

ADS-B Development and Implementation Plan in China



中国民用航空局
空中交通管理局
Air Traffic Management Bureau, CAAC

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1. ADS-B Technology Policy

2. ADS-B Development Projects

3. ADS-B Implementation Plan
in Next Five-Year

4. ADS-B Perspective in China



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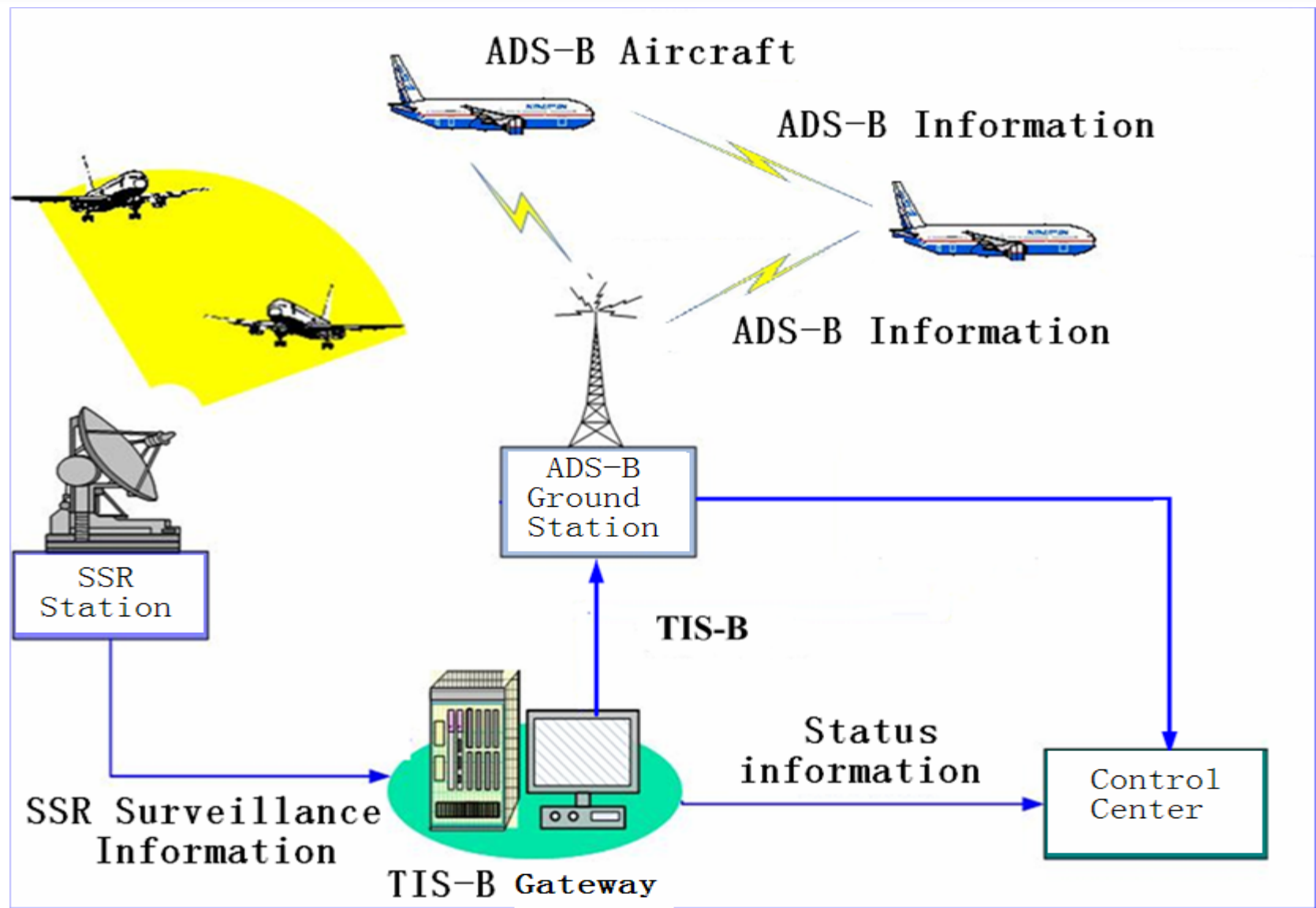


1、 Policy of ADS-B Technology

- Introduction of ADS-B Technology
- ADS-B Strategic Development in China
- ADS-B System Orientation in China



