

出國報告 (出國類別:會議)

非正式東亞飛航管制 協調小組(EATMCG)會議

服務機關: 民用航空局

姓名職稱: 劉子瑜 技正

吳思賢 技士

林正宗 主任管制員

么煥昇 主任管制員

郭至庭 管制員

派赴國家: 韓國

出國期間: 113 年 5 月 28 日至 6 月 1 日

報告日期: 113 年 7 月 5 日

摘要表

計畫編號	會議類第五項			
計畫名稱	非正式東亞管制協調小組(EATMCG)會議			
報告名稱	非正式東亞管制協調小組(EATMCG)會議			
出國人員	姓名	服務單位	職稱	職等
	劉子瑜	民用航空局	技正	薦任八職等
	吳思賢	民用航空局	技士	薦任七職等
	林正宗	飛航服務總臺	主任管制員	薦任八職等
	么煥昇	飛航服務總臺	主任管制員	薦任八職等
	郭至庭	飛航服務總臺	管制員	薦任七職等
出國地區	韓國			
參訪機關				
出國類別	<input type="checkbox"/> 實習(訓練) <input checked="" type="checkbox"/> 其他(<input type="checkbox"/> 研討會 <input checked="" type="checkbox"/> 會議 <input type="checkbox"/> 考察、觀摩、參訪)			
出國期間	113 年 5 月 28 日至 6 月 1 日			
報告日期	113 年 7 月 5 日			
關鍵詞	非正式東亞管制協調小組 EATMCG			
報告書頁數	68			
報告內容摘要	<p>第 16 屆非正式東亞管制協調小組 EATMCG(the East Asia Air Traffic Management Coordination Group)會議於 113 年 5 月 29 至 5 月 31 日於韓國首爾舉行，會議針對 10 份資訊報告 IP(information papers)及 14 份工作報告 WP(working papers)進行資訊分享與協議及程序的討論，其中 13 個 WP 與本區有關，因此會議討論熱烈；由於本區飛航流量管理 (Air Traffic Flow Management, ATFM)系統的開發及推廣已經接近進入實際作業階段，因此在會議中提出 4 份報告，其中有 3 份是有關 ATFM 作業細節及合作的討論，ATFM 的討論更是此次會議的主軸；另外，此次會議是韓國加入 EATMCG 多年後第一次主辦的會議，他們整合了航管、機場公司及航空公司，積極地提出一些報告，希望爭取到好的條件，減輕機場放行的壓力及增進作業效率。此次會議除了 ATFM 的合作外，本區分別與日本、香港及韓國達成幾項共識，後續會進行細節討論及協議書或備忘錄的修訂或建立，將區域的作業改善往前推進。</p>			

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壹、目的

非正式東亞飛航管制協調小組(the East Asia Air Traffic Management Coordination Group, EATMCG) 是臺北飛航情報區與相關鄰區航管作業的協商平臺，今年是第十六次會議具備三個特殊意義：

- 是疫情之後的第一次的實體會議，終於能夠面對面進行討論，在實際會面時可以有深入的討論，更容易達成成果，並建立彼此的信任關係。
- 此次會議是韓國加入 EATMCG 後第一次主辦會議，顯示韓國認同會議的重要性，願意投入更多資源，也代表他們對會議有更多的期待。
- 由於航行量逐漸恢復到接近疫情前的數量，EATMCG 會員之間的飛航流量管理 (Air Traffic Flow management, ATFM)合作將進入實際作業，諸多環節需要釐清。



圖 1. EATMCG16 臺北與會代表

會議於 113 年 5 月 29 日至 5 月 31 日於首爾韓國國立航空博物館(Korea National Aviation Museum)舉辦，與會的國家除了臺灣(如圖 1)以外，還有香港、日本、韓國及菲律賓，臺灣不是國際民航組織(International Civil Aviation Organization, ICAO)成員，EATMCG 是我國航管體系對外重要的國際交流平臺之一，歷年來透過這個平臺完成臺北飛航情報區與鄰區許多合作及改善，本區處於東亞關鍵樞紐位置，運用這個平

臺來整合區域作業，提高本區的航空管制作業效率及安全，也為東亞逐年增長的航
行量提供最佳的航管作業方案。

此次會議我方準備了 3 個工作報告(Working Papers, WP)及 1 個資訊報告(Information
paper, IP)，3 個 WP 分別提出：

- 建立 M750 東側的離場平行航路
- 建議運用計算航機過點時間(Calculated-Time-Over, CTO)改善航點流管
- 整合本區所有邊境點 ATFM 作業

IP 介紹本區 ATFM 作業的進展，包括：

- 自我發展的 ATFM 系統功能
- 國內 ATFM 推廣狀況
- 與國外各國 ATFM 合作的連結
- ATFM Flow Manager 的人員訓練

此次目標希望透過會議事先提出解決方案，協調適合本區實施 ATFM 的作業模式，
整合區域作業共識，讓本區未來開設的 ATFM 席位作業能順利進行；另提出臺北區
域管制中心(下稱臺北區管中心)北部席與福岡區域管制中心(下稱福岡區管中心)有
關 M750 作業優化方案，提升作業安全及效率。



圖 2-圖 5. 臺北與會代表於會議中報告

貳、 過程

一、 行程說明

本次 EATMCG 16 會議會場位於首爾金浦機場旁的韓國國立航空博物館(Korea National Aviation Museum)，會議行程如下：

5 月 28 日 由桃園出發到首爾

5 月 29 日 報到及會議

5 月 30 日 會議

5 月 31 日 會議及參訪

6 月 1 日 由首爾出發返回桃園

考量到此次會議的議題幾乎都與本區有關，除了開會日期 5 月 29 日、30 日及 31 日三天會議議程外，我方都利用會後時間或要求大會給予時間進行每日綜整、澄清與說明，以確保會議中的各項討論都清楚明白。

另外，韓國主辦此次會議爭取了韓國機場公司、駕駛員協會及大韓航空的贊助，以上三個團體也藉此機會呈現其最新的技術發展並表達需求，希望透過會議，提出相關的建議，包含增訂航路、縮短前後隔離等措施，協助其節省油料、碳排放及作業效率。



圖 6. EATMCG16 與會人員於大韓航空總部合影

二、 會議 Information Paper/Working Paper 彙整及議程

本次會議各國共提出 10 份 IP 及 14 份 WP 安排於三日議程中(如圖 7)，歸納所有的報告大致分為幾類：

(一) 一般性資訊 IP

1. IP01: The outcome of the common report form from 2019 to 2023 (Japan)
(2019-2023 區域間航行量分析報告)
2. IP05: The updates on ATFM development in Taipei FIR (Taipei)
(介紹本區 ATFM 作業的進展)
1. IP08: Introduction to contingency plan of consolidating ACCs in Incheon FIR
(Korea)
(仁川飛航情報區內各區管中心之緊急應變計畫)

