ASBUs impact on Regional Work Programme

Presented by the Secretariat

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1-Aviation System Block Upgrade (ASBU) Methodology – Overview

Outline

- Today's Challenges
- Tomorrow's Needs
- Why ASBU methodology
- ASBU explanation
- Next Steps

Today's Challenges

- Air traffic growth expands two-fold every 15 years
- Growth can be a double-edged sword. Challenge is how to achieve both safety and operational improvements
- 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.
- 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.

Tomorrow's Needs

- 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

Global Aviation System Block pgrades

- ICAO established Future Aviation Challenge Team (FACT) and Future Aviation Technical Team (FATT) to develop a new approach which should be
  - Interoperable and
  - Independent of when and where specific ATM improvement programs are introduced
- This approach is the global framework known as **global aviation system block upgrades**

Why this approach?

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

What is the difference between current and 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 involving Airlines and CAAs
  - Planning based on short, medium and long terms
  - Implementation process is through Blocks and corresponding modules

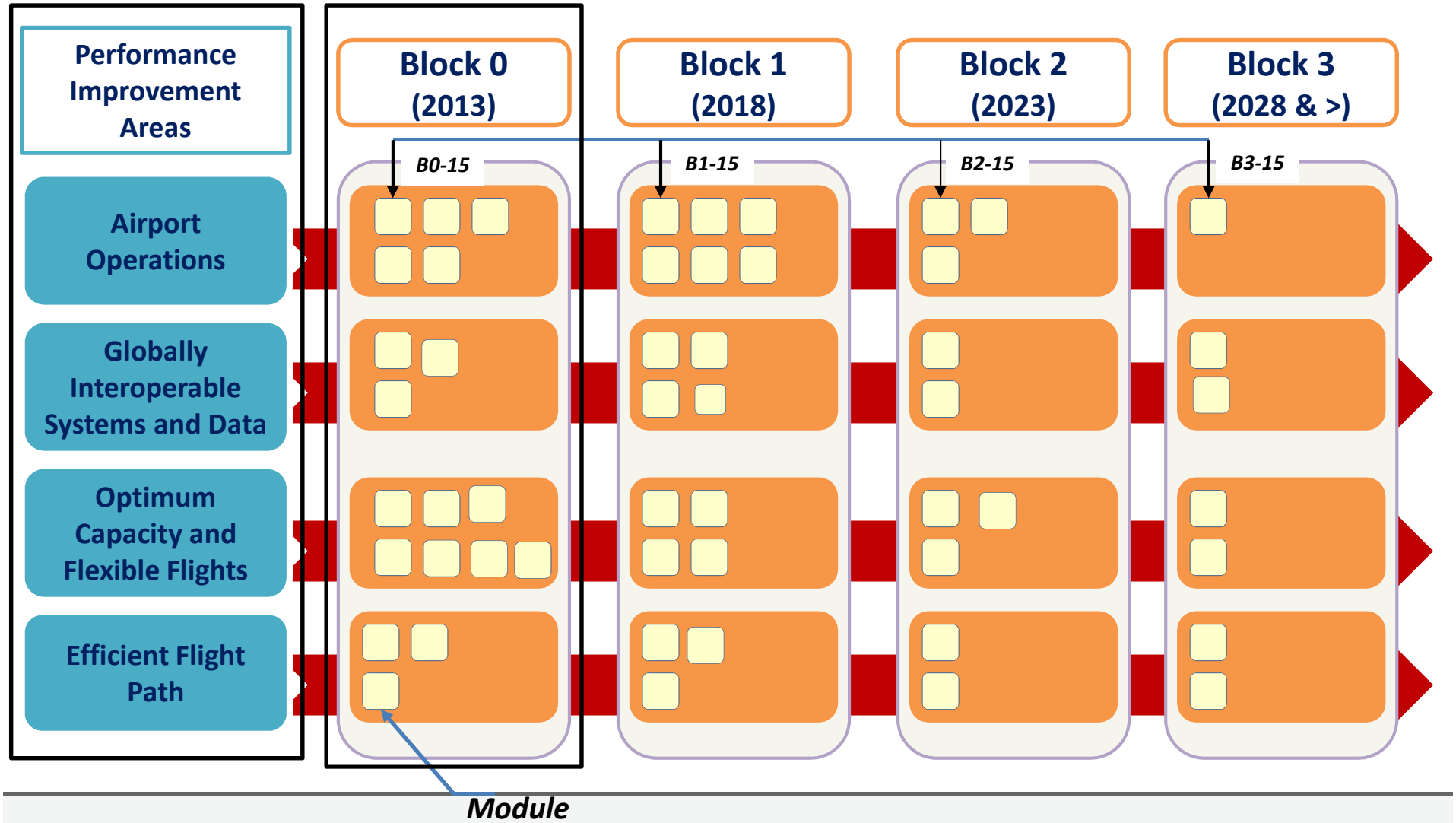
What are the advantages of ASBU methodology?

