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**LEGAL AND REGULATORY DEVELOPMENTS IN AERONAUTICAL
COMMUNICATIONS AND NAVIGATION**

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I Background and Introduction

We will recall, it was stated at the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space convened in 1981, that: ...“ICAO is responsible for developing the position of international civil aviation on all matters related to the study of questions involving the use of space technology for air navigation purposes, including the determination of international civil aviation’s particular requirements in respect of space technology”.²

Consequently, the Special Committee on Future Air Navigation Systems (FANS) was established in 1983 by the International Civil Aviation Organisation (ICAO) Council as a subsidiary body. The Council defined the terms of reference of the FANS Committee as follows:...“To study technical, operational, institutional and economic questions, including cost/benefit effects, relating to the future potential air navigation systems; to identify and assess new concepts and new technology, including satellite technology, which may have future benefits for the development of international civil aviation including the likely implications they would have for users and providers of such systems; and to make recommendations thereon for an overall long term projection for the co-ordinated evolutionary development of air navigation for international civil aviation over a period of twenty-five years”.³

Furthermore, at the 10th Air Navigation Conference convened in 1991, the conference considered Agenda Item 2 - *Consideration of the future air navigation systems (FANS) concept for the future air navigation system, and its capability of correcting the shortcomings of the present communications, navigation, and surveillance (CNS) system*. That conference was presented with an overview of the FANS concept for the future air navigation system, consequent upon which a communication, navigation, and surveillance (CNS) and air traffic management (ATM) concept for FANS was endorsed and developed.⁴

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²ICAO UNISPACE II Report on the Civil Aviation interests in the Use of Outer Space, Background Paper, I.A/CONF.101/BP/IGO/1 (1981). See also, the ICAO Assembly Resolution A15-1 adopted in 1965, at its 15th Session (now superseded and re-named as Resolution A29-11).

³ See ICAO Doc. 9527 – C/1078 C Min 110 and CMin 110/9 (1983); ICAO Doc. FANS/1-Report 1-1(9-13 July 1984); International Maritime Satellite Organisation, *On the Air in Never Beyond Reach - The World of Mobile Satellite Communications*, (ed. Brendan Gallagher) 1989, ISBN 09514469 08, at page 146. For a discussion of events leading up to this decision, see B.D.K. Henaku, *The Law on Global Air Navigation by Satellite: A Legal Analysis of the CNS/ATM System*, 1998, at pages 66 to 70; Guldemann W. Kaiser S. *Future Air Navigation Systems - Legal and Institutional aspects*. Martinus Nijhoff Publishers, 1993 at page 148; Henri Wassenbergh, *Principles of Space Law in Hindsight*, Martinus Nijhoff, 1991, at page 110 to 119; Athar Husain Khan, *Aeronautical Communication, Navigation and Surveillance By Satellite – Towards a Global Framework for Civil Aviation*, in *De Lege Ferenda, Essays in Honour of Henri A. Wassenbergh*, (eds. Tanja Masson-Zwaan and Pablo M.J. Mendes De Leon, Martinus Nijhoff Publishers, 1992, at pages 43 to 51; Milde M.: Legal Aspects of Future Air Navigation Systems, *Annals of Air & Space Law*, Vol XII, 1987 at pages 87-98; Milde M.: Legal Aspects of Global Air-Ground Communication in G.R. Bacelli (Ed.), *Liber Amicorum Honouring Nicolas Matesco Matte – Beyond Boundaries*, Paris 1989, pages 215 – 218; Stofel W.: Legal Aspects of Aeronautical Mobile Satellite Services – The ICAO FANS Concept, *Proceedings of the 36th Colloquium of the International Institute for Space Law*, 1993, pages 116-121; Hong-kyun S.: & Soon-Kil H.: Legal Aspects of Space Activities of ICAO in implementing FANS, *Proceedings of the 36th Colloquium of the International Institute for Space Law*, 1993, pages 98-115.