(二) 現行作業分享報告 IP

2. IP02: Review of the trial operation to change the transfer timing between Fukuoka ACC and Manila ACC (Japan)
(福岡區管中心與馬尼拉區管中心改變交管時機之試作檢討報告)
3. IP03: Coordination of cross-border ATFM for F15 sector in Fukuoka ACC (Japan)
(福岡區管中心 F15 席位之邊境點流量管理協調)
4. IP04: Cross-border ATFM for VVDN (Japan)
(往峴港航班之跨邊境流量管理措施)
5. IP06: Enhancing safety and efficiency at Incheon Int'l Airport through digital tower system (Incheon International Airport Cooperation)
(優化仁川機場數位塔臺系統之安全性及效率)
6. IP07: Introduction to the procedure for prioritizing CTOT allocation for flights subject to curfew due to ATFM (Korea)
(針對宵禁航班之時間帶提高流量管理優先權之程序介紹)
7. IP10: Air traffic flow in Incheon fir during the early morning (Korea)
(仁川情報區內凌晨時段之航班流量分析)

(三) 航管作業改善提案 WP

1. WP02: Efficient traffic flow at BULAN and MOLKA (Japan)
(針對 BULAN 及 MOLKA 航點流量之效率提升)
2. WP05: Constructing a parallel departure route into Fukuoka FIR (Taipei)
(針對臺北離場進入福岡飛航情報區之航班建立平行航路)
3. WP06: Air Traffic Management (ATM) contingency plan of the Philippines (Philippines)
(菲律賓飛航管理緊急應變計畫)
4. WP07: The concept of flexible MINIT allocation based on actual traffic proportion for N892 southbound restriction (Korea)
(針對 N892 航路南向航機，依據實際航行量比例做邊境點流管之概念)
5. WP09: Proposal to establish new airway and reduce separation minima for traffic via MUGUS/ATOTI (Korea)
(建立新航路並減少經 MUGUS/ATOTI 航點航機之邊境點隔離)
6. WP10: Proposal for reducing longitudinal separation minima for entering HO CHI MINH FIR (Korea)
(縮減進入胡志明飛航情報區航機之最低水平隔離)
7. WP11: Proposal to reduce longitudinal spacing for Korea-bound traffic via ENVAR M750 and KAPLI G86 (Korea)
(縮減經由 ENVAR M750 及 KAPLI G86 往韓國之航班之最低水平隔離)
8. WP12: Optimization of ATS routes A461, M501 and A583 (Hong Kong)
(優化 A461, M501 及 A583 航路)

(四) ATFM 作業整合 WP

1. WP03: Constructing an efficient CTO operation model to manage flows into Southeast Asia (Taipei)
(建議運用計算航機過點時間改善航點流管)
2. WP04: Consolidation on all East Asia ATFM Scenarios across Taipei's airspace (Taipei)
(整合本區所有邊境點 ATFM 作業)

3. WP13: Consolidating multiple ATFM measures to enhance operations (Hong Kong)
(整合多重 ATFM 措施)
4. WP14: Ground delay programme for MACAO international airport, Macao China arrivals (Hong Kong)
(澳門機場到場航班之地面等待作業)

EATMCG/16 ORDER OF BUSINESS

29 May 2024	30 May 2024	31 May 2024
09:00 Welcome/Opening and Group Photo Agenda Item 1 Meeting arrangements and updates of EATMCG <ul style="list-style-type: none"> · WP/01 Agenda and time schedule · IP/01 The Outcome of the Common Report Forms from 2019 to 2023 Agenda Item 2 Regional ATS development <ul style="list-style-type: none"> · IP/02 Review of the trial operation to change the timing of transfer sending between Fukuoka ACC and Manila ACC · IP/10 Introduction of the air traffic flow in Incheon ACC · WP/02 Efficient traffic flow at BULAN and MOLKA · WP/05 Parallel Route into Fukuoka · WP/09 Proposal to establish new airway and reduce separation minima for traffic 	Agenda Item 3 Domestic ATM development(Cont'd) <ul style="list-style-type: none"> · IP/08 Introduction to contingency plan of consolidating ACCs in Incheon FIR Agenda Item 4 Regional ATFM development <ul style="list-style-type: none"> · IP/05 The update of Taipei ATFM development · WP/03 Constructing an Efficient CTO Operation Model · IP/03 Coordination of Cross-border ATFM for F15 sector in Fukuoka ACC · IP/07 Introduction to the procedure for prioritizing CTOT allocation for flights subject to curfew due to ATFM · IP/04 Cross-border ATFM for VVDN 	Agenda Item 5 Any other business (Cont'd) <ul style="list-style-type: none"> · Draft summary of discussions Agenda Item 6 Promotion of cooperation between ANSPs and Airlines <ul style="list-style-type: none"> · (PPT) Suggestions for reducing delays and efficient operations
Lunch Break (12:20 ~ 13:40, Sponsored by IAC)	Lunch Break (12:20 ~ 13:40, Sponsored by KAC)	Lunch Break(11:30 ~ 13:00, Sponsored by ALPA-K)
Agenda Item 2 Regional ATS development (Cont'd) <ul style="list-style-type: none"> · WP/12 Optimization of ATS routes A461, M501 and A583 · WP/11 Proposal to Reduce Longitudinal Spacing for Korea-bound Traffic · WP/10 Reducing Longitudinal Separation minima for entering Ho Chi Minh FIR · WP/06 Air Traffic Management contingency plan of the Philippines Agenda Item 3 Domestic ATM development <ul style="list-style-type: none"> · IP/06 Digital tower system at Incheon Int'l Airport · IP/09 UAM development Plan at Gimpo airport 	Agenda Item 4 Regional ATFM development (Cont'd) <ul style="list-style-type: none"> · WP/04 Consolidation on all ATFM Scenarios · WP/14 GDP for Macau Int'l Airport arrivals · WP/07 The concept of Flexible MINIT Allocation · WP/13 Consolidating Multiple ATFM Measures to Enhance Operations Agenda Item 5 Any other business <ul style="list-style-type: none"> · Open Discussions · Review Task List – Update for EATMCG/16 · Arrangements for EATMCG/17 18:00 EATMCG Group Dinner (Sponsored by KATCA)	Agenda Item 6 Promotion of cooperation between ANSPs and Airlines (Cont'd) <ul style="list-style-type: none"> · Technical tour to Korean air's operations center · (PPT) Proposal to operate UPR procedures based on aircraft performance in Southeast Asia 15:00 Closing

圖 7. EATMCG 16 三日議程

其中 IP03: Coordination of cross-border ATFM for F15 sector in Fukuoka FIR (Japan) 及 IP10: Air traffic flow in Incheon fir during the early morning (Korea)，事實上，此 2 份 IP 性質屬於 WP，需要與各會員國協調，但是這兩國似乎想低調地處理議題，因此在會議前更改為 IP，所以，在此報告中特別提出來說明。

此外，會議討論的 14 份 WP 中，有 13 份是針對本區的議題或是與本區相關，由此可以證明本區的關鍵角色，為串聯東南亞與東北亞空中廊道；我方與會成員出發前便積極準備，並呈報民航局有關每一項議題我方處理的方式及態度，在會議中也如預期的承受了很大的壓力。韓國表現得特別積極，據私下瞭解，韓方這次主辦會議受到機場公司及航空公司的壓力，期盼在此次會議爭取到更有利的作業條件。

三、 各國 Working Paper/Information Paper 說明及回應

以下整理出會議中與我方有關之 WP/IP，並依國家/地區進行說明如下：

(一) 日本提出的 WP/IP

1. IP03: Coordination of cross-border ATFM for f15 sector in Fukuoka FIR

日本福岡區管中心為因應其 F15 席位(與本區相鄰，共有 4 個邊境點：SALMI、LIPLO、BULAN、MOLKA，如圖 8)在超過空域容量 70 架次時對各國實施航點分鐘數隔離，主要的措施如下：

