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A UN SPECIALIZED AGENCY

Effective Implementation of the CAR/SAM ANP Vol. III

Effective Implementation of the CAR/SAM ANP Vol. III

01 Global Air Navigation Plan
GANP

02 Basic Building Blocks (BBB) Framework

03 ASBU Framework

04 Performance Framework (KPI)

05 CAR/SAM RANP VOLUME III

The Problem

01

Global Air Navigation Plan

GANP

In Focus: ICAO'S Strategic Objectives


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National
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WELCOME TO THE GLOBAL AIR NAVIGATION PLAN PORTAL
The GANP Portal is a web portal where all aviation stakeholders will be able to find the most relevant information related to the Seventh edition of the GANP
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). Developed in collaboration with and for the benefit of stakeholders, the GANP is a key contributor to the achievement of ICAO's Strategic Objectives and has an important role to play in supporting the United Nations 2030 Agenda for Sustainable Development.
The content of the GANP is organized into a multilayer structure with each layer tailored to different audiences. This allows for better communication with both high-level and technical managers with the objective that no State or stakeholder is left behind. The four-layer structure is made up of global (strategic and technical), regional and national levels, and provides a framework for alignment of regional, sub-regional and national plans. The four-layer structure facilitates decision making by providing a stable strategic direction for the evolution of the air navigation system and, at the same time, timely relevance in the technical content.

OACI

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).

The content of the GANP is organized into a multilayer structure with each layer tailored to different audiences.

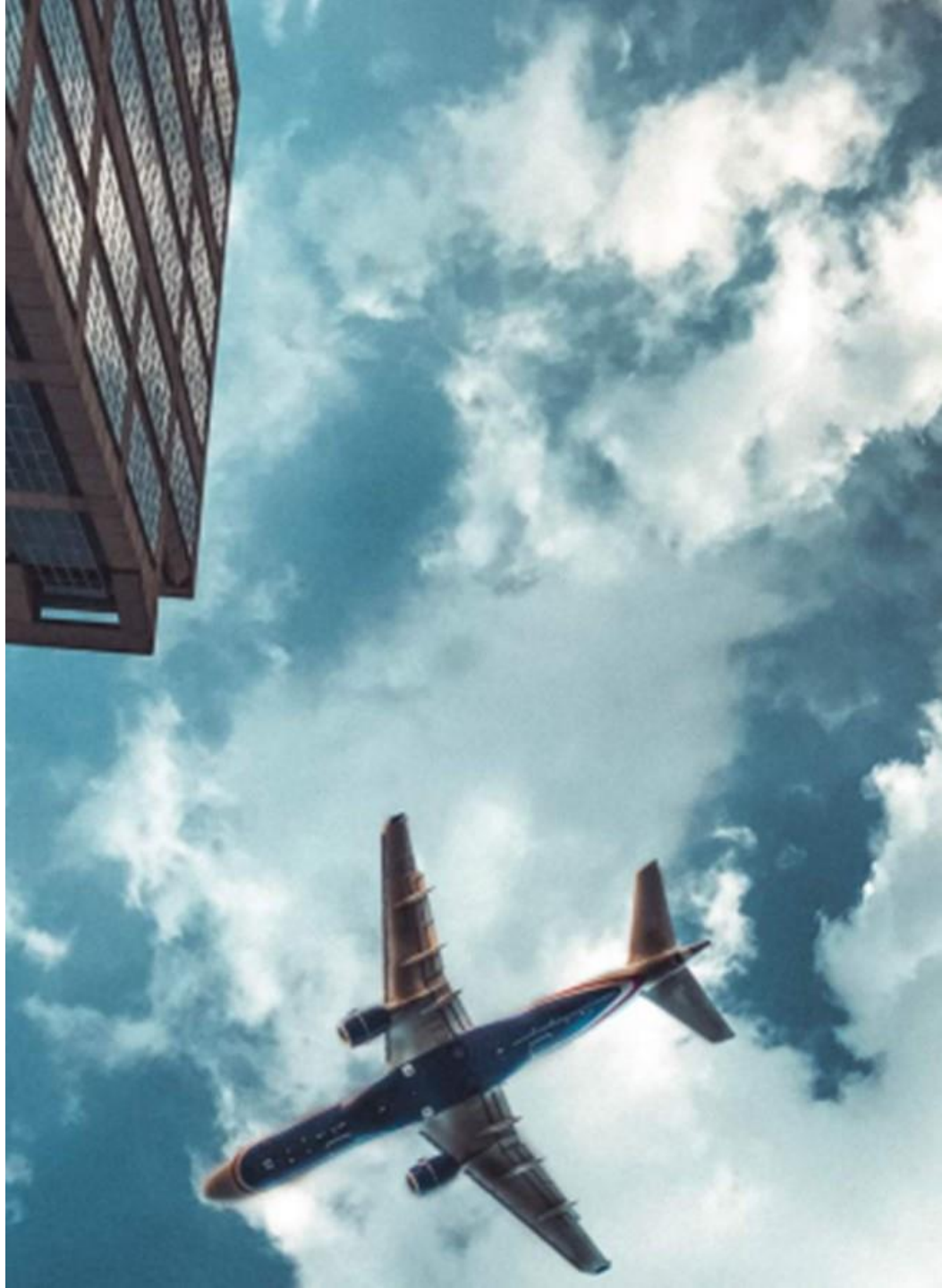
OACI

The **GANP** drives the **evolution** of the global air navigation system to meet the ever growing expectations of the aviation community.

The purpose of the **GANP** is to equitably accommodate all airspace users operations in a safe, secure and cost-effective manner while reducing the aviation environmental impact.

To this end, the **GANP** provides a series of operational **improvements** to increase capacity, efficiency, predictability, flexibility while ensuring interoperability of systems and harmonization of procedures.

The **GASP** supports the implementation of the **GANP** by promoting the effective implementation of safety oversight and a safety management approach to oversight, including safety risk management to permit innovation in a managed way.



ICAO | OACI

The four-layer structure is made up of **global strategic** and **global technical**, **regional** and **national** levels, and provides a framework for alignment of regional, sub-regional and national plans.

