| International Civil Aviation Organization | Organisation de l'aviation civile internationale | Organización de Aviación Civil Internacional | Международная организация гражданской авиации | منظمة الطيران المدني الدولي | 国 际 民 用 航 空 组 织 |

Ref.: T 8/5.1:AP026/12 (CNS)   22 February 2012

Subject: ICAO Special Implementation Project:
Workshop on "Preparations for AN-Conf/12 - ASBU methodology"
(Bangkok, Thailand, 14 - 18 May 2012)

Action required: To advise the names of participants
by 30 April 2012

Sir/Madam,

I have the honour to inform you that ICAO will be holding a workshop on *"Preparations for 12th Air Navigation Conference (AN-Conf/12) – Aviation System Block Upgrades (ASBU) methodology"*, under the programme of Special Implementation Project (SIP) established by the Assembly. The workshop will be held from 14 to 18 May 2012 in Bangkok, Thailand. I hereby extend an invitation to your Administration to participate in this workshop.

The 37th Session of the ICAO General Assembly held in 2010 directed the Organization to double its efforts to meet the global requirements for airspace interoperability while maintaining its focus on safety. Furthermore, the need was recognized to integrate the air, ground and regulatory parts in the air navigation infrastructure planning by addressing flight trajectories as a whole, distributing the decision-making process, taking into account safety risks and recognizing changing role of the human element. In response to these developments, ICAO initiated the ASBU methodology as a global framework that comprises a suite of modules, which are organized into flexible and scalable building blocks and can be implemented in a State or a region depending on the need and level of readiness.

The ASBU initiative will be integrated in the revised Global Air Navigation Plan (GANP, Doc 9750) with intent to seek the endorsement of AN-Conf/12 scheduled from 19 to 30 November 2012 under the concept of One Sky. The revised GANP will also include related technology roadmaps such as CNS, AIM, and Avionics. Consequential amendments will also take place in the Regional and National Performance Framework for Air Navigation Systems and reflected appropriately in the air navigation plans.

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The successful rollout of ASBU concept and modules/technologies will depend on well synchronized strategies for education and training that would also facilitate discussions during the AN-Conf/12. As a result, significant efforts are underway to familiarize States, Regulators, Service Providers, Airline Operators, Military and International Organizations on the concept of ASBUs. Following this, the Secretary General established a SIP consisting of a workshop on *"Preparations for AN-Conf/12 – ASBU methodology"*, for the States of Asia/Pacific Region, in order to provide guidance on ASBU methodology and support States to prepare for their participation in the deliberations concerning ASBU initiative during the AN-Conf/12. Furthermore, the workshop provides an excellent opportunity to understand the agenda of the AN-Conf/12 and expected outcomes.
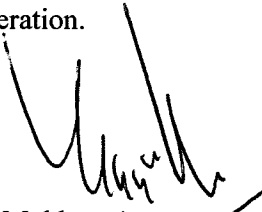
The objective of the workshop is to share with the participants in understanding the air navigation performance planning process through revised Global plan containing ASBU methodology, reviewing related technology roadmaps such as CNS, AIM and Avionics, assessing regulatory needs, defining operational improvements, developing business cases, determining performance metrics and evaluating fuel savings and corresponding environmental benefits through ICAO Fuel Savings Estimation Tool (IFSET). The workshop, through specially designed hands-on exercises, would provide the participants with practical experience for the development of national performance framework on the basis of ASBU concept and understand its impact on Regional Air Navigation Plans.

In order to conduct the hands-on exercises efficiently, meaningfully and within the time constraints of the workshop, you are requested to advise your participants to review the agenda of the workshop **(Attachment A)** as well as background information on ASBUs **(Attachment B)** and bring along with them a copy of the national air navigation plan to the workshop. In this regard, please note that as the workshop covers all disciplines of air navigation systems, I would encourage participation of experts from your State representing the fields of OPS/ATM/CNS/ MET/ AIM/ AGA as you consider appropriate.

The working language of the workshop will be English. The daily subsistence travel allowance in addition to other costs for participants are the responsibility of the nominating States. A workshop bulletin, which contains general information to assist participants is provided in **(Attachment C).**

In order to proceed with the planning for the workshop, I would request you to advise me the names and designation of those who will attend by **30 April 2012.**

Accept, Sir/Madam, the assurances of my highest consideration.

Mokhtar Awan
Regional Director

INTERNATIONAL CIVIL AVIATION ORGANIZATION

APAC REGIONAL OFFICE

SPECIAL IMPLEMENTATION PROJECT (SIP)

WORKSHOP ON PREPARATIONS FOR AN-CONF/12 − ASBU METHODOLOGY
(BANGKOK, 14-18 MAY 2012)