⁴ See ICAO Doc. 9524 – FANS (2-20 May 1988); ICAO Doc. 9583 – AN-CONF/10 (5-20 September 1991), Recommendation 9/1 at 9-3; V.P. Galotti Jr, *The Future Air Navigation System (FANS)*, Ashgate, 1997 at pages 4 to 5; Alessandra A.L. Andre, *The Global Navigation Satellite System*, Ashgate, 2001, at pages 3 to 4.

This paper addresses the most recent legal and regulatory developments applicable to the communications and navigation elements of the global CNS/ATM plan for international civil aviation.⁵ Note that the communications element in CNS/ATM systems, as envisaged by ICAO, encompasses the complementary use of satellite-based and terrestrial-based technology to provide global coverage in the exchange of aeronautical data and voice communication between users and/or automated systems. Such communications may be of a “Fixed” or “Mobile⁶” nature intended for “safety” or “non-safety” purposes. In addition, designed to provide accurate, reliable and seamless position determination capability, worldwide, by means of satellite-based aeronautical navigation, the navigation element of the CNS/ATM systems is characterised by the progressive introduction of area navigation (RNAV) capabilities along with the global navigation satellite system (GNSS).⁷

Therefore, Section II and III of this paper dwell on some of the pertinent and current legal/regulatory issues arising as a result of technological developments and competition in the provision of non-safety⁸ aeronautical mobile satellite services (AMSS)⁹ as well as the perceived institutional/legal issues pertaining to the provision of navigation services to civil aviation. Section IV considers both elements (i.e., non-safety communications and navigation) of the CNS/ATM system especially in the African context and concludes the paper with some recommendations.

II Regulating the Provision of Non-Safety Aeronautical Mobile Satellite Communications¹⁰

The provision of non-safety aeronautical communications is subject to the interpretation, application and national implementation by States, of a fair number of treaties and other international instruments governing activities in national airspaces, polar and oceanic air spaces as well as outer space. A common theme underlying the compliance with most of these instruments is the influence and effect of the national legal systems of sovereign States. The basis for this is that firstly States are deemed responsible for the authorization, certification or the provision of services in the airspace for which they are accountable in addition to having complete and exclusive sovereignty in their territory and the airspace above it¹¹. Secondly States retain the responsibility and right to control and regulate telecommunications taking place within their respective territories.¹² The consequences of the two observations made hereinbefore is, that there

⁵ For a discussion on the use of satellite communications and navigation for international maritime purposes, see the 1979 *Convention on the Establishment of the International Maritime Satellite Organization*; Stephen Doyle, *INMARSAT: The International Maritime Satellite Organisation – Origins and Structure*, 5 J. SPACE L. (1977) at pages 45 to 63; Nandasiri Jasentuliyana *The International Maritime Satellite System in Manual on Space Law* (eds. N. Jasentuliyana and R. Lee) 1979, Oceana Publications, at pages 439 to 465; Francis Lyall, *Law and Space Telecommunications*, Dartmouth Publishing Company Limited, 1989, at pages 209 to 243; David Sagar, *GNSS and Maritime Navigation*, Proceedings of the International Bar Association Conference, 2000, The Netherlands, 17-22 September 2000.

⁶ ICAO has identified Air traffic services, Aeronautical operational control, Aeronautical administrative communications, and Aeronautical Public Correspondence as the 4 (four) types of aeronautical satellite communications within the Aeronautical Mobile Satellite Service (AMSS) category which can be conducted to and from aircraft. See Guldimann W, Kaiser S. op. cit. at page 154; Henri Wassenbergh, op. cit., at page 114.

⁷ See UN Doc. A/AC.105/846, 30 March 2005, at page 5 (Report on the United Nations/United States of America International Meeting on the Use And Applications of Global Navigation Satellite Systems).

⁸ Going by ICAO definitions in note 6 supra, non-safety aeronautical communications would be classified as “Aeronautical Public Correspondence”.

⁹ See Definitions provided in Article 1 paragraph 27 and paragraph 35 of the ITU Radio Regulations. Edition of 2001, adopted by the World Radio Conference 1995 (Geneva), revised and adopted by World Radio Conference 1997 (Geneva) and World Radio Conference 2000 (Istanbul).