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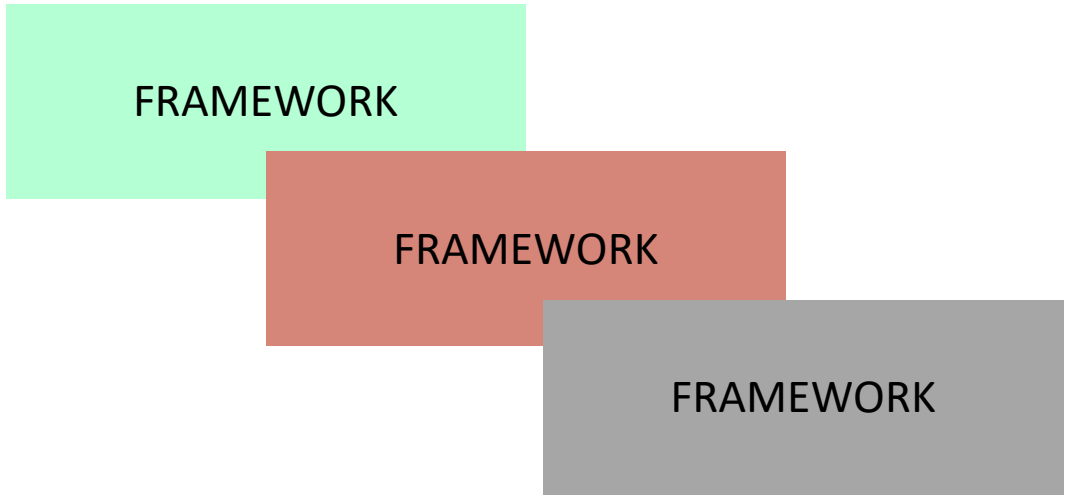
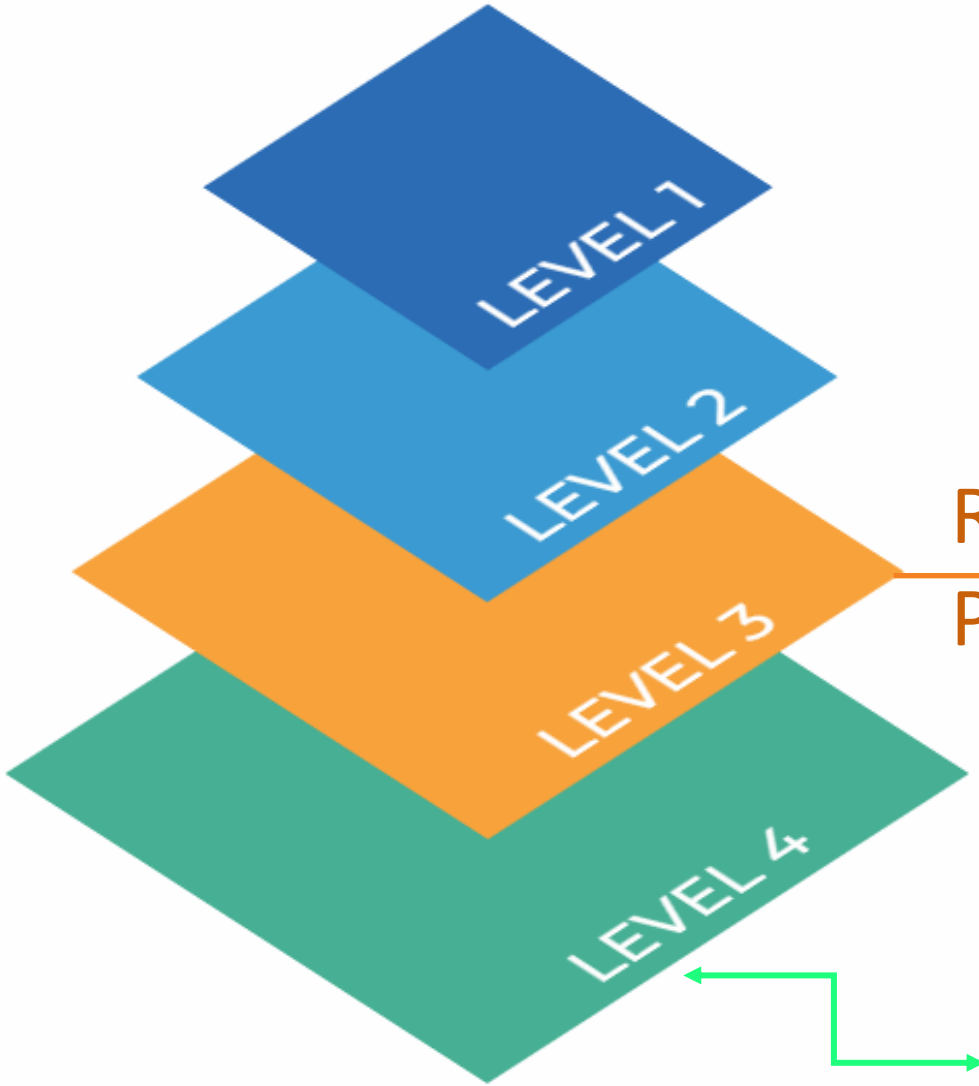
Three FRAMEWOKS



Four LEVELS

OACI

Four LEVELS



REGIONAL PLAN

- VOLUME I
- VOLUME II
- **VOLUME III ⇨ PBA**

NATIONAL PLAN: TEMPLATE

REMIND THE TASK: Effective Implementation of the CAR/SAM ANP Vol. III

THE GANP, THE PERFORMANCE BASED PLANNING, THE ASBU AND PERFORMANCE FRAMEWORKS ARE *DEPLOYED* IN THE REGIONAL AIR NAVIGATION PLAN – RANP, **VOLUMEN III**

Three FRAMEWOKS

02

FRAMEWORK 1

Basic Building Blocks (BBB)

BBBs & USOAP –PQs

Safety oversight is a function by which Member States ensure the effective implementation of:

- Safety-related Standards and Recommended Practices (SARPs), and
- Associated procedures contained in the Annexes to the Convention on International Civil Aviation and related ICAO documents.

An individual State's responsibility for safety oversight is the foundation upon which safe global aircraft operations are built. The lack of appropriate safety oversight in one Contracting State threatens the health of international civil aircraft operations.

ICAO has determined that effective safety oversight systems basically require the effective implementation of the eight essential elements or critical; elements (CEs) of a State Safety Oversight System. Five CEs are related to establishing the system and three are related to implementing the system.

The critical elements begin with the State establishing a primary legislative framework (CE-1) to support safety oversight enforcement of regulations. In keeping with the scope of its civil aviation activities, the State then establishes specific operating regulations (CE-2) and an organization to carry out stated safety functions (CE-3). The State must also establish and maintain technical expertise (CE-4) and guidance for conducting safety oversight activities in the form of adequate facilities, tools and provision of safety-critical information for their staff of technical experts (CE-5).

Once the first five elements are established, the State needs to implement documented processes and procedures to ensure that individuals and organizations performing an aviation activity meet the established requirements before they are allowed to exercise the privileges of a licence, certificate, authorization or approval to conduct the relevant aviation activity. (CE-6).

To demonstrate compliance with these obligations, the State must perform documented surveillance, inspections, audits and monitoring (CE-7). The State must also demonstrate resolution of any safety concerns (CE-8), including enforcement measures that arise during its surveillance and inspections.

Once the safety oversight system is established, CEs 6 and 7 address the capability of the State to comply with its licensing and certification obligations, as well as surveillance and inspection. These obligations are specific to each area of the aviation system and to the requirements defined in each of the ICAO Annexes and Procedures for Air Navigation Services (PANS). Within the areas covered by the Basic Building Block (BBB) framework (air traffic management, aerodromes, search and rescue, meteorology and aeronautical information, and CNS), critical elements 6 and 7 focus on surveilling that the State is ensuring that the air navigation service provider is providing the service according to ICAO SARPs and PANS. The link of the provision of essential air navigation services and their oversight is therefore made through these critical elements.

To ensure the provision of seamless air navigation services based on the deployment of interoperable systems and harmonized procedures, States should boost the implementation of BBBs through their national air navigation plans as a strategic part of their national aviation planning framework.

