ICAO UNITING AVIATION

ICAO – Global Air Navigation Plan

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on behalf of

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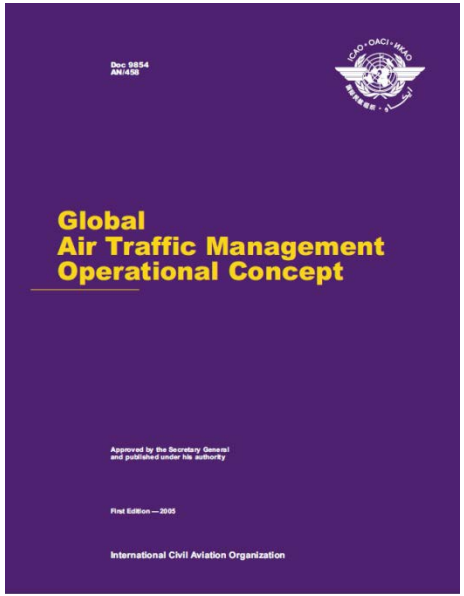
SWIM Workshop

Lima, Peru, 31-3 November 2017

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**

Guiding principles

- Safety
- Human
- Technology
- Collaboration
- Continuity
- Information

The ATM community will **depend** extensively on the **provision of timely, relevant, accurate, accredited and quality-assured information** to collaborate and make informed decisions. **Sharing information on a system-wide basis** will allow the ATM community to conduct its business and operations in a safe and efficient manner.

Aviation is undergoing a FUNDAMENTAL change

DRIVERS FOR CHANGE

- Expectations of the ATM community
  - Expected benefits
    - Airspace users
    - Service providers
    - Regulators
  - Total system performance framework
    - Competing expectations to be balanced

Concept components

AOM — Airspace organization and management
DCB — Demand/capacity balancing
AO — Aerodrome operations
TS — Traffic synchronization
CM — Conflict management
AUO — Airspace user operations
ATM SDM — ATM service delivery management

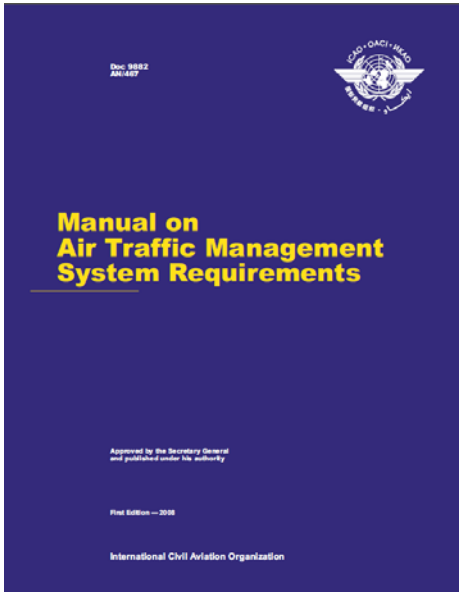
Information: Key for evolution

Global information utilization, management and interchange enabling…

… the future of the air navigation system

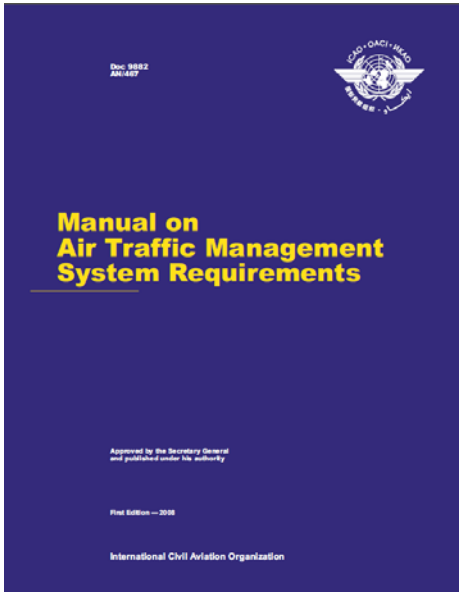
Information Service Requirements

- System-wide information management
- Accredited, quality-assured and timely information
- Nature of information
- Validity period
- Integrated picture
- Aviation data standard and reference system
- Information exchange protocols and procedures
- Collection and integration
- Reduction in transactional friction



Information Service Requirements

- Relevant operational information available
- Optimize flight operations management
- Optimize 4-D trajectory planning and operation
- Status of ATM system resources
- Flight parameters and aircraft performance characteristics
- Access to MET information
- Standards for meteorological model
- Environmental performance targets



Information Management

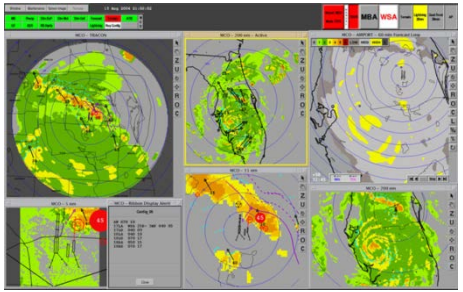
- Functions:
  - Provide accredited, quality-assured timely information
  - Monitor and control quality of shared information
  - Provide information-sharing mechanisms
- Meeting expectations ATM community

