



WORKING PAPER

TWELFTH AIR NAVIGATION CONFERENCE

Montréal, 19 to 30 November 2012

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

CANSO COMMENTS ON THE ASBU METHODOLOGY AND CONTENTS

(Presented by the Civil Air Navigation Services Organisation)

SUMMARY

As the global voice of ATM and a key stakeholder in achieving global harmonization and interoperability under the “One Sky” concept, CANSO has been actively engaged in the aviation system block upgrade (ASBU) initiative. CANSO’s work in ASBU development has focused on two main activities:

- a) providing technical expertise from the ANSP perspective in the development of the ASBU framework and associated roadmaps; and
- b) socializing the ASBU concept among Member ANSPs as well as Associate Members. This has allowed a much wider global understanding and recognition of the benefits of global planning and investment programs and for the timing of investment decisions.

Action: The Conference is invited to consider the recommendations in paragraph 3 on areas requiring additional attention.

1. INTRODUCTION

1.1 The revised *Global Air Navigation Plan* (GANP, Doc 9750) as presented in AN-Conf/12-WP/3 introduces the concept and framework of the aviation system block upgrades (ASBUs), roadmaps for communications, navigation and surveillance (CNS), information management (IM) and avionics requirements of a global air navigation system.

1.2 CANSO will continue to promote a common understanding of the ASBUs for our air navigation service providers (ANSPs) transition planning for their modernization programs. The existing infrastructure will require investments, resources and upgrades by ANSPs. ANSPs must remain synchronized with airborne and adjoining FIR capabilities. Availability of ICAO provisions, demonstrations and validations will assist and support global interoperability.

¹Arabic, Chinese, English, French, Spanish and Russian versions provided by CANSO.

1.3 The ASBU framework provides an evolutionary sequence of improved capabilities that are well-defined, scalable and cost effective. Our ANSPs may commit to the ASBU framework with requisite investment and implementation milestones as part of a globalized system that meets the demands for safety, capacity, efficiency, predictability and environmental stewardship for end-to-end flight. The future ATM system must accommodate a broad community of users and progressive levels of avionics equipage.

2. ASBU MODULE IMPLEMENTATION

2.1 Modules cannot be of the same priority nor have the same criteria for implementation consideration. ICAO through its member States and the PIRGs must determine the criteria and implement a process to inform what is globally representative for harmonization. This information must inform States of ICAO's minimum expectations, what and when it is required, and the best practices and lessons learned on implementation from regional and sub-regional processes.

2.2 The selection of module capabilities that are offered within ASBU Blocks 0 and 1 that ANSPs choose to implement may be the cornerstone for future full operational capability (FOC). ANSPs must consider a number of factors in order to implement individual modules and their capabilities. The geographic location of the ANSP as part of a State regional plan is perhaps the most important consideration for the selection (or elimination) of modules. It is critical that ANSPs plan globally and implement regionally rather than implement as stand-alone ANSPs. Thus, the question that needs to be addressed is how do ANSPs proceed with module capability selection, implementation and transition in order to deliver efficiency, capacity and environmental benefits for these investments so that they are synchronized with aircraft and adjoining FIR investment?

2.3 As the date of transition from Block 0 to Block 1 draws near, States and their ANSPs must decide on which of the Block 0 modules to implement. They must decide whether to implement Block 0 modules on their own or seek regional agreement. In order to build a global seamless air navigation system (GSANS) there must be regional and interregional agreements established as to which of the Block 0 modules to implement. It is imperative that ICAO defines a process for States and their ANSPs to follow in making this determination, either on their own or as a part of a regional or inter-regional group (see sample in Appendix A.)

2.4 As a precursor to any regional agreement, a needs and dependency analysis (NDA) will be required across the Blocks as they pertain to that region. If an ANSP were to choose to 'bypass' a single module based on an individual cost-benefit analysis and its associated capability in Block 0, an NDA will show the impact dependencies of subsequent module capability selection across Blocks 1, 2 and 3 in the same thread and across Blocks of modules in different threads. There are also dependencies within each module capabilities regardless of Block or thread. ICAO will need to conduct this analysis across Blocks and in different threads. ICAO must outline the NDA outcomes of each Module (e.g. B1-40) to identify technology dependence (e.g. Aeromacs – ATN IPS) are that they are linked to associated Services (e.g. CPDLC/ADS-C baseline 2 covering Airport, TMA and En route flight phases).

