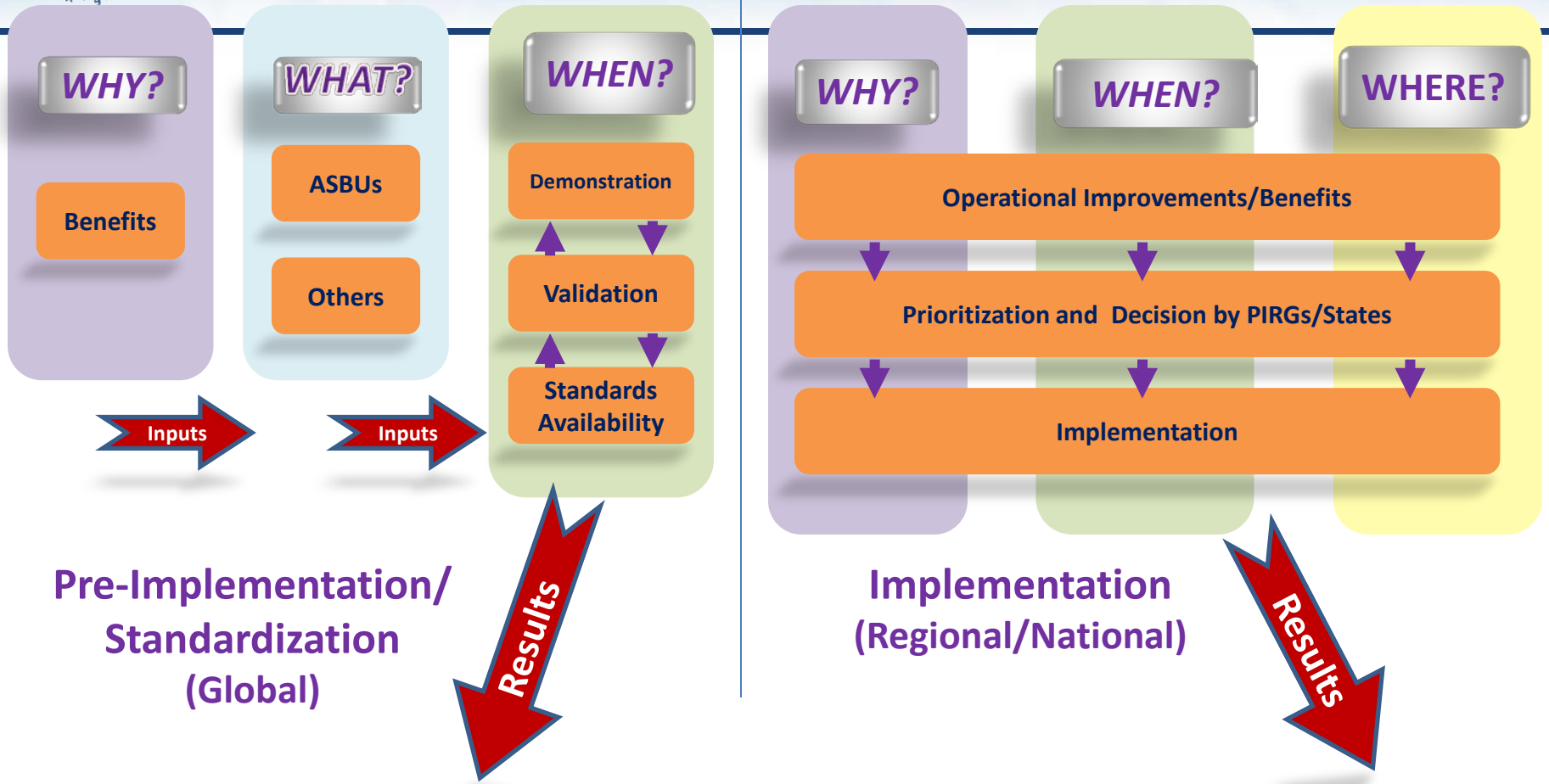
ASBU Approach

- Timing/sizing of the block upgrades are in response to
  - need for Mature standards,
  - Integrated air and ground solutions and
  - Establishment of positive business cases
- Block "0" optimizes current onboard equipage and provides baseline
- Modules lacking specific maturity are purposefully placed in later blocks
- Block upgrades respond to issue of non-homogeneous areas

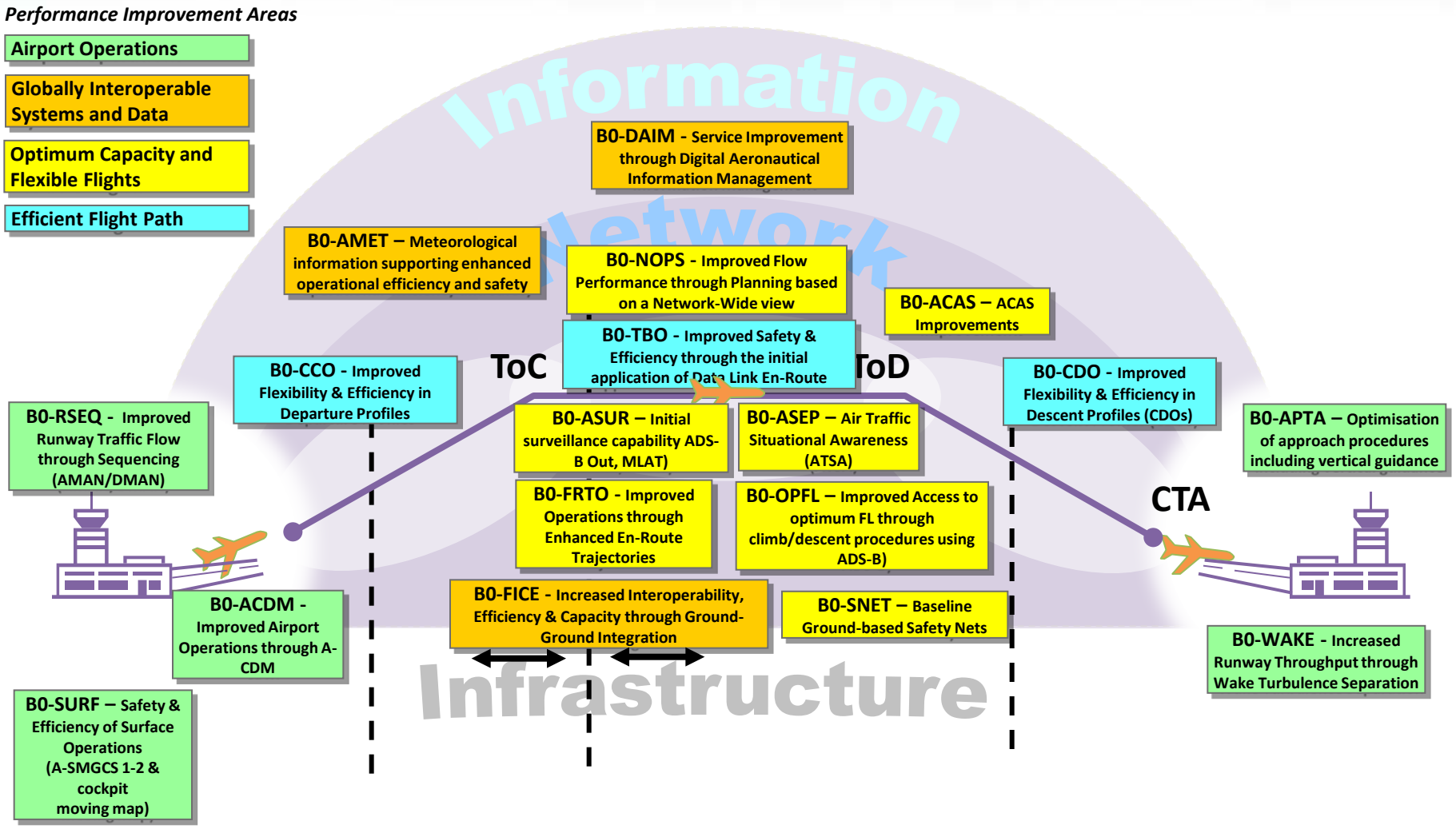
- Addresses ANSP, aircraft and regularity requirements
- Identified 4 improvement areas
- Implementation through Block Upgrades (0, 1, 2, and 3) each comprising a number of modules
- Each module is explained in a standardized 4-5 pages template (checklist)
  - provide a series of measurable, operational performance improvements
  - Organized into flexible & scalable building blocks
  - Could be introduced as needed
  - all modules are not required in all airspaces



NAM/CAR Regions adopted 15 Block 0 modules for the 2013-2018 period (RPBANIP)


WHY?
Benefits
WHAT?
ASBUs
Others
WHEN?
Demonstration
Validation
Standards Availability
Inputs
Inputs
Pre-Implementation/ Standardization (Global)
Results
WHY?
WHEN?
WHERE?
Operational Improvements/Benefits
Prioritization and Decision by PIRGs/States
Implementation
Implementation (Regional/National)
Results
ASBU Implementation Timeline

ASBU Block 0 in Perspective



Airport Operations (PIA 1)

B0-15 RSEQ
Improved Runway Traffic Flow through Sequencing (AMAN/DMAN)
Time-based metering to sequence departing and arriving flights

B0-65 APTA Optimization of Approach Procedures including Vertical Guidance
This is the first step toward universal implementation of GNSS-based approaches