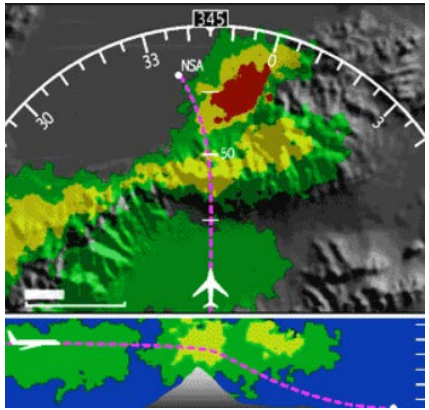
Aeronautical Information

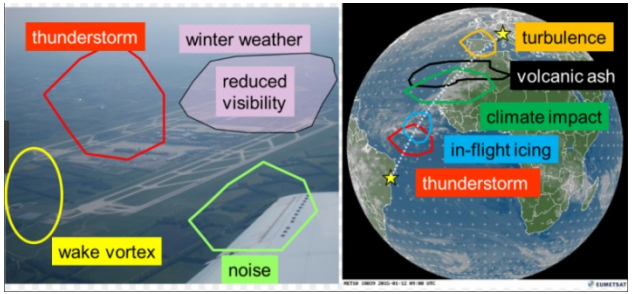
- Temporality and issuance concepts
  - Overload
  - Intelligent IM
- Media
  - Fully electronic
  - Networked environment

Meteorological information

- Integrated function
- Tailored
  - Meet ATM requirement
- Main benefits
- Performance management
  - Quality Assurance







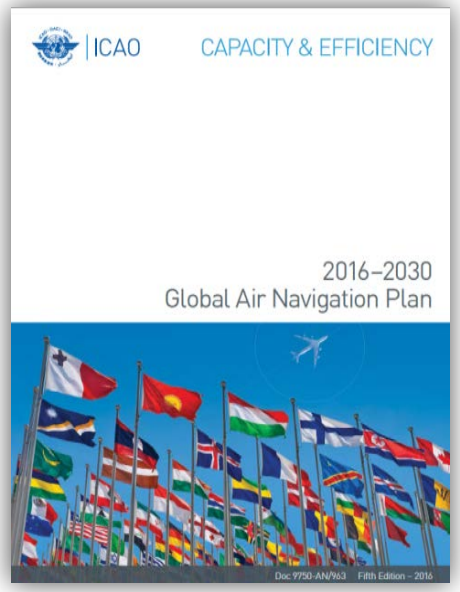
GANP 2013

"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 (ASBU),** provide a consensus-driven modernization framework for integrated planning based on performance

GANP 2016

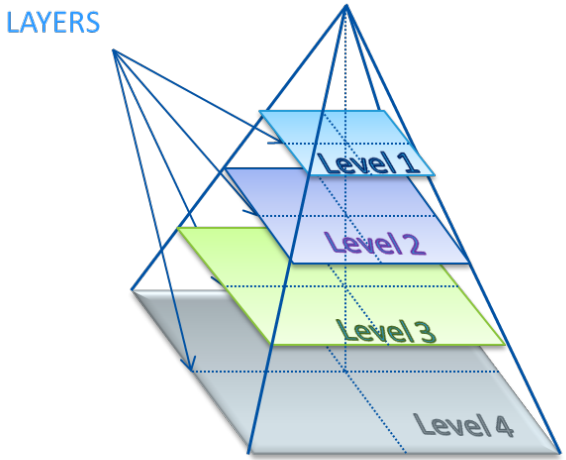
- **Objectives**
  - **International and overarching framework** of a global investment plan: make it more usable towards implementation
  - Keep it **stable** while making the necessary updates/additions
  - Adjust the **periodicity** to the Assembly and ICAO editing cycles
- **A Planning Document for Implementation**
  - GANP should serve as a comprehensive planning tool to **support the development and implementation** of a harmonized global air navigation system




Needs Analysis / Validation
Compliance & Verification
if needed
Global Plans
GLOBAL PLANS
Assess & Measure
SARPs & PANS
Operation of Aircraft
Air Traffic Management
Implementation Planning
Training & Guidance

2019 Update of the GANP

Multilayer Structure



Front door for all stakeholders to ICAO

Document endorsed at highest political level

Written in executive language

Contents derived from underlying

Performance-based de thod for defining implementation strategies

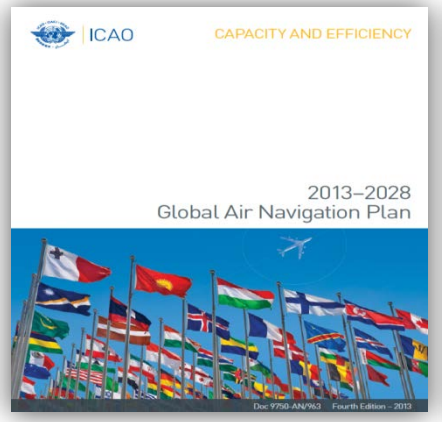
Aligned with the template approved by ICAO Council

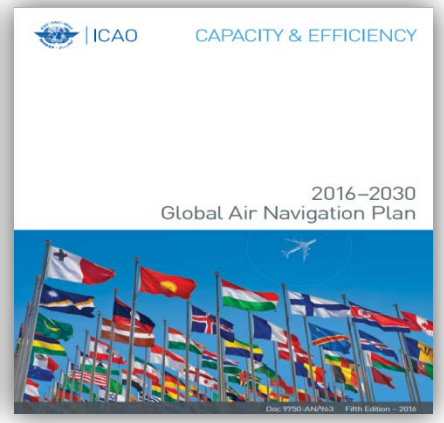
Global Performance Ambitions

KPIs Catalogue

Global Air Navigation Planning

2002 2007 2013 2016





Key concepts

- **ASBU Block**: a six year timeframe whose starting date defines a deadline for an element to be available for implementation.
- **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 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.
- **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.

