



INTERNATIONAL CIVIL AVIATION ORGANIZATION

A United Nations Specialized Agency

Identification and analysis of training needs in the NAM/CAR Regions

International Civil Aviation Organization

CIAC/1, August 27-30 2013

Content



- ICAO strategic objectives
- ATM expectations
- USOAP-CMA
- Main improvements areas
- Planning and implementation
- ICAO programmes
- RPOs & ASBU 0
- RPOS
- Tomorrow`s needs

- The International Civil Aviation Organization (ICAO) sets standards and recommended practices for the safe and orderly development of international civil aviation.
- The Framework consists of 37 Programmes under the three Strategic Objectives as well as 14 programmes under the Supporting Implementation Strategies.
- The Strategic Objectives form the basis for the Organization's activities for the period 2011-2013.

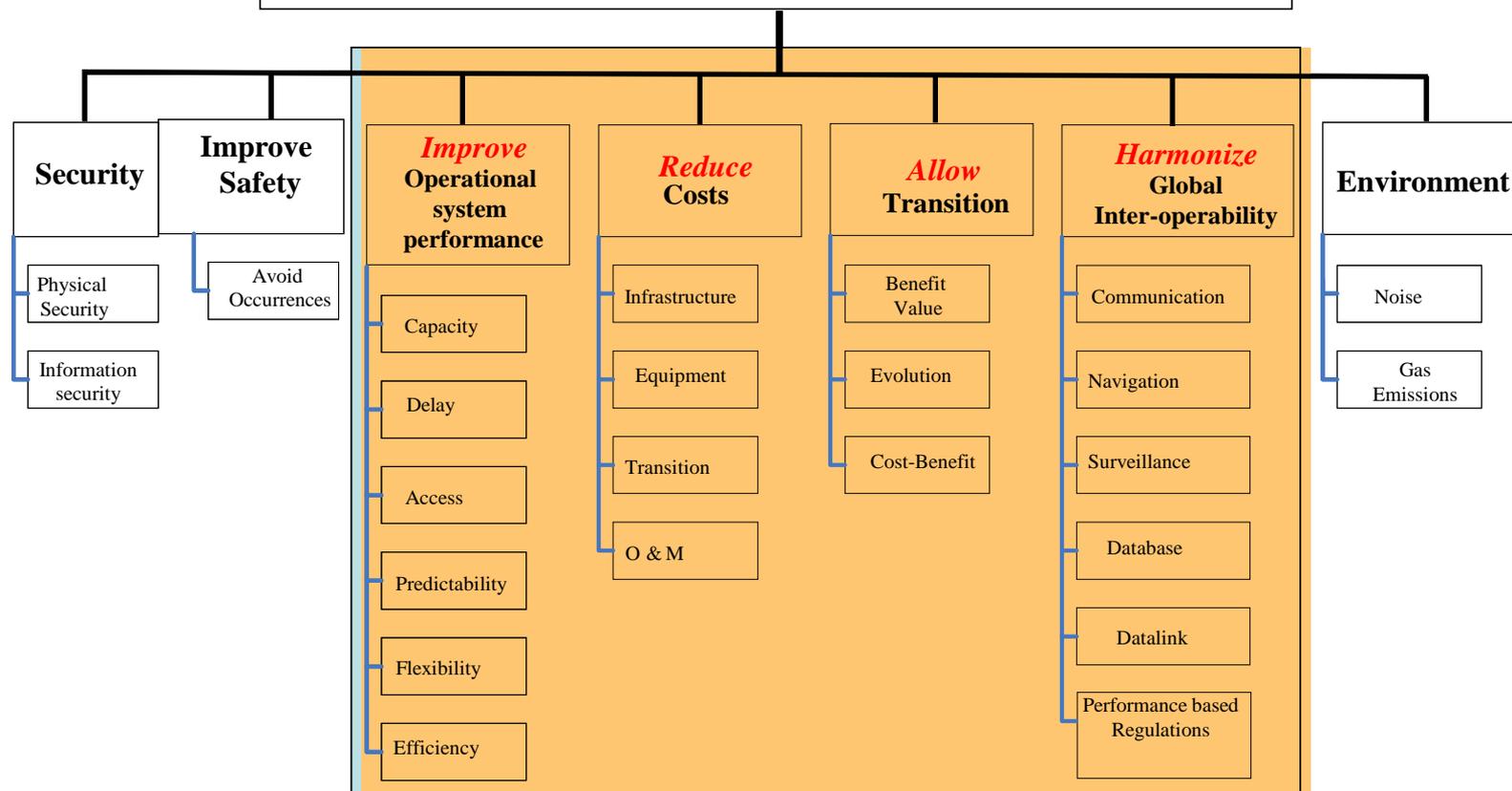
ICAO Strategic Objectives 2011-2013



- In its ongoing mission to foster a global civil aviation system that consistently and uniformly operates at peak efficiency and provides optimum safety, security and sustainability, ICAO has established three Strategic Objectives:
- **Safety:**
 - Enhance global civil aviation safety.
- **Security:**
 - Enhance global civil aviation security.
- **Environmental Protection and Sustainable Development of Air Transport:**
 - Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment.

ICAO Strategic Objectives – ATM Expectations

ATM System Expectations from the Global Air Navigation Plan (Doc 9750)