Introduction of ADS-B Technology





ADS-B Strategic Development in China

“Policy of ADS-B Technology in China” is published by Air Traffic Management Bureau, CAAC in 2007. It defined:

Data Link Selection:

- ✓ Commercial Aviation: 1090ES
- ✓ General Aviation: UAT



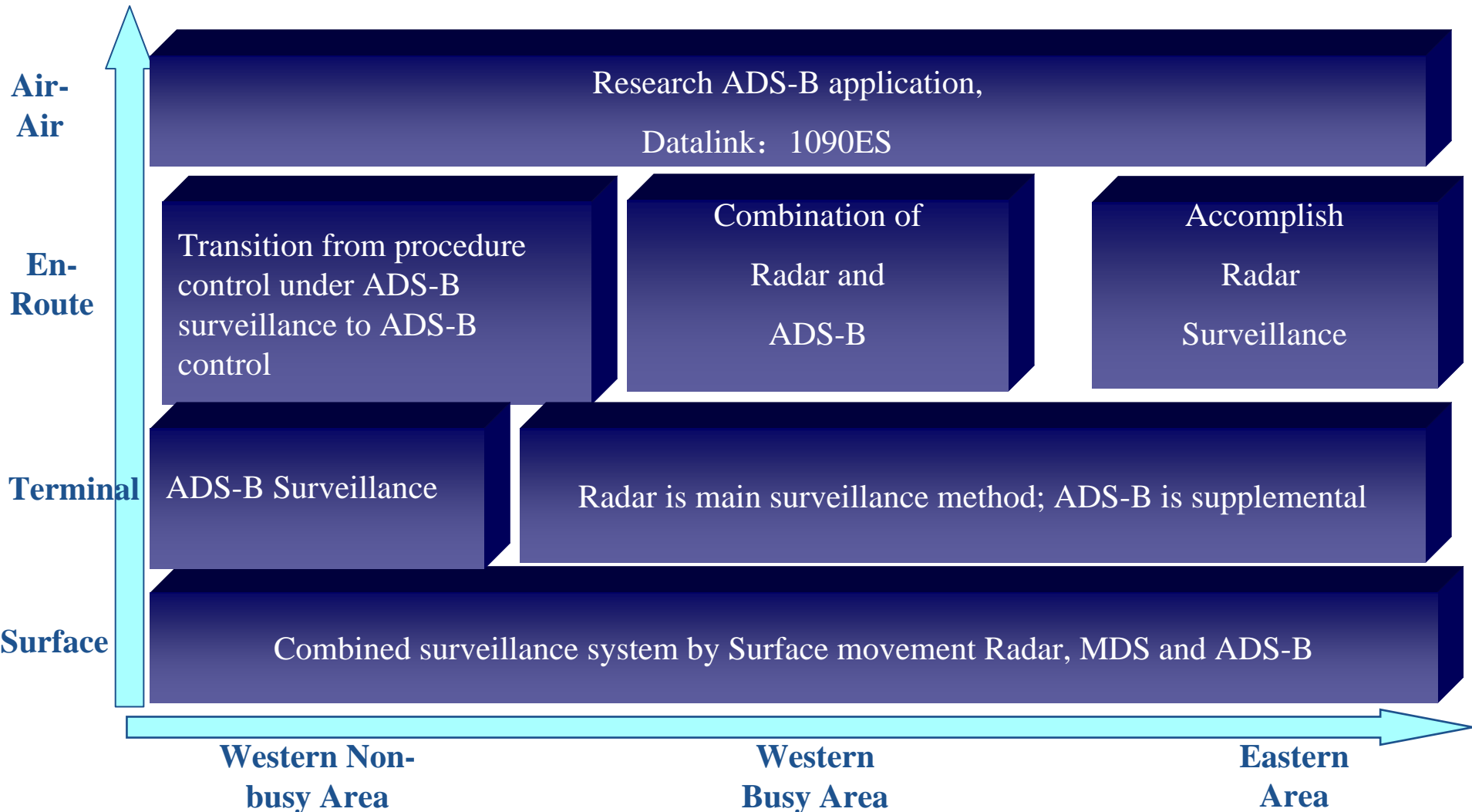
ADS-B Strategic Development in China

Strategic Objectives in 10 years(2010-2020):

- ✓ Compatible with ICAO surveillance development policies; meet the requirements of future civil aviation transportation and ATS development in China; provide surveillance technical standards, operational procedure as to ensure safety and increase efficiency.
- ✓ Evaluation ADS-B system performance and reliability; validation of ADS-B based system.
- ✓ Promote ADS-B application in Western Route to solve the problem of insufficient surveillance and increase flight flow in Western area.
- ✓ Keep with international ADS-B technology trends; build ADS-B system nationwide and promote ADS-B system applications; increase national civil aviation surveillance ability and airspace utilization efficiency; meet the requirement on surveillance system from future flow increase.
- ✓ Adopting the Technology policies of developing and applying Radar and ADS-B surveillance system simultaneously
- ✓ Implementation of ADS-B air-air application (ADS-B IN).



