

International Civil Aviation Organization


ASBU/SIP/Lima/2012-WP/10

ASBU Methodology Summary of Block 0 Modules


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Workshop on preparations for ANConf/12 – ASBU methodology
(Lima, 16-20 April 2012)

Outline

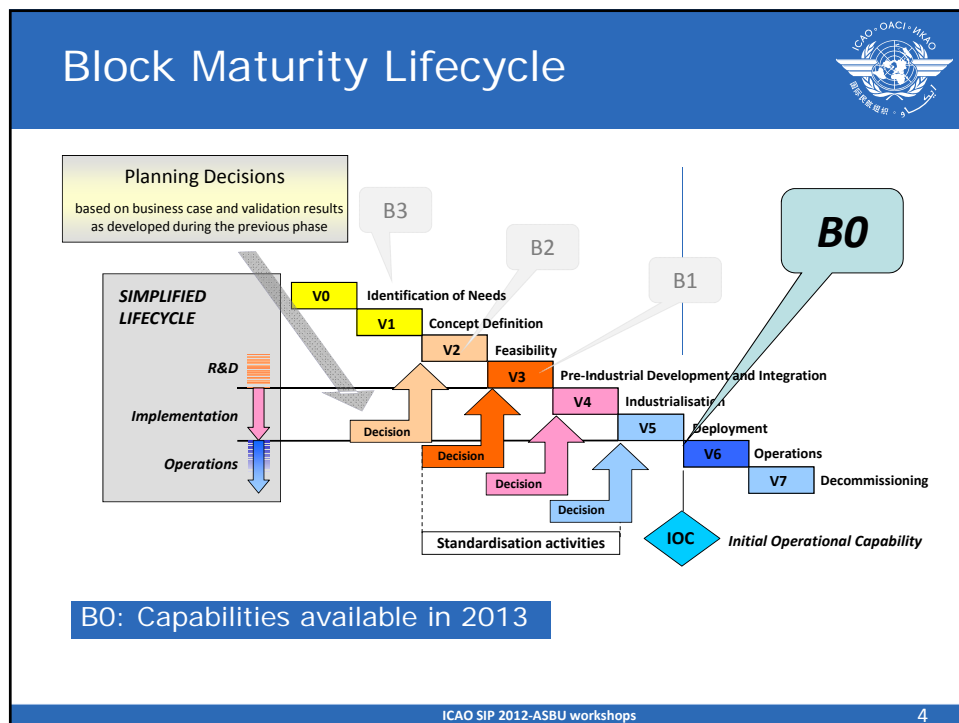
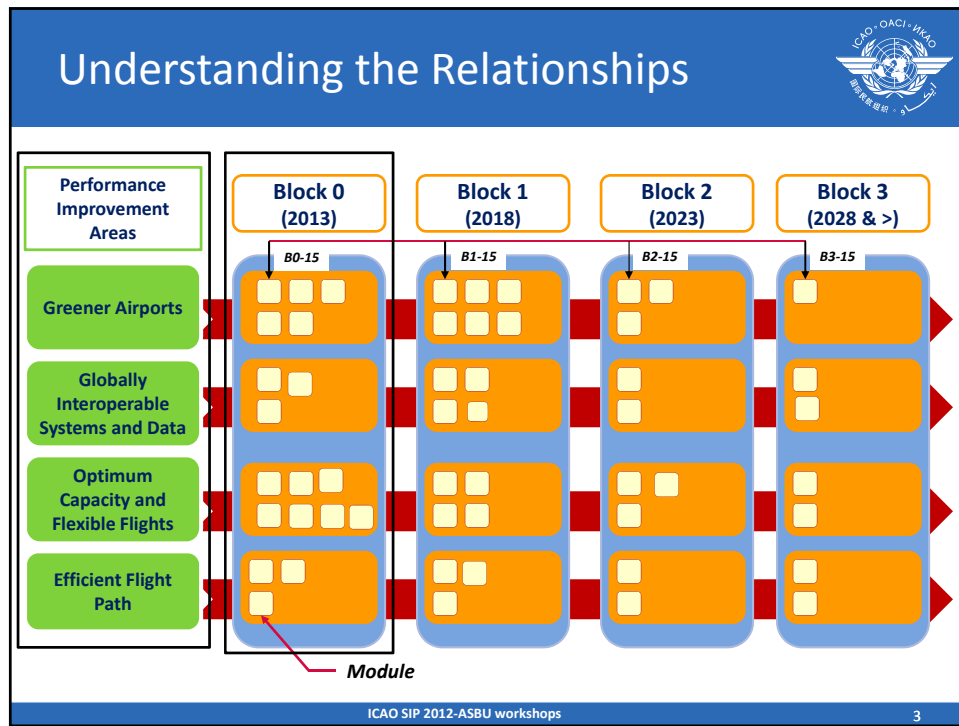


