



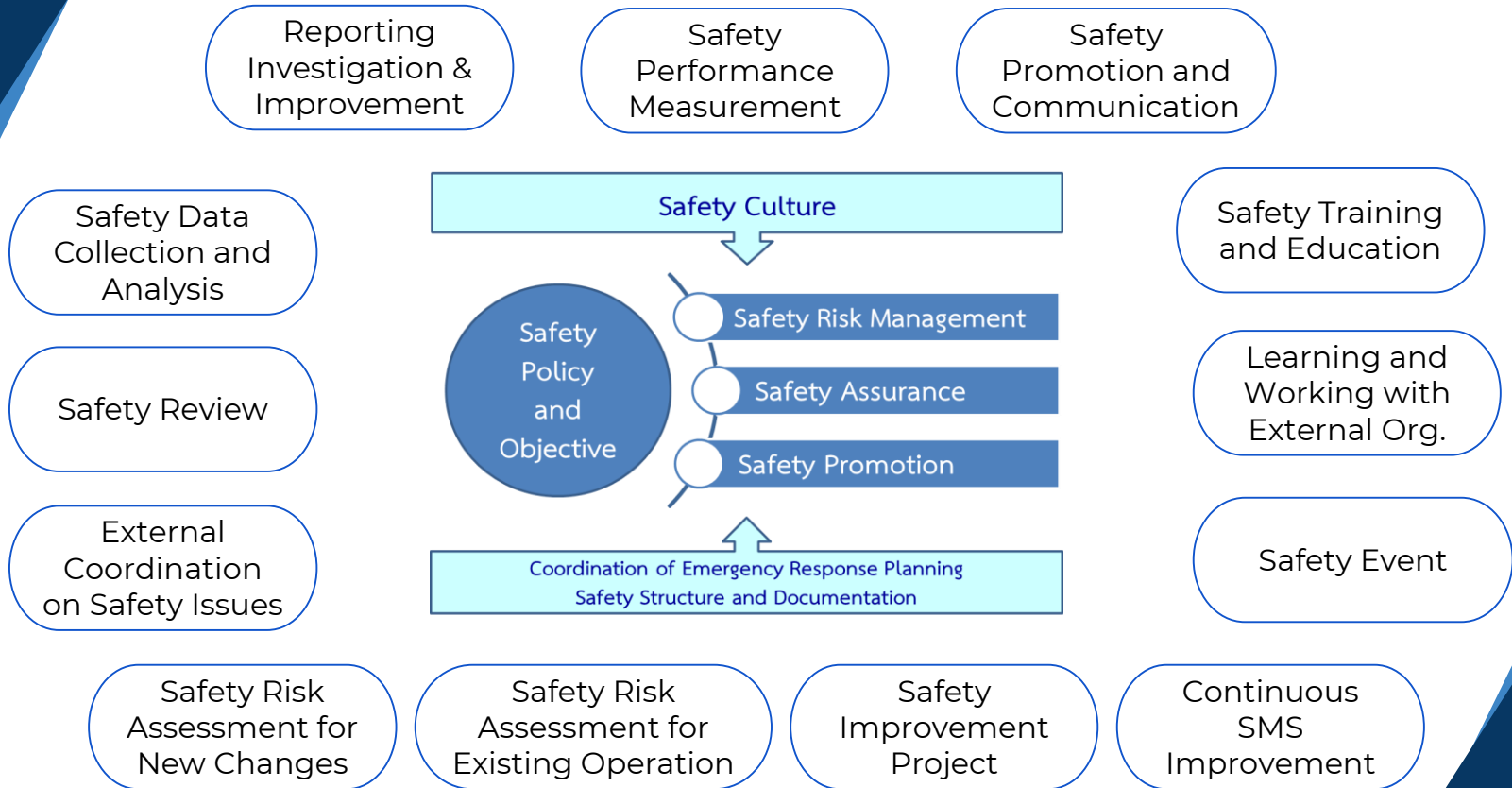
AEROTHAI Focus Areas

**First meeting of the APAC ANSP COMMITTEE (AAC/1)
(Bangkok, Thailand, 17-18 April 2023)**

The background of the slide is a high-angle, aerial photograph of an airplane's wing and tail section. The aircraft is white and is flying over a layer of white, fluffy clouds. The sky above the clouds is a clear, deep blue. The text is overlaid on the right side of the image, partially overlapping the tail of the plane.

