ICAO

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

CAAC Specification for ATMAS Part 3 Data Exchange

Presented by China

CONTENTS

Background

ACTION ITEMS 2-4 (ATMAS TF/2) - Translate the information on MH/T 4029.3 into English first for better understanding by other Member States/Administrations

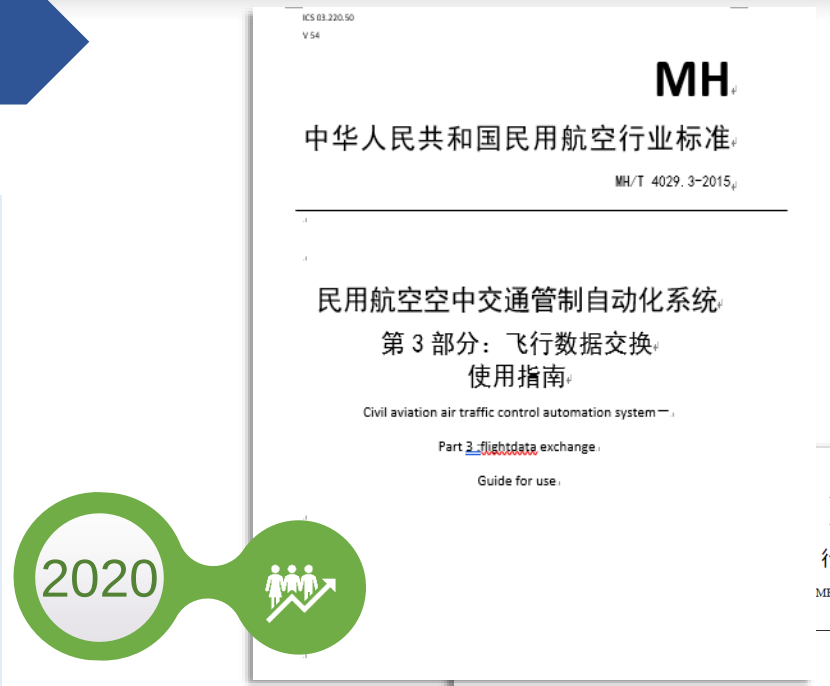
Specification for Data Exchange MH/T 4029.3

Stipulate the requirements for flight data exchange between ATC and related systems

- Standardize ATMAS and related system interconnection interfaces
- **Improve data synchronization between main and fallback ATMAS**
- **Solve the problem of screen handover between ATMAS in different ATC Units**

MH/T 4029.3 - General Situation

- 2015: CAAC issued the industry standard MH/T4029.3“ATMAS—Part 3: Data Exchange.
- 2020: CAAC released the revised edition and guidance manual on the basis of summarizing previous verification operation experience.



CONTENTS

MH/T 4029.3 – Advantages

Data organized in semi-structured, open text form, having the advantages:

- **Good readability**
- **Strong scalability**
- **Strong data compatibility**
- **Adaptive architecture**
- **Send on demand, saving resources**

