



# Distributed Multi-Nodal ATFM Network

18-19 Sep 2017

# Overview of Distributed Multi-Nodal ATFM Network

# Phase development for Multi-Nodal ATFM

## Phase 1

(2015-2016)

- Airport Arrival Constraints
- Implementation of Ground Delay Program

## Phase 2

(2017-20XX)

- GDP supporting Airspace Congestion
- Interconnectivity among ATFM systems

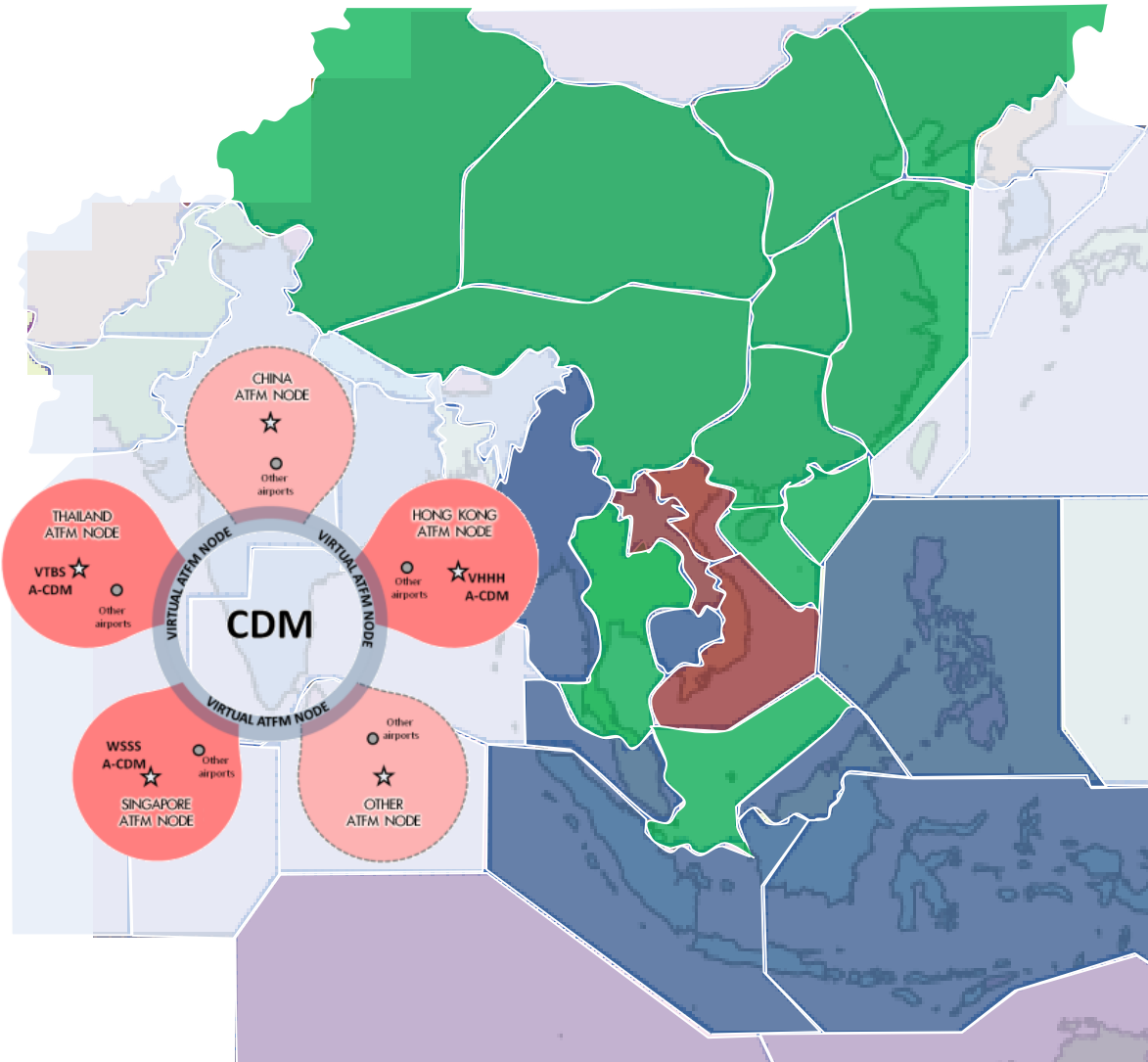
## Phase X

- Fully interconnected Global ATFM

# Stages of Phase 2 Operations

Phase 2 – DCB for Airspace Constraints		
Stage 1 Aug – Oct'17	Stage 2 Nov'17 – Jun'18	Stage 3 Jul' 18 onwards
<p>Airspace Demand and Capacity Assessment</p> <ul style="list-style-type: none"> <li>▪ Demand and Flight Trajectory Accuracy Assessment                             <ul style="list-style-type: none"> <li>❖ FPL accuracy at boundary point on major ATS route (ETO based on FPL EET)</li> <li>❖ Expand to include assessment on FPL accuracy on other ATS route (optional)</li> </ul> </li> <li>• Capacity Assessment                             <ul style="list-style-type: none"> <li>❖ Flow rate on ATS routes / boundary point (separation minima and levels available)</li> <li>❖ Sector Capacity</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Develop procedures for Airspace flow program for Single-Constraint DCB</li> <li>▪ Conduct of Demonstration flights</li> <li>▪ Explore the use of Combined ATFM Measures (Different types of TMI implemented by a single ATFM node)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Operational Trial for Single-Constraint DCB</li> <li>▪ Explore Multiple-Constraints DCB (Multiple TMIs implemented by multiple ATFM node along the route of flight)</li> </ul>

# Tiered Participation Model



**Level 3 ATFM Nodes**  
Generate, Distribute, Comply to CTOT

