International Civil Aviation Organization

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WORKING PAPER

TWELFTH AIR NAVIGATION CONFERENCE

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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

CHANGE IN THE ICAO ASBU MODULE CLASSIFICATION

(Presented by the Russian Federation)

EXECUTIVE SUMMARY

This paper presents a change in the module classification proposed in the aviation system block upgrades (ASBU). Rather than grouping modules by performance improvement areas, the modules would be grouped in accordance with the components of the ICAO *Global Air Traffic Management Operational Concept* (Doc 9854).

Action: The Conference is invited to agree to the recommendation in paragraph 3.4.

1. INTRODUCTION

1.1 The aviation system block upgrades (ASBU) introduce the module classification proposed by ICAO, in which the modules are grouped by performance improvement areas. Below is a summary of the results of an analytical assessment of the structural features of this classification.

2. BACKGROUND

2.1 The Global Air Traffic Management (ATM) Operational Concept defines seven interdependent components of the concept that will be integrated to form the future air navigation system. They comprise airspace organization and management (AOM), aerodrome operations (AO), demand and capacity balancing (DCB), traffic synchronization (TS), conflict management (CM), airspace user operations (AUO), and ATM service delivery management (ATM SDM). The management, utilization and transmission of data and information (IM) are vital to the proper functioning of these components.

2.2 The Global ATM Operational Concept describes the components and, in general terms, their interdependencies, in a global sense. It establishes that the "end state" will be achieved through an evolutionary process, with an ultimate goal of global harmonization not later than the concept horizon of 2025.

2.2.1 The ASBU proposes a classification of modules, grouping them by four performance improvement areas (PIA):

a) PIA 1: Airport Operations;

b) PIA 2: Globally Interoperable Systems and Data – Through Globally Interoperable System-wide Information Management;

c) PIA 3: Optimum Capacity and Flexible Flights – Through Global Collaborative ATM; and

d) PIA 4: Efficient Flight Path – Through Trajectory-based Operations.

2.3 The introduction, supplementary to the components of the Global ATM Operational Concept, of an additional classification of modules according to performance improvement areas does not improve the understanding of the connection between the performance improvements proposed in the modules and the components of the Global Operational Concept. Furthermore, splitting the modules up into ASBU performance improvement areas is not sufficiently clear and unambiguous, and therefore it does not exclude the possibility of difficulties arising in implementation.

2.3.1 For example, Module B0-05, Improved flexibility and efficiency in descent profiles (CDOs) and B1-05, Improved flexibility and efficiency in descent profiles (CDOs) would be placed more appropriately in PIA 1, Airport operations, than in PIA 4, Efficient flight path – through trajectory-based operations. Likewise, Modules B0-101, ACAS improvements and B1-101, New collision avoidance system would be placed more appropriately in PIA 4, Efficient flight path – through trajectory-based operations, than in PIA 3, Optimum capacity and flexible flights – through global collaborative ATM.

2.3.2 Moreover, the modules that include several equivalent elements of performance improvements relating to various components of the Global Operational Concept (for example, Module B3-05, Full 4D trajectory-based operations) seem to be better suited to being split up according to the respective elements.

3. CONCLUSION

3.1 Ambiguities have been identified in the structure of the ASBU module classification based on performance improvement areas.

3.2 To eliminate the ambiguities in the ASBU module classification structure indicated in paragraph 3.1, it is proposed to forgo the ASBU module grouping based on the performance improvement areas proposed by ICAO, and to group the modules based on the components of the Global ATM Operational Concept. A proposal for classifying modules based on the components of the Global ATM Operational Concept is contained in the appendix to this working paper. Italics in the table highlight the changes made in the connections between the modules and the Global ATM Operational Concept components as compared to the connections proposed in ASBU.

3.3 The use of the proposed classification will make it possible to avoid potential difficulties in its implementation and prevent the need to introduce new concepts and terms. It will contribute to achieving greater harmonization between ASBU and the Global ATM Operational Concept.

3.4 The Conference is invited to agree to the following recommendation:

Recommendation 1/x – Change in the ICAO aviation system block upgrade module classification

That the Conference:

a) take into consideration that the aviation system block upgrade classification of modules according to performance improvement areas contains features that will likely cause difficulties to arise in its application; and

b) propose that ICAO review the advisability of the further use of the four performance improvement areas in the ICAO aviation system block upgrades and consider the possibility of classifying modules in accordance with the Global ATM Operational Concept components.

