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

Tel.: +1 514-954-6711

Ref.: ST 13/1-11/71

22 December 2011

Subject: Invitation to attend the Twelfth Air Navigation Conference, Montréal, 19 to 30 November 2012

Action required: a) provide feedback on Aviation System Block Upgrades (ASBUs) not later than 16 February 2012; and b) submit supporting documentation on specific agenda items and notify the names of your representatives not later than 30 September 2012

Sir/Madam,

1. I have the honour to extend to your Government/Organization, on behalf of the Council, an invitation to participate in the Twelfth Air Navigation Conference which will be held in Montréal from 19 to 30 November 2012. The meeting is open to all Member States and, as invited by the Council, to non-Member States and international organizations. The representatives of non-Member States and international organizations may participate in the meeting with observer status.

2. Your attention is drawn to the need for inclusion of appropriate technical experts in your delegation. In consideration of Agenda Items 1 through 6 and the organization plan, the expertise required are in the fields of aerodromes, air routes and ground aids (AGA), aeronautical information management (AIM), air traffic management (ATM), communications, navigation, and surveillance (CNS), meteorology (MET) and operations (OPS).

3. As the military is an important user of the airspace and reserved military airspace is increasingly being sought after for use by civil aviation, you may wish to include military personnel who are involved in such issues, in your delegation.

4. Security and environment are very important elements of the air navigation system and these items will be addressed as they relate to each aspect of the system. Although specific experts in these fields are not required to attend, you may wish to ensure that your delegation is briefed and prepared to address these issues during discussion.

5. A framework for global harmonization and interoperability of air space referred to as aviation system block upgrades (ASBUs) will be central to the discussions at the Conference. A summary of the block upgrades is in Attachment A; the expanded modules are at http://www.icao.int/anconf12/asbu. Your feedback is requested not later than 16 February 2012.

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6. The agenda for the meeting, as approved by the Air Navigation Commission, is presented in Attachment B together with explanatory notes on each agenda item. The meeting will be conducted in Arabic, Chinese, English, French, Russian and Spanish.

7. An organization plan for the meeting, approved by the Air Navigation Commission at the third meeting of its 188th Session on 23 October 2011, is presented in Attachment C.

8. Information on credentials, the structure and conduct of the meeting, visa requirements, registration and other arrangements is provided in Attachment D. Basic rules regarding the submission of supporting documentation are shown in Attachment E.

9. A listing of the global ASBU workshops planned is outlined in Attachment F.

10. May I invite you to:

a) submit feedback on ASBUs not later than 16 February 2012; and

b) submit supporting documentation on specific agenda items for the meeting and advise me of the names of your representatives not later than 30 September 2012.

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

Raymond Benjamin
Secretary General

Enclosures:

A — Background information on ASBUs
B — Agenda of the meeting and explanatory notes on the agenda items
C — Organization plan
D — Agenda, credentials and other administrative arrangements
E — Documentation arrangements for divisional-type meetings
F — Global education schedule for ASBUs of the AN-Conf/12

ATTACHMENT A to State letter ST 13/1-11/71

BACKGROUND INFORMATION ON AVIATION SYSTEM BLOCK UPGRADES (ASBUs)

VERSION TWO

OF THE

WORKING DOCUMENT

ON THE

AVIATION SYSTEM BLOCK UPGRADES

THE FRAMEWORK

FOR GLOBAL HARMONIZATION

ISSUSED: 16 NOVEMBER 2011

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. 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://www.icao.int/anconf12/asbu. 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 those ATM plans including 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 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 other standards-making bodies including AIRINC, EUROCAE, RTCA and SAE International, 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.

