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**Agenda Item 36: Aviation safety and air navigation implementation support**

**REPORT ON WORK PROGRESS OF CHINA REGIONAL MONITORING AGENCY**

(Presented by People's Republic of China)

**EXECUTIVE SUMMARY**

This report presents the work progress of China Regional Monitoring Agency (China RMA) from 2013 to 2015.

<i>Strategic Objectives:</i>	This paper relates to the Safety and Air Navigation Capacity and Efficiency Strategic Objectives.
<i>Financial implications:</i>	
<i>References:</i>	

<sup>1</sup> English and Chinese versions provided by China.

## 1. INTRODUCTION

1.1. In accordance with CAAC’s opinions on Instructions-request for Authorizing Air Traffic Management Bureau CAAC to Establish China RVSM Regional Monitoring Agency, China Regional Monitoring Agency (China RMA) was officially established in April 2008 and was granted ICAO authorization in September of the same year to take over the RMA function from Monitoring Agency for Asia Region (MAAR) in Thailand, and to take full responsibility for risk assessment and monitoring of Reduced Vertical Separation Minimum (RVSM) in information regions in China and Pyongyang of DPR Korea. China RMA is under the leadership of Air Traffic Management Bureau, with the assistance of the Department of Flight Standard and Aviation Data Communication Corporation as the technical support entity.

1.2. Since its inception, China RMA has assumed the management of approvals for aircraft RVSM registration; RVSM capability verification in flight plans; risk assessment; monitoring of Height Keeping Performance of aircraft; building and maintenance of a data interaction platform; international exchanges and cooperation and researches on key technologies. Besides, it has conducted extensive exchanges and cooperation with relevant agencies and entities of foreign countries. And it has provided decision-making support to operational safety of RVSM by means of data analysis, in order to ensure safe operations in RVSM airspace in China. The following is an introduction to the progress on key work by China RMA from 2013 to 2015.

### I. Management of Approvals for Aircraft RVSM Registration

1.3. As of 2015, China RMA continued its management of approvals for aircraft RVSM, finishing newly-added approvals for registration of 346 aircraft from 73 airlines in China and approved deregistration of 138 aircraft from the above airlines, and newly-added approvals for registration of one aircraft from one airline of DPR Korea. Up to now, China RMA has realized management of approvals for registration of 2798 aircraft in China and 11 aircraft of DPR Korea.

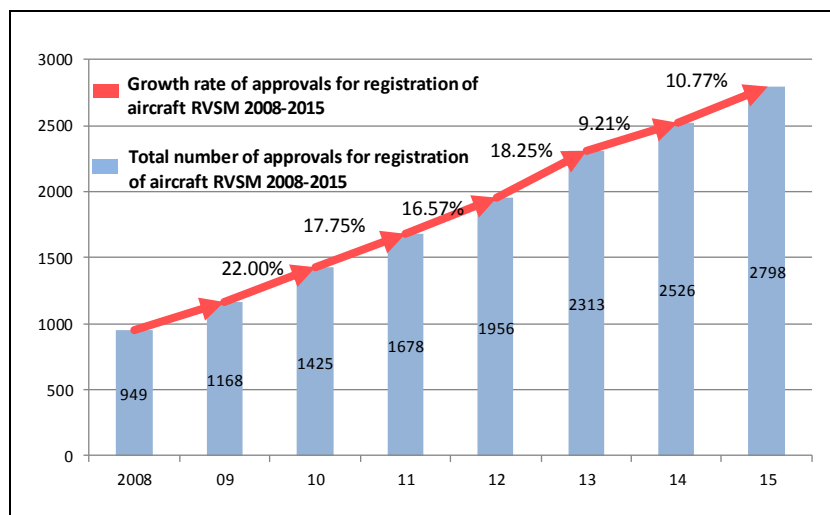


Figure 1: Growth of Approvals for Registration of RSVM in China 2008-2015

1.4. In accordance with ICAO requirements, China RMA has carried out verification of RVSM capability in flight plans since 2012, that is, China RMA compares the contents of the tenth item

