International Civil Aviation Organization

Tenth Meeting of the Air Traffic Management Sub-Group (ATM/SG/10) of APANPIRG

Video Teleconference, 17 – 21 October 2022

Agenda Item 5: ATM Systems (Modernization, Seamless ATM, CNS, ATFM)

CDM PROCESS IN GBA UNDER ADVERSE WEATHER CONDITIONS

(Presented by China)

SUMMARY

This paper presents the latest practices of ATFM in the Greater Bay Area (GBA) and makes proposals to strengthen ATFM Collaboration among APAC region and optimize DOC9971.

1. INTRODUCTION

1.1 Statistics indicate, as early as 2019, among the world's five largest Bay Area aviation markets, the Greater Bay Area, located in the south part of China, has topped the list in terms of passenger throughput (Table1).

Table 1 Comparison of operational statistics in 5 largest bay area in the world

NAME	GBA	London	Paris	New York	LA
Total Runways	10	8	9	14	13
Traffic Volume	1333998	1140675	710845	1250704	871056
International flights	43.06%	90.13%	80.17%	24.84%	14.73%
Peak hour	237	238	150	260	179
DEP OTP	72.99%	64.57%	69.51%	63.00%	77.94%
ARR OTP	81.48%	83.91%	85.16%	80.62%	89.23%
Passenger throughput in 2019	220m	181m	112m	140m	111m
Passenger throughput in 2018	213m	176m	105m	139m	112m

1.2 In the meantime, adverse weather imposes enormous impact on aviation safety and efficiency, take GBA for instance, it's notoriously famous for frequent thunderstorms that occur in more than half of the month (Figue1).

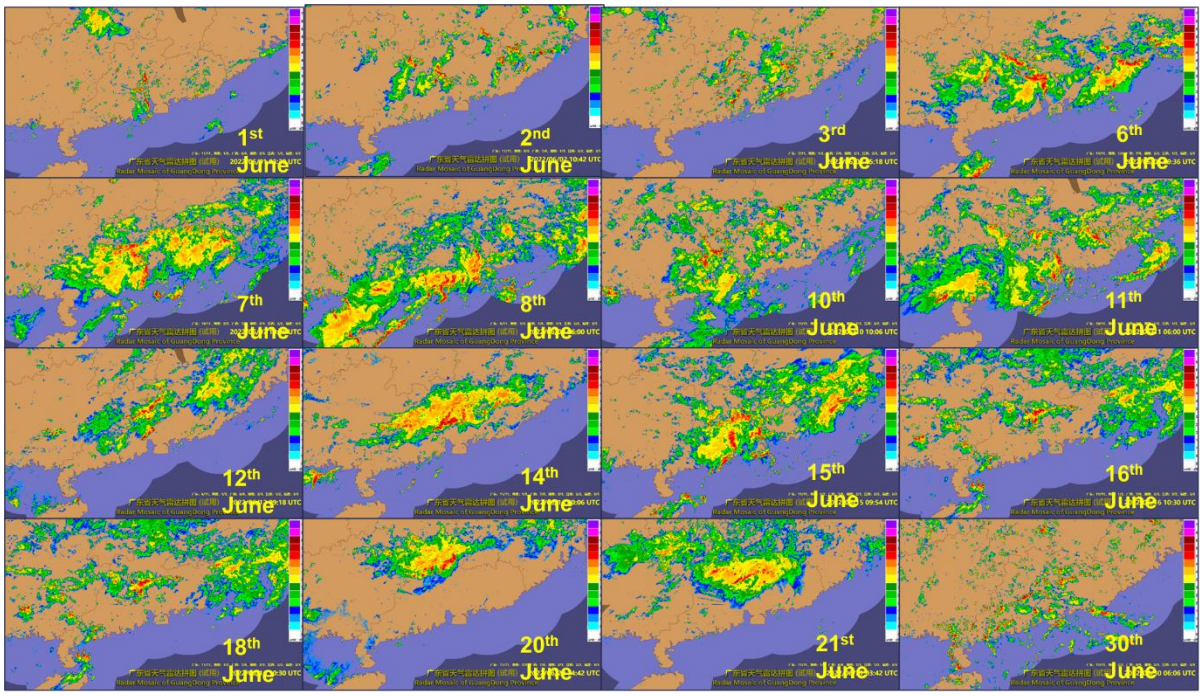

Figure 1: GBA Actual Weather of June

1.3 As air traffic volume is growing very fast in the GBA as well as in the APAC region, ATC capacity is constantly compromised by adverse weather, thus massive delay occurs.