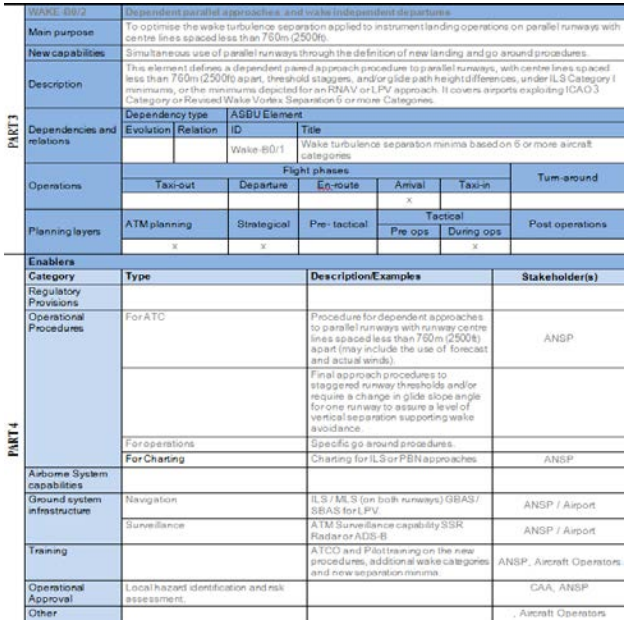
GANP 2019: ASBU Framework

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

PART 1	WAKE	Wake Turbulence Separation	
	CONCEPT OF OPERATIONS OF THE THREAD BY BLOCK		
	BBB	Wake turbulence separation applied to IFR flights is provided based on three aircraft wake turbulence categories (heavy, medium and light) as described in PANS-ATM. The wake turbulence separation does not apply to VFR flights neither to IFR flights executing visual approach when the aircraft has reported having the preceding aircraft in sight although the ATC unit concerned will issue a caution of possible wake turbulence when appropriate.	
	Block 0	Wake turbulence separation applied to IFR flights is provided based on 6 (or more) categories of aircraft wake turbulence categories. In airports with parallel runways with runway centre lines spaced less than 760m (2500 ft) apart, under certain wind conditions, wake turbulence separation can be reduced on dependent parallel approaches or wake turbulence independent departures. Independent segregated parallel operations can be realised.	
	Block 1	Wake turbulence separation applied to IFR flights is provided based on leader/follower static pair-wise wake separations. In airports with parallel runways with runway centre lines spaced less than 760m (2500 ft) apart, under monitored wind conditions, wake turbulence separation can be reduced on dependent parallel approaches or wake turbulence independent departures . Independent segregated parallel operations can be realised, based on static pair-wise wake separations.	
PART 2	Block	Element ID	Title
	Block 0	WAKE-B0/1	Wake turbulence separation minima based on six or more aircraft categories
	Block 0	WAKE-B0/2	Dependent parallel approaches and wake independent departures
	Block 0	WAKE-B0/3	Independent segregated parallel operations
	Block 1	WAKE-B1/1	Wake turbulence separation minima based on leader/follower static pair-wise
	Block 1	WAKE-B1/2	Dependent parallel approaches (with decision support)
	Block 1	WAKE-B1/3	Independent segregated parallel operations (with decision support)

GANP 2019: ASBU Framework

- Template:
  - PART 3:
    - For each element listed in PART 2: description, dependencies, scope,…
  - PART 4:
    - Enablers for each element

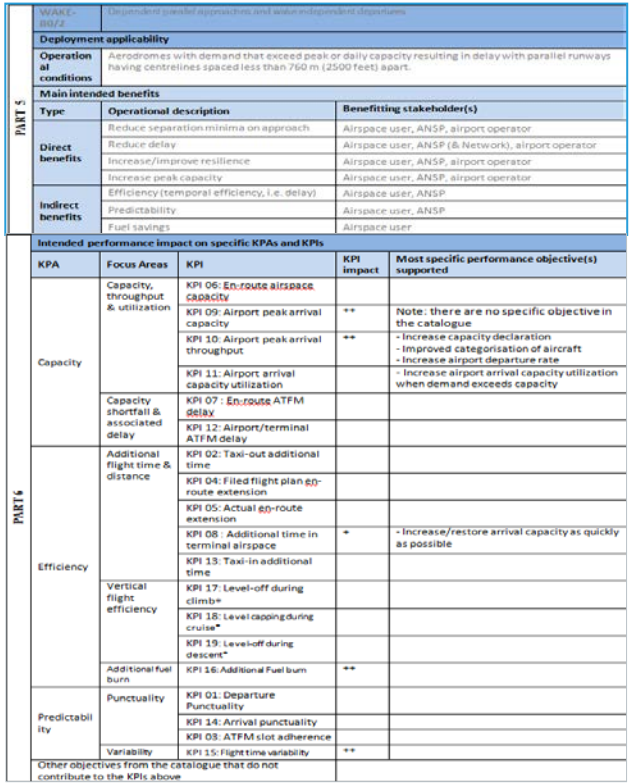


PART 3								
WAKE B0/2	Dependent parallel approaches and wake independent departures							
Main purpose	To optimise the wake turbulence separation applied to instrument landing operations on parallel runways with centre lines spaced less than 760m (2500ft).							
New capabilities	Simultaneous use of parallel runways through the definition of new landing and go around procedures.							
Description	This element defines a dependent paired approach procedure to parallel runways, with centre lines spaced less than 760m (2500ft) apart, threshold staggers, and/or glide path height differences, under ILS Category I minimums, or the minimums depicted for an RNAV or LPV approach. It covers airports exploiting ICAO 3 Category or Revised Wake Vortex Separation 6 or more Categories.							
Dependencies and relations	Dependency type		ASBU Element					
	Evolution	Relation	ID	Title				
			Wake-B0/1	Wake turbulence separation minima based on 6 or more aircraft categories				
Operations	Flight phases							Turn-around
	Taxi-out		Departure	En-route		Arrival	Taxi-in	
						x		
Planning layers	ATM planning		Strategical	Pre- tactical		Tactical		Post operations
						Pre ops	During ops	
	x		x				x	

