International Civil Aviation Organization

Fifth Meeting of the Surveillance Implementation Coordination Group (SURICG/5)

Web-conference, 22 – 24 September 2020

Agenda Item 5: **Update on surveillance activities and explore potential cooperation opportunities**

UPDATE THE ACTION PLAN FOR SURVEILLANCE IN CHINA

(Presented by China)

SUMMARY

This paper represents the current status of civil ATC surveillance business in China and the latest development.

1. Introduction

1.1 At present, the CAAC ATMB has widely deployed primary surveillance radars (PSRs), secondary surveillance radars (SSRs) and ADS-B equipment for air surveillance. These surveillance facilities are applied to identify and track targets in En-route area and in approach control area.

1.2 For the purpose of airport surface surveillance, Surface Movement Radars (SMRs) and Multilateration (MLAT) systems have been used in major airports.

2. Surveillance radar

2.1 Operational Radars

Currently, there are 29 sets of primary/secondary combined radars and 111 sets of secondary surveillance radars in service for civil aviation in China.

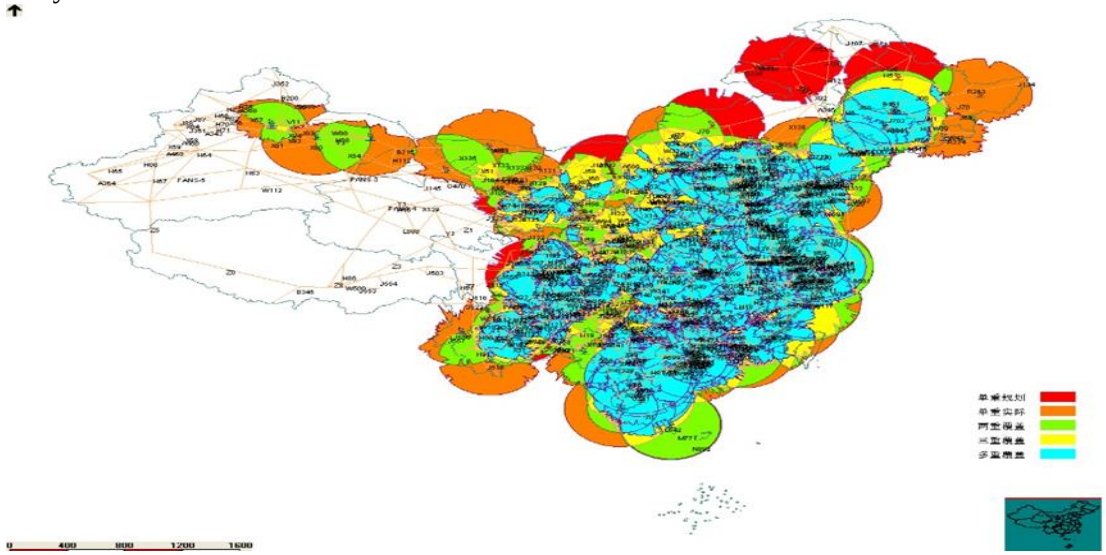

Figure 1: Coverage of operational SSRs in China (6,600 meters)

2.2 Radars under construction

1) At present, a total of 71 sets of radars are under construction, among which 12 sets are primary/secondary combined radars and the rest 59 sets are secondary surveillance radars.

2) For the 12 sets of primary/secondary combined radars, 10 of them are replacements of previous sites while 2 of them are newly built.

3) For the 59 sets of secondary surveillance radars, 16 of them are replacements of previous sites while 43 of them are newly built (Radars under construction are shown in red in Fig2).

4) When the planed deployed is finished, China will have a total of 31 sets of primary/secondary combined radars and 154 sets of secondary surveillance radars in service for civil aviation.