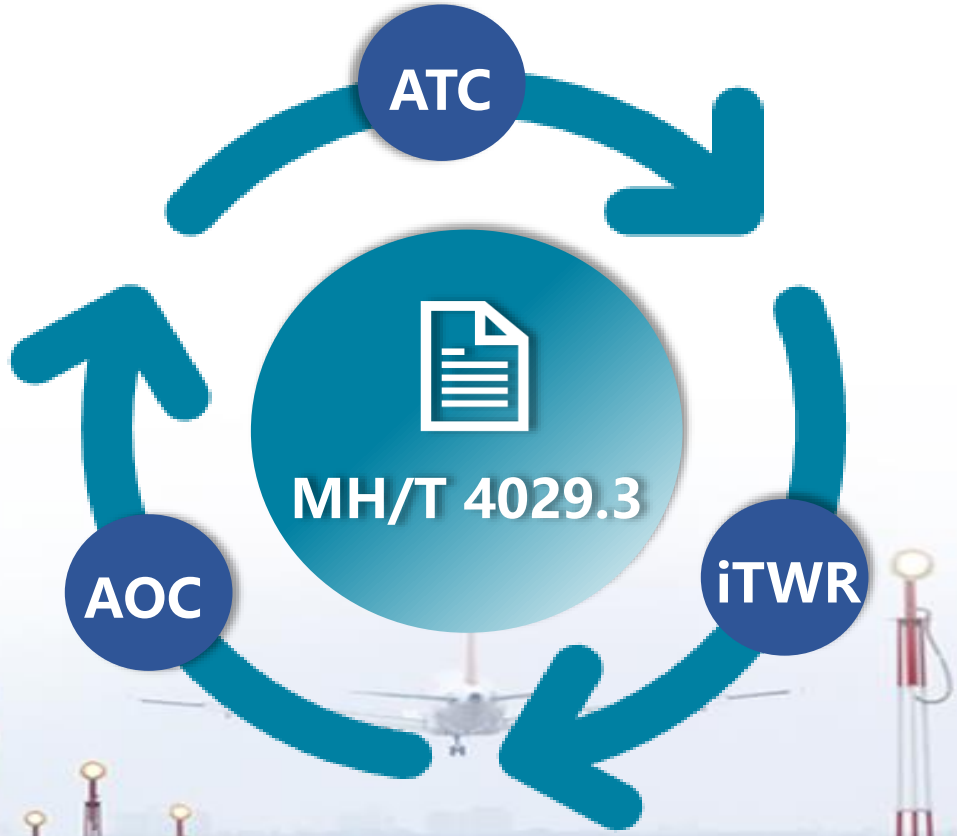
-TITLE BRTA
-FILTIM 120830
-RTAID SP0001
-RTAFLAG SPTW
-RTASTATUS CLS

-TITLE IFPL
-FILTIM 010909
-IFPLID 201332005
-ARCID CSN6435
-ADEP ZBAA
-ADES ZUUU
-EOBD 20130301
-EOBT 0850
-SSRCODE A1270

MH 4029.3 –Applicable System

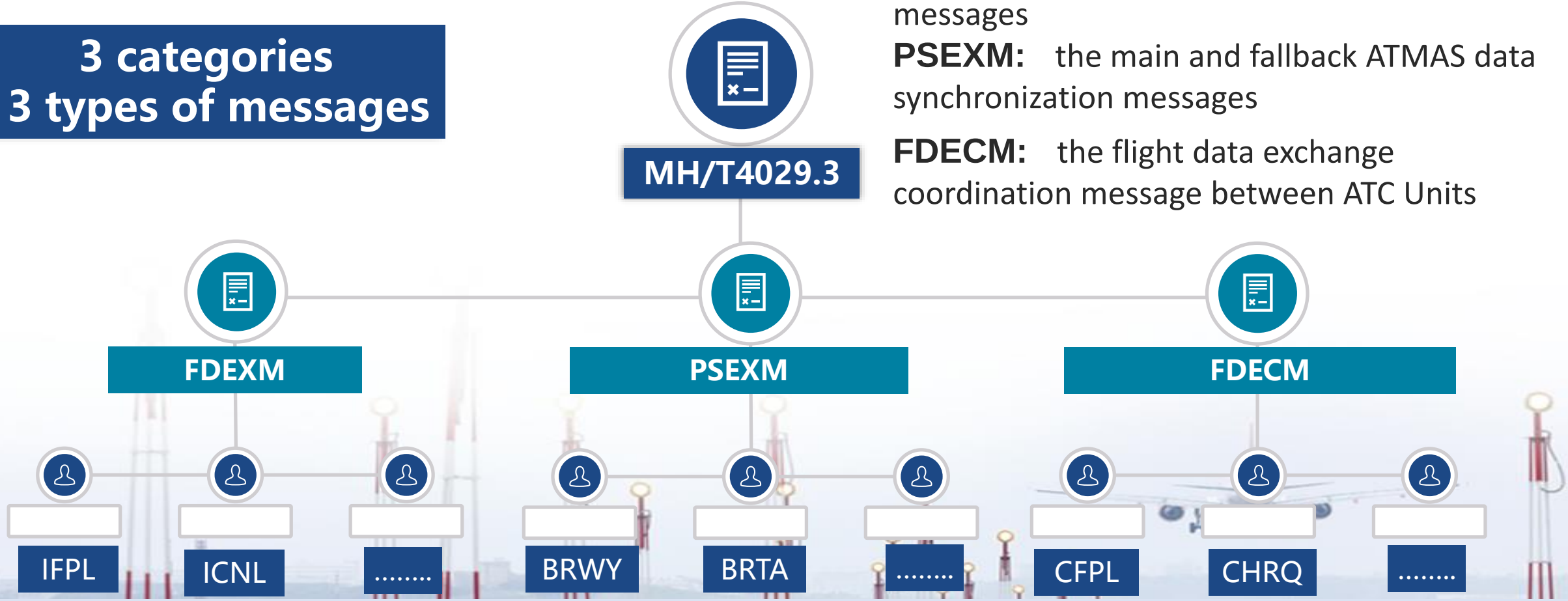
Suitable for flight plan and operational environment data interaction among various systems