ADS-B system Orientation in China





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2、ADS-B Development Projects

- Chengdu-Jiuzhai ADS-B Application and Evaluation Project
- Chengdu-Lasa Route Surveillance Project
- Xisha ADS-B Experimental System
- B215 Route New Technology Application Project



Chengdu-Jiuzhai ADS-B Application and Evaluation Project

■ Scale

- ✓ Chengdu Airport: 1 ADS-B Ground Station
- ✓ Jiuzhai Airport: 1 ADS-B Ground Station
- ✓ A set of ADS-B Data processing and display system
- ✓ A set of ADS-B analysis and Evaluation System



■ Objectives

To Evaluate technological capability of ADS-B System

To Verify the feasibility of ADS-B application in China

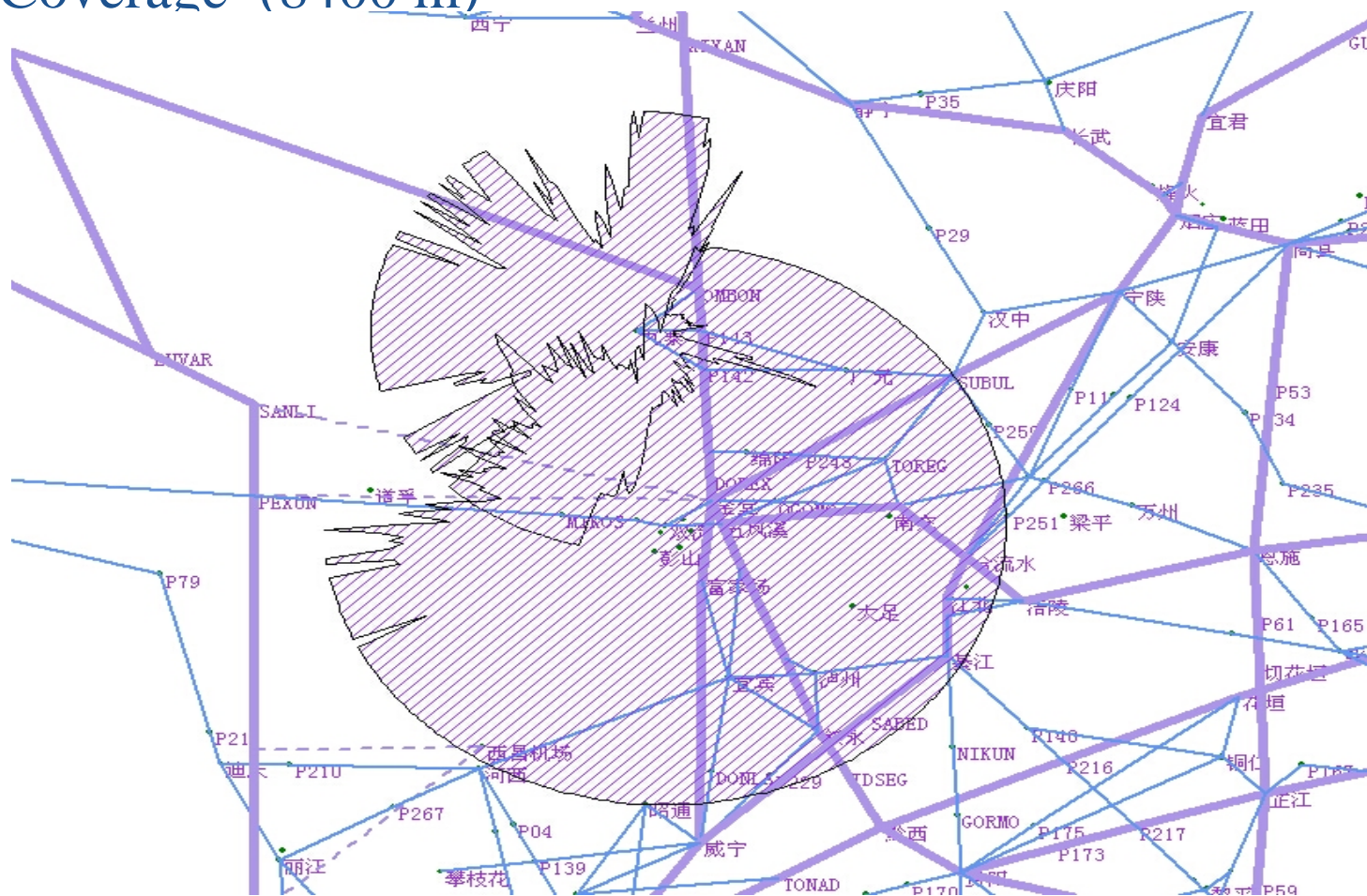
To Provide Suggestions to policy of ADS-B technology, technical standards, operational regulations, etc.