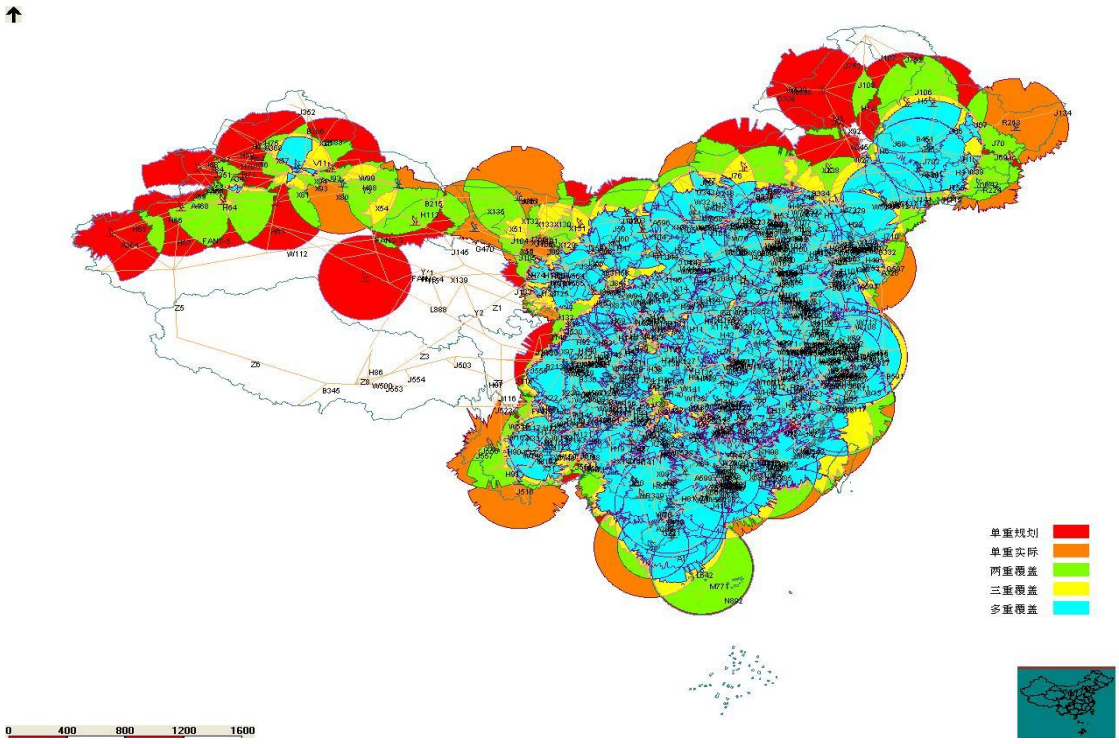

Figure 2: Coverage of SSRs (operational and under construction) in China (6,600 meters)

3. ADS-B

3.1. ADS-B surveillance network of The CAAC ATMB has a hierarchical architecture with the devices of ADS-B ground stations, level-3 local data processing stations, level-2 regional data processing centers and level-1 national data processing centers in the network.

3.2. Currently, China have installed 329 ADS-B ground stations,36 level-3 local data processing stations,8 level-2 regional data processing centers and 1 level-1 national data processing center in China.

3.3. The initial operation of national ADS-B Service has been carried out since October 2019.

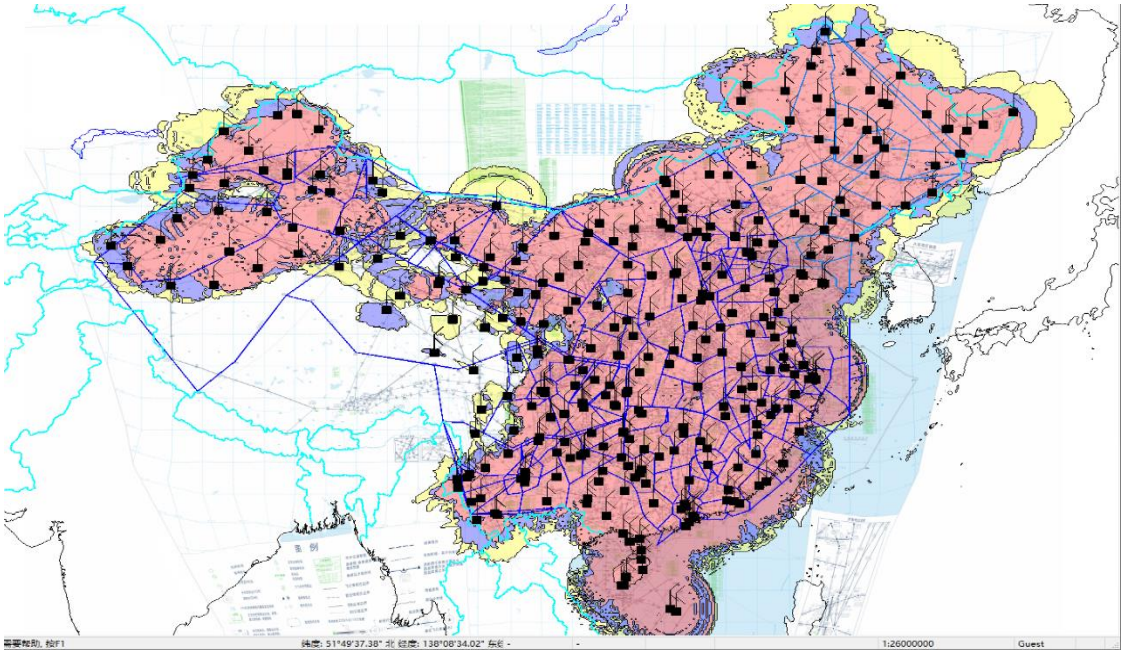

Figure 3: Coverage of operational ADS-B in China (6,600 meters)