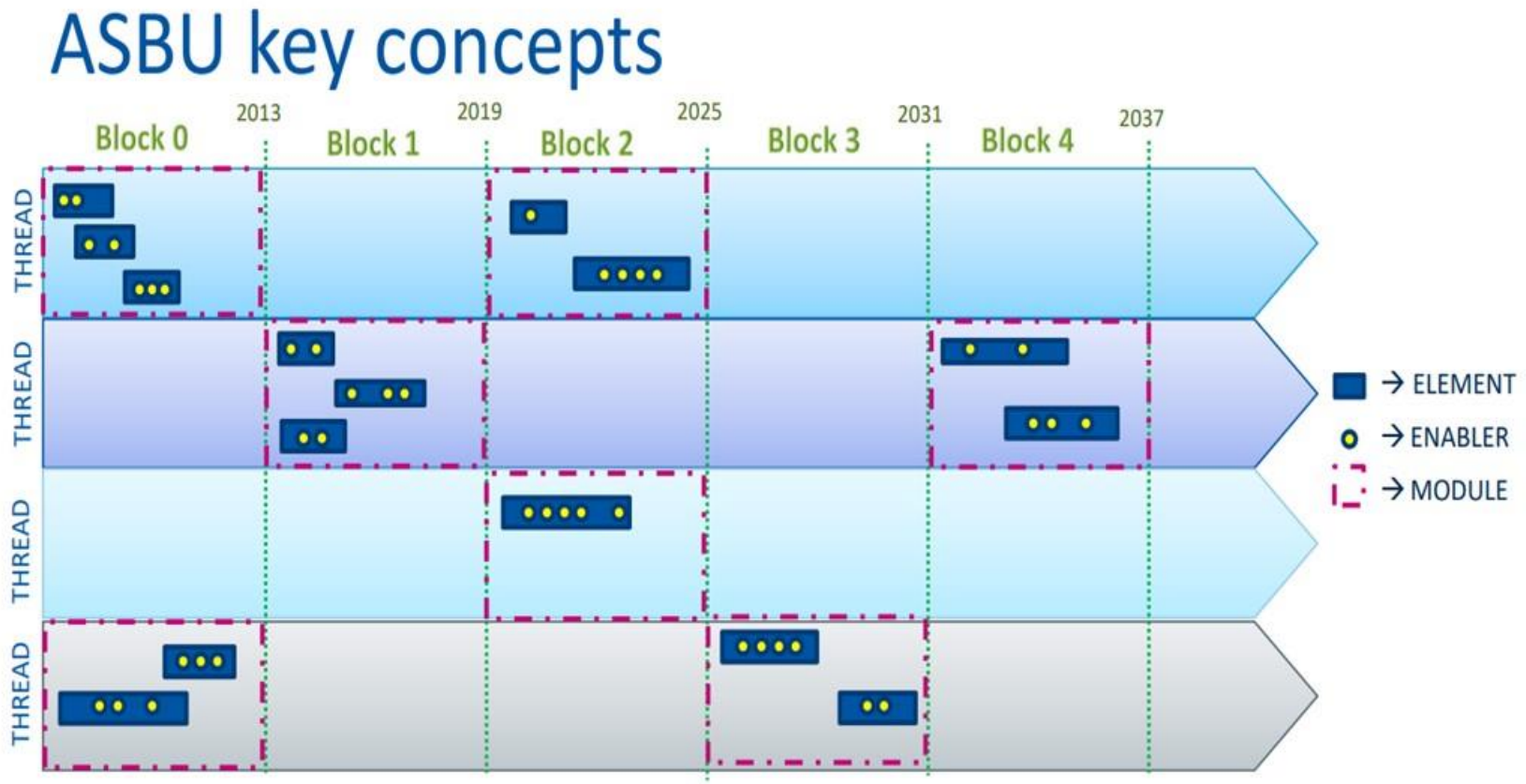
It is important to note that BBBs are considered essential services that States must have operating on a mandated basis, since they obey the implementation of ICAO standards and that the lack of operation of any of them is considered a deficiency.

