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UNITING AVIATION

Asia/Pacific Region A-CDM Planning

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ICAO Airport CDM Seminar

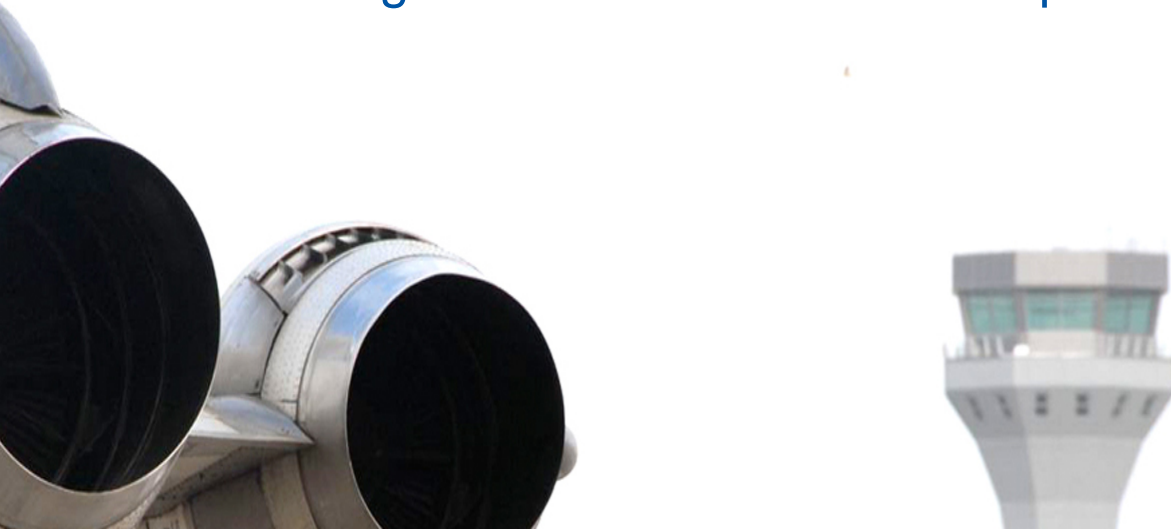
Kunming, China, 19 April 2017





Topics

- The Challenge
- APAC Seamless ATM Plan
- APAC Regional ATFM Concept of Operations
- APAC Regional Framework for Collaborative ATFM
- Regional ATFM and A-CDM Implementation Status