4. Surface Movement Radar(SMR)

4.1. SMR deployment

1) To data, The CAAC ATMB has built and put into operation SMRs in 20 busy airports in 18 different Chinese cities, including Beijing, Tianjin, Shenyang, Dalian, Shanghai, Nanjing, Hangzhou, Xiamen, Guangzhou, Shenzhen, Zhengzhou, Wuhan, Changsha, Chengdu, Kunming, Chongqing, Xi 'an and Urumqi.

2) In the cities of Harbin, Fuzhou, Qingdao, Haikou, Guilin and Guiyang, SMRs are now under construction to further enhance local airport surface surveillance capability and guarantee ATC safe operation there.

3) When the constructions above are completed, there are a total of 28 busy airports in 24 different Chinese cities will have SMR existence.

4.2. Multilateration (MLAT) deployment

1) At present, MLAT system is mainly used in airports with complex surface operating environments. They are equipped with SMRs to monitor the airport activity areas, optimize ground taxiing, and improve operating efficiency.

2) MLAT systems have been deployed and put into operation in busy airports in 11 different Chinese cities including Beijing, Tianjin, Harbin, Zhengzhou, Wuhan, Changsha, Sanya, Guilin, Chongqing, Xi 'an and Urumqi.

3) The CAAC ATMB is now building new MLAT system in busy airports in other 12 Chinese cities, including Shanghai, Nanjing, Hangzhou, Fuzhou, Xiamen, Qingdao, Shenzhen, Guangzhou, Chengdu, Kunming, Guiyang, and Xining.

4) After all the projects under construction are completed, 28 busy airports in 23 cities will have MLAT deployments.

5. The action plan of Surveillance implementation in China

	Near Term(2025)	Mid-Term(2030)
Radar	● Continues to install and upgrade Mode S SSRs in radar control area to guarantee the timely, continuous, accurate and reliable service according to the ATC requirements; ● Further implementation of Mode S SSR data link applications and start to conduct Mode S SSR networking research.	● Maintain the existing scale and number of SSRs according to the short-term plan and SSRs work with other surveillance methods like ADS-B; ● Adjust the deployment of Mode S SSRs or build new ones with the change of air route and/or approach control areas to satisfy the ATC demands; ● Realize a fully comprehensive surveillance system integrated with SSRs and ADS-B equipment; ● Promote the networking implementation of Mode S SSRs.
ADS-B	● Push forward the research on ADS-B related technology and support the application of these new findings, making ADS-B control operations fully available in all ATC area in China; ● Provide ADS-B data services to airports, airlines, aviation-related enterprises, industrial regulators, research institutions and the ordinary people; ● Promote the construction and operation of ADS-B to make ADS-B control operation covers the whole China airspace, according to China's low-altitude airspace management and reform work plan; ● Encourage ADS-B OUT applications based on the BeiDou Navigation Satellite System.	● As the internationalization of BeiDou standard proceed, the CAAC ATMB will steadily integrate the BeiDou Navigation Satellite System into its comprehensive surveillance system. As a secure and precise GNSS source, the BeiDou Navigation Satellite System will make ADS-B applications more secure, always-available, accurate and reliable; ● Continues to learn from the practical international experience about ADS-B IN and conduct ADS-B IN trials in certain specific airspace; ● Make research on Flight Information Service-Broadcast (FIS - B) as an essential part of ADS-B IN applications and realize Air-Air surveillance based on FIS – B trials and practical surveillance demands.
MLAT、SMR	● Use solid-state SMR with MLAT integration as the means for airport surface surveillance.	● According to daily operations in busy airports, deploy more SMRs and MLAT systems and upgrade the existing ones if needed; ● Be open to the introduction of brand-new surveillance technology to safeguard the safe operation of airport surface movement.

6. ACTION BY THE MEETING

6.1. The meeting is invited to discuss about:

1) Note the information contained in this paper, and

2) discuss any relevant matter as appropriate

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