- All partners approach involving service providers, regulators and users facilitating a harmonized planning and implementation of air navigation infrastructure
- 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

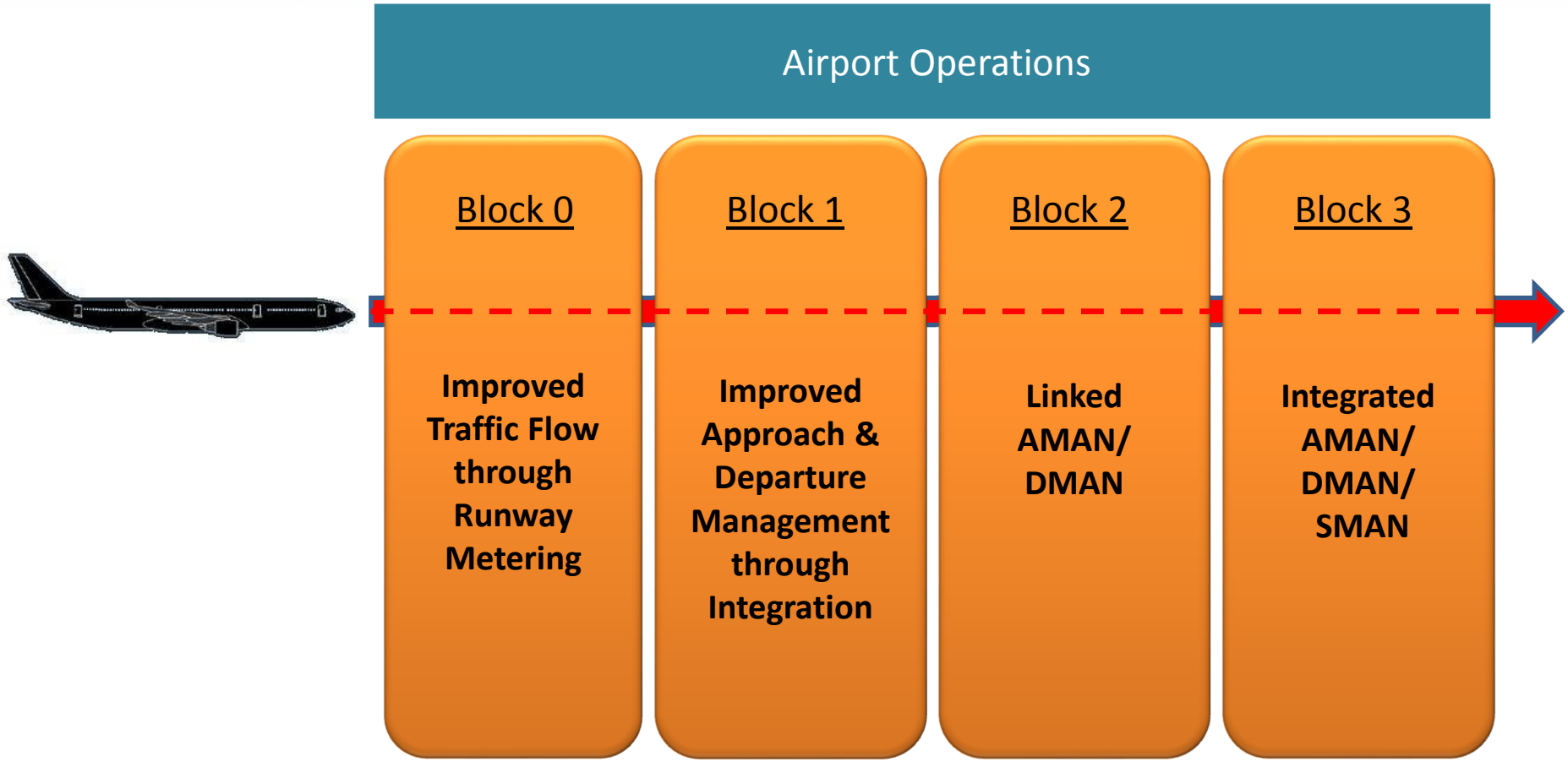
Aviation System Block Upgrades – Definition

