

# CNS EQUIPMENT CERTIFICATION AND LOCALIZATION PROCESS IN CHINA

GUO JING

Director, CNS Division



**Air Traffic Regulation Office, CAAC**



# Part ONE



Certification

➔ CNS Service Providing System is the infrastructure to provide safe and efficient services for civil aviation

➤ Communication:

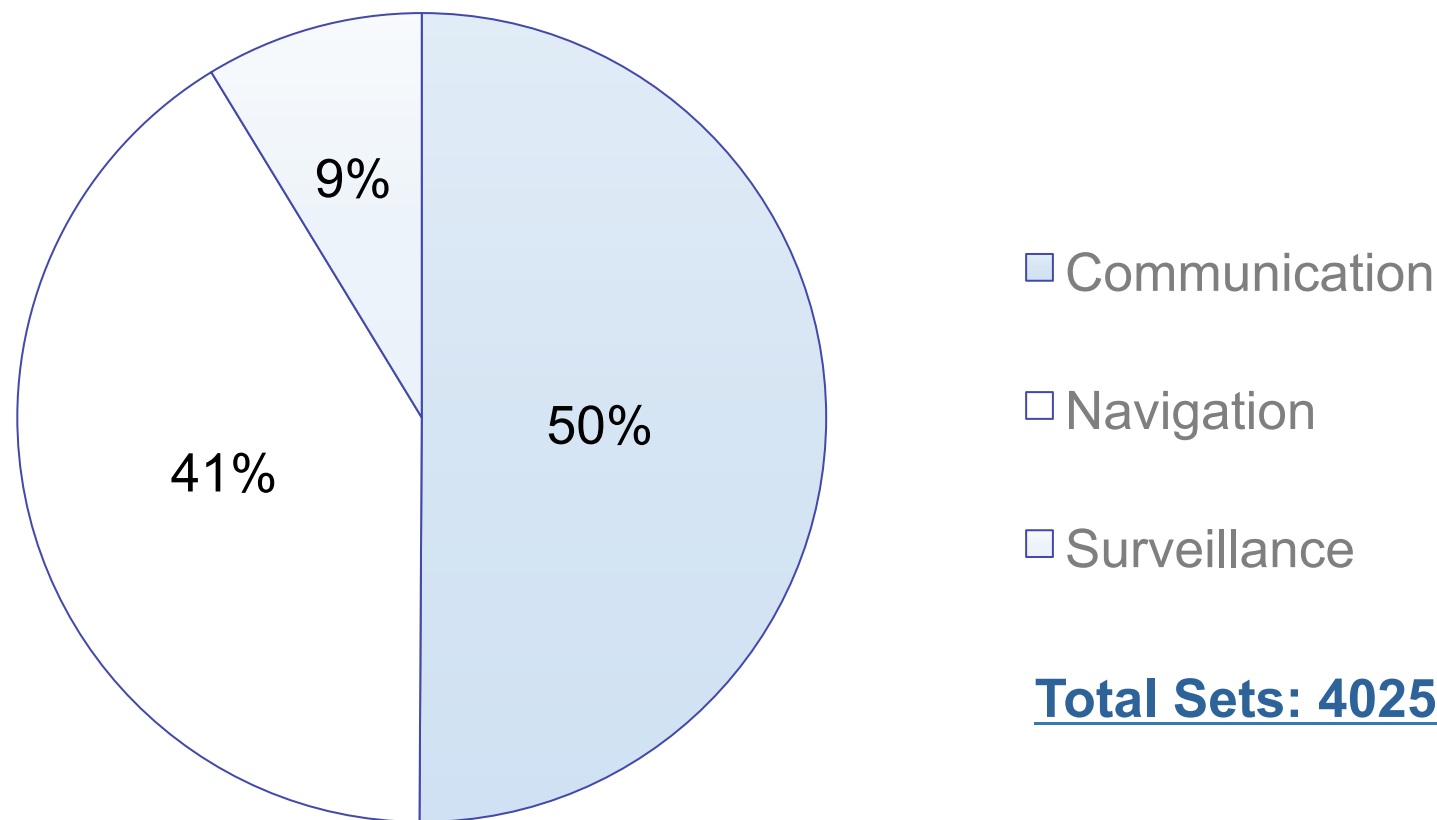
HF, VHF, VCS, AFTN, VAST,  
RECORDER

➤ Navigation:

