Operational Improvements

ICAO International Aviation and Environment Seminar
18 – 19 March 2015, Warsaw, Poland

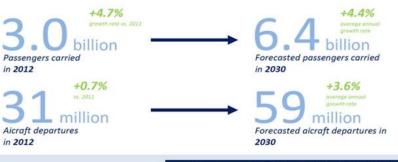*Sven Halle*

Scheduled Commercial Flight Departures: 2005 to 2011

- Africa
- Asia
- Europe
- Latin America and the Caribbean
- Northern America
- Oceania

HIGHEST TRAFFIC GROWTH IN ASIA

Accident Statistics and Accident Rates: 2011

UN Region	Traffic (thousands)	Accidents Number	Accidents Rate[3]	Fatal Accidents
Africa	891	7	7.9	
Asia	7,561	22	2.9	3
Europe	7,143	39	5.5	4
Latin America and the Caribbean	2,625	15	5.7	4
North America	10,979	38	3.5	0
Oceania	855	4	4.7	2
World	30,053	126	4.2	16

NO REGIONAL ACCIDENT RATE EXCEEDING TWICE THE GLOBAL AVERAGE

3.0 billion — Passengers carried in 2012 — +4.7% growth rate vs. 2011

6.4 billion — Forecasted passengers carried in 2030 — +4.4% average annual growth rate

31 million — Aicraft departures in 2012 — +0.7% vs. 2011

59 million — Forecasted aicraft departures in 2030 — +3.6% average annual growth rate

5.4 trillion — Revenue Passenger-Kilometres in 2012 — +4.9% growth rate vs. 2011

World passenger traffic expressed in terms of Revenue Passenger-Kilometres (RPK) on total scheduled services (i.e. international and domestic services combined) increased by 4.9 per cent in 2012 compared to 2011, according to data provided to the International Civil Aviation Organization by its Member States and ICAO estimates.

This represents the third consecutive positive growth for the air transport industry since 2009 and corresponds to an increase of 4.7 per cent over 2011 in the number of passengers carried, reaching 3.0 billion passengers in 2012.

182 billion — Freight Tonne-Kilometres in 2012 — -1.1% growth rate vs. 2011

World passenger traffic - Regional distribution in 2012

The number of aircraft departures reached the record level of 31 million in 2012, an increase of 0.7 per cent compared to 2011.

By 2030, an average annual growth rate of 4.5 per cent for world scheduled passenger traffic will result in more than twice of RPK of the 2012 level, according to ICAO forecasts.

The world air cargo market declined in 2012 (-1.1 per cent in term of Freight Tonne-Kilometres performed, compared to 2011). This represents the second consecutive negative growth since 2010. World scheduled freight traffic is forecasted to grow at an average annual rate of 5.3 per cent over the next twenty years.
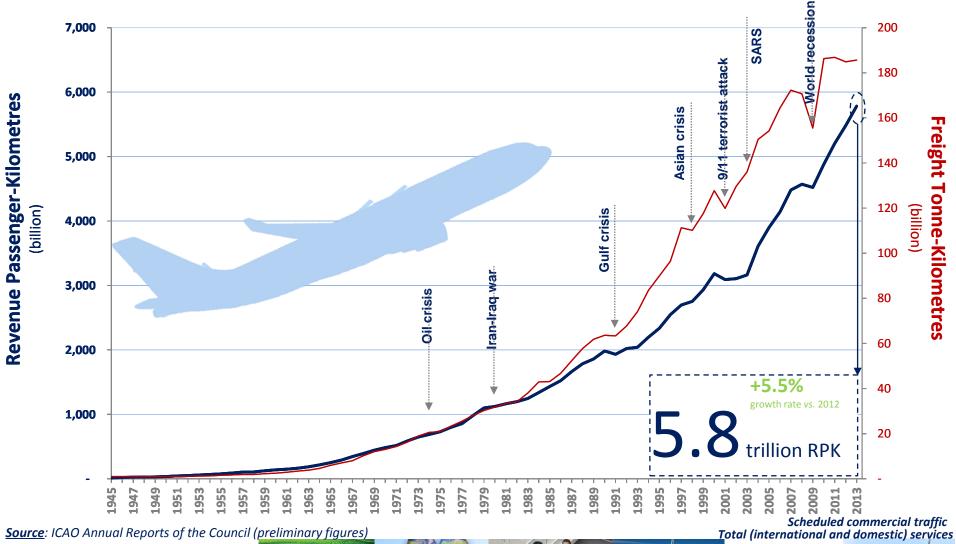
ICAO   UNITING AVIATION

