Global Air Navigation

REGIONAL PERFORMANCE BASED AIR NAVIGATION IMPLEMENTATION PLAN FOR NAM/CAR REGIONS (RPBANIP)

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(Mexico City, February 2014)

Presentation Outline

- Background

- Global Plan (Initiatives)

- RPB-ANIP (Regional Performance Based – Air Navigation Implementation Plan)

- Modules of Block 0 for NAM/CAR Regions

- Interfacing RPOs with ASBU methodology

- Measuring and reporting success

Development of RPB-ANIP (1/2)

- The GREPECAS called States to align their national implementation plans with the regional and Global Air Navigation Plan.

- The Regional Performance Based – Air Navigation Implementation Plan (RPB-ANIP) was approved by the Third North American, Central American and Caribbean Directors General Meeting (NACC/DCA/3), held in Punta Cana, Dominican Republic, in September 2008, with clear priorities, targets and monitoring/reporting processes.

Development of RPB-ANIP (2/2)

- Based on the Recommendation of the AN-Conf/12 Recommendation 6/1, the RPB-ANIP was aligned with ASBU framework.

- This updated and matured Plan was presented to AN/IG/1 Meeting (29 July to 1st August 2013) for review and subsequently submitted to CAAs of NAM/CAR States in December 2013 for final comments.
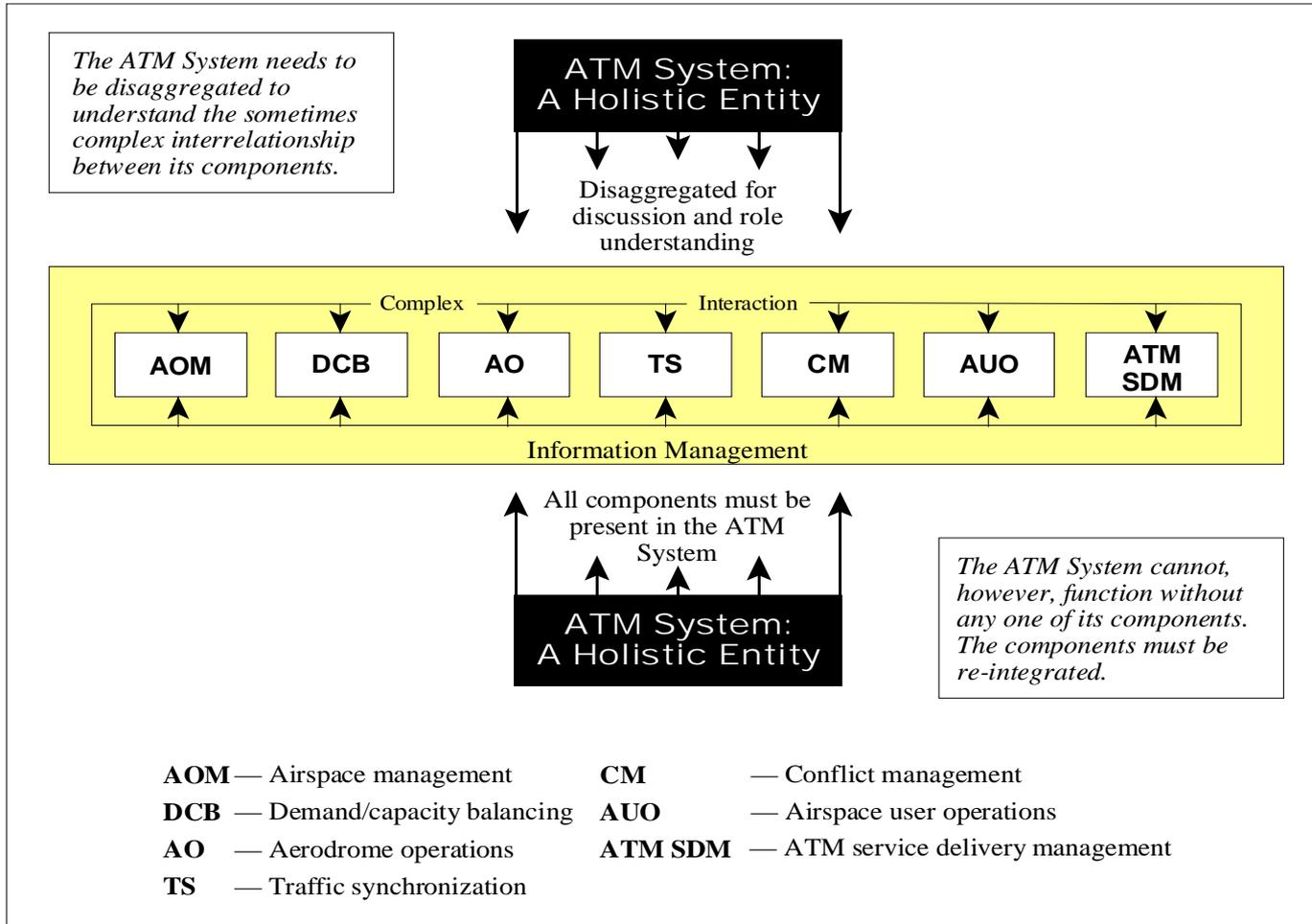
Implementation of Air Navigation Systems