03

FRAMEWORK 2

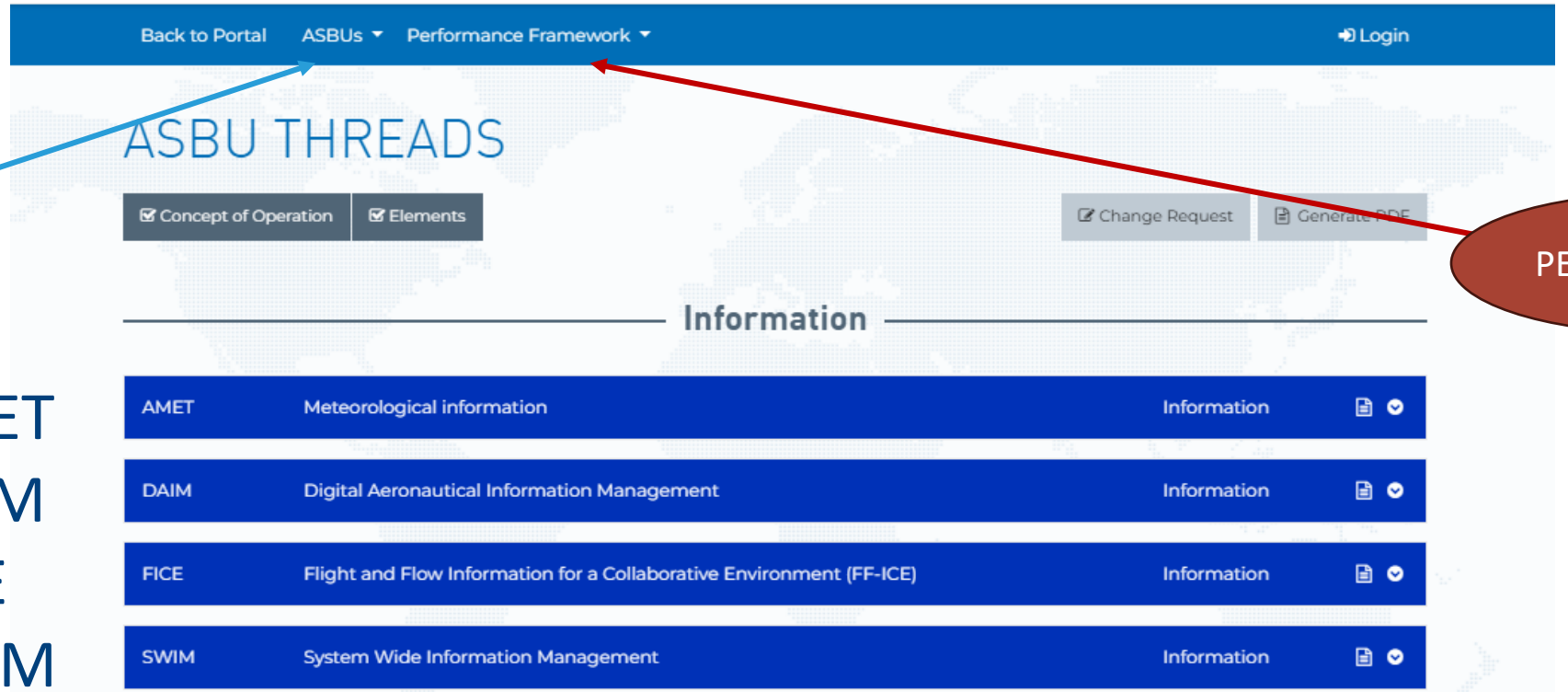
AVIATION SYSTEM BLOCKS UPGRADE

ASBU

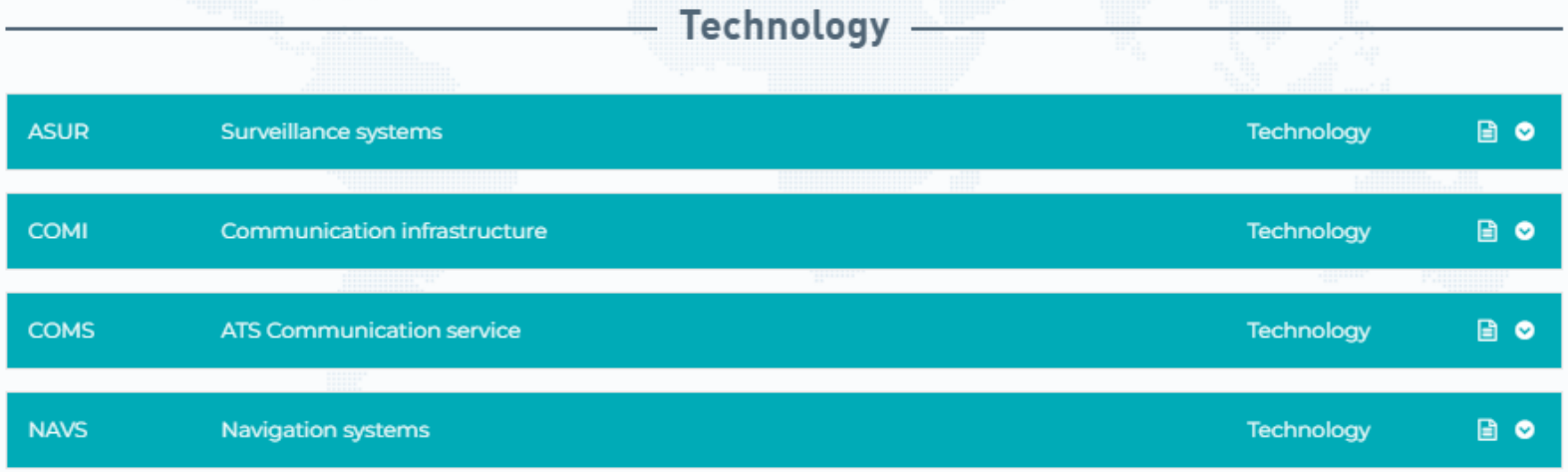


ASBU

PERFORMANCE



- AMET
- DAIM
- FICE
- SWIM



- ASUR
- COMI
- COMS
- NAVS

OACI

- ACAS
- ACDM
- APTA
- CSEP
- DATS
- FRTO
- GADS
- NOPS
- OPFL
- RSEQ
- SNET
- SURF
- TBO
- WAKE

APTA | Improve arrival and departure operations | Operational

CONCEPT OF OPERATIONS BY BLOCK

Block	Description
Baseline	**Terminal Area Arrival and Departure Procedures** Where implemented, standard terminal arrival procedures (STARs) provide a defined lateral path for arriving aircraft to connect to the approach. Similarly, Standard Instrument Departure procedures (SIDS), where implemented, provide a lateral path for aircraft to depart the terminal area after take-off. These terminal procedures enable more efficient terminal airspace management.
	Approach Procedures Aircraft with appropriate equipment are capable of flying instrument approaches promulgated as Instrument Approach Procedures, including ILS and RNP APCH. (Prior to the PBN Manual, the RNP APCH approaches were known as GPS or GNSS Approaches). Approach minima are operationally derived from the procedure design, aircraft type and equipage, and supporting ground infrastructure. PBN procedures may be implemented alone or can be added with existing conventional procedures. Since GNSS can support PBN procedures independent of ground based navigation infrastructure, it is a foundational building block that can enable implementation of PBN to improve arrival, departure and approach operations globally.

APTA MODULE

BLOCK 0

Terminal Area Arrival and Departure Procedures

Procedures implemented as STARS in terminal airspace provide lateral path guidance to support improving the efficiency in the descent phase of flight by enabling near idle power operations from top of descent, to a point where the aircraft transitions to approach operations. For takeoff, SIDS provide a lateral path that can support continuous climb operations to the top of climb where the cruise phase of flight starts.

Enhanced STARS and SIDS with altitude constraints along the lateral path improve ATC management, and further support operational efficiency by providing vertical profiles that all aircraft can follow.

Approach Procedures

Performance based aerodrome operating minima (PB AOM) allows for implementation of vertically guided approaches at a wider range of aerodromes, and facilitates a phased approach to improvement in approach capabilities. Advanced aircraft with technology such as Enhanced Vision Systems (EVS) benefit from operational credits to continue operations below normal minima.

Helicopter Point in Space procedures allow for access to landing locations other than heliports.

BLOCK 1

Terminal Area Arrival and Departure Procedures

Improvement in airspace management is brought by the utilization of advanced capabilities such as standardized Baro-VNAV functionality and scalable RNP. These optimise descent phase and terminal airspace by providing vertical descent and climb corridors in combination with more precise lateral paths in the terminal area. Such advanced capabilities will reduce the amount of protected airspace vertically and laterally which will enhance the efficiency and flexibility of the terminal airspace design, allowing for optimum arrival and departure operations. These enhancements build on the achievements developed in Block 0.

Approach Procedures

Further development of the PB AOM concept includes more options such as synthetic vision guidance systems (SVGS).

BLOCK 2

Approach Procedures

Development of GBAS Cat II/III approaches allows for an alternative precision approach landing system to be used in low visibility operations.

APTA

- B0/1
- B0/2
- B0/3
- B0/4
- B0/5
- B0/6
- B0/7
- B0/8
- **B1/1**
- **B1/2**
- **B1/3**
- **B1/4**
- **B1/5**
- B2/1
- B2/2
- B2/3
- B2/4
- **B3/1**
- **B3/2**

ELEMENTS

Element ID	Title
APTA-B0/1	PBN Approaches (with basic capabilities)
APTA-B0/2	PBN SID and STAR procedures (with basic capabilities)
APTA-B0/3	SBAS/GBAS CAT I precision approach procedures
APTA-B0/4	CDO (Basic)
APTA-B0/5	CCO (Basic)
APTA-B0/6	PBN Helicopter Point in Space (PinS) Operations
APTA-B0/7	Performance based aerodrome operating minima – Advanced aircraft
APTA-B0/8	Performance based aerodrome operating minima – Basic aircraft
APTA-B1/1	PBN Approaches (with advanced capabilities)
APTA-B1/2	PBN SID and STAR procedures (with advanced capabilities)
APTA-B1/4	CDO (Advanced)
APTA-B1/5	CCO (Advanced)
APTA-B2/1	GBAS CAT II/III precision approach procedures
APTA-B2/2	Simultaneous operations to parallel runways
APTA-B2/3	PBN Helicopter Steep Approach Operations
APTA-B2/4	Performance based aerodrome operating minima – Advanced aircraft with SVGS
APTA-B3/1	Parallel approaches without vertical guidance
APTA-B3/2	Implementation of A-RNP to support non-complex simultaneous independent parallel approaches

Elements = SOLUTIONS ??!