- **ATMAS**
- **ATMAS & iTWR**
- **ATMAS & Flight Plan Processing System**
- **ATMAS & AOC**
- **Other Systems**



MH/T 4029.3 – Content Composition

3 categories
13 types of messages



FDEXM： the basic flight data exchange messages

PSEXM: the main and fallback ATMAS data synchronization messages

FDECM: the flight data exchange coordination message between ATC Units

MH/T 4029.3 – FDEXM

FDEXM includes 3 kinds of messages:

IFPL:
individual flight plan message

IDEL:
individual flight plan deletion message

ICNL:
individual flight plan cancellation message

```
-TITLE ICNL
-SOURCE AIRNET:ZUCK
-FILTIM 060830
-IFPLID 101332145
-ARCID CES434
-ADEP ZUUU
-ADES ZBAA
-EOBD 20130106
-EOBT 1135
```

```
-TITLE IFPL
-SOURCE AIRNET:ZUCK
-FILTIM 061210
-IFPLID 201332145
-ADEP EGLL
-ADES EHAM
-ARCID CCA434
-ARCTYP A319
-CEQPT SRW
-EOBD 20130106
-EOBT 1135
-SEQPT C
-WKTRC M
-TTLEET 0054
-FLTRUL I
-FLTTYP S
-ROUTE N0402F270 BPK UM185 CLN UL620 REDFA/N0390F230
-ALTRNT1 EHRD
-OTHERINFO PBN/B1C1D1O1S2 DOF/130106 REG/B1427 SEL/HMBK
CODE/781164 RMK/TCAS II
-SUPINFO E0745 R/VE S/M J/L D/2 8 C YELLOW
-BEGIN RTEPTS
    -PT -PTID EGLL -FL F000 -ETO 20130106115100-ISPASS Y
    -PT -PTID BPK -FL F060 -ETO 20130106120245-ISPASS Y
    -PT -PTID TOTRI -FL F107 -ETO 20130106120605-ISPASS Y
    -PT -PTID MATCH -FL F115 -ETO 20130106120630-ISPASS Y
    -PT -PTID BRAIN -FL F164 -ETO 20130106120915-ISPASS N
    -PT -PTID DAGGA -FL F181 -ETO 20130106121010-ISPASS N
    -PT -PTID CLN -FL F223 -ETO 20130106121220-ISPASS N
    -PT -PTID ARTOV -FL F250 -ETO 20130106121400-ISPASS N
    -PT -PTID REDFA -FL F230 -ETO 20130106122010-ISPASS N
    -PT -PTID EHAM -FL F000 -ETO 20130106124950-ISPASS N
-END RTEPTS
```

