

THIRD MEETING OF THE ALLPIRG/ADVISORY GROUP

(Montreal, 6 – 8 April 1999)

Agenda Item 7: Any other business

**US POLICY STATEMENT ON FUTURE USE
OF THE GLOBAL POSITIONING SYSTEM (GPS)**

(Presented by the United States)

INFORMATION PAPER

SUMMARY

This paper was submitted to the ICAO Council on March 12, 1999 to augment a presentation made by FAA Administrator Jane Garvey before the Council with respect to the future capabilities of the US GPS system. In order to ensure widest dissemination of the policies of the United States regarding the future use of GPS, the text of the paper is re-submitted herewith for the information of ALLPIRG Members. This paper reaffirms the commitment of the United States to continuing development of GPS and its augmentations so that GPS will safely allow operations throughout all phases of flight.

1. INTRODUCTION

1.1 The United States is committed to working with the International Civil Aviation Organization and its member States to develop a seamless satellite navigation and positioning system that transcends national boundaries and improves aviation safety and efficiency worldwide.

2. BACKGROUND

2.1 Satellite navigation and positioning systems represent the most important technological breakthrough in civil aviation navigation, surveillance and air traffic management since radar was introduced over half a century ago. The global positioning system (GPS), developed by the United States, currently is approved for all-weather use during en-route and terminal air navigation, and for non-precision approaches.

2.2 GPS functions as an element of the global navigation satellite system (GNSS) which also includes the Russian GLONASS system. These systems share many common attributes, and it is the goal of the United States to continue the development of GPS in a manner that ensures both systems will function together as part of a seamless GNSS.

2.3 GNSS, with refinements underway today, will provide greater safety by making precision approaches possible at thousands of airports worldwide where no such capability exists today. This benefit will be especially significant in many developing areas of the world where growth in civil aviation operations is outpacing the availability of ground-based navigation aids.

2.4 The United States has pledged before the General Assembly of ICAO to continue to provide GPS signals free of direct user charges to the international civil aviation community and to other peaceful users of satellite navigation and positioning services. This pledge was also affirmed by the President of the United States in a Presidential Decision Directive issued in 1996, and the commitment was solidified by an Act of Congress in 1997. This Act established as a matter of law the provision of GPS services for peaceful civil, commercial, and scientific uses on a continuous worldwide basis free of direct user fees.

2.5 In January 1999, Vice President Gore announced the addition of a third GPS signal (1176.45 MHz) to improve redundancy and enhance the capability of GPS. This enhancement, along with the US Government's earlier commitment to add a second signal (1227.60 MHz), represents a financial investment of \$400 million to enhance GPS services worldwide. These additional frequencies will also be free of direct user charges.

2.6 The Administrator of the Federal Aviation Administration has recently reiterated the FAA's commitment to pursuing GPS and its augmentations as the cornerstone of a modernized US National Airspace System (NAS) and as a means for providing significant safety and efficiency benefits to aviation around the globe.

3. DEVELOPMENTS

3.1 The FAA is firmly committed to delivering GPS and augmentation systems capable of providing navigation services that will support all phases of flight, and recognizes that the transition to such a system will involve complex technical issues and risks. To improve the accuracy, integrity and availability of GPS signals, the FAA is developing a satellite-based wide area augmentation system (WAAS) and a ground-based Local area augmentation system (LAAS). The LAAS will utilize emerging technologies such as pseudolites (or pseudo-satellites) in the U.S. and elsewhere to extend GPS capabilities where and when needed.

3.2 The WAAS and LAAS will permit aircraft to use GNSS as a "sole means" of navigation, and when fully integrated in the U.S. National Airspace System (NAS) the GNSS will be capable of functioning as a "sole service" system. The term "sole service" indicates that GNSS and its augmentations will be the only navigation service provided to support a particular phase of flight in a particular region. The term "sole means" refers to the radionavigation equipment on an aircraft, and signifies that augmented GPS/GNSS equipment will be the only radionavigation equipment required onboard an aircraft to support a particular phase of flight. (*ref. ICAO Circular 267 – Guidelines for the Introduction and Operational Use of the Global Navigation Satellite System*)

3.3 While the FAA remains committed to delivering WAAS and LAAS capable of supporting all phases of flight, there are some safety concerns associated with relying entirely on these systems. As a

result of these continued concerns, an independent risk assessment on the use of GPS-based navigation was conducted by the Johns Hopkins Applied Physics Laboratory. This study concluded that augmented GPS has the technical capability to support all phases of flight. The study team made a series of recommendations on several issues, including risk mitigation, and the FAA is developing an action plan to address those issues. Until these issues are fully resolved, a subset of existing ground-based navigation systems will continue to be provided.

3.4 Internationally, the FAA continues to work in partnership with civil aviation authorities in Europe and Japan to coordinate the development of their satellite-based augmentation systems. In addition, the US is engaged in discussions with the European Union on the EU proposal for a new, independent satellite navigation service known as “Galileo.” We have a number of questions and potential concerns about the specifics of the Galileo proposal, including its proposed regulatory approach to generating revenues. However, to achieve the objective of a seamless, global navigation satellite system without undue increased costs to users, these systems must be interoperable. The FAA will continue to cooperate with others to achieve this goal.

4. CONCLUSIONS

4.1 While augmented GPS will be technically capable of enabling “sole means” navigation, the transition to satellite-based services will depend upon many factors and will drive the pace and extent of GNSS becoming the “sole service.” These factors are related to system performance and user acceptance, and include satellite availability, risks associated with intentional and unintentional interference, user equipment costs, and delivered operational benefits. Prudent operating practices dictate that some conventional ground-based navigation systems be retained until augmented GPS gains the trust and confidence of the civil aviation community as the “sole service” system. Within the NAS, this is expected to take a decade or more.

4.2 The Johns Hopkins Applied Physics Laboratory has published an independent risk assessment of the use of GPS for civil aviation. The assessment concludes that with continued development of augmentations and protective enhancements, augmented GPS can be safely used as the sole means of navigation and can be made capable of becoming the sole service navigation system supporting all phases of flight. The Johns Hopkins report is available on the Internet at the following web site: <http://www.jhuapl.edu/transportation/aviation/gps/>.

4.3 Even though augmented GNSS will have the technical capability of providing sole means, it may not become the sole navigation service in some congested airspace. Each ICAO member State must determine, based on its respective operational requirements, whether or not to use GNSS as its “sole service.”