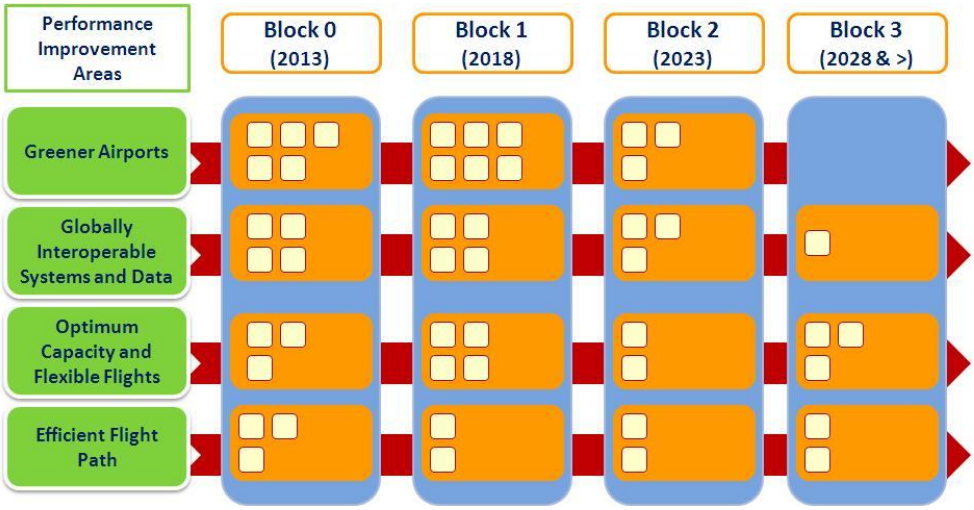

Figure 1. Summary of Blocks Mapped to Performance Improvement Areas

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.

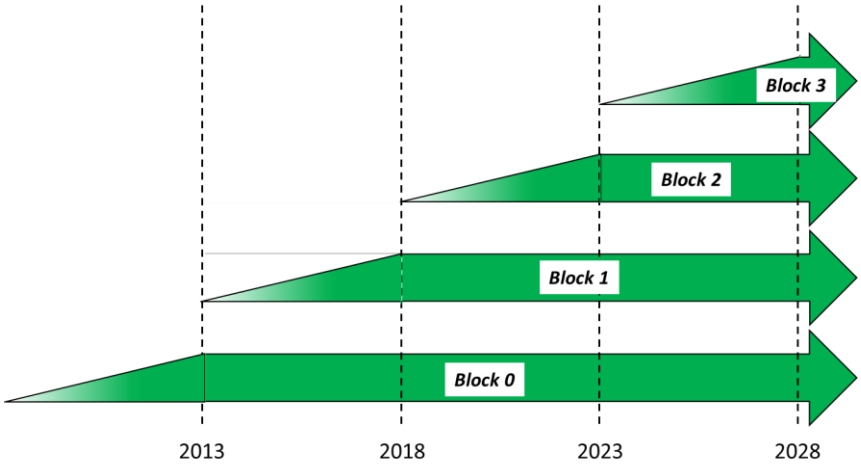

Figure 2. Timing Relationships Between Blocks

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.

