

## FOREWORD.

## 1. Historical background

1.1 The *Satellite Communications (SATCOM) Voice Guidance Material (SVGGM)* is the result of a task force established at the request from the ICAO Air Navigation Commission (ANC) made during its 4th Meeting of the 183rd Session held on 21 January 2010..

1.2 Over the oceanic and remote continental areas, flights have historically been conducted with high frequency (HF) radios due to the advantage of being able to transmit and receive air/ground communications for thousands of miles. Most competent authorities hence required two independent HF sets on-board.

1.3 In the early 1980s, civil aviation recognized the increasing limitations of the present communications, navigation, and surveillance (CNS) systems for air traffic management (ATM) and the need to make improvements to overcome them and meet the future needs. Thus the Council of ICAO established the Special Committee on future air navigation systems (FANS) to study new concepts and new technologies and to recommend a system that would overcome the present and foreseen problems. The Committee made an extensive study of existing systems and the applications of new technologies. It concluded that the limitations of the existing systems are intrinsic to the systems themselves and were so restrictive that the problems could not be overcome on a global scale except by the exploitation of satellite technology. Thus a new concept of air navigation based on satellite technology was developed and consequently endorsed by the Tenth Air Navigation Conference in September 1991

1.4 In 1995, the initial future air navigation system (FANS 1/A) provided an integrated airborne CNS package. In addition to required navigation performance (RNP) and global navigation satellite system (GNSS) capabilities, FANS 1/A includes controller pilot data link communications (CPDLC) and automatic dependent surveillance – contract (ADS-C) capabilities using SATCOM, VHF, and HF data links. CPDLC and ADS-C was seen as the normal or preferred means of ATS communications. However, voice communications would continue to be required in situations where data link was not suitable. At the same time, aircraft became equipped with SATCOM voice capability.

1.5 In June 2001, the 37<sup>th</sup> Meeting of the NAT SPG (12-14 June 2001) agreed that a study would be initiated to assess the viability of using satellite voice communications for waypoint position reporting as an initial step. The study was accompanied by the NAT trials that had been successful and no major difficulties had been encountered. It was noted that the use of SATCOM voice had proven to be very useful during periods of HF blackout.

1.6 In 2003, the 39th NAT SPG Meeting (17-19 June 2003) agreed that the NAT SUPPs needed to be amended to clearly state the conditions under which SATCOM voice could be used. Since then, flight crews are using SATCOM voice instead of HF voice for urgent communications or when HF voice was not operational due to atmospheric conditions. In 2008, the 44th Meeting of the NAT SPG (17-20 June 2008) agreed that the authorization to use SATCOM voice for all ATS communications would permit reduction in risk of communications failure, improve safety of operations, alleviate HF congestion and, without detriment to the safety objectives, provide for MEL relief by removing a requirement to carry the second HF radio. Therefore, another series of trials were carried out with participation of the NAT airspace users, ANS and communications service providers that demonstrated that SATCOM voice is an effective and reliable long range communication system to support all ATS communications..

1.7 In the meantime, some regulatory authorities have granted some operators dispatch relief for a limited time whereby the aircraft may be dispatched for a limited period (5 days) with only a single operational HF radio system and an operational SATCOM voice system. In the interest of lowering operational costs, streamlining operational efficiency and providing better communication tools, aircraft operators are turning to SATCOM voice and data link capability to meet long range communication system (LRCS) requirements. These capabilities include Inmarsat SATCOM voice using geosynchronous orbit satellites and Iridium SATCOM voice, which uses satellites in a low-earth orbit.

1.8 In 2010, the ICAO ANC having reviewed the progress of the NAT SPG SATCOM voice studies, requested that an ICAO inter-regional task force would be established to develop a globally applicable guidance material *Satellite Voice Guidance Material* (SVGGM) in support of the global implementation of aeronautical mobile satellite (route) communications systems (AMS(R)S).

1.9 This edition of the *Satellite Voice Guidance Material* (SVGGM) provides for a comprehensive update of various regional and State guidance material to use SATCOM voice for ATS communications as an alternative to the carriage of one HF radio. It does not at this time provide guidance on the use of SATCOM voice as a stand alone LRCS for ATS purposes as standards for this use have not yet been developed. This includes the incorporation of performance-based specifications and associated guidance on data collection, monitoring, and analysis.

## 2. Scope and purpose

2.1 The SVGGM provides guidance and information concerning SATCOM voice communications for aeronautical use and is intended to facilitate the uniform application of Standards and Recommended Practices contained in Annex 2 — *Rules of the Air* and in Annex 11 — *Air Traffic Services*, the provisions in the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444) and, when necessary, the *Regional Supplementary Procedures* (Doc 7030).

2.2 This guidance material is intended to maximize operational benefits in SATCOM voice operations by promoting seamless and interoperable SATCOM voice operations throughout the world. This edition limits itself to current and near term operations. Future editions are expected to incorporate guidance that applies to the planned expansion of SATCOM voice capability in the high-density continental areas.

