

INTERNAL COLLABORATIVE OPERATION MODE OF CROSS-BORDER ATFM

ATFM/SG/13

Presented by CHINA





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INTRODUCTION

INTRODUCTION

Between ATFM nodes

- The operating mechanism between node and node is becoming increasingly mature in the way of continuous perfection in framework on collaborative ATFM and the application of Asia Pacific Multi-Nodal ATFM Collaboration (AMNAC) in practice



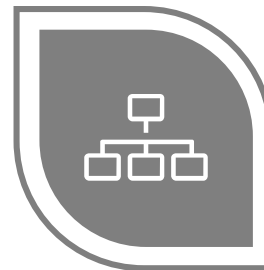
Inner part of node

- Although it formed by single ANSP respectively, it also facing many challenges in practice than expected for the States and Administrations which with mass flight volume and complicated environment due to lack of reference and guidance



Two-level conduction and one-level collaboration

- Same method has different effect in different situation and different environment, so China gradually form a set of well-adapted cross-border ATFM model - “two-level conduction and one-level collaboration” in complicated node interior, which based on some auxiliary methods about theory and practice such as fast simulation and HITL experiment.



Overall planning of domestic and cross-border ATFM

- How to coordinate and concentrate more domestic disperse ATFM requirement to Node Leader, establish overall situational awareness, reduce operational procedure and promote operational efficiency?



/02

DISCUSSION

The origin of “two-level conduction and one-level collaboration”

2015



**At the beginning of distributed multi-nodal
ATFM Network collaboration**

- Due to lack of the amount of cross-border ATFM measures, and China has high exemption to international flights, the problem is not obvious. But with the continuous increasing, ANSP node's interior traditional mode can no longer satisfied the new situation which accompanied by increasing flights and complicated operation environment. Therefore, China starts the specialized research on the optimization of node's interior operation mode.

2020



**NTFM online helps to realize the national wide
common situational awareness**

- Close communications need to be maintained between ATFM operational phase and single constraint ATC, but keep close multi-party communication seems not practical in present phase between node leader and all ATFM units as well as ATC. So, node leader not only needs to undertake the function of information and cooperation, but also take part in the decision making of ATFM measure, this can help to promote overall efficiency by promoting decision-making power largely.

2023



**Node leader is further clear on node's
interior functional position**

- it needs to be involved into the decision making of constraint unit's cross-border ATFM, but it not supposed to much involved into the decision making of domestic ATFM, and for one constraint unit, domestic and cross-border ATFM cannot be separated. Therefore, based on NTFM, China achieves constraint unit's senseless division for domestic and international traffic stream under the same constraints through this CONOPS.

“Two-level conduction and one-level collaboration” operational concept

Traditional ATFM concept:

When need to take ATFM measures to domestic and international flights simultaneously within one constraint airspace: →



Efficiency of ATFM measures will decrease largely

- When predictability of partial flights lower or adjust often, the efficiency of ATFM measures which based on GDP will decrease largely

Some flights cannot be included

- The flight far from constraint airspace unit will unable adopted into the scope of ATFM measure due to the restriction of distance and range

ANSP efficiency will decrease largely

- Node Leader specialized in cooperation rather than decision-making in the part of cooperation and so on, for an ANSP with complicated environment, efficiency will decrease largely

“Two-level conduction and one–level collaboration” operational concept

ATFM solution

- Domestic and international flights are adopted into the same ATFM solution
 - Overall plan the balance of capacity and demand and realize the demand-capacity balancing
-

