International Civil Aviation Organization

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WORKING PAPER

ASSEMBLY — 40TH SESSION

TECHNICAL COMMISSION

Agenda Item 29: Aviation Safety and Air Navigation Regional Implementation Coordination Mechanisms

STANDARDS REQUIRED FOR AIR NAVIGATION SERVICES PROVISION

(Presented by the Dominican Republic)

EXECUTIVE SUMMARY	
This working paper outlines the situation that has arisen from the lack of clear and comprehensive standards for air navigation services provision, and proposes that a body and a procedure be established to monitor such low-level Standards. **Action:** The Assembly is invited to: a) request ICAO to establish a Standard on products and services required for air navigation services; b) request ICAO to establish a Standard-monitoring group that will include the stakeholders, if deemed necessary and possible; c) agree to the institution of the procedure that must be followed by the Standard-monitoring group in setting and amending Standards.	
Strategic Objectives:	This working paper relates to Strategic Objective — *Air Navigation Capacity and Efficiency*
Financial implications:	The activities to which this working paper refers will be carried out according to resources available under the ICAO Regular Programme Budget for 2020–2022, contributions from other States and/or extra-budgetary contributions.
References:	*Global Air Navigation Plan*

1. INTRODUCTION

1.1 Interoperability is one of the cornerstones of a successful global aviation system. The ATM global operational concept can be achieved only by allowing systems and persons to work together, without problems. In practice, however, system interoperability has been a challenge both within and between regions.

[1] Spanish version provided by the Dominican Republic.

1.2 Standard[2] setting is one of the tools required to achieve system interoperability. Many standards have been developed for various services and technologies, but significant problems have nonetheless arisen. This working paper puts forward a procedure for ensuring that standards are followed and updated in a controlled manner.

2. DISCUSSION

2.1 In considering the issue of global harmonization, various factors come into play:

a) State implementation is disparate: States do not all implement the same services at the same time or at the same level. This is the main obstacle to global interoperability, to which an approach based on regional performance may be taken in order to focus efforts on defined objectives. This point is noteworthy, albeit outside the scope of this working paper; and

b) technologies and systems are not developed uniformly: in a common scenario in the region, two aviation[3] system providers develop software that is compliant with established Standards but ultimately incapable of interoperability. This raises the need to agree to necessary changes, which is not always easy to achieve. Both parties may comply with the published Standard but, owing to ambiguities and lack of detail, each one can develop the product in different ways.

2.2 In the latter case, the Standard should be more specific and detailed to enable different providers to produce interoperable products. The Standard Internet Protocol (IP) is an example of a clear and comprehensive standard followed by all system providers. There is no ambiguity in IP addresses or in the way in which they are defined and administered, and no provider extends them in such a way as to make the product incompatible with the ordinary Standard IP. This should hold true for aviation system and services Standards.

2.3 ICAO documentation specifying standards, often with a high level of detail, abounds. Nevertheless, new or unforeseen provisions are made occasionally, and the system provider must, in such cases, decide alone or perhaps bilaterally with a system provider in an adjacent State, on ways and means of adapting to these provisions. Although immediate roll-out is required, there is no guarantee that the next adjacent State will comply, and "islands" of Standards will ultimately emerge, which will require changes to various systems in order to standardize them or make them compatible.

2.4 States and the industry have worked together on joint projects on this subject. The aeronautical information eXchange model (AIXM) stands as a good example. This Standard has a Change Control Board (CCB) composed of air navigation services providers (ANSPs), industry, airlines and the military.[4] The objective of the CCB is to "maintain and to evolve the AIXM Specification as necessary for enabling States to comply with the ICAO global and regional requirements for the provision of aeronautical information, in the context of the evolution towards digital aeronautical information management (AIM) and system-wide information management (SWIM)". It is rewarding for all parties to

[2] In this context, the word "Standard" is used mainly for low-level technical rules and specifications that govern the operation of air navigation systems, in contrast to ICAO Standards in the Annexes and the PANS. These standards are set and maintained mainly by States, groups of States or ad hoc regional working groups.

[3] In this paper, the term "system provider" applies to a State that develops its own software and to any private company that offers such products commercially.

[4] http://aixm.aero/page/governance

have such a body, as stakeholders thus have a considerable guarantee that Standard-compliant systems will work together and that any change or addition to the Standard will be reviewed and be available to all.

2.5 A situation that arose in the Dominican Republic is a good example of insufficiently specified Standards. The NAM ICD had been accepted as the ATS interfacility data communications (AIDC) protocol for use in the NAM/CAR region and had been implemented as such by many States in the region. Owing to certain subtleties in interpreting the ICD, a product was delivered with functionalities that were incompatible with adjacent FIRs (flight information regions). The situation has been resolved, but it has cost the Dominican Republic many months of delayed AIDC implementation, although the software basically had the requisite capability. If an industry-inclusive panel had worked on the differences or ambiguities, the misinterpretation would probably have been identified and the standards would have been amended to be more explicit.

2.6 ICAO already has a procedure for the drafting and amendment of Standards, with a lead time of approximately two years from initial proposal to publication.[5] For the purposes under consideration, an optimized version of the procedure, with fast-track discussion and adoption, could be used for low-level Standards.

2.7 It is important to note, moreover, that the ICAO Air Navigation Commission (ANC) convenes technical panels in order to work on SARP technical details. Instead of establishing a new panel in order to establish agreements on low-level Standards, these panels' purview could be broadened to include the coordination of discussions with the necessary stakeholders in order to improve such Standards.

2.8 At a meeting of the NAM, CAR and SAM regions, convened to consider AIDC and flight plan matters, representatives of Thales, Indra and Atech produced a document containing recommendations to AIDC-implementing States and drawing on shortcomings experienced in the region. This demonstrates the collaborative will and productivity in industry that seeks to improve interoperability, and it reflects the desire for uniformity in specifications, industry-wide awareness of any variation in specifications and a centralized source of information on these specifications, among other things.[6]

3. CONCLUSION

3.1 Clear and comprehensive Standards are a primary means through which service interoperability can be possible. To achieve this level of Standard, all parties involved must be aware of any shortcomings in the Standards and those shortcomings must be resolved in a controlled and inclusive manner. The Assembly is therefore invited to consider and approve the following recommendation: The establishment of a body and a procedure to monitor the development and maintenance of Standards relating to air navigation systems. This monitoring body may establish subgroups to address various areas of implementation, if need be, and should ideally use technological media for timely and efficient exchange of information among members of the group.

— END —

[5] https://www.icao.int/about-icao/AirNavigationCommission/Pages/how-icao-develops-standards.aspx
[6] https://www.icao.int/SAM/Documents/2018-AIDC/AIDCNAMCARSAM%20Final%20Report.pdf , Appendix E