INTERNATIONAL CIVIL AVIATION ORGANISATION

AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP
THIRTEENTH MEETING (APIRG/13)
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Agenda Item 8 : Institutional aspects of CNS/ATM Systems

INSTITUTIONAL ASPECTS OF CNS/ATM SYSTEMS

(Presented by AFCAC)

1. Introduction

In defining the CNS/ATM concept, the ICAO FANS Committee institutionalised the technological advances in the field of communication, navigation and surveillance based on the use of satellites applied to air traffic management.

To the technological revolution of satellite equipment should succeed an "institutional revolution". The modes of funding equipment and air navigation services are disrupted by the introduction of technologies whose design, purchase and maintenance are affected by the authorities of a State other than the State whose airspace is used.

ICAO Contracting States, under the Chicago Convention , are responsible for air navigation services provided to aircraft using their airspace, including when such services are controlled by another State.

2. Legal Aspects

Conventional navigation aids are implemented and maintained by States (possibly through private or semipublic bodies) which are responsible for them under Article 28 of the Convention on international civil aviation.

The use of navigation means and satellite communication has introduced between the user and the contracting States whose airspace is operated, a service provider whose responsibilities have not been so far clearly defined.

That is why the 32nd Session of the ICAO Assembly adopted in October 1998 Resolution A32-19: Charter on States' rights and obligations with respect to GNSS services.

This charter is the first institutional framework for the use of the GNSS services. However, the majority of contracting States were in favour, during the world-wide Conference on the funding of CNS/ATM systems (Rio de Janeiro, May 1998), of the signature of the international Convention on the GNSS. To this end, the 32nd Session of the ICAO Assembly adopted Resolution AS-32/20: Definition and establishment of an appropriate legal framework in the long term governing GNSS implementation.

Pursuant to this Resolution, the Panel of Legal and Technical Experts on the Establishment of a Legal Framework with regard to GNSS (LTEP) met 5 times. The main conclusions of the Panel are summarized

below (extracts of the Appendix A to draft working paper C-WP/11631 which will be examined by the ICAO Council at its 163rd Session).

<< **Institutional issues**

In the discussions of the Group on the institutional issues relating to GNSS, it was recognized that the long-term GNSS would still be evolving. In this connection, the Group noted the initiative in Europe to develop Galileo as a new generation of satellite navigation services. This would bring new developments relating to the institutional aspects of GNSS. Accordingly, institutional issues needed to be revisited in the future as Galileo and other systems further developed.

The Group considered the implications of Article 28 of the Chicago Convention in the context of GNSS and concluded that the implementation of GNSS left unaffected the responsibility of States under Article 28. The consensus of the Group was that there was no need to amend Article 28 of the Convention. At the same time, the Group recognized that in providing such services once GNSS was implemented, most States had to rely on signals-in-space and their augmentation provided by others. Accordingly, additional arrangements establishing a link between the provider or providers of signals-in-space and the State having jurisdiction under Article 28 needed to be considered.

Liability issues

The Group devoted a substantial amount of time to discuss the issue of liability relating to GNSS. The review of the national law of certain States representing different legal systems, based on the working papers presented to the Group, showed that the substantive law governing the liability of air traffic control agencies, which would likely apply in case of failure or malfunction of GNSS systems, was based on fault. It was, in particular, based on negligence (wrongful action or omission, in the case of one State on gross negligence) and it required proof of fault of the ATC agency, or its employees or agents.

It is the conclusion of the Group that the substantive law referred to in he preceding paragraph is reasonably adequate to determine or apportion liability arising from accidents involving failure or malfunction of GNSS systems. However, procedural rules and, in particular, rules relating to jurisdiction are not fully adequate to bring all parties before the same court with a view to ensuring prompt and equitable compensation. In particular, application of the doctrine of sovereign immunity and related principles may in many cases render court action against foreign States or agencies of a foreign State providing ATC or GNSS signals, facilities and services in countries other than their home States difficult or impossible. On the other hand, non-sovereign entities can generally be sued in any place where they have a presence, since the doctrine of sovereign immunity does not apply to them. Nevertheless, the problem of being able to bring them before he same court may exist for other reasons.