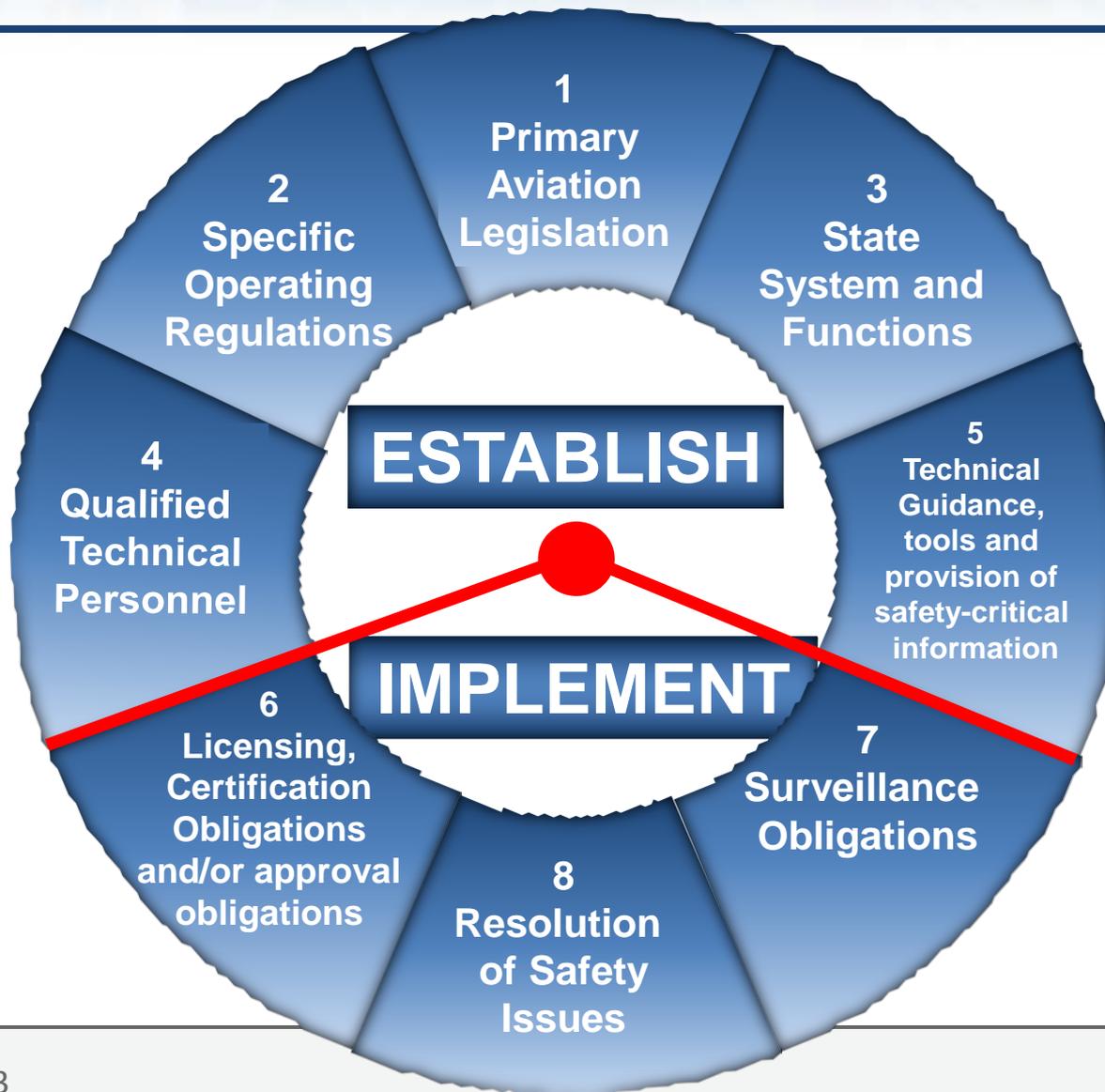


USOAP-CMA, F&R



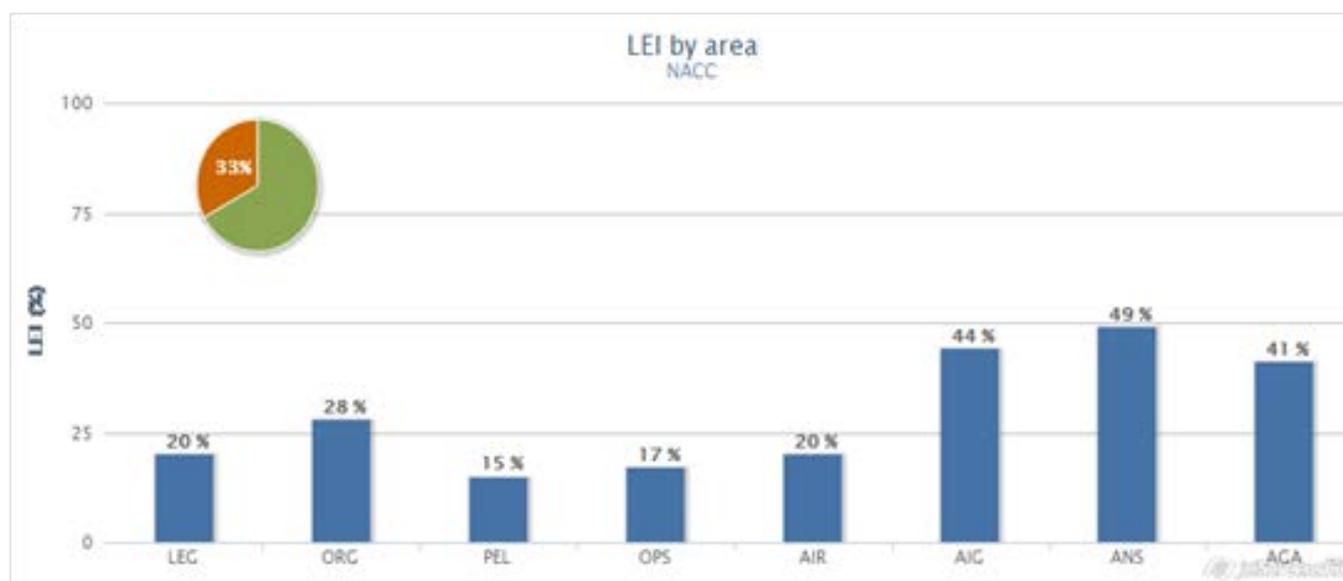
- During the USOAP CMA activities, it has been observed that the LEI associated with Critical Element Four (CE4), *qualification and training of technical staff* is the top issue affecting the effective implementation percentage.
 - **4. Qualified technical personnel**
 - *The State shall establish minimum qualification requirements for the technical personnel performing safety oversight functions and provide for appropriate initial and recurrent training to maintain and enhance their competence at the desired level.*
 - *The State shall implement a system for the maintenance of training records*

A19 - Critical Elements of an Effective Safety Oversight System



Main improvement areas

- ORG reorganization/CAA structure in line with new needs, lack of inspectors and a calculation method of the staff needed.
- ANS lack of regulations and procedures, staff, SMS and training.
- AGA lack of inspectors, procedures, certification, SMS and training.
- AIG lack of autonomy, protection regulations to the AIG information and procedures.