ILS, MB, VOR, DME, NDB

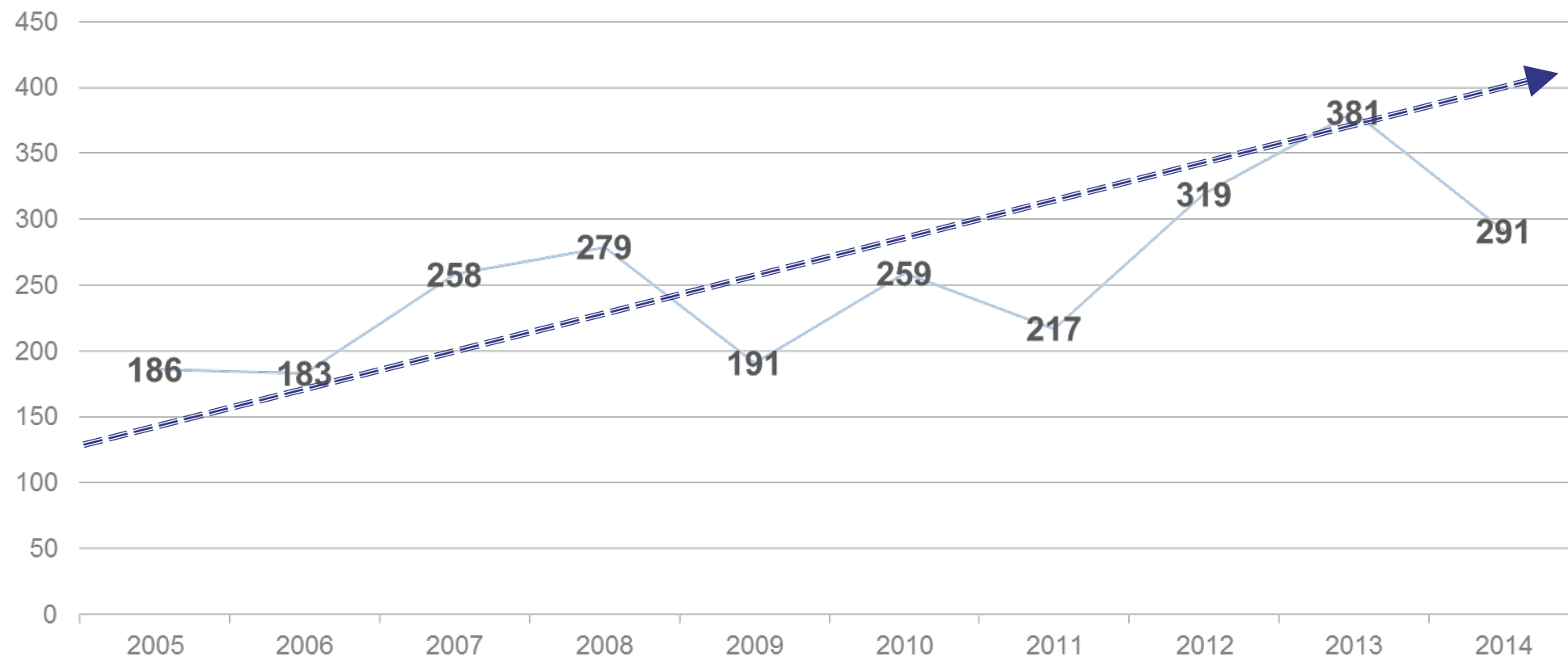
➤ Surveillance:

PSR, SSR, SMR, ADS-B,  
MLAT, ATCAS, A-SMGCAS



## Question

➤ How to guarantee the equipment in safety and reliability?



# CNS Equipment Certification

## Certification System



- ✓ To ensure the CNS equipment compliance with ICAO's SARPs and meeting the operational requirements, CAAC established the CNS equipment certification system in 2002 and continued to improve it.