+ Split domestic and international flights

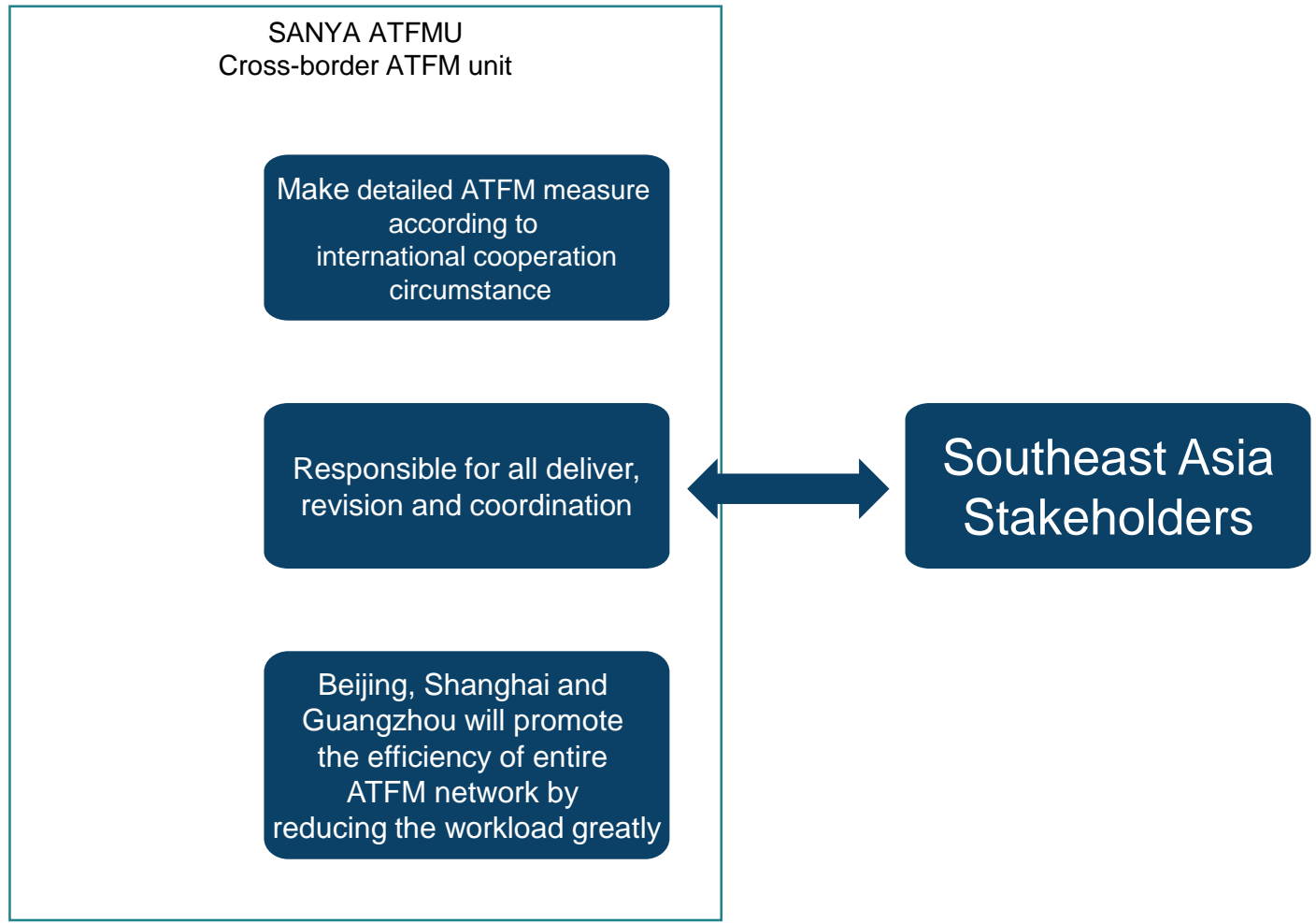
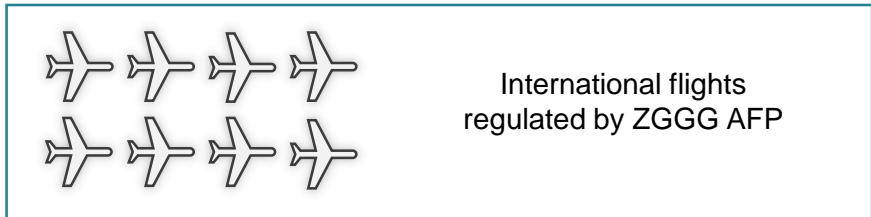
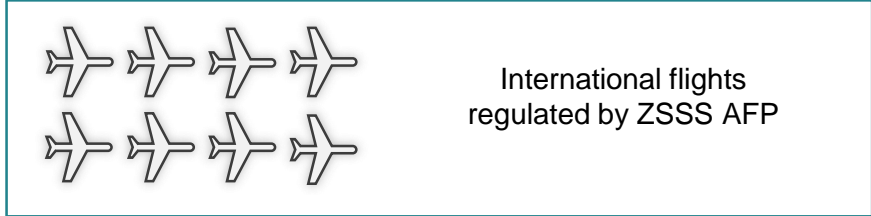
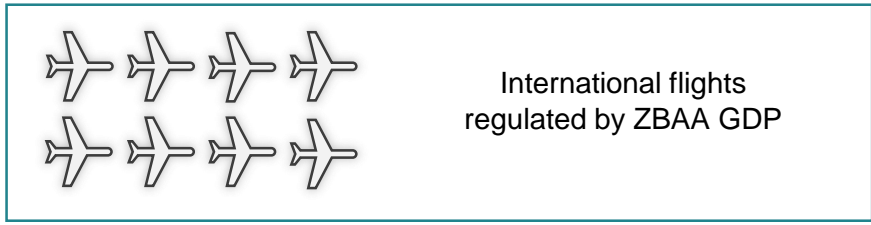
- It will transfer the demand, management and authority of international flights to cross-border ATFM unit, and reduce flight's fluctuation effectively and increase the flexibility of ATFM network
-