- China
- Hong Kong China
- Singapore
- Thailand

**Level 2 ATFM Nodes**  
Receive and Comply to CTOT

- Cambodia\*
- Indonesia
- Malaysia
- Myanmar
- Philippines

**Level 1 ATFM Nodes**  
Observers

- Lao PDR
- Viet Nam\*

**Advisory ATFM Node**

- Australia

# Participating Aerodromes



**Increase participation**  
to further enhance  
Multi-Nodal ATFM

- Level 2 ANSPs

**17+** Airports



- Level 3 ANSPs

**16** Airports



- Total Airports in the  
Multi-Nodal ATFM  
Network

**33+**

# Achievements

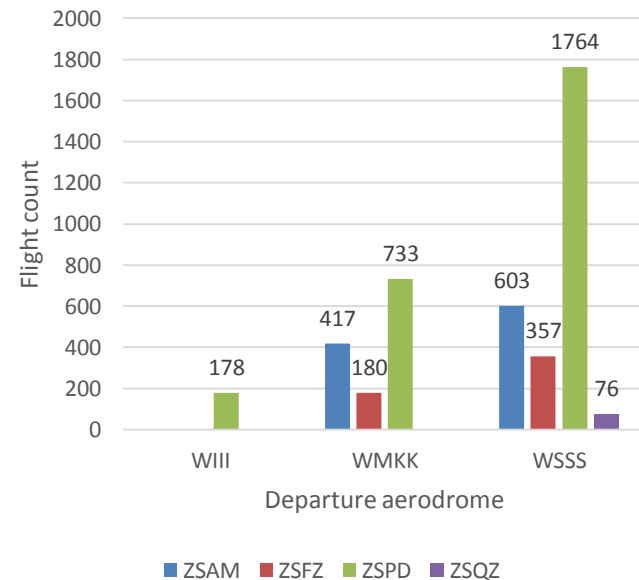
- Distributed Multi-Nodal ATFM Concept was endorsed by ICAO ATM Sub Group
  - Included in 3rd Edition of Doc 9971, official launch in Nov'17
- Operationalised ATFM service since 1 Apr'17
- Post Operation Analysis Framework
  - Development endorsed by ICAO ATFM Steering Group
  - Target for inclusion into Regional Framework for Collaboration ATFM in 2018
- Technical Sub-Group
  - Contributes to the ICAO ATFM-IR/SWG
  - Draft-preliminary ICD presented to ICAO ATFM SG
  - Actions assigned by the meeting
    - Provide template for gathering operation scenarios
    - Based on the operation scenarios obtained, support FIXM Extension development

# Multi-Nodal ATFM to Supplement Existing Flow Restrictions



# Enroute Flow Restrictions – M771

- Extensive flow restriction on M771 for flights bound for destination aerodrome ZSAM, ZSQZ, ZSPD, ZSFZ
- Impact: severe, unpredictable delay for airlines, complex traffic planning for ATC



# Enroute Flow Restrictions – A581

A2110/17 NOTAMN

Q) ZPKM/QXXXX/IV/NBO/E/000/999/

A) ZPKM B) 1707261400 C) 1707262300

E) DUE TO FLT FLOW, ACFT FLY INTO KUNMING CONTROL AREA VIA SAGAG  
ALONG ATS RTE A581, SHALL KEEP 10 MIN SEPERATION.