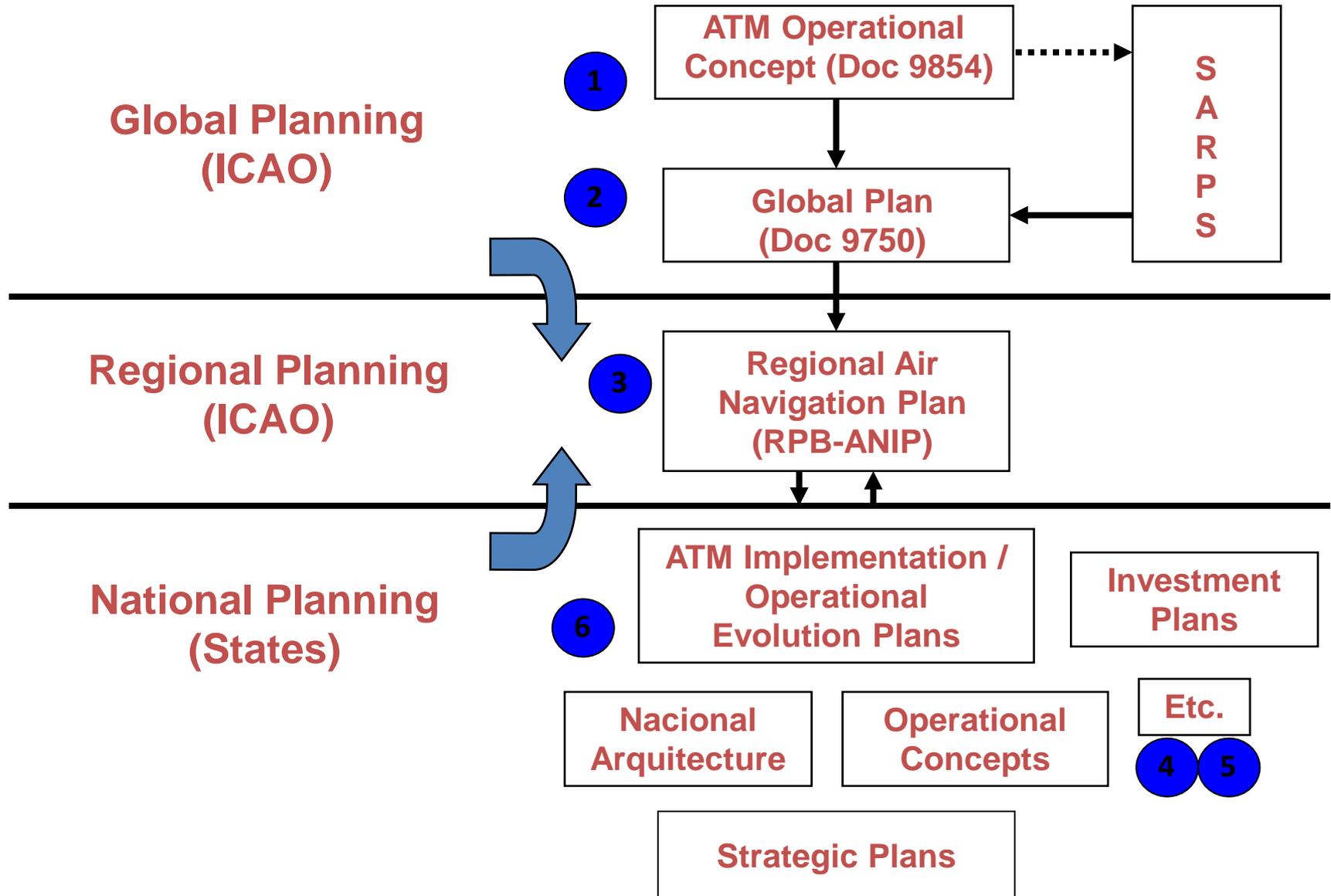


AGA Example

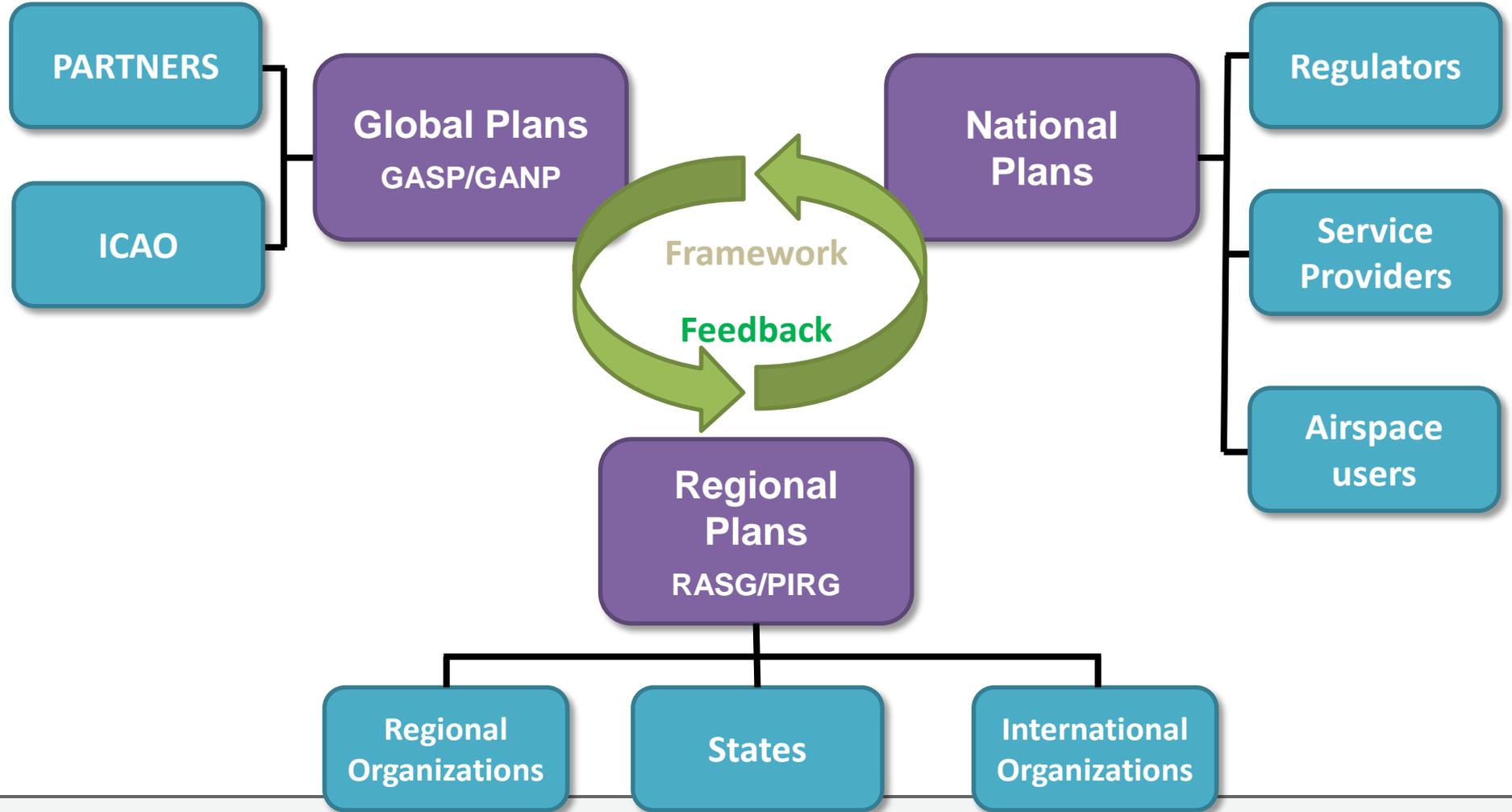


(COMMON FINDINGS) (CRITICAL ELEMENTS)	1	2	3	4	5	6	7	8
NO ROLE CAA IN AERODROME CERTIFICATION /SMS	X							
REGULATIONS NO COMPLY OR DEVELOPED IN ACCORDANCE WITH ANNEX 14		X						
LACK OF REGULATIONS EN THE ORGANIZATION FOR THE CERTIFICATION			X					
PERSONNEL NO QUALIFIED OR TRAINED				X				
NO PROCEDURES & REGULATIONS FOR STAFF ASIGNED FOR CERTIFICATION					X			
AGA INSPECTOR WITHOUT LICENCE TO COMPLY WITH THEIR FUNTIIONS AND RESPONSABILITIES						X		
AGA PERSONNEL WITHOUT NECCESARY EQUIPMENT AND ELEMENTS TO CONDUCT SAFETY ASSESSMENT AND MONITORING							X	
SMS REGULATIONS IN FORCE. HOWEVER, NO EFFECTIVE IMPLEMENTED								X

PLANNING & IMPLEMENTATION STRUCTURE



Working Together



PROGRAMMES



Infrastructure

–

ATM System

Communication	Navigation	Surveillance	ATM
<p>Data</p> <ul style="list-style-type: none"> • VHF • HF • Mode S • Satellite • ATN <p>Voice</p> <ul style="list-style-type: none"> • VHF • Satellite 	<p>GNSS</p> <ul style="list-style-type: none"> • GPS • GLONASS • GALILEO <p>Augmentation</p> <ul style="list-style-type: none"> • ABAS • GBAS • SBAS 	<p>SSR</p> <ul style="list-style-type: none"> • Mode A/C • Mode S <p>ADS-C</p> <ul style="list-style-type: none"> • VHF • HF • Satellite <p>ADS-B</p> <p>MULTILATERATION</p>	<ul style="list-style-type: none"> • PBN (RNAV/RNP) • Airspace Organization and Management (AOM) • Flexible use of airspace (FUA) • Conflict Management • ATC • SAR • ATFM procedures • Demand and Capacity Balancing (DCB) • Traffic Synchronization • Decision Making Support Systems • AOM • AIM • MET • eANP

