RLA/06/901 – Taller/Reunión para la Región SAM sobre Uso Flexible de Espacio aéreo (FUA) y Cooperación Civil – Militar en el ATM
(Lima, Perú, 19 al 23 de junio de 2023)

Sesión 2: Marco OACI – Elementos FUA en el Modulo FRTO del GANP

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7 ma EDICION

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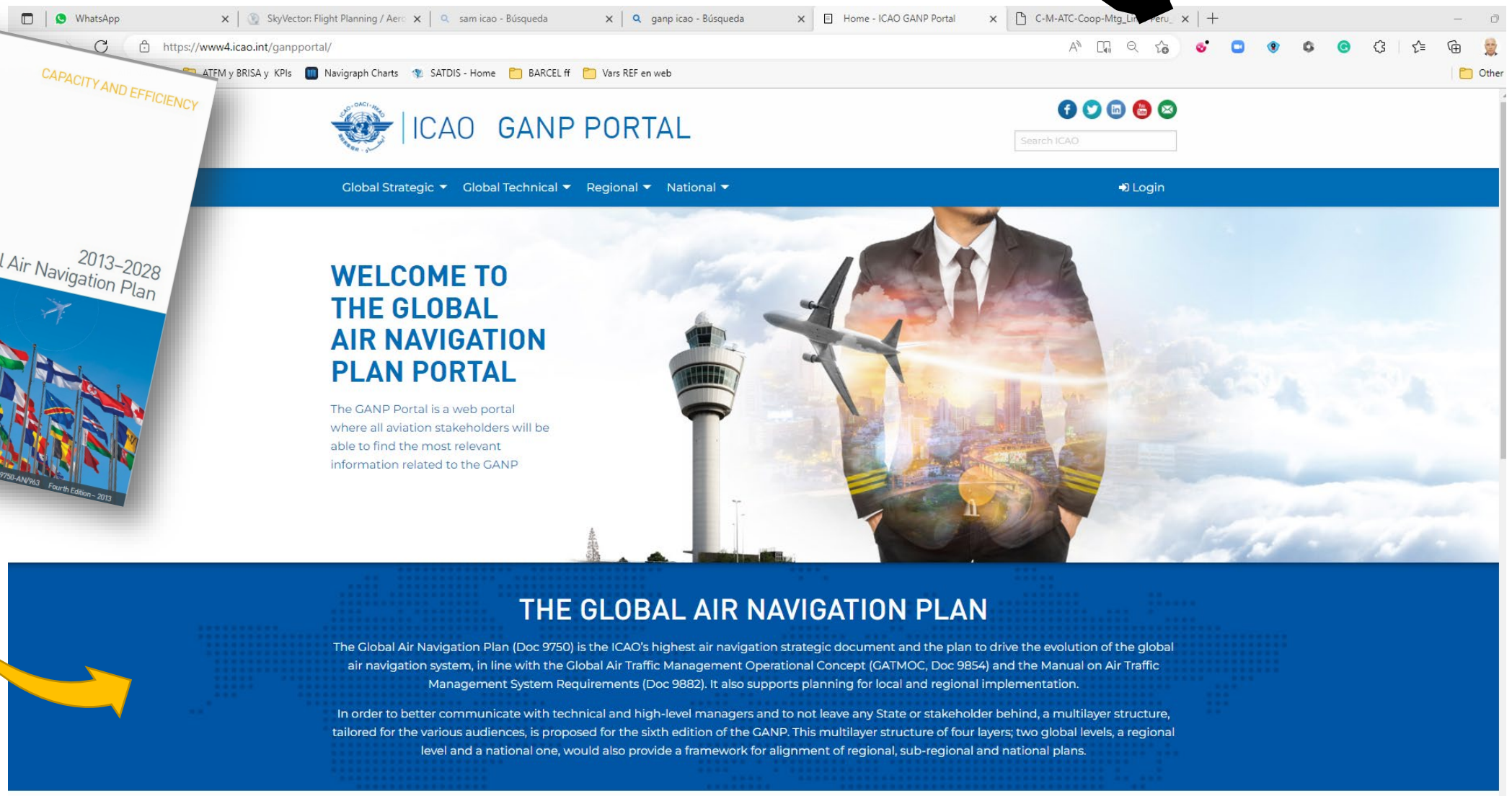


THE GLOBAL AIR NAVIGATION PLAN

The Global Air Navigation Plan (Doc 9750) is the ICAO's highest air navigation strategic document and the plan to drive the evolution of the global air navigation system, in line with the Global Air Traffic Management Operational Concept (GATMOC, Doc 9854) and the Manual on Air Traffic Management System Requirements (Doc 9882). It also supports planning for local and regional implementation.