- 對香港措施：東南亞往日韓航班，於邊境點 ENAVAR、KAPLI 實施分鐘數隔離)。

Departures from VHHH to Japan, Y1 minutes at ENVAR regardless of altitude
Departures from VV** and VT** to Japan, Y2 minutes at KAPLI regardless of altitude
Departures from VHHH to ROK, Y3 minutes at ENVAR regardless of altitude
Departures from VV** and VT** to ROK, Y4 minutes at ENVAR regardless of altitude
*Y1-Y4, Taipei add buffer to cater for catch up

- 對菲律賓措施：菲律賓往韓國航班，於邊境點 POTIB、LIPLO、MOLKA 實施分鐘數隔離。

Departures from RP** to ROK, Z1 minutes at LIPLO/MOLKA regardless of altitude
Departures from RP** to ROK, Z2 minutes at POTIB regardless of altitude
*Z2, Taipei add buffer to cater for catch up

- 對本區的限制：東南亞往日韓航班，於邊境點 MOLKA、IGURU、LIPLO 實施分鐘數隔離。

Departures from VHHH to Japan, X1 minutes at MOLKA regardless of altitude
Departures from VV** and VT** to Japan, X2 minutes at IGURU regardless of altitude
Departures from VHHH to ROK, X3 minutes at LIPLO regardless of altitude
Departures from VV** and VT** to ROK, X4 minutes at LIPLO regardless of altitude

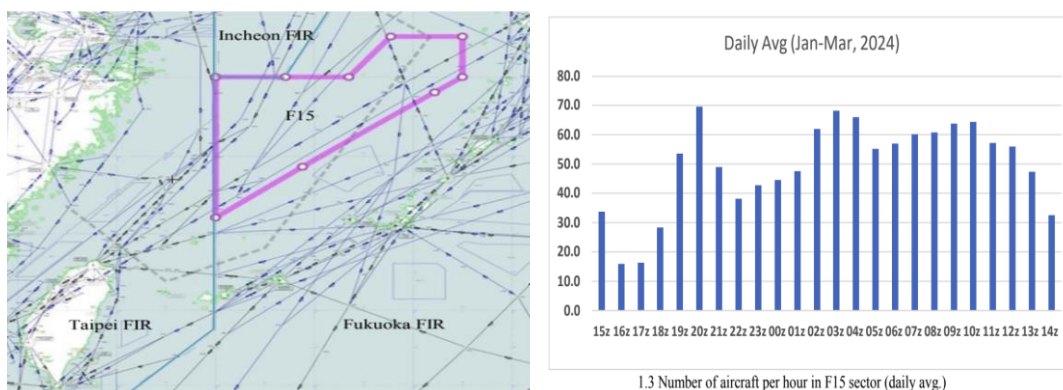


圖 8. 福岡區管中心 F15 席位及分時流量圖

除香港提出部分疑問要求釐清外，各國對於協助日本處理容量問題皆表示支持，我方對於此提案回應如下：

- 由於整體計畫共 6 個分流，再於本區匯集，並依據日本要求提供一定的前後隔離。本區表示在如此高的航行量，還要識別跟管控每一個分流，處理起來相當困難。
- 該方案無涉天氣因素，僅需考慮單位時間的架次，給香港與菲律賓的隔離限制已經管控架次及前後隔離，故無需再要求臺北提供不論高度之邊界時間隔離限制。

因此，我方要求移除給予臺北的限制，另，我方僅提供協調香港及菲律賓的工作。

- 此外，我方提出該方案如要能成功執行，需要泰國、新加坡、越南等亞太區跨邊境多節點飛航流量管理協作(APAC Cross-Border Multi-Nodal ATFM Collaboration, AMNAC)成員國家配合，故必須要較長的前置時間，最好能在 7 小時前進行協商。
- 我方說明使用傳統流管處理容量管控的效果不精準，待本區飛航流量管理席位(ATFMU)開始執行任務後，臺北的 ATFM 系統有能力發送計算起飛時間 (Calculated Take Off Time, CTOT)給 AMNAC 有合作的國家，如果日本接受每一小時流量的做法 (Hourly Flow Rate)，屆時這個問題應該可以有更好的方式來執行。
- 經觀察，日方 F15 席位(與本區相鄰，共有 4 個邊境點：SALMI、LIPLO、BULAN、MOLKA)除了本地時間清晨 4 時(2000UTC)左右的航行量接近 70 架次，本地時間上午 10 時至 12 時(0200UTC-0500UTC)間航行量也接近 70 了，建議福岡區管中心應該開始規劃將該席位分割成 2 或 3 個席位，並增派人力以面對航行量的增長。

此次日本由日本民航局(Japan Civil Aviation Bureau, JCAB)與福岡區管中心與會，流量管理中心 (Air Traffic Management Center, ATMC)沒有派人與會，日方將相關建議帶回討論再與各國協商。

2. WP02: Efficient traffic flow at BULAN and MOLKA

福岡區管中心提出，由於疫情後回復的航情及未來增長預測，應該與臺北區管中心進行更緊密的合作，並提出兩個議題來做說明：

第一個議題是臺北區管中心常因空域內惡劣天氣，要求福岡區管中心將 BULAN 進管桃園機場及松山機場的到場航班以飛航空層(下稱 FL)320 或 FL340 交接，以避免與本區過境航班造成衝突。