Revenue Passenger-Kilometres
(billion)

Freight Tonne-Kilometres
(billion)

Oil crisis

Iran-Iraq war

Gulf crisis

Asian crisis

9/11 terrorist attack

SARS

World recession

+5.5%
growth rate *vs.* 2012

5.8 trillion RPK

Scheduled commercial traffic
Total (international and domestic) services

ICAO UNITING AVIATION

- A global ATM system is envisioned as the foundation of a worldwide integrated, harmonised and interoperable air transportation system. This system is intended to integrate regional and local ATM systems as well as to interoperate and provide seamless services (across all regions, sub-regions and States) to all users in all phases of flight.

- A globally interoperable system will meet requirements for safety and security and provide optimum economic operations that are <u>environmentally sustainable</u> and cost effective.

- The ICAO vision of global harmonisation is therefore based on the need for:
    - Uniform level of safety across all regions, sub-regions and States
    - Optimised traffic flows across all regions, sub-regions and States
    - Physical system-to-system connectedness, sharing pertinent data across systems and regions
    - Common performance requirements, standards and operating procedures
    - Common aeronautical information exchange
    - <u>Meeting environmental objectives</u>
    - Meeting minimum and common security objectives

"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 strategy for integrated planning

- What is an 'Aviation System Block Upgrade' (ASBU)?
  - Intended *Operational Improvement/Metric* to determine success
  - Necessary *Procedures*/Air and Ground
  - Necessary *Technology*/Air and Ground
  - Positive *Business Case* per Upgrade
  - *Regulatory Approval* Plan/Air and Ground
  - Well *understood* by a   a
    Global Demonstration
    Trial
    - All synchronized to allow initial implementation
    - Won't matter **when or where** implemented

- Block Upgrades provide a series of measurable, operational performance improvements
- Organized into flexible & scalable building blocks
- Could be introduced as needed regionally or locally
- Implemented as each individual State requires the capability

Performance Improvement Areas	Block 0 (2013)	Block 1 (2018)	Block 2 (2023)	Block 3 (2028 onward)
Airport Operations				
Globally Interoperable Systems and Data				
Optimum Capacity and Flexible Flights				
Efficient Flight Path				

PRIORITIES

PERFORMANCE BASED NAVIGATION (PBN)

CONTINUOUS DESCENT AND CLIMB OPERATIONS (CDO/CCO)

COLLABORATIVE DECISION-MAKING (CDM & A-CDM) & ATFM

Needs Analysis / Validation

Compliance & Verification

if needed

Global Plans

Global & Regional

Measurement & Reporting

SARPs & PANS

Implementation Planning/Supp.

Training & Guidance

UNITING AVIATION

Annex and PANS Amendments to States

Global Plans

"What"

SARPs & PANS

Annex 1 Annex 6 Annex 8

Guidance Material

DOC 9735 DOC 9946

Seminars and Symposia

Computer-Based Training

Training and guidance were often *not synchronized* with amendments

iKIT

*Using the point of view of the **implementer***

*Provision of a **singular package** for implementation*

Global Plans

2014–2016
Global Aviation Safety Plan

2013–2028
Global Air Navigation Plan

"What"

Compliance & Verification

USOAP Protocol Questions
(if needed)