B0-70 WAKE Increased Runway Throughput through Wake Turbulence Separation
Improved throughput on departure and arrival runways through the revision of current ICAO wake vortex separation minima and procedures (from 3 to 6 categories :re -categorization and CSPR)

B0-75 SURF
Improved Runway Safety (A-SMGCS)
Airport surface surveillance for ANSP

B0-80 ACDM
Improved Airport Operations through ACDM
Airport operational improvements through the way operational partners at airports work together

The combined Block 0 Modules reduce fuel consumption and noise by improving arrival efficiencies and improving information sharing

Globally Interoperable Systems and Data (PIA 2)

B0-25 FICE
Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration
Supports the coordination of ground-ground data communication between ATSU based on ATS Inter-facility Data Communication (AIDC) defined by ICO Document 9694

B0-105 AMET
Meteorological information supporting enhanced operational efficiency and safety
This module includes meteorological information supporting ATM decision support such as WAFS, IAVW, TCAC, Aerodrome warnings, Wind shear and SIGMET. This module enables the reliable identification of applicable ATM solutions when meteorological conditions are impacting (observed) or expected to impact (forecast) aerodromes or airspace

B0-30 DAIM
Service Improvement through Digital Aeronautical Information Management
Transition from product centric to data centric. Introduction of digital processing and management of information, by the implementation of AIS/AIM making use of AIXM, moving to electronic AIP and better quality and availability of data

In Block 0 we improve overall operations and continue to enable Collaborative Decision Making through improved interfacilities communications using standard information formats and baseline Met Services

Optimum Capacity and Flexible Flights (PIA 3)

B0-10: FRTO Improved Operations through Enhanced En-Route Trajectories
Implementation of performance-based navigation (PBN concept) and flex tracking to avoid significant weather and to offer greater fuel efficiency, flexible use of airspace (FUA) through special activity airspace allocation, airspace planning and time-based metering, and collaborative decision-making (CDM) for en-route airspace with increased information exchange among ATM stakeholders

B0-35: NOPS Improved Flow Performance through Planning based on a Network-Wide view
Collaborative ATFM measure to regulate peak flows involving departure slots, managed rate of entry into a given piece of airspace for traffic along a certain axis, requested time at a waypoint or an FIR/sector boundary along the flight.

B0-101 ACAS ACAS Improvements
This addresses short term improvements to the performance of the existing airborne collision avoidance systems (ACAS). Transition form ACAS II version 7.0 to 7.1. Mandatory by Annex 6 provisions.
New- by 1/1/2014 and all by 1/1/2017

B0-85: ASEP Air Traffic Situational Awareness (ATSA)
ATSA provides a cockpit display of a graphical depiction of traffic to assist the pilot in out-the-window visual acquisition of traffic: AIRB and VSA

B0-86: OPFL Improved access to Optimum Flight Levels through Climb/Descent Procedures using ADS-B
The use of In Trail Procedure (ITP) facilitates en-route climb or descent to enable better use of optimal flight levels in environments where a lack of ATC surveillance and/or the large separation minima currently implemented is a limiting factor.

Using procedural concepts (e.g. RNP, FUA, etc.) and Air Traffic Situational Awareness - combined with enhanced planning tools and information sharing, the enroute phase of flight supports additional capacity and flexibility using the Modules of Block 0

Optimum Capacity and Flexible Flights (PIA 3) - Continued

B0-84 – ASUR Initial surveillance capability ADS-B Out, MLAT

Ground surveillance supported by ADS-B OUT and/or wide area multilateration systems will improve safety, especially search and rescue and capacity through separation reductions.

B0-102 – SNET Baseline Ground-based Safety Nets

To monitor the operational environment during airborne phases of flight, the alerts such as Short Term Conflict Alert, Area Proximity Warnings and Minimum Safe Altitude Warnings are proposed in this module. Ground-based safety nets make an essential contribution to safety and remain required as long as the operational concept remains human-centred.

Through ground based safety nets combined with ground surveillance the enroute phase of flight supports additional capacity, flexibility and safety

Efficient Flight Path (PIA 4)

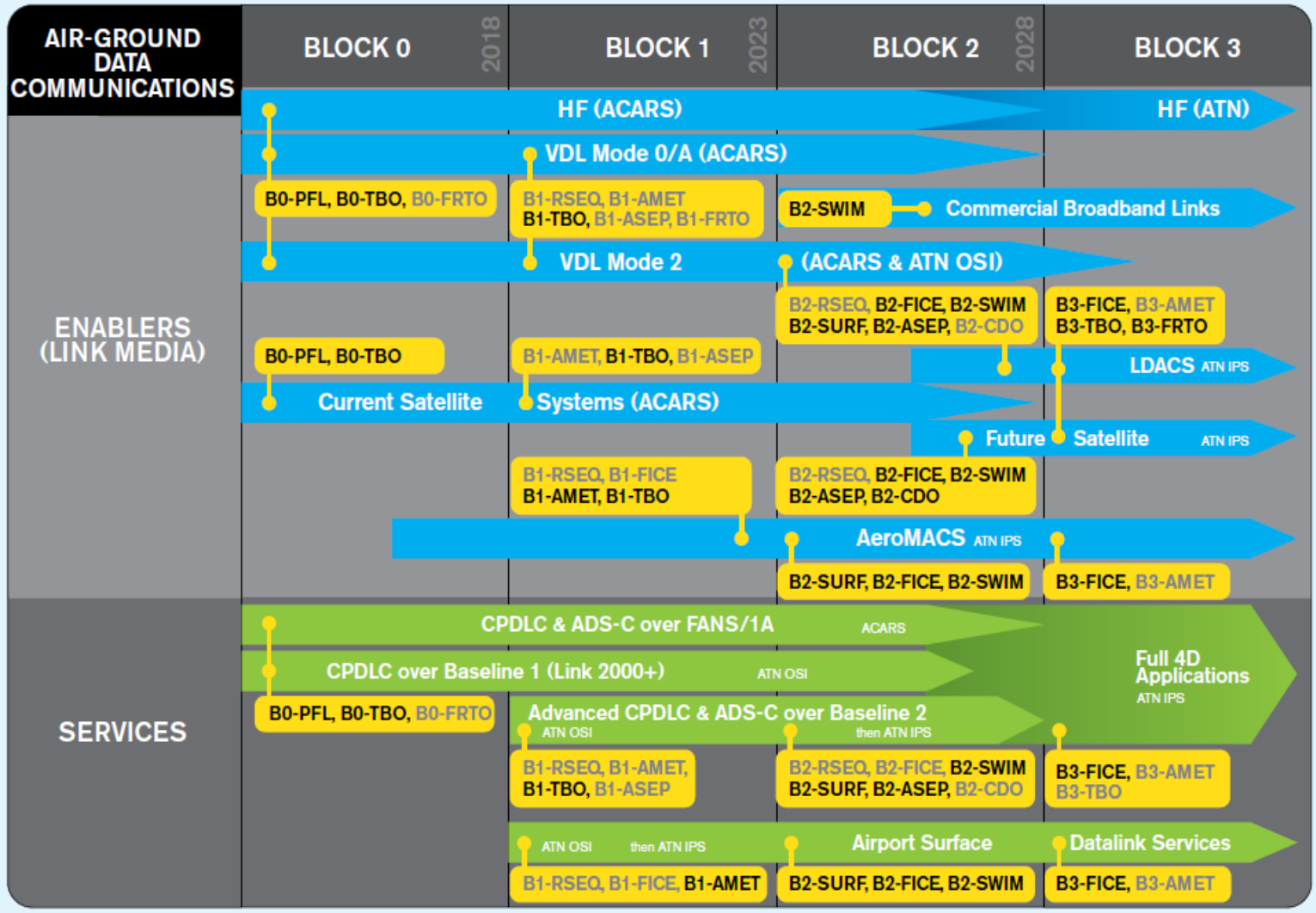
B0-05 CDO
Improved Flexibility and Efficiency in Descent Profiles (CDOs)
It is aircraft operating technique. CDO allows the aircraft to descend continuously from TOD to FAF with minimum engine thrust.

B0-20 CCO
Improved Flexibility and Efficiency in Departure Profiles
Deployment of departure procedures that allow the aircraft to fly their optimum aircraft profile taking account of airspace and traffic complexity with continuous climb operations (CCOs)

B0-40 TBO
Improved Safety and Efficiency through the initial application of Data Link En-Route
Implementation of an initial set of data link applications for surveillance and communications in ATC

The use of procedurally based Optimized Profile Climbs and Descents as well as an initial Data Link Capability helps to establish a Block 0 capability for improved operational efficiencies

