Developing Tomorrow’s Aviation System

Briefing on ICAO’s Aviation System
Block Upgrades

Issued: December 2011
Our Collective Challenge
Developing
Tomorrow’s Aviation System

• Global framework is needed to ensure:
  – Safety is maintained and enhanced
  – ATM improvement programmes are harmonized
  – Barriers to future efficiency and environmental gains are removed, at reasonable cost
Investment certainty is required for:
- Operators
- Infrastructure providers
- Equipment manufacturers

Regulatory approval process must be outlined
- Support States in introduction of significant changes
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• ICAO developed 4-step plan

• Setting the stage for global interoperability
Step 1
Get Harmonization on the Global Agenda

• Initial NextGen/SESAR Symposium (2008)

• Convened Standards Organization Roundtable (2009)

• Established working agreements with Standards Organizations on shared work programmes
Step 2
Global Aviation System Block Upgrades

- Define global aviation system block upgrades
- For interoperability purposes
- Independent of when and where specific ATM improvement programmes are introduced

Why is this approach proposed?
The Reality of Our System Today...

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A Team Effort

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What is a Block Upgrade?

- Measurable Operational Improvement
- Air & Ground Standards & Procedures
- Air & Ground Equipment / Systems + Approvals
- Positive Business Case
We Can Benefit From What Is Already Out There...
4 Blocks Upgrades are Proposed

Block 0
Available now

Block 1
2018

Block 2
2023

Block 3
2028>

Block 0

Block 1

Block 2

Block 3
A Block is Made Up of Modules...
...So a Block is Scalable to Meet Regional or Local Needs
Modules are Grouped in 4 Performance Improvement Areas
Greener Airports
Globally Interoperable Systems & Data
Optimum Capacity & Flexible Flights
Efficient Flight Path
Block 0: Capabilities within our Grasp Today

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

• 3 Priorities have been agreed to:
  – Performance Based Navigation (PBN)
  – Continuous Descent Operations (CDO)
  – Continuous Climb Operations (CCO)
Block 0 - Contents

**Performance Improvement Areas**

- **Greener Airports**
  - 5 Modules depending on: GNSS-based Approaches; Better Wake Vortex Minima; A-SMGCS; Airport CDM, Improved Metering

- **Globally Interoperable Systems and Data**
  - 2 Modules depending on: Ground-Ground Integration based on AIDC; Digital AIM using AIXM and other developments.

- **Optimum Capacity and Flexible Flights**
  - 3 Modules based on: PBN, FUA and CDM in combination; Improved Flow Planning and Air Traffic Situational Awareness

- **Efficient Flight Path**
  - 3 Modules based on: Existing Datalink Operations which support CDOs, CCOs and En-Route Operations

**Block 0**

**Today and Beyond; Based on Operational Need**

- Integrated AMAN/DMAN/SMAN
- Full FF-ICE And More
- Traffic Complexity Management
- Full 4D – TBO And More

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Let’s Focus on Block 1...
Block 1 Modules for:
Greener Airports

NAV Equip.  Wake Vortex
A- SMGCS  A-CDM
Remote Tower  A/D MAN

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Block 1 Modules for:
Globally Interoperable Systems & Data

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Block 1 Modules for:
Optimum Capacity & Flexible Flights

Dynamic ATS Routing
In Trail ADS
Interval Mgmt
WX Info
CDM + FLT Planning

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Block 1 Modules for: Efficient Flight Path

OPDs

RPAs

Synch/
4D
TRAD

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Threads Between Modules... and Across Blocks

Greener Airports

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>
Threads Between Modules... and Across Blocks

Globally Interoperable Systems & Data
Through Global SWIM

Block 0
Increased Interoperability, Efficiency & Capacity through Ground-Ground Integration

Block 1
Increased Interoperability, Efficiency & Capacity through FF-ICE/1 application before Departure

Block 2
Improved Coordination through multi-centre Ground-Ground integration: (FF-ICE/1 & Flight Object, SWIM)

Block 3
Improved Operational Performance through the introduction of Full FF-ICE

Available Now 2018 2023 2028>

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Threads Between Modules... and Across Blocks

Optimum Capacity & Flexible Flights
Through Global Collaborative ATM

Block 0
Improved Flow Performance through Planning Based on a Network-Wide View

Block 1
Enhanced Flow Performance through Network Operational Planning

Block 2
Increased User Involvement in the Dynamic Utilisation of the Network

Block 3
Traffic Complexity Management

Available Now 2018 2023 2028+

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Threads Between Modules... and Across Blocks

Efficient Flight Path
Through Trajectory-based Operations

Block 0
Improved Flexibility & Efficiency in Descent Profiles (CDOs)

Block 1
Improved Flexibility & Efficiency in Descent Profiles (OPDs)

Block 2
Optimised Arrivals in Dense Airspace

Block 3
Full 4D Trajectory based Operations

Available Now 2018 2023 2028>

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Step 3
Global Rollout & Feedback at GANIS

• Held Global Air Navigation Industry Symposium
  – September 2011
  – Over 500 participants from Industry, States and international organizations
• Platform to enable feedback
• Industry voice is critical in our planning
• Essential preparation for AN-Conf/12
• Working Document posted on website

www.icao.int/anconf12/asbu
Step 3
What Happens Post-GANIS?

- Collected feedback on the Working Document
  - Until 17 October 2011
- Technical Team generated Edition 2 (version 3) of the Working Document
  - Week of 24th October 2011
- Edition 2 released for further feedback
  - December 2011
- Proposed revision of Global Air Navigation Plan (GANP)
  - Include technical roadmaps for CNS/AIM, based on ASBUs concept
  - Internal review – May 2012
  - Public consultation – 30 June 2012
    - In all 6 official ICAO languages
- Proposed GANP content will be discussed at AN-Conf/12
  - 19-30 November 2012
Step 4
International Agreement at AN-Conf/12

• Montréal, 19-30 November 2012
• Opportunity to formalize future of infrastructure & equipage
• Strategies for longer-term requirements
• Agreement of first series of block upgrades
  – Level of certainty for all stakeholders
  – Encourage more efficient implementation
• Revised GANP
  – Operational capabilities to manage ATM system requirements
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