AGENDA

AGENDA ITEM	Performance Improvement Area (PIA)	Operational Enhancements and Enablers
Agenda Item 1	Strategic issues	- Operational concept – Global ATM Community vision - ANConf/12 agenda – an overview - Performance Framework for Efficiency - Global Air Navigation Plan (GANP) – Framework for Global planning - Aviation System Block Upgrade (ASBU) methodology – Implementation of Block 0 and Block 1 and strategic direction for Block 2 and Block 3 - Technology roadmaps
Agenda Item 2	ASBU PIA 1: Greener airports – through improving airport performance	- ASBU Block 0 Modules/PIA 1 - Dynamic wake turbulence separation - Airport Collaborative-decision making (CDM)
Agenda Item 3	ASBU PIA 2: Interoperability and data – through globally interoperable SWIM	- ASBU Block 0 Modules/PIA 2 - System-Wide Information Management (SWIM) - Flight and flow information for a collaborative environment (FF-ICE) - Aeronautical information management (AIM)
Agenda Item 4	ASBU PIA 3: Optimum capacity and efficiency – through global collaborative ATM	- ASBU Block 0 Modules/PIA 3 - Collaborative-decision making (CDM) - Dynamic management of Special Use of Airspace (SUA) - Remotely-Piloted Aircraft Systems (RPAS) - Integrated Meteorological information
Agenda Item 5	ASBU PIA 4: Efficient flight paths – through trajectory-based operations	- ASBU Block 0 Modules/PIA 4 - Trajectory-based operation (TBO) - Continuous Decent Operations (CDO) - Continuous Climb Operations (CCO)
Agenda Item 6	Implementation issues	- Environment – Measuring benefits of operational improvements through ICAO Fuel Savings Estimation Tool (IFSET) - Economic issues– Formulation of Business Cases - Regional Air Navigation Plan (ANP)- Transition to eANP on the basis of ASBU methodology
Agenda Item 7	Hands-on exercises	- Development of Infrastructure Report Forms (IRFs) using ASBU methodology for regional/national planning - Use of IFSET in measuring environmental benefits accrued from operational improvements - Group discussions

Reference Documents:

1. Global Air Traffic Management Operational Concept (ICAO Document 9854);

2. Global Air Navigation Plan (ICAO Document 9750);

3. Manual on Global Performance of the Air Navigation System (ICAO Document 9883);

4. The Air Traffic Management System Requirements (ICAO Doc 9882);

5. Air Navigation Plan — Caribbean and South American Regions, Volume I — Basic ANP and Volume II — FASID (ICAO Document 8733, available on ICAONET);

6. Manual on Air Navigation Services (ANS) Economics (ICAO Document 9161);

7. Development of business case for the implementation of CNS/ATM Systems – Guidance Material (available on ICAONET);

8. Detailed Aviation System Block Upgrades;

9. Background information on ASBUs; and

10. Performance-based Navigation (PBN) Manual (ICAO Doc 9613);

— END —

**BACKGROUND INFORMATION ON AVIATION
SYSTEM BLOCK UPGRADES (ASBUs)**

WORKING DOCUMENT

ON THE

AVIATION SYSTEM BLOCK UPGRADES

THE FRAMEWORK

FOR GLOBAL HARMONIZATION

ISSUSED: 16 NOVEMBER 2011

**SECOND VERSION TO THE WORKING DOCUMENT FOR THE
GLOBAL AIR NAVIGATION INDUSTRY SYMPOSIUM (GANIS)**

Preface to this Edition

The International Civil Aviation Organization established a framework for global harmonization and interoperability of air space named the aviation system block upgrades (ASBUs). These are sets of capabilities that provide measurable, operational performance improvements organized into flexible and scalable building blocks that can be introduced and implemented as needed.

Draft ASBUs were presented at the Global Air Navigation Industry Symposium (GANIS), which was held at ICAO in September 2011, and were integrated in the GANIS working document. Since then, constructive feedback forms were received from both States and the Industry and all comments were reviewed by the Future Aviation Technical Team.

Based on the review of the Technical Team, the ASBUs have been revised and are available for review and comment using the forms provided for this purpose at http://www2.icao.int/en/GANIS/Pages/Aviation-System-Block-Upgrades.aspx. Feedback is of particular importance because the ASBUs will form part of the Global Air Navigation Plan (GANP) which will be the subject of a working paper at the Twelfth Air Navigation Conference (AN-Conf/12).

ICAO Aviation System Block Upgrades

Introduction

The 37th Session of the International Civil Aviation Organization (ICAO) Assembly (2010) directed the Organization to increase its efforts to meet the global needs for airspace interoperability while maintaining its focus on safety. ICAO therefore introduced the "Aviation System Block Upgrades" initiative as a programmatic framework that:

    a) develops a set of air traffic management (ATM) solutions or upgrades;

    b) takes advantage of current equipage;

    c) establishes a transition plan; and

    d) enables global interoperability.

ICAO estimates that US$120 billion will be spent on the transformation of air transportation systems in the next ten years. While NextGen and SESAR in the United States and Europe account for a large share of this spending, parallel initiatives are underway in many areas including the Asia/Pacific, North and Latin America, Russia, Japan and China. Modernization is an enormously complex task but the Industry needs the benefits that these initiatives will bring as traffic levels continue to rise. It is clear that to safely and efficiently accommodate the increase in air traffic demand, as well as to respond to the diverse needs of operators, the environment and other issues, a renovation of ATM systems is needed to provide the greatest operational and performance benefits.