CNS/ AIM/ Avionic Roadmaps



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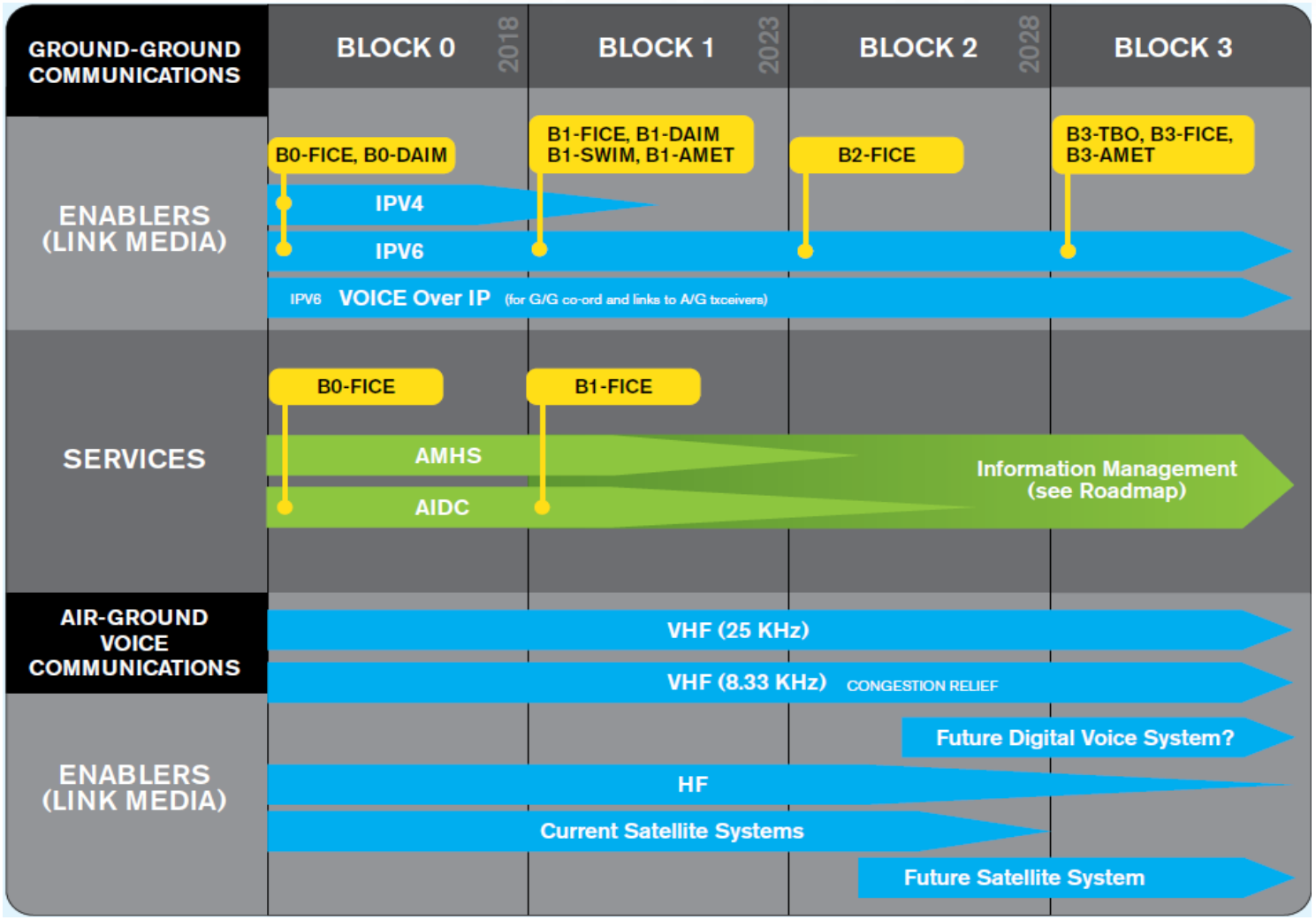

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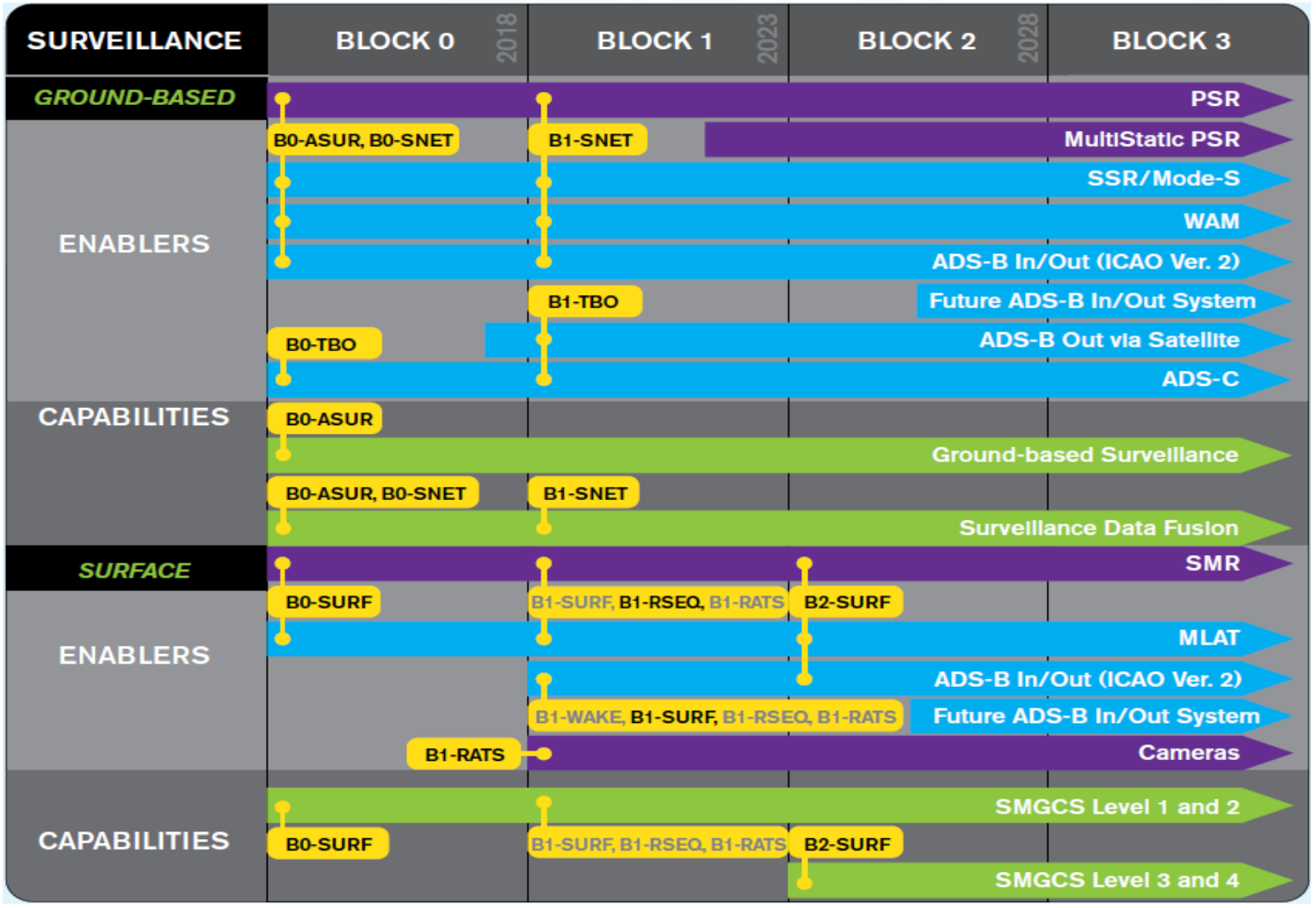

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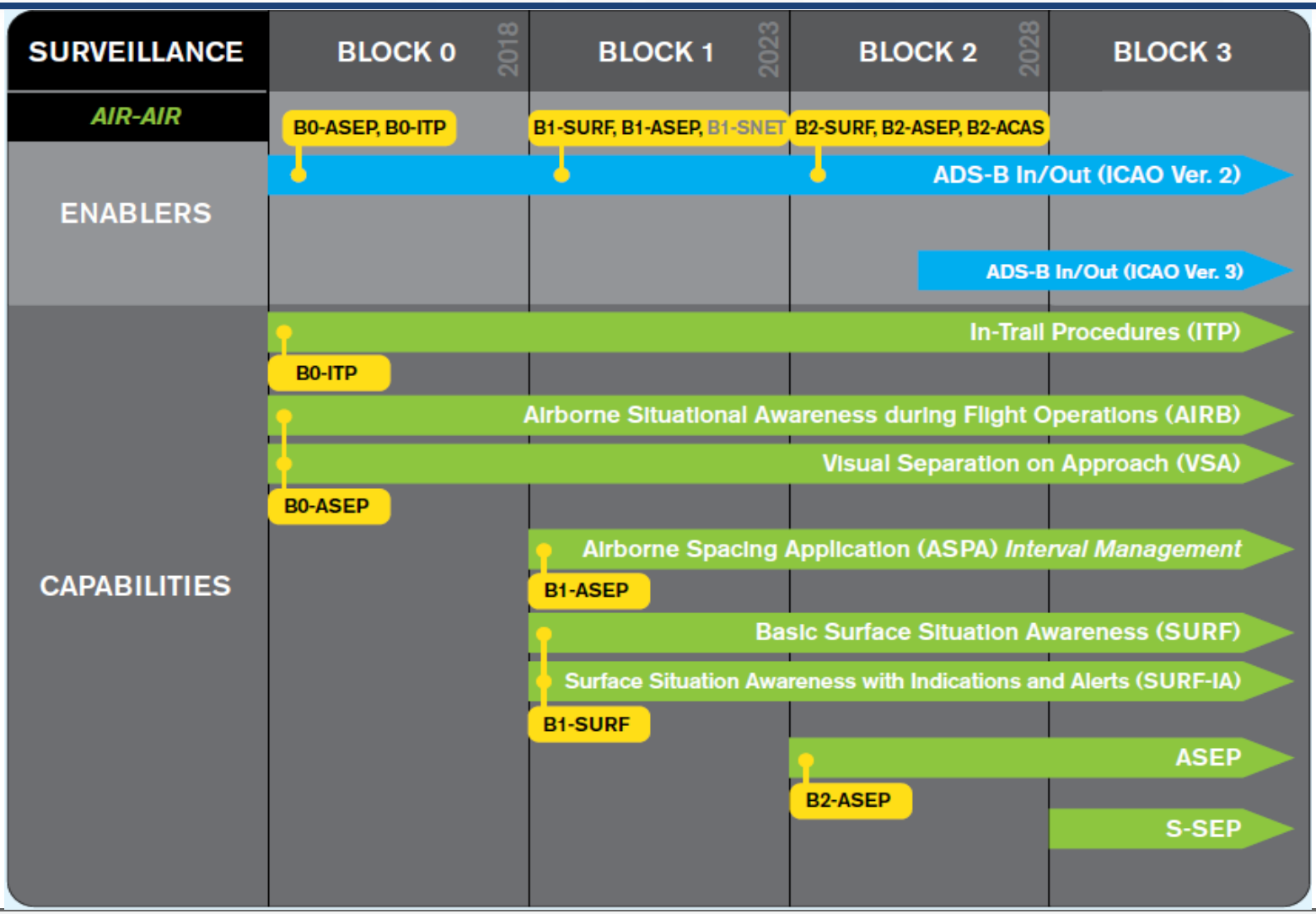