- Global ATM Operational Concept
  (Dcc 9854)

- Global Planning
  (Dcc 9750)

- Regional Planning
  (Doc 8733)

- National Planning
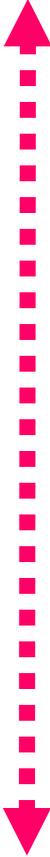
- **Global vision**

- **Strategic Planning**

- **Regional action**

- **National action**

ATM System, Components (Doc 9854)

The ATM System needs to be disaggregated to understand the sometimes complex interrelationship between its components.

ATM System: A Holistic Entity

Disaggregated for discussion and role understanding

Complex   Interaction

| AOM | DCB | AO | TS | CM | AUO | ATM SDM |

Information Management

All components must be present in the ATM System

ATM System: A Holistic Entity

The ATM System cannot, however, function without any one of its components. The components must be re-integrated.

AOM — Airspace management   **CM** — Conflict management

DCB — Demand/capacity balancing   **AUO** — Airspace user operations

AO — Aerodrome operations   **ATM SDM** — ATM service delivery management

TS — Traffic synchronization

Gate to Gate Concept

Phases of Flight (Doc 9854)

DCB

AOM

TS

AUO

Planning

Ramp

Cruise

Collection

Ramp

Dispersion

Approach

Surface departures

Departure

SDM

CM

AO

Landing

Surface arrival
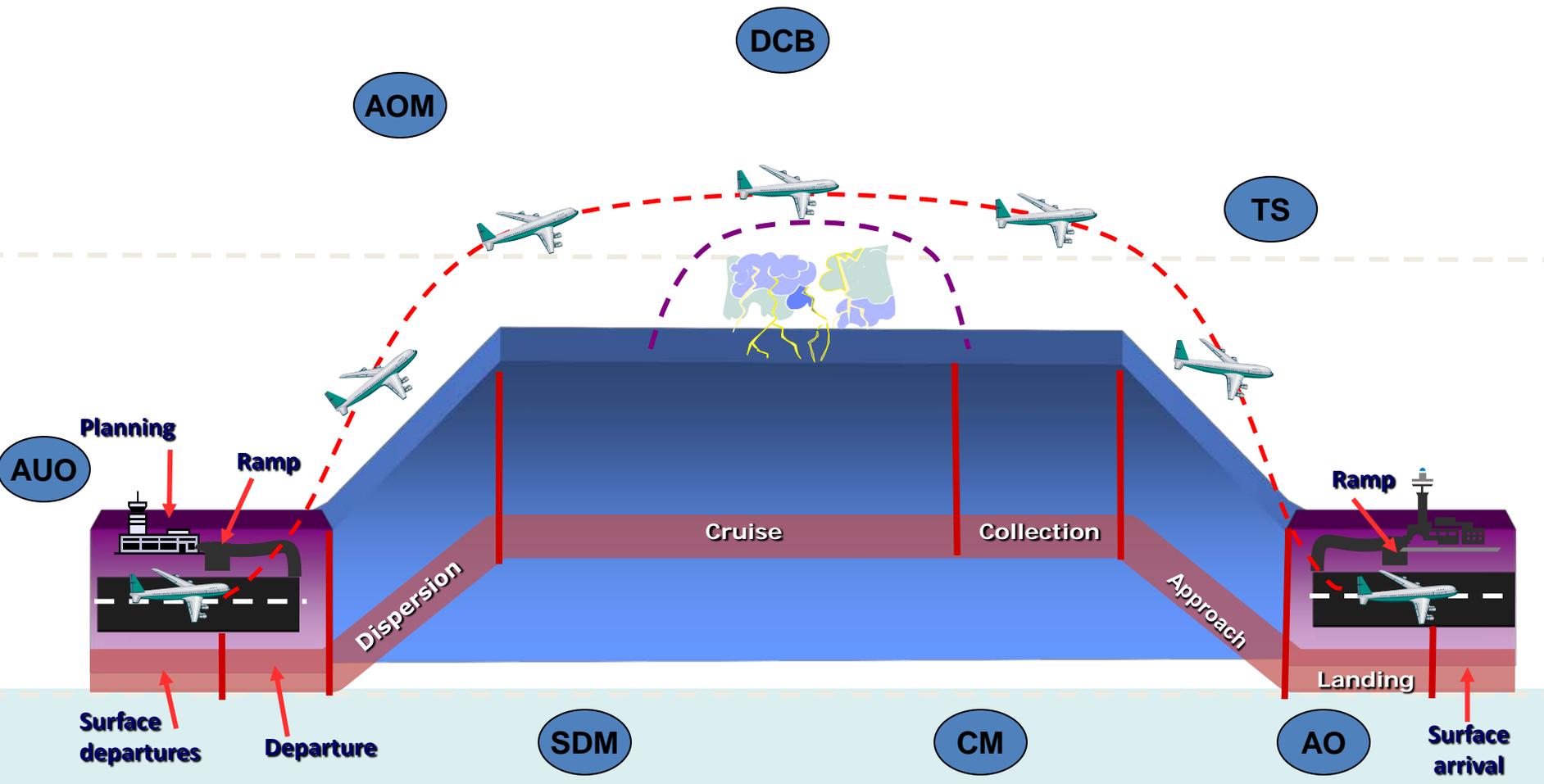
COMMUNICATION (COM) - NAVIGATION (NAV) - SURVEILLANCE (SUR)

Global Plan Initiatives (GPIs; 23)

- Options for ATM improvements

- Relate to ATM objectives in current version of Global Plan

- Result in direct performance enhancements

- Meet performance objectives

- Based on Industry Roadmaps and current regional activities

- Bring near- and medium-term benefits to aircraft operators

GPIs...

(GPI-6) AIR TRAFFIC FLOW MANAGEMENT

Scope: The implementation of strategic, tactical and pre-tactical measures aimed at organizing and handling traffic flows in such a way that the totality of the traffic handled at any given time or in any given airspace or aerodrome is compatible with the capacity of the ATM system.

Related Operational Concept Components: AOM, AO, DCB, TS, CM, AUO

(GPI-7) DYNAMIC AND FLEXIBLE ATS ROUTE MANAGEMENT

Scope: The establishment of more flexible and dynamic route systems, on the basis of navigation performance capability, aimed at accommodating preferred flight trajectories

Related Operational Concept Components: RNAV AOM, AUO

(GPI-9) SITUATIONAL AWARENESS

Scope: Operational implementation of data link-based surveillance. The implementation of equipment to allow traffic information to be displayed in aircraft supporting implementation of conflict prediction and collaboration between flight crew and the ATM system. Improve situational awareness in the cockpit by making available electronic terrain and obstacle data of required quality.

