



International Civil Aviation Organization

**Eight Meeting of the Communications/Navigation/Surveillance and
Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG**

Bangkok, Thailand, 12-16 July 2004

**Agenda Items 4, 5,6 and 7: Aeronautical Mobile Service
 Radio Navigation Aids
 Surveillance
 Aeronautical Electromagnetic Spectrum Utilization**

RESULTS OF THE ELEVENTH AIR NAVIGATION CONFERENCE (2003)

(Presented by Secretariat)

SUMMARY

This paper presents results of the Eleventh Air Navigation Conference (2003), held in Montreal from 22 September to 3 October 2003 with respect to Agenda Items 5, 6 and 7 of the Conference that are of direct interest to the meeting. It also shows the actions taken by the Air Navigation Commission (ANC) and Council on the relevant Recommendations.

1. INTRODUCTION

1.1 The Eleventh Air Navigation Conference (2003), held in Montreal from 22 September to 2 October 2003, dealt with seven agenda items, of which, agenda items 5, 6 and 7 were of direct interest to the meeting. Action taken by the ANC and Council on the Recommendations developed under relevant agenda items of the Conference are provided in the Attachment.

2. DISCUSSION

2.1. The Eleventh Air Navigation Conference (2003) made **one** recommendation to amend Annex 10 — *Aeronautical Telecommunications, Volume I — Radio Navigation Aids* and **sixty** Recommendations on other matters related to its agenda. Of these, ten Recommendations are to be addressed by PIRGs directly. The Future Direction Task Force Meeting held in May 2004 has proposed to APANPIRG that the concerned Sub-Groups study the following recommendations of the Conference, and include in their work programme for action.

Recommendations 1/1, 1/10, 1/13, 4/1, 4/2,4/4, 6/11 and 7/1: ATM/AIS/SAR/SG
Recommendations 1/1, 1/10, 1/13, 4/1, 4/2, 6/11, 7/1 and 7/3: CNS/MET/SG
Recommendations 4/8: Deficiency Review Task Force (DRTF) (review completed as part of DRTF/2)

2.2 The main highlights of the outcome of Air Navigation Conference 2003, under Agenda Items 5, 6 and 7 are provided in the following paragraphs.

Agenda Item 5: Review of the outcome of the ITU World Radio Conference (2003) WRC-2003) and its impact on aeronautical electromagnetic spectrum utilization

2.2.1 The meeting noted the favorable results obtained at the ITU WRC-2003 and identified areas of critical concern to aviation that will be addressed at the WRC-2007. The meeting also recognized the need for ICAO to intensify its activities to secure protection of aeronautical systems from electro-magnetic interference and to develop relevant guidance material, as required (Recommendations 5/1 and 5/2 refer).

2.2.2 With regard to the organization of spectrum planning mechanisms in ICAO, the meeting agreed that ICAO should conduct a review of the current working arrangements. The meeting further recognized the need for developing a plan for the shared use of frequency bands used for radio navigation aids with global navigation satellite system (GNSS) elements, as well as the long-term ability to provide for required microwave landing system (MLS) assignments.

Agenda Item 6: Aeronautical navigation issues

2.2.3 Following the review of information on GNSS development presented by States and satellite navigation service providers, the conference made Recommendation 6/1 for transition to satellite-based air navigation, which encouraged further steps in using GNSS technology. The conference stressed the importance of satellite-based augmentation system (SBAS) capability, which could be provided in three large areas of the world in the near term and would enable approach procedures with vertical guidance (APV).

2.2.4 The conference reviewed the results of GNSS vulnerability studies and concluded that, to date, no vulnerabilities had been identified that compromised the ultimate goal of transition to GNSS as a global system for all phases of flight. Having agreed to Recommendation 6/2 concerning mitigation of GNSS vulnerabilities and Recommendations 6/12 and 6/13 concerning the use of new GNSS elements and signals, the conference, however, recognized that uncertainties would remain regarding the use of satellite navigation service as a sole navigation service and that studies in this area of concern should continue.

