

APEC GIT/15 Brisbane, June 12-17, 2011



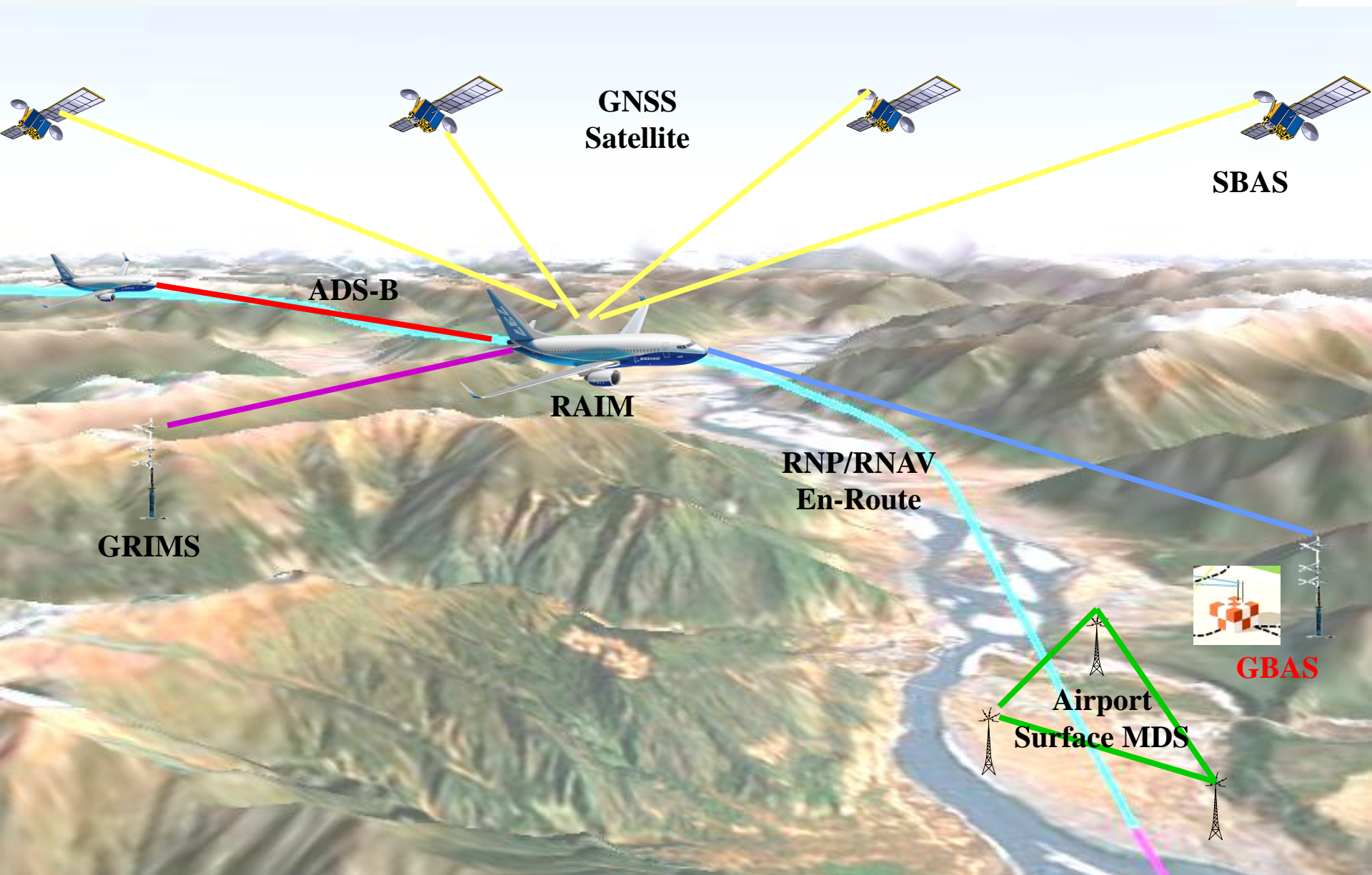
Activities on GNSS implementation Update

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2011年6月14日

GNSS Implementation



Content

❖ Updated Activities on GNSS implementation

- 1. PBN roadmap and way ahead
- 2. ADS-B Implementation update
- 3. GBAS project status
- 4. GRIMS usage and consideration
- 5. RAIMPS service well