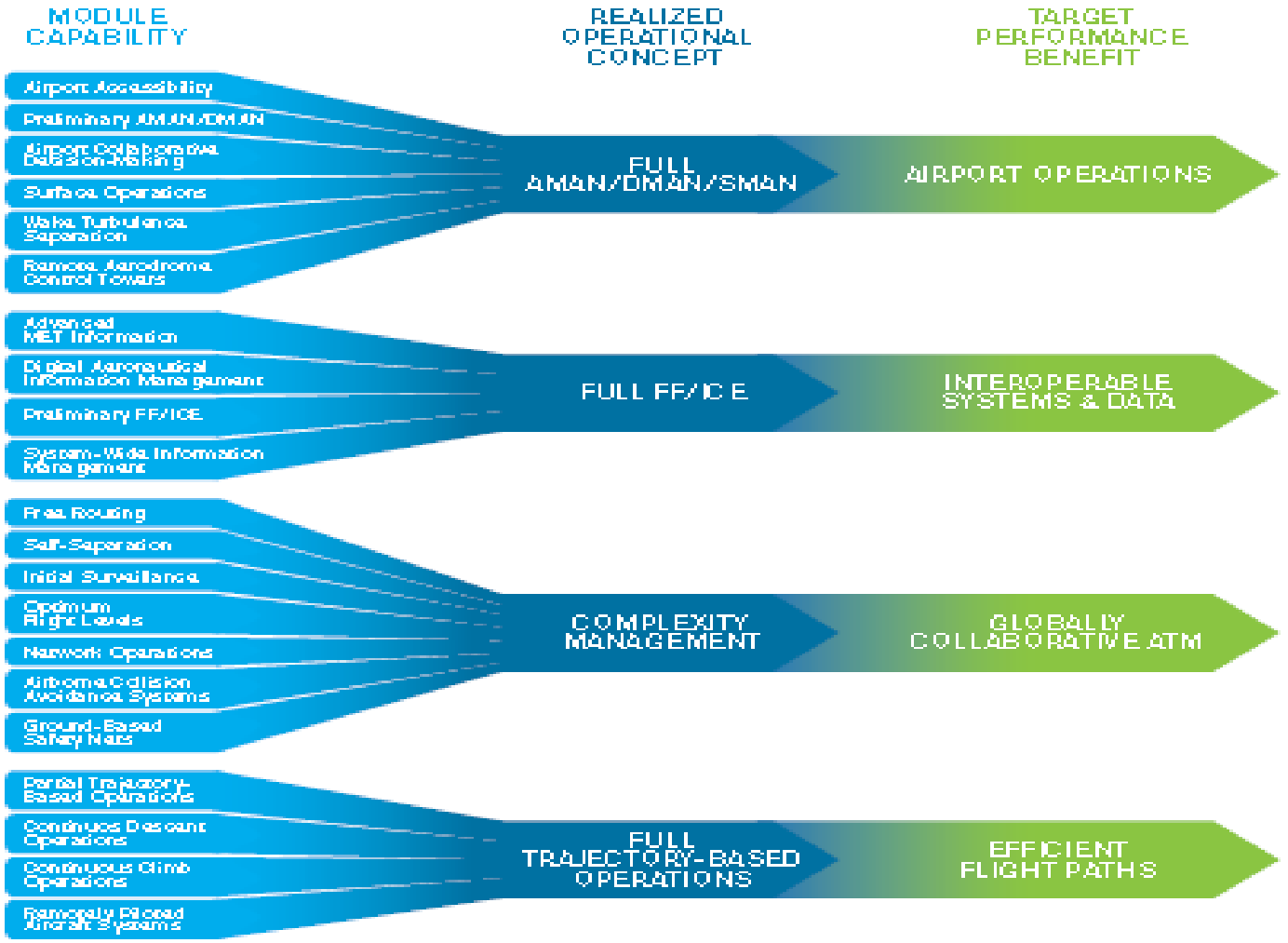
- What is an 'Aviation System Block Upgrade' (ASBU)?
  - Intended *Operational Improvement/Metric* to determine success
  - Necessary *Procedures*/Air and Ground
  - Necessary *Technology*/Air and Ground
  - Positive *Business Case* per Upgrade
  - *Regulatory Approval* Plan/Air and Ground
  - *Well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

Understanding the Relationships



Threads Between Modules… and Across Blocks




MODULE CAPABILITY
REALIZED OPERATIONAL CONCEPT
TARGET PERFORMANCE BENEFIT
Airport Accessibility
Preliminary AMAN/DMAN
Airport Collaborative Decision-Making
Surface Operations
Wake Turbulence Separation
Remote Aerodrome Control Towers
FULL AMAN/DMAN/SMAN
AIRPORT OPERATIONS
Advanced MET Information
Digital Aeronautical Information Management
Preliminary FF/ICE
System-Wide Information Management
FULL FF/ICE
INTEROPERABLE SYSTEMS & DATA
Free Routing
Self-Separation
Initial Surveillance
Optimum Flight Levels
Network Operations
Airborne Collision Avoidance Systems
Ground-Based Safety Nets
COMPLEXITY MANAGEMENT
GLOBALLY COLLABORATIVE ATM
Partial Trajectory-Based Operations
Continuous Descent Operations
Continuous Climb Operations
Remotely Piloted Aircraft Systems
FULL TRAJECTORY-BASED OPERATIONS
EFFICIENT FLIGHT PATHS

Module sample (1/3)

Module N° B#-##: TITLE

Summary	Brief description of benefit provided.	
Main Performance Impact	List of affected KPAs	
Operating Environment/Phases of Flight	Single word entries explaining operating environment(s), i.e; airport surface, etc and/or phases of flight, i.e; approach, en-route, etc.	
Applicability Considerations	Specifics on operating environment and/or types of airspace where Module is applicable	
Global Concept Component(s)	Up to three.	
Global Plan Initiatives (GPI)	Up to three	
Pre-Requisites	Modules that must be implemented to support this module.	
Global Readiness Checklist		**Status** (ready now or estimated date).
	Standards Readiness	
	Avionics Availability	
	Ground System Availability	
	Procedures Available	
	Operations Approvals	

1. Narrative

1.1 General

General description of the module with focus on the operational benefit or capability provided, operating environment and applicability.