2.2.5 The conference identified a number of tasks to be addressed in the future development of aeronautical navigation services and, consequently, made Recommendations 6/3, 6/4, 6/5, 6/6, 6/7, 6/8, 6/12, 6/14, 6/15 and 6/16. Proposed actions on some of these recommendations take into account the work that is already underway in the relevant air navigation panels and study groups.

2.2.6 The conference also reviewed the information presented on experience gained in States with the introduction of GNSS operations, including the results of SBAS test bed trials in three ICAO regions. Recommendation 6/9 encouraged cooperation of States and service providers, and support of service providers to activities leading to the extension of SBAS service areas into neighbouring States and regions.

2.2.7 The conference made Recommendation 6/10 for updates to the ICAO strategy for non-visual aids to approach and landing in Annex 10, and Recommendation 6/11 for amendments to the Global Plan. Both documents, as amended by the conference, would provide general guidance to PIRGs, States, service providers and users in their planning of air navigation services for the foreseeable future.

2.2.8 A number of working papers were presented on various aspects of GNSS that were not covered by the agenda of the conference and therefore not discussed. However, it was agreed that the information and views on legal and institutional issues of GNSS contained in those papers should be referred to the ICAO Council for urgent consideration. Similarly, GNSS economics issues will be brought to the attention of the Air Navigation Services Economics Panel (ANSEP).

Agenda Item 7: Aeronautical air-ground and air-air communications

2.2.9 The conference considered the issue of availability of standardized data link technology in support of the ADS-B concept of use. It identified a growing consensus on the use of the SSR Mode S Extended Squitter as the supporting data link for the near-term introduction of ADS, and highlighted the associated benefits with regard to global interoperability (Recommendation 7/1). At the same time, the conference recognized that, in the longer term, the current Extended Squitter technology may not be able to fully satisfy the potential future evolution of ADS-B requirements, and that therefore ICAO should continue the development of technical provisions for ADS-B link technologies (Recommendation 7/2).

2.2.10 With regard to the future evolution of air-ground communications, the conference was presented with a variety of significantly divergent views, but was able to identify a number of elements that could form the basis for a broad consensus on an evolutionary approach for global interoperability, as laid out in Recommendation 7/3. The need to investigate future technology alternatives for air-ground communications was also recognized (Recommendation 7/4). In this connection, the conference endorsed a set of guidelines on standardization of new communication technologies (Recommendation 7/5).

3. ACTION BY THE MEETING

3.1 The meeting is expected to take note of the:

- a) result of the AN Conf/11 with respect to agenda items 5, 6 and 7 including the actions taken by the ANC and Council; and
- b) action proposed by the Future Direction Task Force for consideration by APANPIRG with respect to related Recommendations of the Conference for action by Sub-Group.

Report Reference		Action by Council (C) Or Air Navigation Commission (ANC)	Recommendation Title and Action Taken
Rec. No.	Page No.		
5/1	5-4	ANC	Preparation for WRC-2007 Approved the recommendation and requested the Secretary General to take appropriate action.
5/2	5-6	ANC	ICAO activities on interference Noted the recommendation and requested: a) the Secretary General to take appropriate action; and b) the Aeronautical Communications Panel (ACP) in coordination with the Navigation Systems Panel (NSP) as required, to develop the necessary guidance material.
6/1	6-9	ANC	Transition to satellite-based air navigation Approved the recommendation and: a) agreed that the relevant panels continue the development of SARPs, procedures and guidance material in line with part a) of the recommendation; and b) requested the Secretary General to bring parts b) and c) of the recommendation to the attention of States and appropriate intentional organizations.
6/2	6-10	ANC	Guidelines on mitigation of GNSS vulnerabilities Noted the recommendation and requested the Secretary General to: a) bring the recommendation to the attention of States and appropriate international organizations; and b) incorporate the guidelines referred to in part a) of the recommendation in the first edition of the <i>Global Navigation Satellite System (GNSS) Manual</i>.
6/3	6-11	ANC	Assessment of atmospheric effects on SBAS performance in equatorial regions Noted the recommendation and requested the Navigation System Panel (NSP) to give priority to the development of suitable guidance material.