PART 4				
Enablers				
Category	Type		Description/Examples	Stakeholder(s)
Regulatory Provisions				
Operational Procedures	For ATC		Procedure for dependent approaches to parallel runways with runway centre lines spaced less than 760m (2500ft) apart (may include the use of forecast and actual winds).	ANSP
			Final approach procedures to staggered runway thresholds and/or require a change in glide slope angle for one runway to assure a level of vertical separation supporting wake avoidance.	
	For operations		Specific go around procedures.	
	For Charting		Charting for ILS or PBN approaches	ANSP
Airborne System capabilities				
Ground system infrastructure	Navigation		ILS / MLS (on both runways) GBAS / SBAS for LPV	ANSP / Airport
	Surveillance		ATM Surveillance capability SSR Radar or ADS-B	ANSP / Airport
Training			ATCO and Pilot training on the new procedures, additional wake categories and new separation minima.	ANSP, Aircraft Operators
Operational Approval	Local hazard identification and risk assessment.			CAA, ANSP
Other				, Aircraft Operators

GANP 2019: ASBU

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

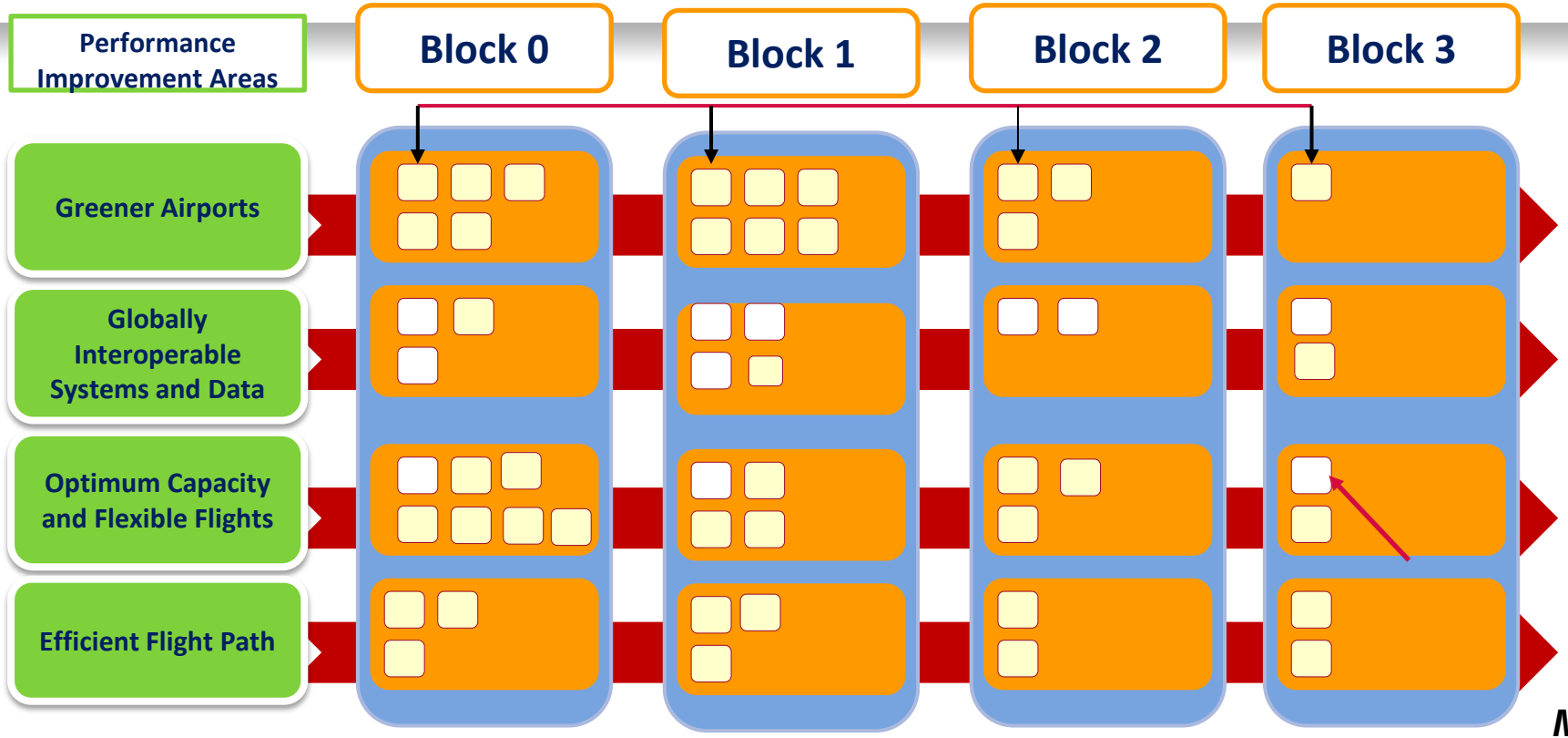


PART 5

WAKE-B0/2	Dependent parallel approaches and wake-dependent departures		
Deployment applicability			
Operational conditions	Aerodromes with demand that exceed peak or daily capacity resulting in delay with parallel runways having centrelines spaced less than 760 m (2500 feet) apart.		
Main intended benefits			
Type	**Operational description**	**Benefitting stakeholder(s)**	
Direct benefits	Reduce separation minima on approach	Airspace user, ANSP, airport operator	
	Reduce delay	Airspace user, ANSP (& Network), airport operator	
	Increase/improve resilience	Airspace user, ANSP, airport operator	