2.3 The following principles were adhered to in the development of this guidance material:

- a) build on the ICAO required communication performance (RCP) framework to provide States with flexibility to apply different standards for different uses, without implication to seamless operations and providing that the safety objectives are satisfied;
- b) provide a basis for States in determining acceptability of any implementation, taking into account routine and emergency use, the provision of ATS using SATCOM voice communications, procedures for the radio operator, controller and flight crew, performance specifications and qualification;
- c) do not address the subject of the in-flight use of portable SATCOM phones as this is not allowed, according to many existing State operating regulations, and it would not address any special applications on their use;
- d) do not specifically address MEL matters, but serve to facilitate State regulatory authorities in establishing policies in such matters; and
- e) do not address the use of SATCOM voice in isolation (i.e., HF voice capability remains available on board and in the ground infrastructure).

2.4 While directed primarily at air traffic services personnel and flight crews, the following personnel should be familiar with various aspects of its contents: regulators, airspace planners, aircraft

operators, dispatchers, communication service providers and radio operators, training organizations, central monitoring and reporting agencies, automation specialists at centers and radio facilities, and aircraft manufacturers and equipment suppliers.

2.5 The guidance will support the following activities:

- a) the States' roles and responsibilities in relation to the following:
  - 1) safety regulatory oversight of air navigation services;
  - 2) operational approval, flight crew training and qualification;
  - 3) airworthiness specification of aircraft SATCOM voice systems
- b) the development of agreements and/or contractual arrangements between air traffic service providers and aircraft operators and their respective communication service providers;
- c) development of operational procedures; and
- d) operational monitoring, analysis, and exchange of operational data among regions, States, Regional Safety Oversight Organisations (RSOOs) and communication service providers.

### 3. Status

3.1 This guidance may contain material that may eventually become Standards and Recommended Practices (SARPs), or PANS provisions when it has reached the maturity and stability necessary for adoption or approval. It may also comprise material prepared as an amplification of the basic principles in the corresponding SARPs, and designed particularly to assist the user in the application of the SARPs and PANS.

### 4. Implementation

4.1 The implementation of procedures is the responsibility of Contracting States; they are applied in actual operations only after, and in so far as, States have enforced them. However, with a view to facilitating their processing towards implementation by States, this complementary guidance material has been prepared in language which will permit direct use by air traffic services personnel and others associated with the provision of air traffic services to international air navigation.

### 5. Promulgation of information

5.1 Information relating to the establishment and withdrawal of and changes to facilities, services and procedures affecting aircraft operations should be notified and take effect in accordance with Annex 15 — Aeronautical Information Services.

### 6. References

*Editor's note 1. — Revised from GOLD, need further review of references for applicability to SATCOM voice. Add missing references. Probably need to add FAA, EASA, RTCA/Eurocae references too.*

6.1 The following references are cited in this document:

- a) ICAO Annex 1 — *Personnel Licensing*;
- b) ICAO Annex 2 — *Rules of the Air*;
- c) ICAO Annex 4 — *Aeronautical Charts*;
- d) ICAO Annex 6 — *Operation of Aircraft – Part I — International Commercial Air Transport — Aeroplanes*;
- e) ICAO Annex 10 — *Aeronautical Telecommunications – Volume II — Communication Procedures* including those with PANS status;
- f) ICAO Annex 10 — *Aeronautical Telecommunications – Volume III — Communication Systems*;
- g) ICAO Annex 11 — *Air Traffic Services*;
- h) ICAO Annex 15 — *Aeronautical Information Services*;
- i) *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, ICAO Doc 4444);
- j) *Regional Supplementary Procedures* (Regional SUPPs, ICAO Doc 7030);
- k) *Procedures for Air Navigation Services — ICAO Abbreviations and Codes* (PANS-ABC, ICAO Doc 8400);
- l) *Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services* (ICAO Doc 8585);
- m) *Aircraft Type Designators* (ICAO Doc 8643);
- n) *Manual on Airspace Planning Methodology for the Determination of Separation Minima* (ICAO Doc 9689);
- o) *Performance-based Navigation Manual* (PBN) (ICAO Doc 9613);
- p) *Manual on Required Communication Performance* (RCP) (ICAO Doc 9869);
- q) *Manual on the Aeronautical Mobile Satellite (Route) Service* (ICAO Doc 9925).
- r) European Commission Regulation (EC) No 859/2008 of 20 August 2008 amending Council Regulation (EEC) No 3922/91 as regards common technical requirements and administrative procedures applicable to commercial transportation by aeroplane (so called “EU-OPS” having replaced the former JAR OPS-1)

## 7. Changes to the document

This document is maintained as a regional document in coordination with all ICAO planning and implementation regional groups (PIRGs) providing data link services within their region. Each participating PIRG establishes a mechanism for submitting and administering change proposals.

Change proposals (CPs) can be submitted by any stakeholder participating in data link operations. The stakeholder should submit a Change Proposal to their ICAO regional office (see **Error! Reference source not found.**). The ICAO regional office will coordinate the change proposal within its own region, other regions, and ICAO HQ, to determine the acceptability of the change proposal. Once the ICAO regional office has completed coordination and the participating PIRGs accept the change proposal, the change is concluded by each of the PIRGs.

## 8. Amendments to the SVGM

<b>Amendment</b>	<b>Source(s)</b>	<b>Subject(s)</b>	<b>Approved applicable</b>
1 <sup>st</sup> Edition (2011)	Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/22 – 2011) North Atlantic Systems Planning Group (NAT SPG/48 – 2012)	<i>Satellite Voice Guidance Material (SVGGM)</i>	Applicable within participating Regions on 1 July 2012.