CANSO AFRICA CONFERENCE

Transforming ATM Performance
Abuja, Nigeria, 7-9 October 2013

Aviation System Block Upgrade (ASBU)
Methodology

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Outline

• ASBU methodology explanation
• Technology Roadmap
• Planning and implementation in the AFI Region
• ASBU Next Steps
Today’s Challenges & Tomorrow’s Needs

- **Air traffic growth** expands two-fold every 15 years
- Challenge **how to achieve both safety and operational improvements**
- Regional and National ATM modernization programmes are being developed worldwide in accordance with ICAO’s Global Air Navigation Plan and Operational Concept
- Nevertheless they are **different in their own way** thus resulting in **interoperability challenges**.
- The 37th session of ICAO General Assembly advised to redouble our efforts with focus on ensuring interoperability of systems while at the same time maintaining or enhancing aviation safety.

- Global framework is needed to ensure:
  - **Safety is maintained** and **enhanced**
  - ATM improvement programs are **harmonized**
  - **Barriers to future efficiency** and **environmental gains** are **removed**, at **reasonable cost**
Global Aviation System Block updates

• ICAO established Future Aviation Challenge Team (FACT) and Future Aviation Technical Team (FATT) to develop a new approach which should be
  – **Interoperable** and
  – **Independent** of when and where specific ATM improvement programs are introduced

• This approach is the **global framework** known as **global aviation system block upgrades**

Why this approach?
What is the Basis for Block Upgrades?

- **Foundation** of blocks originates from existing, near term implementation plans and extracted from (examples):

- Aligned with ICAO **ATM Operational Concept** (Doc.9854)
- Block upgrades will allow structured approach to meet regional and local needs, while considering associated business cases
- They reflect recognition that all modules are **not** required in all airspaces

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What is the difference between current and ASBU methodology?

- **Current methodology**
  - Scope covers only **ground equipment** for ANSPs
  - Planning based on **short and medium term**
  - Implementation process is **through GPIs**

- **ASBU methodology**
  - Scope **extends to airspace users and regulators involving Airlines and CAAs**
  - Planning based on **short, medium and long terms**
  - Implementation process is through **Blocks and corresponding modules**
What are the advantages of ASBU methodology?

- All partners **approach involving service providers, regulators and users** facilitating a harmonized planning and implementation of **air navigation infrastructure**
- Takes into account all related issues such as **air/ground Systems, air/ground procedures, air/ground regulatory requirements and business case formulation**, 
- One stop planning at the same **time flexible** and **scalable**
- Modules provide a series of **measurable, operational performance improvements**, which could be introduced as needed
Aviation System Block Upgrades – Definition

• 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 Global Demonstration Trial
    • All synchronized to allow initial implementation
    • Won’t matter *when or where* implemented
We Can Benefit From What is Already Out There…

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Blocks mapped to Performance Improvement Areas

Performance Improvement Areas
- Airport Operations
- Globally Interoperable Systems and Data
- Optimum Capacity and Flexible Flights
- Efficient Flight Path

Block 0 (2013)
- B0-15 RSEQ

Block 1 (2018)
- B0-15 RSEQ

Block 2 (2023)
- B0-15 RSEQ

Block 3 (2028 & >)
- B0-15 RSEQ

Module
Threads Between Modules... and Across Blocks

Airport Operations

Block 0: Improved Traffic Flow through Runway Metering

Block 1: Improved Approach & Departure Management through Integration

Block 2: Linked AMAN/DMAN

Block 3: Integrated AMAN/DMAN/SMAN

Available Now  2018  2023  2028>

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ASBU Block 0 in perspective

Performance Improvement Areas

- Airport Operations
- Globally Interoperable Systems and Data
- Optimum Capacity and Flexible Flights
- Efficient Flight Path