+ The role of cross-border ATFM unit

- Appropriate ATFM measure should be adopted in cross-border ATFM unit accordingly, in order to realize the function of undertaking external coordination uniformly and simultaneously owing certain authority of decision-making, so as to promote integral operation efficiency



“Two-level conduction and one-level collaboration” operational concept

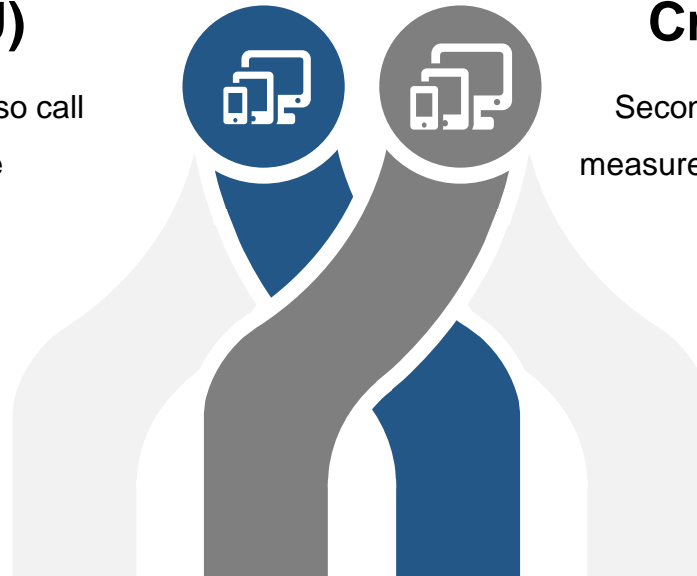


Issuing procedure of ATFM measure

Two-level conduction and one-level collaboration

Originating ATFMU (O-ATFMU)

First stage of ATFM measure is issued by O-ATFMU, also call constraint ATFM unit, issuing originating ATFM measure



Cross-border ATFMU (C-ATFMU)

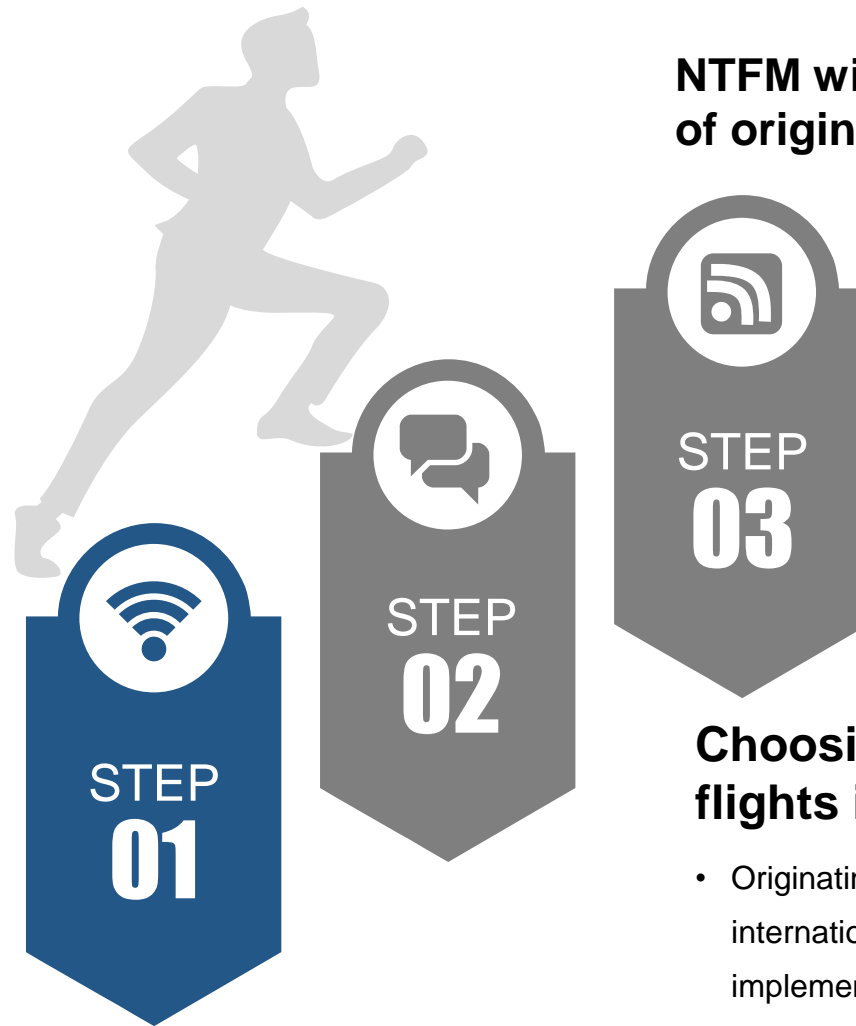
Second stage is issued by C-ATFMU making cross-border ATFM measure according to the split and restriction on international flights