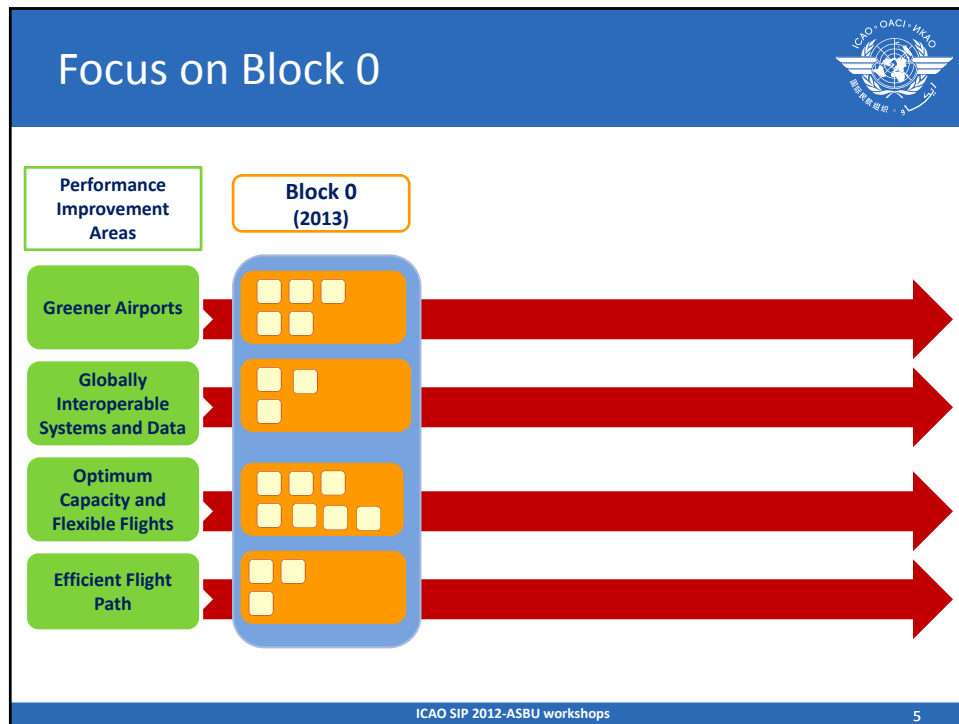
- Block understanding
- Block Maturity cycle
- Block 0 perspective
- Block 0 Modules
- Block 0 implementation



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Global Readiness Checklist

Global Readiness Checklist	Status (ready or date)
Standards Readiness	✓
Avionics Availability	✓
Infrastructure Availability	✓
Ground Automation Availability	✓
Procedures Available	✓
Operations Approvals	✓

- Each Module is evaluated for its readiness
- If any component is not found to be ready it moves to a future Block for implementation
- Those Modules that are not specifically ready at a Block release are noted as “dates of readiness”

All Block 0 Modules Have Met the Readiness Criteria

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Block 0



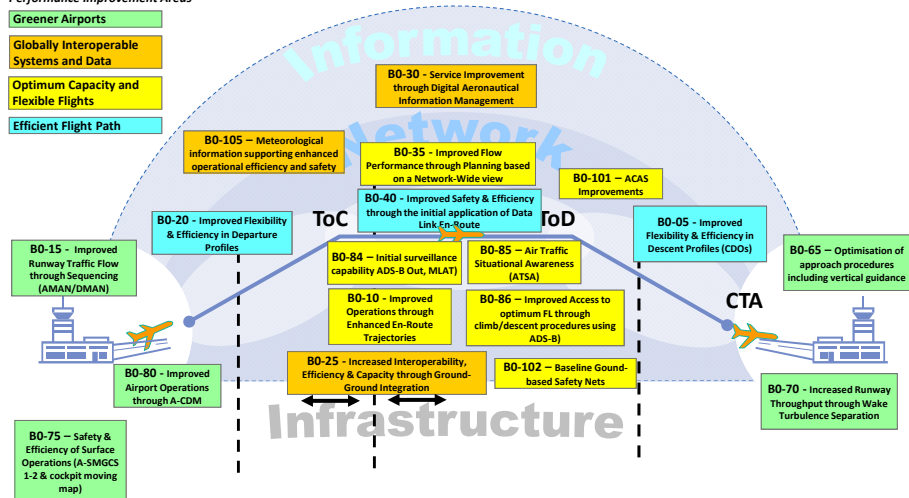
- 4 Main Performance improvement areas
 - Greener Airports (5 modules)
 - Globally interoperable systems & data (3 modules)
 - Optimum capacity & flexible flights (7 modules)
 - Efficient flight path (3 modules)
- Block 0 will serve as the enabler and foundation for the envisioned future aviation systems.