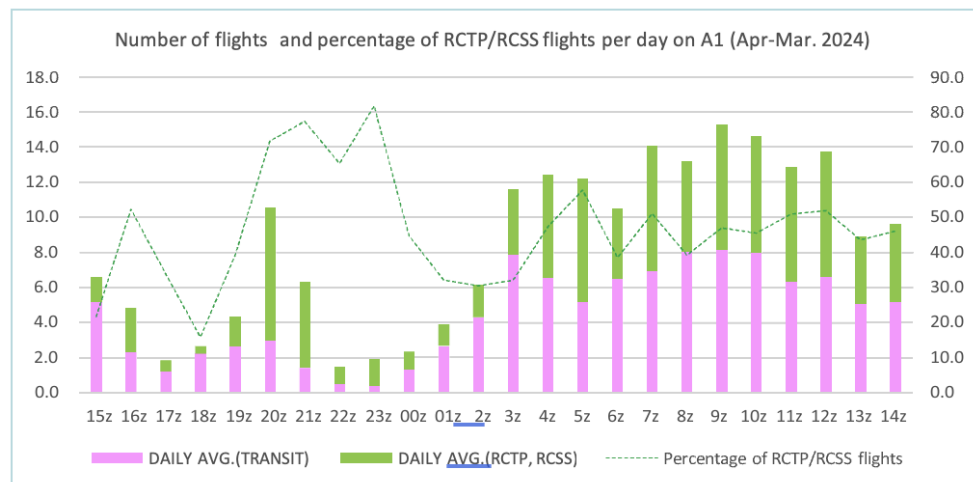


圖 9. A1 航路分時架次比例圖

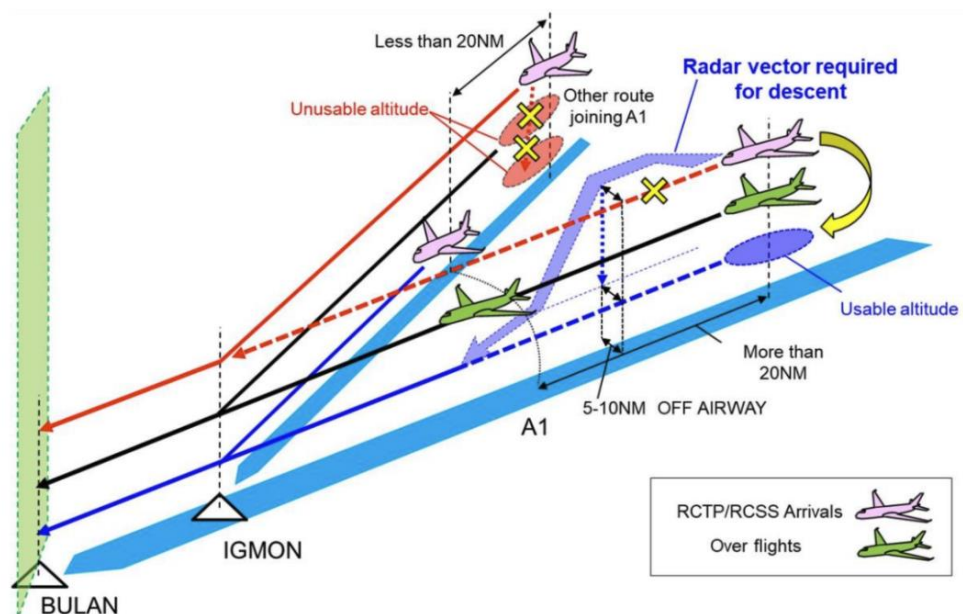


圖 10. A1 航路航機轉換高度說明圖

但由其資料顯示(如圖 9)，將近半數的 BULAN 進管航機是到場桃園機場及松山機場，因此造成福岡區管中心頻繁變換高度(如圖 10)的工作量。

第二個議題是本區離場往 MOLKA 出管的航班(如圖 11)，由於部分航機的巡航高度需要穿越 M750 過境的航班，而又無法於邊境前到達高度，管制員必須將航機引導平行於 M750 東側，並協調福岡區管中心 F15 席位及 F17 席位，以爬升中及航向進行交接，這個部分每日協調量很大，加上 M750 東側有一限航區，引導過於偏南時，有進入限航區的可能，因此需要尋找解決方案。

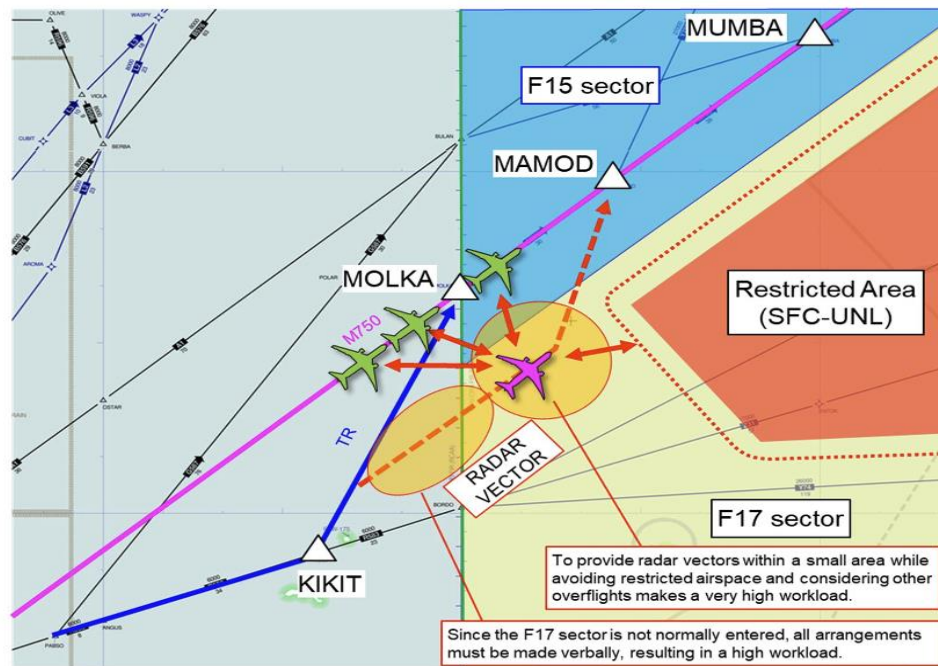


圖 11. 本區離場航班往 MOLKA 示意圖

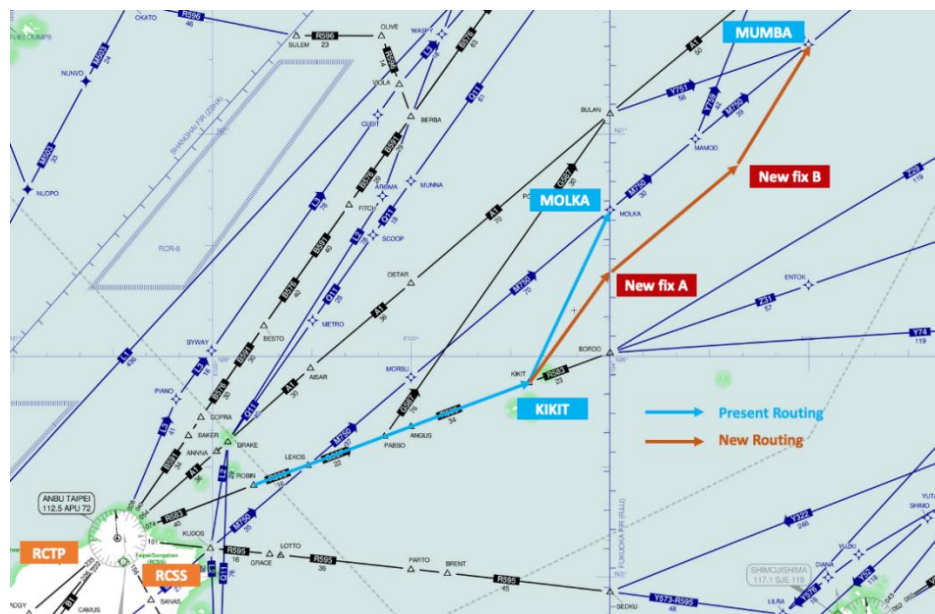


圖 12. M750 平行航路之初步規劃

正好我方亦在此次會議中提出 WP05，希望於 M750 東側建立平行於 M750 的離場爬升航路(如圖 12)，顯見雙方都認為目前的協調量太大，必須想辦法解決。

綜上，日本建議雙方舉辦例行性線上會議，加速改善雙方作業，我方同意日本的議案，並盡快討論建立平行於 M750 的離場航線。

日本表示 JCAB 的業務繁忙，且關係到軍方限制空域，希望分階段實施，但其提出的分階段方案經討論後發現，並無法減少管制作業協調量，因此我方建議，進行一次到位的方案，並願意配合日本的時程，日本表示可討論，此部分尚無結論，仍待後續討論。

(二) 香港提出的 WP/IP

1. WP11: Proposal to reduce longitudinal spacing for Korea-bound traffic via ENVAR M750 and KAPLI G86

香港提議 ENVAR 及 KAPLI 進管前往韓國的航機間隔離由目前的 5 分鐘(約 40 海浬)隔離縮短為 20 海浬。

香港與三亞的協議隔離為後機不追趕前機時，兩機採 20 海浬隔離，或後機追前機時，兩機採 40 海浬隔離；與臺北則為 5 分鐘隔離及後機追前機使用 10 至 15 分鐘隔離，隨著疫情後航行量已經逐漸恢復，作業也越來越困難，因此希望將協議隔離縮短為 20 海浬。