of “W” of data in monthly flight plans against the global RVSM approval database and examines authenticity of reported RVSM operation capabilities, detecting and tracking aircraft whose RVSM capabilities have been reported in flight plans but are not qualified for RVSM approval or in an unclear approval state and then reporting situations to relevant authorities. In 2015, China RMA finished RVSM capabilities verification of data in monthly flight plans from China and DPR Korea and found out a total of 378 defective aircraft and identified 281 defective aircraft finally through tracking. With the development of global RVSM approval and verification and roll-out of relevant work in China, the number of problems on approval status of aircraft in RVSM airspace in China has shown a decreasing trend and timeliness of approvals for registration and data sharing of RVSM in China was further improved.



Figure 2: Statistics on Verifications of RVSM Capabilities in Flight Plans 2012 -2015

## II. Monitoring of Height Keeping Performance of Aircraft

1.5. Height keeping performance of aircraft is a key element to ensure safe operations in RVSM airspace. RVSM is a kind of performance-based operation, so it's necessary to establish a long-time independent monitoring means to ensure that aircraft can continuously meet requirements of the height keeping performance. Based on RVSM approval and registration of current aircraft operators and the RVSM Global Long-term Height Monitoring Requirements, China RMA conducts development of aircraft monitoring plans and implementation of monitoring tasks. At present, China RMA is capable of offering airborne monitoring service; and with the development of Automatic Dependent Surveillance – Broadcast (ADS-B) technology and application of ADS-B data to researches on monitoring of the height keeping performance, China RMA will plan to provide service of ADS-B based monitoring of the height keeping performance to aircraft for which CAAC finishes ADS-B operation certification.

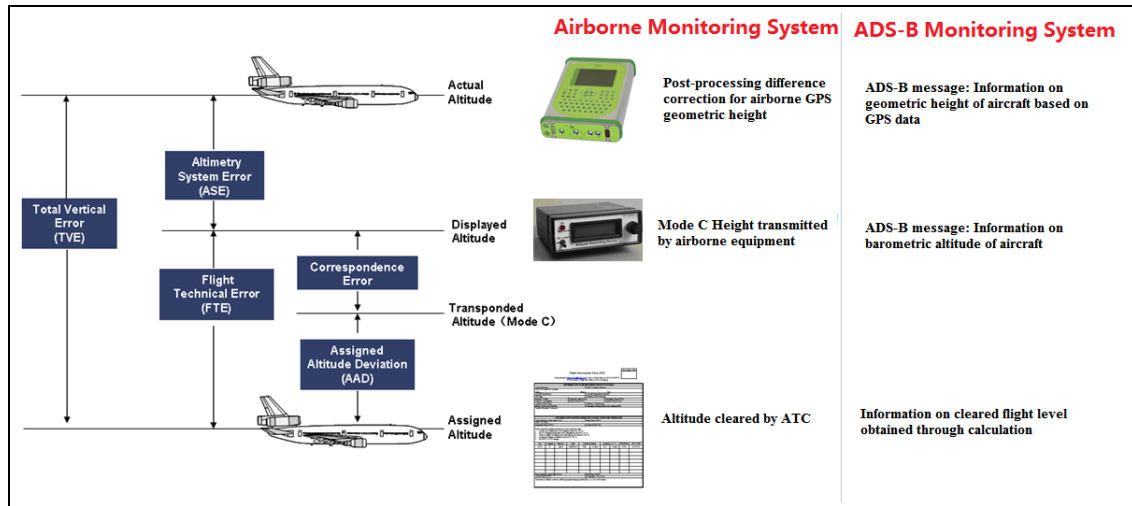


Figure 3: Airborne Monitoring and ADS-B Monitoring Technology

1.6. From 2013 to 2015, RMA completed on-board monitoring for 213 Chinese aircraft in total and for 4 aircraft from one north Korea airlines and issued airborne monitoring reports; through conducting analysis of ADS-B data, RMA finished analysis of monitoring data and height keeping performance trend for 1699 aircraft registered in China and 6784 aircraft registered in foreign countries that operate in Chinese RVSM airspace.