NAM/CAR RPB-ANIP



(Working Draft)
NAM/CAR Regional
Performance-based Air
Navigation
Implementation Plan
(RPBANIP)

v3.0 — July 2013

International Civil Aviation Organization

- Introduction
- **Chp. 1** Traffic Grow and distribution in NAM/CAR regions
- **Chp. 2** Aviation System Block Upgrades (ASBU) - B0
 - Performance Improvement Area (PIA) Air Navigation Report Forms (ANRF)
- **Attachment 1** – Regional Performance Objectives (RPOs)

REGIONAL PERFORMANCE OBJECTIVES (RPO) / RPBANIP



- PBN Implantation
- Improve demand and capacity balancing (DCB) – ATFM
- Implement the Flexible Use of Airspace (FUA)
- Improve ATM situational awareness
- Optimization and modernization of communication infrastructure
- Improve the capacity and efficiency of aerodrome operations
- Improve search and rescue service (SAR)
- AIM Transition
- Improve Meteorological information
- **Safety Management**
- **Development of Human Resources and competency Management**

Modules Block 0 NAM/CAR Regions



Performance Improvement Areas (PIA)	Performance Improvement Area Name	Module	Module Name
PIA 1	Airport Operations	B0-15 RSEQ	Improve Traffic flow through Runway Sequencing (AMAN/DMAN)
		B0-65 APTA	Optimization of Approach Procedures including vertical guidance
		B0-70 WAKE	Increased Runway Throughput through optimized Wake Turbulence Separation
		B0-75 SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)
		B0-80 ACDM	Improved Airport Operations through Airport-CDM
PIA 2	Globally Interoperable Systems and Data - Through Globally Interoperable System Wide Information Management	B0-25 FICE	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration
		B0-30 DATM	Service Improvement through Digital Aeronautical Information Management
		B0-105 AMET	Meteorological information supporting enhanced operational efficiency and safety
PIA 3	Optimum Capacity and Flexible Flights - Through Global Collaborative ATM	B0-10 FRTO	Improved Operations through Enhanced En-Route Trajectories
		B0-35 NOPS	Improved Flow Performance through Planning based on a Network-Wide view
		B0-84 ASUR	Initial capability for ground surveillance
		B0-85 ASEP	Air Traffic Situational Awareness(ATSA)
		B0-86 OPFL	Improved access to Optimum Flight Levels through Climb/Descent Procedures using ADS-B
		B0-101 ACAS	ACAS Improvements
		B0-102 SNET	Increased Effectiveness of Ground-Based Safety Nets
PIA 4	Trajectory-based Operations	B0-05 CDO	More flexibility and efficiency with continuous descend profiles
		B0-20 CCO	More flexibility and efficiency with continuous climb operations- climb profiles
		B040 TBO	More safety and efficiency with initial enr-oute services with data link

Relationship RPOs with modules of Bloque 0

ASBU RPO	PIA1 Airport Operations					PIA2 SWIM			PIA3 Global Collaborative ATM							PIA4 Trajectory-based Operations		
	B01 5 RSE Q	B0 65 APTA	B070 WAKE	B075 SURF	B0 80 ACDM	B025 FICE	B030 DAIM	B0105 AMET	B010 FRTO	B035 NOPS	B084 ASUR	B085 ASEP	B086 OPFL	B0101 ACAS	B102 SNET	B005 CDO	B020 CCO	B040 TBO
PBN Implementation		X							X							X	X	
Implement FUA									X									
Improve DCB	X									X								
ATM Situational Awareness	X			X							X			X	X			X
Improve Cap/Efficiency Aerodrome Operations				X	X													
Optimization of COM infrastructure					X	X												X
Implement AIM							X											
Improve MET information								X										
Improve SAR																		