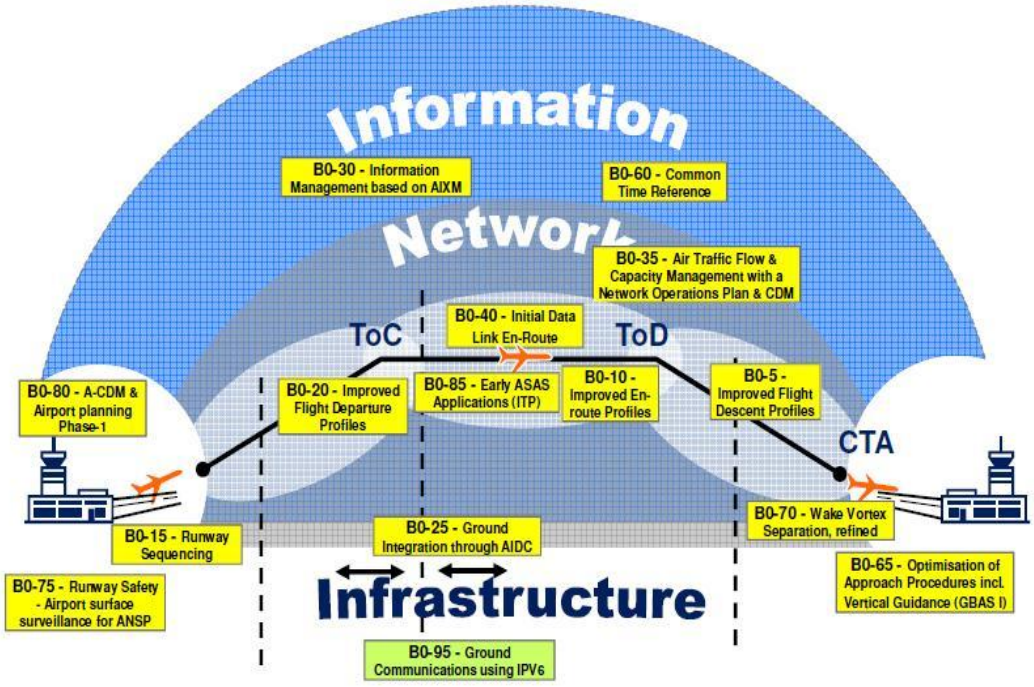

Figure 3. Block 0 in perspective

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.

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 of 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

Block 0	Block 1	Block 2	Block 3
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	
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 Synchronization 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).		**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
B0-20 **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

ATTACHMENT B to State letter ST 13/1-11/71

TWELFTH AIR NAVIGATION CONFERENCE (2012)
AGENDA AND EXPLANATORY NOTES

Introduction

As the air navigation system evolves, ICAO continues to address the challenge of the integration, interoperability and harmonization of systems leading to the concept of "One Sky" for international civil aviation. The One Sky concept emanates from the ICAO *Global Air Traffic Management Operational Concept* (Doc 9854) and supports its evolution. The concept revolves around conceiving the notion globally, developing the implementation plans regionally, and implementing required infrastructure and procedures both regionally and locally. Under One Sky, international traffic flows are addressed from end-to-end with the objective of increasing overall capacity and efficiency, and improving safety, while also reducing the impact on the environment. It is now necessary to agree to a new way of global planning, developing standards, and identifying and implementing operational improvements. Using an enhanced long-term planning regime based on the Aviation System Block Upgrades (ASBUs) initiative (Attachment A to State letter ST 13/1-11/71 refers) feeding into communications, navigation, surveillance, avionics and aeronautical information management roadmaps, the One Sky high-level global architecture should enable the digital environment, integrate aerodromes with a block-to-block strategy, facilitate trajectory-based air traffic management and support performance-based technologies.

Papers should provide proposed inputs to the respective ASBUs, modules and roadmaps along with supporting justification. Security and environment subjects will be addressed within the scope of the AN-Conf/12 as they have an important influence on the air navigation system. However, the larger issues related to security and the environment are addressed in other dedicated forums related to these fields of expertise such as the Committee for Aviation Environmental Protection (CAEP) and the Aviation Security Panel (AVSECP).

Agenda Item 1: Strategic issues that address the challenge of integration, interoperability and harmonization of systems in support of the concept of "One Sky" for international civil aviation

1.1: Global Air Navigation Plan (GANP) – Framework for Global Planning

a) ASBU methodology and contents
b) Communications roadmap
c) Navigation roadmap
d) Surveillance roadmap
e) Avionics roadmap
f) Aeronautical Information Management (AIM) roadmap

With a focus on harmonization and interoperability leading to a global air traffic management (ATM) system, this agenda item introduces the updated GANP and outlines roadmaps and ASBUs that reflect short-, medium- to long-term planning horizons in terms of systems, procedures and technologies expected to be available to States and users. In addition, the five roadmaps will form the basis for development of a frequency spectrum strategy to support implementation. In all cases, a performance-based approach is utilized, based on identified operational improvement outcomes that ensure the end-to-end interoperability of systems. High-level impediments to implementation such as cyber security should be identified and considered as part of the roadmap development process. Arrangements to ensure the periodic update of the ASBUs and roadmaps on a rolling fifteen-year planning horizon will be proposed.

The Conference will be invited to:

a) endorse the concept of ASBUs;
b) endorse communication, navigation, surveillance, avionics and AIM roadmaps;
c) agree on what more needs to be done in terms of the further development of the roadmaps and ASBUs, as well as the way in which this will done;
d) establish timelines and methodologies for the development of a frequency spectrum strategy to complement the roadmaps;
e) endorse the updated GANP, including roadmaps and ASBUs as appendices; and
f) identify and endorse a methodology to periodically update GANP to ensure there are systematic updates to the rolling fifteen-year planning horizon for ASBUs and roadmaps.