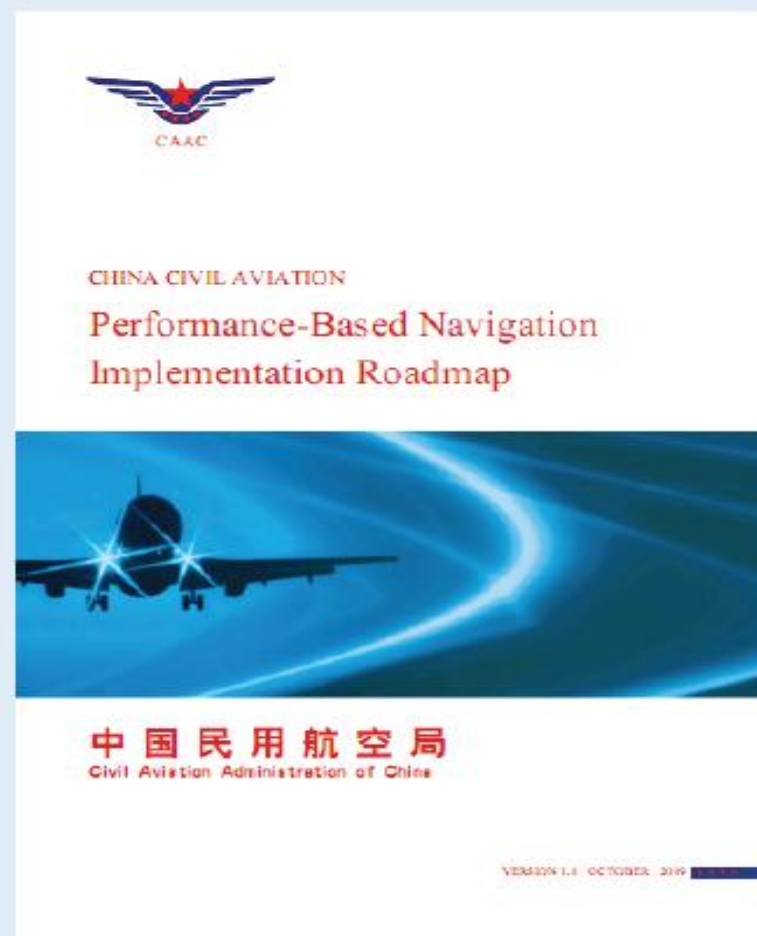
PBN roadmap and way ahead



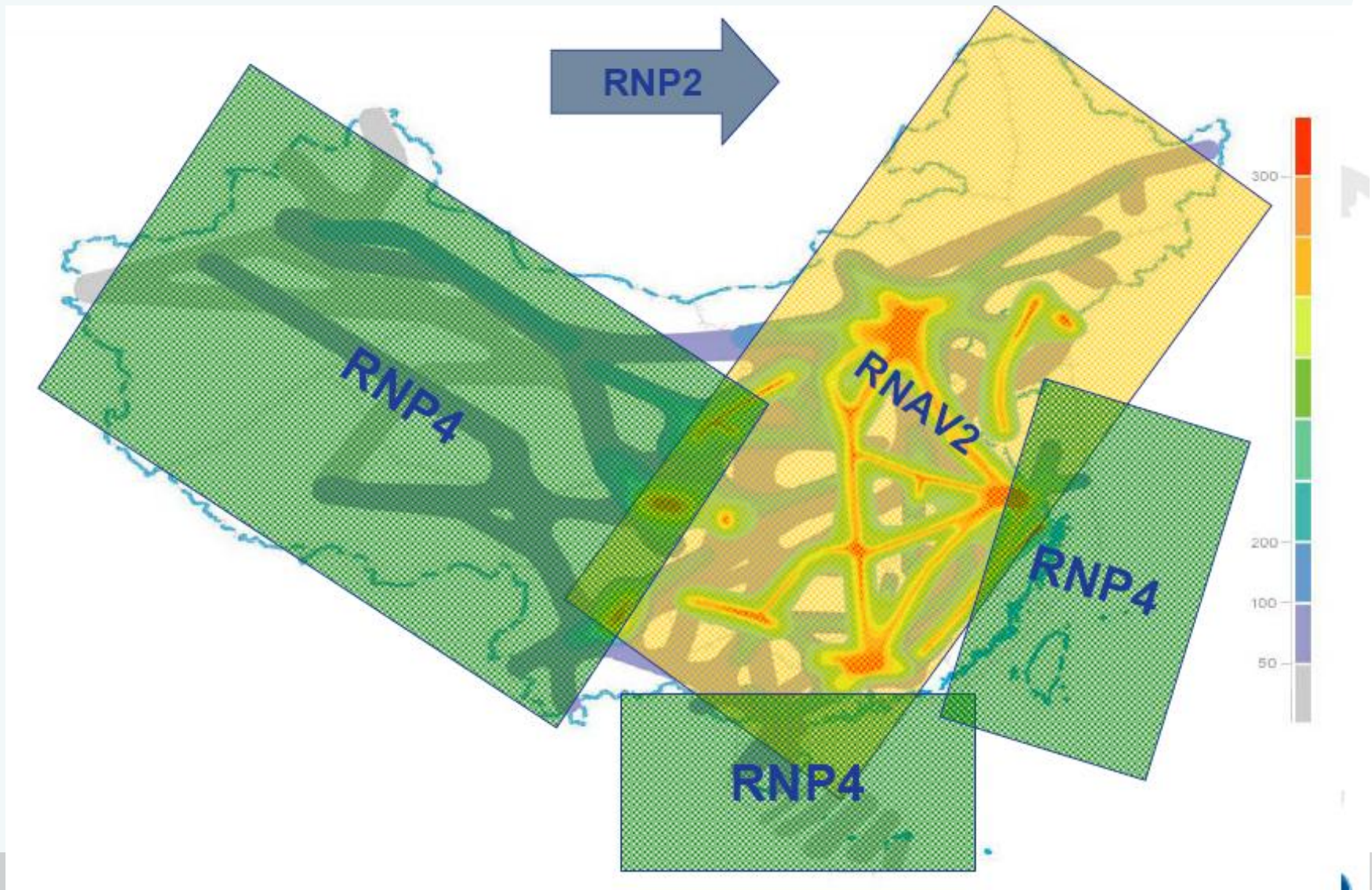
中国民用航空总局
空中交通管理局
Air Traffic Management Bureau, CAAC

PBN Roadmap (Published on October 27, 2009)

5. Implementaion Time Frames; Long term (2013-2016). CAAC will use GNSS on multilateral cooperation, including consideration of using the Compass satellite-based navigation system; 8.2.4 BeiDou Navigation Satellite System