The Group had detailed and lengthy discussions concerning the possible approaches to the problem of liability. It noted that the Montreal Convention of 1999 will go a long way towards ensuring prompt and adequate compensation of airline passengers and shippers. A part of the Group believed that in order to achieve universality and certainty of the new air navigation system, the issue of liability should be dealt with under a universal regime and should not be left to national law. Another part of the Group, however, did not consider it necessary to establish a new universal liability system or a liability convention for GNSS, since there was no indication that the current liability regime under domestic law could not cope with GNSS, and further, since there was no connection between GNSS and the perceived gaps in the liability system.

Eventually, the Group supported a middle ground, namely to explore the approach of a contractual framework. It further agreed that such agreements or contracts forming part of the contractual framework should incorporate a number of common elements, some of which are relating to liability. Such common elements should include at least the following:

a) participants in GNSS, including the contractual provider of services, shall comply with the SARPs of ICAO;

b) the issue of sovereign immunity;

c) while an Article 28 State remains entirely responsible for provision of ATC services in its territory, other participants also at the same time are responsible for the services or elements they undertake to perform; consequently, Article 28 States may wish to ensure that an adequate recourse mechanism is established;

d) participants in GNSS shall ensure that they have adequate means of risk coverage; and

e) liability should be based on fault.

The long-term legal framework for GNSS

Most Members of the Group indicated their dissatisfaction with the status quo of the legal framework. A part of the Group supported the continued exploration of the development of an international convention, which they believed had been an option favoured by the vast majority in LTEP, the Rio Conference and the 32nd Session of the Assembly. They saw the contractual framework as a flexible interim solution from which an international convention or other binding instruments might evolve. Another part of the Group believed that, based on the Group's analysis, the current legal system would adequately address the issues relating to GNSS. These Members took the view that no weaknesses were identified in the general universal long-term framework. Only two potential procedural difficulties were identified in the existing liability framework. They also noted that the LTEP, the Rio Conference and the 32nd Session of the Assembly preceded the analysis carried out in the Study Group.

The middle-ground approach referred to in the paragraph above supported the exploration of a contractual framework. The contractual framework would be a non-mandatory framework and would cover the relationships among different players in various stages of the provision of GNSS services, including primary signal providers, augmentation signal providers, and States having jurisdiction under Article 28 of the Chicago Convention.

In view of the possibility that the contracts relating to GNSS would be negotiated separately among different and numerous parties, the Group recognized that in order to maintain a desired degree of uniformity and to provide essential assurances of confidence in CNS/ATM systems, a set of common elements should be applicable to all the contracts. These common elements are intended to have considerable persuasive force in the search for uniformity. Some of the common elements relating to liability have been identified in paragraph 3.3. above. These arrangements must be consistent with the *Charter on the Rights and Obligations of States Relating to GNSS Services*, which was adopted by the 32nd Session of the Assembly (Resolution A32-19).

In order to ensure that States or other entities would incorporate the common elements into their respective contracts, there would be a need to list all the common elements in one document It was suggested by the Study Group that an Assembly resolution, and possibly also regional air

navigation plans, could be used as a document to list these common elements. States and other entities may then adopt these elements in their contracts. Further study of these matters relating to the long-term legal framework would be required, which should, however, not delay implementation of CNS/ATM.

Consideration of issues relating to liability and other legal principles relating to communications by satellite

This item had been included in the agenda of the Study Group and some aspects of it had been discussed. The Group noted the widespread use of liability disclaimer clauses in the telecommunication industry, including the satellite communications industry. It was of the view that liability relating to the communications was an important issue and may have direct implications for other elements of CNS/ATM systems. Further study was therefore considered necessary in the context of CNS/ATM systems as a whole.