Agenda Item 2: Aerodrome Operations – Improving Airport Performance

2.1: Airport capacity
2.2: Performance-based navigation (PBN) – a practical way to improve airport performance with safety and efficiency

Increased runway infrastructure and advances in air navigation and aircraft systems are fundamental to increasing airport capacity, but are to little avail if overall airport surface operations are not also optimized to improve airport performance. Under this agenda item, the modules that support the key performance area of aerodrome operations will be presented. These are Optimized Airport Accessibility, Increased Runway Throughput through Dynamic Wake Turbulence Separation, Enhanced Safety and Efficiency of Surface Operations, Optimized Airport Operations through Airport Collaborative Decision-Making, Remote Operated Aerodrome Control Tower and Improved Airport Operations through Departure, Surface and Arrival Management. Consideration will also be given to complementary operational procedures that maximize the usage of PBN and which are essential to increasing capacity and enhancing safety through approaches with vertical guidance and stabilization of approaches to help mitigate runway excursions; and collaborative decision-making arrangements that support the sharing of information between operational partners at an airport in order to improve situational awareness and realize substantial efficiencies in the management of surface traffic. Finally, predictability and punctuality, including aspects related to the transit of security and border control points as these are significant contributors/limiters to efficient surface operation, will be reviewed. The routine, real time collaboration and coordination between airport stakeholders in these and many other respects is critical to optimizing the timely and effective use of airport surface infrastructure.

The Conference will be invited to

a) endorse the ASBU modules related to aerodrome operations; and
b) develop strategies and provide guidance on future work for ICAO, States and industry related to PBN, CDM at airports and security issues that have an impact on the ATM system.

Agenda Item 3: Interoperability and data – through globally interoperable system-wide information management (SWIM)

3.1: Performance improvement through the application of system-wide information management (SWIM)
3.2: Improved operational performance through flight and flow – information for a collaborative environment (FF-ICE)
3.3: Service improvement through digital AIM
3.4: Enhance operational decision-making through integrated meteorological information

Global SWIM requires system-level information management solutions rather than individual solutions to develop an integrated ATM network – a global aviation intranet. Under this agenda item, the modules that support the key performance area of Interoperability and Data through Globally Interoperable SWIM will be presented. These are Performance Improvement through the Application of SWIM**,** Service Improvement through Integration of all Digital ATM Information, and Increased Interoperability, Efficiency and Capacity through FF-ICE Application before Departure. The adoption of system-level solutions requires agreement on the various ground/ground and air/ground interfaces, types of data and exchange models to be utilized, quality/integrity requirements for data and consideration of commercial and national security aspects. Implementation methodologies need to be carefully considered to ensure functional, risk-managed deployment strategies across the global system. Developments in the digitization of AIM data and integration of digital MET data will be considered. Recognizing the pivotal role played by an aircraft's flight plan in the data chain, the Conference will be invited to consider proposals for the phased implementation of an advanced flight planning and information sharing concept known as flight and flow information for a collaborative environment (FF-ICE).

The Conference will be invited to:

a) endorse the ASBU modules related to interoperable systems and data; and
b) develop strategies and provide guidance on future work for ICAO, States and industry related to SWIM, FF-ICE, digital AIM and integrated meteorological information.

Agenda Item 4: Optimum Capacity and Efficiency – through global collaborative ATM

4.1: Efficient management of airspace and improved flow performance through collaborative decision-making (CDM)
4.2: Dynamic management of special use airspace