MH/T 4029.3 – PSEXM

PSEXM includes 6 kinds of messages

BRWY:
airport and runway status message

BSEC:
sector assignment message

BRTA:
restricted area status message

BQNH:
query nautical height message

BSSR:
ssr code assignment message

BCWP:
cwp setting message

```
-TITLE BRWY
-SOURCE AIRNET:ZUCK
-FILTIM 120830
-AIRPORT ZUUU
-BEGIN RWYLIST
-RUNWAY- RWYID 02L- RWYSTATUS DEP- INFOR
-RUNWAY- RWYID 02R- RWYSTATUS CLS- INFOR
-END RWYLIST
```

```
-TITLE BSEC
-SOURCE AIRNET:ZUCK
-FILTIM 120830
-BEGIN SECLIST
-LPS- SECTORID ACC01- SECTORS AC01 AC02
-LPS- SECTORID ACC03- SECTORS AC03
-LPS- SECTORID ACC04- SECTORS AC04 AC05
-LPS- SECTORID TWR01- SECTORS TW01 AP01
-END SECLIST
```

MH/T 4029.3 – FDECM

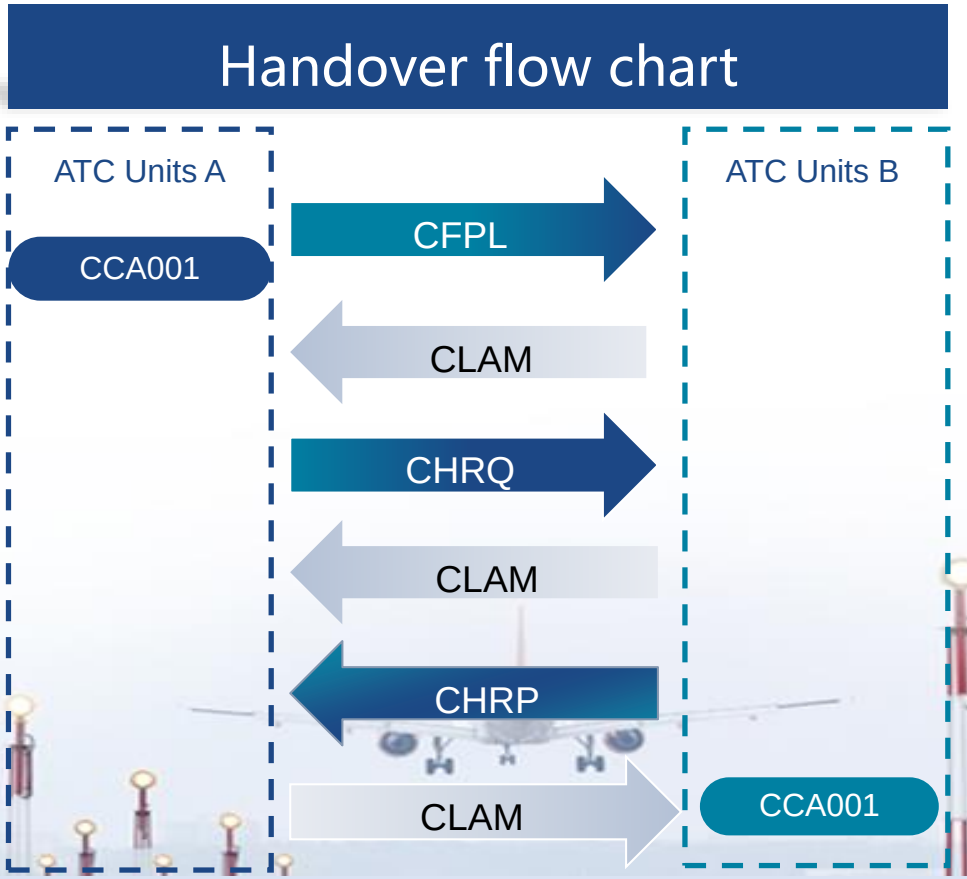
FDECM including 4 types of messages

CFPL：
coordination flight plan

CHRQ：
handover request message

CHRP：
handover response message

CLAM：
logical affirm message



MH 4029.3 – Content Composition

The standard consists of ten chapters:

- **Chapter 1: Introduction ,** the scope of application
- **Chapter 2: Terms, Definitions and Abbreviations**
- **Chapter 3: General data of Exchange Data,** specifies and explains the format and unit of measurement of date, time, speed, altitude, position and other data used in the standard
- **Chapter 4 : Structure of Exchange Data,** specifies and explains the structure, mode, symbol, data field and data item content of exchange data, and defines the flight plan statues

MH 4029.3 – Content Composition

- **Chapter 5: FDEXM fields definition ,**specifies and explains the flight data fields that need to be exchanged between adjacent ATCs and between M/F ATMAS
- **Chapter 6: FDEXM data format,** specifies and explains the use conditions and data structure of three kinds of exchange message (IFPL, IDEL, ICNL).
- **Chapter 7: PSEXM field definition,** specifies and explains the data fields that between M/F ATMAS
- **Chapter 8: PSEXM data format,** specifies and explains the use conditions and data structure of five kinds of exchange message (BSSR, BSEC, BRWY, BRTA, BCWP)
- **Chapter 9: FDECM field definition,** specifies and explains the data fields that between adjacent ATCs
- **Chapter 10: FDECM data format,** specifies and explains the use conditions and message structure of four types of exchange messages (CFPL, CHRQ, CHRP, CLAM)

MH /T 4029.3 – System Connections

Suitable for a variety of protocols and physical connection methods

串口
Serial

HDLC

.....

X.25

网络
network

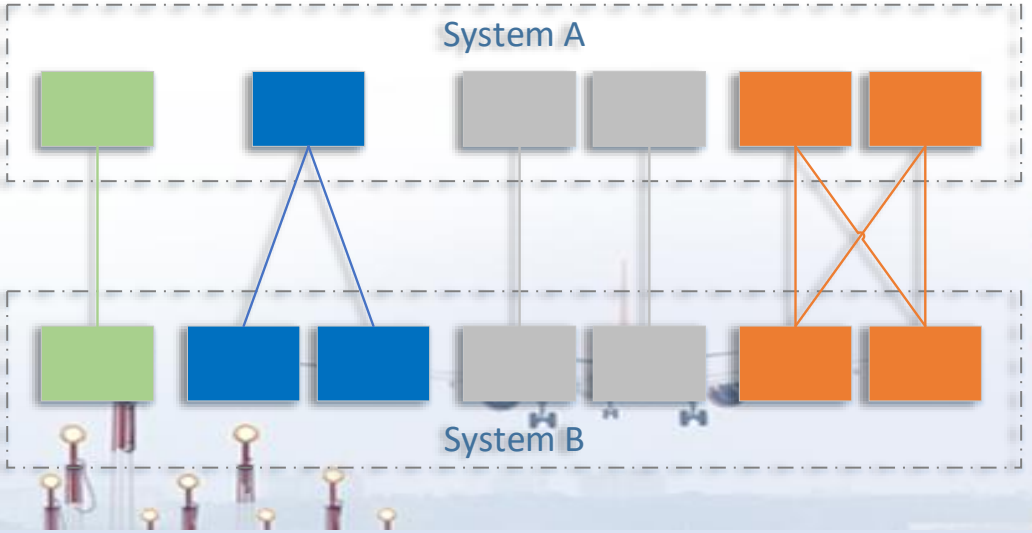
TCP

UDP

.....

