ELEVENTH AIR NAVIGATION CONFERENCE

Montreal, 22 September to 3 October 2003

Agenda Item 6 : Aeronautical navigation issues

PROPOSED UPDATES TO THE ICAO STRATEGY FOR THE INTRODUCTION AND APPLICATION OF NON-VISUAL AIDS TO APPROACH AND LANDING IN ANNEX 10, VOLUME I

(Presented by the Secretariat)

SUMMARY

This paper presents updates to the ICAO Strategy for the introduction and application on non-visual aids to approach and landing in Annex 10, Volume I, Attachment B that were developed by the Global Navigation Satellite System Panel (GNSSP) at the request of the Air Navigation Commission (ANC).

Proposed amendments to the strategy take account of developments in aeronautical navigation since the strategy was approved by the COM/OPS Divisional Meeting in 1995 and are based on the outcome of studies carried out by the panel in preparation for the Eleventh Air Navigation Conference.

Action by the conference is in paragraph 4.

1. INTRODUCTION

1.1 The current ICAO Strategy for the Introduction and Application of Non-visual Aids to Approach and Landing (Attachment B to Annex 10, Volume I) was recommended by the Special Communications/Operations Divisional Meeting (1995), based on material developed by the All Weather Operations Panel (AWOP). The strategy replaced the previous instrument landing system/microwave landing system (ILS/MLS) Transition Plan and was included in Amendment 71 to Annex 10, with an applicability date of 7 November 1996.

1.2 The rationale for this change was that a transition from ILS to a single, global system was not considered to be realistic for the foreseeable future, and that the ILS/MLS Transition Plan should therefore be replaced by a more general strategy.

1.3 This document presents proposed updates to the strategy to take account of developments in aeronautical navigation since the strategy was approved in 1995.

2. REVIEW OF THE STRATEGY

Objectives of the strategy

2.1 The general objectives of the strategy are still valid and are not affected by any developments since 1995. However, there are a number of areas where some updates to the strategy are necessary. The current strategy was intended to be applicable until 2015; it is appropriate to extend the applicability of the updated strategy until 2020.

References to generic criteria

2.2 The current strategy introduced a notion of generic criteria for approach, landing and departure operations which was intended to facilitate the application of emerging technologies for precision approach and landing operations. The development of the Standards and Recommended Practices (SARPs) for GNSS-based precision approach operations has shown that the required navigation performance (RNP) concept did not replace the need for detailed system specific SARPs although the concept was a useful reference for the development of performance requirements. In addition, SARPs are already available for GNSS to support Category I precision approach, and they are under development for Category II/III; thus, no new precision approach and landing systems need to be standardized. It is therefore unlikely that there will be any need to implement the RNP concept for this phase of flight. The references to the generic criteria are deleted in the proposed amendment to the strategy.

Updates to ILS, MLS, GNSS, MMR and other considerations

2.3 Sections on ILS, MLS, GNSS, MMR and other considerations need to be updated based on the latest information available. The most significant changes are proposed as follows:

a) there have been some significant developments in the implementation of Category III MLS;

b) GNSS with ground-based augmentation capable of supporting Category I operations is expected to be operational by 2006. GNSS-based approach with vertical guidance is now operational;

c) development of performance requirements and SARPs for GNSS ground-based augmentation system (GBAS) to support Category II and III operations is in progress. However it is not possible to give an accurate forecast at this time of when an operational capability will be available;

d) there have been some significant developments related to the multi-mode receiver (MMR). Multi-mode receiver Standards have been developed and MMRs have been

fielded with ILS and basic GNSS functions. However, MMRs with other landing functions have yet to be certified and fielded. Currently these other functions are under development and are expected to be available in the following time frames: MMR with MLS function by 2003; MMR with GBAS function to support Category I operations by 2003; MMR to support satellite-based augmentation system (SBAS) functions are not expected to be developed before 2005; and

e) as transition to GNSS as a global system for all phases of flight is a long-term objective, the frequency bands allocated to ILS, MLS and GNSS need to be protected. A statement to this effect is included in the strategy.

2.4 The basic requirement is to have a multi-modal airborne landing capability. The multi-mode receiver is only one element in this. Aircraft implementations for MLS and GBAS are both under development for a limited number of aeroplane models. Currently there is no plan to retrofit the majority of the in-service fleet with either capability.

2.5 The current strategy, which allows ILS to be retained indefinitely during the transition to new technology, does have the disadvantage of limiting the operational and economic benefits which may be available. For example, both MLS and GNSS offer the possibility of improved runway utilisation in low-visibility conditions due to their improved multipath performance. It is more difficult to realize the benefit of this improvement if mixed mode operations (ILS/MLS or ILS/GNSS) are implemented. A statement to this effect is included in the strategy.

Approach and landing operations with vertical guidance

2.6 Standards and criteria for approach and landing with vertical guidance (APV) are now available or under development. APV procedures offer operational benefits and enhanced safety compared with non-precision approaches. It is therefore appropriate for the strategy to include general information to this effect.

Ground-based regional augmentation system (GRAS)

2.7 Draft SARPs for GRAS are currently being developed. Reference to envisaged availability of GRAS operations is included in the strategy.

3. PROPOSED REVISION TO THE STRATEGY

3.1 Proposed revisions to the strategy are presented in the appendix to this working paper in the form of a draft amendment to Annex 10, Volume I.

4. ACTION BY THE CONFERENCE

4.1 The conference is invited to agree on the following recommendation:

RSPP

Recommendation 6/E — Amendment to Annex 10, Volume I, Attachment B — Strategy for introduction and application of non-visual aids to approach and landing

That Attachment B to Annex 10, Volume I be amended as shown in the appendix to this working paper.

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