

ELEVENTH AIR NAVIGATION CONFERENCE

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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**

PROGRESS REPORT CONCERNING THE STUDY ON THE ALLOCATION OF GNSS COSTS

(Presented by the Secretariat)

SUMMARY

This paper presents information about an ICAO study on allocation of GNSS costs amongst civil aviation users and between civil aviation and other users.

1. INTRODUCTION

1.1 The request for a study by ICAO on the allocation of global navigation satellite system (GNSS) costs originated in a recommendation of the World-wide CNS/ATM Systems Implementation Conference, held in Rio de Janeiro, 11 to 15 May 1998 (Recommendation 3/16a). According to that recommendation, ICAO would address the issue of cost allocation amongst all users of GNSS. The recommendation was based on a proposal by thirty-six Contracting States, members of the European Civil Aviation Conference.

1.2 On an initiative by the Special Committee on Future Air Navigation Systems, Phase II (FANS (II)), the Air Navigation Services Economics Panel (ANSEP) had already developed guidance on funding, charging and cost recovery as well as related organizational and managerial aspects of providing and operating GNSS during its session in 1994 - 1996. The conclusions and recommendations made by ANSEP are published in its *Report on Financial and Related Organizational and Managerial Aspects of Global Navigation Satellite System (GNSS) Provision and Operation* (Doc 9660).

1.3 At the end of 1998 EUROCONTROL established a Task Force on the allocation of GNSS costs, which according to its terms of reference was to undertake basically the same task with the EUROCONTROL constituency as ICAO had been called upon to carry out globally. The terms of reference

of the Task Force also envisaged that it would collaborate with ICAO. After evaluating various cost allocation methods the Task Force recommended a “requirements driven” method.

1.4 On the basis of working papers presented by the ICAO Secretariat and EUROCONTROL, the Conference on the Economics of Airports and Air Navigation Services (ANSEConf 2000), held in Montreal from 19 to 28 June 2000, recommended that ICAO continue and extend the scope of its study on the allocation of GNSS costs among user groups, in coalition with non-aeronautical users and taking into account all possible methods for the allocation of costs, including the “requirements-driven method” (Recommendation 25). During its 161st Session the Council approved this recommendation and requested the Secretary General to give priority to completing the study. ANSEP has been assigned to assist the ICAO Secretariat in undertaking the study and target date for completion of the study is, according to the Programme Budget of the Organization, the fourth quarter of 2004.

2. DISCUSSION

2.1 A distinction will have to be made between GNSS basic services and its more advanced services. It will be in the interest of society at large to make the basic services available for all users free of charge. Any kind of charging system, except for a licence fee or a small equipment-related fee at purchase, would be in contradiction to such an ambition. The United States and Russian Federation have declared that they will continue to provide the basic satellite signals free of charge for the foreseeable future. Like Global Positioning System (GPS) and GLObal NAVigation Satellite System (GLONASS), Galileo will be free of charge for the use of its basic service but some applications will have to be paid for, i.e. commercial services based on additional encrypted data, permitting a charge to be made.

2.2 At the Tenth Air Navigation Conference in 1991 it was recommended that the implementation of the CNS/ATM systems should take place at the regional level. While the satellite signal and the basic services of GNSS have a natural global propagation, the various augmentation systems are being developed for applications at a regional (SBAS) or national (local) (GBAS) level. At the global level, it will be difficult to assess and compare the requirements of various user categories in different regions of the world. For example, the requirements on Category II and III operations for civil aviation are much stronger in Europe than in the rest of the world and the requirements for truck transports in Africa and Europe are most likely also quite different. A method needs to be developed on how to assess the requirements of different user categories for more advanced services. The “requirements-driven” method developed by the EUROCONTROL Task Force, focussing on the four transport modes, seems to be one practicable way to address this complex issue. One conclusion which may be drawn from the EUROCONTROL study is that it is probably more practicable to make such an assessment at the regional level, because that is where the institutional machinery is available to discuss the issue and come to an agreement. The initiatives to new satellite constellations as well as augmentation systems have so far all been taken at the regional (or national) level based on specific requirements for certain applications in those regions (or States).

2.3 Consequently, it would not be practicable or realistic to try to develop a cost allocation method for application at the global level. Users of more advanced services will all have to contribute to the costs of regional and national(or local) systems in their respective regions, and civil aviation users will also contribute to systems in other regions through air navigation services charges when operating in those regions. The study will therefore focus on cost allocation at the regional level. It should also be emphasized that the ongoing technological development (e.g. multi-sensor equipment like INS/FMS) together with the application of the RNP concept makes it extremely difficult to predict the architecture of future navigation systems. Future

satellite constellations, like Galileo, may alone or in combination with other constellations provide “more advanced services” even without augmentation systems.

2.4 In considering GNSS cost allocation it will be necessary to make a distinction between allocation amongst civil aviation users and allocation between civil aviation and other users. As regards the former, most of the guidance material required already exists in the ANSEP report on GNSS in Doc 9660, referred to in paragraph 1.2, and in the *Manual on Air Navigation Services Economics* (Doc 9161/3). Allocation between civil aviation and other users is a much more complex task since a large and growing number of user categories in addition to aviation is involved.

3. HOW TO FINALIZE THE STUDY

3.1 A proposal on how to finalize the study was presented to the fourth meeting of the Air Navigation Services Economics Panel (ANSEP/4), which was held 6 to 10 January 2003, and the Panel endorsed that the following principles and assumptions be applied for cost allocation between civil aviation and other users:

- a) basic GNSS services will be provided free of charge, as GNSS is a common good to a multiple number of user categories in society;
- b) any cost allocation of GNSS should take place at the regional level, as the development of various system components normally is initiated by regional organizations or individual States with the purpose to satisfy the needs and requirements of users in the regions concerned;
- c) users of more advanced services will in most cases have to contribute to GNSS components located in their own regions (civil aviation users will, in addition, contribute to costs in those regions where they operate through air navigation services charges);
- d) cost allocation between civil aviation and other users should be discussed and agreed upon (at the regional level), in consultations with the civil aviation users, before any costs are recovered from civil aviation;
- e) cost allocation should be based on users’ requirements on the systems; and
- f) once civil aviation’s share at the regional level has been determined allocation among States (and providers) and en route/approach and aerodrome control services may be performed according to existing ICAO policy and guidance.

3.2 The panel agreed that the detailed cost allocation between various user categories should be carried out at a regional level in the context of implementation of GNSS components. ICAO, with the assistance of ANSEP, will at this stage limit its efforts to the development of some general guidance. There may be a need during the study to approach representatives of other user categories in order to have some support for the guidance that will be developed. This may be done through the United Nations family and with the involvement of relevant non-governmental organizations. Panel members, as representatives of different regions of the world, will also try to confirm the relevance of draft guidance material for application in their regions (States). In addition, input will be sought from providers of satellite based augmentation services and

associations representing GNSS augmentation transmitting equipment and receiver manufacturers. A small working group has been established within ANSEP to advance the study.

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