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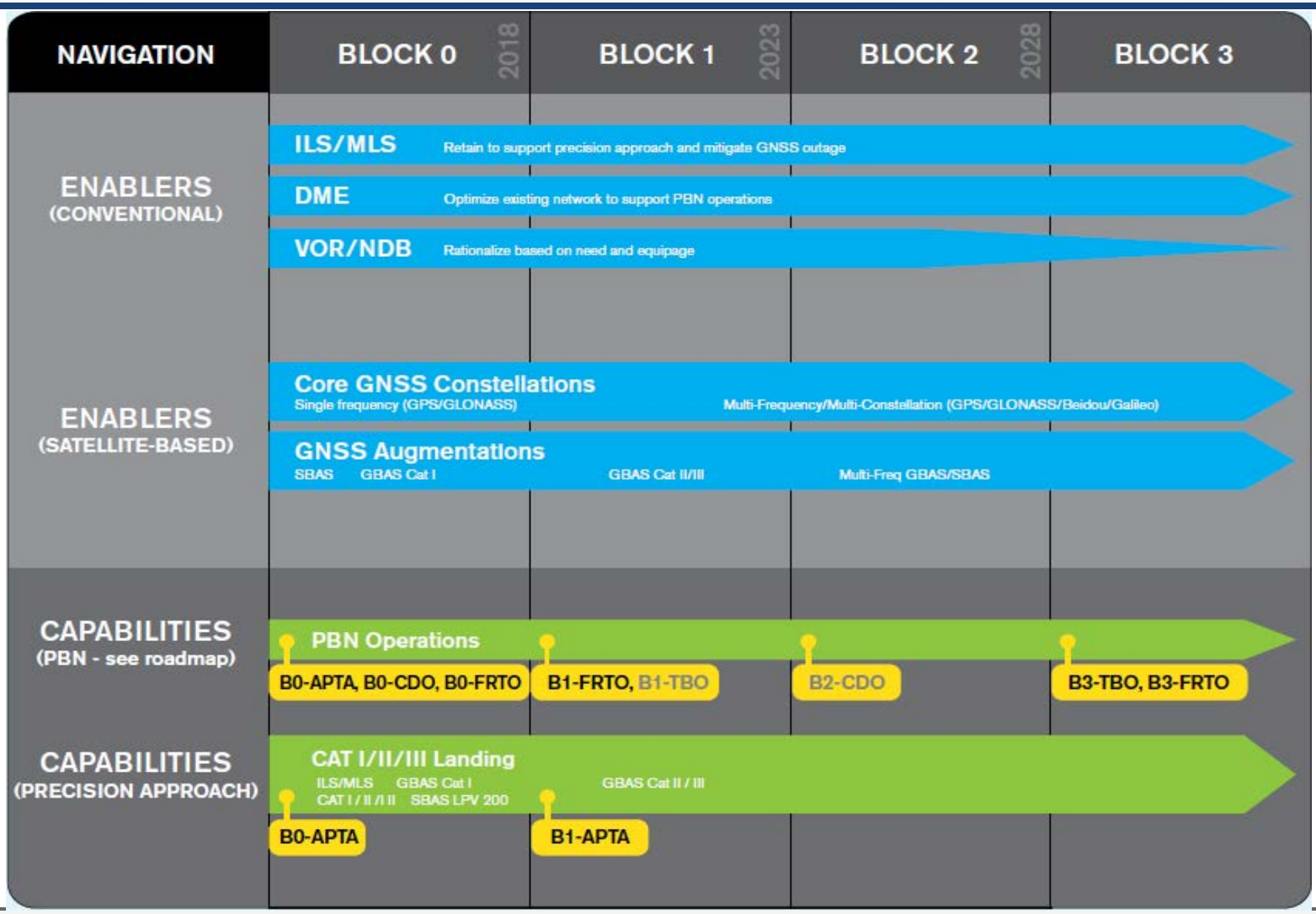

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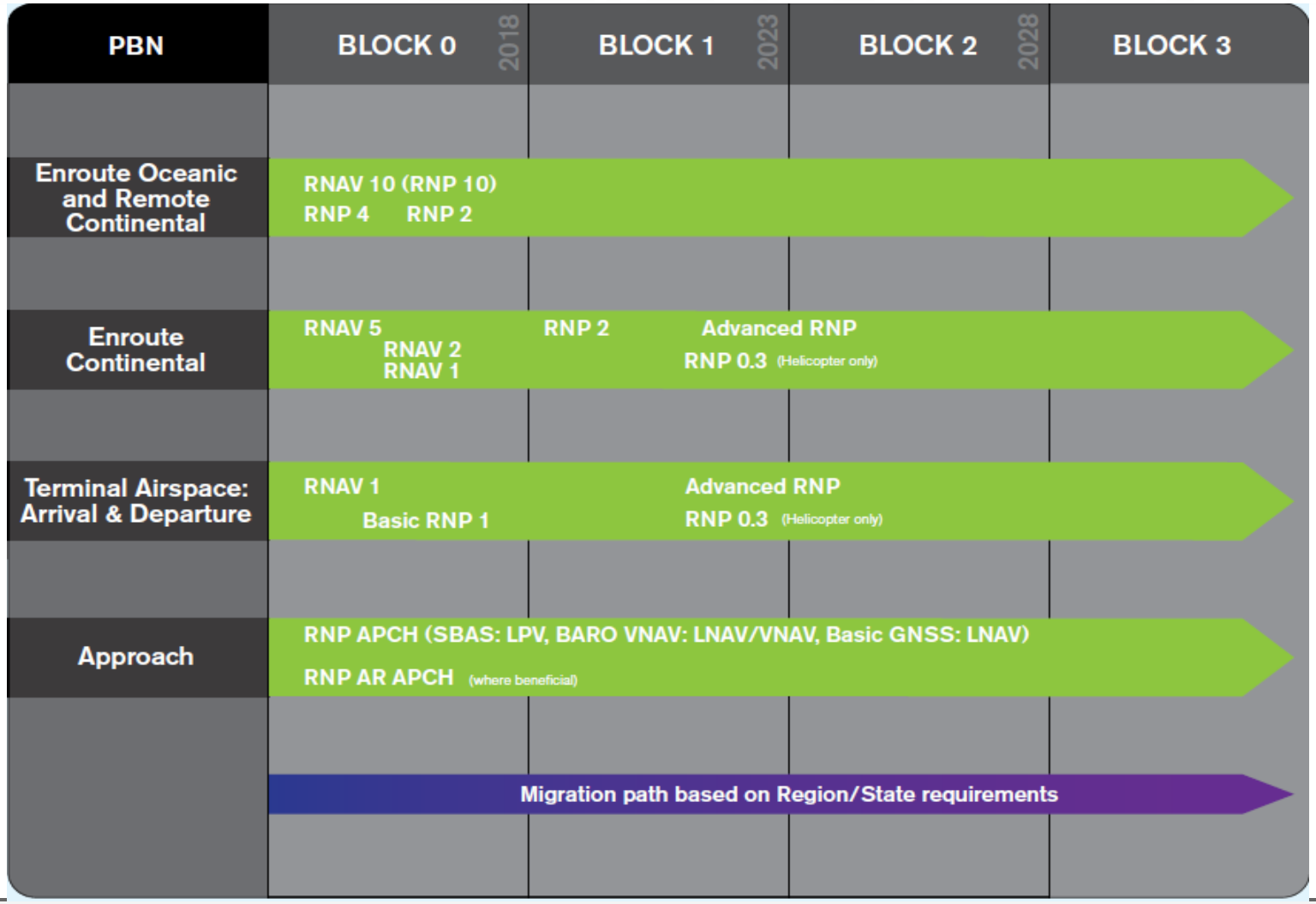