SARPs & PANS

Personnel Licensing

Operation of Aircraft

Airworthiness of Aircraft

Annex 1   **Annex 6**   **Annex 8**

Implementation Planning

Universal Safety Oversight Audit Programme Continuous Monitoring Manual

Manual on Regional Accident and Incident Investigation Organization

Guidance material

SYMPOSIUM
01- DD Month 201Y
ICAO Headquarters, Montréal, Canada

Seminars, workshops and Symposia

Computer-Based Training

Assess & Measure

2014
Air Navigation Report
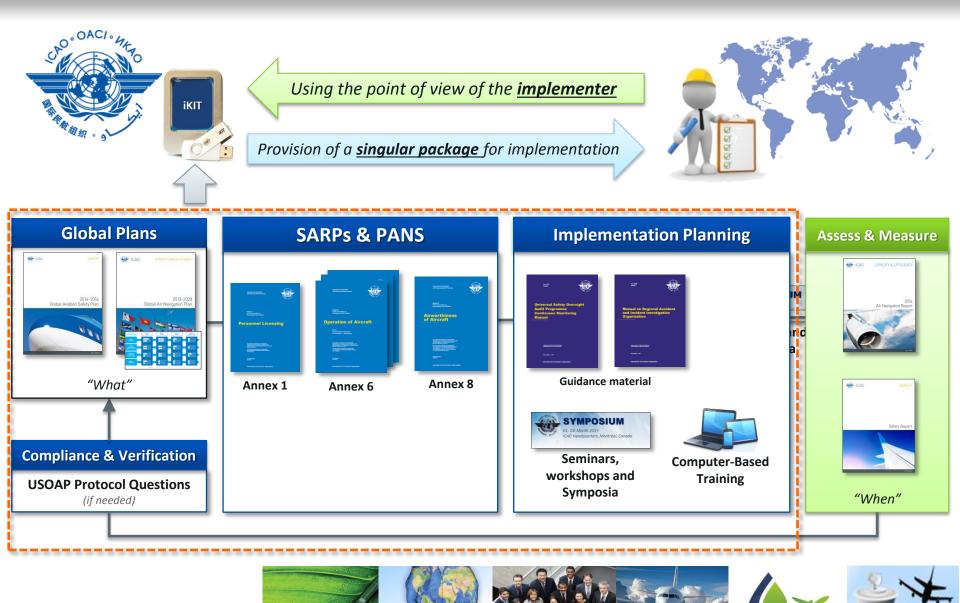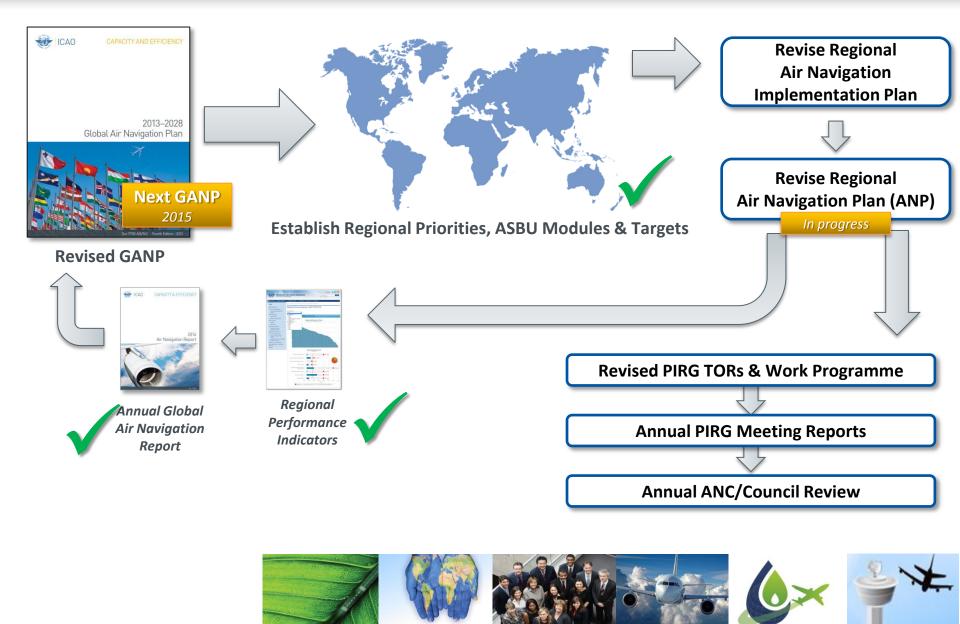
Safety Report