Aviation system block upgrades comprise suites of modules, each having the following essential elements:

    a) a clearly defined and measurable operational improvement and success metric;

    b) necessary equipment and/or systems in aircraft and on the ground, along with an operational approval or certification plan;

    c) standards and procedures for both airborne and ground systems; and

    d) a positive business case over a clearly defined period of time.

Modules are organized into flexible and scalable building blocks that can be introduced and implemented in a State or a region depending on need and level of readiness, while recognizing that all the modules are not required in all airspaces.

The concept of the block upgrades originates from existing near-term implementation plans and initiatives providing benefits in many regions of the world. The block upgrades are largely based on operational concepts extracted from the United States' Next Generation Air Transportation System (NextGen), Europe's Single European Sky ATM Research (SESAR) and Japan's Collaborative Actions for Renovation of Air Traffic Systems (CARATS) programmes. Also included was the feedback from States with evolving modernization programmes received at the recent Global Air Navigation Industry Symposium. The block upgrades are also aligned with the ICAO *Global Air Traffic Management Operational Concept* (Doc 9854). The intent is to apply key capabilities and performance improvements

drawn from these programmes across other regional and local environments with the same level of performance and associated benefits on a global scale.

The block upgrades describe ways to apply the concepts defined in the ICAO *Global Air Navigation Plan* (Doc 9750) with the goal of achieving regional performance improvements. They will include the development of technology roadmaps to ensure that standards are mature and to facilitate synchronized implementation between air and ground systems and between regions. The ultimate goal is to achieve global interoperability. Safety demands this level of interoperability and harmonization which must be achieved at a reasonable cost with commensurate benefits.

Leveraging upon existing technologies, block upgrades are organized in five-year time increments starting in 2013 continuing through 2028 and beyond. Such a structured approach provides a basis for sound investment strategies and will generate commitment from States, equipment manufacturers, operators and service providers.

The block upgrades will be formalized at the Twelfth Air Navigation Conference in November 2012 and will form the basis of the new or revised Global Air Navigation Plan (GANP).

The development of block upgrades will be realized by a shift in focus from top-down planning to more bottom-up and pragmatic implementation in the regions. The ASBU initiative will influence ICAO's work programme in the coming years, specifically in the area of standards development and associated performance improvements.

Stakeholder Roles and Responsibilities

Stakeholders, including service providers, regulators, airspace users and manufacturers, will face increased levels of interaction as new, modernized ATM operations are implemented. The highly integrated nature of capabilities covered by the block upgrades requires a significant level of coordination and cooperation among all stakeholders. Working together is essential for achieving global harmonization and interoperability.

For ICAO and its governing bodies, the block upgrades will enable the development and delivery of necessary Standards and Recommended Practices (SARPs) to States and Industry in a prompt and timely manner to facilitate regulatory and technological improvement and to ensure operational benefits worldwide. This process will be facilitated by the standards roundtable process, which involves ICAO, States and Industry, and by various technological roadmaps.

States, operators and Industry will benefit from the availability of SARPs with realistic lead times. This will allow regional regulations to be identified, the development of adequate action plans and, if needed, investment in new facilities and/or infrastructure.

Stakeholders worldwide must prepare the ATM system for the future. The block upgrades initiative should constitute the basis for future ATM modernization plans. Where plans are already in place, they should be aligned with objectives defined in the block upgrades.

For the Industry, the ASBU initiative forms the basis for planning future development and delivering products to the market at the proper target time.

For service providers or operators, block upgrades should serve as a planning tool for resource management, capital investment, training, as well as for potential reorganization.

What is an Aviation System Block Upgrade?

An aviation system block upgrade (ASBU) designates a set of improvements that can be implemented globally to enhance the performance of the ATM system. There are four components of a block upgrade.

Module — a deployable package based on performance or capability. It offers a clear operational benefit, supported by procedures, technology, regulation/standards as necessary, and a business case. A module will be also characterized by the operating environment within which it may be applied.

It is important that each module be both flexible and scalable to the point where its application could be managed through any set of regional plans and still realize the intended benefits. The preferential basis for the development of the modules relied on the applications being adjustable to fit many regional needs as an alternative to being made mandated as a one-size-fits-all application. Even so, it is clear that many of the modules developed in the block upgrades will not be necessary to manage the complexity of air traffic management in many parts of the world.

Thread — a series of dependent modules reaching across successive block upgrades which represents a coherent evolution over time from basic to more advanced capability and associated performance while reflecting key aspects of the global ATM concept. The date considered for allocating a module to a block is that of the initial operating capability (IOC)

Block — is made up of modules that, when combined, enable significant improvements and benefits.

The notion of blocks is based on five year intervals. Detailed block descriptions can include more accurate implementation dates, often not at the exact reference date of a block. The purpose, however, is not to indicate when a module implementation must be completed, unless dependencies among modules logically suggest such a completion date.

Performance Improvement Area (PIA) — sets of modules in each block are grouped to provide operational and performance objectives in the environment to which they apply, thus forming executive high-level view of the intended evolution. The PIAs facilitate comparison of ongoing programmes.