AEROTHAI SMS' s Implementation Challenges

AEROTHAI SMS Components





Examples of Implementation Challenges

- **Shortage of safety management personnel**
 - Safety work require a lot of effort
 - Need knowledge and experience in services so need long time to develop full SMS competency
 - Staff retention / Compensation
 - Scope of safety work is always expanding
- **Lack of good understanding of safety culture**
 - Just Culture: acceptable vs. unacceptable behaviors
 - Safety data protection policy
- **Safety performance measurement**
 - Misuse of SPIs for evaluation of a unit or an individual's performance
 - Difficult to set SPTs
 - Individual units' lagging indicators can be tricky to set



AEROTHAI Safety Performance

Lagging Indicator

SPI	SPT (recalculate every year)
Accident per 100,000 movements with AEROTHAI involvement	“0”
ATS-related “Loss of separation” incidents <ul style="list-style-type: none">■ “Serious” category per 100,000 movements■ “Major” category per 100,000 movements■ “Minor” category per 100,000 movements	Average LOS in each category “from other ANSPs”
Service availability in CNS according to SLA-CNS-ATS	Target range of service availability in each service

Note:

1. ATS-related “Runway Incursion” incidents in “Serious” and “Major” category will be new SPI in 2022
2. Alert Level is established for all SPTs



AEROTHAI Safety Performance

Leading Indicator

- (Future development) **SMS Maturity Level from CANSO Standards of Excellence (SoE)** will become AEROTHAI's Leading Indicator
- CANSO SoE measures maturity in SMS in different components eg. safety culture, safety policy, risk management process, safety reporting, management of change, training and education

Unit's SPI/SPT

- Each ATC Center will be assigned safety activities / projects with contribution to AEROTHAI's overall SPT.
- The safety activities / projects are revised every year
- The completion of activities / projects according to plan will become the SPT of each unit



Take Away Points

- **In terms of safety performance measurement, AEROTHAI clearly benefited from other ANSPs' synergy through CANSO.**
- **If Asia Pacific ANSPs can set up a platform to collaborate with specific topics and clear goals, we can all benefit from the results:**
 - SPI Benchmarking
 - Sharing approaches to manage fatigue risks
 - Sharing ways to make safety work more efficient, for example, utilizing automation tools
 - Sharing ways to address common hazards, for example, lasers, military exercises, etc.

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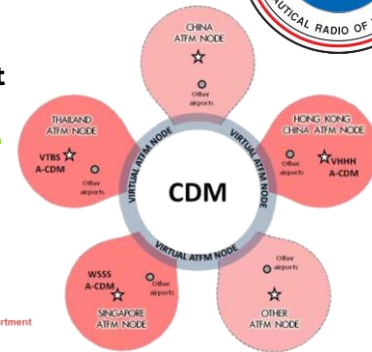
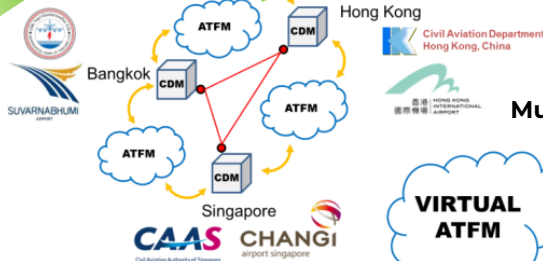
AEROTHAI ATFM Success Story

Cross-Border ATFM Development



Research Collaboration on Regional ATFM Concept 2013

Distributed Multi Nodal Regional ATFM Concept 2014 -



Asia-Pacific Cross-Border Multi-Nodal ATFM Collaboration (AMNAC)



Tripartite CDM Project between BKK-HKG-SIN 2012-2013

CANSO Whole of flight CDM Pilot Project Bangkok-Singapore 2011-2012



BOBCAT ATFM Service 2007 - ...