Related Operational Concept Components: AO, TS, CM, AUO

NAM/CAR RPB-ANIP

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

v3.0 — October 2013

International Civil Aviation Organization

- Introduction

- **Cap. 1** Traffic grow in NAM/CAR Regions

- **Cap. 2** Aviation System Block Upgrade (ASBU) - B0
  - **Air Navigation Report Form** (ANRF)

- **Attachment 1 - REGIONAL PERFORMANCE OBJECTIVES** (RPOs)
  - Air Traffic Management
  - Communication, Navigation and Surveillance
  - Meteorology
  - Search and Rescue Services
  - Aeronautical Information Services
  - Aerodromes and Ground Aids

Air Traffic Forecast

Timeframe 2007 - 2027	CAR/SAM	South America and North America
Passengers	8.9% 27 millions	5.7% 173 millions
Aircraft movements	8.2% 282.000 movements	5% 1.625.700 movements

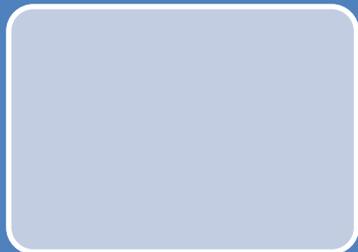**Forecast for CAR/SAM Regions (Doc 9917)**

Planning Considerations: RPB-ANIP

Planning methodology

Planning Tools

ASBU Modules considered CAR Region

Performance objectives strategy implementation

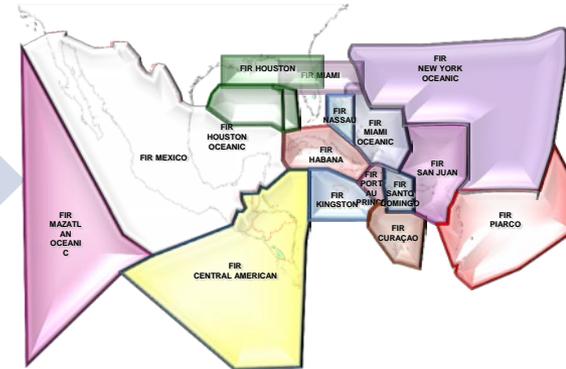Improve Safety, Capacity and efficiency

GANP requirements

Services, infrastructure and human resources

Current Evaluation

Performance reporting form (ANRF) Metrics from ASBU modules

Strategy of implementation

Monitoring and follow up by RO NACC

REGIONAL PERFORMANCE OBJECTIVES (RPO)
RBB-ANIP

- PBN implementation
- Improve demand and capacity balancing (DCB) – ATFM
- implementation of the Flexible Use of Airspace (FUA)
- Improve ATM situational awareness
- Optimization and modernization of communication infrastructure
- Improve aerodrome capacity and efficiency operations
- Improve Search and Rescue (SAR)
- AIM transition
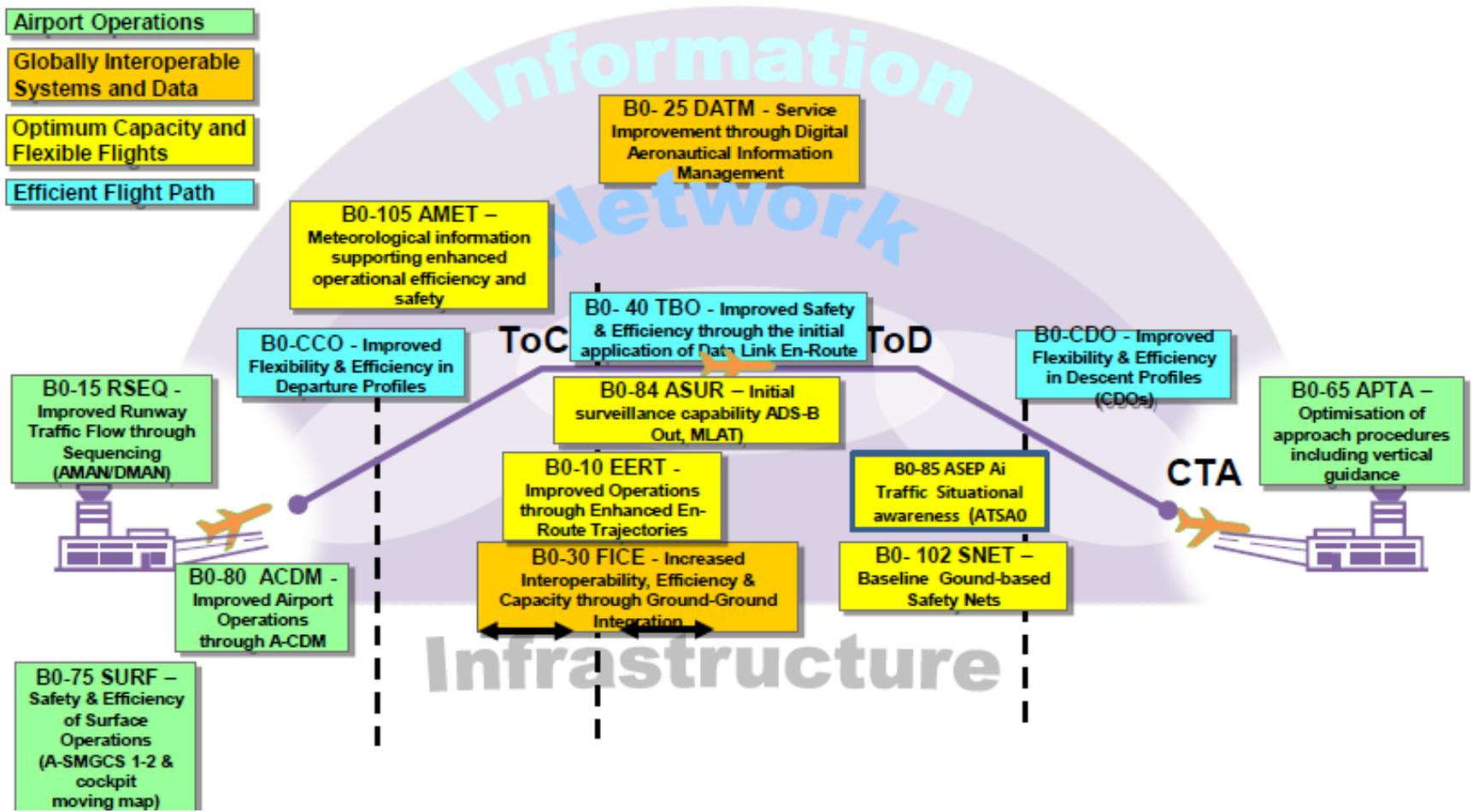- Improve Meteorology information

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	Efficient Flight Path – Through Trajectory-based Operations	B0-05 CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)