The four performance improvement areas are as follows:

1. *Greener Airports*
2. *Globally Interoperable Systems and Data* – through globally interoperable system-wide information management
3. *Optimum Capacity and Flexible Flights* – through global collaborative ATM
4. *Efficient Flight Path* – through trajectory-based operations

Figure 1 illustrates the relationships between the modules, threads, blocks, and performance improvement areas.
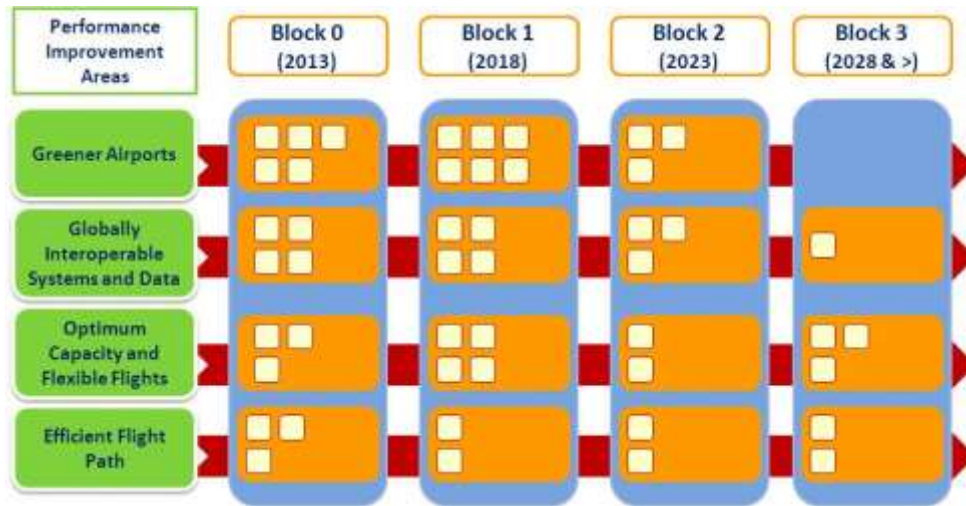
Figure 1. Summary of Blocks Mapped to Performance Improvement Areas

Note that each block includes a target year. Each of the modules that form the block must meet a readiness review that looks at the availability of standards (including performance standards, approvals, advisory and guidance documents, etc.), avionics, infrastructure, ground automation and other enabling capabilities. To provide a community perspective each module should have been fielded in two regions and should include operational approvals and procedures. This allows States wishing to adopt the blocks to draw on the experience gained by those already employing those capabilities.

Figure 2 illustrates the relative timing of each block. Note that early lessons learned are included in preparation for the initial operating capability date. For the Twelfth Air Navigation Conference it is recognized that Blocks 0 and 1 represent the most mature of the modules. Blocks 2 and 3 provide the necessary vision to ensure that earlier implementations are on the path to the future.
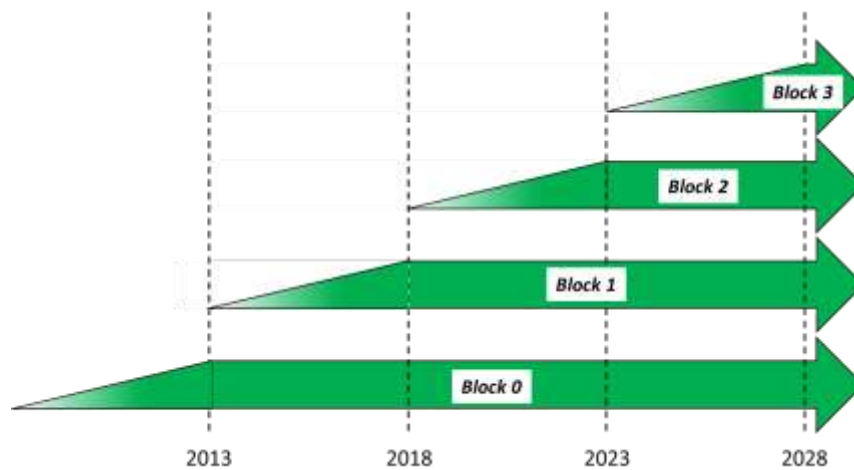