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Block 0 in Perspective



Performance Improvement Areas






Greener Airports (PIA 1)

<p>B0-15 Improved Runway Traffic Flow through Sequencing (AMAN/DMAN) Time-based metering to sequence departing and arriving flights</p>	<p>B0-75 Improved Runway Safety (A-SMGCS) Airport surface surveillance for ANSP</p>
<p>B0-65 - Optimization of Approach Procedures including Vertical Guidance This is the first step toward universal implementation of GNSS-based approaches</p>	<p>B0-80 Improved Airport Operations through ACDM Airport operational improvements through the way operational partners at airports work together</p>
<p>B0-70 Increased Runway Throughput through Wake Turbulence Separation Improved throughput on departure and arrival runways through the revision of current ICAO wake vortex separation minima and procedures (re-categorisation, CSPR and WIDAO)</p>	<p><i>The combined Block 0 Modules reduce fuel consumption and noise by improving arrival efficiencies and improving information sharing</i></p>


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Globally Interoperable Systems and Data (PIA 2)

<p>B0-25 Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration Supports the coordination of ground-ground data communication between ATSU based on ATS Inter-facility Data Communication (AIDC) defined by ICO Document 9694</p>	<p>B0-30 Service Improvement through Digital Aeronautical Information Management Initial introduction of digital processing and management of information, by the implementation of AIS/AIM making use of AIXM, moving to electronic AIP and better quality and availability of data</p>
<p>B0-105 – Meteorological information supporting enhanced operational efficiency and safety This module includes meteorological information supporting automated decision processes or aids such as meteorological information translation, ATM decision support. This module enables the reliable identification of applicable ATM solutions when meteorological conditions are impacting (observed) or expected to impact (forecast) aerodromes or airspace</p>	<p><i>In Block 0 we improve overall operations and continue to enable Collaborative Decision Making through improved interfacilities communications using standard information formats and baseline Met Services</i></p>

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Optimum Capacity and Flexible Flights (PIA 3)

B0-10: Improved Operations through Enhanced En-Route Trajectories
Implementation of performance-based navigation (PBN concept) and flex tracking to avoid significant weather and to offer greater fuel efficiency, flexible use of airspace (FUA) through special activity airspace allocation, airspace planning and time-based metering, and collaborative decision-making (CDM) for en-route airspace with increased information exchange among ATM stakeholders

B0-85: Air Traffic Situational Awareness (ATSA)
ATSA provides a cockpit display of a graphical depiction of traffic to assist the pilot in out-the-window visual acquisition of traffic:


B0-86: Improved access to Optimum Flight Levels through Climb/Descent Procedures using ADS-B
The use of In Trail Procedure (ITP) facilitates en-route climb or descent to enable better use of optimal flight levels in environments where a lack of ATC surveillance and/or the large separation minima currently implemented is a limiting factor.

B0-35: Improved Flow Performance through Planning based on a Network-Wide view
Collaborative ATFM measure to regulate peak flows involving departure slots, managed rate of entry into a given piece of airspace for traffic along a certain axis, requested time at a waypoint or an FIR/sector boundary along the flight.

B0-101 ACAS Improvements
This addresses short term improvements to the performance of the existing airborne collision avoidance systems (ACAS).

Using procedural concepts (e.g. RNP, FUA, etc.) and Air Traffic Situational Awareness - combined with enhanced planning tools and information sharing, the enroute phase of flight supports additional capacity and flexibility using the Modules of Block 0

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Optimum Capacity and Flexible Flights (PIA 3) - Continued

B0-84 – Initial surveillance capability ADS-B Out, MLAT
Ground surveillance supported by ADS-B OUT and/or wide area multilateration systems will improve safety, especially search and rescue and capacity through separation reductions.

B0-102 – Baseline Ground-based Safety Nets
To monitor the operational environment during airborne phases of flight, the alerts such as Short Term Conflict Alert, Area Proximity Warnings and Minimum Safe Altitude Warnings are proposed in this module. Ground-based safety nets make an essential contribution to safety and remain required as long as the operational concept remains human-centred.

Through ground based safety nets combined with ground surveillance the enroute phase of flight supports additional capacity, flexibility and safety

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Efficient Flight Path (PIA 4)


B0-05
Improved Flexibility and Efficiency in Descent Profiles (CDOs)
Deployment of performance-based airspace and arrival procedures that allow the aircraft to fly their optimum aircraft profile taking account of airspace and traffic complexity with continuous descent operations (CDOs)

B0-40
Improved Safety and Efficiency through the initial application of Data Link En-Route
Implementation of an initial set of data link applications for surveillance and communications in ATC

B0-20
Improved Flexibility and Efficiency in Departure Profiles
Deployment of departure procedures that allow the aircraft to fly their optimum aircraft profile taking account of airspace and traffic complexity with continuous climb operations (CCOs)


The use of procedurally based Optimized Profile Climbs and Descents as well as an initial Data Link Capability helps to establish a Block 0 capability for improved operational efficiencies

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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)



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Challenges - How to Get There?



- It is all about managing risk
- Block 0 risks are minimum
 - Global Readiness Checklist is complete
 - The Modules are well understood and supported
- But risks do exist
 - States may not be capable of ensuring successful deployment of Block 0
 - If Block 0 is not implemented as a foundation, certain functionalities may not be available as enablers for future blocks
 - We must Identify and resolve policies necessary to enable the future blocks now

Implementation – The Time is Now



- The Modules of Block 0 are ready for implementation today
 - Standards are ready — The Infrastructure is available
 - Avionics are ready — Ground Automation is ready
 - Procedures and Operational Approvals are in place
- Establishing the foundation for the future is now
- Care was taken to ensure that regional implementation of the Blocks or the Modules are well described and ready for implementation

