ICAO

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

Data Integration in Tower

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Chapter1: Background research

Chapter2: Technical solution

Chapter3: Implementation roadmap

Chapter1: Background research

Chapter2: Technical solutions

Chapter3: Implementation roadmap

1 System description:

The ATM system mainly includes:

- **Air traffic control (ATC) system**

  Aircraft surveillance data and flight plan data

- **Advanced surface movement guidance control (ASMGCS) system**

  Monitoring, warning, route planning for ground target

- **Collaborative decision making (CDM) system**

  Traffic management and constraint information distribution

2.1 Current status:

- Most of the above systems on site come from different manufacturers
- There is no interaction between these systems
- Input the same data repeatedly in multiple systems, or obtain the same data from different systems through external interfaces

2.2 Existing problems:

- Increase the labor burden
- Cause the inconsistent data between systems
- Raise many operational risks and security dangers

3 Solution:

During Beijing Daxing international airport project:

- The main ATC system: THALES Company, Australia
- The backup ATC, ASMGCS, CDM system: LES Company, Nanjing

3 Solution:

We jointly studied and formulated the implementation plan of data integration for ATC system and other systems:

- Investigate the operational requirements
- Complete the ECR and ICD documents
- Upgrade system functions
- Achieve the scheme verification and engineering application

4 Significance:

- Solve the above problems
- Improve the safety and operational efficiency
- The first time of cooperation between Chinese and foreign manufacturers in this field

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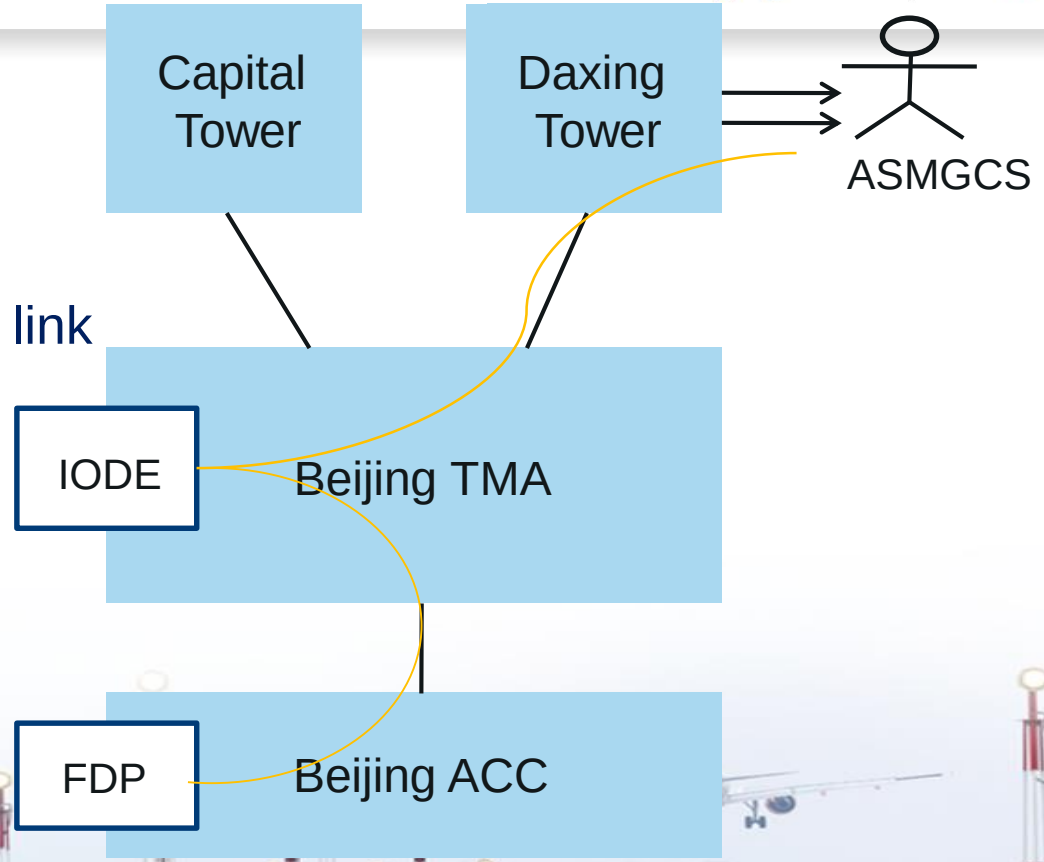
1 System interface:

- Connection on the tower
- TCP/IP protocol and redundant link
- Dedicated IODE software



2 Implementation method:

The way of data types choosing -- Subscription mode:

- Initialization by the client (ASMGCS) to the server (ATC).
- The content can be filtered through conditions (STATE, AIRPORT)
- The client can select the specific data items (RFL, CFL, DRWY, SID)
- The data customization

2 Implementation method:

The way of data update:

- **UPDATE – ITEM:** The updated data on server-side will be released according to subscription
- **REQUEST – ITEM:** The client sends updated data to the server; The server publishes the data after permission.
- These data item owns different W/R permission

3 Interactive data type:

- **Data format -- XML:**

  Open-ended, readability and facilitate post-processing

- **Data classification:**

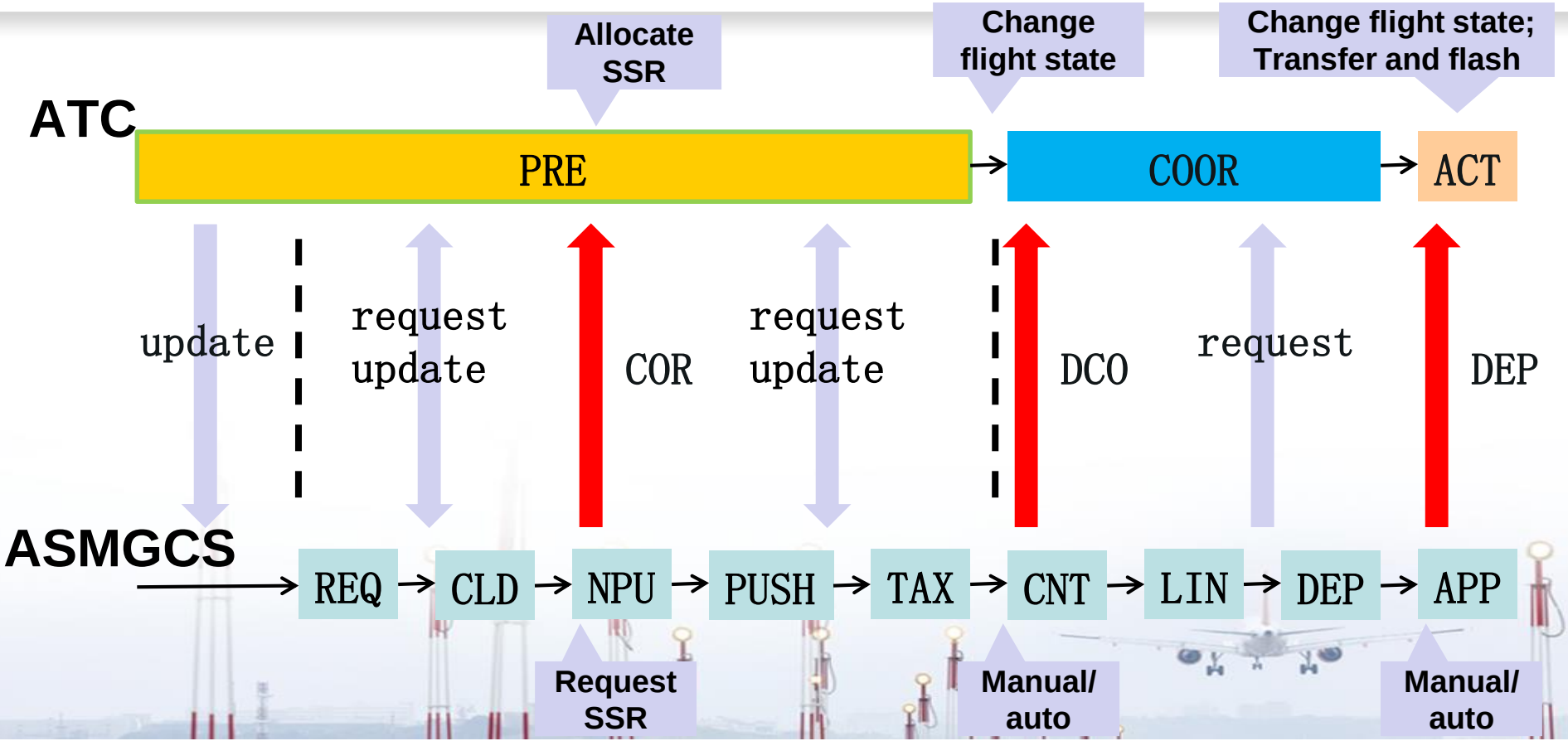
  Information data: ADEP, ADES, CFLS, ROUTE, DRWY, SID , etc.

  Command: DCO, TOC, AOC, DEP, COR, etc.