	Increase peak capacity	Airspace user, ANSP, airport operator	
Indirect benefits	Efficiency (temporal efficiency, i.e. delay)	Airspace user, ANSP	
	Predictability	Airspace user, ANSP	
	Fuel savings	Airspace user	

PART 6

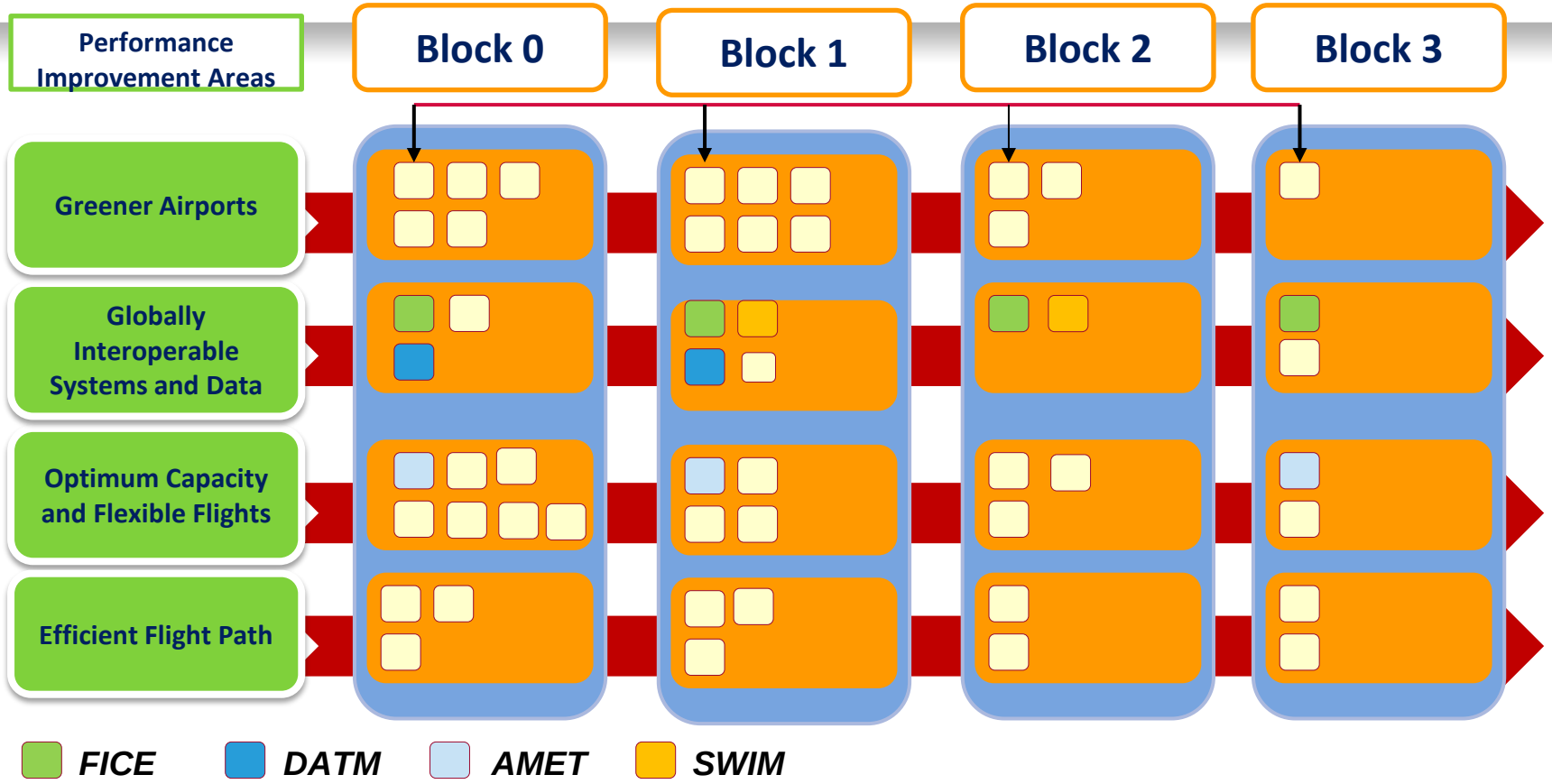
Intended performance impact on specific KPAs and KPIs				
KPA	**Focus Areas**	**KPI**	**KPI impact**	**Most specific performance objective(s) supported**
Capacity	Capacity, throughput & utilization	KPI 06: En-route airspace capacity		
		KPI 09: Airport peak arrival capacity	**	Note: there are no specific objective in the catalogue
		KPI 10: Airport peak arrival throughput	**	- Increase capacity declaration - Improved categorisation of aircraft - Increase airport departure rate
		KPI 11: Airport arrival capacity utilization		- Increase airport arrival capacity utilization when demand exceeds capacity
	Capacity shortfall & associated delay	KPI 07 : En-route ATFM delay		
		KPI 12: Airport/terminal ATFM delay		
Efficiency	Additional flight time & distance	KPI 02: Taxi-out additional time		
		KPI 04: Filed flight plan en-route extension		
		KPI 05: Actual en-route extension		
		KPI 08 : Additional time in terminal airspace	*	- Increase/restore arrival capacity as quickly as possible
		KPI 13: Taxi-in additional time		
	Vertical flight efficiency	KPI 17: Level-off during climb*		
		KPI 18: Level capping during cruise*		
		KPI 19: Level-off during descent*		
	Additional fuel burn	KPI 16: Additional Fuel burn	**	
Predictability	Punctuality	KPI 01: Departure Punctuality		
		KPI 14: Arrival punctuality		
		KPI 03: ATFM slot adherence		
	Variability	KPI 15: Flight time variability	**	
Other objectives from the catalogue that do not contribute to the KPIs above				