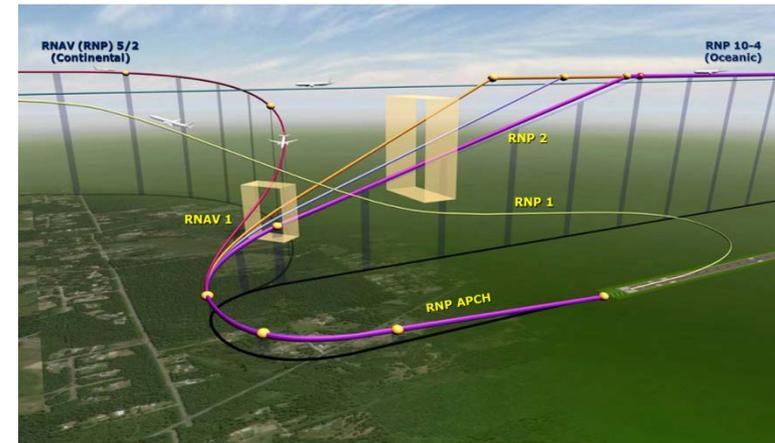
RPO completed: RPO5 New ICAO Flight Plan model implementation

RPO merged into other RPO: RPO on WGS-eTOD implementation and RPO on WRC- State support and best use of radiofrequency spectrum

RPO 1: PBN implementation (Annex 11, Doc 4444)



- PBN Airspace Concept (Doc 9613)
- Comprehensive airspace redesign for CAR Region (Doc 9992)
 - 7 State projects underway
- Continuous Descent Operations (CDO, Doc 9931)
 - Potential benefit of 250 kg fuel per arrival
- Continuous Climb Operation (CCO, Doc 9933)
- Training Workshops planned for 2013-2014
 - Emerging ATC training techniques – Improve Capacity
 - PBN operational Approval (Doc 9997)
 - PANS OPS / PBN Training (Doc 8168 - Doc 9905)
 - Safety Assessments (Doc 9859)



RPO 2: Civil/Military cooperation for the Flexible Use of Airspace (FUA)



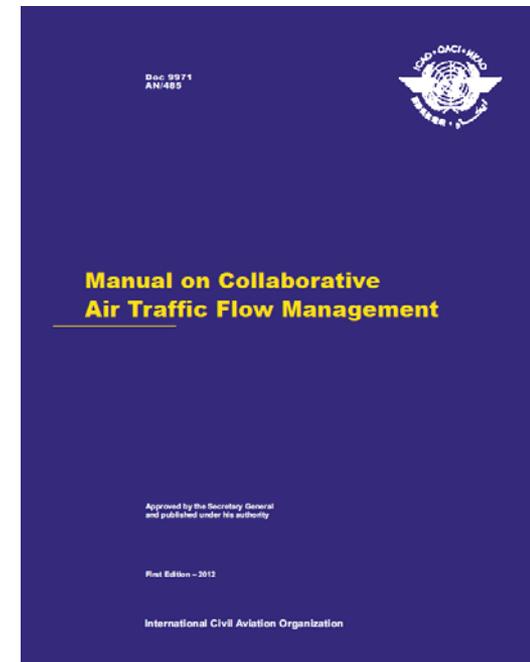
- ICAO Circular 330 - *Civil /Military Cooperation in ATM*
- ICAO will hold collaborative seminars/workshops on Civil/Military Cooperation
- Review all restricted areas in CAR Region



RPO 3: Improve Demand and Capacity Balance: Air Traffic Flow Management



- Manual on CDM (Doc 9971)
- Regional ATFM implementation
 - Establish national/regional ATFM units and processes for demand and capacity balancing
 - Define airport and ATS capacity
 - Database and data collection for aircraft operations
- Regional coordination between All Stakeholders
- Workshops From 2012



RPO 4: Improve Situational Awareness



- Surveillance Systems related guidance – Doc 9684, Doc 9688, Doc 9863, Doc 9924, etc.
- ADS separation guidance- Cir 326
- Surveillance techniques for AMAN and time-based metering and Departure management
- Automation and the human-machine interface training
- Training in the operational standards and procedures
- Controllers must receive specific training for separation provision, information service and search and rescue based on the ADS-B and WAM systems
- Training on specific ground-based safety nets training and be assessed as competent for the use of the relevant ground-based safety nets and recovery techniques



RPO 5: Improve Capacity and Efficiency in Aerodrome operations



- Aerodrome operations
- Rescue and Fire Fighting Services
- Wildlife management and control
- Aeronautical studies
- Risk assessment
- Airfield marking, signs and lighting
- Obstacle evaluation
- SMS approval and surveillance
- Aerodrome inspection
- Aerodrome certification process – Aerodrome Manual contents
- Aerodrome maintenance