To Improve surveillance coverage on Chengdu-Jiuzhai route (planned to take effect by the end of this year)



Chengdu-Jiuzhai ADS-B Application and Evaluation Project (Cont')

■ Coverage (8400 m)





■ Evaluation Contents

✓ Core Evaluation Contents

- Accuracy
- Integrity
- Velocity
- Heading
- False Target probability
- Position
- Data Link

✓ Other Evaluation Contents

- Altitude
- Reliability
- Coverage
- Distance
- Error Distribution
- Distance Distribution



■ Evaluation Conclusions

- ✓ Conclusion from the comparison of ADS-B data and SSR
 - ADS-B data has advantages over SSR in Accuracy, Integrity, False Target probability, Reliability, Distance Distribution, Error Distribution etc.
 - ADS-B data has better performances than SSR data in Velocity, Heading
 - ADS-B data can match SSR in Altitude, Coverage
- ✓ ADS-B is preferable than SSR, and ADS-B data link can satisfy the rise of surveillance requirements.



Chengdu-Lasa Route Surveillance Project

■ Summary

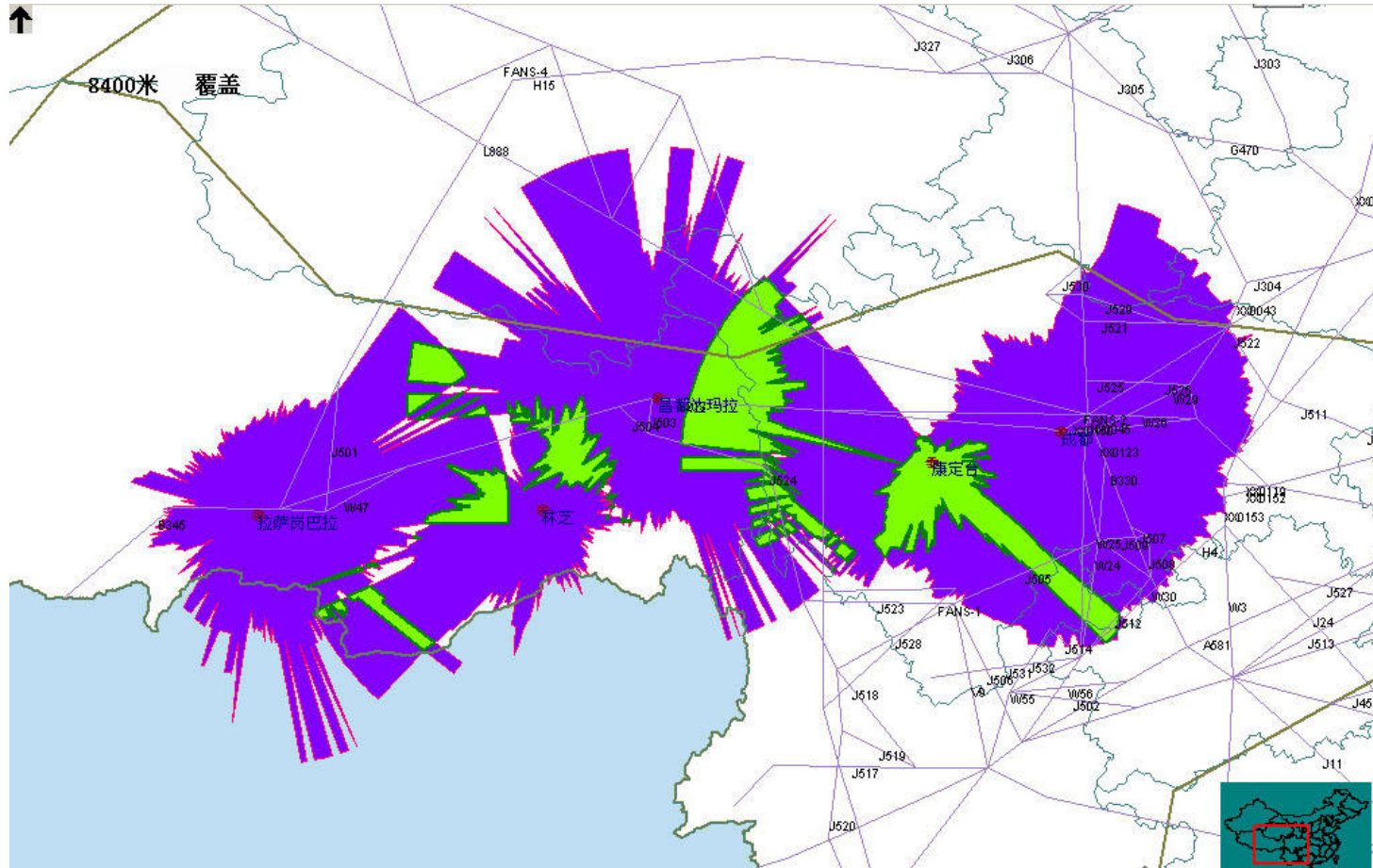
- ✓ 5 sets of ADS-B Ground Stations: Ganbala Lasa, Gongga Lasa, Linzhimilin, Changdudamala, Ganzikangding
- ✓ A set of ATC system is installed in **Lasa** (including two Area Control suites, a tower control suite, a flight plan coordination suite, a system manage suite and a system monitor suite)
- ✓ **Upgrading of an ATC system** installed in Chengdu
- ✓ Establishment of a **RAIM server system** in Beijing