**Certification Approval**

**Review, Checking and Evaluation**

**Technical Testing**

### Civil Aviation Communication, Navigation and Surveillance Work Rule (CCAR-115TM-R1)

Administrative Rule on CNS Equipment Maintenance Personnel Licensing (CCAR-65TM-I-R3)

Civil Aviation CNS Equipment Certification Rule (CCAR-87)

Administrative Rule on Civil Aviation Navigation Systems Operational Approval (CCAR-85-R1)

Flight Inspection Rule on Civil Aviation CNS Systems (CCAR-86)

Civil Aviation CNS Equipment Certification Procedure (AP-87-TM-2011-01)

### → Level

→ GB (1)

→ MH (68)

→ Technical standards in CNS/ATM is set under the actual situation in China, and according to the relevant ICAO documents. Standards of EUROCAE and RTCA is also considered as a reference.

→ CAAC, ATMB, research institutions and industry all participated in the standard setting.

# CNS Equipment Certification

## Procedure



- 1 System Design Review
- 2 Factory Checking
- 3 Quality Control System Evaluation
- 4 System Factory Testing
- 5 Onsite Stability and Reliability Testing
- 6 Pre-operation Testing



## Basis

**GB/T 27025-2008 《标准和检验实验室能力的通用要求》**

*General Requirements for the Competence of Calibration and Testing Laboratories*

**ISO/IEC/EN 17025 《标准和检验实验室能力的通用要求》**

*General Requirements for the Competence of Calibration and Testing Laboratories*

**国家级电子工业安全与电磁兼容检测中心**

*National Safety and EMC Testing Center of Electronic Industry*

**国家电子产品质量监督检测中心**

*National Electronic Products Quality Supervising Test Center*

**国家级计量检测实验室**

*National Calibration and Testing Laboratories*



### 咨询通告

中国民用航空局空管行业管理办公室

编 号: AC-115-TM-2012-02

下发日期: 2012年12月10日

1090MHz 扩展电文广播式自动相关监视  
地面站(接收)设备测试要求



## ADS-B

Strict criteria  
for testing  
and  
validation



### 信息通告

中国民用航空局空管行业管理办公室

编 号: IB-TM-2013-04

批准日期: 2013年4月17日

1090MHz 扩展电文广播式自动相关监视  
地面站(接收)配置指导材料

  
**CAAC**  
**民用航空空中交通通信导航监视设备**  
CIVIL AVIATION COMMUNICATION/NAVIGATION/SURVEILLANCE EQUIPMENT  
**使用许可证**  
CERTIFICATE OF APPROVAL

证书编号:  
CERTIFICATE NO.: **Z-S-(ADS-B)-EXP28-HAIGE**

设备生产厂家: 广州海格通信集团股份有限公司  
MANUFACTURER: GUANGZHOU HAIGE COMMUNICATIONS GROUP INCORPORATED COMPANY

设备类型: 广播式自动相关监视系统地面站设备  
EQUIPMENT TYPE: Automatic Dependent Surveillance-Broadcast Ground Station

设备型号及产地: EXP28 中国  
MODEL AND ORIGIN: EXP28 China

根据《民用航空空中交通通信导航监视设备使用许可管理办法》(CCAR-87)及有关规定要求,经审查,该设备符合取得民用航空空中交通通信导航监视设备使用许可证条件。  
特发此证,以兹证明。

THIS IS TO CERTIFY THAT THE EQUIPMENT MENTIONED ABOVE COMPLIES WITH THE CIVIL AVIATION CNS EQUIPMENT CERTIFICATION RULES (CCAR-87) AND RELEVANT PROVISIONS, AFTER NECESSARY REVIEW AND TEST.

颁发日期: 2017年  
DATE OF ISSUE: 30/06/2017 截图(Alt + A)

有效期至: 2022年06月29日  
VALID UNTIL: 29/06/2022

发证机关:  
AUTHORIZED BY: 