1.4 Implementing CDM and multiple TMIs properly could mitigate the problem mentioned above, improve on time performance (OTP), and facilitate the recovery of aviation market from COVID-19.

1.5 This paper presents some real operation practices and puts forward proposals for developing guidance materials based on the feedback from the airspace users (AUs).

2. DISCUSSION

2.1 Weather plays a significant role in aviation operation, and nearly 70% of flight delay is caused by adverse weather, which makes precise and consistent weather forecast in a timely manner highly necessary.

2.2 In pre-tactical phase of ATFM, the first thing is to determine the capacity for operation day, with various weather forecast products, such as Numerical Weather Prediction (NWP), ATC controllers can evaluate the impact of the weather and then determine the capacity well in advance (Figue2).

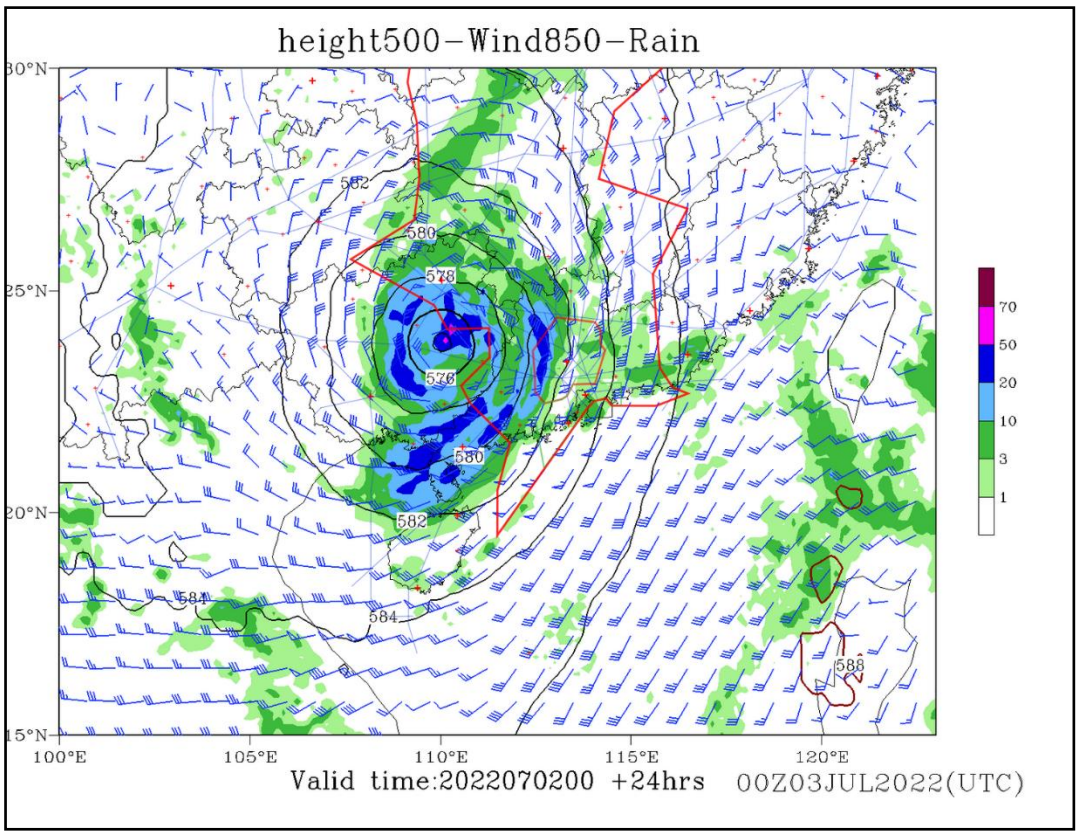

Figure 2: Numerical Weather Prediction

2.3 Once capacity is determined, imbalance of demand and capacity can be found, then ATFM personnel activate proper traffic management initiative (TMI) such as ground delay program (GDP) on the pre-tactical platform of NTFM, and calculated take-off time (CTOT) will be generated for certain flights, those CTOTs only serve as a "what if" function, for they would not be transmitted directly to airlines in a system-to-system manner, but can only be seen on NTFM interface. Because airlines also have their version of NTFM, they can use these virtual CTOTs as reference to evaluate and adjust the pre-plan for those flights with predicted massive delays and subsequently text to passengers, in such way, more predictability is achieved, passengers won't be held in cabin or terminal for extended period of time.

2.4 In tactical phase, operational decisions are made collaboratively among all stakeholders. ATFM personnel will have short meetings with ATC supervisors, weather forecasters, airlines and airports. ATC capacity will be assessed frequently to make sure TMIs are compatible with capacity level.

2.5 Some other TMIs such as Re-routing, Cherry Picking, and Slot Swapping are also used in operation. They are all listed in DOC9971-*Manual on Collaborative ATFM*, however feedback from airlines pointed out that by different ATFM bodies, although the terminologies for these TMIs are the same, they were conducted somehow differently, which means airlines need to adapt themselves to different rules with different ATFM bodies. In this regard, this paper invites the meeting to note this problem, and call on ICAO to provide some guidance materials to introduce the rules, mechanisms, work procedures used by different ATFM bodies.