Performance Improvement Areas
Block 0
Block 1
Block 2
Block 3
Greener Airports
Globally Interoperable Systems and Data
Optimum Capacity and Flexible Flights
Efficient Flight Path
Module

GLOBALLY INTEROPERABLE SYSTEMS AND DATA (SWIM)

GLOBALLY INTEROPERABLE SYSTEMS AND DATA (SWIM)

BLOCK 0	BLOCK 1	BLOCK 2	BLOCK 3
B0-FICE	B1-FICE	B2-FICE	B3-FICE
B0-DATM	B1-DATM		
B0-AMET	B1-AMET		B3-AMET
	B1-SWIM	B2-SWIM	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Block 0
Block 1
Block 2
Block 3
Greener Airports
Globally Interoperable Systems and Data
Optimum Capacity and Flexible Flights
Efficient Flight Path
FICE
DATM
AMET
SWIM

AMET: MET INFORMATION

- MET information vs. existing products
  - Information = phenomenon/parameter and data characteristics such as severity, accumulation, intensity, probability of occurrence, confidence/ uncertainty of forecasts and reliability, etc.

AMET Block 0

- Concept of operations
  - *Global, regional and local meteorological information to support flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning*.

- Elements
  - AMET-B0/1 Meteorological observation products
  - AMET-B0/2 Meteorological forecast products
  - AMET-B0/3 Climatological and historical meteorological products
  - AMET-B0/4 Dissemination of meteorological products

AMET-B0/1	METEOROLOGICAL OBSERVATIONS PRODUCTS
Main purpose	Meteorological observations in support of flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning.
New capabilities	Provision of additional observations. More automated observations. Higher temporal and spatial resolution for lightning, radar and satellite information.

AMET-B0/2	METEOROLOGICAL FORECAST PRODUCTS
Main purpose	Meteorological forecasts (including advisories and warnings) in support of flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning.
New capabilities	Greater resolution (spatial and temporal) of gridded WAFS information. ICE, TURB, CB WAFS. Improved visualisation of meteorological forecast products.

AMET-B0/3	CLIMATOLOGICAL & HISTORICAL METEOROLOGICAL PRODUCTS
Main purpose	Climatological products in support of the design and planning of infrastructure, flight routes and airspace management. Historical meteorological observations, forecasts, advisories and warnings in support of incident and accident investigation.
New capabilities	Nil

AMET-B0/4	DISSEMINATION OF METEOROLOGICAL PRODUCTS
Main purpose	Dissemination of meteorological products in support of flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning
New capabilities	Commencement of the exchange of meteorological information using the ICAO Meteorological Information Exchange Model (IWXXM), being the conversion of Traditional Alphanumeric Code (TAC), using an IWXXM schema, into XML/GML.

AMET Block 1

- Concept of operations
  - *Meteorological information supporting automated decision process or aids, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support.*

- Elements

  AMET-B1/1 Meteorological observation information
  AMET-B1/2 Meteorological forecast information
  AMET-B1/3 Climatological and historical meteorological information
  AMET-B1/4 Meteorological information in SWIM

AMET-B1/1	METEOROLOGICAL OBSERVATIONS INFORMATION
Main purpose	Meteorological observations information in support of automated decision process or aids, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support.
New capabilities	Commencement of change from product-centric to data-centric information. Space weather information. Sulphur dioxide (SO_2) services. Enhanced hazardous weather services.

AMET-B1/2	METEOROLOGICAL FORECAST INFORMATION
Main purpose	Meteorological forecast information (including warnings) in support of automated decision process or aids, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support.
New capabilities	Commencement of change from product-centric to data-centric information. Space weather information. Sulphur dioxide (SO_2) services. Enhanced hazardous weather services.

AMET-B1/3	CLIMATOLOGICAL AND HISTORICAL METEOROLOGICAL INFORMATION
Main purpose	Climatological products in support of the design and planning of infrastructure, flight routes and airspace management. Historical meteorological observations, forecasts, advisories and warnings in support of incident and accident investigation.
New capabilities	Climatological data. Climate change information.

AMET-B1/4	METEOROLOGICAL INFORMATION IN SWIM
Main purpose	Meteorological information in SWIM in support of automated decision process or aids, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support.
New capabilities	Meteorological information in ICAO Meteorological Information Exchange Model (IWXXM) form starts to replace traditional alphanumeric code (TAC) products. Human-readable products will start to be derived from the IWXXM information (rather than the other way around). The introduction of web services allows for progressive replacement of fixed line dissemination systems.

