International Civil Aviation Organization

Seventh Meeting of CNS/MET Sub-Group of APANPIRG and Tenth Meeting of CNS/ATM IC Sub-Group of APANPIRG

Bangkok, Thailand, 15 – 21 July 2003

Agenda Item 4: **Aeronautical Mobile Service;**
Agenda Item 5: **Radio Navigation Aids;**
Agenda Item 7: **Aeronautical electromagnetic spectrum utilization;**
Agenda Item 16: **Safety and Security in Air Traffic Management;**
Agenda Item 17: **Air Traffic Management Operational Concept**

AN-CONF/11 AGENDA ITEMS

(Presented by the Secretariat)

SUMMARY

This paper provides agenda and explanatory notes on agenda items of the AN-Conf/11 for reference.

Agenda Item 1: Introduction and assessment of a global air traffic management operational concept

Agenda Item 2: Safety and security in air traffic management

Agenda Item 3: Air traffic management performance targets for safety, efficiency and regularity and the role of required total system performance (RTSP) in this respect

Agenda Item 4: Capacity - enhancement measures

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

Agenda Item 6: Aeronautical navigation issues

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

Agenda Item 8: Any other business

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ELEVENTH AIRNAVIGATION CONFERENCE (2003)
AGENDA AND EXPLANATORY NOTES

Agenda Item 1: Introduction and assessment of a global air traffic management operational concept

1.1 the global air traffic management operational concept;

1.2 enabling concepts in support of the global air traffic management operational concept;

1.3 the need for a global air navigation plan; and

1.4 the role of airborne collision avoidance systems (ACAS) technologies.

To date, no comprehensive description has been developed of how new communications, navigation and surveillance/air traffic management (CNS/ATM) technologies should evolve into a global and more efficient ATM system. Consequently, there has been, to some degree, an *ad hoc* implementation of available technologies. To remedy this, work on a global ATM operational concept is currently underway by the Air Navigation Commission with the assistance of the Air Traffic Management Operational Concept Panel (ATMCP). The operational concept will describe how an integrated global ATM system should operate and provide States and industry with clearer objectives for designing and implementing ATM and supporting systems.

By the time of the AN-Conf/l1, work on the operational concept and on the technical means of implementing the concept, including the development of concepts of use for sub-elements and enabling technologies (e.g. airborne separation assistance system (ASAS), automatic dependent surveillance-broadcast (ADS-B)), will have been greatly progressed. The review and assessment of the operational concept by the AN-Conf/11 will facilitate the eventual acceptance and implementation of the concept into the planning framework of States and planning and implementation regional groups (PIRGs). The foregoing matters are expected to result in recommendations that would guide and encourage transition and implementation.

Along with the development of an ATM operational concept and supporting operational and technical requirements, implementation of a global ATM system requires a blueprint of the envisaged air navigation infrastructure of facilities and services. It is expected that a discussion at the conference of the present air navigation planning processes would help to identify the most appropriate methods to meet the future implementation planning needs.

Airborne collision avoidance systems play an important role in overall ATM system safety, although they are not used in calculation of system safety. In light of the introduction of an ATM operational concept and changes to the separation services to be provided in the future ATM system, it is important to have a clear understanding of the role of collision avoidance systems technologies in the future.

Agenda Item 2: Safety and security in air traffic management

2.1 safety management systems and programmes;
2.2 safety certification of ATM systems;
2.3 safety regulation;
2.4 Global Aviation Safety Plan (GASP); and
2.5 safety and security of the ATM infrastructure.

Managing and regulating safety in ATM systems will be an increasingly critical and complex endeavour, especially considering the move toward greater autonomy of ATM service providers. It is necessary that a global approach using standardized procedures and methods be adopted. The majority of States do not yet have safety management programmes in place; neither have they established the formal means for regulating safety in ATM. Considering the imminent need to address safety management in ATM systems, and the scheduled expansion of the safety oversight programme to include air traffic services, it is considered essential to address all aspects of ATM safety at the global level. States may also wish to take advantage of the conference to discuss the new Standards and Recommended Practices (SARPs) and procedures associated with safety management systems, their means of implementation, together with all related aspects of ATM safety regulation.