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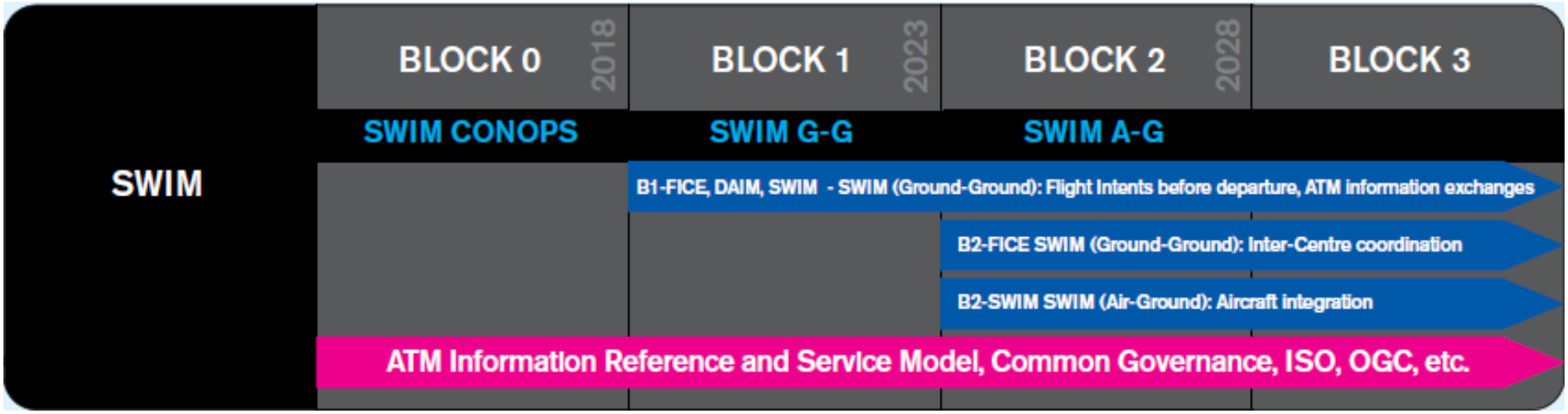

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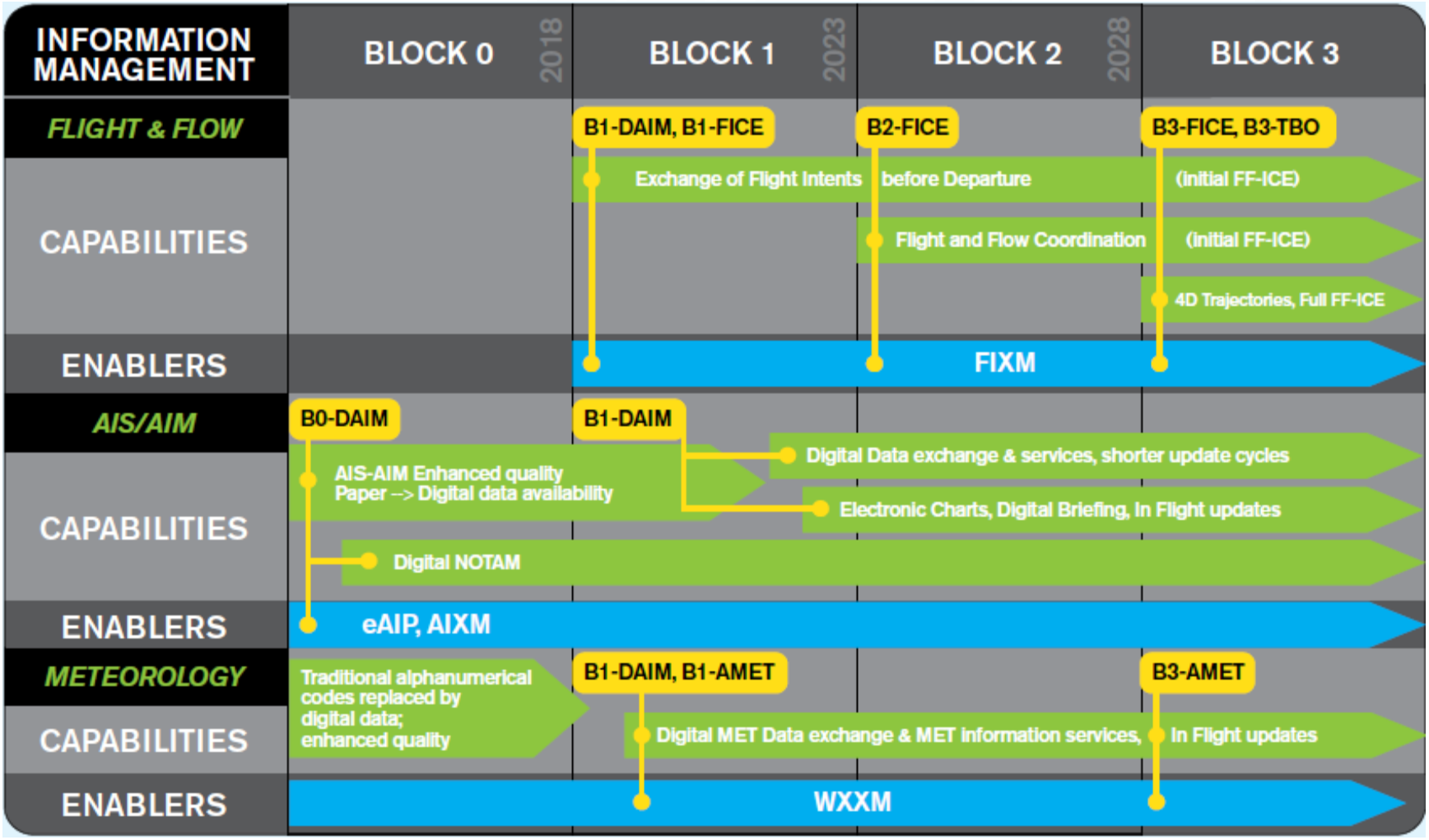

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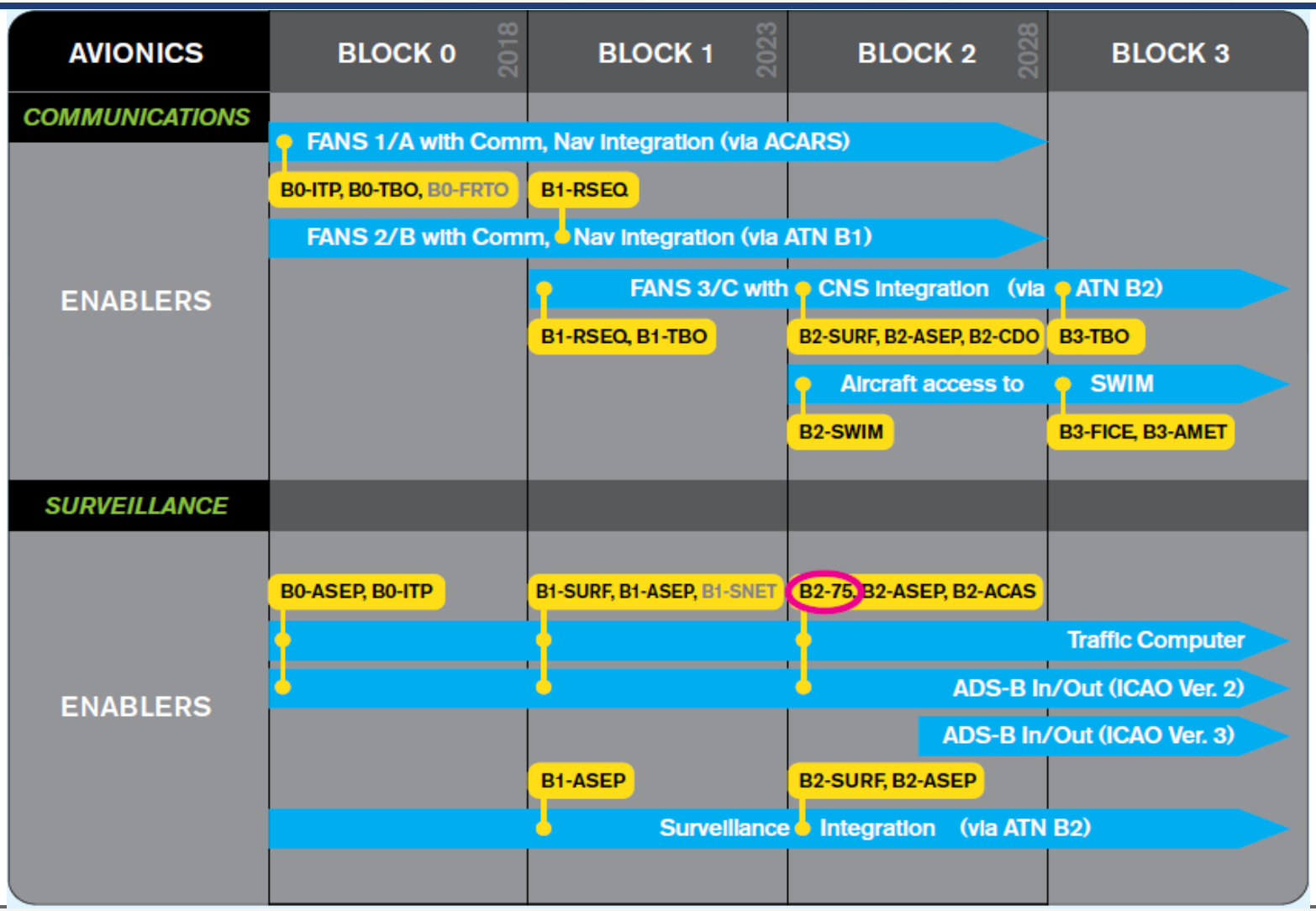