PBN Route plan

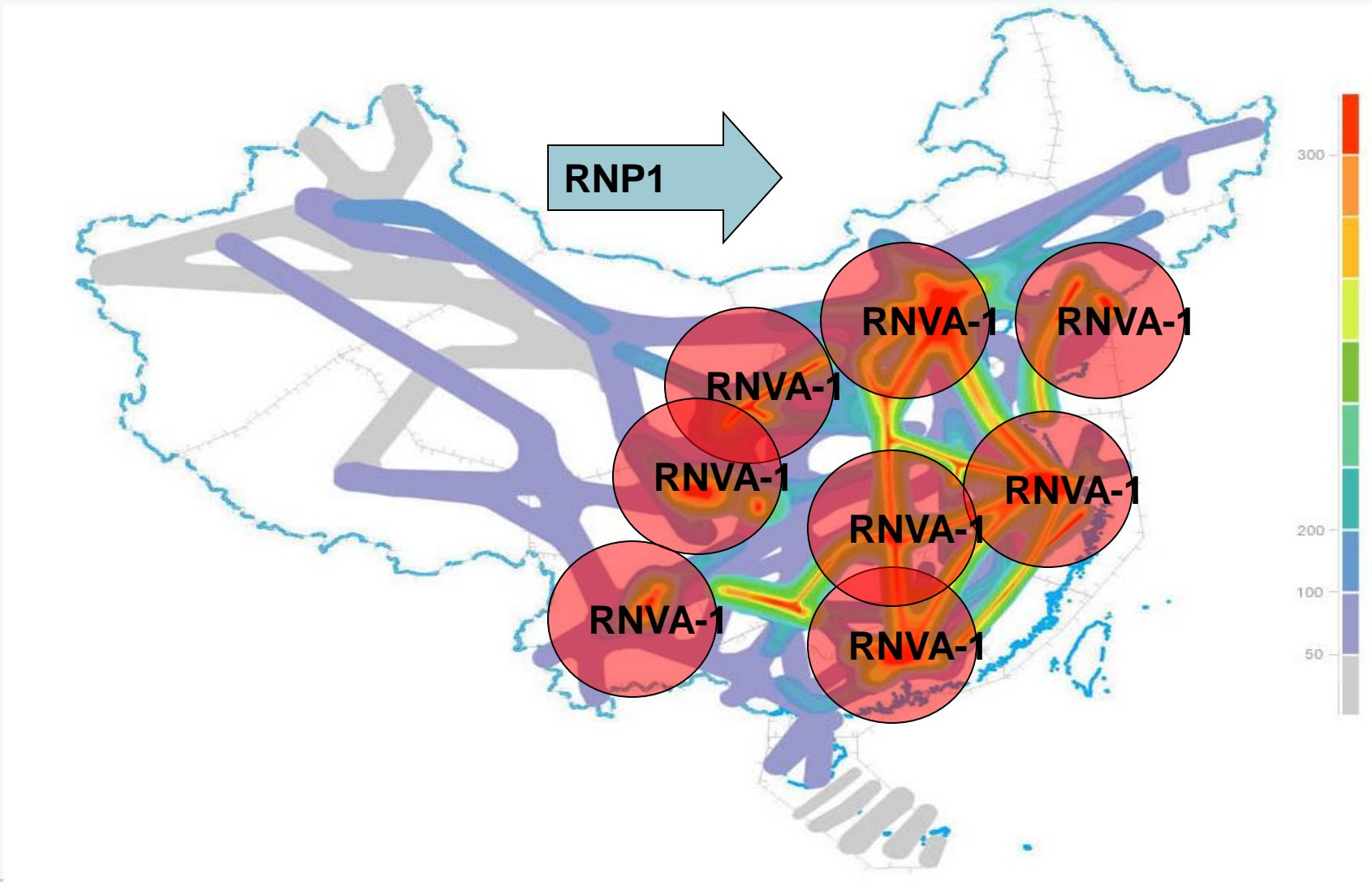


PBN application

RNP/RNAV(En-Route)

- **The length is 10.4 thousand kilometers**
- **4 routes at Sanya area RNP10**
- **West China L888, Y1, Y2, Y3 routes RNP4**
- **Ali to Lasa route RNP4**
- **Xining to Yushu route RNP4**
- **Plan to establish Beijing – Shanghai RNAV2 Route and Chendu – Lasa RNP4 route**

PBN terminal plan



PBN application

Terminal and Airport (18 airports)

- Beijing, Guangzhou, Tianjin, Shenzhen, Shanghai 5 airports RNAV1
- Guyuan, Sanya, Mianyang 3 airports RNP APCH
- Yanji, Xining, Yushun, Lasha, Linzhi, Chandu, Lijiang, Ali, Huangshan, Bangda, 10 airports RNP AR APCH



咨询通告

中国民用航空局飞行标准司

编 号:AC-91-FS-2010-01R1

下发日期:2010年3月1日

在终端区和进近中
实施 RNP 的运行批准指南





ADS-B Implementation update



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

ADS-B Implementation

Manual and Operation procedure ready and plan confirm ADS-B En-route initial operation

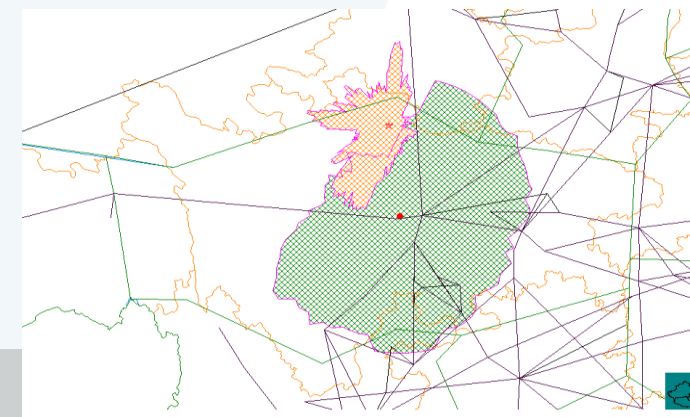
- 18,May,2011 chengdu-lasha
- 16,June,2011 Sanya FIR en-route

1. ADS-B policy;
2. Ground station technical requirement;
3. Ground station implementation roadmap
4. Ground station layout standard;
5. Flight inspection Outline;
6. Operation and Maintenance manual