Recognizing the need to reduce the worldwide accident rate, the Air Navigation Commission proposed the ICAO Global Aviation Safety Plan (GASP) to the Council in 1997. In 1998 the 32nd Session of the Assembly endorsed the concept. GASP has helped focus the attention of the aviation community both within and outside of ICAO, on current and future safety issues. The review and discussion of GASP at the conference will lead to a clearer understanding of what the plan is intended to achieve, and the methods for accomplishing this. Recommendations of the conference would facilitate an acceptance of GASP by the wider aviation community.

Since the events of 11 September 2001, security of aircraft, as well as of the supporting air navigation infrastructure, has become a major concern for civil aviation. The ATM system may be able to contribute to improved security through the provision to responsible authorities of appropriate assistance and information. On the other hand, the ATM system, as well as ATM related information, should be protected from security threats. The conference will offer an opportunity to address global efforts aimed at improved security of ATM systems and information.

Agenda Item 3: **Air traffic management performance targets for safety, efficiency and regularity and the role of required total system performance (RTSP) in this respect**

3.1 performance targets for air traffic management; and

3.2 the concept of RTSP.

The present ATM infrastructure has evolved without globally-agreed criteria for, *inter alia,* safety , efficiency and regularity. As a result, there are no means to ensure that emerging and future ATM systems will meet minimum levels of performance. Furthermore, only a limited amount of work on ATM performance by bodies outside ICAO has been accomplished. It is foreseen that RTSP will serve as a means for the measurement of safety, efficiency and regularity of the emerging and future global ATM system. Although the work on RTSP is still in its early stages, progress is expected to be made by the time of the conference. The Air Navigation Commission, with the assistance of the ATMCP, has begun work on defining RTSP and elaborating on its role in ATM systems performance measurement. It is foreseen that recommendations of the conference could facilitate the endorsement of RTSP.

Agenda Item 4: **Capacity - enhancement measures**

4.1 global measures; and

4.2 regional measures.

Implementation of capacity-enhancing measures in the vicinity of aerodromes is increasingly being considered by individual States. These measures are often in response to increasing demand and associated political and industrial pressures. At the same time, there has been a growing awareness within the civil aviation community that safety must be improved in light of increasing traffic, particularly in the vicinity of aerodromes. The use of procedures and separation minima inconsistent with ICAO provisions is an obvious threat to safety through a lack of standardization. In the same way, accommodating regional needs for capacity enhancement through amendments to ICAO Regional Supplementary Procedures (SUPPs) will also lead to a disparity of ICAO procedures. Based on the above, a global approach to addressing capacity-enhancing measures should be developed. Discussions at the conference of the problems associated with increasing demand will facilitate a common understanding as to the most appropriate methods to alleviate the situation and prepare for the future environment.

The international civil aviation community is entering a new stage in its evolution that will see the introduction of increasing levels of automation and other technologies, changes to the role of the users and operators of the systems, and increasing pressure to increase capacity and accommodate more aircraft into the available airspace. The subjects above address these issues which should be thoroughly examined and discussed at the worldwide level. Furthermore, the subjects have a relationship to each other in that they all relate to safety. The new global ATM operational concept, along with the maturing work of the panels of the Air Navigation Commission, offer a unique opportunity to address safety, capacity and performance issues in the new millennium, with a view to ensure a harmonized evolution which would enhance efficiency as well as safety.

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

The agenda for the ITU WRC-2003 contains more than fifteen items which may have an impact on aeronautical radionavigation and cormnunication services. The outcome ofWRC-2003 on these items will be presented for review by the conference. Subjects of particular importance include radionavigation satellite service/aeronautical radionavigation service (RNSS/ARNS) compatibility, future aeronautical utilization of the 5 GHz band in light of spectrum requirements for the microwave landing system (MLS), regulatory provisions permitting the operation of new ICAO standard systems supporting navigation and surveillance functions in the band 108-117.975 MHz and possible new requirements for ARNS and/or aeronautical mobile (R) services (AM(R)S). Additionally, the continuing availability of spectrum for aeronautical communications and navigation will be considered. The conference will also review the draft agenda of the WRC-2006 to identify any items of potential concern to aviation that would need to be addressed in preparation for that conference.

