



THIRTEENTH AIR NAVIGATION CONFERENCE

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COMMITTEE A

Agenda Item 2: Enabling the global air navigation system 2.2: Integrated CNS and spectrum strategy

BDS RDSS SERVICE

(Presented by China)

EXECUTIVE SUMMARY

This paper presents information of the RDSS of BeiDou Navigation Satellite System (BDS). The RDSS is a unique feature of BDS. It can be used in conjunction with the navigation function of BDS to provide low-cost, high-efficiency tracking and monitoring services for aircraft flight around the world.

1. INTRODUCTION

1.1 China has independently built and operated the BeiDou Navigation Satellite System (BDS) with a three-step strategy of development: to complete the construction of the BDS-1 and provide services to the whole country by the end of 2000; to complete the construction of the BDS-2 and provide services to the Asia-Pacific region by the end of 2012; and to complete the construction of the BDS and provide services worldwide around 2020. It is planned to complete the launch of 18 satellites of BDS global system by the end of 2018, taking the lead in providing basic services to countries along the Silk Road Economic Belt and the 21st Century Maritime Silk Road (“The Belt and Road Initiative” for short).

1.2 BDS provides Radio Determination Satellite Service (RDSS) together with the well-known Radio Navigation Satellite Service (RNSS).

1.3 Currently, BDS RDSS is widely used inside China and is capable of supporting the tracking and monitoring services of flights within the coverage of BDS.

2. DISCUSSION

2.1 RDSS is a two-way positioning and timing service provided by BDS, and its short message communication capacity is 120 Chinese characters per message.

¹ English and Chinese versions provided by China

2.2 The carrier frequency of data link between user and GEO is L band (1610 - 1626.5 MHz) for uplink and S band (2483.5 - 2500 MHz) for downlink. The frequency coordination between RDSS and Iridium is undergoing actively.

2.3 RDSS has emergency communication, message broadcasting, positioning reporting and surveillance functions, which could be widely used for in low-altitude surveillance, fishing vessel supervision, island reef construction, offshore rescue, forest fire prevention, disaster relief and disaster mitigation services.

2.4 RDSS has been widely used in China's general aviation field. Typical services include: (1) Low-altitude aircraft position monitoring service, which utilizes the advantages of RDSS without terrain occlusion, and applies it to the ground-to-air communication field to solve the communication and surveillance of low-altitude aircraft. (2) Meteorological data service, through the data dictionary to map various weather conditions, helping pilots to quickly obtain the latest weather reports, and reporting the meteorological conditions in the air to the ground. (3) Aeronautical information services, through limited characters express relatively rich message content, providing real-time intelligence data for pilots and ground dispatchers through mapping. (4) Ground-to-air emergency two-way communication service, providing relatively reliable ground-to-air communication in emergency situations, ground personnel and crew can send messages to each other anytime and anywhere.

2.5 In June 2014, ICAO presented the concept of the Global Aeronautical Distress and Safety System (GADSS), requiring airlines to establish aircraft tracking and monitoring capabilities, including maintaining up-to-date aircraft travel records, as well as locations of survivors, aircrafts and flight recorders during forced landings. The aircraft tracking system requires: in normal situations, the position report should be sent at 15 min interval or less; when an abnormal event occurs, the position report should be sent at 1 min interval, and the air traffic control or airline can determine the position of aircraft within 11 km. RDSS is one of the main means of using satellite to obtain aircraft positioning information accurately, and its performance can meet the above-mentioned location reporting requirements.

2.6 As a low-cost, high-efficiency data communication link, RDSS can be used with RNSS to provide tracking and monitoring services to global aircraft operations. It is possible to support flight tracking services within the BDS coverage.

3. CONCLUSION

3.1 BDS RDSS service has potential to provide cost-effective service to GADSS. CAAC will continue researching the feasibility of using RDSS for flight tracking and reporting further information in the future.

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