		B0-40 TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route
		B0-20 CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)

RELATIONSHIP BETWEEN RPOs and B0 MODULES

ASBU / RPO	PIA1 Airport Operations					PIA2 SWIM			PIA3 Global Collaborative ATM							PIA4 Trajectory-based Operations		
	B015 RSEQ	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	
FUA									X									
DCB	X			X	X				X									
ATM Situational Awareness	X			X							X				X			X
Improve SAR																		
Improve Cap/Efficiency Aerodrome Operations				X	X													
COM				X	X													X
AIM							X											
MET								X										

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

ATM Performance and Expectations Doc 9883

- Safety
- Security
- Cost-Effectiveness
- Access and Equity
- Capacity
- Environment

- Predictability
- ATM Community Participation
- Flexibility
- Efficiency
- Global Interoperability

The Safety and AN *System*

GLOBAL PLANS

Pending Council Approval

Outlines Global Priorities and Targets
Reviewed by ANC; Approved by Council
Endorsed by Assembly

PIRG-RASG *agreed to establish by certain dates:*

Safety
(As soon as possible)

Air Navigation
(May 2014)

Feedback loop for continuous improvement

GLOBAL PERFORMANCE REPORTS

2013 Safety Report — **Available**

2014 Air Navigation Report — **April 2014**

Reporting against Global Priorities
Global Reports (online) Annually
Special Version (print) for Assembly

REGIONAL PERFORMANCE DASHBOARDS

Africa – Aug 2013

All Regions - Mar 2014

Adopts Global Priorities, sets additional as needed
Used by PIRGs and RASGs to Measure Performance
Regional Office Updates Dashboard (online) semiannually

Air Navigation Reporting Process

- PIRGs are progressing with planning and implementation of ASBUs

- The next step calls for an air navigation performance measurement, monitoring and reporting strategy.