我方與日本在出管點 LIPLO/SALMI 的協議隔離為 30 海浬/40 海浬，於行前內部討論及向民航局報告中都認為提議香港改採 30 海浬的隔離是適合且合理的，並依此向香港說明，香港表示靜待臺北回覆，後續修改雙方協議書。

2. WP13: Consolidating multiple ATFM measures to enhance operations

分享自 AMNAC 開始運作多節點 Multi-Nodal ATFM 後，開始遭遇多重 CTOT 的問題，香港認為應該讓上、下游相關 ATFMU 都分享 CTOT 資訊，再由其中一個 ATFMU 整合成單一的 CTOT。

我方所提 WP04，針對處理多重 ATFM CTOT 的方法，建議使用空域流量計畫 (Airspace Flow Program, AFP)>地面延遲計畫 (Ground Delay Program, GDP)的原則，提供塔臺、機場及航空公司都有清楚的判斷原則，盡量減少作業面協調；減少協調是 Multiple ATFM 能成功的重要因素；香港表示 AMNAC 針對多重 CTOT 的處理方式仍未找出可行的方法，且上、下游協調過程複雜，遇修正時又再來一遍，實務上是很難運作的，香港會把我方意見反應給 AMNAC 會員。

3. WP14: Ground delay programme for Macao international airport, Macao China arrivals

香港 ATFMU 將代表澳門國際機場發送 GDP/CTOT 給各國，同時其每日發送的 ATFM 每日計畫(ATFM Daily Plan, ADP)將包含澳門國際機場的資訊，本區表示瞭解並於 ATFMU 成立後配合辦理。

(三) 菲律賓提出的 WP/IP

1. WP06: Air Traffic Management (ATM) contingency plan of the Philippines

菲律賓在多年前便提出報告，為因應其 CNS/ATM 故障的緊急情況，要求各國在情況出現時能提供協助，因此制定緊急應變計畫，但是提案停滯不前，直到去年元旦發生嚴重停電事件後，方才積極進行此案。

菲律賓提出的緊急應變計畫以航路(如圖 13)進行劃分，與本區有關的部分為 CRM1 及 CRM2。

CRM1 為由本區自 KABAM 出管的西南向航機：

- 限制使用 FL320/FL360/FL400 三個高度(如圖 14)，與目前實施大規模天

氣偏航 (Large Scale Weather Deviation, LSWD) 的高度相同。

- 希望臺北於 KABAM 通知航機於 MUMOT 航點 log on to VVHM ADS-C CPDLC，在 MIGUG 航點聯繫胡志明 HCM ACC 120.7。

CRM2 則責成佬沃近場臺(LAOAG App)通知航機於 POTIB 航點南面 5 分鐘聯繫臺北區管中心 127.9 或 129.1。

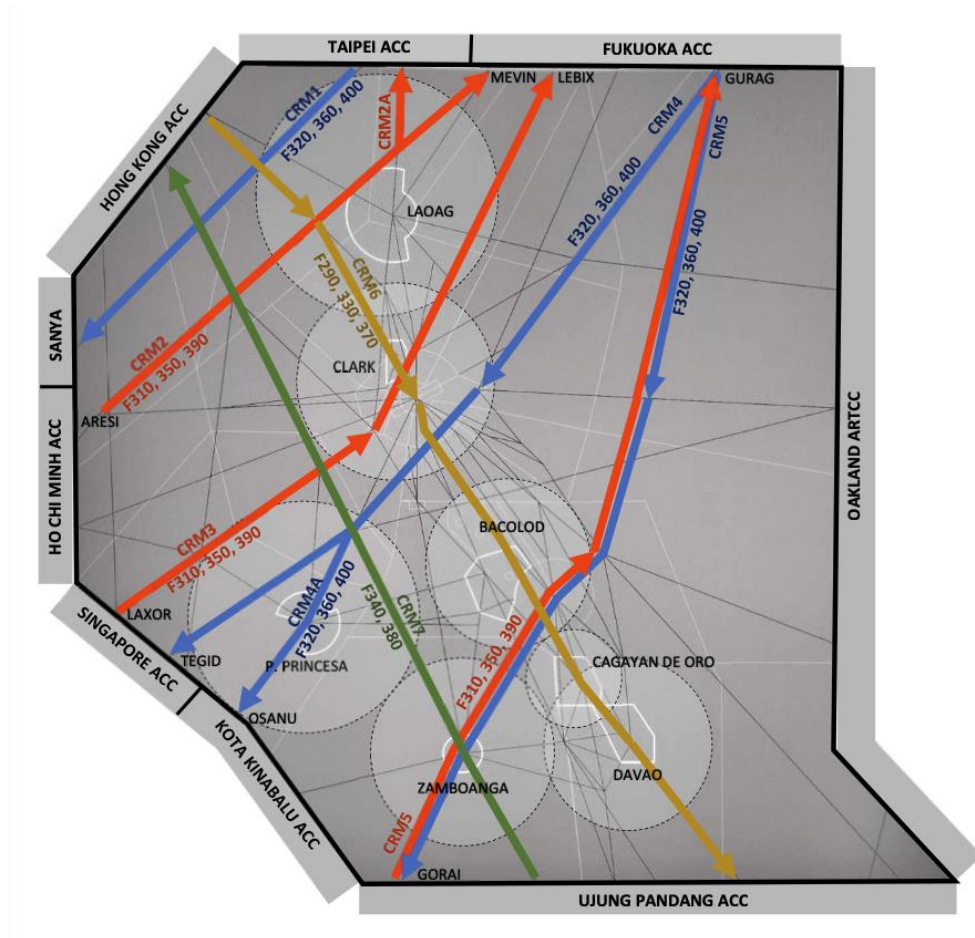


圖 13. 菲律賓緊急應變計畫之規劃航路示意圖

APPENDIX A. CAAP LEVEL 2 ATM Contingency Plan

Contingency Route	ATS Route	Direction	FLAS	ATSu	Transfer of Communication	Remarks
CRM 1	N892 KABAM-MIGUG	Southwest	FL 320 FL 360 FL 400	TPE ACC	At MUMOT Log on to VVHM ADS-C CPDLC At MIGUG, to contact HCM ACC 120.7	International operators may choose to avoid the Manila FIR by using alternate ATS routes in other FIRs.
CRM 2 /2A	L625 ARESI-MEVIN	Northeast	FL 310 FL 350 FL 390	HCM ACC	Applicable between 2200-1400UTC: At AVMUP contact LAO Approach 122.3 MHz. Laoag Approach to advise aircraft At MEVIN contact Fukuoka ACC 123.9 MHz. Applicable between 1400-2200UTC: At MEVIN contact Fukuoka ACC 123.9 MHz.	International operators may choose to avoid the Manila FIR by using alternate ATS routes in other FIRs.
	L625 ABVAR M646 ARESI - POTIB	Northeast	FL 310 FL 350 FL 390	HCM ACC	Applicable between 2200-1400UTC: At AVMUP contact LAO Approach 122.3 MHz. Laoag Approach to advise aircraft To contact TPE ACC 129.1/127.9 MHz 5 minutes before POTIB. Applicable between 1400-2200UTC: Contact Taipei ACC 129.1/127.9 MHz 5 minutes before POTIB.	LAOAG Approach Facility Hours of Operations 2200-1400UTC.