2.5 Capabilities and services must also be reflected in the domain roadmaps (e.g. air-ground data communication) synchronizing the date of technology availability, associated ICAO provisions and a 'critical mass' of air/ground capability. An effective NDA will enhance important investment decisions in order to harmonize and synchronise timely implementation and delivery of benefits. Technology deployment cycles have been traditionally long (20-25 years) in order to realise their full return on investment (ROI) and therefore need to be modular and scalable.

2.6 The process for achieving regional agreements needs ICAO guidance and assistance. How do the regions come to an agreement in view of the number of ANSPs and differing requirements of each? Should there be a hierarchy of ANSPs within the same region? For example, should ANSPs with the greater amount of traffic per flight hours have greater influence within the region for regional decisions due to regional flows? Do these ANSPs that drive regional decisions have a greater incentive to improve service delivery and hence bear the

burden for financing the ground systems and incentivizing operators to pioneer the conversion to an earlier module capability level? ICAO should address how to deal with these differing requirements within regions and implementation cycles.

2.7 Regional agreements should provide ‘seamlessness’ across FIR boundaries in order to support core traffic flows as an end-end optimized business trajectory. This requires a high level of cross-boundary and cross-region collaboration. A single flight from Dubai, UAE to Sao Paulo, Brazil can potentially fly across 6 ICAO regions (Middle East, Europe, East Africa, West Africa, NACC and SAM). The GSANS is highly dependent on transparency of air navigation capabilities across regions and it is this issue of cross-region collaboration that will determine module capability requirements across regions in supporting end-end flight. This collaboration between regions will be most important to the GSANS concept and this is where ICAO must foster the promulgation of baseline cross-regional dependencies in order to ensure consistency and progression as the Blocks and their capabilities are introduced globally (as was the case with RVSM and WGS-84).

2.8 The PIRGs must determine decision points relating to the ASBUs implementation, and ensure they are part of the timelines for implementation published in the GANP and the Regional Air Navigation Plans. The decision points may relate to early implementation to benefit core traffic flows (ref. para 2.5) or completion of Operational Trials in order to establish technology readiness, Standards readiness, mandates, information required to assist regions and sub-regions in preparing for and funding implementation, and metrics to evaluate the business case and performance improvements.

2.9 ICAO’s seven regional offices must actively assist States in identifying the facilities and services required to support international civil aviation for ASBU implementation. This will enhance the value of the harmonization that can be realized within the ASBU framework through the extensive implementation by States. Air navigation deficiencies identified through filed differences or USOAP audits that have a negative impact on safety, efficiency and predictability levels must be actively mitigated. With regard to enhancing the global ATM system, CANSO and its industry partners are well-positioned to identify root causes of difficulties experienced by regions and States and should have a lead role in the development of solutions and alternatives to common and specific problem. ANSP participation within the PIRG process is strongly encouraged.

2.10 The current ICAO regional air navigation plans (RANPs) must evolve under the ASBU framework. This partnership approach may provide for the identification of potential problems, the analysis of root causes, and the tailoring of solutions and implementation methods at regional, sub-regional or State levels. Increased transparency, cooperation, and assistance are the basic principles of the strategy, aimed at enabling States to fulfil their obligations. PIRGs must consciously collaborate with sub-regional groups on planning and implementation. The interregional mechanism should be utilized to ensure that all interface issues are attended to with a view to moving closer to a seamless global ATM system. On-going work to increase the efficiency and effectiveness of the PIRGs should ensure that these overall initiatives are pursued in a cost-effective manner within an environment of reduced resources.

2.11 ICAO should complete development of a cost benefit analysis (CBA) and performance metrics that support the development of business cases for implementation, avoiding duplication of effort where possible by adopting appropriate guidance material already existing or under development. Regions must take advantage of this information and capture the wider economic costs/benefits within a regional perspective that sub-regions or States within that region can agree to and use within their legal and regulatory framework. Successful ADS-B implementations have demonstrated that airborne investments when spread across large route network operations deliver a positive business case. Similarly, establishing a network of ground-based ADS-B and VHF ground stations predicated on effective service volumes rather than FIR boundaries and data sharing agreements where required has proven to be a successful economic model. It must also be rigorous and comprehensive, allow meaningful comparisons and be scalable according to needs. Investment decisions by airspace users, ANSPs and airports to implement individual ASBU elements must be driven by a business case, which demonstrates to what extent the investment will enhance performance improvements as required in the airspace.

2.12 The PIRGs must lead the effort to determine what the minimum requirements are for harmonization and integration within their particular region that ensures safe, predictable, efficient, and environmentally responsible services to system users. These requirements will allow ICAO to have a process to deliberate GANP updates.