AMNAC Status 2023



1,000+

Rounds of distributed ATFM measures (GDPs) activated

19+ Project meetings

11 ANSPs participating in the project
(+ Airservices Australia in the beginning)

~8 Years since the start of the implementation
(2015 – Today)



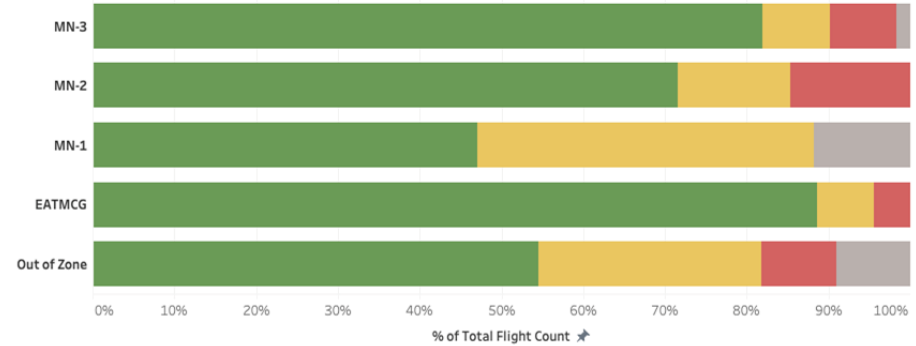
Tiered Participation Model ⇔ Post-Ops Analysis



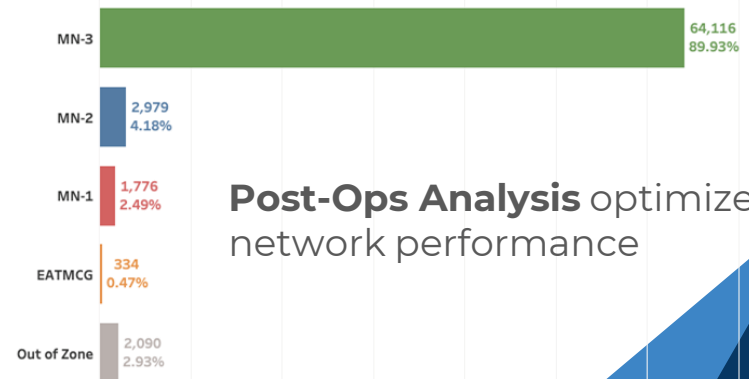
Tiered participation model adopted cater for varying level of readiness & increase number of International Airports in the network to