■ Significance

To Achieve the continuous ADS-B coverage of main Flight Level on Chengdu-Lasa route



- Coverage (8400 m)





Chengdu-Lasa Route Surveillance project (Cont')

■ Time Schedule

- ✓ Approved by CAAC in Jun. 2009;
- ✓ To install equipments in Aug.2010;
- ✓ Put into operation.



Xisha ADS-B Experiment System

■ Summary

- ✓ Installed a double redundancy ground station in Nov.2008;
- ✓ Updated the Telephonics ATC system in Haikou Control Center;

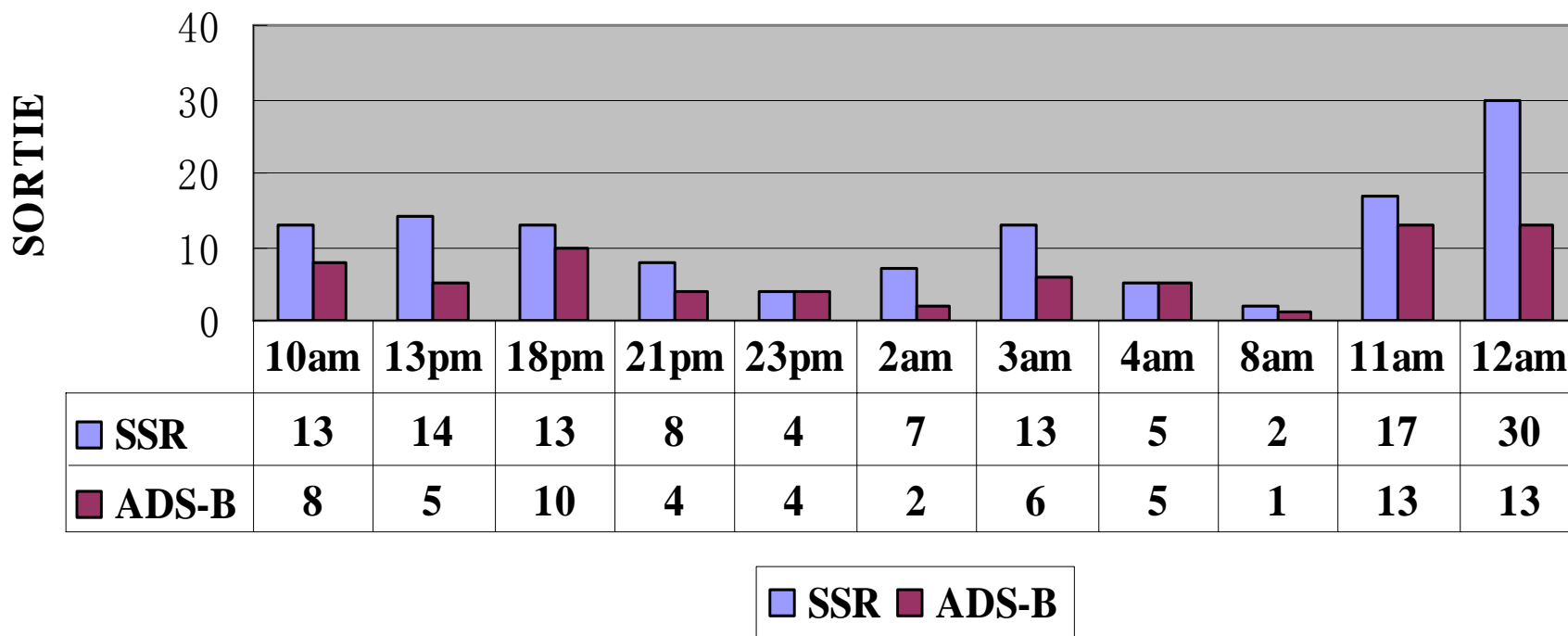
■ Significance

- ✓ Strengthening surveillance capability in South China Sea Area to complement Xisha SSR data
- ✓ Collecting flight statistics data, analyze the airborne capability of ADS-B (out) of flight operating in this area
- ✓ The ADS-B data has been applied for performance evaluating by Hongkong civil aviation



Xisha ADS-B Experiment System (Cont')

Figure of statistics on 16-17 Nov,2009



→ Only 50%-60% of the aircraft have the ADS-B OUT ability according to the preliminary statistics of Xisha ADS-B ground station



Xisha ADS-B Experiment System (Cont')

■ Future Planning:

- ✓ To install a set of ADS-B ground station in Xisha
- ✓ To install two sets of ADS-B ground stations in Sanya
- ✓ To strengthen the surveillance capability in the South China Sea
- ✓ To improve the experimental applications of ADS-B technology in oceanic area



B215 Route New technology Application Project

■ Summary

- ✓ 8 New Ground Stations: Urumqi(2), Shanshan, Hami, Jiayuguan, Ejinaqi, Minqin and Yinchuan

■ Significance

Dual coverage with SSR (already installed in “Eleventh Five- Year Plan”) on B215 route