**许可证载明信息**  
CERTIFICATION INFORMATION

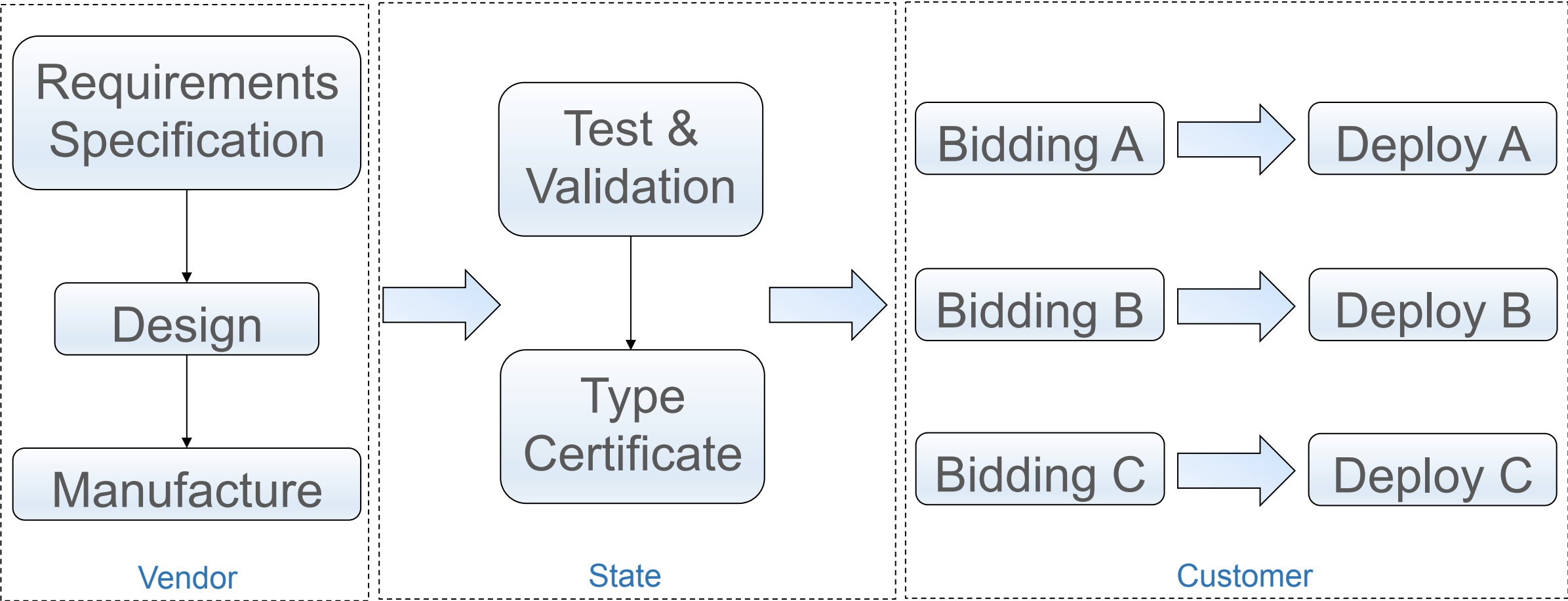
一、设备适用范围(Scope of Application):  
适用于民用航空机场或航路的监视  
Surveillance for Aerodrome or Route

二、售后服务提供 (After-sales Service Provider):  
广州海格通信集团股份有限公司  
GUANGZHOU HAIGE COMMUNICATIONS GROUP INCORPORATED COMPANY