44

Compliance Rate by Departure Groups

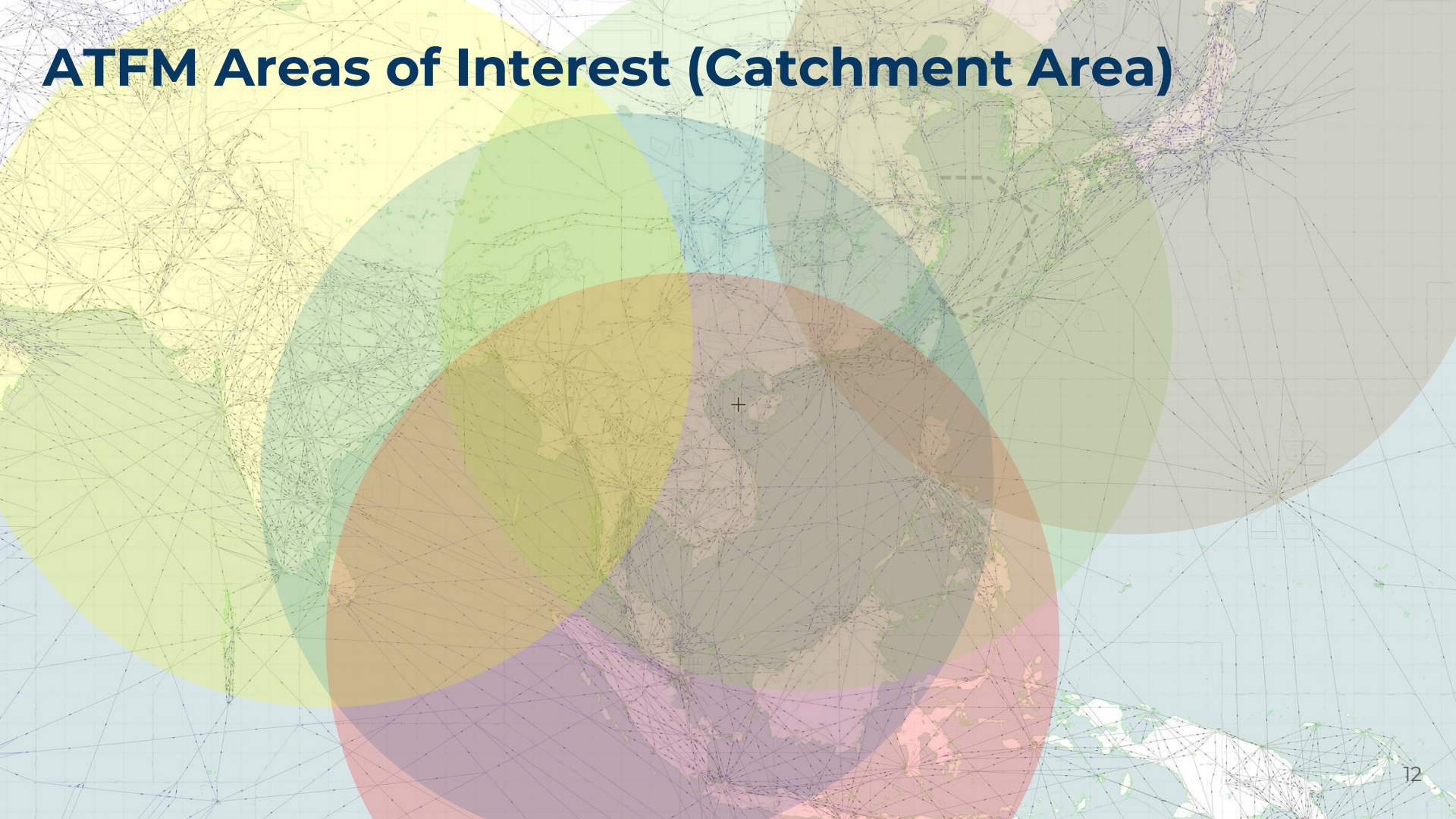


Flight Count by ADEP Levels (Initiating ATFMU: All)



Post-Ops Analysis optimizes network performance

ATFM Areas of Interest (Catchment Area)





ATFM Lessons Learned

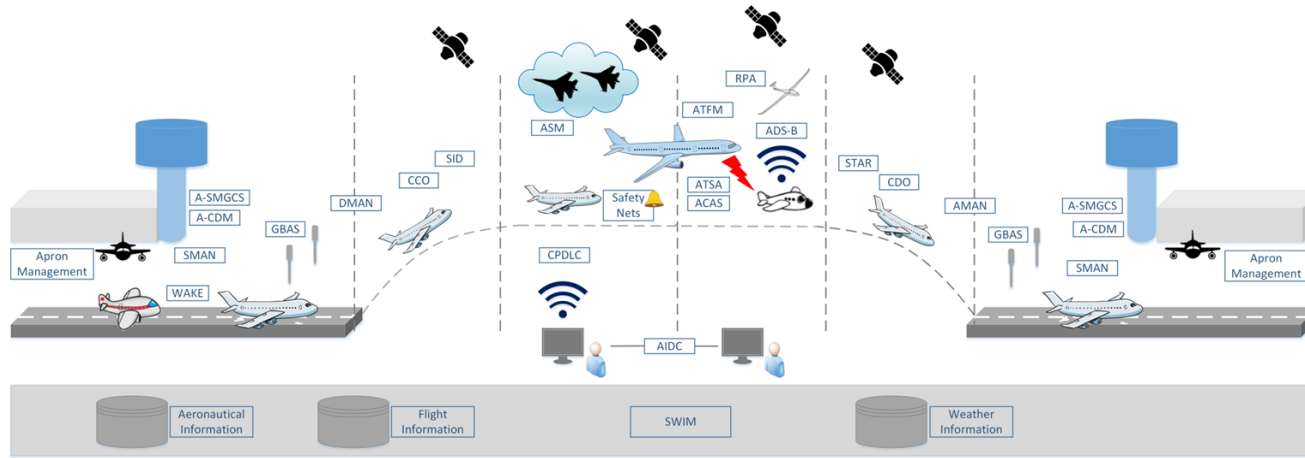
- Collaboration is key to sustainable ATFM development
- Tiered Participation caters for varying level of readiness
- Post-Operations Analysis ensures fine-tuned cross-border ATFM service
- ATFM Area of Interest Concept helps guide ANSP collaboration approach