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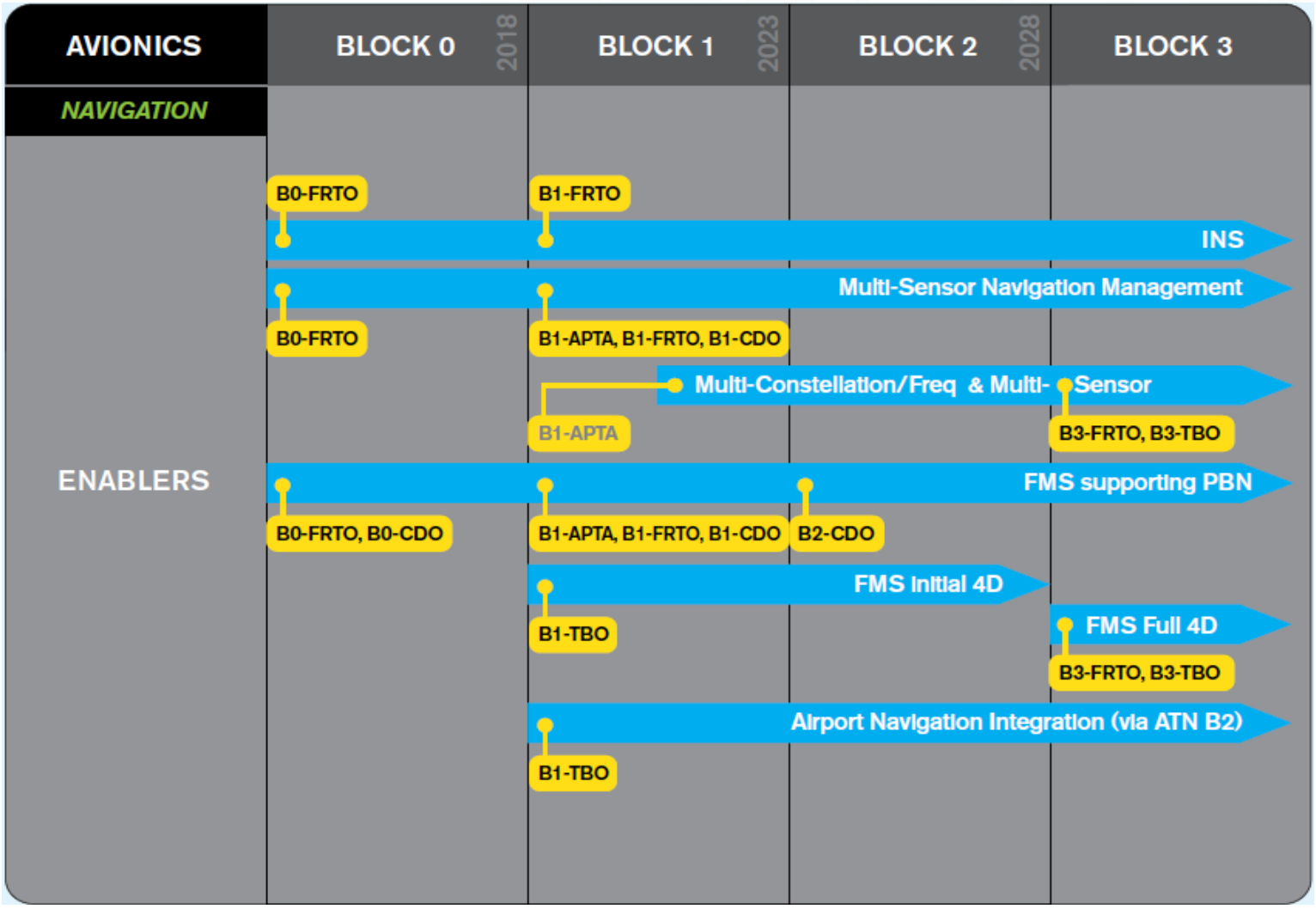
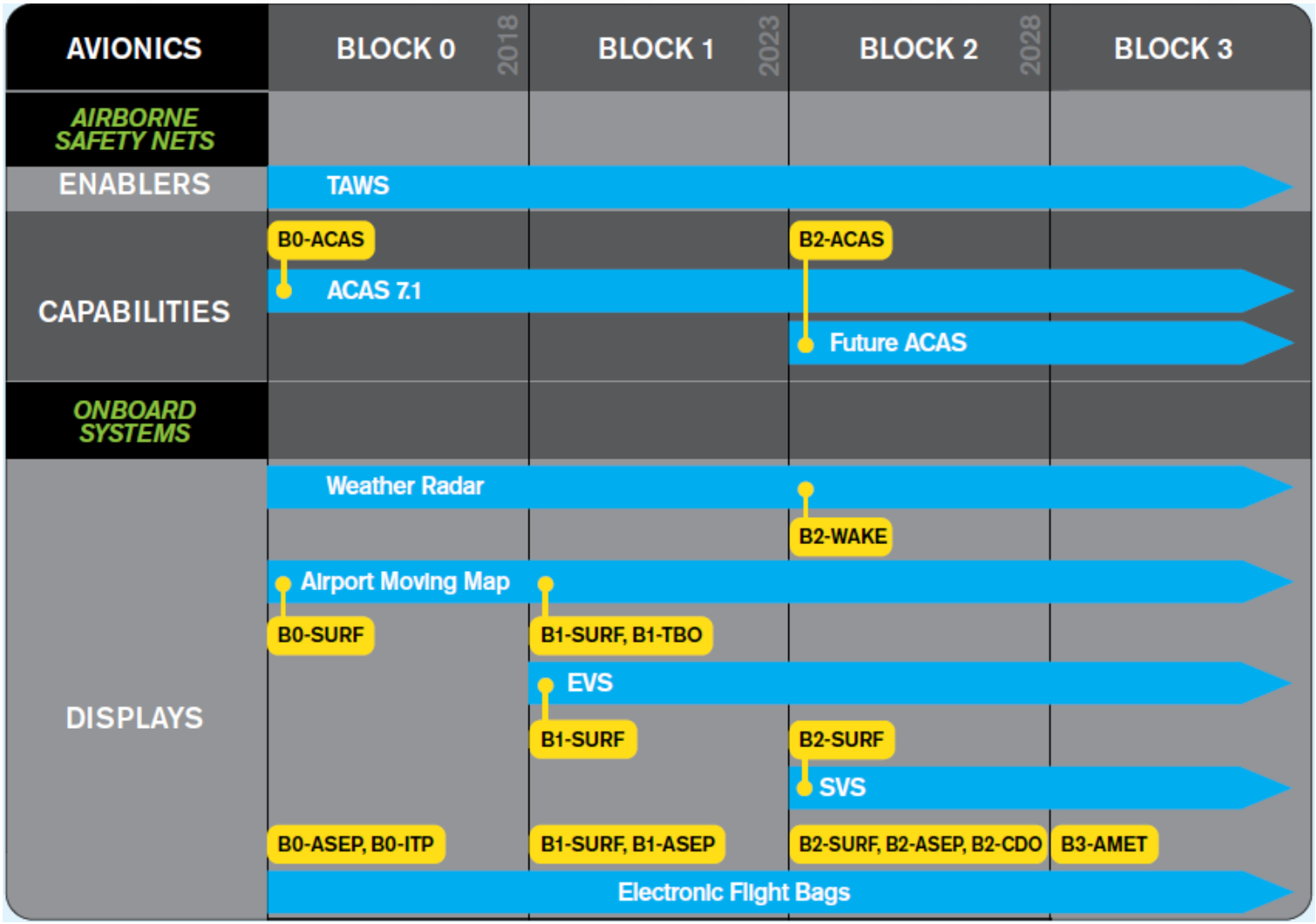


CNS/ AIM/ Avionic Roadmaps



Block 0: Priority

- Block 0 initiatives must leverage on existing on-board avionics
- 3 Priorities have been agreed to by the Global community:
  - Performance Based Navigation (PBN)
  - Continuous Descent Operations (CDO)
  - Continuous Climb Operations (CCO)

- Block 0 risks are minimum
  - Global Readiness Checklist is complete
  - The Modules are well understood and supported
- States need to ensure successful deployment of Block 0
  - If Block 0 is not implemented as a foundation, certain functionalities may not be available as enablers for future blocks
- Identify and resolve policies necessary to enable the future blocks now

ASBU B0 Implementation

The Modules of Block 0 are ready for implementation today

- Standards are ready
- Avionics are ready
- Procedures and Operational Approvals are in place
- The Infrastructure is available
- Ground Automation is ready

Need to ensure that regional implementation of the Blocks or the Modules are well described and ready for implementation

- ICAO and States (training organization, Administration, etc.) to provide training on ASBU approach
- Training entities to update training curricula for ASBU Approach
- Training to ensure interoperability and effective ASBU implementation

AGENDA

- 12th Air Navigation Conference results
- 4th edition of the Global Air Navigation Plan
- Aviation System Block Upgrades
- Regional and Global reporting
- Update of regional Training Programs, Plans and Curricula

The Safety and AN *System*

A Better Way for the Future?

Outlines Global Priorities and Targets

Reviewed by ANC; Approved by Council
Endorsed by Assembly

Feedback loop for continuous improvement

Reporting against Global Priorities

Global Reports (online) Annually
Special Version (print) for Assembly

***PIRG-RASG** agreed to establish by certain dates:*

Safety
(As soon as possible)

Air Navigation
(May 2014)

Adopts Global Priorities, sets additional as needed
Used by PIRGs and RASGs to Measure Performance

Regional Office Updates Dashboard (online) semiannually

Air Navigation Reporting

PROCESS

- PIRGs are progressing with planning and implementation of ASBUs
- The next step calls for an air navigation performance measurement, monitoring and reporting strategy.
- Methodology for reporting
  - States to send data to RO through Air Navigation Report Form (ANRF) or equivalent form/on ongoing basis
  - RO will consolidate data from all States and publish through Regional Performance Dashboard /on ongoing basis
  - HQ will consolidate data from all ROs and publish Global Air Navigation Report/annually

- The current Performance Framework Form (PFF) has been redesigned and aligned with ASBU framework and called the Air Navigation Report Form (ANRF)
- ANRF will be the basis for performance reporting of the ASBU implementation
- The ANRF templates for all the 18 Modules of ASBU Block 0 will be available in the upcoming Regional eANP.