1.1.1 Baseline

Capability in place prior to the implementation of this module. This section is appropriate where the module provides an improvement over an existing capability.

1.1.2 Change brought by the module

Additional information on the operational benefit or capability plus any significant change to operations. For complex modules may be decomposed into constituent elements.

1.2 Element 1 (if needed)

1.3 Element 2 (if needed), etc.

Module sample (2/3)

2. Intended Performance Operational Improvement/Metric to determine success

KPAs	Specific improvement provided.

CBA	Illustrative example of Cost-Benefit to be expected. The mechanisms supporting the cost benefit must be clearly stated.

3. Necessary Procedures (Air & Ground)

Description of new procedures. Where procedures exist or are under development, references to these must be provided. For procedures to be developed, the requirement must be clearly stated (This is applicable to latter blocks).

4. Necessary System Capability

4.1 Avionics

Description of required avionics. Where avionics exist or are under development, references to these must be provided. For avionics to be developed, the requirement must be clearly stated (This is applicable to latter blocks).

4.2 Ground Systems

Description of required ground systems. Where ground systems exist or are under development, references to these must be provided. For ground systems to be developed, the requirement must be clearly stated (This is applicable to latter blocks).

5. Human Performance

5.1 Human Factors Considerations

General statements on the impact on operational functions.

5.2 Training and Qualification Requirements

Description of required training and qualification requirements. Where they exist or are under development, references to these must be provided. For training and qualification requirements to be developed, the requirement must be clearly stated (This is applicable to latter blocks).

5.3 Others

TBD

Module sample (3/3)

6. Regulatory/standardisation needs and Approval Plan (Air and Ground)

Description of required regulatory and standardisation needs and approval plans. Where they exist or are under development, references to these must be provided. For regulatory and standardisation needs to be developed, the requirement must be clearly stated (This is applicable to latter blocks).

7. Implementation and Demonstration Activities

7.1 *Current Use*

Description and results of current demonstration activities and implementation status, for each known region.

7.2 Planned or Ongoing Activities

Description of planned demonstration and implementation activities, for each known region.

8. Reference Documents

This section shall contain details of all known reference documents both published and in preparation.

8.1 Standards

ICAO and Industry Standards (ie; MOPS, MASPS, SPRs).

8.2 Procedures

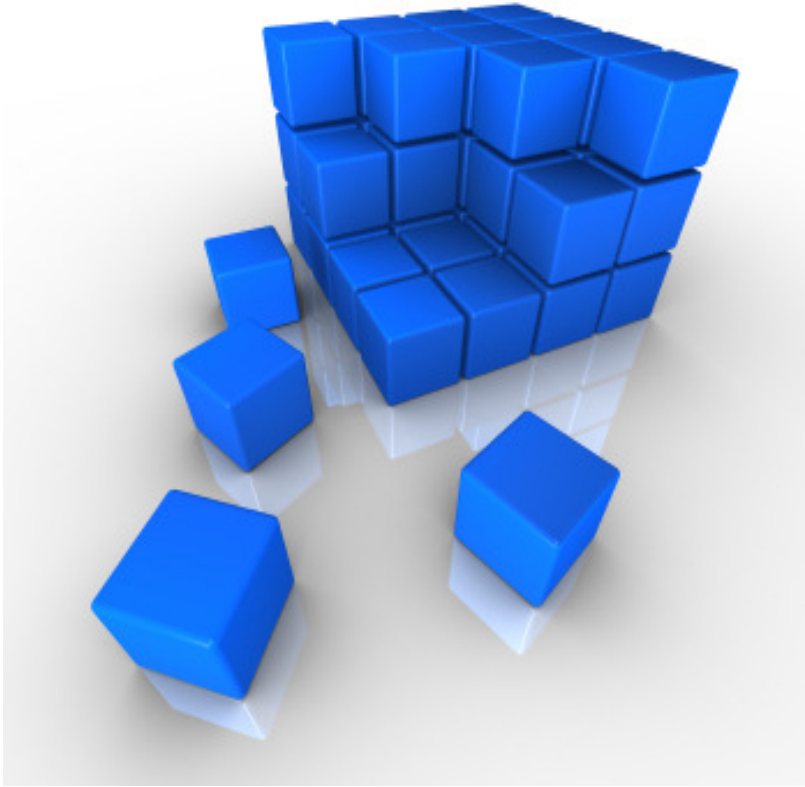
Documented procedures by States and ANSPs,