DATM: Aeronautical Information

- Digital vs. Paper documentation & telex-based text messages . Quality management
  - Through aeronautical information service (AIS) to aeronautical information management (AIM) implementation, use of aeronautical information exchange model (AIXM), migration to electronic aeronautical information publication (eAIP) and better quality and availability of aeronautical data.
- Cross-domain information exchange
- Access via internet-protocol-based tools

DATM Block 0

- Concept of operations
  - *Aeronautical information which encompass improved data quality (accuracy, resolution, integrity, timeliness, traceability, completeness, format), timely distribution of information, digital exchange and processing of information, and more efficient management of aeronautical information to avoid reliance on manual processing and manipulation. Quality-assured aeronautical information is essential.*
- Elements
  - DATM-B0/1 Provision of quality-assured aeronautical data and information
  - DATM-B0/2 Provision of digital AIP data sets
  - DATM-B0/3 Provision of digital terrain data sets
  - DATM-B0/4 Provision of digital obstacle data sets
  - DATM-B0/5 Provision of digital instrument flight procedure data sets
  - DATM-B0/6 Provision of digital aerodrome mapping data sets
  - DATM-B0/7 NOTAMs improvement

AIM-B0/1	Provision of quality-assured aeronautical data and information
Main purpose	The main purpose of this element is to ensure that aeronautical data and information comply with quality standards in order to meet the needs of airspace users and support the safety of flight operations.
New capabilities	1) Implementation of quality management systems to ensure that aeronautical data and information comply with the required standards. 2) Use of common reference systems (spatial – WGS84 and temporal- AIRAC) to facilitate consistent interpretation of aeronautical data and information and facilitate their timely exchange. 3) Full move into an automated data-centric environment so that the management, processing, verification, usage and exchange can be done in a structured, automatic manner and human intervention is reduced. 4) Aeronautical data and information is of high quality if it is aggregated and provided by authoritative sources. This requires to properly control relationships along the whole data chain from the origination to the distribution to the next intended user (formal arrangements with data originators, neighbouring States, data and information service providers and others).

AIM-B0/2	Provision of digital AIP data sets
Main purpose	The purpose of this element is to introduce the capability to provide AIP data sets to users in an interoperable and mutually-understood manner.
New capabilities	Replacement of existing sections of the AIP through the provision of digital AIP data sets. AIM envisages a migration to a data-centric environment where aeronautical data and information (AIP) will be provided in a digital form through the use of information exchange models (e.g. AIXM) and in a structured way.

AIM-B0/3	Provision of digital terrain data sets
Main purpose	The purpose of this element is to introduce the capability to provide terrain data sets to users in an interoperable and mutually-understood manner.
New capabilities	Provision of terrain data as digital data sets. AIM envisages a migration to a data centric environment where terrain data will be provided in a digital form and in a structured way.

AIM-B0/4	Provision of digital obstacle data sets
Main purpose	The purpose of this element is to introduce the capability to provide obstacle data to users in an interoperable and mutually-understood manner.
New capabilities	Provision of obstacle data as digital data sets. AIM envisages a migration to a data centric environment where obstacle data will be provided in a digital form through the use through the use of information exchange models (e.g. AIXM) and in a structured way.

AIM-B0/6	Provision of digital Instrument flight procedure data sets
Main purpose	The purpose of this element is to introduce the capability to provide instrument flight procedure data to users in an interoperable and mutually-understood manner. It also includes the need to use specific criteria for coding instrument flight procedures to ensure compliance with the navigation specifications, consistency in design, coding and operation of PBN procedures and avoid differences in the aircraft behaviour in response to the coded path terminators.
New capabilities	Provision of instrument flight procedure data as digital data sets. AIM envisages a migration to a data centric environment where instrument flight procedure data will be provided in a digital form through the use of information exchange models (e.g. AIXM) and in a structured way. Applying new rules for coding Instrument flight procedures will limit the number of allowable path terminators for PBN procedures in compliance with the PBN Navigation Specifications.

AIM-B0/7	NOTAM improvements
Main purpose	To provide timely and relevant information about status and condition of the ANS infrastructure to the next intended users via NOTAM.
New capabilities	1) Identification of clear operational conditions to determine when a NOTAM shall or shall not be originated, thus ensuring that the information provided meets the needs of the users. 2) Replacement of paper NOTAMs by a digital version through the use of information exchange models (e.g. AIXM), thus enhancing the quality of information provided.

DATM Block 1

- Concept of operations
  - *This module addresses the need for increased aeronautical information integration and will support a new concept of ATM information exchange fostering access via internet-protocol-based tools based on service orientation in accordance with the SWIM concept.*

    Additional aeronautical information may be required.
- Elements
  - DATM-B1/1 AIM requirements to support NOPS-B1/5

AIM-B1/1	AIM requirements to support NOPS-B1/5
Main purpose	Provide additional AIM information regarding airspace usage plan to support enhanced Network operations features
New capabilities	Airspace usage plan (AUP) and User usage plan (UUP) are exchanged using SWIM.

FICE: FLIGHT & FLOW INFORMATION

- Manual vs. digital transfer of flight data. TBO foundation.
  - Implement pre-flight collaborative coordination and maintenance of advanced flight information: improved response to operators flight preferences.

FICE Block 0

- Concept of operations
  - *To improve coordination between air traffic service units (ATSUs) by using ATS basic interfacility flight data communication. The benefit is the improved efficiency through digital transfer of flight data.*
- Elements
  - FICE-B0/1 Automated basic Inter facility data exchange

FICE-B0/1	Automated basic Inter facility message exchange
Main purpose	To improve message exchange between ATS facilities by automating it.
New capabilities	Replacement of coordination via voice by automatic message exchange
Description	This element represents a first automation step in the evolution of the coordination between neighbouring ATS units to guarantee that all related and necessary flight information will be available to the other unit as per agreement.