RPO 6: Optimization and modernization of Communication Infrastructure



- Communication system and services related guidance: Doc 9694, GOLD document, Doc 9718, Doc 9869, Doc 9741, Doc 9816, etc.
- Data link training
- ATN related Training (AMHS, AIDC and other applications)
- Communication and Navigation Systems training (GNSS) in support of PBN
- Courses on new technology and operational concept
- Training in the operational standards and procedures
- automation and HMI training updates
- Training on planning concept like RCP



RPO 7: AIM Implementation



BASIC AIM TRAINING

- International, Regional, and National Aviation Regulation
- Air Traffic Management (ATM)
- Aerodromes (AGA)
- Aircraft Operations And Characteristics
- Meteorology (MET)
- Geography (GIS), Cartography (MAP)
- Communication, Navigation, And Surveillance (CNS)
- Quality Management Systems (QMS)
- Safety Management Systems (SMS)
- Human Factors
- Aeronautical Information Management (AIM) Concepts And Strategies
- Information Technology (IT)

DATA AND INFORMATION MANAGEMENT

- Pre-Process data and Meta Data
- Process Data
- Operate Database
- Produce Data Sets/Files
- Maintain Data/Information And Library

STATIC DATA OUTPUT

- Generate AIP/AIP Amendment
- Generate AIP Supplement
- Generate Aeronautical Information Circular (AIC)
- Produce Aeronautical Charts

RPO 7: AIM..



DYANMIC DATA OUTPUT

- Generate NOTAM
- Generate Checklist of Valid NOTAM
- Generate ASHTAM
- Generate SNOWTAM

ADDITIONAL PRODUCTS

- Generate Additional Products
- Prepare additional products (e.g., business products, VFR flight guide)

PRE- AND POST-FLIGHT INFORMATION

- Pre-Flight Preparation
- Post-Flight Preparation

ARO

- Process FPL
- Coordination Activities
- Assist the pilot in the pre-flight and post-flight phase
- Coordinate with ATS
- Coordination with Search and Rescue Coordination Center
- Coordinate with other organizations

RPO – Meteorological information



- Forecast provided by the World area forecast centres (WAFC)
- Volcanic ash advisory centres (VAAC)
- Tropical cyclone advisory centres (TCAC)
- The international airways volcano watch (IAVW)
- Aerodrome warnings
- Wind shear warning and alerts
- SIGMETs (that could affect the safety of aircraft operations and other operational meteorological (OPMET) information including METAR/SPECI and TAF)

RPO - Safety



- Safety Management
 - State Safety Programme (SSP)
 - Safety Management Systems (SMS)
- Safety Oversight
 - Government Safety Inspector
- Accident and Incident Investigation
 - ECCAIRS/ADREP
- Dangerous Goods
- Safety Audits
- Aviation Medicine



A19 – safety management

- The new Annex 19 aims to implement a comprehensive State safety framework, which includes four major elements/topics: Policy and Standardization, Safety Monitoring, Analysis and Implementation of corrective actions.
- The ICAO NACC Regional Office has organized several activities to improve regional safety in response to the needs of States.
- However, further actions from States are necessary to ensure implementation of safety management framework.

Tomorrow's Needs



- Global framework is needed to ensure:
 - ATM improvement programmes are harmonized
 - Safety is maintained and enhanced
 - Barriers to future efficiency and environmental gains are removed, at reasonable cost
- Interoperability purposes
- Planning & implementation using ASBU 0 modules
- Independent of when and where specific ATM improvement programmes are introduced





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(NACC) Office
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(SAM) Office
Lima

ICAO
Headquarters
Montreal

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Central African
(WACAF) Office
Dakar

European and
North Atlantic
(EUR/NAT) Office
Paris

Middle East
(MID) Office
Cairo

Eastern and
Southern African
(ESAF) Office
Nairobi

Asia and Pacific
(APAC) Office
Bangkok

Thank You

A world map is shown in a light blue color. Eight colored dots are placed on the map, each connected by a thin line to a text label describing an ICAO regional office. The dots are: a blue dot in Mexico, a blue dot in South America, an orange dot in North America (Montreal), a blue dot in West Africa, a blue dot in Europe, a blue dot in the Middle East, a blue dot in East Africa, and a blue dot in Southeast Asia. A large, rounded rectangular box with a grey-to-white gradient background and a dark border is centered over the map, containing the text 'Thank You' in a bold, dark blue font.