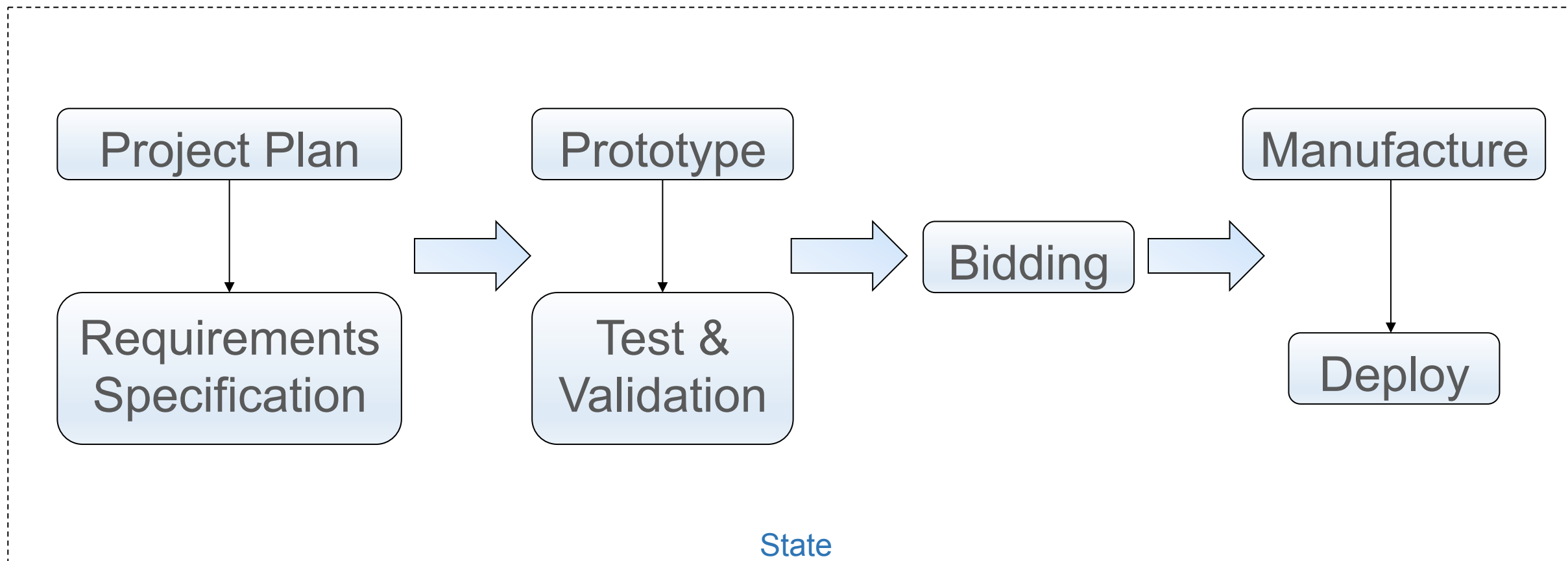
三、设备包含要素 (Essential Information of Equipment):  
接收机天线型号: JW-F-1090(全向), SL-B-1090(定向)  
Receiver Antenna Model: JW-F-1090(Omnidirectional), SL-B-1090(Directional)  
GNSS 接收天线型号: OSANM22001D  
GNSS Antenna Model : OSANM22001D



### CAAC Certification Mode:



## Other mode(Project based):



### Project Based Certification

- Unified national project
- Closed loop
- Applicable for one project
- Including operational trials

### Type Based Certification

- Multiple equipment types
- Open loop
- Continuously applicable
- Before operation

# Part TWO



Localization

➤ Communication (6):

HF, VHF, VCS, AFTN-MS,  
ATIS, DR

➤ Navigation (5):