FICE Block 1

- Concept of operations
  - *Establish foundation for TBO by enabling exchange of advanced flight information between operators and ATM and unique identification of the flight. Implement pre-flight collaborative coordination and maintenance of advanced flight information: improved response to operators flight preferences. Capacity and demand balancing improvement (better capacity utilization) due to timely and accurate flight information.*

- Elements
  - FICE-B1/1 Flight Information Exchange Model (FIXM)
  - FICE-B1/2 eFPL processing
  - FICE-B1/3 Planning Service
  - FICE-B1/4 Flight Plan Information Requests

FICE-B1/1	Flight Information Exchange Model
Main purpose	Provide and extensible XML schema to support the services envisioned by FF-ICE Step 1 Provisions as well as for the use by ATC/ATM applications e.g. NOPS, APTA, etc.
New capabilities	• Support the exchange of the Globally Unique Flight Identifier (GUFI) as prescribed in the FF- Ice Manual. • Support for data in the current ATS messages of interest in PANS-ATM Appendix 3 • Support for new content envisioned for FF-ICE/1, e.g. 4D Trajectories, to be described in the new PANS-ATM Appendix 7 being developed for ATMRPP. • Support for messaging, such as addresses, versioning, message numbers which supports FIXM in the FFICE and SWIM environment

FICE-B1/2	eFPL processing (basic element)
Main purpose	Provides for full flight plan processing that includes full constraint testing and enhanced flight information sharing.
New capabilities	An ATM Service Provider (ASP) implementing FF-ICE must accept any valid Filed Flight Plan, i.e. whether with minimum required content or any of the more advanced content. The ASP must also decide whether and how to take advantage of more advanced content provided by the operator to include: • Climb and descent performance data to allow more accurate and consistent calculation of 4D Trajectories by the service provider. • Operator-calculated 4D-Trajectory to allow understanding by the service provider of the operator expectations. • Operator constraints that the service provider can take into account when assessing the flight and developing a clearance.

FICE-B1/3	Planning Service (optional)
Main purpose	Allows flight operator to test portions of proposed flights with advanced service providers as part of the flight planning cycle.
New capabilities	To provide the Planning Service, a provider needs at a minimum to be able to determine relevant constraints applicable to a flight and feed them back to the operator. A service provider that supports Preliminary Flight Plans and provides feedback must also evaluate whether to provide a "re-evaluation" service, i.e. updates to the feedback that reflect changes to constraints after the initial feedback is provided.

FICE-B1/4	Flight Plan Information Requests (optional)
Main purpose	Makes available a query and reply service allowing an operator to query the service providers for information on one of its flights - allows an operator to verify the status of a flight previously submitted.
New capabilities	A service provider implementing FF-ICE must at a minimum support flight plan information requests that replicate the function of the RQP and RQS messages and allow another service provider or operator to request an FF-ICE flight plan, or supplementary information about a flight in FF-ICE format.

SWIM: INFORMATION MANGEMENT

- ATS messages vs. SWIM.
  - Enabler for all envisioned ATM information exchange in support of ATM operations
- Point-to-point connectivity and protocols using pre-defined messages
- Advanced exchange of ATM information via a secure aviation intranet

SWIM Block 1

- Concept of operations
  - *System Wide Information Management replaces the current point-to-point technologies by a secure aviation intranet relying on internet technologies for providing information (exchange) services to the entire ATM community. In order to facilitate information exchange through standardised SWIM information services via, for example, request/reply or publish/subscribe exchange patterns, common data models and service descriptions are defined and appropriate governance rules are established. This thread is not in itself an operational improvement but rather a fundamental enabler to support all ATM improvements that require information to be made available.*

SWIM Block 1

- Elements
  - SWIM-B1/1 SWIM information service provider
  - SWIM-B1/2 SWIM information service consumer
  - SWIM-B1/3 SWIM registry

SWIM-B1/1	SWIM Information service provider
Main purpose	Provide an information service provider the tools to make available ATM information in a SWIM environment
New capabilities	Information services are exposed to the ATM community preferably via a registry. Via the registry metadata specifying the characteristics of the provided information are made available in an information service description SWIM Information services support request/reply or publish/subscribe access mechanisms Information Service provider provides access to their services thanks to access point that are made available to the authorized users.

SWIM-B1/2	SWIM information service consumer
Main purpose	Provide an information service consumer the tools to access and use ATM information in a SWIM environment
New capabilities	A SWIM information consumer has access to registries in order to discover the information services available. SWIM information service consumer may need metadata mining capabilities if they want to automatically understand the information offering provided in the service description. Request and subscribe exchange patterns have to be supported as those are SWIM information access mechanisms. Capability to connect to an IP access point as SWIM services is made available over an IP infrastructure.

SWIM-B1/3	SWIM registry
Main purpose	To provide a mechanism to discover and ultimately access SWIM information services within an internet-based ATM information environment.
New capabilities	A registry is the preferred means to discover and provide relevant ATM information services. It offers the SWIM service provider with the capability to expose SWIM information services to potential consumers. A registry enables a SWIM service consumer to discover and find sufficient description (namely metadata) about SWIM information services. Provide the capability for managing the metadata in the registry. Registry includes user access control mechanism.

What does this mean in real life?

https://www.faa.gov/tv/?mediaId=1437

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