2.13 The implementation of the ASBU program will have several components that reference the use of performance metrics. This includes the aforementioned activity of supporting the business case and the use of the air navigation report form (ANRF) for reporting and monitoring progress. Both of these activities will require well informed performance measures. ICAO guidance on performance measures can be found in the ICAO *Manual on Global Performance of the Air Navigation System* (Doc 9883).

2.14 It is recognized that actual implementation will be challenging as the data capabilities will vary by region. It is also often difficult to separate out improvements due to ATM given that there are many significant external factors that can influence before and after trends. However, there are demonstrated examples of how ANSP's can use existing databases to provide informed trends on ATM performance. CANSO can further this effort through its existing work program.

2.15 Based on a review of current ICAO documents, CANSO supports the update of Doc 9883 and the continued refinement of the ANRF with the goal of promoting a globally harmonized ATM. The success of ICAO's ability to monitor and provide recommendations will draw largely from guidance material, and ICAO may find it useful to draw upon the practical experience of performance monitoring in use by ANSPs today.

3. CONCLUSION

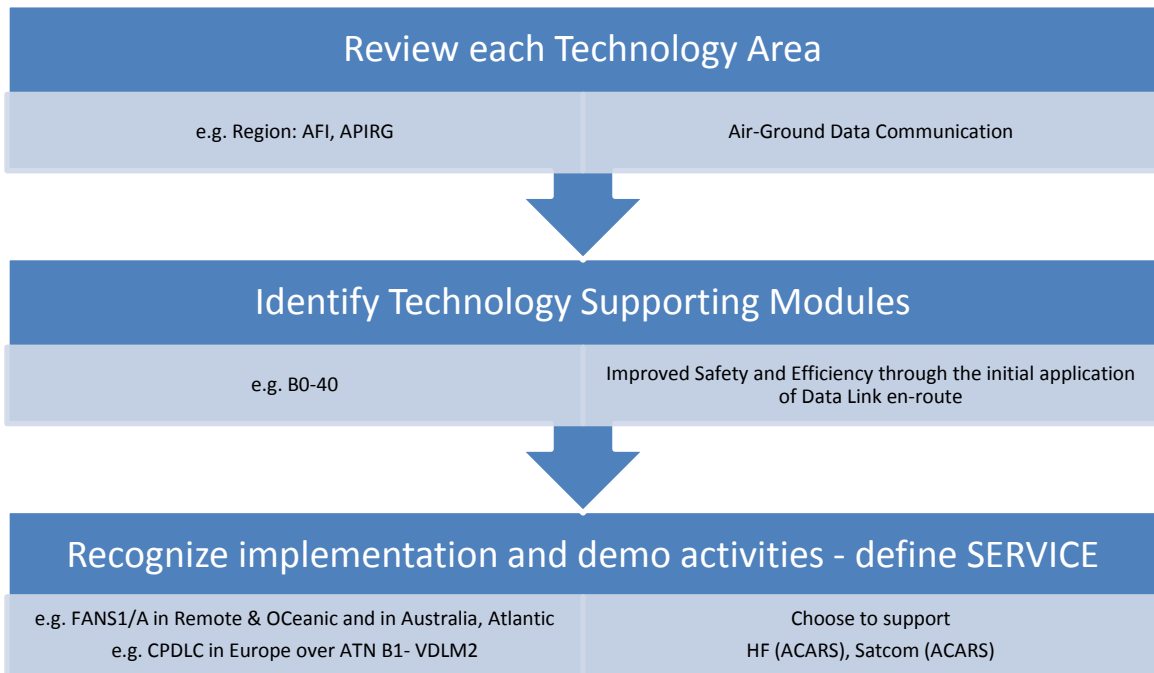
3.1 CANSO's approach to the ASBU methodology fosters active participation of industry and focuses additional attention on the areas as identified in the following recommendation:

Recommendation 1/x - CANSO comments on the ASBU methodology and contents

That the Conference:

- a) urge ICAO to define the methodology for a global seamless air navigation system and conducts a needs and dependency analysis on a regional and interregional basis;
- b) endorse the need to develop a needs and dependency analysis to assist air navigation service providers and planning and implementation regional groups in the selection of Block modules;
- c) request ICAO to provide the necessary guidance to the planning and implementation regional groups and States in the regions on regional and interregional agreements on aviation system block upgrade modules implementation, and where air navigation service provider participation is strongly encouraged; and
- d) urge ICAO to complete the development of guidance material on cost benefit analysis and define a set of performance metrics to measure performance, adopting such appropriate guidance material that may be already available or under development.

APPENDIX



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