Information Network

- B0-DATM - Service Improvement through Digital Aeronautical Information Management
- B0-AMET - Meteorological information supporting enhanced operational efficiency and safety
- B0-NOPS - Improved Flow Performance through Planning based on a Network-Wide view
- B0-TBO - Improved Safety & Efficiency through the initial application of Data Link En-Route
- B0-ACAS - ACAS Improvements

Infrastructure

- B0-CO - Improved Flexibility & Efficiency in Departure Profiles
- B0-CCO - Improved Capacity through Sequencing (AMANDMAN)
- B0-RSEQ - Improved Runway Traffic Flow through Sequencing (AMANDMAN)
- B0-ASUR - Initial surveillance capability ADS-B Out, MLAT
- B0-EERT - Improved Operations through Enhanced En-Route Trajectories
- B0-FICE - Increased Interoperability, Efficiency & Capacity through Ground-Ground Integration

CTA

- B0-ACTA - Optimisation of approach procedures including vertical guidance
- B0-ACDM - Improved Airport Operations through A-CDM
- B0-SURF - Safety & Efficiency of Surface Operations (ASMGCS 1-2 & cockpit moving map)
- B0-SNET - Baseline Ground-based Safety Nets

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Block 0

- 4 Main Performance improvement areas (PIA)
  - Airport Operations (5 modules)
  - Globally interoperable systems & data (3 modules)
  - Optimum capacity & flexible flights (7 modules)
  - Efficient flight path (3 modules)

- Block 0 will serve as the enabler and foundation for the envisioned future aviation systems.
Timing Relationship Between Blocks

Block 0

Block 1

Block 2

Block 3

2013
2018
2023
2028

Transforming ATM Performance
## Module N° B#-##: TITLE

<table>
<thead>
<tr>
<th>Summary</th>
<th>Brief description of benefit provided.</th>
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</thead>
<tbody>
<tr>
<td>Main Performance Impact</td>
<td>List of affected KPAs</td>
</tr>
<tr>
<td>Operating Environment/Phases of Flight</td>
<td>Single word entries explaining operating environment(s), i.e; airport surface, etc and/or phases of flight, i.e; approach, en-route, etc.</td>
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<tr>
<td>Applicability Considerations</td>
<td>Specifics on operating environment and/or types of airspace where Module is applicable</td>
</tr>
<tr>
<td>Global Concept Component(s)</td>
<td>Up to three.</td>
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<tr>
<td>Global Plan Initiatives (GPI)</td>
<td>Up to three</td>
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<tr>
<td>Pre-Requisites</td>
<td>Modules that must be implemented to support this module.</td>
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<tr>
<td>Global Readiness Checklist</td>
<td>Status (ready now or estimated date).</td>
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<td>Standards Readiness</td>
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<td>Avionics Availability</td>
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<td>Ground System Availability</td>
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<td>Procedures Available</td>
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<td>Operations Approvals</td>
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### 1. Narrative

#### 1.1 General
General description of the module with focus on the operational benefit or capability provided, operating environment and applicability.

#### 1.1.1 Baseline
Capability in place prior to the implementation of this module. This section is appropriate where the module provides an improvement over an existing capability.

#### 1.1.2 Change brought by the module
Additional information on the operational benefit or capability plus any significant change to operations. For complex modules may be decomposed into constituent elements.

#### 1.2 Element 1 (if needed)

#### 1.3 Element 2 (if needed), etc.
Module sample (2/3)

2. Intended Performance Operational Improvement/Metric to determine success

<table>
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<tr>
<th>KPAs</th>
<th>Specific improvement provided.</th>
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CBA | Illustrative example of Cost-Benefit to be expected. The mechanisms supporting the cost benefit must be clearly stated.

3. Necessary Procedures (Air & Ground)
Description of new procedures. Where procedures exist or are under development, references to these must be provided. For procedures to be developed, the requirement must be clearly stated (This is applicable to latter blocks).

4. Necessary System Capability

4.1 Avionics
Description of required avionics. Where avionics exist or are under development, references to these must be provided. For avionics to be developed, the requirement must be clearly stated (This is applicable to latter blocks).