2.6 ATC facilities should also and always bear in mind that when adverse conditions occur, trying every possible means to improve capacity is quite important. Some good examples are re-configurating the sectors so the inbound and outbound traffic can be well separated bytaking full advantage of holding patterns to increase the redundancy of operation, etc.

2.7 Feedback from the frontline operational personnel also suggests that there needs to be a close cooperation between adjacent MET units, for instance, between Guangzhou MET center and Hong Kong observatory.

2.8 In addition, in May 2022, the Pearl River Delta (PRD) Operational Management Committee was officially inaugurated and put in operation. Representatives from ATC, the three airports in PRD (Guangzhou, Shenzhen and Zhuhai), as well as relevant airlines, work in the same room and can conveniently conduct face-to-face meetings and make quick judgments and decisions on the operational situations, effectively increasing situational awareness and information sharing.

Conclusion

2.9 Efficient and intense collaboration among all stakeholders is crucial in a congested airspace with large traffic volume and adverse weather conditions.

2.10 Multiple TMIs are necessary to cope with complex situations, and rules and procedures on these TMIs should be as universal as possible among all bodies.

2.11 Airports in the Greater Bay Area are located very close to each other, ATFM bodies in this area need to enhance their cooperation in various aspects: information sharing, CDM, collaborative post operation analysis (POA) and so on.

2.12 CDM principle also applies to MET service. It is in the interest of all stakeholders to strengthen the cooperation among meteorological institutes in GBA.

3. ACTION BY THE MEETING

3.1 The meeting is invited to

a) Note the practices of multiple TMIs application and CDM process in GBA.

b) Encourage to share more experience on CDM process.

c) Urge APAC states and bodies to strengthen cooperation, facilitate information sharing, and harmonize CDM procedures.

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<table>
<tr><td colspan="3">Draft Conclusion/Decision ATM/SG/10-X: Share more experience of CDM process</td></tr>
<tr><td colspan="2">What: Share more experience of CDM process, and Urge APAC states and bodies to strengthen cooperation and facilitate information sharing and harmonize CDM procedures.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☒ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: Collaborative decision-making (CDM) process can enable all stakeholders to make better decisions and improve the safety, capacity and efficiency of operations.</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: dd-Mmm-yy</td><td colspan="2">Status: Draft to be adopted by Subgroup</td></tr>
<tr><td colspan="3">Who: ☐Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:</td></tr>
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