The wide collaboration of operational stakeholders supported by appropriate information and decision-support tools will enable decisions to be made that include consideration of the preferences expressed by respective airspace users while ensuring the most efficient use of, and greatest possible access to, all airspace resources on an equitable basis. Under this agenda item, the modules that support the key performance area of Optimum Capacity and Flexible Flights will be presented. These are Improved Operations through Free Routing, Enhanced Flow Performance through Network Operational Planning, Better Operational Decisions through Integrated Weather Information, Increased Capacity and Flexibility through Integrated Weather Information**,** Increased Capacity and Flexibility through Interval Management, and Initial Integration of Remotely-Piloted Aircraft Systems into Non-Segregated Airspace. The Conference will be presented with general developments in the area of collaborative decision-making (CDM), with specific attention to the progress in overall air traffic flow management within and across flight information regions (FIRs) and the advances in arrival and departure management functions enabled by automated systems. Enhancements to the management of special use airspaces in both the civil/civil and civil/military context remain a pressing need and the Conference will seek to identify improvements based on automated sharing of real time information including aircraft surveillance data between agencies. An information exchange in relation to unmanned aircraft systems/remotely-piloted aircraft system (UAS/RPAS) developments will take place under this agenda item.

The Conference will be invited to:

a) endorse the ASBU modules related to optimum capacity and efficiency; and
b) develop strategies and provide guidance on future work for ICAO, States and industry related to CDM for ATM, dynamic sharing of airspace and integration and accommodation of military traffic into civil airspace.

Agenda Item 5: Efficient Flight Paths – through trajectory-based operations

5.1: Improved traffic synchronization through 4D trajectory-based operation (TBO)
5.2: Increased flexibility and efficiency in descent and departure profiles

A move from the present ATM model (where the present location of the aircraft is known) to a trajectory-based management concept (where the future location of the aircraft is also known) is fundamental in increasing the efficiency of flight paths. By using shared dynamic trajectory information to facilitate wide area CDM between adjacent air navigation service providers (ANSP) in the same and neighboring FIRs, the ATM system will be able to analyze and accurately predict future situations based on three-dimensional and ultimately four-dimensional parameters. Under this agenda item, the modules that support the key performance area of Efficient Flight Paths – through Trajectory-based Operations will be presented. These are Improved Traffic Synchronization and Initial 4D Trajectory-based Operation and Improved Flexibility and Efficiency in Descent Profiles. Flights will be accommodated in a manner that achieves the optimum system outcome with minimal deviation from the user preferred 4D flight trajectory. Automation, both in the air and on the ground, will be used to create an efficient and safe flow of traffic while preserving the ability of the human operators to intervene when and as needed to preserve the overall safety of the system. The Conference will consider developments in regard to the synchronization of traffic flows at merging points in the en-route environment, and in terminal control areas (TMAs) to optimize the landing sequence, by application of time-based metering at intermediate points. Departure and arrival procedures that take into account airspace and traffic complexity while facilitating flight via optimum profiles by enabling continuous climb operations (CCOs), continuous descent operations (CDOs) and optimized profile descents (OPDs) will be addressed. Supporting ATM procedures and arrangements such as conflict management, airspace organization and management, demand and capacity balancing and environmental management will be an essential component of these discussions.

The Conference will be invited to:

a) endorse the ASBU modules related to efficient flight paths; and
b) develop strategies and provide guidance on future work for ICAO, States and industry related to Improved Traffic synchronization through 4D trajectory-based operation (TBO) and Increased flexibility and efficiency in descent and departure profiles.

Agenda Item 6: Future Direction

6.1: Implementation plans and methodologies
6.2: Standardization – approach to SARPs development in support of One Sky

At the strategic level, the operational concept provides a vision and the Global Plan provides a global framework for the implementation of air navigation systems. The regional planning and implementation process is the principal engine of ICAO's implementation work of air navigation systems. It is here that the top-down approach comprising global guidance and regional harmonization measures converge with the bottom-up approach constituted by national planning by States. Additionally, the successful rollout of new concepts and technologies will depend on well synchronized strategies for education and training. Human factors will also be addressed where there is or could be human interaction, as a user and/or as an information source. This is specifically the case with AIM, SWIM, avionics and flight procedure design, or any automated function where the fallback may be human operation. Civil aviation is served by a number of standards-making bodies at the global, regional, national and industry level, with the high-level standards produced by ICAO providing the basis for development of detailed State and industry technical standards. In an increasingly multidisciplinary environment, ensuring the efficient development and delivery of relevant global standards in a coordinated and timely manner remains a significant challenge.