"When"

➢ Actions for improved implementation

- impact assessments considering implementation requirements and roll-out plan for new SARPs prior to adoption, as applicable;

- Annex amendments on a two-year cycle and an associated realistic schedule for notification, adoption and applicability of the new SARPs;

- availability of implementation assistance prior to applicability;

- a communication strategy, plan and methods to raise awareness of new SARPs;

- a coordinated programme for assistance to States between ANB, Regional Offices, TCB, and regional organizations and groups;

- enhanced monitoring of implementation to identify and prioritize targeted assistance; and

- more timely updating of USOAP protocol questions.

Revised GANP

Next GANP *2015*

Establish Regional Priorities, ASBU Modules & Targets

Revise Regional Air Navigation Implementation Plan

Revise Regional Air Navigation Plan (ANP)
In progress

Revised PIRG TORs & Work Programme

Annual PIRG Meeting Reports

Annual ANC/Council Review

Annual Global Air Navigation Report

Regional Performance Indicators

PBN Implementation Programme

–   Led by ICAO with 9 Partners

–   Multi-disciplinary and collaborative approach

Achievements in 2012-2013

–   **PBN GO Teams Phase I** in 9 locations covering all regions, involving more than 300 PBN experts worldwide

•   Focused on raising a champion State

–   Establishment of the **FPP/RSO in Beijing**

–   Launched the **1st iKIT** during the PBN Symposium (2012)

–   4th Edition of the **PBN Manual**, **OPS Approval Manual**, and **CCO Manual** delivered

–   First set of computer-based training modules delivered
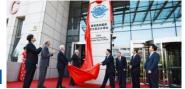
Achievements in 2014

–   Establishment of the **PBN AFPP Office in Dakar**

–   Finalization of **PBN GO Teams phase II**

•   Educating regions by means of regional implementation example

–   Updated Flight procedures and Separation minima to support PBN

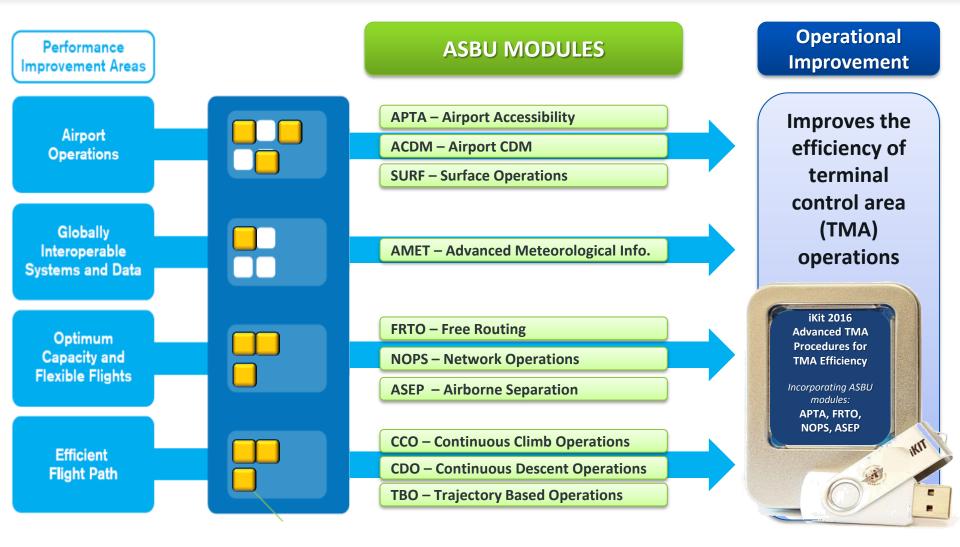–   PBN Endorsements and PBN revenue generating programme established