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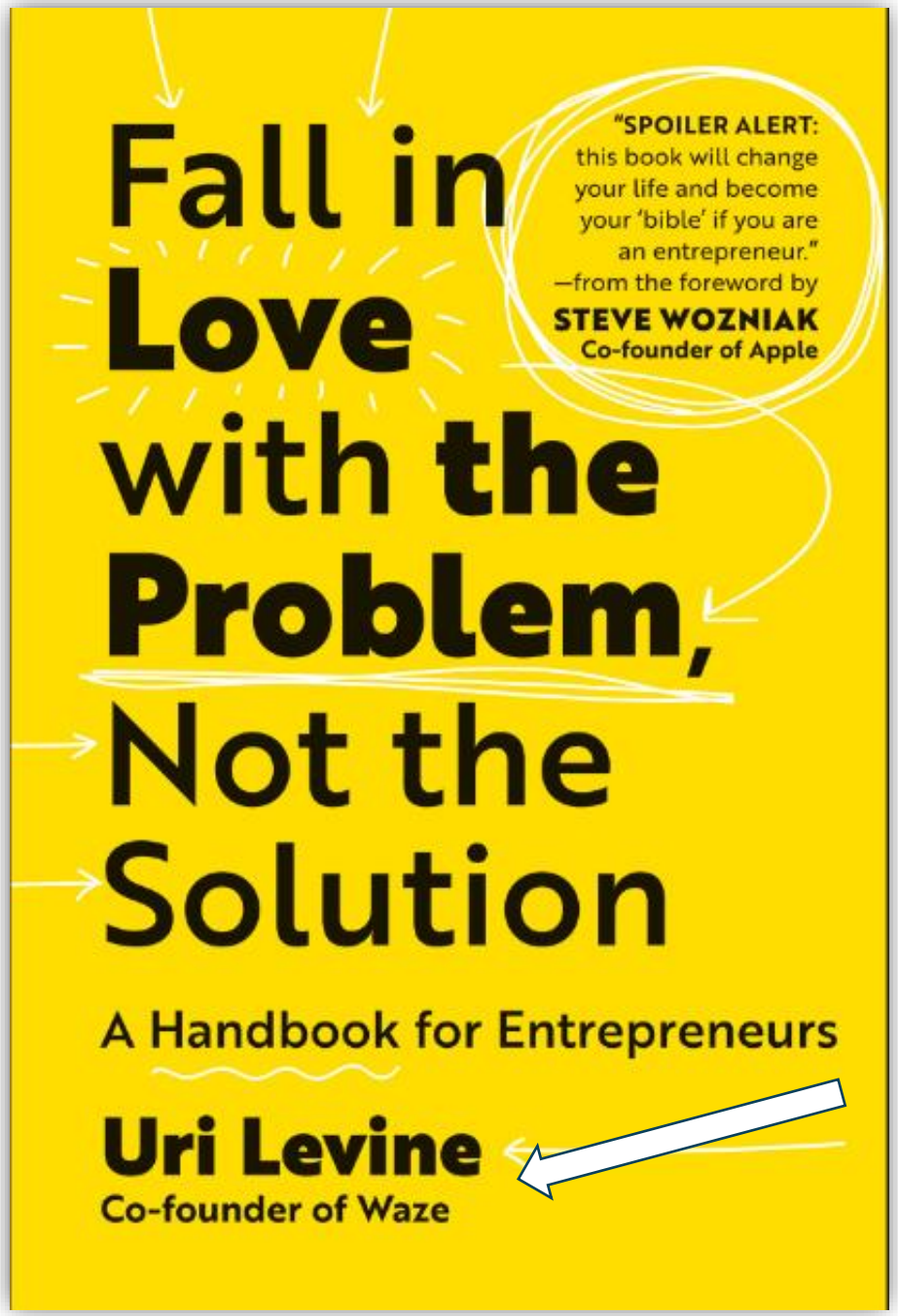
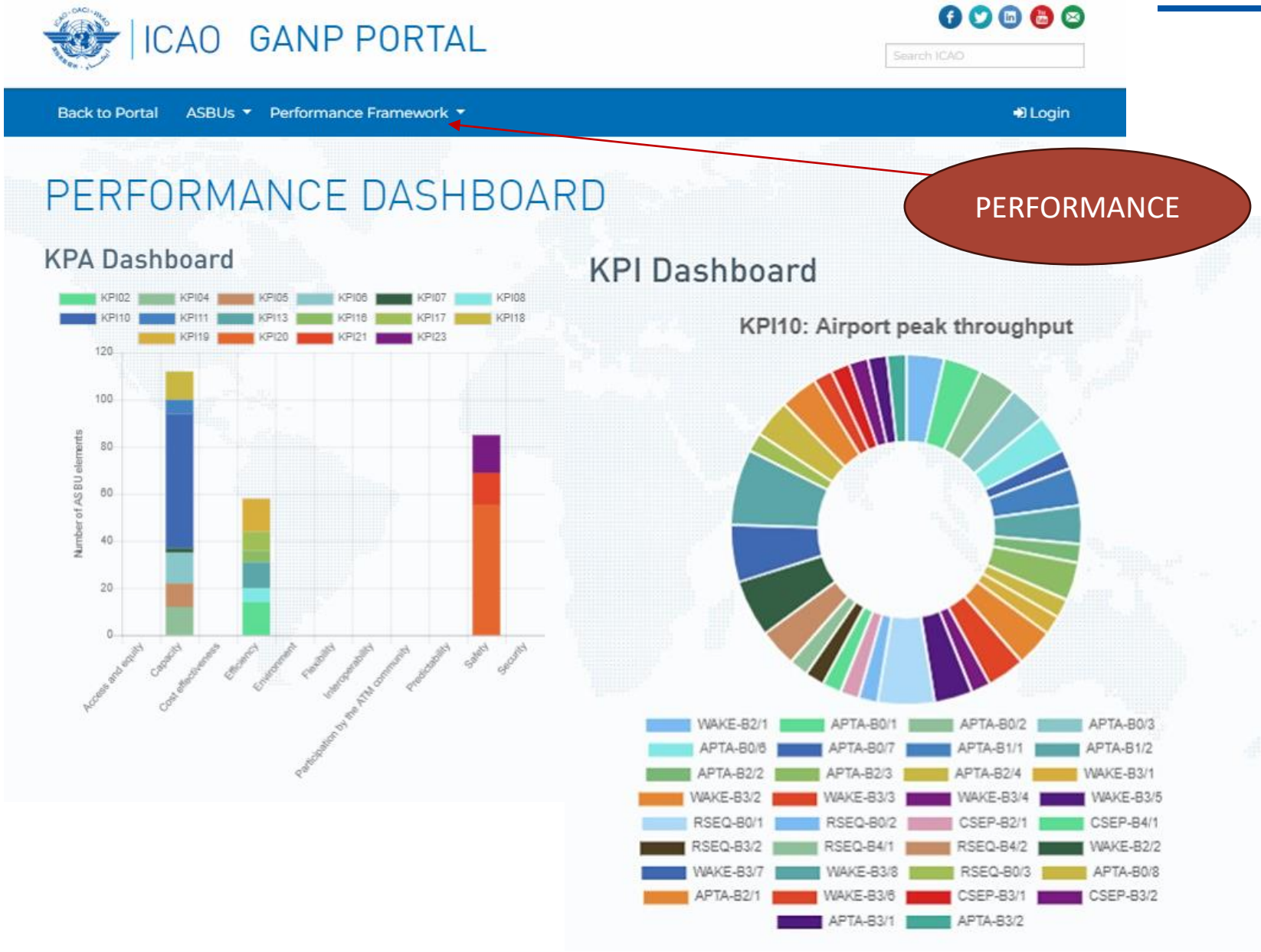

