

ICAO Asia/Pacific Regional Webinar
Implementation of ATM Automation System in APAC Region
7th June 2022 (Indochina Time, UTC+7)

Research and Realization of Continuous Operation on M/B ATMAS in China

Presented by China

A photograph of an air traffic control room. Several people in professional attire are seated at a long desk with multiple computer monitors. One person is pointing at a screen. The room is dimly lit with blue ambient lighting. The background shows more monitors and a map of the world.

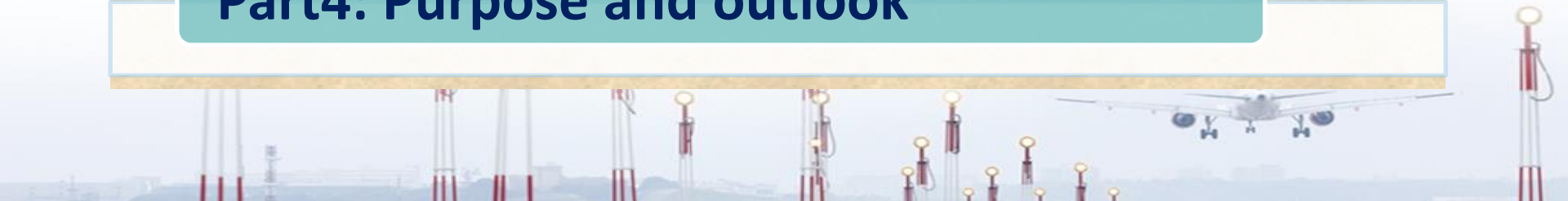


Part1: Background

Part2: Challenge

Part3: Solutions

Part4: Purpose and outlook



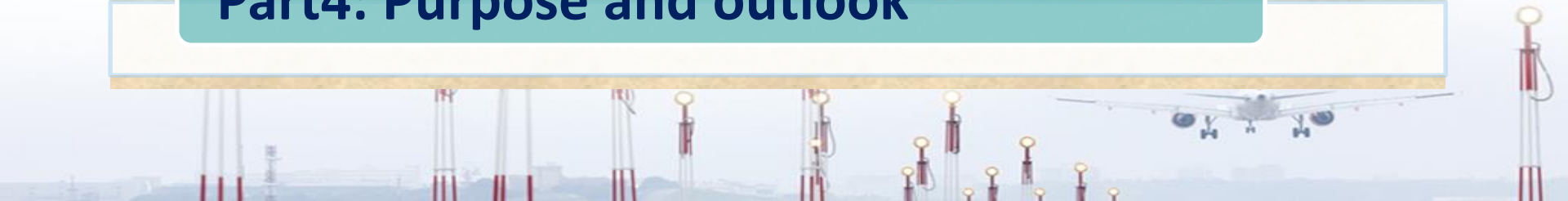


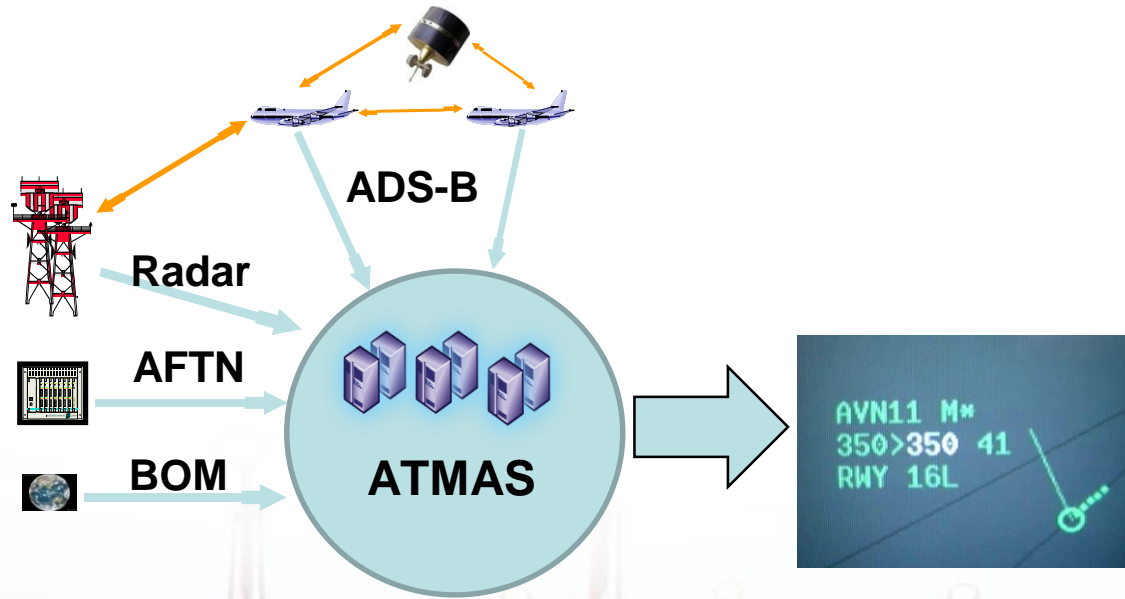
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ATM Automation System:

- ◆ Core system of ATC operation
- ◆ Maintain **continuous operation** in emergencies
- ◆ "Regional ATM Contingency Plan" and "Asia Pacific Seamless ANS Plan".
- ◆ Solutions for **management, people, equipment, and the environment**



1 Background:



ATM Automation System:

- ◆ 2004, Beijing, Shanghai, and Guangzhou ACC
- ◆ Each ACC is equipped with main and emergency ATMAS
- ◆ Improve the emergency system to meet the backup requirements
- ◆ Promote the **continuous operation of the M/B automation systems**





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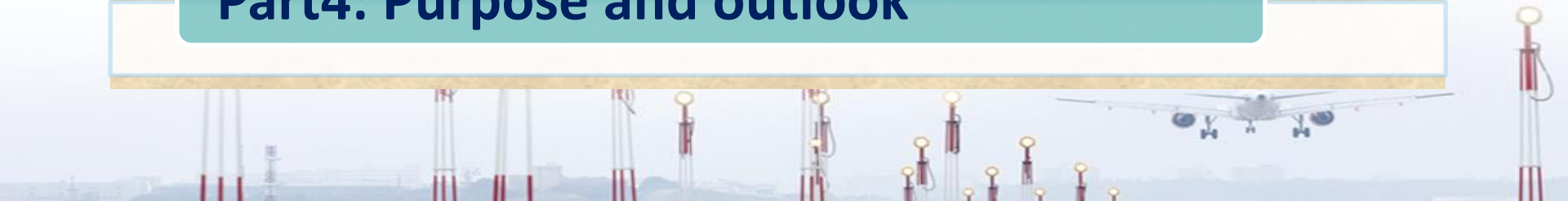
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2 Challenge:

System Level

Construction stage:

- Different manufacturers for the M/B systems
- Differences in the functions and operations

Operation stage:

- Use the main system for a long time
- Be familiar with its functions, operations, and data
- Not updating the backup system synchronously

The controller's willingness to use is reduced

Main System



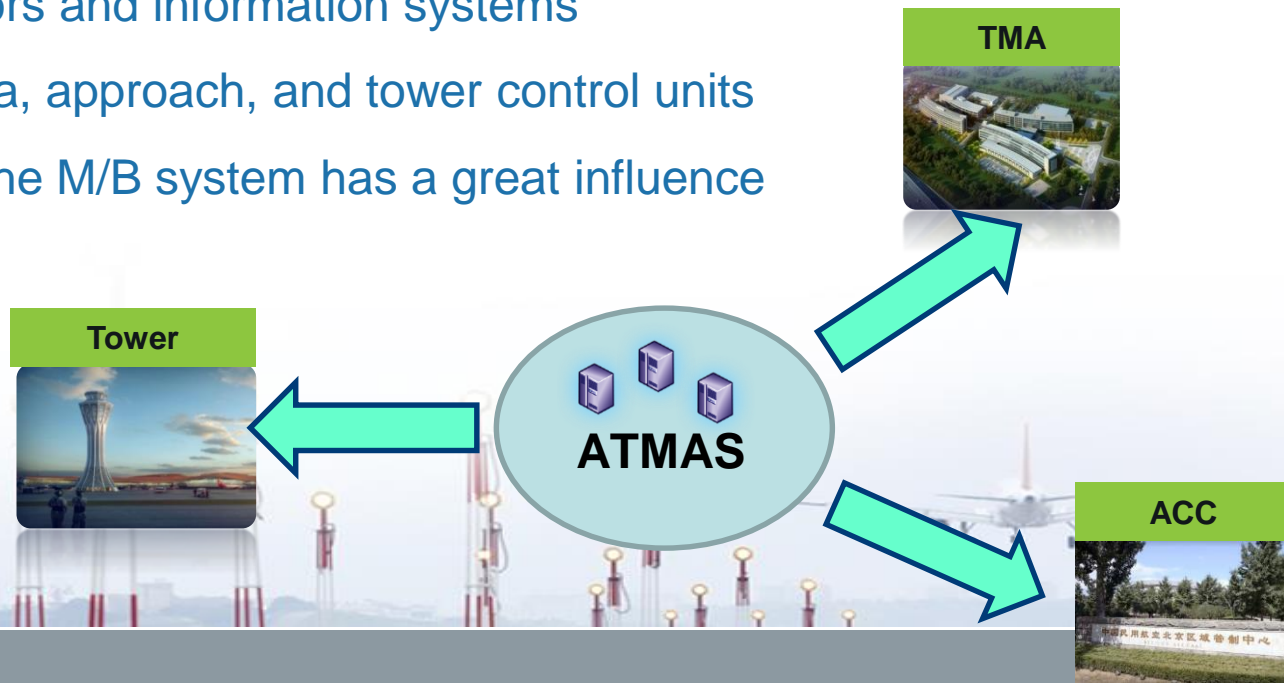
Backup System

2 Challenge:

Management Level

ATMAS is no longer independent:

- Connect with sensors and information systems
- Provide use for area, approach, and tower control units
- The switchover of the M/B system has a great influence



2 Challenge:

Management Level

Each participant has different job roles:

- Need to cooperate in strict time.
- This makes the workflow more complicated.

The switching decision is uncertain

- Partial and ambiguous problems are difficult to decide

Role and Switch?





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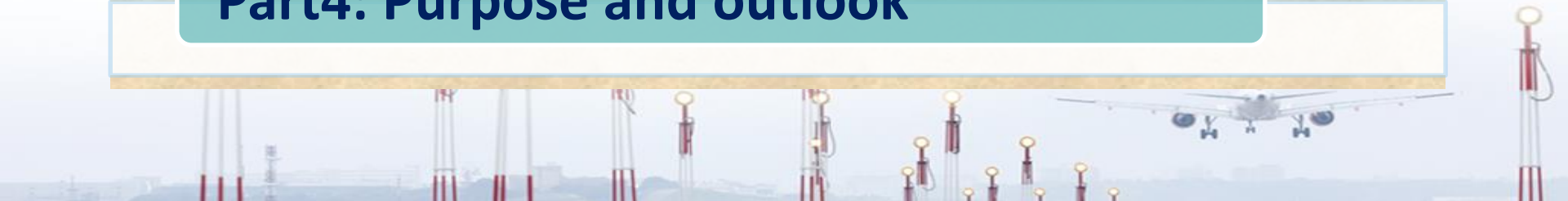
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3.1 Policy and Management:

- ◆ ATMB has put forward requirements for the normal use of backup systems
- ◆ Require all ATCUs to achieve **24-hour continuous use** of backup systems during busy periods
- ◆ From the "main-backup" mode to the "dual-main" mode

Balance use of two systems



3.1 Policy and Management:

- ◆ Each site should have regulations and procedures:
- ◆ First, the manager identifies and analyzes the risks, and controls it
- ◆ Then, clarify the responsibilities, and formulate **work procedures and checklists**
- ◆ Finally, ATCU organizes rehearsals

procedure

莱斯备用自动化系统使用方案 V3.0
一、目的与范围
为规范民航华北空管局备用(莱斯)自动化系统使用的相关工作,降低管制运行风险,根据民航局空管局《民航空管自动化备份系统使用管理规定(试行)》的相关要求,由空管部、通导部组织运管中心、空管中心、大兴空管中心、飞服中心、技保中心、网络中心和天津空管分局共同制定本方案。目的在于实现空管自动化主、备系统切换期间各相关管制单位、设备保障单位的协调、一致,从而保证空管自动化主、备系统切换期间和切换后管制服务的平稳、有序。

checklist

北京主备自动化系统切换检查单 切换时操作		
切换时间T为____时____分,从T时开始完成以下内容 检查时间:____时____分	检查人	
检查项目	准备正常打✓	备注
通报塔台管制:自动化系统目前为双主状态,请使用莱斯自动化系统对空指挥,切换时间为T		
检查各系统服务器、席位运行情况。 记录各个系统在切换过程中出现的问题		
在主任席将 INFO ABO IN 设置为OFF		
在ASMGCS系统/电子进程单系统监控接收信号源, 从ICDE切换至LESATC。将ATC切换至TTS		
T+10分钟检查以下内容 检查时间:____时____分	检查人	
检查项目	状态正常打✓	备注

3.2 Personnel:

ATMB emphasizes the importance of continuous operation:

- ◆ Increase the willingness of personnel to use the backup system
- ◆ Prepare for possible failures in use

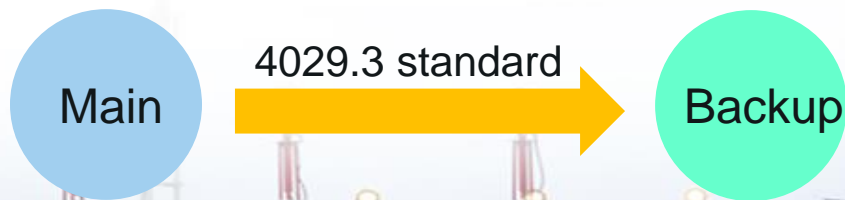
The training for controllers and technical staff:

- ◆ Backup systems (operations, maintenance, troubleshooting, differences)
- ◆ Work procedures (switching procedures, checklist, operation steps)
- ◆ Emergency response
- ◆ Organize an assessment to verify the effect



3.3 System functions:

- ◆ ATMB has formulated and released the **4029.3 data interface standard**:
 - defines the content and format of data synchronization between the M/B systems
- ◆ Require all sites and manufacturers to implement this
- ◆ Software patches and version upgrades



3.4 External environment:

- ◆ Each site checks the external interface and connection of the backup system:
 - improve the network configuration or add new links
- ◆ Solve the problems of AIDC operation (such as AFTN line delay and dedicated line switching)
 - research and test technical solutions

Backup system should have the same external environment as the main system



3.5 Application:

- ◆ The backup system usage time of each ATCU has been significantly improved

Sites	Results
Chengdu and Chongqing ACCs	Complete the balance use of the M/B systems within a single month, realizing the "dual-main" mode
Hangzhou, Wenzhou, Fuzhou, Qingdao, Wuhan, Zhuhai Shenzhen, Haikou, Chengdu, Chongqing, Kunming, Xi'an, Urumqi, and other ACCs	The backup system can be used continuously for 7 days in a single month
Beijing and Shanghai ACCs	The backup system can be used continuously for 24 hours during busy periods
Some ATCUs	Only use the backup system at night



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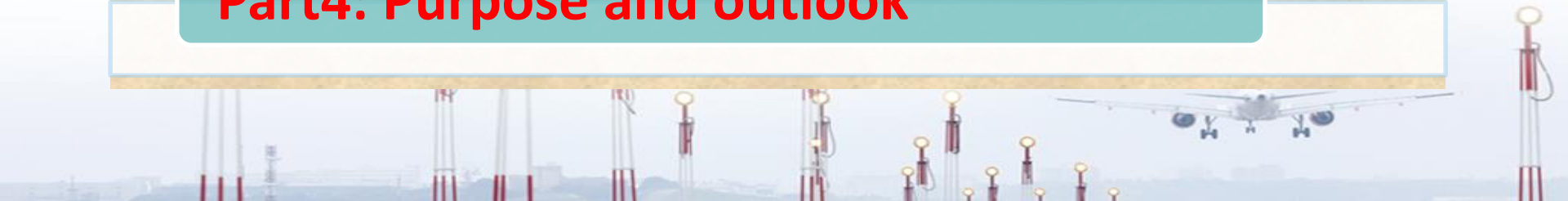
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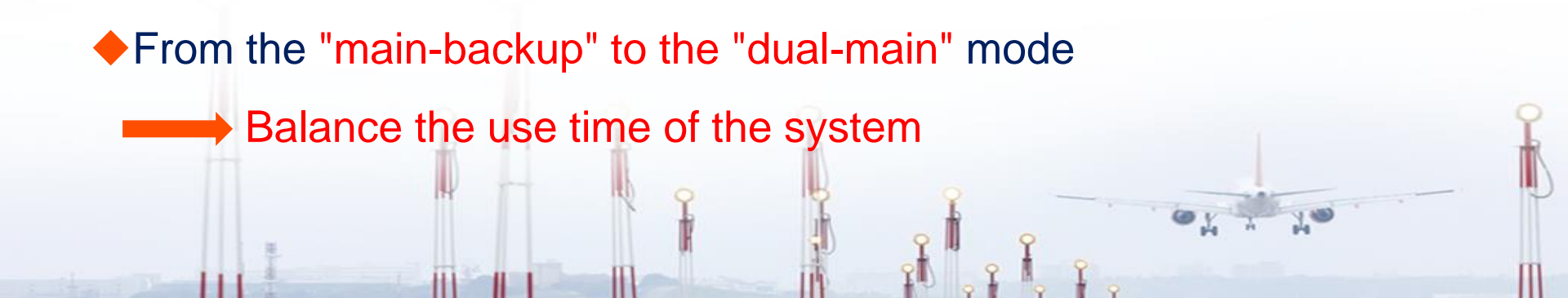
Part3: Solutions

Part4: Purpose and outlook



4 Purpose and outlook

- ◆ Most of China's ATCU sites have achieved **24-hour continuous use** of the backup system during busy periods
- ◆ Share the experience and solution for the continuous operation
- ◆ Promote the continuous operation of the ATM automation system
- ◆ From the **"main-backup"** to the **"dual-main"** mode
 - ➔ **Balance the use time of the system**





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Thank You for attention!