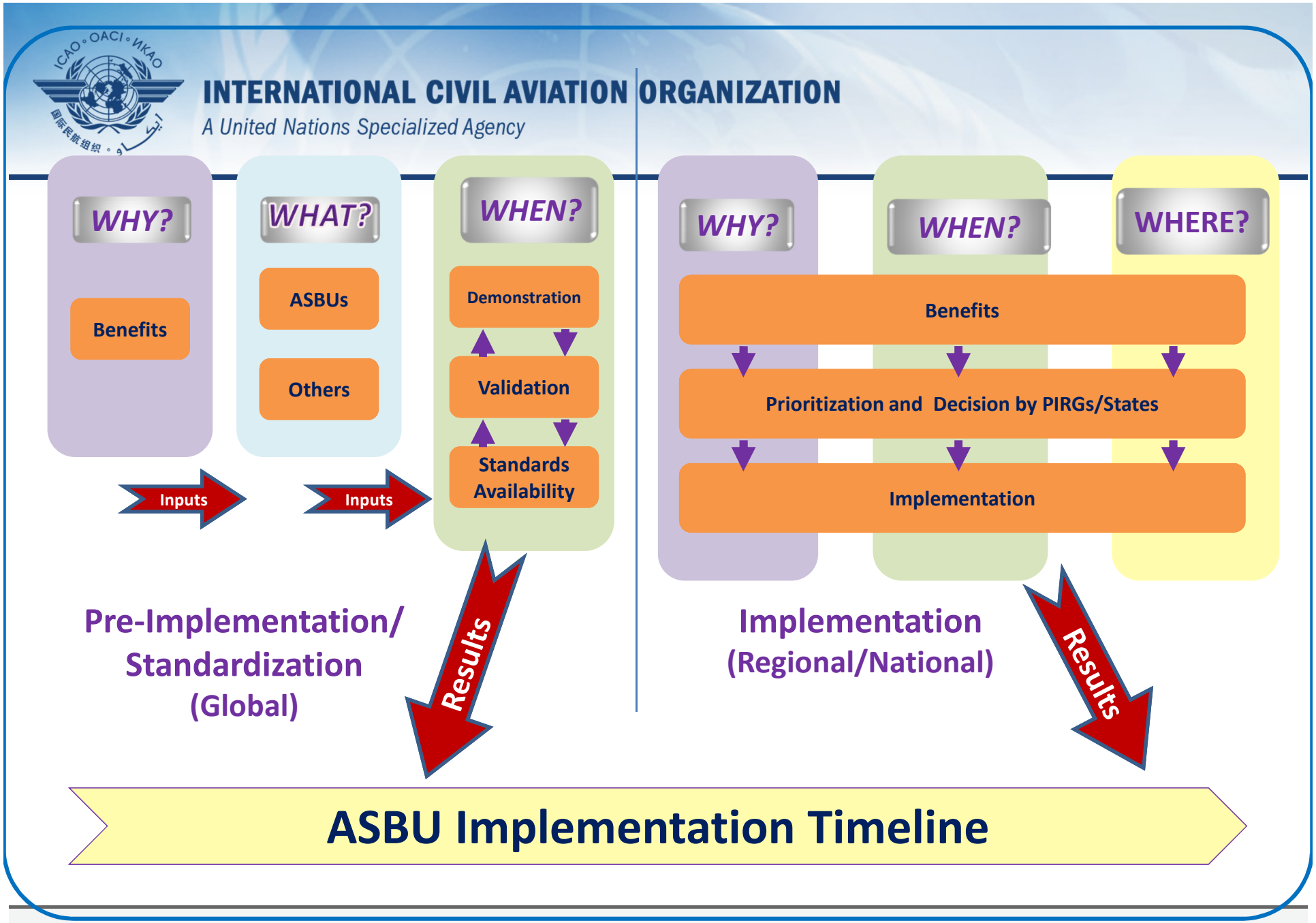
8.3 Guidance Material

ICAO Manuals, Guidance Material and Circulars. Also any similar industry documents