In order to better communicate with technical and high-level managers and to not leave any State or stakeholder behind, a multilayer structure, tailored for the various audiences, is proposed for the sixth edition of the GANP. This multilayer structure of four layers; two global levels, a regional level and a national one, would also provide a framework for alignment of regional, sub-regional and national plans.

MULTILAYER STRUCTURE OF THE GANP

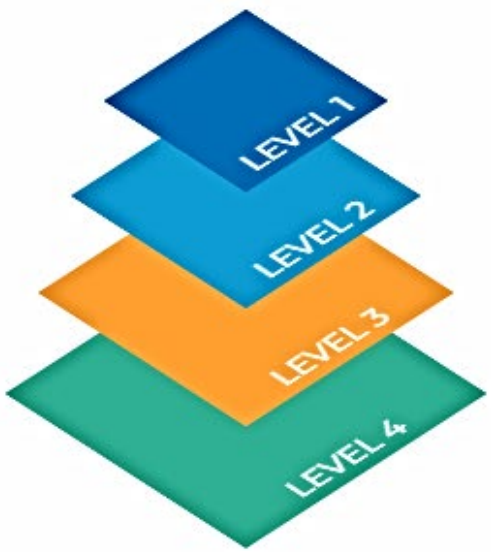
Click a level to navigate

GLOBAL STRATEGIC

GLOBAL TECHNICAL

REGIONAL

NATIONAL



MULTILAYER STRUCTURE OF THE GANP

Click a level to navigate

GLOBAL STRATEGIC

GLOBAL TECHNICAL

REGIONAL

NATIONAL

GLOBAL STRATEGIC

Provides high-level strategic directions for decision makers to drive the evolution of the global air navigation system towards a common agreed vision.

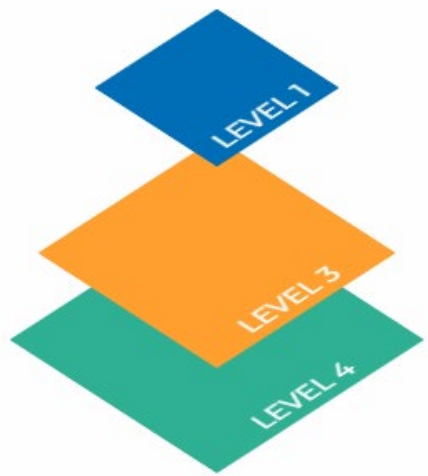
GANP STRATEGY

GLOBAL STRATEGIC

GLOBAL TECHNICAL

REGIONAL

NATIONAL



GLOBAL TECHNICAL

Supports technical managers in planning the implementation of basic air navigation services and new operational improvements in a cost-effective manner.

ASBUs & PF

AN-SPA

BBBs

ASBU – HILOS CONDUCTORES

- ***Información***

- ***CNS Tecnología & Servicios***

Information

AMET	Meteorological information
DAIM	Digital Aeronautical Information Management
FICE	Flight and Flow Information for a Collaborative Environment (FF-ICE)
SWIM	System Wide Information Management

CNS technology and services

ASUR	Surveillance systems
COMI	Communication infrastructure
COMS	ATS Communication service
NAVS	Navigation systems

