



INFORMATION PAPER

FIFTH MEETING OF THE ALLPIRG/ADVISORY GROUP

(Montreal, 23 – 24 March 2006)

Agenda Item 5.2: Global harmonization of RNP/area navigation (RNAV) implementation

JCAB MTSAT FUNCTIONS AND CURRENT STATUS

(Presented by the Civil Aviation Bureau, Japan)

SUMMARY

Civil Aviation Bureau Japan (JCAB) has decided to implement the ICAO CNS/ATM systems for Japan, centering on Multi-functional Transport Satellite (MTSAT), which will provide the aeronautical mobile satellite service (AMSS) and satellite-based augmentation system (SBAS) capabilities for ATS providers and aircraft operators in the Asia/Pacific Region. This paper provides the functions of JCAB MTSAT and the current status.

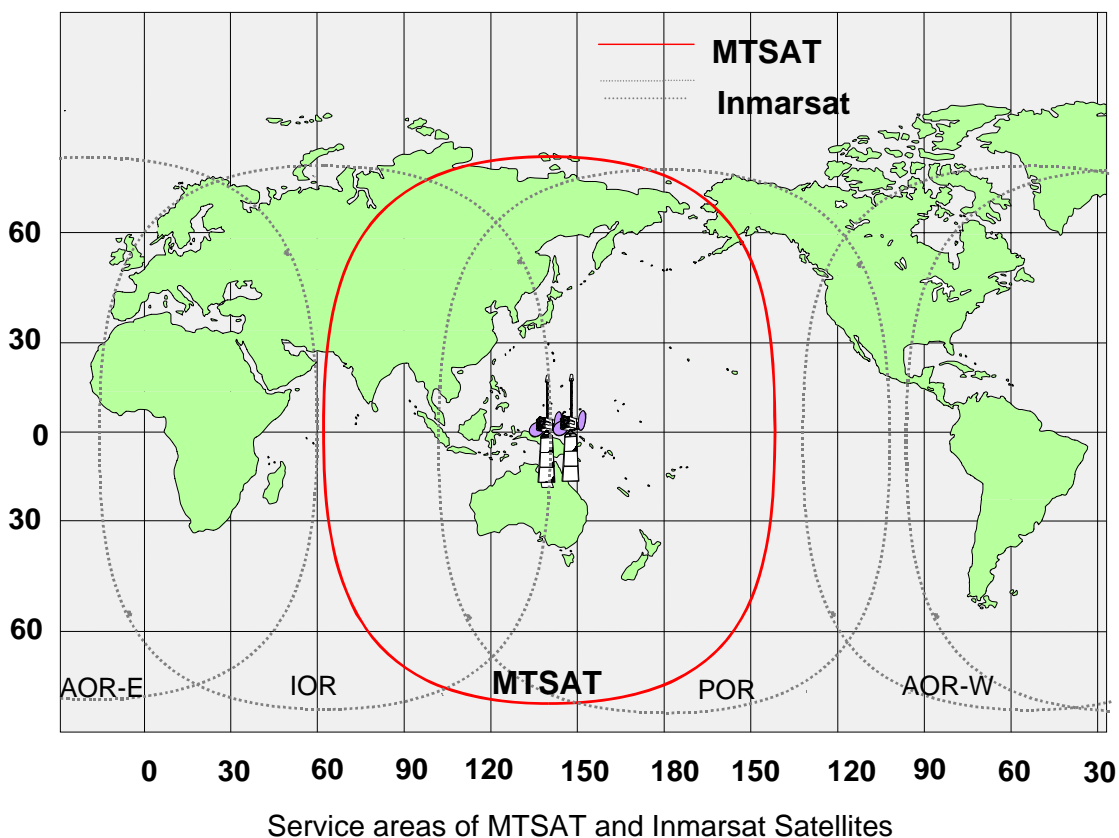
Action by ALLPIRG/6 is in paragraph 7.

1. INTRODUCTION

1.1 In 1994, the Council for Civil Aviation, a consultancy body for the Minister of Transport, forecasted that air traffic in the North and Central Pacific (NOPAC and CENPAC) in 1992 would double by 2000 and triple by 2010. The Council considered that the existing air navigation systems could not cope with the increasing NOPAC and CENPAC traffic, and that new air navigation systems, based on satellite technology, should be implemented for Japan to cater to the future traffic in Japan and the adjacent airspace. The Council also considered that in order to make the air navigation systems safer and more reliable, sufficient system redundancy was required. The Council recommended, therefore that a new aeronautical satellite should be launched and the air navigation systems should be implemented centering on such a new satellite in order to ensure the systems safer and more reliable.

