



WORKING PAPER

TWELFTH AIR NAVIGATION CONFERENCE

Montréal, 19 to 30 November 2012

Agenda Item 6: Future direction

6.1: Implementation plans and methodologies

**IMPLEMENTATION OF A GLOBALLY HARMONIZED AIR NAVIGATION SYSTEM –
COORDINATION AND INTERACTION AMONG ICAO, REGIONS, STATES AND INDUSTRY**

(Presented by Japan)

SUMMARY

The 4th amendment of the *Global Air Navigation Capacity and Efficiency Plan* (Doc 9750) has been formulated to assist States and industry to pursue globally harmonized and interoperable air navigation system (ANS) through a phased approach. The overall process will be governed by a cyclic management conceptual scheme, dubbed “System of Systems” (refer to Chapter 1 of the new GANP). Such new scheme needs to be managed and run effectively not only from the viewpoint of scheme designer, but also from that of States and industry involved in it. On practical term, clarification of the details of the scheme and improvement to the current ICAO practices are expected in operating the new management scheme.

This working paper addresses challenges in deploying ASBUs in a harmonized and interoperable manner, and proposes actions to facilitate such deployment and effective drive of the new management scheme.

Action: The Conference is invited to consider this working paper and agree to the proposals in paragraph 3.

1. INTRODUCTION

1.1 The 4th amendment of Global Air Navigation Plan (GANP) has been formulated to assist States and industry in realizing harmonized and interoperable ANS by introducing a step-wise approach, aviation system block upgrades (ASBUs) and technology roadmaps. Deployment of the ASBUs will be managed by an ICAO-devised cyclic management process, dubbed, “System of Systems”, which incorporates a looped chain of annual tactics and triennial policy amendment process (ref. Chapter 1, GANP).

1.2 In contrast with the pre-AN-Conf/12, during which there appeared to be institutional matters such as inadequacy of transparency, cyclic feedback mechanism, and interregional coherency in ANS implementation, the new scheme to be employed by the whole aviation community is expected to facilitate globally harmonized ANS implementation by overcoming the said matters.

1.3 A State, mostly as a regulator or provider of air navigation services (ANSP), also as a virtual end-player in the “Systems of system”, needs to consider the optimum use of the new scheme, affirming States’ roles and conduct in the process, and additional tactics besides setting unified technical standards to realize a harmonized system. With cognizance of the GANP being a joint high-level policy product by State and industry

through their close collaboration, aviation industry also needs to have clear stance, role and responsibility in the entire cyclic review scheme of the GANP.

1.4 This working paper, based on Japan's recent experiences in CARATS (Japan's ATM modernization programme) and regional discussion, addresses challenges in pursuing a globally harmonized and interoperable ANS, and proposes actions for ICAO, States, and industry to facilitate such deployment from a practical perspective.

2. DISCUSSION

Assistance to States and industry in addressing transition and co-existence issues

2.1 The future ANS modules envisioned in ASBUs will bear drastically different features from that of the so-called "legacy systems", which are still dominant in a large part of the world. In light of the complex and highly-integrated natures peculiar to satellite systems, network systems and digital systems, as any ATM modernization programme progresses, stakeholders concerned will confront the unprecedentedly complicated questions such as "conventional to modern" transition and co-existence of multi-generations. This is true, for instance, to the case in which aircraft with state-of-the-art avionics fly into airspace where the legacy systems are dominantly established to satisfy operational requirements there, or to the case in which aircraft operators and air navigation service providers do not have synchronized investment between airborne and terrestrial side.

2.2 Some States have successfully been replacing or installing systems such as ADS-B out, VDL/M2 to pursue ATM improvement in their service area by employing regulatory or financial measures, but this is not always the case with other States, especially those whose aviation environment cannot be applied with the same business model as in the success States, or those whose ATM modernization has not proceeded systematically as the forerunners. Technical, operational or institutional solutions to transition and co-existence issues should be of great help to many States. They also have to undertake cost-benefit analysis and measures for assuring avionics equipage.

2.3 These challenges, in general, may tend to be tabled at regional fora as regional matters, but considering the need for interregion and global harmonization, the interregional or global nature of future systems and ATM enhancement, and the emerging ATM paradigm shift within a decade or so, it is suggested from an implementation perspective that, an instrument be developed which allows States, and industry as appropriate, to share the good practices of forerunners and practical materials useful to resolving implementation challenges as appropriate. The ASBUs outline implementation cases of States, system capability, sets of required provisions in individual module, but sharing such practical information on an e-platform can assist States in finding out clues to transition and co-existence issues. Defining first which working body should appropriately address the global issues, the body can contribute to the development of more implementation-focused guidelines.