Sigue…

ASBU – HILOS CONDUCTORES OPERACIONALES

ACAS	Airborne Collision Avoidance System (ACAS)
ACDM	Airport Collaborative Decision Making
APTA	Improve arrival and departure operations
CSEP	Cooperative Separation
DATS	Digital Aerodrome Air Traffic Services
FRTO	Improved operations through enhanced en-route trajectories
GADS	Global Aeronautical Distress and Safety System (GADSS)
NOPS	Network Operations
OPFL	Improved access to optimum flight levels in oceanic and remote airspace
RSEQ	Improved traffic flow through runway sequencing
SNET	Ground-based Safety Nets
SURF	Surface operations
TBO	Trajectory-based operations
WAKE	Wake Turbulence Separation

FRTO	Improved operations through enhanced en-route trajectories	Operational

CONCEPT OF OPERATIONS BY BLOCK

Block	Description
Baseline	En-route trajectories are constrained by the fixed route network, permanently segregated areas, conventional navigation or limited use of area navigation (RNAV), rigid allocation of airspace between civil and military authorities, and rigid sector configurations. Conflict detection is a manual task, performed on the basis of paper/electronic flight strips.
Block 0	En-route trajectories are enhanced by using more direct routings, and collaborative airspace management process and tools. ATCOs are assisted by tools for the conflict identification and conformance monitoring.
Block 1	Block 1 introduces the initial steps towards trajectory-based operations by the enhancement of FRTO B0 processes and system support or the deployment of new processes and system support where necessary. In continental airspace, the most important operational improvement is related to Free Route Airspace (FRA) as the continuation of direct routing introduced in FRTO B0. For airspace where FRA cannot be deployed, or for connectivity between FRA and terminal manoeuvring areas (TMAs), RNP routes might be considered. Collaborative airspace management is enhanced with new features such as real time airspace management (ASM) data exchanges. Additional system capabilities such as dynamic sectorization intend to align the traffic demand to the available capacity.
Block 2	Block 2 includes further steps towards trajectory-based operations by the enhancement of FRTO B1 processes and system support or the deployment of new processes and system support where necessary applicable to both continental and oceanic airspace where trajectory type operations are common.

ELEMENTS

Element ID	Title
FRTO-B0/1	Direct routing (DCT)
FRTO-B0/2	Airspace planning and Flexible Use of Airspace (FUA)
FRTO-B0/3	Pre-validated and coordinated ATS routes to support flight and flow
FRTO-B0/4	Basic conflict detection and conformance monitoring
FRTO-B1/1	Free Route Airspace (FRA)
FRTO-B1/2	Required Navigation Performance (RNP) routes
FRTO-B1/3	Advanced Flexible Use of Airspace (FUA) and management of real time airspace data
FRTO-B1/4	Dynamic sectorization
FRTO-B1/5	Enhanced Conflict Detection Tools and Conformance Monitoring
FRTO-B1/6	Multi-Sector Planning
FRTO-B1/7	Trajectory Options Set (TOS)
FRTO-B2/1	Local components of integrated ATFM and ATC Planning function (INAP)
FRTO-B2/2	Local components of Dynamic Airspace Configurations (DAC)
FRTO-B2/3	Large Scale Cross Border Free Route Airspace (FRA)
FRTO-B2/4	Enhanced Conflict Resolution Tools

FRTO B0/2

FRTO-B0/2	Airspace planning and Flexible Use of Airspace (FUA)	Operational

Main Purpose
Establish the Flexible Use of Airspace (FUA) process and improve data exchange between civil and military stakeholders by automation to enable a more efficient use of airspace based on transparency and due regard to national security needs.

New Capabilities
Deployment of automated airspace management (ASM) support systems to manage the airspace reservations based on the airspace user needs and resulting from civil-military collaborative decision-making process and more flexibly according to the airspace user needs.

Description
This element addresses strategic/long term airspace management, pre-tactical planning and tactical operations. Automated ASM support systems improve airspace management processes and flexible airspace planning including time horizon specifications in all flight phases (strategic, pre-tactical and tactical time horizon) by providing mutual visibility on civil and military requirements. They also support flexible airspace planning according to civil and military ANSPs and airspace user requirements, including permit cross border and use of segregated areas operations regardless of national boundaries.