圖 14. 規劃航路之高度限制

我方考量協助菲方的可行性：

- 臺北 HCN 附近的無線電及雷達距離 MUMOT 及 MIGUG 航點分別為 244 及 556 海浬，飛航服務無法涵蓋。
- 在航管系統的設定及功能上，因為航機遠離邊境點後，航管系統自動移除航機 Label，雷達幕上無法持續顯示該機資訊。
- 最後是責任歸屬問題，在未解除無線電服務之前，本區於該情況下提供航管服務，航機安全隔離的責任該如何釐清。

菲律賓表示此計畫是 ICAO 指定的計畫，內容將公告於其 AIP 上供駕駛員遵循及參考，與計畫相關的香港與日本也表示支持及配合，並表示此公告的制訂及發布是標準的程序無關責任，並表示各國都應制訂此程序，只是將轉換波道的資訊公告出來，我方表示會將資訊帶回討論。

返國後，民航局經討論後表示應變計畫既與 ICAO ANNEX11 內容相關，爰同意配合，並基於互助互惠原則提供協助，總臺臺北區管中心現已通知菲律賓進行協議書或備忘錄草案的討論。

(四) 韓國提出的 WP/IP

韓國提出的議題數量最多，其中有關前後隔離的議題都是韓國持續追蹤的；

今年韓國承辦會議，其企圖心更加的明顯，會議中占用較多時間討論。

1. WP07: The concept of flexible MINIT allocation based on actual traffic proportion for N892 southbound restriction

韓國此報告是有關本區收到菲律賓 KABAM N892 LSWD 限制時，可用高度減少為 FL320/FL360/FL400 三個高度，我方因此必須對日韓實施分鐘數隔離(Minutes In Trail, MINIT)流管限制，在 SALMI 航點進管的限制是不論高度 10 分鐘一架，日本 ATMC 依據我方加諸的限制，在 MUGUG 航點限制韓國不論高度 13 分鐘一架；衝擊最大的時段是在上半夜，該流管限制實際執行的結果，韓國每小時經由 SALMI 航點進入本區僅有 3~4 架次，造成嚴重的延遲(如圖 15 及圖 16)，有些機場有宵禁，衍生其他的狀況；韓國希望臺北能依據各國航機比例，給予應有的時間帶 Slot 分配，以減少韓方航機的延遲。