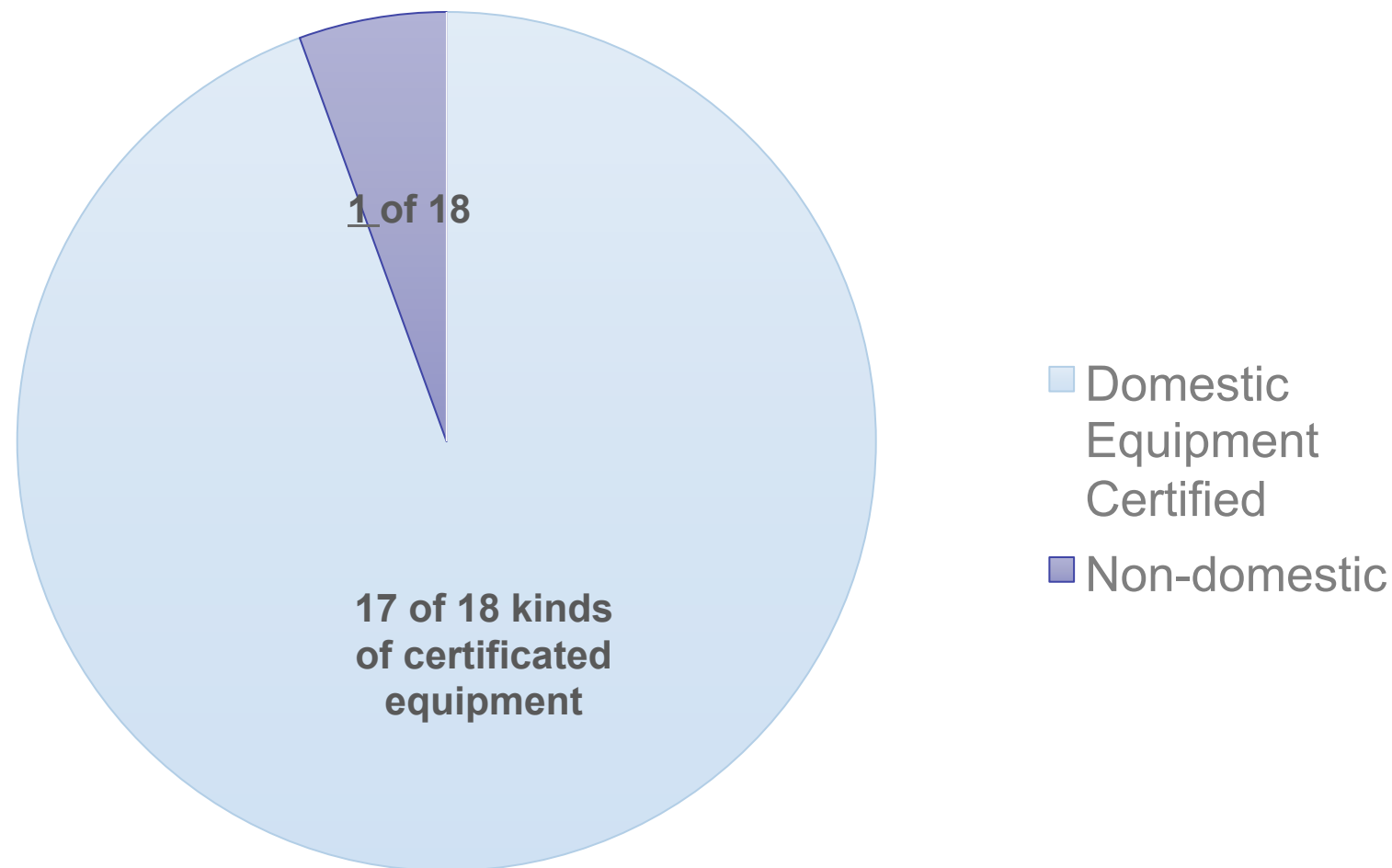
ILS, MB, VOR, DME, NDB

➤ Surveillance (7):