Fall in Love with the Problem, Not the Solution
"SPOILER ALERT: this book will change your life and become your 'bible' if you are an entrepreneur."
—from the foreword by
STEVE WOZNIAK
Co-founder of Apple
A Handbook for Entrepreneurs
Uri Levine
Co-founder of Waze

04

FRAMEWORK 3

Performance framework (KPI)



KEY PERFORMANCE INDICATORS (KPI)

https://www4.icao.int/ganpportal/ASBU/KPI

- Definition
- Units of Measurement
- Measured Operations
- Variants
- Characterized Objects
- Usefulness of the KPI
- Parameters
- Data Requirement
- Data Feed Providers
- Formula / Algorithm
- References & Examples of Uses

KEY PERFORMANCE INDICATORS (KPI)

(CONT.)

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

KEY PERFORMANCE INDICATORS (KPI)

(CONT.)

SAFETY KPIs

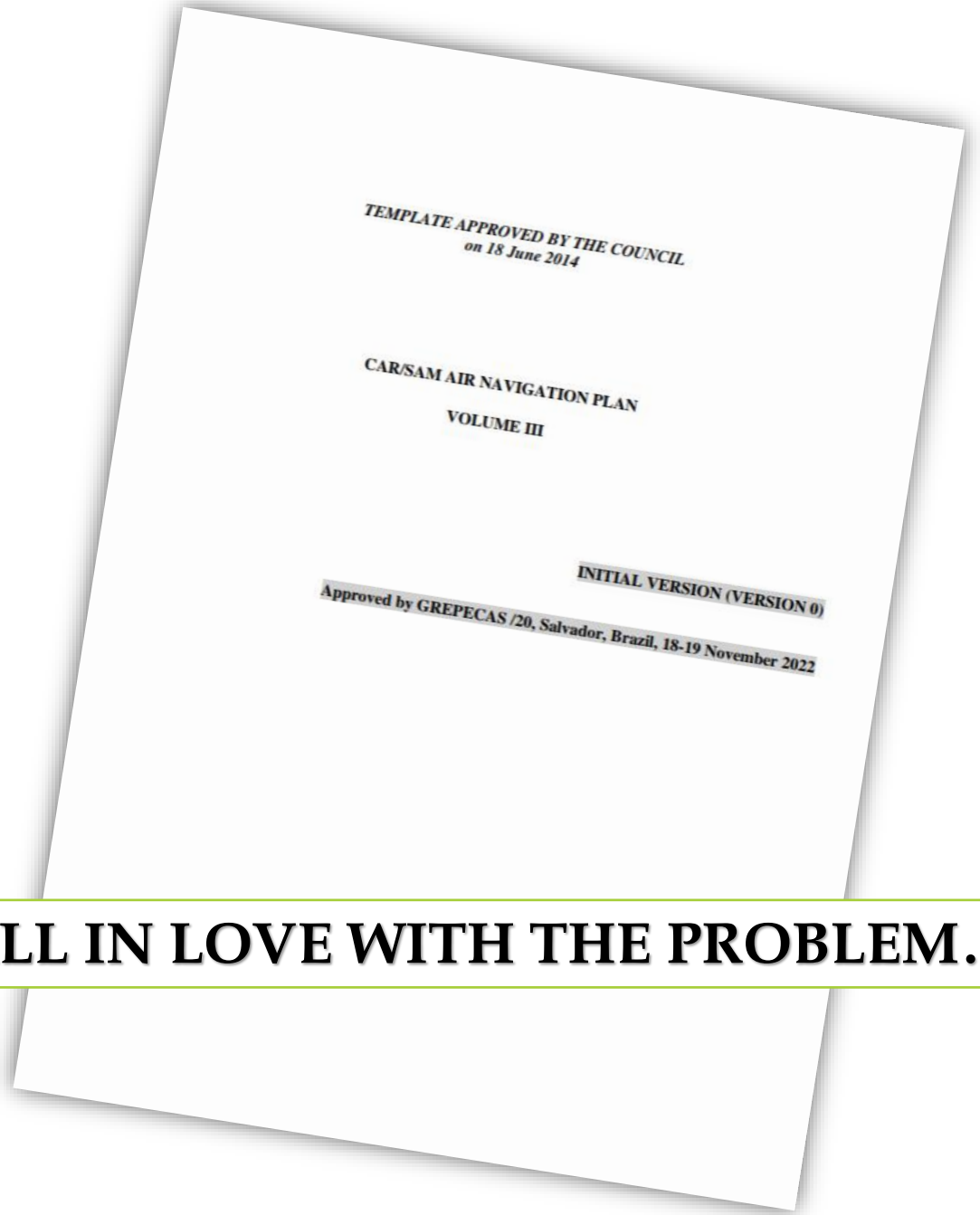
KPI20	Number of aircraft accidents
KPI21	Number of runway incursions
KPI22	Number of runway excursions
KPI23	Number of airprox/TCAS alert/loss of separation/near midair collisions/midair collisions (MAC)

KEY PERFORMANCE INDICATORS (KPIS)

- KPIs are quantitative means of measuring current/past performance, expected future performance, and actual progress in achieving performance goals.
- Regional performance targets help the aviation community identify relevant and timely improvements (operational improvements) to a given region's air navigation system.
- In addition, at the national level, States can set performance targets for their different operating environments using the list of KPIs, taking into account regional performance requirements.

05

CAR/SAM RANP
VOLUME III



FALL IN LOVE WITH THE PROBLEM….

OACI

CAR/SAM Regional air navigation Plan - RANP

VOL I
(assignment of responsibilities – Art. 28 Convention)

VOL II
(responsibilities of States for the provision of essential aerodrome and air navigation facilities and services – GREPECAS Planning)

VOL III
(contains dynamic/flexible plan elements that provide system modernization and enhancement)

FRAMEWORK

BBB

1 - Represented by BBB vs PQ USOAP compliance in each State.