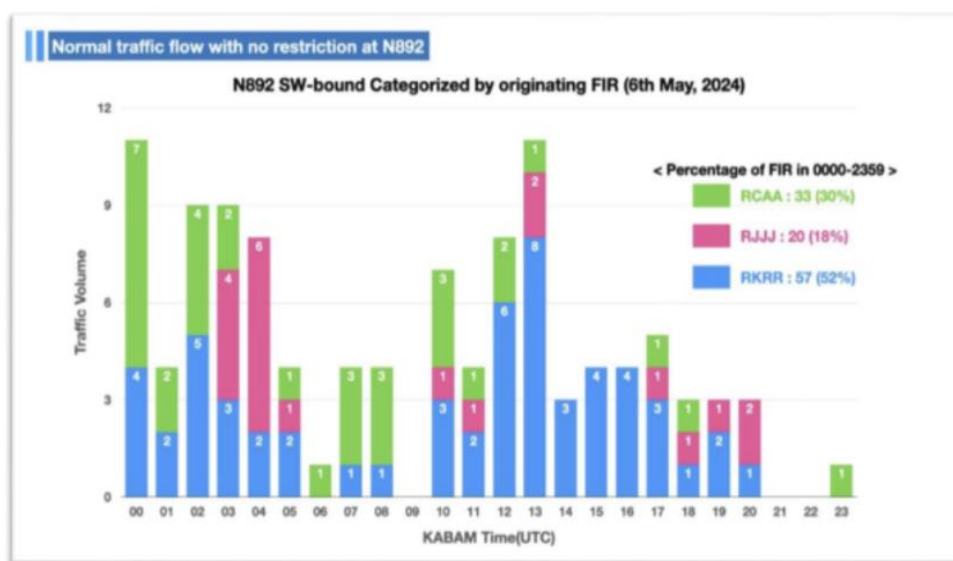


圖 15. 無流管限制時段之航班分布

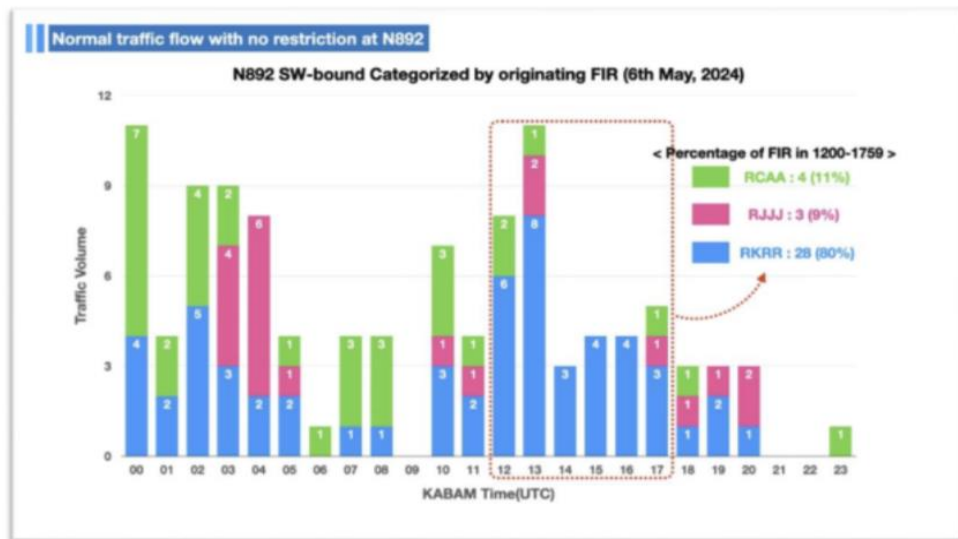


圖 16. 有流管限制時段之航班分布

Typhoon Detour Flights Restrictions table						
Created: 08.03.0600/UT						
Fix	Start(UTC)	End(UTC)	China → Korea			
SADU	2300	1800	2 TDP flights in 15 minutes			
	1800	2300	2 TDP flights in 20 minutes			
AGAVO-WA	1800	1559	2 TDP flights in 30 minutes			
AGAVO-A328	1800	1559	2 TDP flights in 30 minutes			
< Flexible Split for Korea-Japan >						
Conversion to Capacity per hour for ease of calculation		2 flights in 15 min ⇒ 8 flights in 60 min 2 flights in 20 min ⇒ 6 flights in 60 min 2 flights in 30 min ⇒ 4 flights in 60 min				
MINT based on Korea-Japan TDP traffic ratio		(SADU)				
		8.3.0900~8.3.1800 Korea 70%, Japan 30%				
		→ Korea 6 Slots, Japan 2 Slots				
		→ Korea: 10 MINIT, Japan: 30 MINIT				
		8.3.1800~8.3.2300 Korea 10%, Japan 90%				
		→ Korea 1 Slots, Japan 5 Slots				
		→ Korea: 60MINIT, Japan: 12 MINIT				
		8.3.2300~8.4.0900 Korea 50%, Japan 50%				
		→ Korea 4 Slots, Japan 4 Slots				
		→ Korea: 15MINIT, Japan: 15 MINIT				
MINT based on Korea-Japan TDP traffic ratio		(AGAVO-WA)				
		8.3.1800~8.4.1559 Korea 100%				
		→ Korea 4 Slots, Japan 0 Slots				
		→ Korea: 15 MINIT				
		(AGAVO-A328)				
		8.3.1800~8.4.1559 Korea 100%				
		→ Korea 4 Slots, Japan 0 Slots				
		→ Korea: 15 MINIT				
		< Flexible Split for Korea-Japan >				
		Conversion to Capacity per hour for ease of calculation 2 flights in 15 min ⇒ 8 flights in 60 min 2 flights in 20 min ⇒ 6 flights in 60 min 2 flights in 30 min ⇒ 4 flights in 60 min				
ONKJ		Start(UTC)	End(UTC)	Korea → Japan		
		8.3.0900	8.3.1800	30 MINIT for TDP		
		8.3.1800	8.3.2300	12 MINIT for TDP		
		8.3.2300	8.4.0900	15 MINIT for TDP		
If Expect the next update at around every 0000(UTC) and 0600(UTC)						

Typhoon Detour Flights Restrictions table						
Created: 1005.0600/UT						
Fix	Start(UTC)	End(UTC)	China → Korea			
SADU	1004.0000	1007.1800	2 TDP flights in 20 minutes			
AGAVO			2 TDP flights in 30 minutes			
< Flexible Split for Korea-Japan >						
Conversion to Capacity per hour for ease of calculation		2 flights in 20 min ⇒ 6 flights in 60 min 2 flights in 30 min ⇒ 4 flights in 60 min				
MINT based on Korea-Japan TDP traffic ratio		(SADU)				
		1005.0800~1005.2359 : Korea 90%, Japan 10%				
		→ Korea 6 Slots, Japan 0 Slots				
		→ Korea: 10 MINIT, Japan: Prior Coordination Required				
		1006.0000~1006.0900 : Korea 85%, Japan 25%				
		→ Korea 5 Slots, Japan 1 Slots				
		→ Korea: 12 MINIT, Japan: 60 MINIT				
		(AGAVO)				
		1006.0200~1006.0900 : Korea 100%, Japan 0%				
		→ Korea 4 Slots, Japan 0 Slots				
		→ Korea: 15 MINIT, Japan: Prior Coordination Required				
ONKJ (bound for SADU)		Start(UTC)	End(UTC)	Korea → Japan		
		1005.0750	1005.2349	Prior Coordination Required		
Other Flies (bound for AGAVO)		Start(UTC)	End(UTC)	Korea → Japan		
		1005.2350	1006.0750	60 MINIT		
Other Flies (bound for AGAVO)		Start(UTC)	End(UTC)	Korea → Japan		
		1005.0750	1006.0750	Prior Coordination Required		
If Prior Coordination : When Japan informs Korea of the ETOT or ETO (at FIR boundary) of a TDP flight, Korea will coordinate the appropriate time range to the Japanese TDP flight. If Expect the next update at around 1006.0600(UTC). But if there are any significant rate changes, we will update this table in advance.						

圖 17. NARAHG 容量調整措施

為此，韓國介紹東北亞流量管理合作小組 (Northeast Asia Regional ATFM Harmonization Group, NARAHG)試行的分時段需求調整容量的作法(如圖 17)，原則是“哪個點有較高的需求，就給較多的容量”，依據不同時段進行協調，給予不同的流管限制，韓方希望 KABAM 航點能使用同樣的觀念運作。

本區認同及理解目前流管限制的問題及侷限，但是在本區 ATFMU 開始運作前，尚無工具提供分析，但近期會與日本協商縮短其對韓國的限制。

本區的 ATFMU 規劃於未來幾個月內開始運作，屆時在實施 KABAM LSWD 將會有重大的改善，臚列如下：

- 取消全時段流管，將僅針對需要時段採取措施。
- 採用計算過航點時間(Cross Time Over, CTO)後，將所有航班納入考量，韓國起飛的航班會得到應有的容量。
- 即使採取 MINIT，也會採用混和措施(Hybrid Measure)，對日本與臺北離場航機實施 CTOT，韓國起飛的航班也不會被犧牲。

2. IP10: AIR traffic flow in Incheon FIR during the early morning

近半年來，韓國每日本地時間凌晨 3 時至 6 時(1900-2200UTC)間，限制由 LIPLO/SALMI 前往韓國的出管航班不能使用 FL390；本區收到日本限制後，會再限制香港在 ENVAR 不能使用 FL390，後續三亞等沿線都收到相同的限制。

有此限制的原因是由於在韓國仁川區管中心濟州南部席(Jeju South Sector)空域內有一個井字的交叉，由南北向 Y711 及 Y722 兩條航路與東西向 A593 及 Y590 交會(如圖 18)，其中 Y590 與 Y722 兩條航路都使用 FL390，依據韓國提供的資料，Y590 航路（由上海飛航情報區進入仁川飛航情報區）每日大約有 22%的航機使用 FL390，為了作業安全，於是每天實施高度限制(LIPLO Y741 ATOTI Y722)。