NTFM divides the capacity of originating ATFM measures into domestic traffic flow capacity and international traffic flow capacity, and cross-border ATFMU implement cross-border ATFM measures according to international traffic flow capacity

Level 1 procedure (O-ATFM measure issuing procedure)

Ensure whether the international flights are regulated in ATFM

- Originating ATFMU will decide whether partial or whole international flights are regulated in ATFM measure according to own demand and capacity imbalance situation



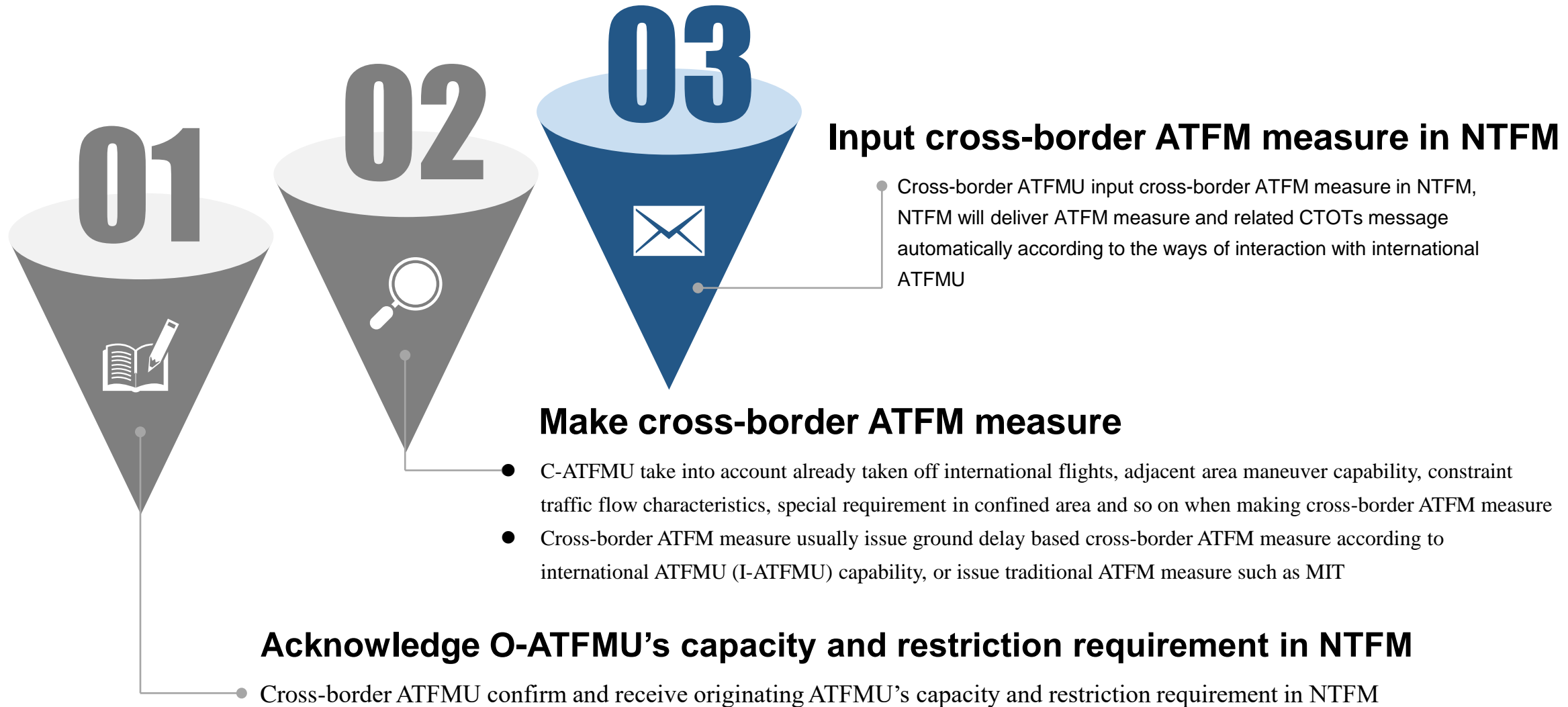
NTFM will automatically transfer the capacity of originating ATFM measures to C-ATFMU