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The Challenge



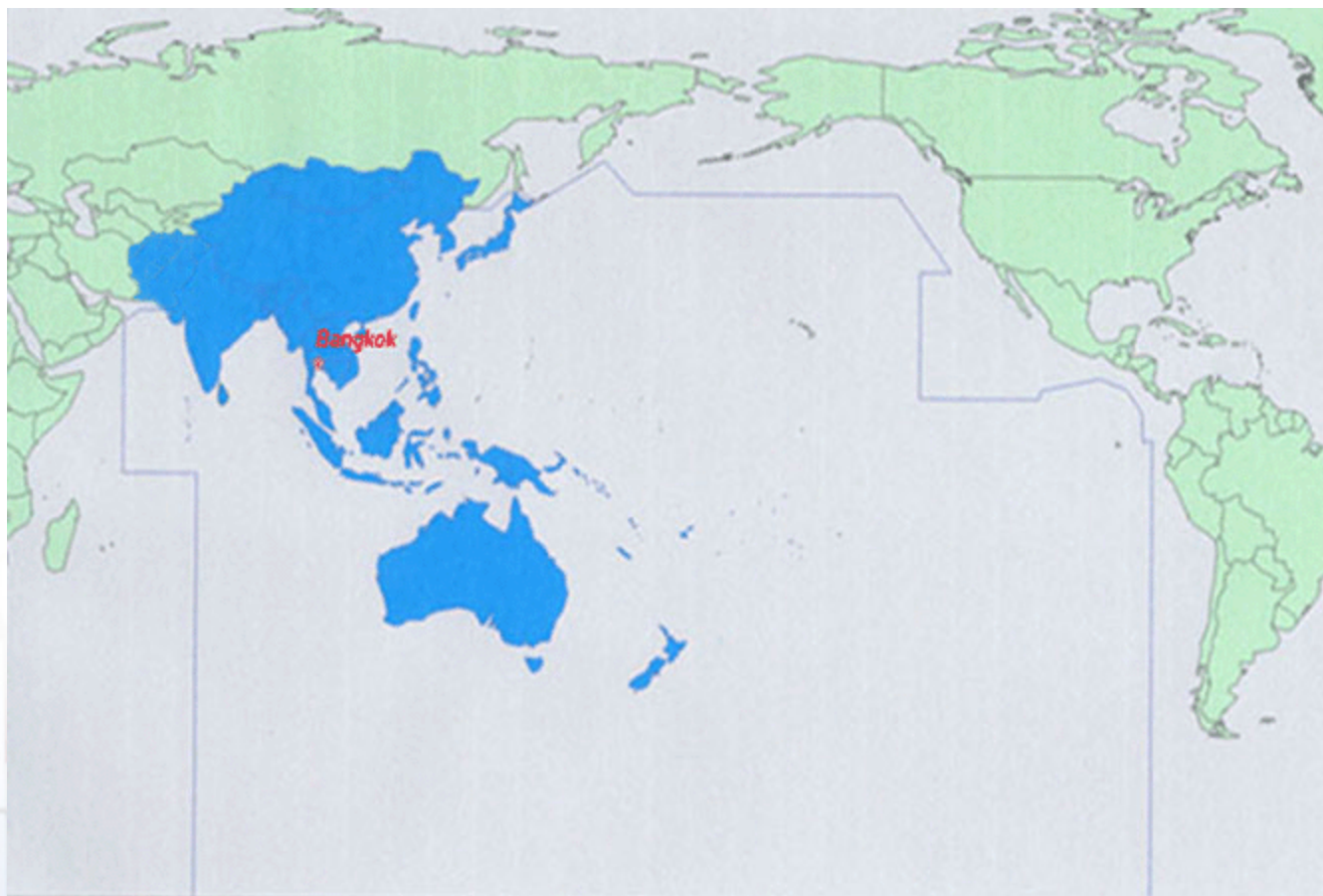


- The ICAO Asia/Pacific Region
 - 38 States
 - 2 Special Administrative Regions of China
 - 2 States accredited to other Regional Offices
 - USA (Oakland Oceanic FIR)
 - France (French Polynesia)
 - 50 FIRS
- World's largest ICAO Region
 - Geographically
 - Passengers
 - Traffic movements





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- Traffic Demand and Capacity Constraints
 - East Asia and Northeast Asia
 - China, Japan, Republic of Korea
 - Very high rate of traffic growth in China
 - Mainly LCC using narrow-body jets
 - South East Asia
 - Also very high rates of traffic growth
 - Many high density FIRs and city pairs
 - High density traffic operating in narrow corridors
 - Archipelagos (Indonesia, Philippines)
 - South Asia and inter-regional and
 - **CONSTRAINED AIRPORTS**





- Traffic Demand and Capacity Constraints
 - Many small FIRs with short transit times
 - Large volumes of Special Use Airspace
 - Little civil-military cooperation
 - Some domestic ATFM implementation
 - Little effective ATC Centre-to-Centre automation
 - No network management facility
 - Airport demand exceeds capacity
 - Poor runway throughput rates and surface movement





- Traffic Demand and Capacity Constraints

“Increased capacity is the primary and central method for management of increasing demand.”

Asia/Pacific Regional Framework for Collaborative ATFM – Collaborative ATFM Principles.

- At airports?

- Concrete on the ground (runways, taxiways, aprons)
- ATC separation/runway throughput improvement
- Surface movement guidance and control systems
- Collaborative decision-making
- Other capacity improvements???





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APAC Seamless ATM Plan





Administered by ICAO HQ

Global Vision
Global Air Traffic Management Operational
Concept (Doc 9854)

Global Reporting
Global Air Navigation Report
Global Air Safety Report

Global Strategy
Global Air Navigation Plan (Doc 9750)
Global Aviation Safety Plan (Doc 10004)

Regional Reporting
Asia/Pacific Regional Dashboard

Administered by ICAO Regional Office

Regional Vision
Asia/Pacific Region Air Navigation Plan
(Doc 9763)

Regional Implementation Monitoring
Asia/Pacific Regional Picture

Regional Implementation Strategy
Asia/Pacific Seamless ATM Plan
(incorporated into eANP Vol. III), including:

- Asia/Pacific Regional ATFM Framework
- Regional ATM Contingency Plan (draft)
- Asia/Pacific Search and Rescue Plan
- AMS, NAV and SUR strategies

Regional Implementation Reporting
Seamless ATM Reporting

Regional Guidance Material
Seamless ATM Guidance Material
State Seamless ATM Plan Template



- Asia/Pacific Seamless ATM Plan
- Developed by Asia/Pacific Seamless ATM Planning Group (APSAPG))
- Adopted by APANPIRG/24
 - June 2013
- Updated by APANPIRG/27
 - September 2016