广播式自动相关监视 (ADS-B) 运行规程
(草稿)

中国民用航空局空中交通管理局

第一版
2010年9月 成都



ADS-B Regulation ready

- ❖ a) **CCAR-93TM-R2**
- ❖ b) **IB-FS-2008-002**
- ❖ c) **CCAR-AC-91-FS/AA-2010-14**
- ❖ d) **ICAO DOC 4444-ATM/501**
- ❖ e) **ICAO ADS-B IMPLEMENTATION AND OPERATIONS GUIDANCE DOCUMENT**
- ❖ f) **RTCA DO-242 Minimum Aviation System Performance Standards for Automatic Dependent Surveillance Broadcast (ADS B)**
- ❖ g) **RTCA DO-282**
- ❖ h) **RTCA DO-303/EUROCAE ED-126 ADS-B-NRA**
- ❖ i) **MH/T XXXX—2011; Operation standards for ADS-B UAT mode of Civil Aviation Administration of China**



GBAS project status

Progress of GBAS project

- ❖ **Initial GBAS Site survey had been conducted**
- ❖ **Technical exchange and personnel training finished for ATMB, local airport and Airline last year. Discussed in Shanghai last month.**
- ❖ **Three flight inspection aircraft is under further study and evaluation test. prepared for the future calibration and certification requirement.**
- ❖ **CAAC had a PDR just before last month and find there still some implementation issue need to be reconfirmation before approve the whole plan.**
- ❖ **ATMB under further detail design adjust and explanation for change to CAAC**

GBAS consideration

- ❖ **promote RNP +GBAS solution**
- ❖ **certificate GBAS needed**
- ❖ **GBAS CAT-I and RNP flight procedure test as expected**
- ❖ **Solved the technical and operation issues**
- ❖ **let all regulation get ready.**
- ❖ **GBAS prototype**
- ❖ **Experiment on cured approach especially for the terrain-challenged airport and some noise-sensed zones,**
- ❖ **GBAS flight calibration and GBAS flight monitor control equipment development**
- ❖ **R&D on CAT 2/3 technical requirement**
- ❖ **Carrier phase differential GBAS study**
- ❖ **Dual Frequency GBAS study**
- ❖ **Dual constellations GBAS study**



GRIMS usage and consideration

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2011年6月14日

GRIMS usage and consideration

- ❖ GRIMS result already used in ADS-B trail systems to let controller know the risk of using GPS (HPL) .
- ❖ We will also use this system as the platform for further wide differential service study and future decision tools





RAIMPS service well

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2011年6月14日

GPS satellite status

GPS data download

航卫星完好性监测系统

首页 简介 发布 统计 RAIM预测 下载 关于我们

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- 航路预测
- 航路分析
- 关于

Terminal Prediction

AREA Prediction

ROUTE Prediction

系... M和NANU报文, 不保证应用的报文与GPS卫星实际情况相一致。

RAIM预测可能受到卫星的突发故障、电离层剧烈变化等多种不可预测因素的影响, 这些因素无法及时反应到RAIM预测系统的输入, 将可能导致预测结果与实际不符, 系统不承担由此造成后果的法律责

C-91FS-01或AC-91-08的使用许可。

RAIM预测服务是在制定飞行计划时提供机载接收机RAIM可用性的预测, 为飞行签派部门和管制部门提供航路、终端区和非精密进近阶段的RAIM可用性信息, 为制定飞行计划提供必要的依据。

RAIMPS service well and consideration

- ❖ **After done some preliminary evaluation in 2009, CAAC flight standard department and ATMB evaluated this system on Dec., 10, 2009. It began initial operation from Dec. 29th, 2009.**
- ❖ **Now the CAAC RAIM prediction system is operating well as expected.**
- ❖ **RAIMPS result will used in ADS-B initial operation to help no GRIMS coverage to let controller know the risk of using GPS, Which target used as a ADS-B Surveillance aid tool in Chengdu-Lasha air route give out essential information for ADS-B situation prediction. .**
- ❖ **after RAIMPS get enough validation and verification, CAAC can approval its open for service and establish a operation monitor procedures and regulation ready as well**
- ❖ **As a basis to help us begin ARAIM and RRAIM study**
- ❖ **in the future, it can merge with Chinese COMPASS/BeiDou navigation satellite system.**



谢谢!

Thanks!