- NTFM divides originating ATFM measures into domestic traffic flow restriction and international traffic flow restriction, and change the restriction of international traffic flow to capacity or restriction to cross-border ATFMU

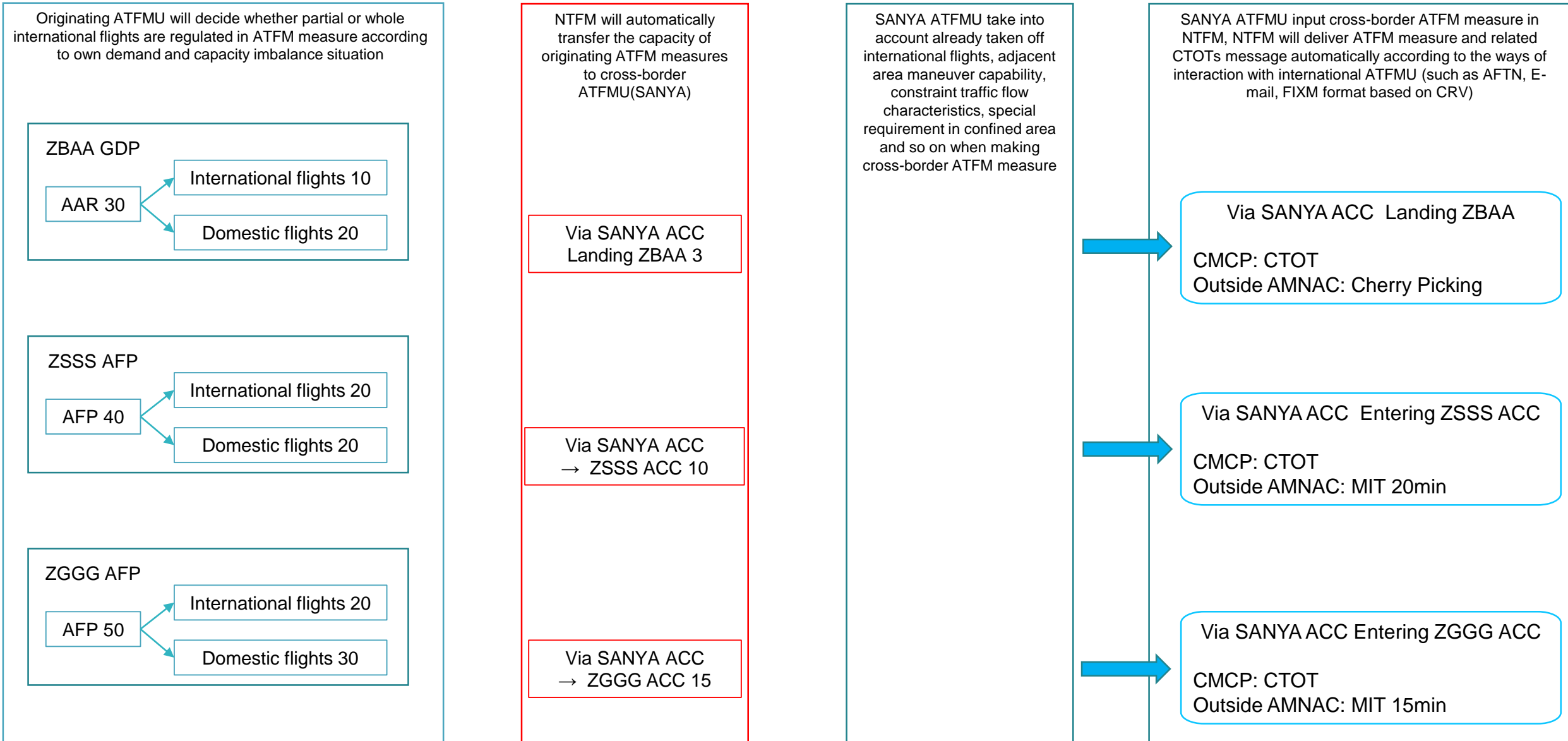
Choosing confined range of international flights in ATFM measure making