- Methodology for reporting
  - States to send data to RO through Air Navigation Report Form (ANRF) or equivalent form/on ongoing basis
  - RO will consolidate data from all States and publish through Regional Performance Dashboard /on ongoing basis
  - HQ will consolidate data from all ROs and publish Global Air Navigation Report/annually

Air Navigation Reporting Process

- The current Performance Framework Form (PFF) has been redesigned and aligned   with ASBU framework and called the Air Navigation Report Form (ANRF)

- ANRF will be the basis for performance reporting of the ASBU implementation

- The ANRF templates for all the 18 Modules of ASBU Block 0 will be available in the upcoming Regional eANP.

REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO) Performance Improvement Area 4: Efficient Flight Path – Through Trajectory-based Operations				
ASBU B0-CDO: Impact on Main Key Performance Areas (KPA)				
Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	N	Y	Y	Y

Note: "Applicable" row spans under blank first column; values: Access & Equity = N, Capacity = N, Efficiency = Y, Environment = Y, Safety = Y.

ASBUB0- CDO: Implementation Progress	
Elements	**Implementation Status (Ground and Air)**
1. CDO	
2. PBN STARs	

ASBU B0-CDO: Implementation Roadblocks/Issues				
Elements	**Implementation Area**			
	Ground Implementation	**Air Implementation**	**Procedures Availability**	**Operational Approvals**
1. CDO				
2. PBN STARs				

ASBU B0-CDO: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	**Performance Metrics**
Access & Equity	Not applicable
Capacity	Not applicable
Efficiency	Kilograms of fuel saved per flight
Environment	Kilograms of CO_2 emissions reduced per flight (= KGs fuel saved per flight x 3.157)
Safety	Number of controlled flight into terrain (CFIT) incidents/accidents

ASBU B0-CDO: Performance Monitoring and Measurement (Implementation)	
Elements	**Implementation Indicators/Metrics**
1. CDO	Percentage of international aerodromes/TMAs with CDO implemented
2. PBN STARs	Percentage of international aerodromes/TMAs with PBN STARs implemented

Regional Performance Dashboard

- Transparency and sharing of information are fundamental to a safe and efficient global air transportation system.

- Consistent with this principle, the Organization is introducing "Regional 'Performance Dashboard' - the homepages for every public website of the ICAO Regional Offices.

- These dashboards will illustrate the regional implementation status relating to the strategic objectives on Safety, Air Navigation Capacity and Efficiency, and Environmental Protection.

Regional Performance Dashboard Definition

- The Dashboard will show targeted performance at the regional level and will, initially, contain graphics and maps with a planned expansion to include the Aviation System Block upgrades (ASBU) Block 0 Modules.

- This new interactive online system will be in place in August 2013 for AFI region and March 2014 for the remaining regions and will be updated at regular intervals.

- Dashboard will be user friendly and able to deliver the message at glance.

Regional Performance Dashboard – Home page of ICAO RO website

GENERAL FORMAT

Regional Directors responsible for the **selected UN Region**

For Safety:
Effective Implementation
(No State names)
For Efficiency:
Air Navigation Implementation
(by State)
For Environment:
Fuel savings and CO2 reduction
(by State)

Regional Performance by **Strategic Objective**

Regional Performance Indicators

Message:

Provide the status of **Safety**, **Efficiency**, *and* **Environment** *for the Region*

Regional Performance Dashboard
Indicators/metrics for Air Navigation

AIR NAVIGATION

Metrics

1. **PBN TERMINAL**
   % of international aerodromes with APV

2. **PBN ENROUTE**
   % of PBN routes/airspaces

3. **CDO**
   % of international aerodromes/TMAs with CDO

4. **CCO**
   % of international aerodromes/TMAs with CCO

5. **Estimated Fuel Savings/ C02 Emissions Reduction Based on IFSET**

6. **ATFM**
   % of ATS Units/international aerodromes providing ATFM service

7. **AIM**
   % of needed elements (from AIS to AIM Roadmap) facilitating the transition from AIS to AIM that have been implemented – PHASE I