### III. Safety Assessment

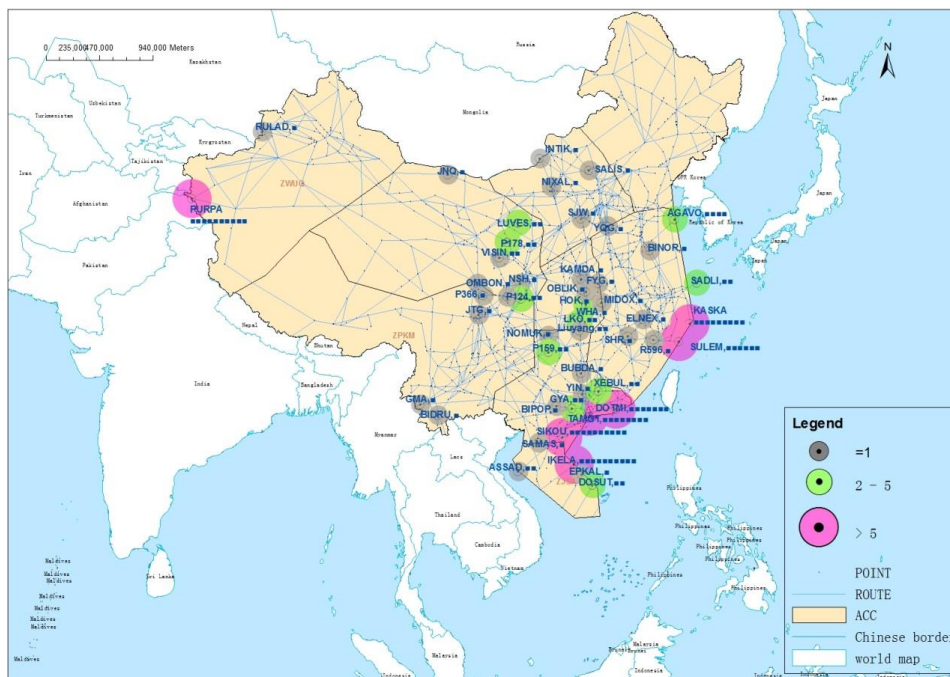


Figure 4: Geographical Distribution of RVSM Operation Deviation Events in 2015

1.7. China carries out collection and analysis of RVSM operation deviation (referred as Large Height Deviation (LHD) internationally) events and reports to ICAO the results of data collection and analysis and safety assessment of airspace. The concept of LHD was developed in the beginning of RVSM implementation. Through quantifying vertical collision risks in airspace during the RVSM safety assessment, RMA collects events contributing to the vertical collision risks in RVSM airspace and then analyses these events and extract parameters to support risk calculation and to directly reflect problems affecting airspace operation safety. And by doing so, RMA can identify causes and rules for these events and finally find out ways and solutions to address the problems in collaboration with relevant departments concerning air traffic control, flight and policy making, thus avoiding occurrence of similar events, reducing risks and ensuring safety.

1.8. From 2013 to 2015, China RMA handled a total of 296 LHD events and finished coordination for obtaining LHD data for China-Mongolia (Beijing-Ulan Bator), China-Japan (Shanghai-Fukuoka), China-Pakistan (Urumqi-Lahore), South China Sea (Guangzhou/Zhanjiang/Sanya-Hong Kong/Taipei), thereby improving the LHD reporting culture in these regions. ICAO spoke highly of the work done by China RMA at Regional Monitoring Agency Coordination Group (RMACG) and Asia Pacific Regional Airspace Safety and Monitoring Advisory Group (RASMAG) and gave credit to the improvement of operational environment and safety assessment of Chinese RVSM airspace.