CREATED: 26 Jul 2017 05:30:00

SOURCE: ZBBBYNYX

- MINIT restrictions on A581 at VLVT/ZPKM boundary (SAGAG)
- Impact: difficulty in operations and lack of situational awareness



# Enroute Flow Restrictions – A581

- Solution: CTO-based GDP/CTOT by BKK ATFMU
- MINIT conversion → CTO
- CTO-based GDP/CTOT

CTOT information from Bangkok ATFMU

Waypoint	SAGAG
Begin Restriction	2017-07-26 10:00 UTC
End Restriction	2017-07-26 19:30 UTC

Due to capacity constraints as per details above, ground delay program is implemented for flights operating into the flights and associated CTOTs.

All flights  
 ACID  ADEP  ADES values separated by comma (,)

No.	ACID	ADEP	ADES	EOBT (FPL)
1	CCA404	WSSS	ZUUU	26 / 08:00
2	CES742	VTBS	ZPPP	26 / 08:45
3	CQH8518	VTBS	ZUUU	26 / 08:50
4	TGW2968	WSSS	ZLXY	26 / 09:05
5	CES2594	VTCC	ZPPP	26 / 09:30
6	AIQ588	VTBD	ZLXY	26 / 09:55
7	SLK938	WSSS	ZUUU	26 / 09:45
8	XAX326	WMKK	ZUUU	26 / 10:15
9	XAX346	WMKK	ZLXY	26 / 10:15      26 / 10:44      26 / 15:34
10	SLK980	WSSS	ZUCK	26 / 10:30      26 / 11:04      26 / 15:36
11	CES754	VDSR	ZPPP	26 / 11:30      26 / 11:45      26 / 13:47
12	CTV8816	WADD	ZPPP	26 / 11:20      26 / 11:49      26 / 17:12

## A1672/17 NOTAMN

Q) VTBB/QAFXX/IV/NBO/E/000/999/1354N10036E999

A) VTBB B) 1707260820 C) 1707262300

E) DUE TO FLOW RESTRICTION FROM ZPKM FIR ALL FLT FM/OVERFLY VTBB FIR OPR INTO ZPKM FIR VIA SAGAG BTN 1400-2300UTC SHALL COMPLY WITH THE FLW PROC.

1. FILE FPL AT LEAST 3 HR PRIOR EOBT
  2. GND DLA PROGRAM (GDP) THRU THE CALCULATED TAKE-OFF TIME (CTOT) WILL BE ISSUE FOR FLT DEP FM VTBB FIR VDPP VDSR WMKK WMKL WMKC WMKP WSSS WADD WARR WIII WBGG WBGR AND WBKK
  3. ATFM DAILY PLAN (ADP) WILL BE PUBLISHED AND E-MAIL THRU CTC CHANNEL
  4. CTOT WILL ISSUED APPROX 1200UTC NOTIFY BY E-MAIL AFTN AND HTTP://ATFM.AEROTHAI.AERO OR HTTP://202.57.133.148
  5. IF NO CTOT RECEIVED PLS CTC BKK ATFMU ASAP TO OBTAIN CTOT
  6. CTOT WINDOW -5,+5MIN
  7. FLT DEP FROM THAILAND FLT CREWS SHALL CTC CLR DELIVERY AT LEAST 20 MIN PRIOR TO CTOT
  8. ANY MODIFICATION OF FLT (DLA/CNL) PLEASE CTC YR ATFM UNIT OR BKK ATFMU VIA TEL +66 2287 8024, +66 2287 8025 OR E-MAIL ATFMU (AT)BOBCAT.AERO
- CREATED: 26 Jul 2017 08:20:00  
SOURCE: VTBDYNYX

# ATFM Harmonisation

# ATFM Harmonisation

- Seamless cross border ATFM service require harmonization for ATFM processes and procedures among all ATFM service provider in the region
- Facilitate coordination and interoperability between ANSPs that provides ATFM services
- Essential for aircraft operators and airlines to support cross border ATFM operations in the region

# ATFM Harmonisation

- NARAHG, North-Asia ATFM Harmonisation Group
  - China, Korea and Japan
  - Cross border ATFM in Northeast Asia
    - CRACP, Cross Region ATFM Collaborative Platform
- 1st Coordination meeting between NARAHG and Multi-Nodal ATFM planed to be held in Beijing hosted by ICAO APAC RSO in Nov 17
  - Focus on understanding differences in Concept of Operation and technical development roadmap
  - Subsequently, to chart out the strategy to reconcile the differences
  - Processes utilised in this coordination meeting, could serve as the template for future harmonisation meeting with other ATFM service providers in the region and globally



Thank you