Figure 2. Timing Relationships Between Blocks

An illustration of the improvements brought by Block 0 for the different phases of flight is presented in Figure 3. It highlights that the proposed improvements apply to all flight phases, well as to the network as a whole, to information management and to infrastructure.
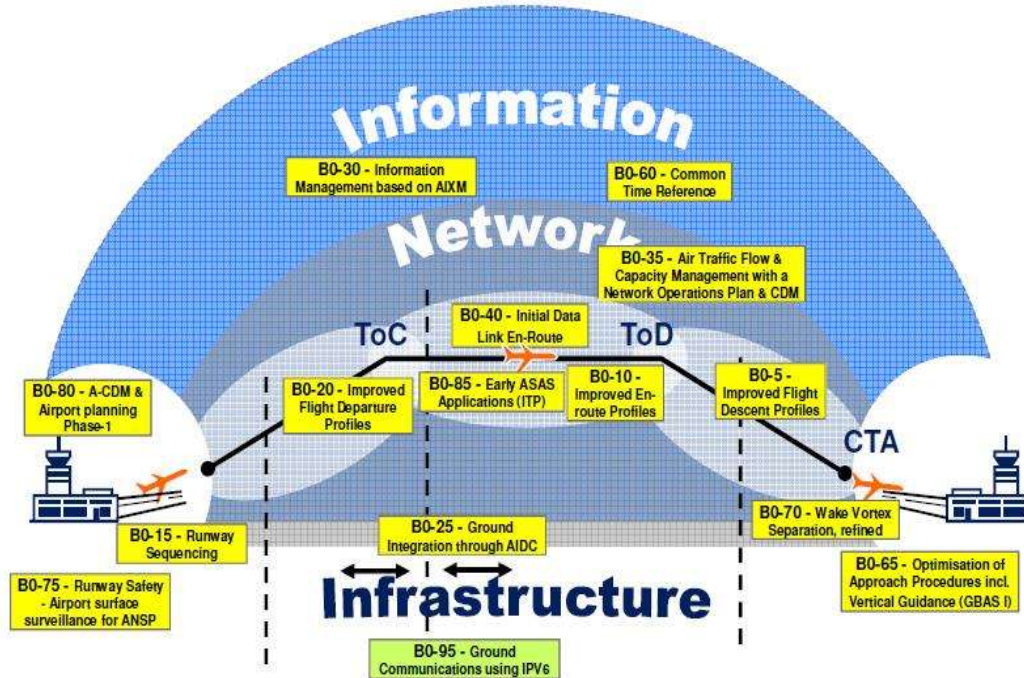
Figure 3. Block 0 in perspective

Global Air Navigation Plan

The GANP is a strategic document that has successfully guided the efforts of States, planning and implementation regional groups (PIRGS) and international organizations in enhancing the efficiency of air navigation systems. It contains guidance for systems improvements in the near- and medium-term to support a uniform transition to the global ATM system envisioned in the Global ATM Operational Concept. Long-term initiatives from the operational concept, however, are maturing and GANP must be updated to maintain its relevance and compatibility.

The United States and Europe share a common ATM modernization challenge as both operate highly complex, dense airspace in support of their national economies. Although quite different in structure, management and control, their systems are built on a safety-focused infrastructure while actively seeking and delivering the required efficiency gains. The United States has a single system that spans the entire country while Europe's is a patchwork of systems, service providers and airspace defined mostly by State boundaries. Both legacy infrastructures must migrate to a new, upgraded and modernized operational paradigm.

Over the past ten years, as the ATM operational concepts were developed, the need was recognized to:

   a)   integrate the air, ground and regulatory parts, including airport operations, by addressing flight trajectories as a whole and sharing accurate information across the ATM system;

   b)   distribute the decision-making process;

   c)   address safety risks; and

   d)   change the role of the human being using improved integrated automation.

These changes will support new capacity-enhancing operational concepts and enable the sustainable growth of the air transportation system.

ICAO aims for the block upgrades initiative to become the global approach for facilitating interoperability, harmonization, and modernization of air transportation worldwide. As implementation proceeds, the highly integrated nature of the block upgrades will necessitate transparency between all stakeholders to achieve a successful and timely ATM modernization.

The Twelfth Air Navigation Conference provides the opportunity for significant progress and to arrive at decisions for the globally coordinated deployment of the block upgrades, progress reviews and updates are planned at regular intervals following the first application the block upgrades.

Conclusion

The global aviation system block upgrade initiative constitutes a worldwide framework for ATM system modernization. Offering a structure based on expected operational benefits, it will facilitate investment and implementation processes, by clarifying the clear relationship between technology and operational improvements.

However, block upgrades will only play their intended role if sound and consistent technology roadmaps are developed and validated. As well, all stakeholders involved in worldwide ATM modernization should align their activities and planning to the related block upgrades. The challenge of the Twelfth Air Navigation Conference will be to establish a solid and worldwide endorsement of the aviation system block upgrades as well as the related technology roadmaps into the revised Global Air Navigation Plan, under the concept of One Sky.

Appendix A: Summary Table of Aviation System Block Upgrades Mapped to Performance Improvement Areas