Summary of ASBU Approach

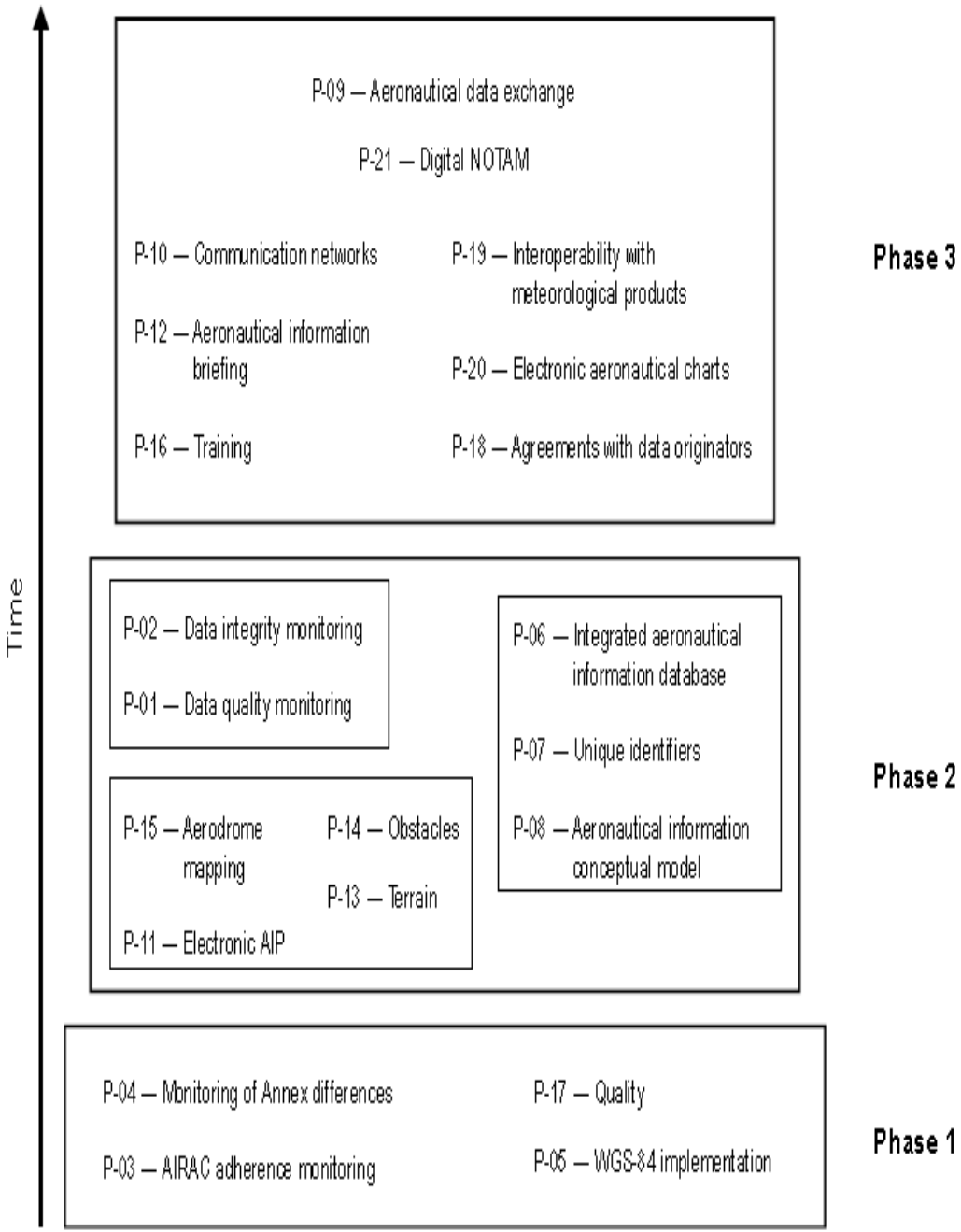
- **Addresses ANSP, aircraft and regularity requirements**
- **Identified 4 improvement areas**
- **Implementation through Block Upgrades (0,1,2, and 3) each comprising a number of modules**
- **Each module is explained in a standardized 4-5 pages template**
  - provide a series of measurable, operational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