Unlawful interference with CNS/ATM systems

This item has also been included in the agenda of the Study Group. The threat for the safety of civil aviation from unlawful interference with CNS/ATM systems, including both jamming and spoofing of broadcast signals and intrusion into air traffic control data networks, was noted by the Group. A concern was expressed in the Group regarding the inadequacy of the current legal framework in dealing with this issue. The Group recognized the importance of this issue and the need for further study as part of the overall legal aspects of CNS/ATM. It noted that while this issue fell within the broad mandate of this Study Group, it did not have sufficient time to consider it thoroughly prior to the 33rd Session of the ICAO Assembly.>>

It should be noted on this issue that AFCAC adopted Resolution S16-1 in Cairo in April 2001 during its 16th Plenary Session. Under this Resolution (see Appendix), AFCAC urges African States to back up ICAO's efforts to regulate the legal framework of the Global Navigation Satellite System (GNSS), including an international Convention on the GNSS and directs the Bureau to establish a working group of a limited number of African States, comprising legal and technical experts, to formulate a set of principles and rules to govern future arrangements for the provision of satellite-based air navigation services in the African airspace so as to preserve the interests of African States in this field.

3. Financial Aspects

The implementation of CNS/ATM systems requires heavy investments. The cost of such investments would be borne mainly by airlines and providers of air navigation services and aeronautical communications, both private and public.

Capital market access could be a problem for some public operators. However, the main difficulty, for most of the operators, is an assessment of the profitability of the equipment to be implemented.

To this end, it would be necessary to conduct cost/benefit studies. Such studies would make possible to define the CNS/ATM systems components whose operation would be profitable at given target dates.

These studies will include notably the cost of the transitional period during which the conventional and satellite equipment will co-exist at a high cost as well as the training cost of personnel for the purpose of using this new equipment.

ICAO has defined a methodology for the conduct of these studies (Circular 257/SAT/106), whose cost in itself is prohibitive for some operators.

The implementation schedule should also be taken into account in regions where the major part of the African air traffic is exchanged, the operation of different air borne equipment on the same route being extremely costly for airlines. To assist States in conducting such studies, AFCAC identified the following funding sources:

- **International financial facility for aviation safety (IFFAS):** the 33rd Session of the ICAO Assembly will consider the IFFAS project, two of the three objectives of this project being the implementation of the CNS/ATM systems:

    1. Global implementation of CNS/ATM systems components;
    2. Funding of projects directly linked to the ICAO Safety Oversight Programme;
    3. Elimination of shortcomings and deficiencies in the air navigation field, having an impact on the safety of international civil aviation.

It should be noted that the IFFAS project stems from proposals made and supported by African States during the world-wide Conference on the funding of CNS/ATM systems (Rio de Janeiro, May 1998) concerning the creation of an International Aeronautical Fund.

AFCAC Resolution S16-10 relating to the creation of one IFFAS directs the AFCAC Bureau to present a working paper on the IFFAS project on behalf of African States, to the 33rd Session of the ICAO Assembly, backing up the creation of this fund and notably, underscoring the importance of the global nature of IFFAS. The uncertainty is still hanging at this stage over the effective creation of the IFFAS as well as its financing mode. During the Rio de Janeiro Conference, the need for this kind of structure was however underscored and the agreement in principle given by the ICAO Council, has made more probable its creation.

- **Capital private market**: many private and public operators have access to capital private markets. Most of the equipment and services necessary for the implementation of systems are already or will be funded in future through private funds, aeronautical charges offering to private financiers sufficient guarantees .

- **Donors**: safety and environmental protection have become priority concerns worldwide. On the other hand, globalization has made global the concepts of systems for aviation safety and environmental protection, notably within the framework of the Kyoto Protocol. Therefore, conscious of the negative repercussions for the populations and economies, of the deficiencies in this field in any area in the world, “rich” countries seem to be willing to concentrate their efforts on this sectors.

The importance of the CNS/ATM systems for the environmental protection and aviation safety has made possible the securing of funds for development aid for projects contributing in the implementation of CNS/ATM systems in Africa.