PSR, SSR, SMR, MLAT, A  
-SMGCAS, ADS-B, ATCAS

➤ Total: 18

---





# CNS Localization in China

## Key Equipment



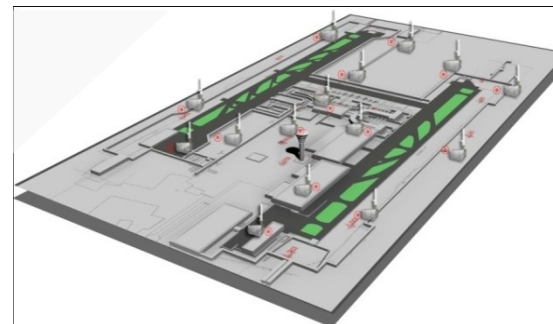
Air Traffic Regulation Office, CAAC



VHF



VOR/DME



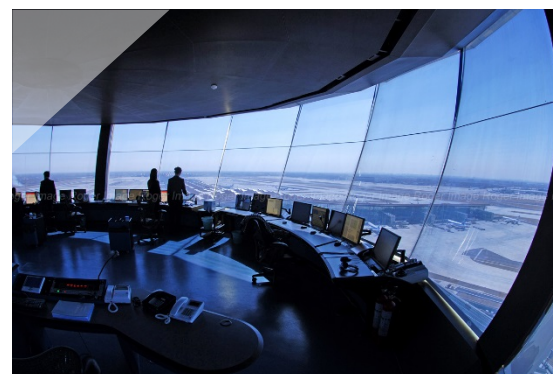
MLAT



VCS



PSR/SSR



ATC SYSTEM



AFTN



ADS-B



Recorder

- 100% domestic manufacturer



NDB

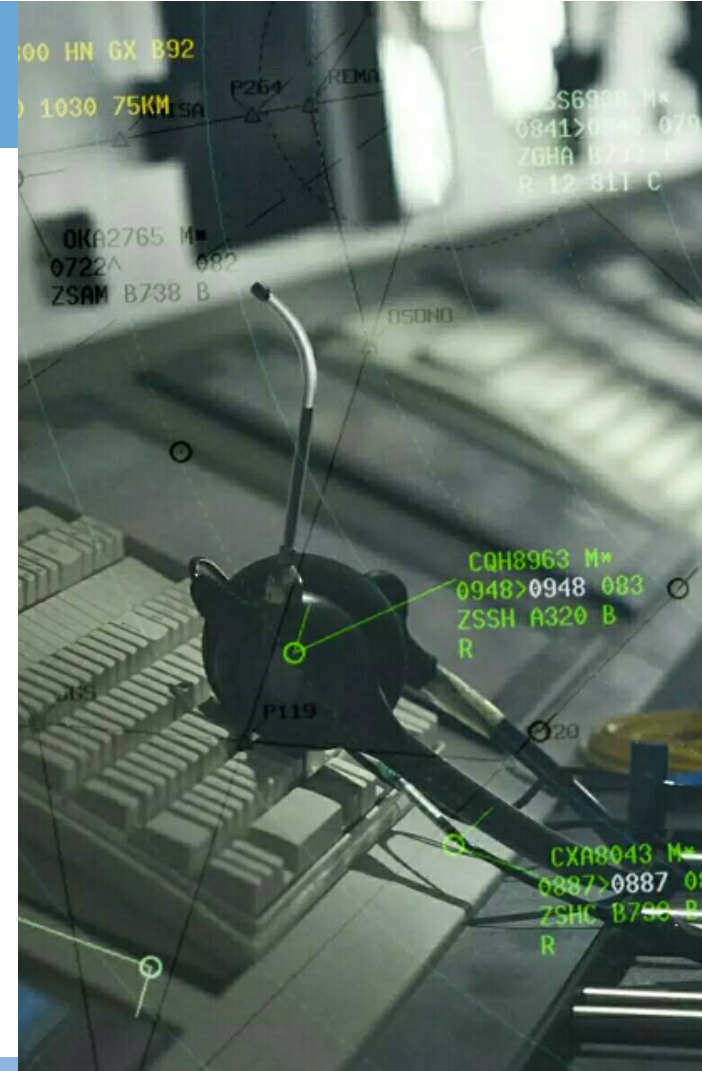
## ADS-B Localization

- Key Element in ICAO ASBU
- Completed 3 ADS-B Test Projects
- Over 600 ADS-B Ground Stations Will Be Installed in China Till 2020
- More Strict Certificate Criteria
- Up to 6 Certified Domestic Manufacturers
- Market Share in China: 100%



## ATC Automation System

- Core Equipment in ATM
- Independent Research and Development Started in The 1980s
- Up to 5 Major Certified Domestic Manufacturers
- Market Share in China: 70%
- Deployed in Largest Area Control Center: Shenyang & Urumqi