4.2 Ground Systems
Description of required ground systems. Where ground systems exist or are under development, references to these must be provided. For ground systems to be developed, the requirement must be clearly stated (This is applicable to latter blocks).

5. Human Performance

5.1 Human Factors Considerations
General statements on the impact on operational functions.

5.2 Training and Qualification Requirements
Description of required training and qualification requirements. Where they exist or are under development, references to these must be provided. For training and qualification requirements to be developed, the requirement must be clearly stated (This is applicable to latter blocks).

5.3 Others
TBD
6. Regulatory/standardisation needs and Approval Plan (Air and Ground)
Description of required regulatory and standardisation needs and approval plans. Where they exist or are under
development, references to these must be provided. For regulatory and standardisation needs to be developed,
the requirement must be clearly stated (This is applicable to latter blocks).

7. Implementation and Demonstration Activities

7.1 Current Use
Description and results of current demonstration activities and implementation status, for each known region.

7.2 Planned or Ongoing Activities
Description of planned demonstration and implementation activities, for each known region.

8. Reference Documents
This section shall contain details of all known reference documents both published and in preparation.

8.1 Standards
ICAO and Industry Standards (ie; MOPS, MASPS, SPRs).

8.2 Procedures
Documented procedures by States and ANSPs,

8.3 Guidance Material
ICAO Manuals, Guidance Material and Circulars. Also any similar industry documents
Mitigating the Risks

• Deployment of block upgrades was chosen to resolve many identified risks
• Timing and sizing of the block upgrades are in response to need for Mature standards, Integrated air and ground solutions and Establishment of positive business cases
• Block “0” optimizes current onboard equipage and provides baseline
• Modules lacking specific maturity are purposefully placed in later blocks
• Block upgrades respond to issue of non-homogeneous areas
• Block components are intended to interoperate seamlessly independent of how they are implemented in neighboring States
Block 0: Priority

• Block 0 initiatives must leverage on existing on-board avionics

• 3 Priorities have been agreed to by the Global community:
  – Performance Based Navigation (PBN)
  – Continuous Descent Operations (CDO)
  – Continuous Climb Operations (CCO)
Performance-based Navigation (PBN)
An example of ASBU approach

Operational Improvement
- Fewer Runway Excursions
- Less Noise & Emissions
- Fuel Savings
- Lower Pilot workload
- Lower ATC Workload

Performance Monitoring by PIRGs/States
- Metrics

Positive Business Case
- Minimum investment; using existing airborne technology
- Rollout (Formulation of business case by States)

Necessary Procedures
Air & Ground
- Annex 3 (2012)
- Procedures ATM (2010+2012)
- Procedures ABC (2010)
- Continuous Descent Operations (2010)
- Continuous Climb Operations (2012)
- Rollout (planning & implementation by PIRGs/States)

Necessary Technology
Air & Ground
- Annex 10 (2008)
- GNSS Manual (2011)
- Rollout (planning & implementation by PIRGs/States)

Global Demonstrations and/or Trials
- Oceanic – RNP 4; Pacific
- Continental – RNAV 5; S. America
- RNAV 10; Red Carpet Africa
- Challenging Approaches
  - Lhasa, Queenstown
- Rollout (planning & implementation by PIRGs/States)

Regulatory Approval Plan
Air & Ground
- Ops Approval Handbook (2011)
- PBN Model Regulations (2011)
- Rollout (planning & implementation by PIRGs/States)
AIM/SWIM

An example of ASBU Approach

AIM
- Quality
- Timeliness
- Digital
- Secured
- Standardized
- Interoperable
- Shared

"to"

AIS

"into"

SWIM

Flight

Weather

Surveillance

Airport

Environment

Capacity Demand

Flow Management
Summary of ASBU Approach

- Addresses ANSP, Aircraft and Regularity requirements
- Identified 4 improvement areas (PIA 1,2,3,4)
- Implementation through Block Upgrades (0,1,2, and 3) each comprising a number of Modules
- Each module is explained in a standardized 4-5 pages template:
  - provide a series of measurable, operational performance improvements
  - Organized into flexible & scalable building blocks
  - Could be introduced as needed
  - all modules are not required in all airspaces
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Technology Roadmaps
## PBN