2.4 In light of the growing need for more practical materials at the planning and implementation stage, it is requested that an extensive study be carried out to create a scheme for sharing implementation-assisting materials focused on transition and co-existence issues, and an effective mechanism of developing such materials.

Industry-State collaboration at regional level

2.5 The GANP including its appendices is the fruit of close collaboration of States and industry, which have been the very proof of a follow-up on the relevant Assembly Resolution. SARPs and other ICAO technical provisions are also the products of the joint work of States and industry. The GANP describes industry's participation in some parts of the entire "system of systems" scheme (ref. Chapter 1, GANP). This implies that the

success of globally harmonized ASBUs deployment depends on mutual understanding and continued collaboration between them, throughout a life cycle of the entire ANS.

2.6 The collaboration principle above should be the case with regional affairs. However, the GANP does not appear to adequately address the role and responsibility of industry in each stage in the entire cyclic process. Another view from Japan's experience in PIRG meetings is that had there been industry's views and experience through standardizations activities at ICAO panels or RTCA/EUROCAE Special Committees, it would have helped to make the regional discussion more accurate, coherent and timely by collating standardization work and on-field implementation work. In some cases implementation issues are dealt with at the region or at panels separately without direct and systematic communication in-between. In another case, status of standardization work at panels is not necessarily effectively provided with PIRG member States, otherwise a partial snapshot of standardization work on a limited system is provided.

2.7 In light of the priceless value of industry's contribution in regional implementation and efficacy of PIRGs activity under the new GANP framework as well as in standards development, it is requested that ICAO consider a scheme to appropriately address these issues and clearly define the thought in GANP or other ICAO document as appropriate.

Need for a catalyst or a driver of interregion harmonization

2.8 States have been working on harmonized implementation of ANS on regional basis through PIRGs and other bi/multilateral air navigation meetings. Iterative work by the regional fora results in today's Regional Air Navigation Plan, SUPPs and other regionally adopted documents, which support the present air navigation systems in each region.

2.9 As the ASBUs represent, future ATM performance improvement relies on technology advancement, symbolized by the complex and highly-integrated aeronautical systems such as satellite-based CNS systems, information-centric digital network systems, interdependent CNS systems, and enhanced ATM automation. These imply that satellite service coverage beyond an FIR or a region, ground networking beyond an FIR boundary, and integration of various CNS components of different service providers require more adequate, effective and systematic regional coordination. The wider these systems extend or advance, the more critical such interregional coordination becomes to achieve interoperability between systems and seamless ATM operation between FIRs.

2.10 Currently, most of the regional issues are dealt with by respective PIRGs meetings, but there are some issues, especially the ones relating to the above-mentioned systems, which seem more appropriate to be discussed at interregion or global fora with great efficiency and timeliness, without duplication of work. Review of ANRF and the subsequent analyses based on the Form should function in identifying regional gaps, drawing the attention of ATM stakeholders concerned to the issues, and proposing remedial action in a transparent and effective manner. Should there still be a formal mechanism for interregion or multi-region coordination like ALLPIRG meeting, such a mechanism should be instrumental in systematically solving the inter-regional issues in light of the increasing need accruing from the regionalization or globalization of aeronautical systems. It is worthwhile studying a new approach or remedial measures as to interregional coordination before the new systems envisioned in ASBUs spread in an incoherent or a disorderly fashion.

2.11 In this context, it is requested that such a mechanism to ensure interregional coordination be clearly laid out in the GANP or in another document as appropriate.

3. CONCLUSION

3.1 Based on the consideration of the three subjects in Section 2, the Conference is invited to agree to the following recommendation.

Recommendation 6/x – Harmonized implementation of air navigation systems

That the Conference request ICAO to:

- a) consider the creation of a scheme for sharing implementation-assisting materials focused on transition and co-existence issues, and an effective and efficient working method to develop such materials;
- b) clearly address industry's involvement in the whole cyclic process of air traffic management modernization in both global and regional context in the Global Air Navigation Plan or in another document as appropriate;
- c) consider the way to effectually utilize industry's contribution to the planning and implementation regional group meetings, taking into account of their contribution in standards making and work efficiency; and
- d) clearly define a methodology in the Global Air Navigation Plan to ensure interregional and global harmonization of air navigation services through ANRF reporting in an effective and timely manner, and consider the employment of interregional and multi-regional fora.

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