2 - GANDD – air navigation deficiencies

GASP (Doc 10004) paragraph 3.3

FRAMEWORK

ASBU

Improvement ambitions and selected solutions. **6-step method. Performance-based planning**

FRAMEWORK

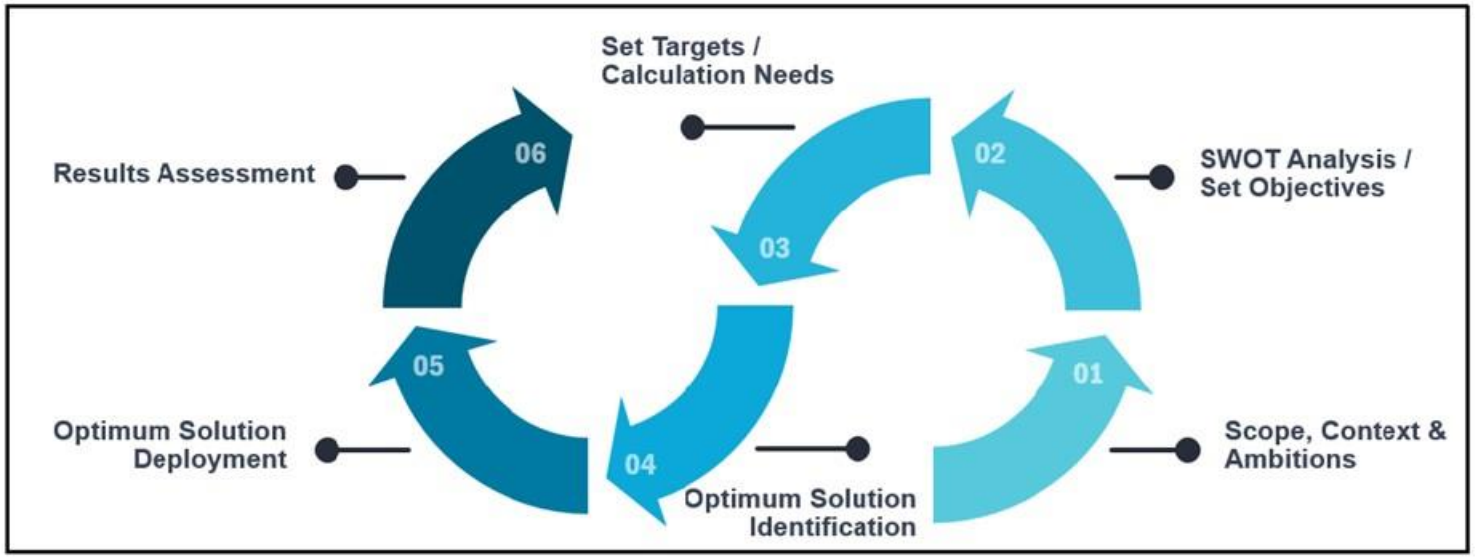
KPI

Baseline and monitoring of the performance obtained

Alignment with Regional Planning

NANP (States)

Vol I, II y III



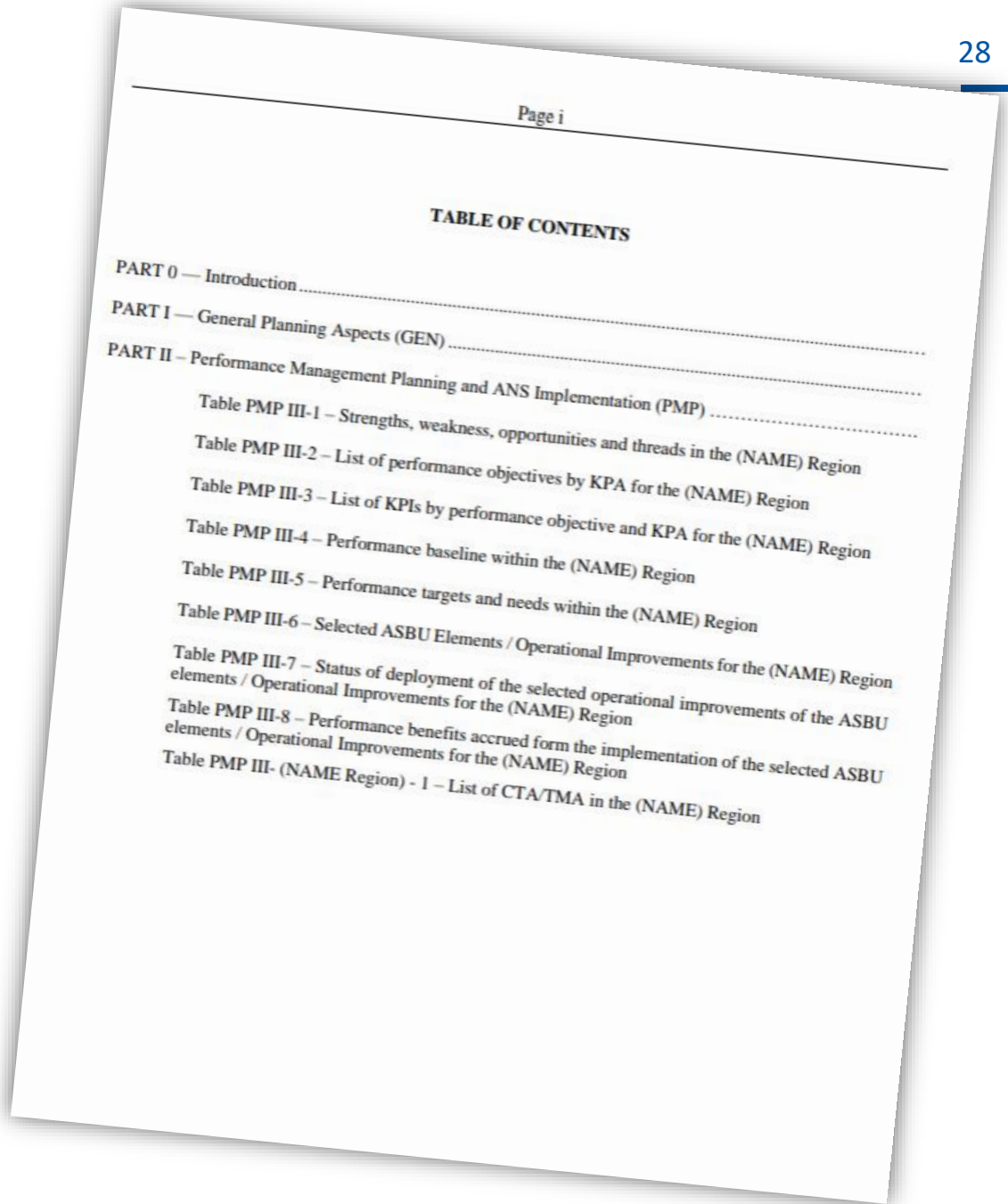
6-step method

CAR/SAM RANP VOLUME III

The information contained in Volume III relates to:

- Planning: planned objectives, priorities, goals and needs at the regional or subregional level;
- Monitoring and reporting: monitoring performance and implementation of agreed targets; or
- Guidance: Provide regional guidance material for the implementation of specific systems/procedures in a harmonized manner.

GREPECAS is responsible for administering and regularly updating Volume III.