<table>
<thead>
<tr>
<th>Block 0</th>
<th>2018</th>
<th>Block 1</th>
<th>2023</th>
<th>Block 2</th>
<th>2028</th>
<th>Block 3</th>
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<td><strong>Terminal Airspace: Arrival and Departure</strong></td>
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<td>RNP APCH (SBAS: LPV, BARO VNAV: LNAV/VNAV, Basic GNSS: LNAV)</td>
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<td><strong>RNP AR APCH</strong> (where beneficial)</td>
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**Migration path based on Region/States requirements**
<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>Block 0</th>
<th>2018</th>
<th>Block 1</th>
<th>2023</th>
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<td><strong>B2-SURF</strong></td>
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<td><strong>Capability</strong></td>
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<td><strong>SMGCS Level 3 and 4</strong></td>
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<td><strong>Ground-based surveillance</strong></td>
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- **Enabler**
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  - B2-SURF

- **Capability**
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  - SMGCS Level 1 and 2
  - SMGCS Level 3 and 4

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- **Surface**
  - B0-SURF
  - B1-SURF, B1-RSEQ, B1-RTWR
  - SMR

- **Enabler**
  - B0-TBO
  - B1-TBO

- **Capability**
  - B0-ASUR
  - B1-TBO

- **Ground-Based**
  - B0-ASUR
  - B1-TBO

- **Surface**
  - B0-SURF
  - B1-SURF, B1-RSEQ, B1-RTWR
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  - B0-ASUR
  - B1-TBO
CANSO AFRICA CONFERENCE

Transforming ATM Performance

Abuja, Nigeria, 7-9 October 2013

Aviation System Block Upgrade (ASBU)

Planning and implementation in the AFI Region
The Dilemma
Development and trends of Civil Aviation industry in AFRICA

Context

- Air Transport: key stakeholder in a huge continent
- Air Transport in Africa: 3-5% of Global Market
- For next two decades
  - Annual Growth estimated trend: 5.9% Vs 4% for Global growth
  - 125 Millions PAXs to 377 Millions PAXs
- Air Transport based on Safety of life

Cost effectiveness to provide air navigation service rely on a balanced investment ensuring Performance Based Navigation.

Challenges

- Building One sky to ensure the provision of a seamless Air Navigation Service
- Safety of Civil Aviation, Continuity, Regularity of air traffic rely on a robust seamless integrated infrastructure, systems, procedures and human capacities ...
- Users requirements
- Interoperability requirements
- Environment protection
Huge region with remote areas such as:

- Desert (Sahara and Kalahari)
- Deep equatorial forests
- Oceanic area (Atlantic and Indian oceans, Mediterranean and Red seas)
<table>
<thead>
<tr>
<th>Areas of routing (AR)</th>
<th>Traffic Flows</th>
<th>Areas involved</th>
<th>Type of area covered</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Africa-Indian Ocean (AFI) Region</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AR1</td>
<td>Europe — South America (EUR/SAM) (oceanic)</td>
<td>Atlantico 1, Canarias, Casablanca, Dakar Oceanic, Recife, Sal Oceanic</td>
<td>Oceanic en route low density in southern part and oceanic high density in northern part</td>
<td>Major traffic flow EUR/SAM</td>
</tr>
<tr>
<td></td>
<td>Atlantic Ocean interface between the AFI, NAT and SAM Regions</td>
<td>Accra, Dakar, Johannesburg, Luanda, Sal</td>
<td>Oceanic en route low density</td>
<td>Homogeneous ATM area AFI/NAT/SAM</td>
</tr>
<tr>
<td>AR3</td>
<td>Europe — Eastern Africa routes including the area of the Indian Ocean</td>
<td>Addis Ababa, Antananarivo, Asmara, Cairo, Dar es-Salaam, Entebbe, Khartoum, Mauritius, Mogadishu, Nairobi, Seychelles, Tripoli</td>
<td>Continental en route/oceanic low density</td>
<td>Major traffic flow AFI/EUR</td>
</tr>
<tr>
<td>AR5</td>
<td>Continental Western Africa including coastal areas</td>
<td>Accra, Addis Ababa, Brazzaville, Dakar, Dar-es-Salaam, Entebbe, Kano, Khartoum, Kinshasa, Nairobi, N'Djamena, Niamey, Roberts</td>
<td>Continental/oceanic low density</td>
<td>Homogeneous area AFI (this is a growing traffic, developing into major traffic flow)</td>
</tr>
<tr>
<td>AR6</td>
<td>Trans-Indian</td>
<td>Antananarivo, Bombay 1, Johannesburg Male 1, Mauritius, Melbourne 1, Seychelles</td>
<td>Oceanic high density</td>
<td>Homogeneous ATM area AFI/ASIA</td>
</tr>
</tbody>
</table>
HOMOGENEOUS AREAS AND MAJOR TRAFFIC FLOWS IN THE AFI REGION
How to ensure interoperability

- Taking benefit on AFI States commitment on Safety
  - APIRG Conclusion 16/28: AFI CNS Systems implementation strategies
  - APIRG Conclusion 16/31: Collective approach for the Management of CNS/ATM system elements

- Updating and Implementing AFI ANP
  - Focussing on ICAO SARPs and guidances through ASBU concept
  - Alignment of AFI ANP and AFI CNS/ATM strategies with the new GANP (APIRG Sub Groups)
  - Delivering transitional benefits while continuing evolution
## Performance Improvement Area 1

### PIA 1

<table>
<thead>
<tr>
<th>Performance Improvement Area Name</th>
<th>Module</th>
<th>Module Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Airport Operations</strong></td>
<td>B0-15</td>
<td>Improve Traffic flow through Runway Sequencing (AMAN/DMAN)</td>
</tr>
<tr>
<td></td>
<td>B0-65</td>
<td>Optimization of Approach Procedures including vertical guidance</td>
</tr>
<tr>
<td></td>
<td>B0-70</td>
<td>Increased Runway Throughput through optimized Wake Turbulence Separation</td>
</tr>
<tr>
<td></td>
<td>B0-75</td>
<td>Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)</td>
</tr>
<tr>
<td></td>
<td>B0-80</td>
<td>Improved Airport Operations through Airport-CDM</td>
</tr>
<tr>
<td>Performance Improvement Area Name</td>
<td>Module</td>
<td>Module Name</td>
</tr>
<tr>
<td>----------------------------------</td>
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</tr>
<tr>
<td><strong>Globally Interoperable Systems and Data-Through Globally Interoperable System Wide Information Management</strong></td>
<td>B0-25</td>
<td>Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration</td>
</tr>
<tr>
<td></td>
<td>FICE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B0-30</td>
<td>Service Improvement through Digital aeronautical Information Management</td>
</tr>
<tr>
<td></td>
<td>DATM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B0-105</td>
<td>Meteorological information supporting enhanced operational efficiency and safety</td>
</tr>
<tr>
<td></td>
<td>AMET</td>
<td></td>
</tr>
<tr>
<td>Performance Improvement Area Name</td>
<td>Module</td>
<td>Module Name</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Optimum Capacity and Flexible Flights – Through Global Collaborative ATM</td>
<td>B0-10</td>
<td>Improved Operations through Enhanced En-Route Trajectories</td>
</tr>
<tr>
<td></td>
<td>B0-35</td>
<td>Improved Flow Performance through Planning based on a Network-Wide view</td>
</tr>
<tr>
<td></td>
<td>B0-84</td>
<td>Initial capability for ground surveillance</td>
</tr>
<tr>
<td></td>
<td>B0-85</td>
<td>Air Traffic Situational Awareness (ATSA)</td>
</tr>
<tr>
<td>Performance Improvement Area Name</td>
<td>Module</td>
<td>Module Name</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>Efficient Flight Path – Through Trajectory-Based Operations</td>
<td>B0-05 CDO</td>
<td>Improved Flexibility and Efficiency in Descent Profiles (CDO)</td>
</tr>
<tr>
<td></td>
<td>B0-40 TBO</td>
<td>Improved Safety and Efficiency through the initial application of Data Link En-Route</td>
</tr>
<tr>
<td></td>
<td>B0-20 CCO</td>
<td>Improved Flexibility and Efficiency Departure Profiles- Continuous Climb Operations (CCO)</td>
</tr>
</tbody>
</table>
## Performance Improvement Area 3