¹⁰ Tare Brisibe, *Convergence and Technology Acceleration in non-safety Aeronautical Satellite Communications: Policy for the 21st Century*, Space Policy, Vol. 21 Issue 3, August 2005, at pages 185 -194.

¹¹ On State sovereignty in airspace, see: Article 1 to the 1944 International Convention on Civil Aviation, Chicago, done 7 December 1944, entered into force 4 April 1947; 15 UNTS 296; Bin Cheng, *The Law of International Air Transport*, 1962, at page 122; Peter Haanappel, *The Law and Policy of Air Space and Outer Space, A Comparative Approach*, Kluwer Law International, The Netherlands, 2003 at page 15; Guldimann W, Kaiser S. op. cit. at page 9; Tare Brisibe, *State Sovereignty and Aeronautical Public Correspondence by Satellite*, JALC Vol. 69 Part IV, 2005.

¹² See Preamble to the Constitution and Convention of the International Telecommunication Union, Decisions, Resolutions and Recommendations, Final Acts of the Plenipotentiary Conference of the International Telecommunication Union (Kyoto, 1994), Instruments amending the Constitution and Convention of the International Telecommunication Union (Geneva, 1992) ITU, Geneva, 1995, ISBN 92-61005521-4

is no *a priori* freedom to operate radio transmitters for telecommunications within the territory of a foreign State.¹³

Generally speaking, the pertinent international instruments applicable to non-safety aeronautical communications relate namely to the regulation of satellite telecommunications; international civil aviation; trade in services and the protection of copyrights,¹⁴ subject to compliance with the provisions of *inter alia*, Articles III, VI, VII, and VIII, of the 1967 Outer Space Treaty¹⁵, the combined effect of which impose responsibility on States Parties to the Treaty to ensure that any space activities performed by non-governmental entities are authorised and continually supervised by that State Party, in accordance with international law.¹⁶ It was stated¹⁷ in 2003, that approximately 3,000 (three thousand) aircraft have been equipped with satellite communications systems. The majority being configured for *inter alia* non-safety aeronautical communications. In effect, the state of the art allows for the connection of onboard facilities with existing fixed networks e.g. domestic telephone networks, in addition to permitting the switching of connections to other aeronautical passenger facilities, thus enabling personal communications by/for passengers and crew. The range of communications services includes voice, and high speed data communications. It is anticipated that this portfolio will be extended to include audio-visual services.

On the current state of the Regimen, one must therefore consider balancing the rights of sovereign States to regulate telecommunications conducted in their respective territories (including airspace), within the framework of their national laws and policies, against the need for satellite operators and their service providers of non-safety aeronautical communications service providers to comply with international as well as national legal and regulatory frameworks. This equilibrium ought to be achieved bearing in mind the fact that operators and their service providers deserve to gain competitive access to national markets under transparent and non-discriminatory regulatory procedures.¹⁸

Bearing the above in mind, what has been defined by the International Telecommunication Union (ITU) as the AMSS offers digital voice and data services and was traditionally provided through the mobile satellite service radio-frequency bands 1 545 MHz - 1 555 MHz and 1 646.5 - 1 656.5 MHz. At the World Radio Conference (WRC) 2000 a Resolution 216 (*Possible broadening of the Secondary allocation to the mobile-satellite service (Earth-to-space) in the band 14-14.5 GHz to cover aeronautical applications*) to:

...”examine the possibility of broadening the secondary allocation to the mobile-satellite service (Earth-to-space), except aeronautical mobile-satellite, in the 14-14.5GHz band to include aeronautical use, if the ITU Radiocommunications Sector studies demonstrate that such a secondary service can be operated without causing interference to the primary services”.

¹³ Henri Wassenbergh, op. cit., at page 110.

¹⁴ The scope of this paper is limited to legal regulatory issues arising from international instruments regulating satellite telecommunications and international civil aviation. For discussions on the regimen relating to international trade in telecommunications services (including satellite based services) as well as the protection of copyrights, see: Andreas F. Lowenfeld, *International Economic Law*, Oxford University Press, 2002, at pages 125 to 131; World Intellectual Property organisation: *Intellectual Property Handbook*.