Agenda Item 6: Aeronautical navigation issues

6.1 global navigation satellite system (GNSS) development status based on reports from States, service providers and industry organizations;

6.2 navigation policy issues in the light of present and envisaged GNSS services and architectures, integration and back-up options;

6.3 amendments on aeronautical navigation subjects in relevant ICAO documents including the *Global Air Navigation Plan for CNS/ATM Systems* (Doc 9750), Annex 10 -*Aeronautical Telecommunications* and other documents as necessary; and

6.4 directions for future development of aeronautical navigation services.

The *Global Air Navigation Plan for CNS/ATM Systems* (Global Plan, Doc 9750) indicates that successful implementation of the global navigation satellite system (GNSS) would provide seamless global navigation for all phases of flight, thus offering the possibility for many States to dismantle some or all of their ground-based navigation aids. The Special Communications/Operations Divisional Meeting (1995) (SP COM/OPS/95, Doc 9650) recormnended (Recommendation 3/1) the development of SARPs, procedures and criteria to support the gradual introduction of GNSS. The meeting also developed Recommendation 5/1 proposing an amendment to Annex 10 to incorporate the ICAO strategy for introduction and application of non-visual aids to approach and landing (Annex 10, Volume I, Attachment B) which promoted GNSS as an ICAO standard aid in addition to the instrument landing system (ILS) and MLS.

In its assessment of GNSS, the SP COM/OPS/95 raised a number of concerns over system capabilities and identified issues to be addressed in validation activities and feasibility studies. Subsequently, further concerns were raised regarding the ability of GNSS to become the "sole-means" navigation system. These concerns were partially addressed through Amendment 1 to the Global Plan. However, the ability of GNSS to become the only navigation system for all phases of flight continues to be questioned, thus various back-up options have been proposed.

Developments in recent years have indicated that progress towards the objectives established in the Global Plan was slower than initially envisaged. It has also been suggested that some GNSS-related issues may not be resolved until additional civil signals or core satellite constellations are introduced. It is expected that the conference will be informed by respective States/service providers regarding their plans for modernization of the global positioning system (GPS) and the GLObal NAvigation Satellite System (GLONASS), and deployment of the Galileo system. A status report on Category I GNSS-based operations and feasibility studies of GNSS-based Category II/III approaches and aerodrome surface operations will also be available to demonstrate GNSS capability to support all phases of flight. Thus, the future (2010 onwards) GNSS architecture will be made known to the conference together with SARPs in Annex 10, Volume I, Chapters 2 and 3 [1]which define present and near-term GNSS with its augmentations.

After eight years of GNSS development and implementation activities (since SP COM/OPS/95), the conference will review up-to-date information on GNSS status, its future architecture and levels of service that could be provided at the various stages of system evolution. Other subjects involve system status monitoring and NOTAMs, GNSS vulnerability to intentional and unintentional interference, interference mitigation and database issues. In light of this information, the conference would also assess the role of terrestrial radio navigation aids and area navigation capability .The discussions are expected to address, in particular, the need for a back-up system(s) and conclude with updated guidelines for transition to satellite navigation. As a result, the conference is expected to recommend revisions to the navigation sections in the Global Plan, draft amendments to SARPs in Annex 10, and update the ICAO strategy for introduction and application of non-visual aids to approach and landing.

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

As a result of growing aeronautical communications requirements and of the potential spectrum scarcity created by claims on aeronautical spectrum by non-aeronautical parties, efficient utilization of the aeronautical spectrum by conununications systems is becoming a critical aspect of air navigation planning. Over the last decade, ICAO has introduced into Annex 10 a number of new air-ground and

[1] The first packages of GNSS SARPs was introduced in Annex 10 with Amendment 76 and became application on 1 November 2001. Amendment 77 to Annex 10 introduced a number of GNSS enhancements.

air-to-air communication technologies, both digital (HF data link, VHF digital link, SSR Mode S and AMSS) and analog (8.33 kHz channel spacing for VHF DSB-AM). Implementation of some of those technologies is currently underway and contributes to increasing the aggregate aviation spectrum requirements, while conventional air-ground voice communications systems continue to operate, still representing the main medium for operational communications.

It is expected that the conference will review the results of the most recent ICAO work on the optimal utilization of the terrestrial and satellite aeronautical communication bands (HF , VHF and L-band) including the development of new air-ground and air-to-air communications systems meeting evolving requirements. The planned evolution of existing systems and potential development of future systems will be considered, together with any associated proposals for changes to ICAO documents.

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