The Conference will be invited to:

a) make recommendations to guide the way forward in implementing the updated GANP;
b) in the human factors context, determine where there may be need for global standardization or future emphasis; and
c) make recommendations on multi-party approaches to standards development that take advantage of coordination and collaboration within the ICAO/State relationship, and between ICAO and standards bodies, to support the implementation timeframes specified in the roadmaps.

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ATTACHMENT C to State letter ST 13/1-11/71

ORGANIZATION PLAN

BODY	*AGENDA ITEM*	**19 TO 30 NOVEMBER 2012**																					
		M		T		W		T		F		S		S	M		T		W		T		F	
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	6.2																					DR6		

O – Opening session
P – Plenary meeting
DR – Review of draft report
R – Review of final report

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ATTACHMENT D to State letter ST 13/1-11/71

AGENDA, CREDENTIALS AND OTHER ADMINISTRATIVE ARRANGEMENTS

Agenda

1. In response to our earlier State letter ST 13/1-11/10, dated 31 March 2011, requesting your comments on a tentative list of subjects proposed for the agenda of the Conference, we received overall general support with new additions. Some of the new subjects suggested by the States although important could not be included in the agenda due to the fact they were either beyond the scope of the Conference or the matter was being dealt with by other ICAO fora.

Credentials

2. Credentials are required for the meeting. Such credentials should be signed on behalf of the State or international organization concerned, by a person duly authorized to do so, giving the name and position of each member of the delegation and indicating the capacity in which he or she is to serve at the meeting (Member States: Delegate, Alternate, Adviser; non-Contracting States and international organizations: Observer). The credentials may be sent in advance to the Secretary General or be deposited, when registering on-site, with the Secretary of the meeting through the designated Credentials Coordinator.

Organization

3. The meeting will be conducted in accordance with the *Directives to Divisional-type Air Navigation Meetings and Rules of Procedure for their Conduct* (Doc 8143-AN/873/3, Part I, paragraph 6). The Conference will meet in Plenary the morning of the first day and again the last day to approve the Report of the Conference. All agenda items will be dealt with in one committee to allow for the multidisciplinary nature of most of the subject matter.

4. In view of limited space availability in the main ICAO conference room some delegates may have to be accommodated in an adjacent conference room. This adjacent room will have live video broadcast of the Conference deliberations. Also, facilities will be provided such that the delegates in the adjacent room could contact electronically their chief delegate in the main conference room for any coordination.

Visa

5. In compliance with Annex 9 — *Facilitation*, paragraph 3.19, Canada has dispensed with the requirement for entry visas for temporary visitors from many States. However, some nationals continue to require visas for entry into Canada. It is suggested that any participant who requires a visa take steps to obtain it in good time from the nearest Canadian authorities. Furthermore, in order to facilitate entry formalities upon arrival in Canada, it is suggested that participants carry with them a copy of the document notifying them that they are representatives of their State/Organization at the meeting and that they so identify themselves to the Canadian immigration authorities.

Registration and other arrangements

6. Online registration for this event and additional information related to hotels and other logistic arrangements are available on the AN-Conf/12 website at www.icao.int/anconf12. General information regarding accommodations and other facilities in Montréal will also be posted on the ICAO website.

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ATTACHMENT E to State letter ST 13/1-11/71

TWELFTH AIR NAVIGATION CONFERENCE (2012)
DOCUMENTATION ARRANGEMENTS FOR DIVISIONAL-TYPE MEETINGS

General

1. The Secretariat will prepare a basic working paper on each agenda item, defining the problem and providing a brief historical background. As appropriate, the working paper will include lines of development, tentative conclusions and specific suggestions for action. The Secretariat working papers will be circulated as early as practicable before the meeting. You can expect to see the first papers published on the ICAO AN-Conf/12 website from 30 June 2012.

2. To the extent practicable, use will be made of preparatory machinery such as correspondence with States and international organizations, panels and study groups to develop specific action proposals on individual agenda items. Working papers are papers submitted for consideration under specific agenda items. States and international organizations should prepare their working papers as either "action papers" or "information papers". The former will comprise working papers containing specific proposals for action. All other working papers will be deemed to be "information papers".