**PIA 3 (2/2)**

<table>
<thead>
<tr>
<th>Performance Improvement Area Name</th>
<th>Module</th>
<th>Module Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimum Capacity and Flexible Flights – Through Global Collaborative ATM</td>
<td>B0-86</td>
<td>Improved access to Optimum Flight Levels through Climb/Descent Procedures using ADS-B</td>
</tr>
<tr>
<td></td>
<td>OPFL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B0-101</td>
<td>ACAS Improvements</td>
</tr>
<tr>
<td></td>
<td>ACAS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B0-102</td>
<td>Increased Effectiveness of Ground-Based Safety Nets</td>
</tr>
<tr>
<td></td>
<td>SNET</td>
<td></td>
</tr>
</tbody>
</table>
Categorization of 15 Block 0 Modules

Essential (E): These are the ASBU modules that provide substantial contribution towards global interoperability, safety or regularity.

Which modules may be candidate for AFI Region?

Desirable (D): These are the ASBU modules that, because of their strong business and/or safety case, are recommended for implementation almost everywhere.

Which modules may be candidate for AFI Region?
Categorization of Block 0 Modules

Specific (S): These are the ASBU modules that are recommended for implementation to address a particular operational environment or mitigate identified risks.

By the time being no modules seems to be candidate for the AFI Region.

Optional (O): These are the ASBU modules that address particular operational requirements and provide additional benefits that may not be common everywhere.

Which modules seem to be candidate for AFI Region?
Criteria for priority allocation

• **Priority 1** = Immediate Implementation

• **Priority 2** = Recommended Implementation
<table>
<thead>
<tr>
<th>PIA</th>
<th>Module Description</th>
<th>Module</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIA 1</td>
<td>Improve Traffic flow through Runway Sequencing (AMAN/DMAN)</td>
<td>B0-15</td>
<td>RSEQ</td>
</tr>
<tr>
<td></td>
<td>Optimization of Approach Procedures including vertical guidance</td>
<td>B0-65</td>
<td>APTA</td>
</tr>
<tr>
<td></td>
<td>Increased Runway Throughput through optimized Wake Turbulence Separation</td>
<td>B0-70</td>
<td>WAKE</td>
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<td>Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)</td>
<td>B0-75</td>
<td>SURF</td>
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<td>Improved Airport Operations through Airport-CDM</td>
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<td>ACDM</td>
</tr>
</tbody>
</table>
### Exercise on Block 0 Modules priorities (2/4)