1.2 According to recommendations developed by the Council, JCAB has decided to launch a new aeronautical satellite, integrating aeronautical mission into the meteorological observation mission of the Geo-stationary Meteorological Satellite, which is being utilized for providing meteorological information to the Asia/Pacific States since the 1970s. JCAB considered that a new satellite should be designed to be widely utilized for aircraft operators and ATS providers in the Asia/Pacific Region in

addition to the existing satellites. This new satellite is known as Multi-functional Transport Satellite, MTSAT.



2. MTSAT SYSTEM

2.1 MTSAT has two missions, i.e. meteorological mission and aeronautical mission. The aeronautical mission of MTSAT will contribute to each element of the ICAO CNS/ATM Systems, i.e. communication, navigation and surveillance.

2.2 The MTSAT system will provide direct controller-pilot communication in voice (SAT-Voice) and data (controller-pilot datalink communication: CPDLC), GPS augmentation information, and automatic dependant surveillance (ADS) capabilities. The MTSAT system will not only be capable of handling oceanic ATS communications within the Japanese FIRs, but will also be offered to the civil aviation community in the Asia/Pacific Region as an aviation infrastructure, which could facilitate the implementation of the ICAO CNS/ATM Systems.

2.3 In order to provide service continuously, even in natural disasters, two aeronautical satellite centers have been implemented at two different locations in Japan, i.e. Kobe (approximately 500 km west of Tokyo) and Hitachi-ota (approximately 100 km northeast of Tokyo).

3. AMSS FUNCTIONS OF MTSAT

3.1 The aeronautical mobile satellite services (AMSS) functions of MTSAT include the provision of all the aeronautical communications defined by ICAO, i.e. Air Traffic Services (ATS), Aeronautical Operational Control (AOC), Aeronautical Administrative Communications (AAC), and Aeronautical Passenger Communications (APC). These communication services could be available for ATS providers and aircraft operators in the Asia/Pacific Region through a datalink service provider.

3.2 Following the system evaluation and staff training for the MTSAT system, the AMSS functions of MTSAT will become operational in 2006.

4. MTSAT SATELLITE-BASED AUGMENTATION SYSTEM (MSAS)

4.1 MTSAT Satellite-based Augmentation System (MSAS) is a satellite-based augmentation system (SBAS), equivalent to the United States WAAS and European EGNOS. MSAS provides aircraft with GPS augmentation information to satisfy navigation performance requirements, i.e. integrity, continuity and availability requirements, which are essential to the use of GPS for aircraft operation as a sole means of navigation.

4.2 Currently, MSAS is in the test phase with broadcasting test messages from MTSAT-1R. Following this test phase, total system integration test including MTSAT-2 will be performed. MSAS commissioning is scheduled for 2007 after various certification activities, as a highly reliable system with two MTSATs.

5. STATUS OF MTSAT

5.1 MTSAT-1R was launched on 26 February 2005. It is now on the orbit and End to End Communication check is currently being conducted. The second satellite, MTSAT-2, was also successfully launched on 18 February 2006. The aeronautical missions of each MTSAT are designed to have a service life of ten years, and additional MTSATs will be launched at a regular interval to replace existing MTSATs. Consequently, the MTSAT system will be maintained in a dual operation, including satellites and ground systems, for the foreseeable future.

6. CONCLUSION

6.1 The AMSS functions of MTSAT will become operational in 2006. MSAS is in the test phase with broadcasting test messages from MTSAT-1R. Following this test phase, total system integration test including MTSAT-2 will be performed. MSAS commissioning is scheduled for 2007 after various certification activities, as a highly reliable system with two MTSATs.

6.2 The MTSAT system has been designed to meet the ICAO SARPs and is interoperable with the existing satellite system. Two MTSATs will cover airspace throughout most of the Asia/Pacific Region. The MTSAT system will offer an opportunity for ATS providers and aircraft operators in the Asia/Pacific Region to have highly reliable communication, navigation and surveillance systems.

6.3 JCAB, as a government ATS provider, offers the MTSAT system to the Asia/Pacific States on a non-profit basis, as an aviation infrastructure for supporting implementation of the ICAO CNS/ATM Systems.

7. ACTION BY ALLPIRG

7.1 The ALLPIRG/5 Meeting is invited to note the information contained in this information paper.

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