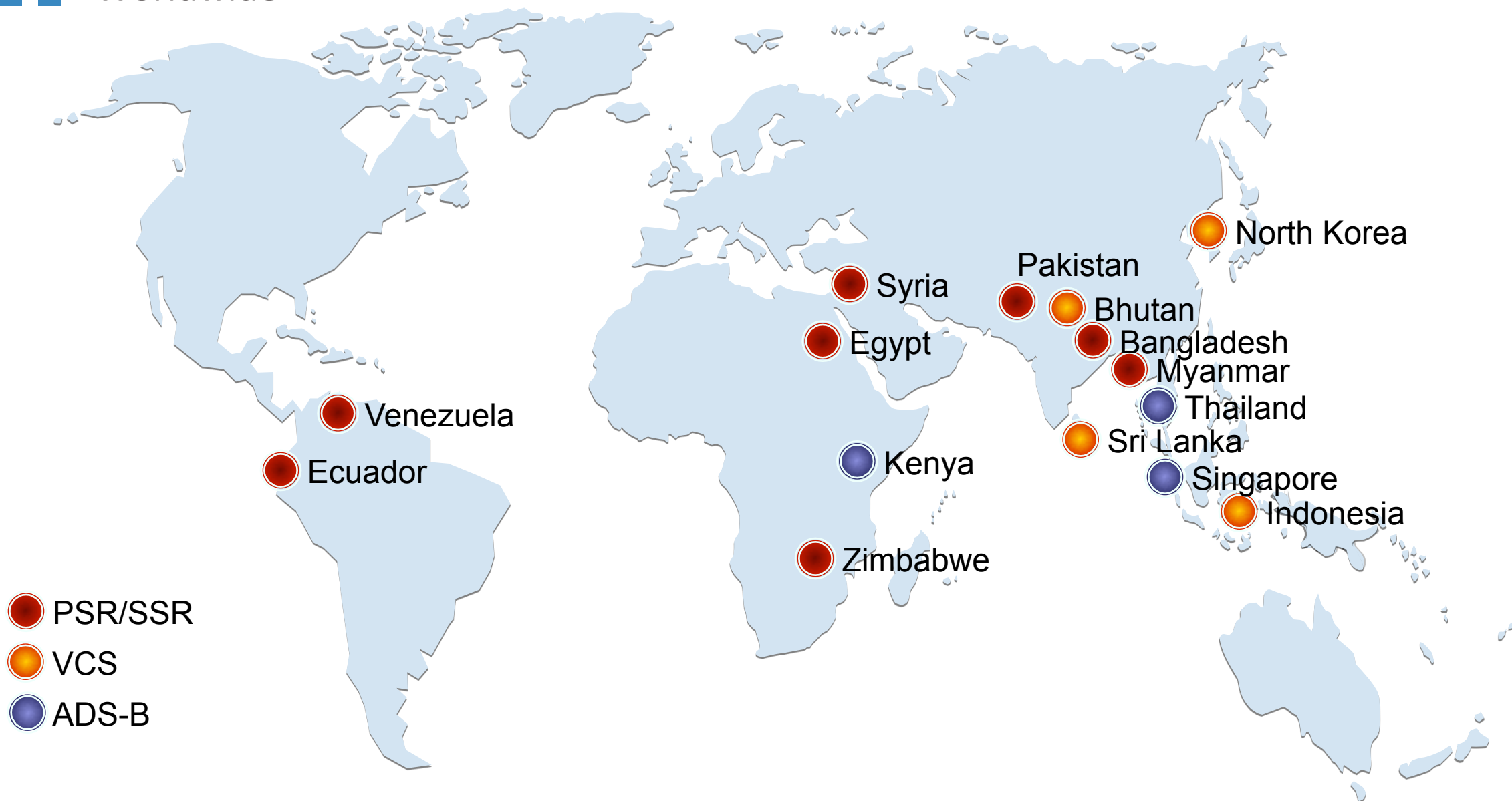


# CNS Localization in China

Worldwide



Air Traffic Regulation Office, CAAC



# Part **THREE**



Responsibility

# Responsibility

Multiple Levels of Work



Air Traffic Regulation Office, CAAC

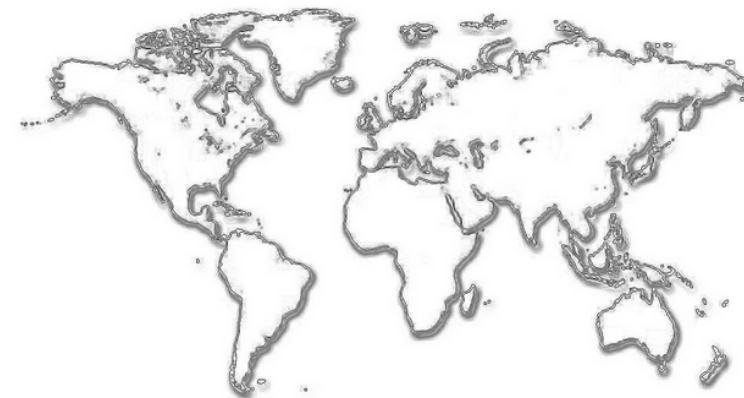
System Design



Quality Control



...



States

User Requirements



Compliance with Standards



## Suggestions

- States are suggested to set up their own legal system and standard system for CNS equipment certificate, including relevant rules, regulations, documents and standards, based on ICAO Annexes and documents as well as their state's upper-level law.
- Individual procedures should be issued for a certain state based on their own legal system and standard system. Highly unlikely, to issue a common procedure for different member states due to the differences of individual legal systems.
- According to above regulations, standards, procedures, Technical services or assistances such as evaluation or testing process could be offered by other states who has technical resources when in need.





Thanks for  
Your Attention



**Air Traffic Regulation Office, CAAC**