International Civil Aviation Organization

FIFTEENTH MEETING OF THE COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND METEOROLOGY SUB-GROUP (CNS/MET SG/15) OF APANPIRG

Bangkok, Thailand, 25 – 29 July 2011

Agenda Item 4: Aeronautical Mobile Service (AMS)

1) discuss satellite data-link communication continuity issues

NEAR-TERM FUTURE PLAN OF MTSAT SYSTEMS

(Presented by Japan)

SUMMARY

This paper presents the near term future plan of MTSAT SYSTEMS.

This paper relates to – **Strategic Objectives:**
A: **Safety** – Enhance global civil aviation safety
E: **Continuity** –Maintain the continuity of aviation operations

Global Plan Initiatives:
GPI-17 Data link applications
GPI-22 Communication infrastructure

1. Introduction

1.1 Multi-functional Transport Satellite (the MTSAT) is a space segment of an Aeronautical Mobile Satellite (Route) Service (AMS(R)S) system (the MTSAT System) which Japanese Civil Aviation Bureau (JCAB) have in operation. The MTSAT System consists of two MTSATs, four Ground Earth Stations (the GES) and terrestrial networks interconnecting GESs. Aeronautical Satellite Centers (the ASC) that are overlooking the operation of MTSAT System are located at Kobe and Hitachiota. One of the MTSATs, MTSAT-1R, is in the orbit of 140E and the other, MTSAT-2, is in the orbit of 145E.

1.2 The End of Life (the EOL) of MTSAT-1R, which is an nominal estimate of life span based on the system designing, is prospected to fall on during Japanese Fiscal Year 2014 (JFY: from 1 April of the CY to 31 March next CY) and the EOL of MTSAT-2 is JFY2015. Taking the manufacturing period and budgetary system of Japan into account, JFY2010 was a decision making point as to the replacement plan for the existing MTSAT Systems.

2. Discussion

2.1 Initial framework for MTSAT AMSS

2.1.1 At the onset of MTSAT Systems project in the mid 90's, the future launch of the MTSAT was planned to the effect that satellites would be replaced by new satellites at the time of their EOL. The communication payload of a satellite should meet the latest aeronautical satellite communication standards including ICAO SARPs which are applicable at the time of system design.

2.2 Recent development of aeronautical mobile satellite services in the world

2.2.1 Currently, Inmarsat Classic Aero by Inmarsat-3 still dominates the aeronautical satellite safety communication since apart from MTSAT only the Classic Aero and Iridium are SARPs compliant and the number of commercial users for Iridium is much smaller than that of Classic Aero. However, reportedly the company has a plan to cease the service in the near future to promote Swift Broadband (the SBB) by Inmarsat-4. The SBB has already been in service globally, but, according to the company's report, the pace of acquiring new customers is seemingly not making a good progress（. European Space Agency is running so-called "Iris project" in Europe. L-band digital aeronautical communication system will be employed in its system along with terrestrial communication system. It is planned to commence full-fledged service in 2020. Moreover, there seems to be other ongoing or planned satellite projects which will deploy AMSS including AMS(R)S. Thus, the world of aeronautical satellite communication is changing now and no one knows what provider or system will provide AMSS around 2020 with what technical standards. For now, there seems to be no outstanding or imminent standardization activity for future AMSS at ICAO Aeronautical Communication Panel as well as RTCA/EUROCAE.

2.3 A JCAB study on future AMSS system

2.3.1 Overview of study

2.3.1.1 A comprehensive study for next generation satellite was conducted last year in JCAB. One of the purposes of study was to consider an appropriate communication standard for the successor to AMSS payload of MTSAT-1R, which is scheduled to terminate its service in JFY2014.

2.3.2 Life expectancy of MTSAT-2

2.3.2.1 The calculation of remaining fuel showed that MTSAT-1R would reach its EOL in JFY2014 as originally planned, . Whereas, MTSAT-2 has an outlook of four year expansion of its life thanks to sufficient amount of fuel remained for its operation.

2.3.3 Study outcome

2.3.3.1 Recent development of aeronautical mobile satellite service in the world suggested that there was no definite candidate for around 2020. This uncertainty made it difficult to specify the aeronautical communication standard for next generation satellite. Consequently, JCAB did not make a decision to replace MTSAT-1R, but to continue to provide AMSS via MTSAT-2 after the termination of MTSAT-1R AMSS payload.

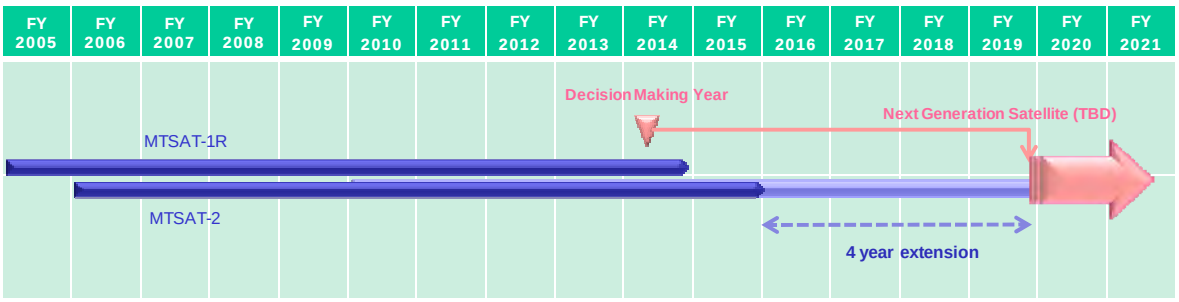

Figure 1: MTSAT implementation and operation plan (JFY2010 Revision)

2.3.4 AMSS performance

2.3.4.1 MTSAT-2 will be the sole MTSAT, which will be in operation beyond JFY2014. JCAB believes that MTSAT System by single satellite still meets the Communication Service Provider portion of RCP240 defined in Global Operational Data Link Document (GOLD) thanks to the high availability of communication satellite and redundancy of ground system. Unless there are big changes in terms of ATC procedural rules and requirements or air traffic environment, there will be no adverse impact on oceanic air traffic control in the Asia and Pacific region.

2.3.4.2 In order to meet the air traffic demand and to provide safe and efficient ATS in the region in the future, AMSS will certainly continue to play an important role in oceanic ATC operation. Progress or plan of AMSS providers in the world need to be taken well into account when APANPIRG bodies address regional communication strategy, Regional Air Navigation Plan and AMSS performance. JCAB, with its own experience and practical data accumulated through MTSAT Systems operation, will be willing to contribute to the discussion on AMSS performance required for ATC operation in this region.

3. Action by the Meeting

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matters as appropriate as preliminary step toward the second Satellite Datalink Operation Continuity Meeting(SOCM/2) planned in this November .

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