PFF re-designated as ANRF

REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO) Performance Improvement Area 4: Efficient Flight Path – Through Trajectory-based Operations					
ASBU B0-CDO: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	**N**	**N**	**Y**	**Y**	**Y**

ASBUB0- CDO: Implementation Progress	
Elements	**Implementation Status (Ground and Air)**
1. CDO	
2. PBN STARs	

ASBU B0-CDO: Implementation Roadblocks/Issues				
Elements	**Implementation Area**			
	Ground Implementation	**Air Implementation**	**Procedures Availability**	**Operational Approvals**
1. CDO				
2. PBN STARs				

PFF re-designated as ANRF

ASBU B0-CDO: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	**Performance Metrics**
Access & Equity	Not applicable
Capacity	Not applicable
Efficiency	Kilograms of fuel saved per flight
Environment	Kilograms of CO_2 emissions reduced per flight (= KGs fuel saved per flight x 3.157)
Safety	Number of controlled flight into terrain (CFIT) incidents/accidents

ASBU B0-CDO: Performance Monitoring and Measurement (Implementation)	
Elements	**Implementation Indicators/Metrics**
1. CDO	Percentage of international aerodromes/TMAs with CDO implemented
2. PBN STARs	Percentage of international aerodromes/TMAs with PBN STARs implemented

Regional Reporting
Regional Performance Dashboard

Transparency and sharing of information are fundamental to a safe and efficient global air transportation system.

ICAO is introducing "Regional 'Performance Dashboard' - the homepages for every public website of the ICAO Regional Offices.

- These dashboards will illustrate the regional implementation status relating to the strategic objectives on Safety, Air Navigation Capacity and Efficiency, and Environmental Protection.
- The Dashboard will show targeted performance at the regional level and will, initially, contain graphics and maps with a planned expansion to include the Aviation System Block upgrades (ASBU) Block 0 Modules.
- This new interactive online system will be in place for March 2014 for the all ICAO regions and will be updated at regular intervals.
- Dashboard will be user friendly and able to deliver the message at glance.

Regional Performance Dashboard
Proposed Format – Home page of ICAO RO website

GENERAL FORMAT

Regional Directors responsible for the **selected UN Region**

For Safety:
Effective Implementation
(No State names)
For Efficiency:
Air Navigation Implementation
(by State)
For Environment:
Fuel savings and CO2 reduction
(by State)

Regional Performance by **Strategic Objective**

Regional Performance Indicators

Message:

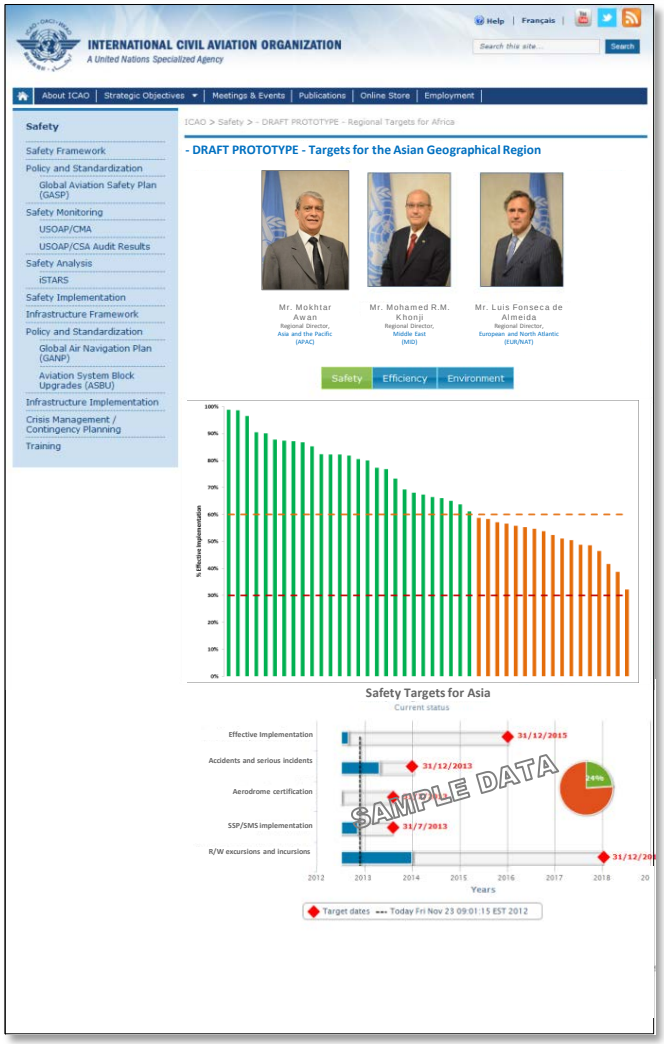
*Provide the status of **Safety**, **Efficiency**, and **Environment** for the Region*

Regional Performance Dashboard Indicators/metrics for Safety

SAFETY

Metrics

1. **Safety Oversight**
   Effective Implementation by State
2. **Accidents and serious incidents**
   Number of accidents per million departures
3. **Runway Excursions and Incursions**
   Runway excursion and incursion accidents as a percentage of all accidents
4. **Aerodrome certification**
   Number of certified international aerodromes
5. **SSP/SMS Implementation**
   Implement Phase 1 of State Safety Programmes (SSP) and ensure that all Service Providers implement a Safety Management System (SMS)



Regional Performance Dashboard Indicators/metrics for Air Navigation

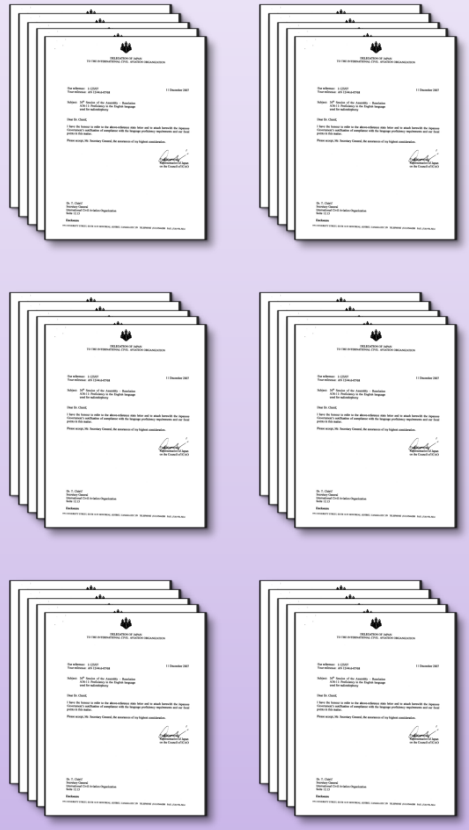
AIR NAVIGATION

Metrics

1. **PBN TERMINAL**
   % of international aerodromes with APV
2. **PBN ENROUTE**
   % of PBN routes/airspaces
3. **CDO**
   % of international aerodromes/TMAs with CDO
4. **CCO**
   % of international aerodromes/TMAs with CCO
5. **Estimated Fuel Savings/ C02 Emissions Reduction Based on IFSET**
6. **ATFM**
   % of ATS Units/international aerodromes providing ATFM service
7. **AIM**
   % of needed elements (from AIS to AIM Roadmap) facilitating the transition from AIS to AIM that have been implemented – PHASE I

