Overview of the Aviation System Block Upgrades (ASBUs) Concept and PBN

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The 30’000 Feet View

- Air traffic growth expands two-fold once every 15 years
- Growth can be a double-edged sword
- Challenge is how to achieve both safety and operational improvements
  - Globally harmonized
  - Environmentally responsible
  - Cost-effective
Developing Tomorrow’s Aviation System

- Investment certainty is required for:
  - Operators
  - Infrastructure providers
  - Equipment manufacturers
- Regulatory approval process must be outlined
  - Support States in introduction of significant changes
Developing Tomorrow’s Aviation System

- ICAO developed a plan

- Setting the stage for global interoperability
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...
A Team Effort
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+
A Block is Made Up of Modules...
...So a Block is Scalable to Meet Regional or Local Needs
Integrated Planning through Block Upgrades

Performance Improvement Areas

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

Block 0 (2013)

Block 1 (2018)

Block 2 (2023)

Block 3 (2028 onward)
# Increased Runway Throughput Through Optimized Wake Turbulence Separation

## Summary

Improved throughput on departure and arrival runways through optimized wake turbulence separation minima, revised aircraft wake turbulence categories and procedures.

## Main performance impact as per Doc 9854

KPA-02 – Capacity, KPA-06 – Flexibility.

## Operating environment/Phases of flight

Arrival and departure

## Applicability considerations

Least complex – Implementation of revised wake turbulence categories is mainly procedural. No changes to automation systems are needed.

## Global concept component(s) as per Doc 9854

CM – conflict management

## Global plan initiatives

GPI-13: Aerodrome design  
GPI 14: Runway operations

## Main dependencies

Nil

## Global readiness checklist

<table>
<thead>
<tr>
<th>Standards readiness</th>
<th>2013</th>
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</thead>
<tbody>
<tr>
<td>Avionics availability</td>
<td>N/A</td>
</tr>
<tr>
<td>Ground systems availability</td>
<td>N/A</td>
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<tr>
<td>Procedures available</td>
<td>2013</td>
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<tr>
<td>Operations approvals</td>
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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)
Performance Improvement Areas

Airport Operations

Globally Interoperable Systems and Data

Optimum Capacity and Flexible Flights

Efficient Flight Path

Block 0
Today & beyond; based on operational need

- Optimization of approach procedures
- Increased runway throughput through WT separation
- Improve traffic flow through runway sequencing
- Safety and efficiency of surface operations
- Improved airport operations through airport-CDM

- Digital aeronautical information management
- Increased interoperability, efficiency and capacity
- MET information supporting enhanced operation

- Improved flow performance through network planning
- Improved ops. through enhanced en-route trajectories
- Initial capability for ground surveillance
- Air traffic situational awareness (ATSA)
- Improved access to optimum flight levels
- ACAS improvements
- Increased effectiveness of ground based safety nets

Integrated AMAN/DMAN/SMAN

Full FF-ICE And More

Traffic Complexity Management

Full 4D – TBO And More
Benefiting from All the Modules

- There is added value in using all modules
- States should view modules in B0 & B1 as critical:
  - Formalizing a minimum track
  - They will allow for benefits down the road in B2 & B3
The Cost of Not Implementing

- Focusing on what it will cost if modules are not implemented:
  - Increased risk of serious incidents and accidents
  - Negative impact on operations
  - Environmental repercussions
  - etc.

<table>
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<tr>
<th>Baseline Fuel Consumption</th>
<th>Post-Operational Improvement Fuel Consumption</th>
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<td><img src="Image" alt="Baseline Fuel Consumption" /></td>
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</table>

Baseline $\text{minus}$ Post-operational Consumption $\text{equals}$ Fuel Saved
Desired Outcomes of AN-Conf/12

- Endorsement of:
  - Global Air Navigation Plan, as unified planning mechanism

- Agreement on:
  - Integrated work programme
  - Structure and management of “Expert Groups”

- Recommendations on ICAO technical work programme:
  - Endorsement for short term Block Upgrades
  - Agreement on Block 1

- Clear strategic direction for future infrastructure:
  - Endorsement for medium and long term Block Upgrades
  - Agreement on Blocks 2 & 3
ICAO

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