MQ

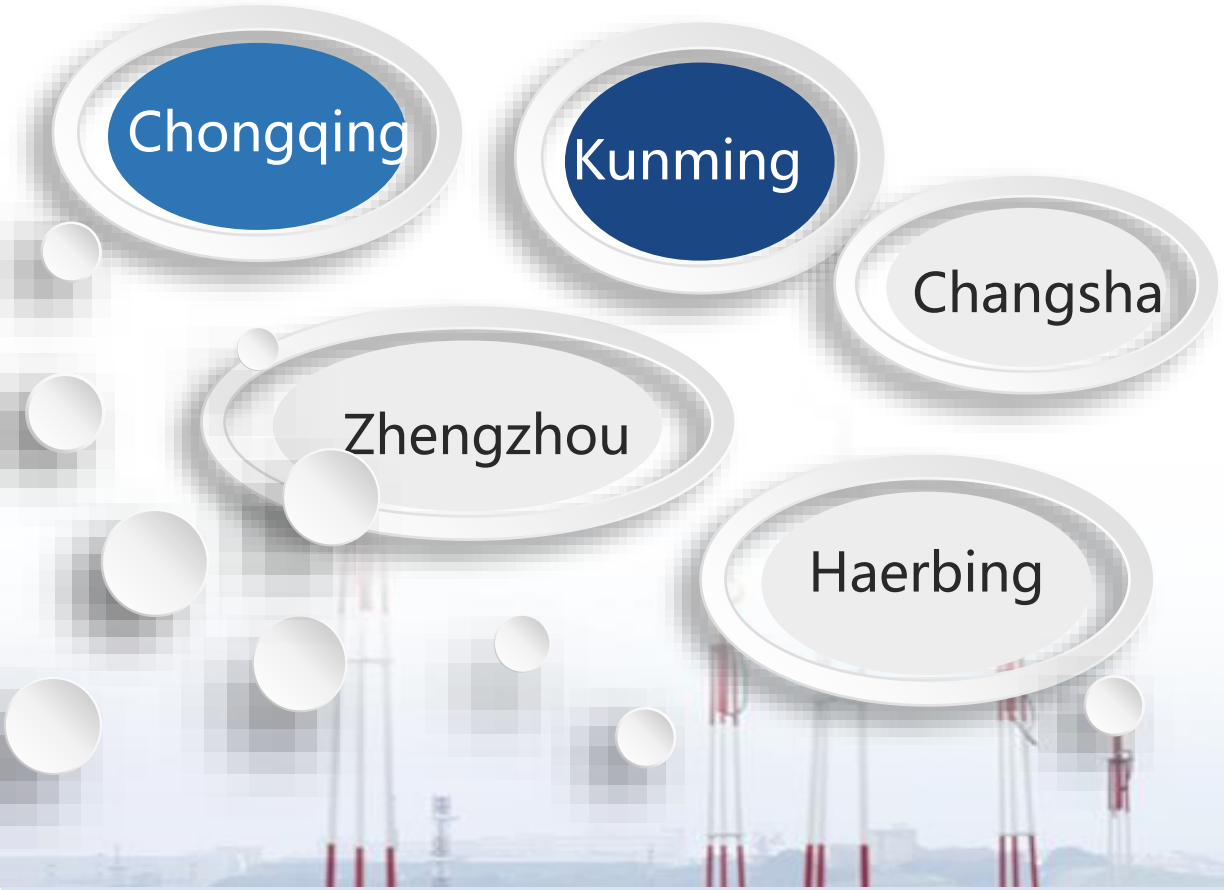
Multiple different connections between systems



CONTENTS

Application—PSEXM

Achieved data synchronization between ATMAS in all sub **bureaus**.