¹⁵ *Treaty on principles Governing Activities in the Exploration and Use of Outer Space, including the Moon and other Celestial bodies* (hereinafter Outer Space Treaty), London/Moscow/Washington, adopted 19 December 1966, opened for signature 27 January 1967, entered into force 10 October 1967, 610 UNTS 205.

¹⁶ For a discussion on the extent to which the Outer Space Treaty and national law impacts on the activities of private entities, see Henri Wassenbergh, op. cit., at pages 22 to 31; Phillip Dan, *The Future Role of Municipal Law in Regulating Space Related Activities*, in *Space Law: Views of the Future*, (eds. Tanja L. Zwaan and Walter W.C. De Vries) Kluwer Law and Taxation Publishers, 1988, at pages 125 to 134; Frans G. Von der Dunk, *Public Space and Private Enterprise – The Fitness of International Space Law Instruments for Private Space Activities*, 1999 Proceedings of the Project 2001 – Workshop on Legal Issues of Privatising Space Activities, at page 12.

¹⁷ See ICAO Doc. AN-Conf/11-IP/1.A Agenda Item 7.

¹⁸ Tare Brisibe, *Policy and Regulatory Developments in Asia-Pacific after the GMPCS-MoU and the WTO General Agreement on Trade in services: A Case for GMPCS System Operators*, PTR, Volume 21 No. 3, 1st Quarter 2000.

Technical studies conducted by the ITU concluded that appropriately designed AMSS systems can operate on a secondary basis in the 14-14.5 GHz band without causing harmful interference to services having primary allocations in the band. Additional studies also showed the feasibility of AMSS systems sharing with services operating under secondary allocations in the said band. Consequently, a draft new Recommendation (ITU-R M.1643)¹⁹ was approved at the WRC 2003. What is relevant to the thrust of this paper is that the Recommendation provides technical guidelines for operation and licensing of AMSS networks by States within the framework of their national laws and policies to ensure compatible operations with other services operating in the band.

With respect to the provision of audio-visual services²⁰ to aircraft we will recall that as far back as the 1960's, the medium of television gave rise to what has been described as an international awareness of both immense potential advantages that would permit the acceleration of national programmes of integration, economic development, health, agriculture, education, communal development and culture as well as potentially serious problems in the form of:

- Programmes deliberately transmitted from one State to another in order to achieve certain political objectives, e.g. propaganda, incitement and interference with internal affairs of another State;
- Programmes which while not unfriendly, contain material or employ techniques that would be prohibited in the receiving States. This could include programmes containing violence or obscenity or even commercial advertising messages, particularly where subliminal advertising techniques might be employed;
- Programmes that are unwanted largely because they are foreign. This could include news or public information programmes that depict events from the viewpoint of the originating State. It could include programmes that serve to depict a foreign way of life in such a manner as to glorify that way of life or belittle the culture of others or to raise expectations in the receiving country.

At present there is a deadlock in the process of developing international instruments to govern DBS.²¹

As far as international civil aviation is concerned, non-safety aeronautical communications is subject to the provisions of the 1944 Chicago Convention as well as ICAO Assembly Resolution 36/1 (now known as Resolution A29-19) adopted at the 29th Session in 1992. More specifically, the Chicago Convention's Article 30(a) provides that:

“Aircraft of each contracting State may, in or over the territory of other contracting States, carry radio transmitting apparatus only if a license to install and operate such apparatus has been issued by the appropriate authorities of the State in which the Aircraft is registered. The use of radio transmitting apparatus in the territory of the Contracting State whose territory is flown over shall be in accordance with regulations prescribed by that State”.

¹⁹ *Technical and Operational requirements for aircraft earth stations of aeronautical mobile-satellite service including those using fixed-satellite service network transponders in the band 14-14.5 GHz (Earth-to-space)*.