- Originating ATFM personnel choose the range of confined international flights when originating ATFMU need to implement ATFM measure in NTFM

Level 2 procedure (C-ATFM measure issuing procedure)



“Two-level conduction and one-level collaboration” operational concept



Receiving procedure of ATFM measure

NTFM received measures or CTOTs by AFTN or CRV



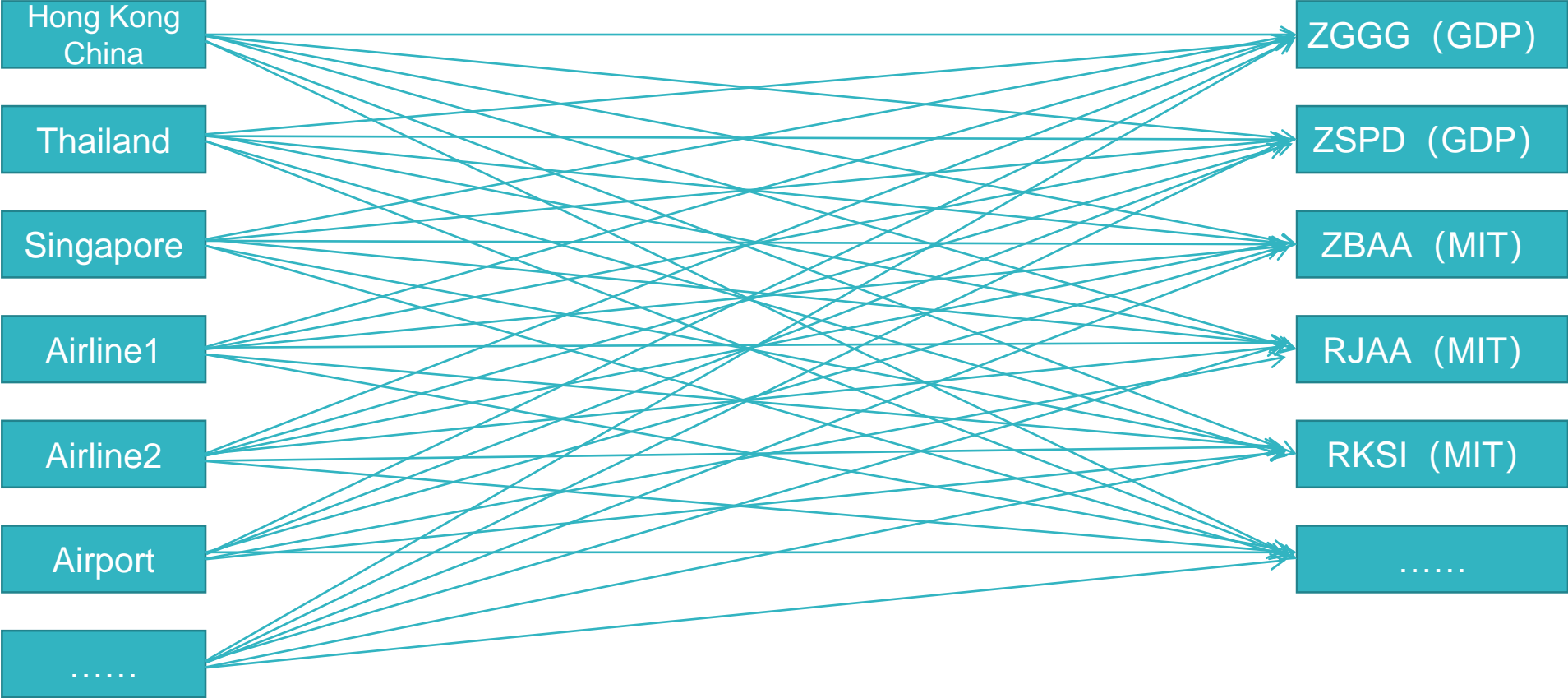
C-ATFMU (SANYA) received measures or CTOTs by internet, e-mail and phone call...