#### IV. System R&D

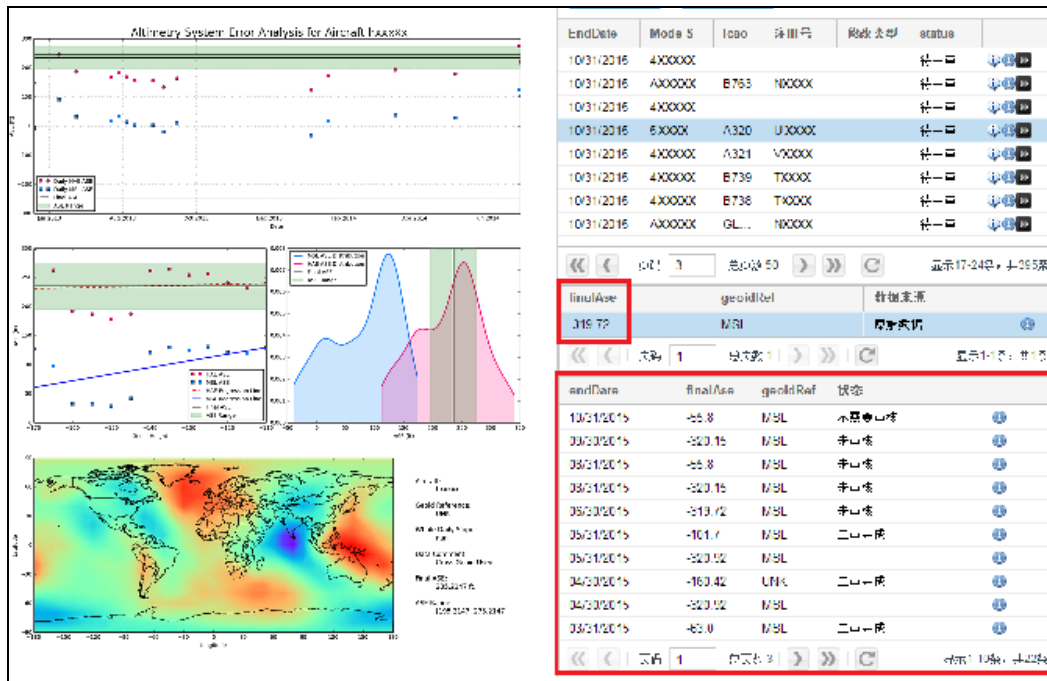


Figure 5: Diagram of Data Analysis Interface of AHMS System

1.9. China RMA has finished preliminary research and development of Project of ADS-B data based Height Monitoring System (AHMS), so it can provide aircraft operators with an analysis result of ADS-B monitoring data and a monitoring report, attaining the capabilities of monitoring of ADS-B height keeping performance of aircraft in terms of technology and data analysis on a big batch basis, therefore,

laying a foundation for developing the monitoring technology that has ADS-B monitoring data as the main source for its data analysis.

1.10. China RMA, under the support and care of leaders at various levels, makes efforts to refine its skill, dares to explore and makes continuous innovation, thus recording a series of breakthroughs. Its founding marks that the operation monitoring, verification of approved data, monitoring of height keeping performance of aircraft, assessment of safety risks in Chinese RVSM airspace no longer relies on other countries, thereby holding a say in international conferences. At first, China RMA learned from advanced regional monitoring agencies in the world. Now, it has played an important role in the international aviation community and delivered monitoring and training to other countries and regions. China RMA has bridged the gap in the field of RVSM in China.

1.11. Since its establishment in 2008 to now, China RMA had 2 800 aircraft that under its jurisdiction registered and carried out airborne monitoring for 520 aircraft in China and for more than 90 aircraft in other countries and regions including Iran, Korea and Hong Kong, China. And China RMA also carried out ADS-B monitoring for 2 508 Chinese aircraft and 6 269 foreign aircraft, and found out a total of dozens of defective aircraft through RVSM capability verification in flight plans. At the same time, it launched risk assessment of RVSM airspace and made continuous efforts to reduce LHD events and ensure flight safety in airspace.

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