<table>
<thead>
<tr>
<th>PIA</th>
<th>Module Description</th>
<th>Module</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIA 2</td>
<td>Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration</td>
<td>B0-25</td>
<td>FICE</td>
</tr>
<tr>
<td></td>
<td>Service Improvement through Digital Aeronautical Information Management</td>
<td>B0-30</td>
<td>DAIM</td>
</tr>
<tr>
<td></td>
<td>Meteorological information supporting enhanced operational efficiency and safety</td>
<td>B0-105</td>
<td>AMET</td>
</tr>
<tr>
<td>PIA</td>
<td>Module Description</td>
<td>Module</td>
<td>Priority</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------------------------------</td>
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<td>----------</td>
</tr>
<tr>
<td>PIA 3</td>
<td>Improved Operations through Enhanced En-Route Trajectories</td>
<td>B0-10</td>
<td>FRTO</td>
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<tr>
<td></td>
<td>Improved Flow Performance through Planning based on a Network-Wide view</td>
<td>B0-35</td>
<td>NOPS</td>
</tr>
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<td></td>
<td>Initial capability for ground surveillance</td>
<td>B0-84</td>
<td>ASUR</td>
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<td>Air Traffic Situational Awareness(ATSA)</td>
<td>B0-85</td>
<td>ASEP</td>
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<td></td>
<td>Improved access to Optimum Flight Levels through Climb/Descent Procedures using ADS-B</td>
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<td></td>
<td>ACAS Improvements</td>
<td>B0-101</td>
<td>ACAS</td>
</tr>
<tr>
<td></td>
<td>Increased Effectiveness of Ground-Based Safety Nets</td>
<td>B0-102</td>
<td>SNET</td>
</tr>
</tbody>
</table>
### Exercise on Block 0 Modules priorities (4/4)

<table>
<thead>
<tr>
<th>PIA</th>
<th>Module Description</th>
<th>Module</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIA 4</td>
<td>Improved Flexibility and Efficiency in Descent Profiles (CDO)</td>
<td>B0-05</td>
<td>CDO</td>
</tr>
<tr>
<td></td>
<td>Improved Safety and Efficiency through the initial application of Data Link En-Route</td>
<td>B0-40</td>
<td>TBO</td>
</tr>
<tr>
<td></td>
<td>Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)</td>
<td>B0-20</td>
<td>CCO</td>
</tr>
</tbody>
</table>
1. AIR NAVIGATION REPORT FORM (ANRF)

AFI Regional Planning for ASBU Modules

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-25/FICE:
   Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration

   Performance Improvement Area 2:
   Globally Interoperable Systems and Data – Through Globally Interoperable System Wide Information Management

3. ASBU B0-25/FICE: Impact on Main Key Performance Areas (KPA)

<table>
<thead>
<tr>
<th>Access &amp; Equity</th>
<th>Capacity</th>
<th>Efficiency</th>
<th>Environment</th>
<th>Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

4. ASBU B0-25/FICE: Planning Targets and Implementation Progress

5. Elements

| 1. Complete AMHS implementation at States still not counting with this system | December 2014 |
| 2. AMHS interconnection | December 2014 |
| 3. Implement AIDC/OLDI at some States automated centres | June 2014 |
| 4. Implement operational AIDC/OLDI between adjacent ACC’s | June 2018 |
| 5. Implement the AFI Comn regional network | June xxx |

6. Targets and implementation progress (Ground and Air)
### 8. ASBU B0-25/FICE: Performance Monitoring and Measurement

#### 8A. ASBU B0-25/FICE: Implementation

<table>
<thead>
<tr>
<th>Elements</th>
<th>Performance Indicators/Supporting Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Complete AMHS implementation at States still not counting with this system</td>
<td>Indicator: Percentage of States with AMHS implemented&lt;br&gt;Supporting metric: Number of AMHS installed</td>
</tr>
<tr>
<td>2. AMHS interconnection</td>
<td>Indicator: Percentage of States with AMHS interconnected with other AMHS&lt;br&gt;Supporting metric: Number of AMHS interconnections implemented</td>
</tr>
<tr>
<td>3. Implement AIDC/OLDI at some States automated centres</td>
<td>Indicator: Percentage of ATS units with AIDC or OLDI&lt;br&gt;Supporting metric: Number of AIDC or OLDI systems installed</td>
</tr>
<tr>
<td>4. Implement operational AIDC/OLDI between adjacent ACC’s</td>
<td>Indicator: Percentage of ACCs with AIDC or OLDI systems interconnection implemented&lt;br&gt;Supporting metric: Number of AIDC interconnections implemented, as per CAR/SAM FASID Table CNS 1Bb</td>
</tr>
<tr>
<td>5. Implement AFI regional comm network</td>
<td>Indicator: Percentage of phases completed for the implementation of the AFI digital network&lt;br&gt;Supporting metric: Number of phases implemented</td>
</tr>
</tbody>
</table>