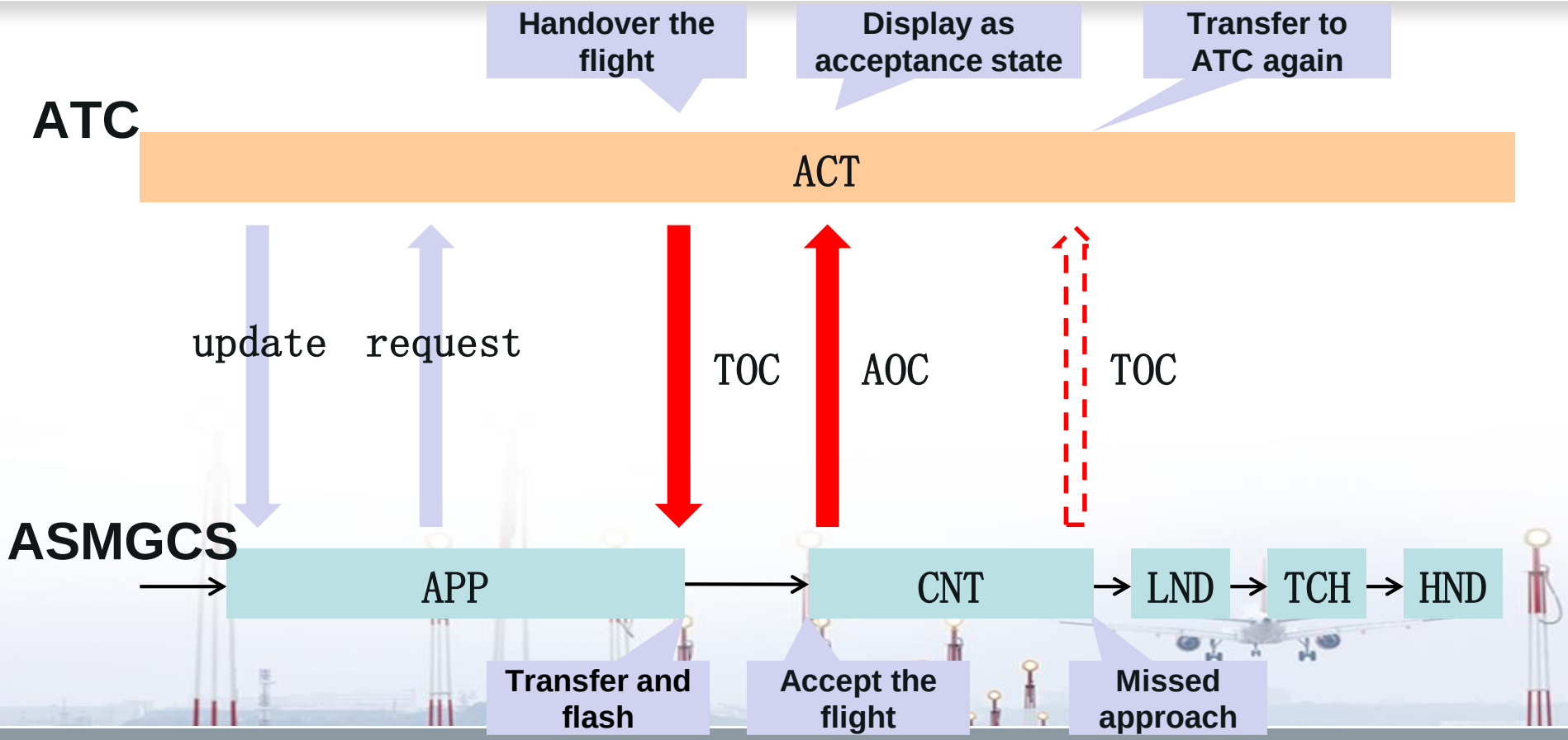
4 Implementation effect:□

- Trigger SSR allocation and change flight state in ATC system.
- Implement the data interaction
- Achieve the hand-over and acceptance of aircrafts

5 Process examples -- Departure



5 Process examples -- Arrival



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1 Milestone:

- ◆Nov 2016, investigation &requirement discussion
- ◆Feb 2017, system design&ECR/ICD
- ◆May 2017, system software development
- ◆July 2017, internal test
- ◆Apr 2018, ATC system FAT
- ◆Sep 2018, ASMGCS system FAT
- ◆May 2019, SAT of these systems
- ◆Oct 2019, put into operation

2 Application&Promotion plan:

- Oct 2019, use at Beijing Daxing international airport
- Verify the necessity of data integration and 4029.3 standard in tower
- From 2020 to 2025, promote in north China and other places
- Prepare technical guidance materials and ICD documents
- Submit to Central ATMB for the supplements of 4029.3
- Submit working-paper to ICAO

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Thank You for attention!