C-ATFMU (SANYA) received traditional ATFM measures

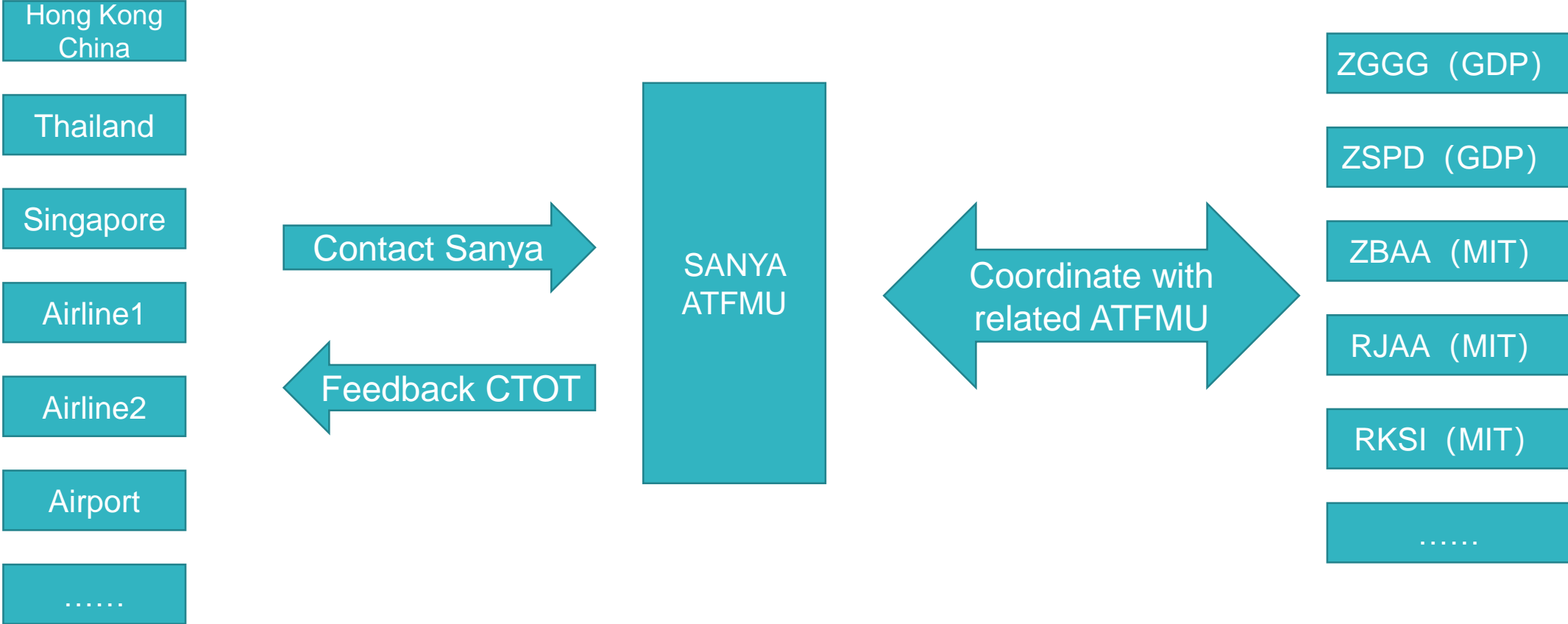


Cross-border ATFM coordination



virtual scenarios

Cross-border ATFM coordination



virtual scenarios



/03

**ACTION BY THE
MEETING**

ACTION BY THE MEETING



01

- Note the information contained in this paper

02

- Perfect this CONOPS for internal operation of cross-border ATFM together

03

- Encourage that regard complicated node take this CONOPS as reference sample in node interior ATFM operation

04

- Discuss any relevant matters as appropriate

Thanks

FOR YOUR TIME

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