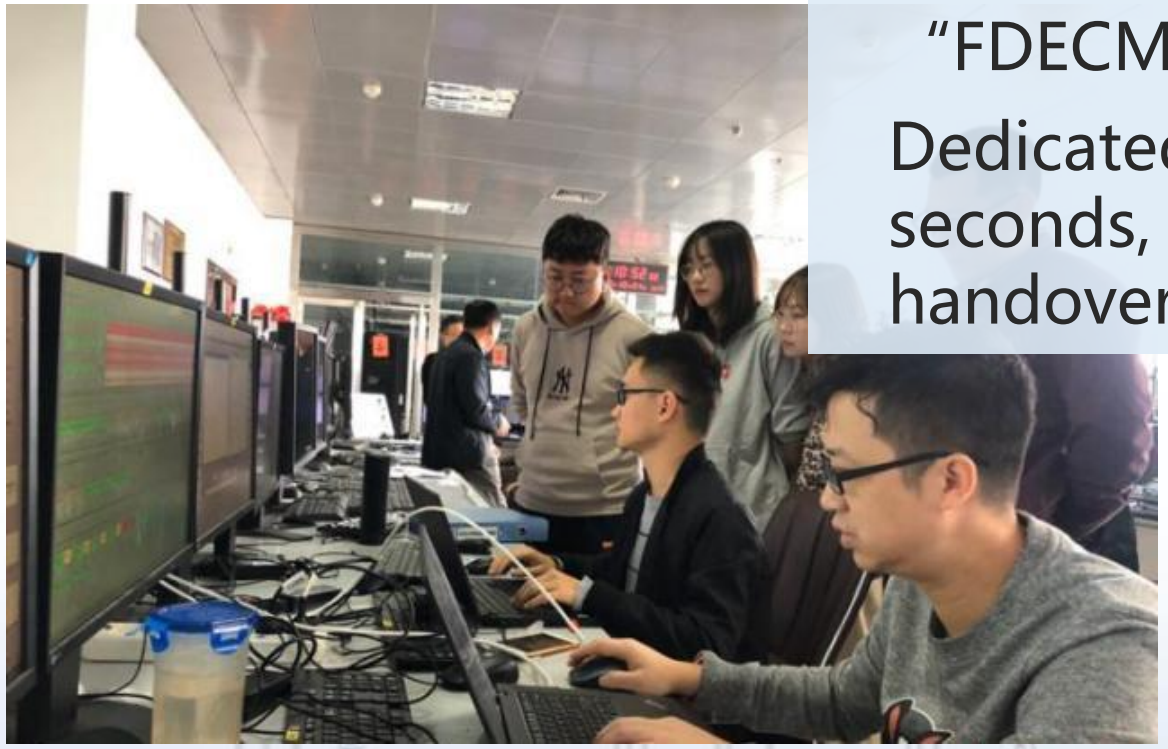
- CDATC
- LES
- INDAR
- FIPS
- .....

- Flight Plan
- HMI DISP
- SECTOR div.&merg
- RWY status
- Restricted airspace

➢ Application—FDECM

In March 2021， Xiamen ACC and Fuzhou TMA had finished validation and put into operation of “FDECM screen handover ”， with a handover success rate of over 95% and a reduction of 400 calls per day for control transfer coordination.

Application—Combined PSEXM & FDECM



In October 2019, Gansu, Ningxia and Qinghai ATMAS realized networked operation and “FDECM screen handover”.

Dedicated line handover takes less than 5 seconds, which significantly improves flight handover efficiency.

Application—Extended FDECM

4029.3

FDECM

+

扩展报文
Extended message

申请二次代码报文CSRQ
SSR request message

二次代码分配报文CSSR
SSR allocation message

申请放行时间报文CEDQ
CTOT request message

放行时间分配报文CEDP
CTOT reply message

区内支线机场进港、出港航班与昆明间的电子移交
Electronic transfer of regional airports

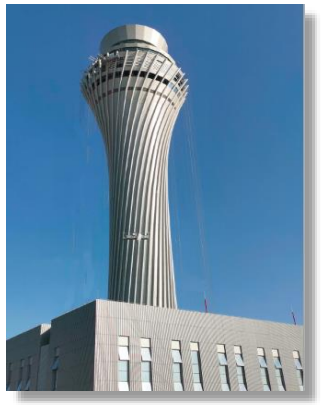
区内支线机场向昆明申请航班放行时间电子化
CTOT share of regional airport

昆明向区内支线机场起飞航班分配二次代码电子化
SSR allocation of regional airport

In April 2019， Kunming ATMAS have realized the FDECM screen handover with Xishuangbanna and Dali airport.