#### 8A. ASBU B0-25/FICE: Performance Monitoring and Measurement

#### 8 B. ASBU B0-25/FICE: Performance Monitoring

<table>
<thead>
<tr>
<th>Key Performance Areas</th>
<th>Metrics (if not indicate qualitative Benefits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access &amp; Equity</td>
<td>NIL</td>
</tr>
<tr>
<td>Capacity</td>
<td>Reduced controller workload and increased data integrity supporting reduced separations translating directly to cross sector or boundary capacity flow increases</td>
</tr>
<tr>
<td>Efficiency</td>
<td>The reduced separation can also be used to more frequently offer aircraft flight levels closer to the optimum; in certain cases, this also translates into reduced en-route holding</td>
</tr>
<tr>
<td>Environment</td>
<td>NIL</td>
</tr>
<tr>
<td>Safety</td>
<td>Better knowledge of more accurate flight plan information</td>
</tr>
</tbody>
</table>
“Do we know where to go?”
Global Air Traffic Management Operational Concept

Approved by the Secretary General and published under his authority

First Edition — 2006

International Civil Aviation Organization

YES. (DOC. 9854)
• We needed a vision: the operational concept

• We needed implementation framework: GANP, AFI ANP;

• Local systems implementation is going towards their operation maturity;

• CNS infrastructure is available even though to be improved;

• Initiatives to be taken CANSO, ANSPs AFCAC...
Global ATM Concept

Scope

✈ Operational concept describes the services that will be required to operate the global air traffic system up to and beyond 2025.

✈ Addresses the needs to increase user flexibility and maximize operating efficiencies in order to increase system capacity and improve safety levels in the future air traffic management system.
Guiding principles & Expectations

Guiding Principles

• Safety
• Humans
• Technology
• Information
• Collaboration
• Continuity

Expectations

• Access and Equity
• Capacity
• Cost-effectiveness
• Efficiency
• Environment
• Flexibility
• Global interoperability
• Participation by the ATM community
• Predictability
• Safety
• Security
Integration

Rich Information environment

People
- Management
- ATM Service provider
- Aircraft operations
- Maintenance Engineering
- Airspace User
- Conflict Management

Systems
- Aerodrome Operator
- Communications
- Navigation
- Surveillance
- Aerodrome operations
- Airspace user operations
- Demand capacity balancing
- ATM service delivery management
- Traffic synchronisation

Concept components

Transforming ATM Performance
Way and Steps Forward

• Bilateral initiatives to be conducted based on space organization and coordination requirements;

• Regional initiative through Regional bodies (APIRG Sub-Groups and Task Forces, AFCAC, Sub Regional Economic integration Institutions)

• Seek for the key enablers driving towards the seamless system in the framework of single sky;

• Initiative through the AFI ANPs coordinating meetings (Cotonou Declaration)
Short Terms Actions

Alignment of the AFI ANP with the GANP 4th Edition

- FASID et tables
- Strategies CNS
- ToRs APIRGs Sub Groups and Task Forces
- Modules Categorization and prioritization
- Sensitization of Stakeholders Nairobi 21-Z5 October 2013

Implementation

- Update of current and planned ATM/CNS components with regard to the Modules candidate
- Enhancement of cooperation amongst stakeholders
- CBA Exercise
- Monitoring (Metrics ANRFs)

AFI ANP to be developed by May June 2014
HOMOGENEOUS AREAS AND MAJOR TRAFFIC FLOWS IN THE AFI REGION
We know where to go, but…

Vision without Action is a day-dream, Action without Vision is a nightmare.”
Transforming ATM Performance