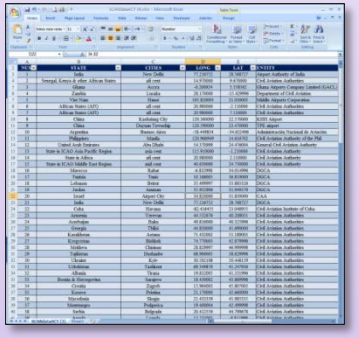
Air Navigation Reporting Current

REPORTS



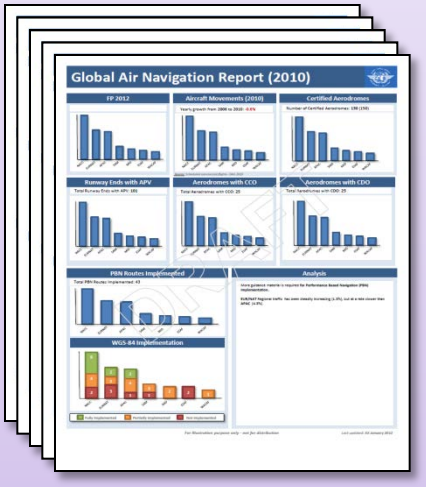
PAPER

DATA



ELECTRONIC / PAPER

ANALYSIS

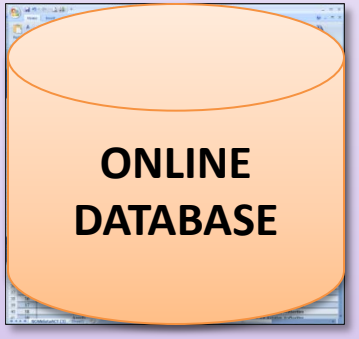


ELECTRONIC / PAPER

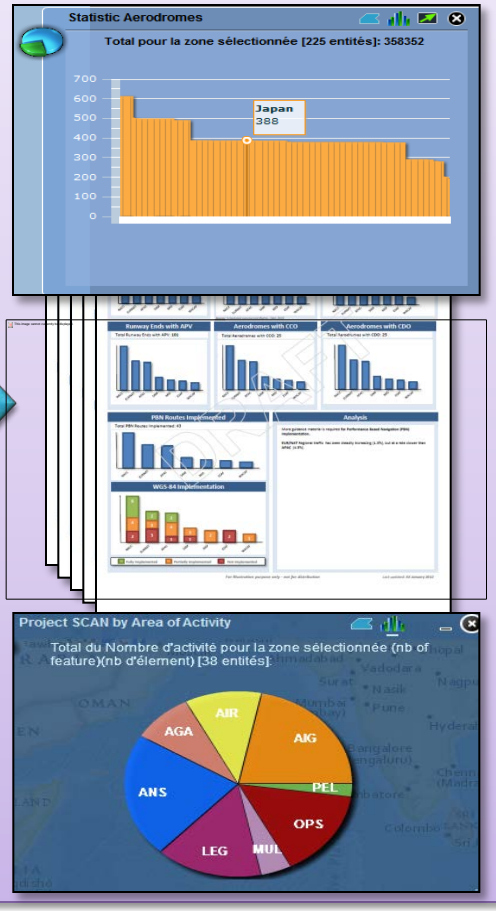
Air Navigation Reporting Future

REPORTS

DATA



ANALYSIS



ONLINE

ONLINE

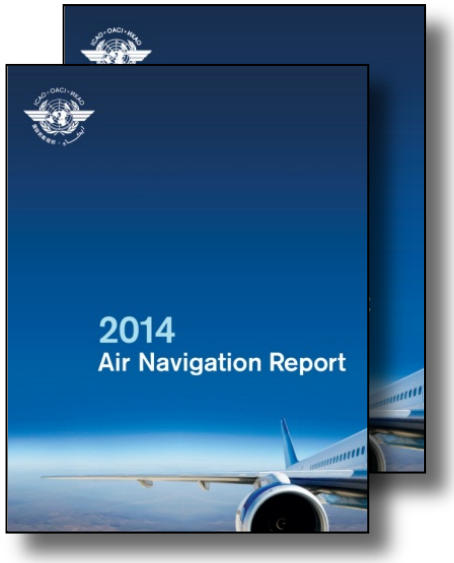
ONLINE

Measuring Against the Global Plans
Reporting Mechanism and Tools

Regional Bodies

Web Portal

Report

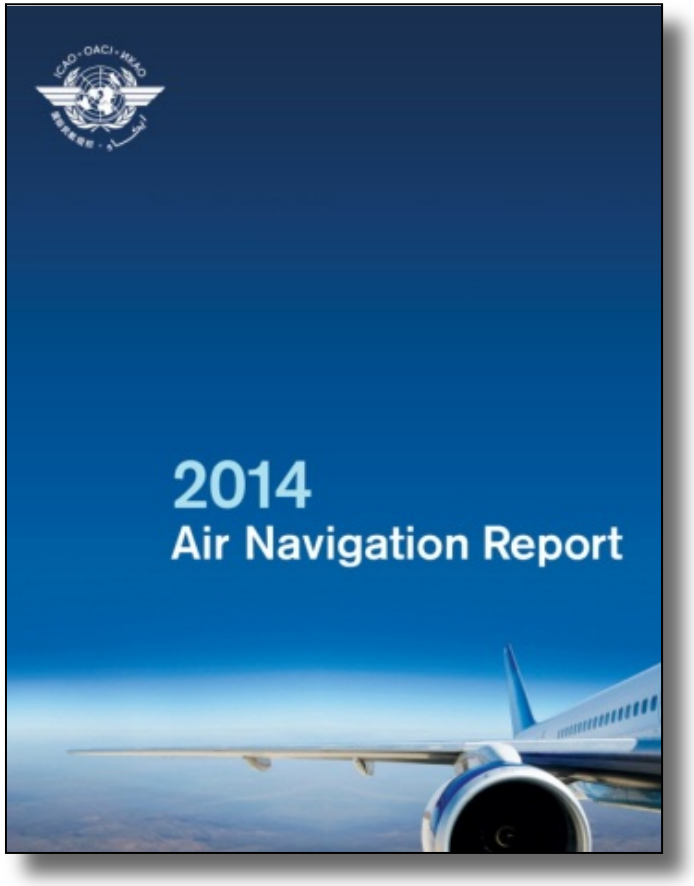


- **Visualize** the status of implementation through dynamic and interactive charts
- Provide **feedback** on the data (qualification of the data)
- Perform **self-assessments**, generate ad-hoc **reports** and **export** data
- Provide a venue for data collection towards the **Annual Reports**

Annual Global Air Navigation Report Purpose

- Transparency and sharing of information are fundamental to a safe and efficient global air transportation system.
- Consistent with this principle and much like the existing annual Safety Report, the proposed annual Global Air Navigation Report will assist PIRGs and States in understanding which areas require special attention to effectively improve air navigation performance worldwide . First Report in April 2014
- Help propagate information on implementation success stories.
- Provide an opportunity for the civil aviation community to evaluate progress across different ICAO regions.
- Facilitate more effective interregional harmonization planning
- The outcomes of the Report could also help to identify annual tactical adjustment priorities for regional work programmes, as well as informing longer-term policy adjustments.

Annual Global Air Navigation Report
Proposed contents



- global air navigation challenges;
- measuring against those challenges;
- status of operational measures for performance improvement;
- implementation progress of selected priority ASBU Block 0 Modules.
- sharing of successful initiatives and key demonstrations

Annual Global Air Navigation Report
An initial dataset

This initial dataset for both Regional Performance Dashboard and the Global Air Navigation Report was recently agreed by the PIRG Chairs in a coordination meeting held on 19 March 2013

1. **Performance Based Navigation (PBN) - Terminal**
   % of international aerodromes with APV
2. **Performance Based Navigation (PBN) - Enroute**
   % of PBN routes/airspaces
3. **Continuous Descent Operations (CDO)**
   % of international aerodromes/TMAs with CDO
4. **Continuous Climb Operations (CCO)**
   % of international aerodromes/TMAs with CCO
5. **Estimated Fuel Savings/ C02 Emissions Reduction Based on IFSET**
6. **Air Traffic Flow Management (ATFM)**
   % of ATS Units/international aerodromes providing ATFM service
7. **Aeronautical Information Management (AIM)**
   % of needed elements (from AIS to AIM Roadmap) facilitating the transition from AIS to AIM that have been implemented – PHASE I

AGENDA

- 12th Air Navigation Conference results
- 4th edition of the Global Air Navigation Plan
- Aviation System Block Upgrades
- Regional and Global reporting
- Update of regional Training Programs, Plans and Curricula

Update of regional Training Programs, Plans and Curricula

The constant evolution of CNS/ATM technology brings new challenges to air navigation as seen in the GANP Roadmaps and mapped in the ASBU

Training requirements have to be adapted regularly and training offer needs to be up-to-date.

- A Contracting State, or the organization authorized by the State authority providing CNS/ATM services, should establish methods for determining job competencies.
- All personnel directly engaged in Air Navigation matters should be qualified for their job functions.
- Training allows the improvement of human performance

Update of regional Training Programs, Plans and Curricula

- The successful application of regulations concerning the safety and regularity of CNS/ATM systems operation and the achievement of regulatory objectives (safety-efficiency-security) can be achieved only by properly planned and maintained TRAINING (including basic training, qualification training and recurrent training programmes) for all persons involved

Training for planning, implementation, deployment and ongoing operation of tomorrow´s aviation system

Datalink evolution

Trayectory-based operations

Flight-Flow Information for a Collaborative Environment

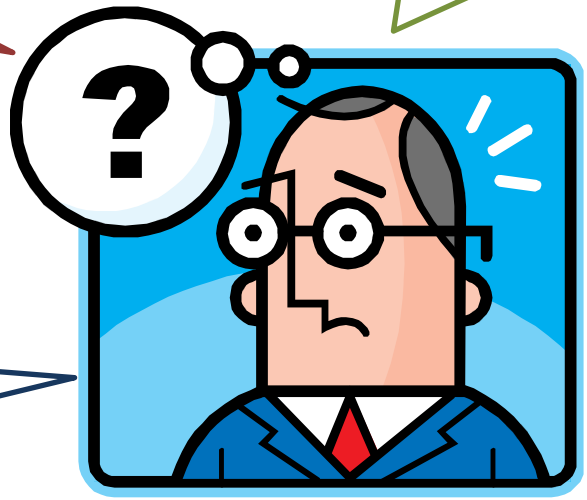
System Automation

Human Performance

Update of regional Training Programs, Plans and Curricula

Does your administration know about your State Performance-based Air Navigation Plan? ASBU compliant Plan?

Are your Training plans/Programs/Curricula associated or relating to the ASBU Approach?



Do you have an ASBU basic course implemented or other ASBU related courses?

Do you know the NAM/CAR Regional Implementation Working Groups training needs?

Do you know about the Regional Training Plan for the NAM/CAR Regions?

Do you know about the NAM/CAR Regional Performance based Air Navigation Implementation Plan (RPBANIP)?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Thank You