Maturity Level
Ready for implementation

Human Factor Considerations
1. Does it imply a change in task by a user or affected others? **Yes**
2. Does it imply processing of new information by the user? **Yes**
3. Does it imply the use of new equipment? **Yes**
4. Does it imply a change to levels of automation? **Yes**

PLANNING LAYERS
ATM planning | Strategical | Pre-tactical | Tactical-Pre ops | Tactical-During ops

OPERATIONS
Departure | En-route | Arrival

DEPENDENCIES AND RELATIONS

Type of Dependencies	ASBU Element
Relation-operational need	FRTO-B0/1 - Direct routing (DCT)
Relation-operational need	NOPS-B0/1 - Initial integration of collaborative airspace management with air traffic flow management

ENABLERS

Enabler Category	Enabler Type	Enabler Name	Description / References	Stakeholders	Year
Regulatory provisions	Operational Approval	Operational approval to provide FUA	Follow regulations for regulatory approval Reference : ICAO Circular 330 Civil/Military Coordination European Union Regulation (EC) No 2150/20... read more	CAA ICAO	2013
Operational procedures	Design and operations	FUA Procedures for Dynamic Airspace Management	Design and use of operational procedures Reference: EUROCONTROL European Route Network Improvement Plan (ERNIP) - Part 1: European Airspace Design ... read more	ANSP Aircraft operator	2013
Ground system infrastructure	ATM systems	Tools and System to support FUA	Tools to be implemented and existing systems upgraded to conduct FUA operations. Reference European Route Network Improvement Plan (ERNIP) - Part 3... read more	ANSP	2013
Training	-	Training requirements for FUA	Training for FUA Provide training to staff prior to implementation	ANSP Aircraft operator	2013
Ground system infrastructure	ATM systems	ATFM system for FUA	Upgrade ATFM/flight planning systems to support FUA Reference: EUROCONTROL NM Flight Planning Requirements document December 2018 (https://www.euroc... read more	ATM network function	2013

INTENDED PERFORMANCE IMPACT ON SPECIFIC KPAS AND KPIS

KPA	Focus Areas	Most specific performance objective(s) supported	KPI Impact	KPI
Access and equity		Improve airspace reservation management	++	
Efficiency	Flight time & distance	Facilitate direct routing of portions of the flight (if this does not cause network problems)	++	KPI05: Actual en-route extension
Efficiency	Flight time & distance	Overcome route selection inefficiencies associated with route & airspace availability as known at the flight planning stage	++	KPI04: Filed flight plan en-route extension
Efficiency	Flight time & distance	Reduce need for tactical ATFM rerouting to circumnavigate airspace closed at short notice	++	KPI05: Actual en-route extension
Efficiency	Flight time & distance	Reduce need to avoid airspace because of lack of confirmation that it will be open	++	KPI04: Filed flight plan en-route extension
Efficiency	Vertical flight efficiency	Reduce altitude restrictions during climb to avoid Special Use Airspace	++	KPI17: Level-off during climb
Efficiency	Vertical flight efficiency	Reduce altitude restrictions during cruise to avoid Special Use Airspace	++	KPI18: Level capping during cruise
Efficiency	Vertical flight efficiency	Reduce altitude restrictions during descent to avoid Special Use Airspace	++	KPI19: Level-off during descent

PERFORMANCE OBJECTIVE CATALOGUE

Change Request

- Efficiency
- Capacity
- Predictability
- Safety
- Security
- Environment
- Cost effectiveness
- Interoperability
- Access and equity
- Participation by the ATM community
- Flexibility

11 Key Performance Areas

KPI OVERVIEW

Change Request | Generate PDF

KPI01	Departure punctuality
KPI02	Taxi-out additional time
KPI03	ATFM slot adherence
KPI04	Filed flight plan en-route extension
KPI05	Actual en-route extension
KPI06	En-route airspace capacity
KPI07	En-route ATFM delay
KPI08	Additional time in terminal airspace
KPI09	Airport peak capacity

[No Title]

KPI10	Airport peak throughput
KPI11	Airport throughput efficiency
KPI12	Airport/Terminal ATFM delay
KPI13	Taxi-in additional time
KPI14	Arrival punctuality
KPI15	Flight time variability
KPI16	Additional fuel burn
KPI17	Level-off during climb
KPI18	Level capping during cruise
KPI19	Level-off during descent

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- Gracias