INTERNATIONAL CIVIL AVIATION ORGANIZATION



ASIA/PACIFIC SEAMLESS ATM PLAN

Version 2.0, September 2016

This Plan was developed by the Asia/Pacific Seamless ATM Planning Group (APSAPG) and amended by APANPIRG

Approved by APANPIRG/27 and published by the
ICAO Asia and Pacific Office, Bangkok



- **A-CDM related Performance Expectations (Summary)**
- Aerodrome Operations (Phase I – November 2015)
- Apron management, ATM coordination, airport capacity analysis, surface movement guidance
- A-CDM Systems
- Aerodrome Operations (Phase II – November 2019)
- Additional (parallel) runways, taxiways, other aerodrome facilities)
- Declared airport terminal and runway capacity
- Collaborative Airport Operations Planning and Airport Operations Centres
- Integrated AMAN/DMAN, A-SMGCS, and SMAN (or ASDE-X)



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APAC Regional ATFM Concept of Operations





- Regional ATFM
Concept of Operations
- Initially developed by CAA Singapore
 - Collaboration with Industry and Research partners
- Adapted by APAC ATFM/SG
- Supports the Regional ATFM Framework
- Adopted by APANPIRG/26
 - September 2015

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ASIA/PACIFIC REGIONAL
AIR TRAFFIC FLOW MANAGEMENT
CONCEPT OF OPERATIONS

Version 1.0 September 2015

This document was developed by the Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG)

Approved by APANPIRG/26 and published by the
ICAO Asia and Pacific Office, Bangkok



- **Key Concepts**
- *Distributed multi-nodal ATFM network*
- *“A virtual ATFM platform of interconnected States and or sub-Regional groups operating an ATFM network”*
- *No central network management*

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ASIA/PACIFIC REGIONAL
AIR TRAFFIC FLOW MANAGEMENT
CONCEPT OF OPERATIONS



• Key Concepts

• Delay absorption intent

• Distributes delay through various phases of flight

• Delay intent fields

- Ground (gate) delay intent
- Airport surface delay intent
- Airborne delay intent





Civil Aviation Authority of Singapore - Windows Internet Explorer

CAAS

Major: TGW
12 Flights Affected

TMI Start Time: 2013-08-15 0700 UTC
TMI End Time: 2013-08-15 1000 UTC

ACID	From	SOBT	TMI Delay	Gate Delay	ARPT Surface Delay	Airborne Delay
TGW2133	VHHH	0400	0	0	0	0
TGW2133	VTSS	0430	20	0	0	20
TGW2783	RPVM	0435	25	0	0	25
TGW2639	VOMM	0500	25	10	5	10
TWG2105	VTBS	0630	25	25	0	0

Reset Submit

Internet | Protected Mode: On 100%



- **Key Concepts**
- *Delay absorption intent*
- Future inclusion in Regional Framework for Collaborative ATFM
- Still in the concept stage





- **Other Concepts**
- Maximum Delay
- Slot swapping
- Compliance
- Post-Operations Analysis
- A-CDM interoperability

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- Regional ATFM
Concept of Operations
- Available on the ICAO
Asia/Pacific Regional Office
eDocuments web-page
- ICAO APAC eDocuments
web-page
- APAC ATFM Concept of
Operations

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APAC Regional Framework for Collaborative ATFM





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- Asia/Pacific Framework for Collaborative ATFM
- Developed by APAC Air Traffic Flow Management Steering Group (ATFM/SG)
- Adopted by APANPIRG/26
 - September 2015
- Minor update APANPIRG/27
 - September 2016

Asia/Pacific Framework for Collaborative ATFM

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ASIA/PACIFIC FRAMEWORK

FOR

COLLABORATIVE AIR TRAFFIC FLOW MANAGEMENT

Version 2.0 September, 2016

This Plan was developed by the Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG)

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Seamless ATM Guidance Material
State Seamless ATM Plan Template



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- Asia/Pacific Framework for Collaborative ATFM
- References the ATFM Concept of Operations
- Aligned with ICAO Doc 9971 – *Manual on Collaborative ATFM* (Second Edition 2014)