Performance Improvement Area 1: Greener Airports

Block 0	Block 1	Block 2	Block 3
B0-65 **Optimization of approach procedures including vertical guidance** This is the first step toward universal implementation of GNSS-based approaches	**B1-65** **Optimized Airport Accessibility** This is the next step in the universal implementation of GNSS-based approaches		
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	**B1-70** **Increased Runway Throughput through Dynamic Wake Turbulence Separation** Improved throughput on departure and arrival runways through the dynamic management of wake vortex separation minima based on the real-time identification of wake vortex hazards	**B2-70 (*)** **Advanced Wake Turbulence Separation (Time-based)**	
B0-75 **Improved Runway Safety (A-SMGCS Level 1-2 and Cockpit Moving Map)** Airport surface surveillance for ANSP	**B1-75** **Enhanced Safety and Efficiency of Surface Operations (ATSA-SURF)** Airport surface surveillance for ANSP and flight crews with safety logic, cockpit moving map displays and visual systems for taxi operations	**B2-75** **Optimized Surface Routing and Safety Benefits (A-SMGCS Level 3-4, ATSA-SURF IA and SVS)** Taxi routing and guidance evolving to trajectory based with ground/cockpit monitoring and data link delivery of clearances and information. Cockpit synthetic visualization systems	
B0-80 **Improved Airport Operations through Airport-CDM** Airport operational improvements through the way operational partners at airports work together	**B1-80** **Optimized Airport Operations through Airport-CDM Total Airport Management** Airport operational improvements through the way operational partners at airports work together		
	B1-81 **Remote Operated Aerodrome Control T** The performance objective is to provide safe and cost-effective ATS to aerodromes where dedicated local ATS is no longer sustainable or cost effective, but where there is a local economic and social benefit from aviation		
B0-15 **Improved RunwayTraffic Flow through Sequencing (AMAN/DMAN)** Time-based metering to sequence departing and arriving flights	**B1-15** **Improved Airport Operations through Departure, Surface and Arrival Management** Extended arrival metering, integration of surface management with departure sequencing bring robustness to runway management and increase airport performances and flight efficiency	**B2-15** **Linked AMAN/DMAN** Synchronized AMAN/DMAN will promote more agile and efficient en-route and terminal operations	**B3-15** **Integrated AMAN/DMAN/SMAN** Fully synchronized network management between departure airport and arrival airports for all aircraft in the air traffic system at any given point in time

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

Block 0	Block 1	Block 2	Block 3
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 ICAO Doc 9694, *Manual of Air Traffic Services Data Link Applications*	**B1-25** **Increased Interoperability, Efficiency and Capacity though FF-ICE/1 Application before Departure** Introduction of FF-ICE step 1 to implement ground-ground exchanges using common flight information reference model, FIXM, XML and the flight object used before departure	**B2-25** **Improved Coordination through Multi-centre Ground-Ground Integration: (FF-ICE/1 and Flight Object, SWIM)** FF-ICE supporting trajectory-based operations through exchange and distribution of information for multicentre operations using flight object implementation and IOP standards	
B0-30 **Service Improvement through Digital Aeronautical Information Management** Initial introduction of digital processing and management of information through the implementation of AIS/AIM making use of AIXM, moving to electronic AIP and better quality and availability of data	**B1-30** **Service Improvement through Integration of All Digital ATM Information** Implementation of the ATM information reference model integrating all ATM information using UML and enabling XML data representations and data exchange based on internet protocols with WXXM for meteorological information		**B3-25** **Improved Operational Performance through the Introduction of Full FF-ICE** All data for all relevant flights systematically shared between air and ground systems using SWIM in support of collaborative ATM and trajectory-based operations
	B1-31 **Performance Improvement through the Application of System-Wide Information Management (SWIM)** Implementation of SWIM services (applications and infrastructure) creating the aviation intranet based on standard data models, and internet-based protocols to maximize interoperability	**B2-31** **Enabling Airborne Participation in Collaborative ATM through SWIM** Connection of the aircraft an information node in SWIM enabling participation in collaborative ATM processes with access to rich, voluminous and dynamic data including meteorology	

Performance Improvement Area 3:
Optimum Capacity and Flexible Flights – Through Global Collaborative ATM

Block 0	Block 1	Block 2	Block 3
B0-10 **Improved Operations through Enhanced En-route Trajectories** Implementation of performance-based navigation (PBN) 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	**B1-10** **Improved Operations through Free Routing** Introduction of free routing in defined airspace, where the flight plan is not defined as segments of a published route network or track system to facilitate adherence to the user-preferred profile		**B3-10** **Traffic Complexity Management** Introduction of complexity management to address events and phenomena that affect traffic flows due to physical limitations, economic reasons or particular events and conditions by exploiting the more accurate and rich information environment of a SWIM-based ATM
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 way-point or an FIR/sector boundary along the flight, use of miles-in-trail to smooth flows along a certain traffic axis and re-routing of traffic to avoid saturated areas	**B1-35** **Enhanced Flow Performance through Network Operational Planning** ATFM techniques that integrate the management of airspace, traffic flows including initial user driven prioritization processes for collaboratively defining ATFM solutions based on commercial/operational priorities	**B2-35** **Increased User Involvement In The Dynamic Utilisation of The Network.** Introduction of CDM applications supported by SWIM that permit airspace users to manage competition and prioritization of complex ATFM solutions when the network or its nodes (airports, sector) no longer provide capacity commensurate with user demands	
	B1-105 **Better Operational Decisions through Integrated Weather Information (Planning and Near-term Service)** Weather information supporting automated decision process or aids involving: weather information, weather translation, ATM impact conversion and ATM decision support		**B3-105** **Better Operational Decisions through Integrated Weather Information (Near and Intermediate Service)** Weather information supporting both air and ground automated decision support aids for implementing weather mitigation strategies

Performance Improvement Area 3:
Optimum Capacity and Flexible Flights – Through Global Collaborative ATM

B0-85
Air Traffic Situational Awareness (ATSA)
This module comprises two ATSA (air traffic situational awareness) applications which will enhance safety and efficiency by providing pilots with the means to achieve quicker visual acquisition of targets:
- AIRB (enhanced traffic situational awareness during flight operations)
- VSA (enhanced visual separation on approach).