Provide a reference for merging and displaying ADS-B and SSR information



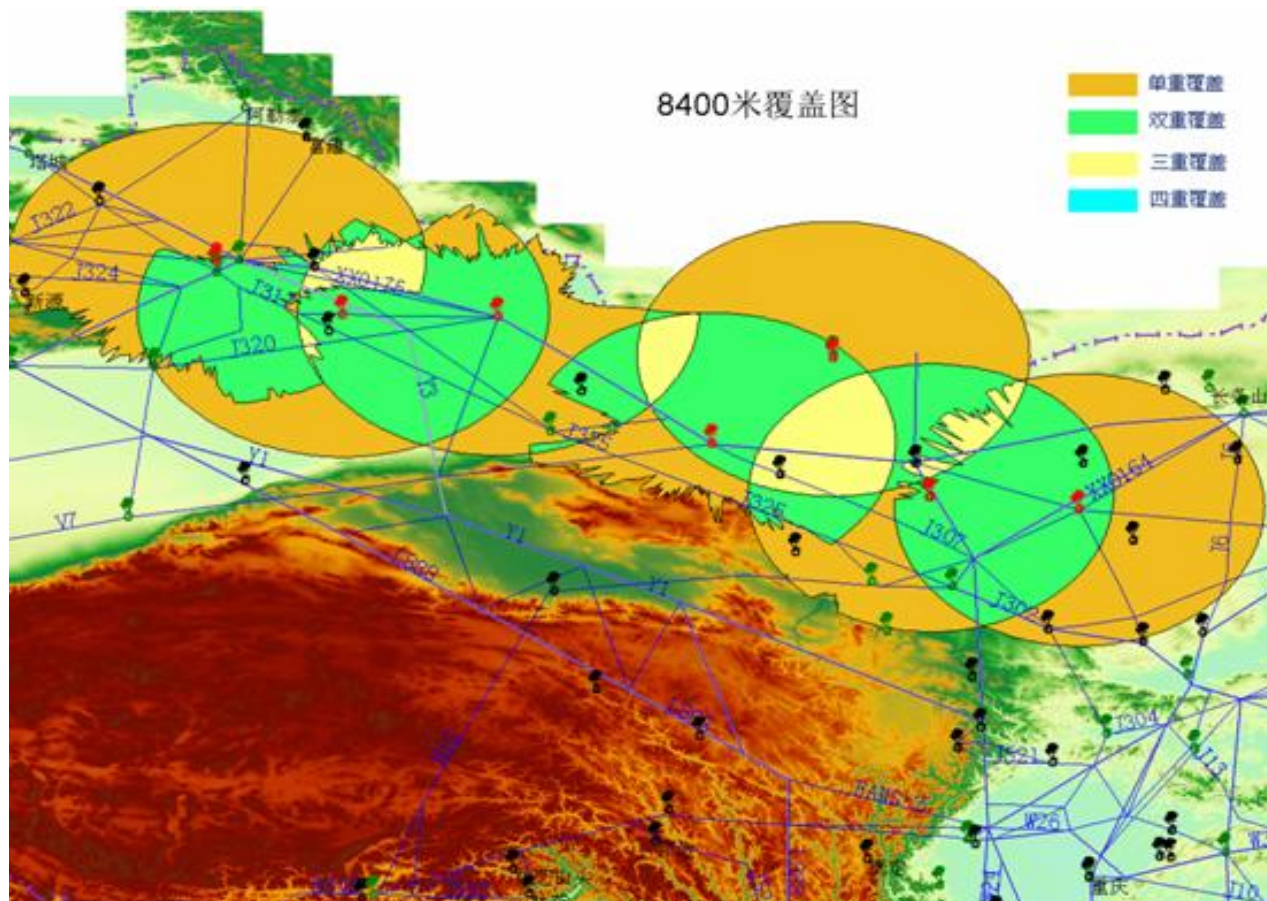
B215 Route New technology Application Project (Cont')

- Time Schedule
 - ✓ Waiting for Approval by CAAC



B215 Route New technology Application Project (Cont')

■ Coverage (8400 m)





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3、ADS-B Implementation Plan in Next Five-Year

■ Planning Object

- ✓ Increase **flow** on the basis of flight **safety**

■ Planning Details

- ✓ Installing ADS-B ground stations in Western Non-Radar Area, **to solve the “unseen” problem on Western Route**
 - (B215,B330,H15,V7,J325,Chengdu-Lasa,Lasa-Ali): To install six sets of ADS-B ground station in Geermu, gangca, mangya, chaka, qilian, changma
 - (western route of Urumqi on B215 route and Xinjiang part on V7 route):To install thirteen sets of ADS-B ground station in Rikeze, Naqu, Diqing, Qiemo, Ruoqiang, Hetian, Kuerle, Kuche, Tazhong, Kashen, Akesu, Yining, Kelamayi
 - (To strengthen Surveillance capability on Chengdu-Lasa, Chengdu-Ali route and the area of Lasa): To install six sets of ADS-B ground station in Taizhao, Bangda, Daofu, Ali(3)



Planning Details (Cont')

✓ SSR Surveillance **Supplements**

- To use 3 sets of ADS-B ground station in Urumqi, Hami, Shanshan (installed in B215 Route New technology Application Project), to strengthen the surveillance capability of Urumqi airport, approach and terminal areas
- To install some ADS-B ground stations in Shantou, Lincang, Mangshi, Tengchong

To Install forty-one ADS-B Ground Stations within China in the “Twelfth Five-Year Plan”, and extend ADS-B applications

- To install ADS-B ground stations in Northeast area so as to satisfy the development of General Aviation
- ✓ To enhance surveillance capability and extend surveillance coverage of **oceanic area**
 - To install two ADS-B ground stations in Xisha, Sanya



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4、ADS-B Perspective in China

- Strengthen ADS-B development in **Western Area**, and realize Radar-like control in ADS-B Surveillance
- Establish ADS-B surveillance system in **Eastern Busy Area**, and attain coverage of air route and 5 nm Separation control
- Combining ADS-B with MLAT and SMR, etc.in **Eastern Busy Airports**, achieve A-SMGCS (Level 4) (can effectively monitor and guide aircrafts and vehicles on airport surfaces)



Thanks!

Jun 2010