Asia Pacific ANSPs to further collaborate on expansion of cross-border ATFM service capability and facilitate effective implementation of cross-border ATFM solutions

An aerial view of an airplane wing flying over a sea of clouds. The wing is on the left side of the frame, extending towards the center. The sky is a deep blue, and the clouds below are a lighter, misty blue. The text is centered over the wing and sky.

AEROTHAI Journey towards TBO

AEROTHAI 2040 Operational Concept



Performance-based Air Navigation Service

Management of a flight in **all phases of operations and all phases of flight**:

- Based on its **4D trajectory**
- Supported by **highly-interconnected systems** (without boundaries among them)
- Enabled by **collaborative and harmonized** operational approach
 - Able to cope with emergence of new entrants

AEROTHAI Journey



- Mini Global Demo I & II
- ICAO APAC SWIM TF Establishment
- SWIM in ASEAN Demonstration
- FIXM v4.1 APAC Extension (ATFM, A-CDM)

- ATFM/A-CDM Integration
- FIXM v4.2 Extension (ATFM, A-CDM, TS, FF-ICE, TBO)

2014 - 2019

2020

2021

2022

2023

←----- Multi-Regional TBO Demo ----->

- Prototype Development
 - SWIM technical infrastructure
 - SWIM information services
 - FF-ICE/R1 services
- FF-ICE/R1 Tabletop Exercise

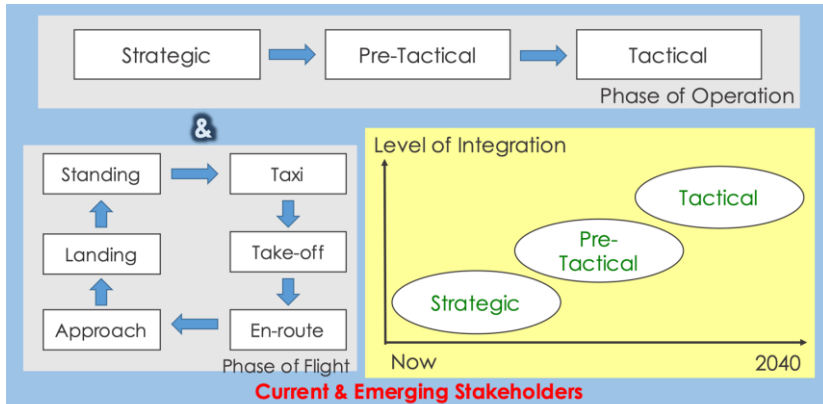
- ASM/ATFM/A-CDM Integration
- FF-ICE/R1 Technical Trial
- Lab demo, e.g.
 - FF-ICE/R2 post-departure (airborne) trajectory negotiation and revision
 - ATFM/AMAN integration
 - FF-ICE/R1 & A-CDM integration

AEROTHAI Key Lessons Learned



Collaborative and Harmonized Operational Approach Integration with Stakeholders

- Seamless information exchange among stakeholders is critical
 - Common situational awareness
 - Predictability
 - Collaborative decision making



- Use of standardized information exchange models
- Use of open standards and utilization of open-source protocol
- Mediation: A key to bring diverse stakeholder onboard

AEROTHAI Key Lessons Learned



- Harmonized operational requirements
 - Trajectory modeling
 - Trajectory evaluation
 - Integration between strategic and pre-tactical/tactical operations
- Participation of AUs: Tangibly contribute to improved ATM performance
- Mixed-mode operational environment: FF-ICE/TBO capable/not-capable

Increased Operational Efficiency and Sustainability of ATM

**Asia Pacific ANSPs to collaborate on building the foundation for TBO
in Asia Pacific**