B1-85
Increased Capacity and Flexibility through Interval Management
To create operational benefits through precise management of intervals between aircraft whose trajectories are common or merging, thus maximizing airspace throughput while reducing ATC workload and enabling more efficient aircraft fuel burn reducing environmental impacts

B2-85
Airborne Separation (ASEP)
To create operational benefits through temporary delegation of responsibility to the flight deck for separation provision between suitably equipped designated aircraft, thus reducing the need for conflict resolution clearances while reducing ATC workload and enabling more efficient flight profiles.

B3-85
Self-separation (SSEP)
To create operational benefits through total delegation of responsibility to the flight deck for separation provision between suitably equipped aircraft in designated airspace, thus reducing the need for conflict resolution clearances while reducing ATC workload and enabling more efficient flight profiles

B0-86
Improved Access to Optimum Flight Levels through Climb/Descent Procedures Using ADS-B
The aim of this module is to prevent flights to be trapped at an unsatisfactory altitude for a prolonged period of time. The in trail procedure (ITP) uses ADS-B-based separation minima to enable an aircraft to climb or descend through the altitude of other aircraft when the requirements for procedural separation cannot be met.

B0-101
ACAS Improvements
Implementation of ACAS with enhanced optional features such as altitude capture laws reducing nuisance alerts, linking to the autopilot for automatic following of resolution advisories

B2-101
New Collision Avoidance System
Implementation of airborne collision avoidance system (ACAS) adapted to [take account of the] trajectory-based operations [procedures] with improved surveillance function supported by ADS-B and adaptive collision avoidance logic to reduce nuisance alerts and minimize deviations

Performance Improvement Area 4:
Efficient Flight Path – Through Trajectory-based Operations

Block 0	Block 1	Block 2	Block 3
B0-05 **Improved Flexibility and Efficiency in Descent Profiles (CDOs)** Deployment of performance-based airspace and arrival procedures that allow aircraft to fly their optimum aircraft profile taking account of airspace and traffic complexity with continuous descent operations (CDOs)	**B1-05** **Improved Flexibility and Efficiency in Descent Profiles (OPDs)** 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 optimized profile descents (OPDs)	**B2-05** **Optimized Arrivals in Dense Airspace** Deployment of performance-based airspace and arrival procedures that optimize the aircraft profile taking account of airspace and traffic complexity including optimized profile descents (OPDs), supported by trajectory-based operations and self-separation	**B3-05** **Full 4D Trajectory-based Operations** Trajectory-based operations deploys an accurate four-dimensional trajectory that is shared among all aviation system users at the core of the system. This provides consistent and up-to-date information system wide which is integrated into decision support tools facilitating global ATM decision-making
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	**B1-40** **Improved Traffic Synchronisation and Initial Trajectory-based Operation** Improve the synchronization of traffic flows at en-route merging points and to optimize the approach sequence through the use of 4DTRAD capability and airport applications, e.g.; D-TAXI, via the air-ground exchange of aircraft-derived data related to a single controlled time of arrival (CTA).		
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)			
	B1-90 **Initial Integration of Remotely-piloted Aircraft (RPA) Systems into Non-segregated Airspace** Implementation of basic procedures for operating RPAs in non-segregated airspace including detect and avoid	**B2-90** **Remotely-piloted Aircraft (RPA) Integration in Traffic** Implements refined operational procedures that cover lost link (including a unique squawk code for lost link) as well as enhanced detect and avoid technology	**B3-90** **Remotely-piloted Aircraft (RPA) Transparent Management** RPA operate on the aerodrome surface and in non-segregated airspace just like any other aircraft

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International Civil Aviation Organization

**ICAO SPECIAL IMPLEMENTATION PROJECT (SIP)
WORKSHOP ON PREPARATIONS FOR AN-CONF/12 – AVIATION
SYSTEM BLOCK UPGRADES (ASBU) METHODOLOGY**

(Bangkok, Thailand, 14 – 18 May 2012)

WORKSHOP BULLETIN

1.   Schedule of Workshop

1.1   The opening session of the workshop will be held at 0900 hours on Monday 14,

May 2012 at the "Kotaite Wing" of the ICAO Regional Office, Bangkok.

1.2   The daily order of business will be announced on the first day of the workshop.

2.   Registration of participants

2.1   Participants are requested to register at the Registration Desk in the lobby of Kotaite Wing between 0830 and 0900 hours on the opening day of the workshop. Participants are also requested to wear the identification badge all the time they are inside the ICAO premises.

3.   Officers and Secretariat concerned with the Meeting

3.1   Messrs. Li Peng and Sujan K. Saraswati, Regional Officers CNS of the ICAO Asia and Pacific Office will act as Secretaries of the meeting. Their contact addresses are as follows:

> Mr. Li Peng, Regional Officer CNS
> Tel: +66 (2) 537-8189 to 97 Ext. 158
> Fax: +66 (2) 537-8199
> E-mail: pli@bangkok.icao.int

> Mr. Sujan K. Saraswati, Regional Officer CNS
> Tel: +66 (2) 537-8189 to 97 Ext. 155
> Fax: +66 (2) 537-8199
> E-mail: ssaraswati@bangkok.icao.int

3.2   The daily Meeting service is the responsibility of Ms. Sarangtip Sundarachampaka Administrative Officer. Ms. Sriprae Somsri, CNS/MET Secretary, will provide secretarial support.