²⁰ Also known as Direct broadcast satellite services (DBS), are considered as “a radiocommunication service in which signals transmitted or retransmitted by space stations are intended for direct reception by the general public. In the broadcasting satellite service, the term direct reception shall encompass both individual and community reception”. See Article 1 paragraph 38, ITU Radio Regulations.

²¹ *The Distribution of Programme Carrying Signals Transmitted By Satellite*, in *Manual on Space Law* (eds. N. Jasentuliyana and R. Lee) 1979, Oceana Publications, at pages 239 to 253; Jan Busak, *The Need for an International Agreement on Direct Broadcasting By Satellites*, 1 J. SPACE L. (1973) at pages 139-154; Aldo Armando Cocca, *The Supreme Interests of Mankind Vis-a-Vis The Emergence of Direct Broadcast*; 2 J. SPACE L. (1974) at pages 83 to 94; Carl Christol, *The 1974 Brussels Convention relating to the Distribution of Programme Carrying Signals Transmitted By Satellite: An Aspect of Human Rights*, 6 J. SPACE L. (1977) at pages 19 to 35; P. Rainer, D. Gregory, R.V. Harvey, A. Jennings, *Satellite Broadcasting*, John Wiley & Sons, 1985, at pages 242 to 266; David Fisher, *Prior Consent to International Direct Satellite Broadcasting*, Martinus Nijhoff Publishers, 1990, pages 152 to 186; Carl Christol, *Space Law – Past, Present and Future*, Kluwer Law, 1991, at pages 115 to 130; M. Lesueur Stewart, *To See The World – The Global Dimension in International Direct Television Broadcasting By Satellite*, Martinus Nijhoff, 1991, pages 3 to 100.

Furthermore, Article 30(b) of the Chicago Convention provides that:

“Radio transmitting apparatus may be used only by members of the flight crew who are provided with a special license for the purpose, issued by the appropriate authorities of the State in which the aircraft is registered”.

Previous attempts at interpreting²² the provisions of Article 30(a) and 30(b) of the Chicago Convention and how these Articles apply to S-APC were made in 1989. The results of a comprehensive study led to the passing of ICAO Assembly Resolution 36/1 (now known as Resolution A29-19) adopted at the 29th Session in 1992 referred to hereinbefore. The issue therefore is whether the said Articles of the 1944 Chicago Convention and the relevant ICAO Assembly Resolution constitute the most appropriate international legal basis for States to implement national laws regulating non-safety aeronautical communications, considering advances in technology prevailing in the new millennium.

III Institutional and Legal Issues relating to Navigation²³

Future and current navigation providers include the Global Positioning System (GPS) (United States), the Global Navigation Satellite System (GLONASS) (Russian Federation) and Galileo (European Union). Regional or augmentation system providers include GPS AND Geo-Augmented Navigation System (GAGAN) (India), the European Geostationary Navigation Overlay Service (EGNOS) (European Union), the Wide-Area Augmentation System (WAAS) (United States), the Multi-Transport Satellite-Based Augmentation System (MSAS) (Japan), Beidou (China).²⁴

In this regard, the ICAO Assembly Resolution A32-20, paragraph 5, had instructed the Council and the Secretary General, within their respective competencies, and beginning with a Secretariat Study Group, to:

- a) ensure the expedited follow-up of the recommendations of the Worldwide CNS/ATM Systems implementation Conference, as well as those formulated by the Panel of Legal and Technical Experts on the Establishment of a Legal Framework with Regards to GNSS especially those concerning institutional issues and questions of liability; and
- b) consider the elaboration of an appropriate long-term legal framework to govern the operation of GNSS systems, including consideration of an international convention for this purpose, and to present proposals for such a framework in time for their consideration by the next ordinary session of the Assembly.