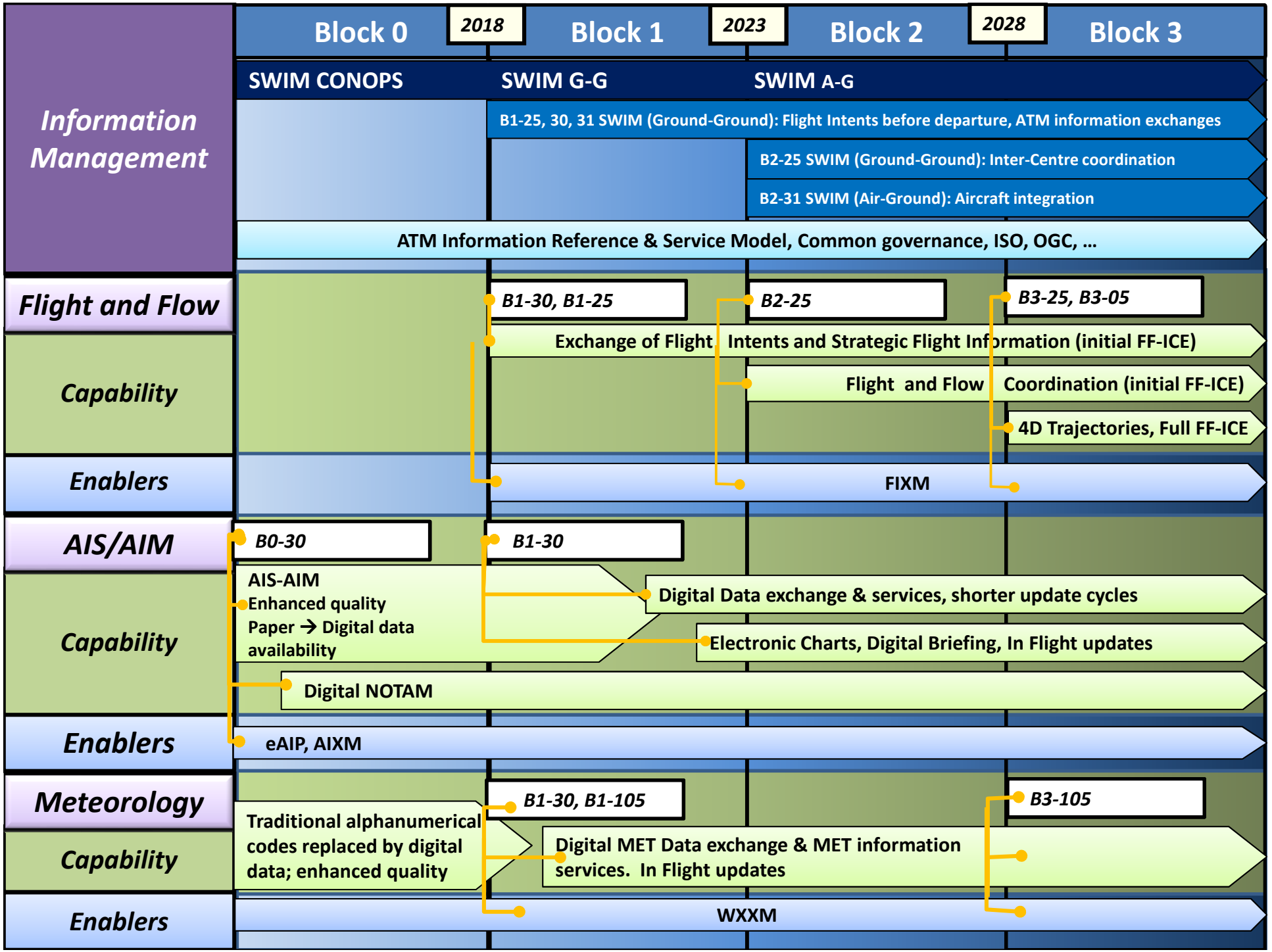

INTERNATIONAL CIVIL AVIATION ORGANIZATION
A United Nations Specialized Agency
WHY?
Benefits
WHAT?
ASBUs
Others
WHEN?
Demonstration
Validation
Standards Availability
Inputs
Inputs
Pre-Implementation/ Standardization (Global)
Results
WHY?
WHEN?
WHERE?
Benefits
Prioritization and Decision by PIRGs/States
Implementation
Implementation (Regional/National)
Results
ASBU Implementation Timeline

AIM Roadmap – 3 Phases and 21 Steps

- **Phase 1 :**
  - Consolidation, mainly quality requirements; AIRAC adherence; WGS-84; and the provision of terrain and obstacle data**.**
- **Phase 2 :**
  - Going digital, introduction of database-driven processes (eAIP, AIXM); enhance the quality and availability of existing products.
- **Phase 3 :**
  - **Information Management**, new products and services; provision of the new data that will be required by the future ATM components.



Information Management Roadmaps


Information Management
Block 0
2018
Block 1
2023
Block 2
2028
Block 3
SWIM CONOPS
SWIM G-G
SWIM A-G
B1-25, 30, 31 SWIM (Ground-Ground): Flight Intents before departure, ATM information exchanges
B2-25 SWIM (Ground-Ground): Inter-Centre coordination
B2-31 SWIM (Air-Ground): Aircraft integration
ATM Information Reference & Service Model, Common governance, ISO, OGC, …
Flight and Flow
Capability
Enablers
B1-30, B1-25
B2-25
B3-25, B3-05
Exchange of Flight Intents and Strategic Flight Information (initial FF-ICE)
Flight and Flow Coordination (initial FF-ICE)
4D Trajectories, Full FF-ICE
FIXM
AIS/AIM
Capability
Enablers
B0-30
B1-30
AIS-AIM
Enhanced quality
Paper → Digital data availability
Digital Data exchange & services, shorter update cycles
Electronic Charts, Digital Briefing, In Flight updates
Digital NOTAM
eAIP, AIXM
Meteorology
Capability
Enablers
B1-30, B1-105
B3-105
Traditional alphanumerical codes replaced by digital data; enhanced quality
Digital MET Data exchange & MET information services. In Flight updates
WXXM

International Agreement at AN-Conf/12

- Montréal, 19-30 November 2012
- Opportunity to formalize future of infrastructure through ASBUs
- More assistance to States for all ASBU Block 0 Modules
  - Implementation kits for ASBU Modules will be delivered
- Agreement of ASBU Block 1 upgrades
  - Level of certainty for all stakeholders
  - Encourage more efficient implementation
- Strategies for longer-term requirements – ASBU Blocks 2 and 3
- Approval of GANP
  - Operational capabilities to manage ATM system requirements