For all these options, AFCAC is willing to assist States who so wish.

4. Conclusion

The satellite-based communication, navigation and surveillance systems applied to air traffic management have disrupted the conventional outlines of liability and the funding of air navigation equipment and services.

In this context, ICAO role is crucial for a coordinated and harmonized implementation at global level, any delay in a given region of the world resulting in heavy extra costs for air operators.

Within the framework of ICAO, Africa should see to it that its specificities are duly taken into account :

- **from a legal point of view**: Africa is dependent upon other continents for the provision of GNSS signals, communication satellites for the provision of services… for which African contracting States are however responsible under the Convention on international civil aviation.

- **from the economic point of view**: the lack of or insufficiency of conventional navigation aids, radar coverage and ground/ground and ground/air communication equipment justifies the urgent nature and the economic merits of the implementation of the CNS/ATM systems in Africa. Paradoxically however, the insufficiency of structures and/or financial resources means is a specific obstacle for developing countries, in addition to technical and organizational constraints facing all States.

Consequently, African States must, within the framework of AFCAC and ICAO regional bodies, cooperate with a view to defending their specific interest bearing in mind their own constraints.

It is in this spirit of an enhanced South/South cooperation that the 16 AFCAC Plenary Session held in Cairo from 21-26 April 2001 adopted Resolution S16-1 relating to the implementation of CNS/ATM systems.

Pursuant to the aforementioned Resolution and in close cooperation with ICAO, the AFCAC Executive Bureau and Secretariat will leave no stone unturned to ascertain that the African continent will fully participate in the transition, at a global level, to the CNS/ATM systems.

RESOLUTION S16-1 : IMPLEMENTATION OF THE CNS/ATM SYSTEMS IN THE AFI REGION

THE COMMISSION :

CONSIDERING that it is incumbent upon States to provide air navigation facilities and services under the Convention on International Civil Aviation;

CONSIDERING that ICAO has developed a transition plan for the implementation of CNS/ATM systems worldwide, and that the Organization is in charge of its planning in the AFI Region;

CONSIDERING that African States have difficulties in having access to the capital market, with the resulting consequences in their ability to invest in air navigation infrastructure;

NOTING with satisfaction that in conformity with Resolution S15-1 requirements, numerous African States took part in the Rio de Janeiro Conference and at a high level of responsibility, and that they have unanimously supported AFCAC working papers;

CONVINCED of the importance of the regional and sub-regional cooperation in the field of CNS/ATM;

INVITES the African States to:

a) reaffirm their willingness to implement the CNS/ATM systems in Africa according to the time schedule which has been established by ICAO;

b) reaffirm the central role played by AFCAC, in close cooperation with ICAO, in the implementation of the CNS/ATM systems in Africa, in particular as far as the institutional aspects and of the implementation are concerned;

c) support efforts made by ICAO to regulate the legal framework of the global satellite navigation system (GNSS) including an international Convention on the GNSS;

d) convert their aeronautical navigation data in conformity with the World Geodetic Reference System (WGS-84); and

e) adopt any measure aiming at protecting the radio-frequency spectrum which has been assigned to international civil aviation.

REQUESTS the Bureau :

a) to see to a strengthening of sub-regional cooperation in the implementation of CNS/ATM systems in Africa;

b) to ensure a better distribution and a systematic sharing of information between African States;

c) to look for the necessary funding in order to undertake, in close coordination with ICAO, a cost-benefit analysis of the implementation of the CNS/ATM systems at the level of the continent;

d) to contribute to the search of the necessary funding for an efficient and rapid implementation of the CNS/ATM systems in the AFI Region;

e) to take the necessary steps for the convening of a continental Conference on air navigation safety;

f) to establish a working group of a limited number of African States, composed of legal and technical experts, to formulate a set of principles and rules to govern the future arrangements for the provision of satellite based air navigation services in the African airspace so as to preserve the interests of African States in this field; and

DECIDES that this Resolution supersedes and replaces Resolution S15-1.