Asia/Pacific Framework for Collaborative ATFM

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ASIA/PACIFIC FRAMEWORK

FOR

COLLABORATIVE AIR TRAFFIC FLOW MANAGEMENT

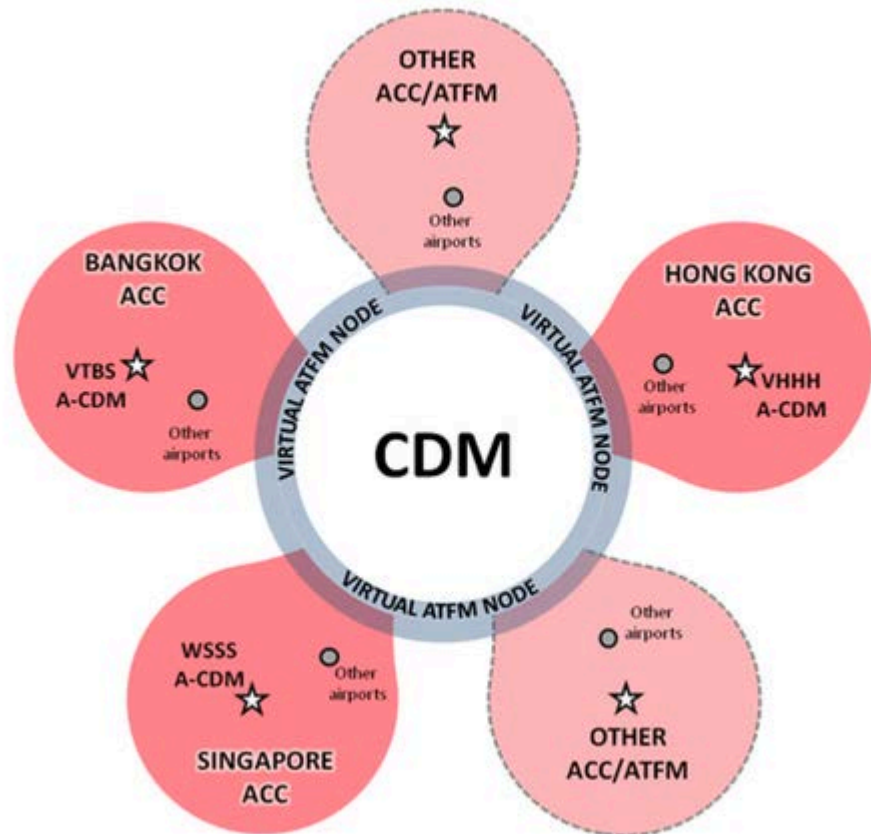
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- Asia/Pacific Framework for Collaborative ATFM
- Key inclusions
 - Core concept:

Distributed Multi-Nodal ATFM Network





- Asia/Pacific Framework for Collaborative ATFM
- **Key inclusions**
 - ATFM terminology and communications
 - Agreed Information Exchange Model (FIXM)
 - Tiered participation levels (example for trials)
 - MET information for ATFM
 - ATFM Daily Plan template
 - ATFM Training Requirements





- Asia/Pacific Framework for Collaborative ATFM
- Document sections include *inter alia*:
 - Background information and guidance
 - Analysis of current situation (2014-2015)
 - Performance Improvement Plan for Regional ATFM Capability
 - Phase IA expected implementation 12 November 2015
 - Phase IB expected implementation 25 May 2017
 - Phase II expected implementation 8 November 2018





- Asia/Pacific Framework for Collaborative ATFM
- Performance Improvement Plan
 - Each phase has objectives for
 - ATFM Regulations
 - ATFM Systems
 - Strategic, Pre-Tactical ATFM or Tactical ATFM
 - Capacity/Demand Monitoring and Analysis
 - Capacity Improvement
 - ATFM Execution
 - ATFM Measures
 - Post-Operations Analysis





- **A-CDM Related Performance Expectations (Summary)**
- Phase IB – May 2017
- Integration of ATFM, AMAN/DMAN and A-CDM systems through common fixes, terminology, comms protocols (FIXM/ADEXP))
- Airport and terminal airspace capacity increases - ATC separation standards and techniques, reduced runway occupancy - all *ATFM Program Airports*
- Strategic airport slot allocation
- Pre-tactical modelling of expected airport configuration and traffic demand, and the effect of ATFM measures
- CDM capability, enabling the sharing of all relevant information with all stakeholders