Reduces 300~500 control handover calls every day.

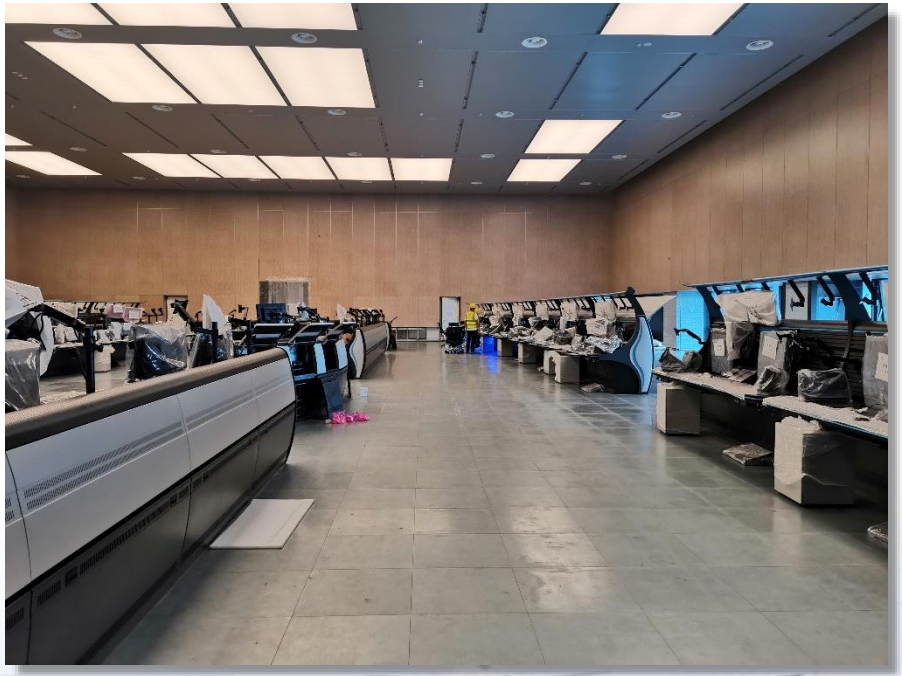
Application - Extended PSEXM & FDECM



Tianfu TWR

Flight Plan Consistency
Environment Data Consistency
Correlation Consistency

- ✓ Transfer
- ✓ Miss Approach Alert
- ✓ Departure Flight Sequence



Jianyang TMA

- ✓ Transfer
- ✓ Miss Approach Alert
- ✓ Departure Flight Sequence

Shuangliu TWR

Flight Plan Consistency
Environment Data Consistency
Correlation Consistency

CONTENTS

Summary and Outlook

- Unified system data interaction standards to solve data synchronization problems
- Improved system synergy， improved security
- Increased ATC redundancy and reduced maintenance pressure
- Reduced workload and improved efficiency

Meetings	PAPERs
ICAO APAC ATMAS SYMPOSIUM	*SP105 – Overall System Design and Implementation of Main/Backup ATM Automation System*
ICAO APAC SURICG/4	*IP14_ CHN AI8 ATC handover between Automation Systems.*
ICAO APAC APA TF/6	*IP07_CHN AI.3 Promotion and application of electronic handover technology based on MHT4029.3*
ICAO APAC APA TF/7	*IP15_CHN AI. 3 - Research on technical solutions electronic handover between upper and lower sectors*
ATMAS TF/2	IP04_CHN AI.4.4 - Solution of Flight Plan Association Consistency
ATMAS TF/2	IP08_CHN AI.4.4 - Requirement and Implementation of Data Interaction
ATMAS TF/2	WP12_CHN AI.4.2 - Application of Flight Data Exchange in ATM Automation System
SURICG/7	IP15_CHN AI.8a - Exploration and practice of electronic handover in complex transfer environment between adjacent ATC units

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Thanks!

Looking forward to progress together !