2-Impact of ASBUs on regional work programme

Impact of ASBUs on regional work programme

PLANNING

Follow-up to AN-Conf/12-Recommendation 6/1- by May 2014

- Regional air navigation plans
  - Align ANPs (Basic ANP/FASID) with ASBU framework
  - Tables mapped to relevant Block 0 Modules
- Meetings to Projects
  - Project - based approach to ASBU implementation
- PIRG Subgroups/Task Forces
  - Align with ASBUs based logical groupings with multi-disciplinary approach
  - Additional guidance expected from “ALLPIRG” in March 2013
- Programmes not covered by ASBU framework
  - To be mapped to nearest ASBU Module (coordinate the identification of such programmes and related modules within/between regions)
- Changing roles of Regional Officers/Work Plan
  - Oriented to performance improvements
- Involvement of regulators and users
  - Commitment through regional plans
  - Users’ commitment to be further addressed

Impact of ASBUs on regional work programme

IMPLEMENTATION

- Minimum path
  - Categorize and determine priority for ASBU Block 0 Modules
    - To be agreed at regional, interregional and global levels
- iKITS
  - Disseminate ASBU Block 0 Modules details
    - Modalities for dissemination to be agreed (via HQ, ROs, meetings, missions)
- Training
  - Provide more training (through Workshops/Seminars/CBT, Industry/Partners' Initiatives, etc.)
  - Development of National ASBU plans. ASBU GO-teams
- Air Navigation Deficiencies (as currently defined by Council)
  - Identify and group deficiencies by ASBU modules and not by disciplines
- Missions to States
  - Include ASBU implementation in the scope of missions to States

Impact of ASBUs on regional work programme

MONITORING

- Key Performance Indicators /Metrics
  - Determine KPIs/supporting metrics for ASBUs (Doc 9883)
- GIS based reporting for global AN Report
  - Reporting mechanism/GIS webpage for Regions/collection of data
- Dashboard reporting
  - Performance targets/Indicators
  - Guidelines for the collection of data to be circulated to ROs
- ANRF (based on GANP/ANP template)
- Reporting on Mission to States
  - ASBU implementation to be reflected in mission reports
  - Need to update Regional Office Manual (ROM) guidance for mission reports
- CMA
  - Mapping to ASBUs for oversight as recommended by AN-Conf/12
- Electronic tools (iSTARS, GIS, CMA)
  - Use of tools for ASBU monitoring

Impact of ASBUs on regional work programme

PIRG WORK

- ASBU Module implementation through regional agreements
  - Fast-track procedure needed to ensure timely harmonization of requirements between regions (irrespective of PIRG meeting cycles)
- Ensure that all required supporting procedures, regulatory approvals and training capabilities are set in place
- Provide support for business cases required to document operational benefits, based on Global Plan's technology roadmaps and module descriptions
- Organize regular consultations with States and industry to align the specific measures and initiatives that they integrate into Regional Air Navigation Plans
- Coordinate reporting from States and industry, annual AN Report, and any required tactical work programme revisions
  - Consider, if necessary, synchronizing PIRG meetings with the annual AN reporting schedule

3-Transition from paper-based ANPs to e-ANP

Current situation

- BANPs
  - Reviewed and updated before the endorsement of the ASBU methodology, new GANP, GASP, etc
  - Many differences exist between regions
- FASID
  - Few progress :
    - ✓ AIM, MET and AOP Tables
    - ✓ CNS, ATM, SAR (not yet)
    - ✓ Many differences exist between regions

Need for Change

- The current ANPs are no longer achieving the expected results and not keeping pace with new developments
- We need to:
  - Make important changes, starting with the policy level: new vision and objectives
  - Agree on how the “new” ANP/eANP should look like.
  - Have the same understanding/vision

Issues to be addressed

- Link with air navigation charges
- Structure of the ANP i.e: Basic ANP and FASID
- Format/content of the ANP
- Alignment of Regional e-ANPs with ASBU methodology
- Link with air navigation deficiencies
- Procedures for amendment of the ANP
- Link with Performance approach and air navigation report (ANRF)
- Regional eANPs-new features, databases, GIS, etc.
- Planning Tools: ATS Routes, Frequency management, ICARD, etc
- States/PIRGs involvement in the process of review/development of ANPs/eANPs
- Harmonization between Regions
- Timeframe and resources to achieve the final goal

Way forward

- Agreement needed on:
  - ✓ ANP-related high level issues (policy, objectives, scope, procedure for amendment, etc);
  - ✓ the content of the ANPs/eANPs: requirements, assignment of responsibilities, list of facilities and services and/or status of implementation (performance);
  - ✓ the format/layout of the ANP (Volumes, Parts, Sections, Sub-Sections, Tables/databases, etc); and
  - ✓ the mechanism for the review of ANPs and development of eANPs and develop an associated Action Plan with clear milestones and timelines

Conclusion

- The AIM Task Force is invited to include the following tasks in its work programme
  - Identification of ASBU Block 0 Modules of relevance to the AFI Region; and
  - Development of proposals for corresponding performance indicators/metrics;
    - for consideration by the ATS/AIM/SAR/SG/13 meeting (2013)
  - Development of communication infrastructure requirements
    - for consideration by the CNS/SG/5 meeting (2013)
- To address these tasks, the Task Force should consider
  - Establishing a Working Group to work through electronic correspondence and teleconference, as appropriate

ICAO

Uniting Aviation on

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