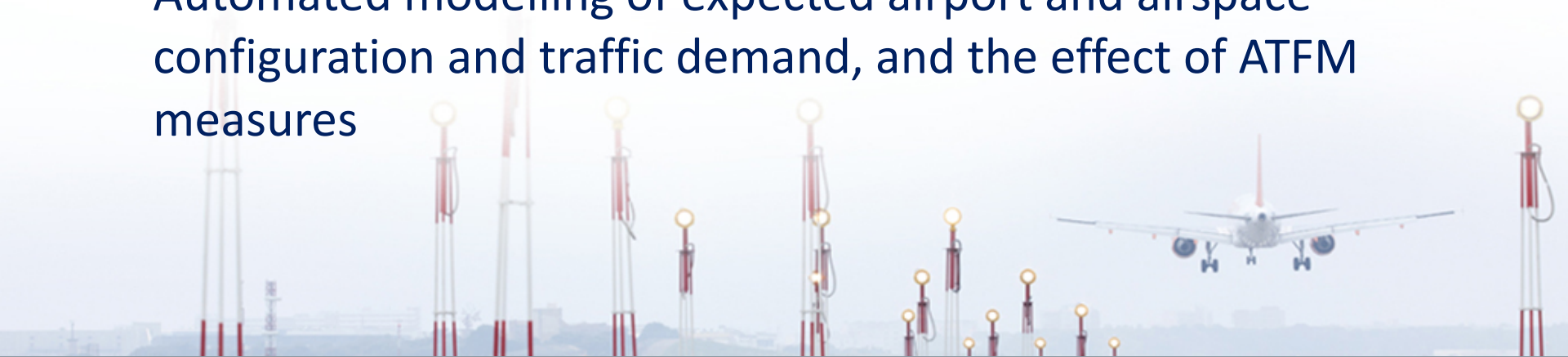


- **A-CDM Related Performance Expectations (Summary)**
- Phase IB – May 2017
- Dynamic update of airport and airspace capacity constraints, capacity calculation, demand information, modelling of tactical ATFM programs should be implemented.
- Tactical ATFM at *ATFM Program Airports*
- post-operational analysis of cross-border ATFM programs, including feedback from airspace users, airports operators, ATS and other ATFM units. Daily post-ops analysis conferences.





- **A-CDM Related Performance Expectations (Summary)**
- Phase II – November 2018
- Distributed multi-nodal ATFM information distribution capability utilizing FIXM version 3.0
- Full interoperability of cross border ATFM, A-CDM, AMAN, DMAN, ATM automation and airspace user systems provide seamless gate-to-gate collaborative ATFM operations.
Automated modelling of expected airport and airspace configuration and traffic demand, and the effect of ATFM measures





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- Asia/Pacific Framework for Collaborative ATFM
- Available on the ICAO Asia/Pacific Regional Office eDocuments web-page
- ICAO APAC eDocuments web-page
- APAC Regional Framework for Collaborative ATFM

Asia/Pacific Framework for Collaborative ATFM

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ASIA/PACIFIC FRAMEWORK

FOR

COLLABORATIVE AIR TRAFFIC FLOW MANAGEMENT

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APAC Regional ATFM and CDM Implementation Status





- **ATFM**
- APAC Seamless ATM Plan Phase I
- Expected Implementation November 2015

- Performance Expectation:

7.32 High density FIRs (refer Figure 12) supporting the busiest Asia/Pacific traffic flows and high density aerodromes should implement ATFM incorporating CDM to enhance capacity, using bi-lateral and multi-lateral agreements.

- Metric

% of high density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes using operational ATFM platforms incorporating CDM



- **ATFM**
- APAC Seamless ATM Plan Phase I (November 2015)
- Applicable Administrations: **21** (of 40 APAC Administrations)
- Regional overall implementation: **65%**
- **11** Administrations **implemented 100%**
(Australia, DPR Korea, Fiji, Hong Kong China, Indonesia, Japan, Mongolia, Philippines, Republic of Korea, Singapore, Viet Nam)
- **5** Administrations *partial implementation (50% to 78%)*
- **2** Administrations *not yet analyzed*
- **2** Administrations *no progress*
- **1** Administration *no data provided*





- **A-CDM**
- APAC Seamless ATM Plan Phase I
- Expected Implementation November 2015
- Performance Expectation:
 - 7.2 *All high density aerodromes should operate an A-CDM system serving the MTF and busiest city pairs, with priority implementation for the busiest Asia/Pacific aerodromes*
- Metric
 - % of high density international aerodromes having implemented improved airport operations through airport-CDM*



- **A-CDM**
- APAC Seamless ATM Plan Phase I (November 2015)
- Applicable Administrations: **19** (of 40 APAC Administrations)
- Regional overall implementation: **28%**
- **3** Administrations **implemented 100%**
(Australia, China, Singapore)
- **6** Administrations ***partial implementation (10% to 90%)***
- **4** Administrations ***not yet analyzed***
- **4** Administrations ***no progress***
- **2** Adminisrtations ***no data provided***





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CELEBRATING 70 YEARS OF
THE CHICAGO CONVENTION

70



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(MID) Office
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THANK YOU

Aviation is safe because it has the culture to learn and react