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APPENDIX

CLASSIFICATION OF ASBU MODULES, GROUPED IN ACCORDANCE WITH THE GLOBAL OPERATIONAL CONCEPT COMPONENTS

Number	Module Name	OCD component	Associated OCD components	PIA ASBU
B0-75	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	AO	CM	1
B1-75	Enhanced Safety and Efficiency of Surface Operations (A-SMGCS/SURF-IA) and EVS	AO	CM	1
B2-75	Optimized Surface Routing and Safety Benefits (A-SMGCS Level 3-4 and SVS)	AO	CM, DCB, TS	1
B0-80	Improved Airport Operations through Airport-CDM	AO	IM	1
B1-80	Optimized Airport Operations through A-CDM Total Airport Management	AO	IM	1
B1-81	Remotely Operated Aerodrome Control	AO	IM, CM	1
B0-10	Improved Operations through Enhanced En-Route Trajectories	AOM	AUO, DCB	3
B1-10	Improved Operations through Free Routing	AOM		3
B3-10	Traffic Complexity Management	AOM	TS, DCB	3
B1-90	Initial Integration of Remotely-Piloted Aircraft (RPA) Systems into non-segregated airspace	AOM	AUO, CM	4
B2-90	Remotely Piloted Aircraft (RPA) Integration in Traffic	AOM	AUO, CM	4
B3-90	Remotely Piloted Aircraft (RPA) Transparent Management	AOM	AUO, CM	4
B0-65	Optimization of approach procedures including vertical guidance	AUO	AOM	1
B1-65	Optimised Airport Accessibility	AUO	AO	1
B0-05	Improved Flexibility and Efficiency in Descent Profiles (CDOs)	AUO	AOM, AO, TS	4
B1-05	Improved Flexibility and Efficiency in Descent Profiles (OPDs)	AUO	AOM, AO, DCB, CM, TS	4
B2-05	Optimized Arrivals in Dense Airspace	AUO	AOM, TS	4
B3-05	Full 4D Trajectory-based Operations	AUO	AOM, DCB, CM, TS	4
B0-20	Improved Flexibility and Efficiency in Departure Profiles	AUO	AOM, TS	4
B0-70	Increased Runway Throughput through Wake Turbulence Separation	CM		1
B1-70	Increased Runway Throughput through Dynamic Wake Turbulence Separation	CM		1
B2-70	Advanced Wake Turbulence Separation (Time-based)	CM		1
B0-84	Initial capability for ground surveillance	CM		3

Number	Module Name	OCD component	Associated OCD components	PIA ASBU
B0-85	Air Traffic Situational Awareness (ATSA)	CM	TS	3
B1-85	Increased Capacity and Efficiency through Interval Management	CM	TS, DCB	3
B2-85	Airborne Separation (ASEP)	CM		3
B3-85	Airborne Self-Separation (SSEP)	CM		3
B0-86	Improved Access to Optimum Flight Levels through Climb/Descent Procedures using ADS-B	CM	AUO, AOM	3
B0-101	ACAS Improvements	CM		3
B2-101	New Collision Avoidance System	CM		3
B0-102	Increased Effectiveness of Ground-Based Safety Nets	CM		3
B1-102	Ground-based Safety Nets on Approach	CM		3
B0-35	Improved Flow Performance through Planning based on a Network-Wide view	DCB	TS, AOM	3
B1-35	Enhanced Flow Performance through Network Operational Planning	DCB	TS, AOM	3
B2-35	Increased user involvement in the dynamic utilization of the network	DCB	TS, AOM, AUO	3
B0-25	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration	IM	CM	2
B1-25	Increased Interoperability, Efficiency and Capacity though FF-ICE/1 application before Departure	IM	DCB, CM	2
B2-25	Improved Coordination through multi-centre Ground-Ground Integration: (FF-ICE/1 and Flight Object, SWIM)	IM	AUO, AO, DCB, CM	2
B3-25	Improved Operational Performance through the introduction of Full FF-ICE	IM		2
B0-30	Service Improvement through Digital Aeronautical Information Management	IM		2
B1-30	Service Improvement through Integration of all Digital ATM Information	IM		2
B1-31	Performance Improvement through the application of System Wide Information Management (SWIM)	IM		2
B2-31	Enabling Airborne Participation in collaborative ATM through SWIM	IM		2
B0-105	Meteorological information supporting enhanced operational efficiency and safety	IM	AOM, DCB, AO	2
B1-105	Enhanced Operational Decisions through Integrated Meteorological Information (Planning and Near-term Service)	IM	AOM, DCB, AO	2
B3-105	Enhanced Operational Decisions through Integrated Meteorological Information (Near-term and Immediate Service)	IM	AOM, DCB, AO, TS, CM	2
B0-40	Improved Safety and Efficiency through the initial application of Data Link En-Route	IM	CM, TS	4

Number	Module Name	OCD component	Associated OCD components	PIA ASBU
B1-40	Improved Traffic Synchronization and Initial Trajectory-Based Operation	IM	CM, TS	4
B0-15	Improve Traffic Flow Through Runway Sequencing (AMAN/DMAN)	TS	AO	1
B1-15	Improved Airport operations through Departure, Surface and Arrival Management	TS	AO	1
B2-15	Linked AMAN/DMAN	TS		1
B3-15	Integration AMAN/DMAN/SMAN	TS		1

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