Report Reference		Action by Council (C) Or Air Navigation Commission (ANC)	Recommendation Title and Action Taken
Rec. No.	Page No.		
6/4	6-12	ANC	Automated means for reporting and assessing the effects of outages on GNSS operations Noted the recommendation and requested the Navigation Systems Panel (NSP) to consider the development of the relevant provisions.
6/5	6-13	ANC	Early resolution of issues arising from implementation of RNAV and RNP Approved the recommendation and requested the Secretary General to progress the necessary work as a matter of urgency with the assistance of the Required Navigation Performance and Special Operational Requirements Study Group (RNPSORSG).
6/6	6-13	ANC	Advanced GNSS RNAV procedure design Approved the recommendation and requested the Navigation Systems Panel (NSP) and Obstacle Clearance Panel (OCP) to develop relevant proposals for consideration by the ANC.
6/7	6-13	ANC	Curved GNSS RNAV procedures Approved the recommendation and requested the Navigation Systems Panel (NSP) and Obstacle Clearance Panel (OCP) to develop relevant proposals for consideration by the ANC.
6/8	6-14	ANC	GNSS/INS integration Approved the recommendation and requested the Navigation Systems Panel (NSP) to develop relevant proposals for consideration by the ANC.
6/9	6-15	C	Support of an participation in SBAS pre-operational implementation activities Approved the recommendation and requested the Secretary General to bring it to the attention of States and appropriate international organizations.
6/11	6-19	C	Amendment to the Global Plan – Navigation Approved the recommendation and requested the Secretary General to take appropriate action.
6/12	6-20	ANC	Development of guidance material on application of new GNSS elements and their combinations Noted the recommendation and requested the Navigation Systems Panel (NSP) to develop the required guidance material

Report Reference		Action by Council (C) Or Air Navigation Commission (ANC)	Recommendation Title and Action Taken
Rec. No.	Page No.		
6/13	6-20	C	Potential constraints on using multiple GNSS signals Noted the recommendation and requested the Secretary General to bring it to the attention of States and appropriate international organizations.
6/14	6-21	ANC	GNSS services in the 960 – 1 215 MHz band Approved the recommendation and: a) requested the Secretary General to bring part a) of the recommendation to the attention of States and appropriate international organizations; b) requested the Navigation Systems Panel (NSP) to develop proposals for consideration by the ANC.
6/15	6-22	ANC	Updating of SARPs for radio navigation aids in Annex 10, Volume I Approved the recommendation and requested the Navigation Systems Panel (NSP) to develop relevant proposals for consideration by the ANC.
6/16	6-23	ANC	Completion of guidance material on application of data quality SARPs in Annex 15 Noted the recommendation and requested the Secretary General to expedite publication of the <i>Quality Management System Manual for AIS/MAP Services</i>.
7/1	7-11	ANC	Strategy for the near-term introduction of ADS-B Approved the recommendation and requested the Secretary General to bring it to the attention of States and appropriate international organizations.
7/2	7-12	ANC	Support of longer term ADS-B requirements Approved the recommendation and: a) requested the Secretary General to bring part a) of the recommendation to the attention of States and appropriate international organizations; b) requested the ACP and the SCRSP, in coordination with other appropriate panels, to continue the development of provisions for ADS-B technologies as required.

Report Reference		Action by Council (C) Or Air Navigation Commission (ANC)	Recommendation Title and Action Taken
Rec. No.	Page No.		
7/3	7-17	ANC	Evolutionary approach for global interoperability of air-ground communications Approved the recommendation and requested the Secretary General to bring it to the attention of States and appropriate international organizations.
7/4	7-18	ANC	Investigation of future technology alternatives for air-ground communications Approved the recommendation and requested the ACP to carry out the relevant activities.
7/5	7-18	ANC	Standardization of aeronautical communication systems Approved the recommendation and requested all ICAO bodies involved in the standardization of aeronautical communication systems to apply it in their work.