4.   Meeting documents for distribution

4.1   All working/information papers for the meeting will be posted on the ICAO APAC web site. Participants are requested to submit papers through following email address and download and bring all meeting documents with them. No hard copy of papers will be distributed.

> E-mail address for meeting documents: icao_apac@bangkok.icao.int

4.2   Any ICAO publications required by the participants may be obtained from the ICAO Regional Office Library located on the first floor of the Secretariat building. These publications may be purchased or borrowed for reference during the Meeting and returned to the Librarian at the end of the meeting.

5.   Location of the ICAO Regional Office and hotel accommodation

5.1   ICAO Regional Office is located at 252/1 Vipawadee-Rangsit Road, Ladyao, Chatuchak, Bangkok next to the Petroleum Authority of Thailand (PTT) Headquarters and opposite Sofitel Centara Grand Bangkok Hotel. It is about 40 km from the Bangkok/Suwarnabhumi International Airport and about 12 km. from Sukhumvit Road, where most of the recommended hotels are located. Location of the Regional Office and the route map of the Bangkok Mass Transit System (BTS, also known as the Skytrain) and MRTA Sub-way system (the Underground Metro) are published in the APAC website http://www.icao.int/apac/ under the heading "Information for Visitors".

5.2   The nearest BTS (Skytrain) station to the Office is Mo Chit and the nearest MRTA station to the Office is Phahon Yothin. Detailed routing instructions are provided on the web site.

5.3   Participants   may   contact   the   listed   hotels   directly   by   telephone/fax/ e-mail for reservation. Due to heavy demand for hotel accommodation reservations should be made as early as possible. The Regional Office would be pleased to assist participants in making hotel reservation, if required. **When making reservation, participants should mention that they are attending ICAO meeting to get the special room rate.**

5.4   Participants are requested to make their own arrangements for transportation from the airport to the city and from their hotels to the venue of the meeting.

5.4.1   Thai Airways International and Airport Taxi Services operate private limousine services from the airport to downtown Bangkok, at about Baht 1,000 per vehicle. Public taxi service is also available at the taxi stands at the airport. In addition to the fare indicated in the taximeter, 50 Baht surcharge is required to be paid for hiring a taxi from airport to city. The Bangkok Mass Transit Authority operates Airport Bus service to the city centre. In addition a train service has been introduced recently between Suvarnabhumi Airport and the city center. Express and City Line services with different ticket rates operate at regular intervals connecting airport with the city.

5.4.2   When departing, the hotel can arrange for transportation to the airport. Public taxis, which are less expensive than hotel taxis, are also available. Most taxis have a fare meter.

6.   Passport, visa and customs

6.1   All foreign nationals entering Thailand must possess valid passports or other valid documents for travel. Participants from certain countries are not required to obtain visas for a temporary visit not exceeding 15 days. It should, however, be noted that the temporary visas issued upon arrival at the Airport cannot be extended beyond the period of 15 days except under extraordinary circumstances. It is, therefore, suggested that all participants consider obtaining official visas from the Royal Thai Embassy or Consulate prior to their arrival in Thailand. Participants may wish   to   obtain   information   on   entry   requirements   by   accessing   the   web   page http://www.mfa.go.th/web/2630.php

6.2　　　　International certificates of vaccination against yellow fever are required if arriving within 6 days after leaving or transiting an infected area.

6.3　　　　There are no restrictions on import of foreign currency. However, if the amount exceeds US$10,000 it must be declared on entry. Foreign currencies may be taken out of the country up to the amount imported and declared. (Current exchange rate US$1 = Baht 29.00 approx).

7.　　　　Other Useful Information

7.1　　　　Time in Thailand is 7 hours ahead of Co-ordinated Universal Time (UTC+7).

7.2　　　　International credit cards such as American Express, Diners Club, Visa, Master Card, etc. are normally accepted at major hotels and department stores.

7.3　　　　All commercial banks exchange major foreign currencies and are open from 0830 to 1530 hours from Monday through Friday and some keep the foreign exchange counter open until 2000 hours during weekdays. Foreign exchange counters operated by various commercial banks are located at several places in the city and are also open during Saturdays and Sundays and on public holidays from 1000 to 2000 hours. To change travellers' cheques you are required to show your passport.

7.4　　　　Weather in Bangkok is generally hot with high humidity. November is part of the cold season in Thailand which lasts from November until February. More weather information can be obtained from the web site of the Thai Meteorological Department: http://www.tmd.go.th/en/

7.5　　　　Most hotels add a 10% service charge to the room rate in addition to the government tax of 7%. Baggage boys at hotel expect at least Baht 20. At restaurants, a tip of about 10% is expected unless a service charge has been added to the bill.

7.6　　　　Although the tap water in Bangkok is chemically treated, it is, however, recommended that participants drink only bottled water and beverages.

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