Submission of working papers

3. States and international organizations should submit their working papers electronically in Microsoft Word format to ANConf12@icao.int as far in advance of the meeting as practicable and not later than six weeks prior to the opening of the meeting (i.e. **30 September 2012**) in order to permit translation, reproduction and distribution in due time prior to the meeting. Papers received after 30 September 2012, but not later than 30 October 2012, will be processed as promptly as possible in the language or languages in which they are submitted. Papers received after that date will not be processed.

4. To facilitate the timely reproduction of documentation and its use by the meeting, you are requested to observe the rules governing the format, content and length of working papers as outlined herein. It is important to note that the deadline for submission of documentation will be strictly enforced and no additional documentation will be accepted for distribution at the site of the meeting.

5. Only working papers submitted by States will be translated; documentation received from international organizations will be distributed only in the language or languages submitted. Papers received not later than two weeks before the opening of the meeting will be printed and distributed.

6. Working Papers should be limited to four pages of text including attachments. As a matter of policy, working papers of more than four pages and information papers are no longer translated by the Organization. Unless exceptional circumstances prevail, longer papers will have to be presented as information papers in their original language(s) only. If the subject of such longer papers is considered essential to the meeting's work, a summary of not more than four pages should be produced for translation.

Availability of working papers

7. The documentation for the meeting will be placed on the ICAO website at www.icao.int/anconf12, on an ongoing basis. A template for the working and information papers will also be placed on the website for use when preparing the documentation. As time available for the discussions of the working papers is very limited due to the expected number of working

papers, all participants are requested to continually check the website for documentation updates and to familiarize themselves with the papers before coming to the Conference. A presentation time of two minutes per working paper will be strictly adhered to; please prepare your introductions appropriately so that you make the most significant points within that time period.

8. Working papers will be processed in accordance with the following priorities:

First priority — "Action papers"

Second priority — "Information papers", with the understanding that, if necessary, abstracts, when provided, will be reproduced first.

"Action" papers

9. "Action" papers should be presented in the following form:

a) Each paper should be limited to one agenda item.

b) Each paper should be brief and not exceed four pages of print including the text of amendment proposals where applicable.

c) Immediately after the agenda item heading and the title identifying the subject matter of the paper, there should be a statement framed in a box, specifying the nature of the proposal, and the recommended action along the lines of the following example:

SUMMARY

This paper presents the draft global air traffic management operational concept for review and assessment. The operational concept was developed by the Air Traffic Management Operational Concept Panel (ATMCP), working under the direction of the Air Navigation Commission. Action by the meeting is at paragraph 6.

Action: The Conference is invited to ….

d) The first part of each paper should explain concisely the purpose of the proposal, its rationale and include essential references to the history of the subject.

"Information" papers

10. States and international organizations desiring to present material not written specifically for an agenda item (such as lengthy technical studies) should provide sufficient quantities thereof for distribution at the meeting. Such material will not be reproduced as working papers.

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ATTACHMENT F to State letter ST 13/1-11/71

GLOBAL EDUCATION SCHEDULE FOR AVIATION SYSTEM BLOCK UPGRADES (ASBUs) OF THE TWELFTH AIR NAVIGATION CONFERENCE (2012)

Significant efforts are underway to familiarize stakeholders with the concept of aviation system block upgrades (ASBUs) including workshops as follows:

ASBU Workshops:

NACC Region in Mexico City – 27 February to 2 March 2012
SAM Region in Lima – 16 to 20 April 2012
APAC Region in Bangkok – 21 to 25 May 2012
EUR Region (Eastern part) in Paris – 25 to 29 June 2012
WACAF Region in Dakar – 16 to 20 July 2012
ESAF Region in Nairobi – 13 to 17 August 2012
MID Region in Cairo – 30 September to 4 October 2012

ICAO also intends to hold a two-day seminar in Montréal on 16 and 17 November 2012 on the ASBUs for any attendees who were not able to make the regional presentations. The agenda for this seminar will be presented in the next E-Bulletin on the Conference in 2012.

— END —