Upcoming iKits

Performance Improvement Areas

ASBU MODULES

Operational Improvement

Airport Operations

- APTA – Airport Accessibility
- ACDM – Airport CDM
- SURF – Surface Operations

Globally Interoperable Systems and Data

- AMET – Advanced Meteorological Info.

Optimum Capacity and Flexible Flights

- FRTO – Free Routing
- NOPS – Network Operations
- ASEP – Airborne Separation

Efficient Flight Path

- CCO – Continuous Climb Operations
- CDO – Continuous Descent Operations
- TBO – Trajectory Based Operations

Improves the efficiency of terminal control area (TMA) operations

iKit 2016 Advanced TMA Procedures for TMA Efficiency

Incorporating ASBU modules:
APTA, FRTO, NOPS, ASEP

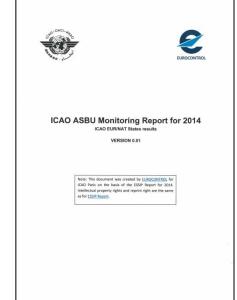| Module	Title	Benefits
B0-CDO	Continuous Descent Operations	Reduced fuel burn on arrival
B0-FRTO	Free Route Operations	Reduced in-flight fuel burn
B0-RSEQ	Runway Sequencing	Reduced airborne holding and taxi-out time
B0-CCO	Continuous Climb Operations	Reduced fuel burn during climb
B0-NOPS	Network Operations	Reduced fuel burn in all phases of flight, including taxi
B0-TBO	Trajectory Based Operations	Reduced in-flight fuel burn
B0-WAKE	Wake Turbulence Separation	Reduced taxi-out time and reduced in-flight fuel burn
B0-ACDM	Airport Collaborative Decision Making	Reduced taxi-out time
B0-ASUR	Alternative Surveillance	Reduced in-flight fuel burn
B0-OPFL	Optimum Flight Levels	Reduced in-flight fuel burn
B0-APTA	Approach procedures including vertical guidance	Reduced fuel burn during arrival, fewer missed approaches
B0-SURF	A-SMGCS, ASDE-X	Reduced taxi and airborne holding time
B0-FICE	Increased efficiency through ground - ground integration	Reduced in-flight fuel burn
B0-DAIM	Digital AIM	Reduced in-flight fuel burn
B0-AMET	Met information supporting enhanced operational efficiency	Reduced fuel burn in all phases

- **EANPG Conclusion 55/02 – Regional planning for ASBU Implementation**

✓ The ASBU Block 0 Modules prioritization table, as provided in App G to this report, is endorsed as the initial version of the EUR ASBU Implementation Plan;

✓ The mechanism for monitoring and reporting the implementation status of Priority 1 Modules, using the combined efforts of Eurocontrol ESSIP mechanism and the ICAO EUR questionnaire, as provided at App F to this report, should be used for collecting information for the reporting period 2013-2014;

✓ Eurocontrol is invited to consider extending the scope of the ESSIP/LSSIP reporting tool(s) to the ICAO EUR States outside of the ECAC area; and

✓ The ASBU Block 0 Modules prioritization table be reviewed on an annual basis and be extended to cover Block 1 Modules, as appropriate.

ICAO ASBU Monitoring Report for 2014
ICAO EUR/NAT States results

VERSION 0.01

Note: This document was created by EUROCONTROL for ICAO Paris on the basis of the ESSIP Report for 2014. Intellectual property rights and reprint right are the same as for ESSIP Report.

North American
Central American
and Caribbean
(NACC) Office
MexicoCity

South American
(SAM) Office
Lima

ICAO
Headquarters
Montreal

Western and
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