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OACI

06

THE PROBLEM

To date, most States are in the preparatory process for the formulation of KPI baselines.

Therefore, to move forward with Volume III, it is necessary to **re-improve tasks for compliance** with step 3 by the States.
Identified problems during the process:

– Lack of understanding of the relevance of the CAR/SAM ANP Regional Plan as a global planning instrument and for the establishment of international responsibilities, and of the relationship of the Regional Plan with the right to establish aeronautical charges.

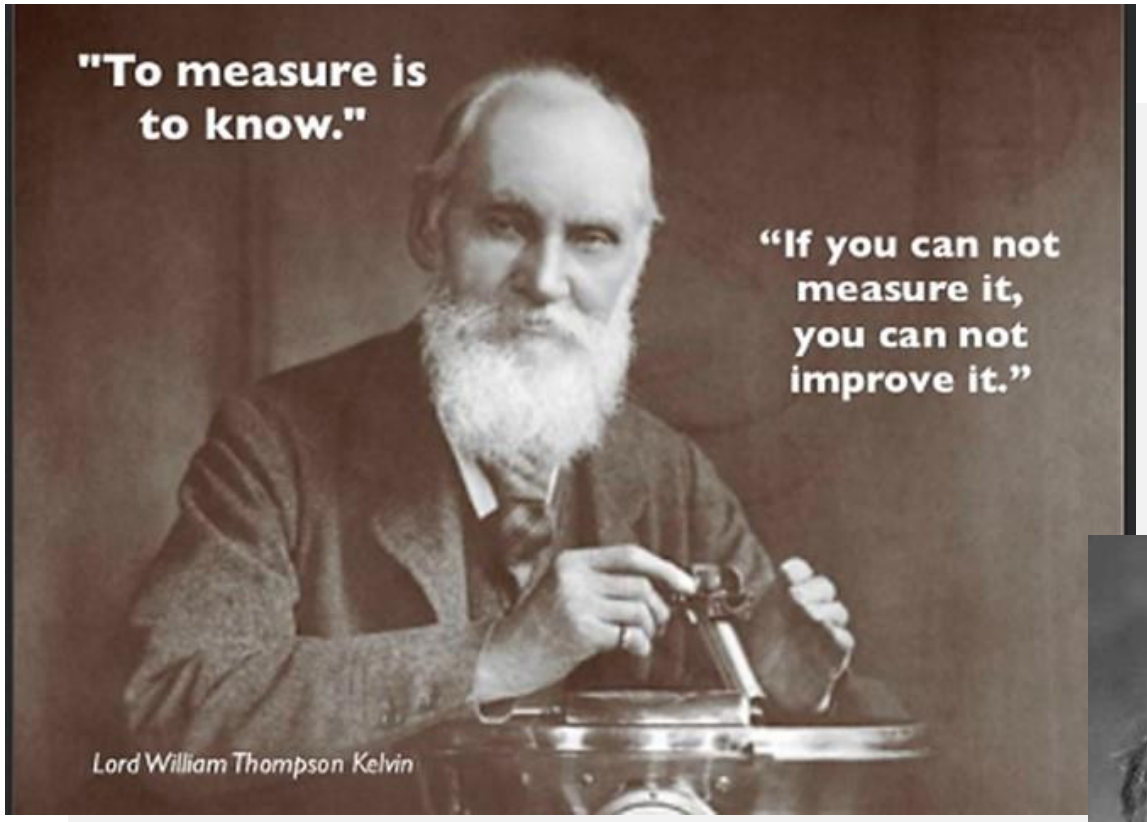
THE PROBLEM

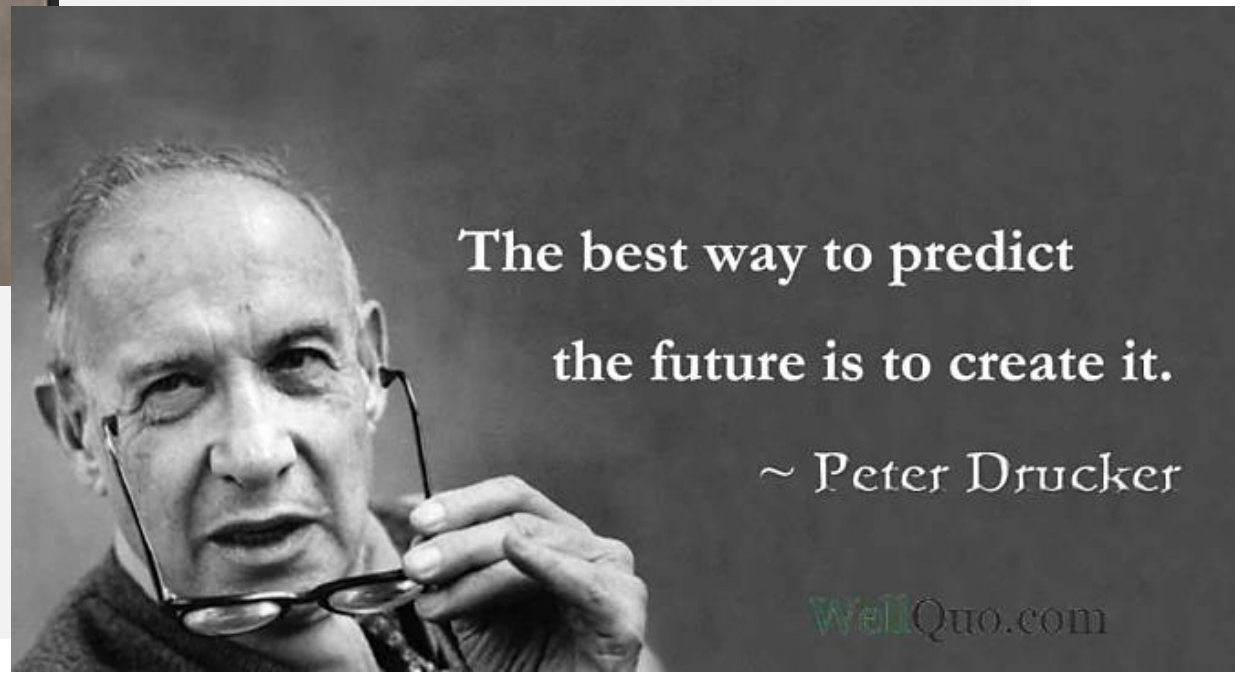
– Lack of cooperation between the State air navigation planning body and the data providers that are necessary for the formulation of KPIs. In some cases, both depend on the same administration, however, the delivery of data is not facilitated.

– Insufficient resources, knowledge and/or technology to manage *simple* indicators and *complex* indicators (example: KPI17 and KPI19 require automation).

– Need to improve the cost-benefit analysis in the decision-making process for implementing improvement elements in the air navigation area.

– Reorientate regional planning to introduce the six-step method as a reference for GREPECAS, so that it can be verified that the agreed improvement elements for air navigation provide the expected results. Identify the tools necessary for the NACC and SAM Offices to appropriately assist with this objective.


"To measure is to know."
"If you can not measure it, you can not improve it."
Lord William Thompson Kelvin


The best way to predict the future is to create it.
~ Peter Drucker
WellQuo.com

Gracias!

OACI