It is on record that the Secretariat Study Group on Legal Aspects of CNS/ATM Systems held five meetings between April 1999 and March 2001²⁵. Based upon the progress report described above at the 33rd Session, it was decided *inter alia*:

- a) that further work on the legal aspects of CNS/ATM systems be carried out so as to finalize the concept of a contractual framework for CNS/ATM as an interim framework and provide a path toward its implementation, including the consideration of an international convention, having regard to the following guidance to:

²² See ICAO Doc. LC/28-WP/4-1 4/11/91. Report of the Rapporteur on the Legal Aspects of the Global Air-Ground Communications; Milde M. *United Nations Convention on the Law of the Sea – Possible implications for International Air Law*, *Annals of Air & Space Law*, 1983, Vol. VIII, pages 167 – 200.

²³ See generally, Paul B. Larsen, *Global Navigation Satellite Systems: Universal Technology Under Divisive Legal Regimes*, Vol. XXVII *Annals of Air & Space Law*, 2002 at pages 387 to 399; Michael Milde, *Institutional and Legal Problems of the Global Navigation Satellite System (GNSS): Solutions in Search of a Problem*, in *The Utilization of the World’s Air Space and Free Outer Space in the 21st Century*, (eds. Chia-Jui Cheng and Doo Hwan Kim), Kluwer Law International, 2000, at pages 337 to 357.

²⁴ UN Doc. A/AC.105/846, 30 March 2005, at page 5. (Report on the United Nations/United States of America International Meeting on the Use And Applications of Global Navigation Satellite Systems).

²⁵ ICAO Doc. A33-WP/34, Progress Report on the Establishment of a Legal Framework with regard to CNS/ATM Systems including GNSS.

- 1) be mindful of States' reliance on others to provide all or part of their CNS/ATM services;
- 2) consider carefully the kinds of relationships States should have with providers of services or elements of services; and
- 3) ensure that States retain full responsibility under the Chicago Convention for services provided on their behalf; and

b) that a report be presented to the next ordinary session of the Assembly.

Pursuant to this decision, the Secretariat Study Group on Legal Aspects of CNS/ATM systems finalized its work in January 2004. It reports to have reviewed the current legal framework applicable to CNS/ATM systems, identified certain inadequacies, discussed in detail a contractual framework for the systems, and studied the possibility of an international convention for this purpose²⁶. Specific details of progress made to date include the production of a *Charter on the Rights and Obligations of States Relating to GNSS Services* (Assembly Resolution A32-19) and a *Statement of ICAO Policy on CNS/ATM Systems Implementation and Operation* (approved by the Council on 9 March 1994). The report noted the general agreement that there is no legal obstacle to implementation of CNS/ATM and that nothing in the concept is inconsistent with the Chicago Convention. The Group also found no substantive gaps in the major national liability²⁷ systems it studied to the exception of two specific and limited procedural concerns having to do with sovereign immunity and inconvenient forums for claims in some countries.

In addition, the Report reflects consideration of a contractual framework involving detailed discussions aimed at concluding a set of contractual clauses in the form of a “*Draft Contractual Framework Relating to the Provision of GNSS Services*”. No consensus was reached on this issue. With regards to an international convention it is stated that there were two schools of thought in the Study Group regarding an international convention as a long-term legal framework to govern the operation of GNSS systems. One was that, at present, not enough experience had been gained with the implementation of CNS/ATM systems, and GNSS in particular, and that it was therefore premature at this point to elaborate and draft an international convention. The other was that an international convention was necessary and desirable. Whether or not an international convention is necessary at this time remains moot.

IV Harmonisation of non-safety Aeronautical Communications and Navigation under African Skies

It is submitted that the global nature of non-safety aeronautical communications and navigation can only be efficiently regulated within a framework that is uniform on as wide a scale as possible. Furthermore, technological developments, in the non-safety aeronautical communications service sector of the mobile-satellite industry is witnessing the coming together of what were previously thought of as separate actors, namely, telecommunications, information technology and media. This development has brought to the forefront a challenge to law and regulation. Both the *International Agreement on the Use of INMARSAT Ship Earth Stations within the Territorial Sea and Ports of 1985*²⁸ as well as the *Global Mobile Personal Communications By Satellite Memorandum of Understanding & Arrangements*²⁹ have enabled a fair amount of success in providing a uniform framework for the respective services which they seek to regulate, i.e.

²⁶ The final report on the work of the Secretariat Study Group on Legal Aspects of CNS/ATM systems is set out in *Final Report on the Work of the Secretariat Study Group on Legal Aspects of CNS/ATM Systems*, the Appendix to Doc. A35-WP/75, 28/07/04.

²⁷ Cf discussions pertaining to possible liability scenarios for satellite navigation services, by: Francis P. Schubert, *An International Convention on GNSS Liability: When Does Desirable Become Necessary?*, Vol. XXIV *Annals of Air & Space Law*, (1999) at page 245; Michael Milde, *op. cit.*, *Supra* note 23 at pages 354 to 356; Frans G. von der Dunk, *Galileo and Liability: Towards a Coherent System*, IBA Newsletter of Outer Space Committee of the Section on Business Law, Vol 5 No. 2, August 2003 at pages 5 to 15; Frans G. von der Dunk, *Liability for Global Navigation Satellite Services: A Comparative Analysis of GPS and Galileo*, 30 *J. SPACE L.* (2004) at pages 129 to 167.

²⁸ The primary objective of the contracting parties was the stipulation of reciprocal rights and duties with a view to facilitating the circulation of satellite communications terminals employed on maritime platforms.

²⁹ Under the GMPCS MoU and Arrangements the States participating in the Agreement undertook primarily to adjust their national laws and practices to international licensing standards, through the mutual recognition of type approval procedures between States in order to achieve uniformity in the field of facilitation of mobile-satellite services.

maritime mobile-satellite services and land mobile-satellite services, respectively. It is therefore appropriate for this author to recommend that a specific and comprehensive multilateral instrument formulated specifically for non-safety aeronautical mobile-satellite services, within the remit of an appropriate institutional authority of a binding nature, supplemented by national laws, would provide lasting solutions.

With respect to GNSS, it is also submitted that what may be of immediate relevance to the African region is the feasibility of harmonising the provision of GNSS systems (in the context of the global CNS/ATM plan) applications under “one African Sky” similar to the “Single European Sky” as recommended by the Action team on GNSS established pursuant to the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III).³⁰ According to Article 28 of the Chicago Convention, States are required to provide air navigation facilities, systems and procedures within their territory. In pursuance hereof, States are responsible for the provision and maintenance of air navigation facilities. Likewise, States bear responsibility for the utilisation of those facilities to provide air navigation services to aircraft flying over, into or out of their airspace. While States have retained their sovereignty different types of international organisations have been set up over the years to undertake specific activities.

The FANS II defined three major institutional concepts which had a bearing on the level of acceptability of the CNS/ATM system and consequently on the level of global implementation of the identified options. The three concepts identified were ownership, control and operation.

- 1.) FANS considered ownership to be the quality to have or hold CNS/ATM including GNSS space segment or ground based infrastructure as property, which provides the owner with a number of rights and obligations, within the boundaries of laws, regulations and agreements.
- 2.) Control, on the other hand, was perceived as providing the competence to exert control over policy and to define the framework for operations. Exerting control means, for example to influence standard-setting, and to define procedures and financing arrangements.
- 3.) Operation is the provision of a CNS/ATM including GNSS system and the related services in compliance with ICAO Standards and Recommended Practices. The operator of the space or ground based infrastructure is tasked with day to day management responsibilities. The operational functions may include technical management, financial management and commercial management.

What can be distilled from the FANS implementation options is that although ownership of the GNSS system is not the most essential element, dependence on inaccurate and single state system is not conducive to safety of international air navigation nor acceptable to States. An effort could therefore be made to ensure global civil owned and accurate GNSS system. Alternatively, or as a transitional measure, regional augmentation systems could be implemented and eventually interconnected to achieve the ultimate goal of a seamless airspace. A number of implementation options are therefore left open to African States without prejudice to the functions of ASECNA (The Agency for Air Navigation Security in Africa and Madagascar) of which 16 African countries are members.

³⁰ UN Doc. A/AC.105/846, 30 March 2005, at page 9. (Report on the United Nations/United States of America International Meeting on the Use And Applications of Global Navigation Satellite Systems).