為減少各國間的協調，並協助航空公司預劃作業，與會各國同意韓方發布長期 NOTAM，但要求韓國持續提供 Y590 使用 FL390 的情況。

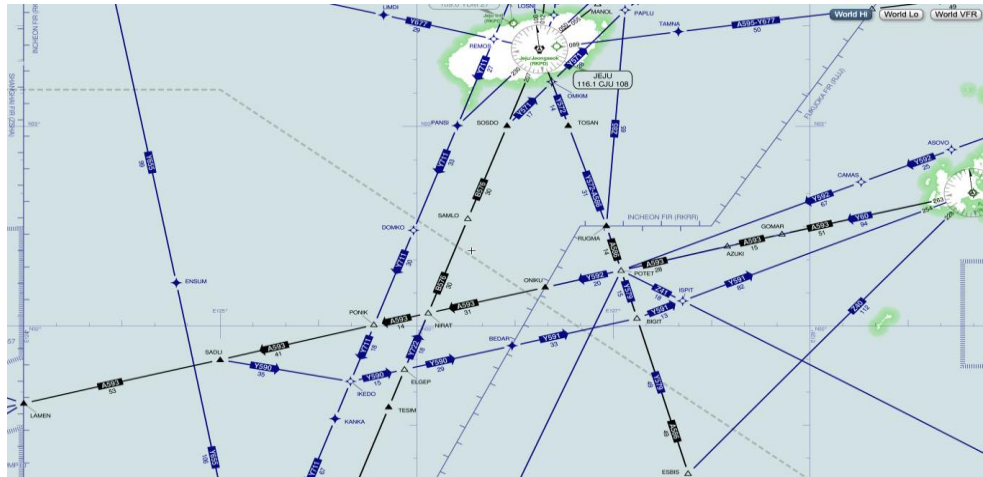


圖 18. 仁川境內航路交會圖

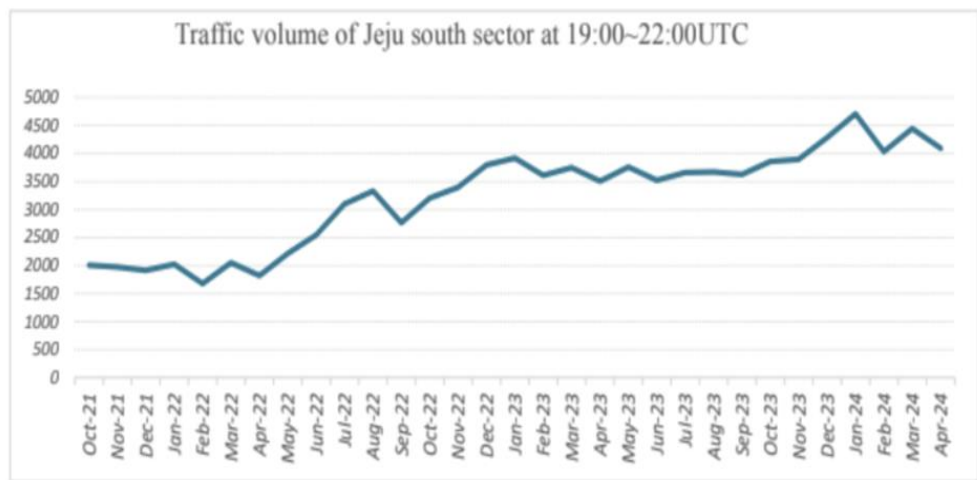


圖 19. 仁川區管中心濟州南部席每日航情量

3. WP10: Proposal for reducing longitudinal separation minima for entering HO CHI MINH FIR

韓國說明由於在三亞飛航情報區之後，航情在胡志明飛航情報區後會分流進入曼谷飛航情報區(如圖 20)，建議針對到場胡志明飛航情報區的航機隔離，由原先的 60 海浬縮短為 30 海浬。

實際上，我國及香港都無法同意韓國的論述，該類別航情由韓國 MUGUS 出管進入本區、香港、三亞及胡志明，沿途不斷有航機加入使航路更加壅塞，另就本區出管點 KAPLI 而言，無法僅就前往胡志明飛航情報區航機考量，因此拒絕了韓國的請求，並強調 KAPLI 的隔離討論不會單獨針對某一個機場航路或情報區，必須就整體航情來評估。



圖 20. 航機進入胡志明情報區示意圖

4. WP09: Proposal to establish new airway and reduce separation minima for traffic via MUGUS/ATOTI

韓國為減輕 MUGUG 南下的壅塞，會引導前往菲律賓的航機改走 RUGMA 由東南面進入日本，但是由於繞行會增加哩程，因此向日本提議建立直飛航線以縮短距離。

由於韓國提議的路徑會經過日方的限航區，因此拒絕韓國的請求。

這份報告另外要求本區針對前機快於後機的航機，將目前的隔離由 60 海哩縮短為 50 海哩，30 海哩的部分縮短為 25 海哩。

我方表示仍需維持 60 海哩隔離，原因如下：

- 進管點與出管點配置高度 (Flight Level Allocation Scheme, FLAS)不一致：
由 SALMI 進管使用 FL300/320/340/360/380/400 共 6 個高度，出管部分在 KAPLI 只有 FL300/340/380/400 共 4 個高度，在 POTIB 只有 FL300/340/380 共 3 個高度，容量是不均衡的。
- 進管點與出管點前後隔離不一致：
由於 KABAM 出管使用 10-15 分鐘的隔離(約 80-120 海哩)，如果在 SALMI

進管使用 50 海里的隔離，我方將無法處理出管的隔離。

- 空域擁擠及交叉衝突:

Q11 及 A1 都是航行量極大的航路，再加上兩岸航線，將導致北部空域更加忙碌；Q11 及 A1 兩條航路在 DRAKE 交會，同高度的衝突會因為隔離得縮短後更形嚴重。

- Q11 的航機後續會與 IGURU 進管的航機再交會，形成另外一個衝突，更密的航情也讓空域更擁擠，處理衝突更困難。

至於 30 海里縮短為 25 海里的部分，因本區長程雷達加上 ADS-B 的涵蓋最遠大約在 SALMI 外 25 海里，且涵蓋範圍於惡劣天氣狀況會變差；若縮短隔離，Q11 及 A1 兩條主幹道匯集在 DRAKE 的同高度衝突會更多更難處理，因此我方拒絕了韓國的請求。

上述兩個 WP 都希望臺北能縮短 60 海里的隔離限制，韓國每一年都會提出，採用漸進策略，逐步縮短隔離。韓國人能理解我方的難處，但仍繼續緊迫，因此這個議題是需要花時間去研究，須根據更多數據資料，從空域、航點容量與交叉衝突等各方面來分析本區可接受最低隔離，這是個困難卻無法逃避的議題。

參、心得

- 一、此次 EATMCG 16 會議是 COVID-19 疫情後的第一次實體會議，也是第一次由韓國主辦，意義重大。能面對面討論問題，加上各區 ATFM 合作日趨緊密，本區也規劃開設流量管理席位(ATFMU)，令本次會議討論異常熱烈。各國於會議中、休會及會後都持續溝通、討論、交換資訊與協商，加上討論之議題多都與本區有關，對我方而言參加 EATMCG 會議是個攻守都需拿捏得宜的會議，Give-And-Take 是門藝術，也是本區折衝爭取利益及合作的極重要的場合。
- 二、本區規劃於 114 年將啟動 ATFM 作業，諸多國際間的合作及 ATFM 作業設定都尚待釐清，雖然本次會議本區提出的 WP 已經引發了熱烈討論，惟細節與協議仍需與各國持續討論，與各鄰區建立未來持續透過線上會議推進的共識。
- 三、機構贊助與產業參與：韓國舉辦此次會議相當用心，動員飛航指揮中心(Air Traffic Command Center, ATCC)及飛航管理辦公室 (Air Traffic Management Office, ATMO) 人員接待、舉辦會議及安排參訪活動，並找來韓國機場公社(Korea Airport Corporation)、大韓航空(Korean Air)及韓國航空公司飛行員協會(Airline Pilots Association-Korea)贊助本次會議，航空產業的合作模式值得本區參考；航空公司、機場公司與飛行員透過合作網絡，可以表達其營運作業需求，共同尋求解決方案並瞭解航管的作業模式，是個多贏的作法。
- 四、會議準備：本次會議安排周全，首先韓國國立航空博物館(Korea National Aviation Museum)的會議場地選擇很好，會議設備新穎齊全，讓會議進行得很順利；其次，會議之間的活動及時間安排也促進各國代表間的互動，並增加其航管、ATFM 人員與各國的連結及區域作業的瞭解，培養國際會議人才及經驗，這樣的投資非常值得。

肆、建議

- 一、本區 ATFM 的發展透過 CTOT 試作及總臺成立 ATFM 發展小組開始啟動，從小組成立時間算起，歷時 1 年 8 個月，期間除持續與 EATMCG 會員進行試作外，小組自行開發的 ATFM 系統已完成桃園機場 ATFM 功能與各邊境 ATFM 功能；ATFM 業務亦推廣至桃園、高雄、松山及臺中機場等本區主要國際機場，國外的合作也跨越日本、韓國、香港及菲律賓等 EATMCG 會員國，往南延伸到泰國及新加坡。臺北區管中心的 ATFM 人員訓練也於 113 年 6 月底完成，本區啟動流量管理席位運作的 ATFM 前置作業已初步完成，營運所需人力規劃須由作業人力中調配，在作業人力尚無虞下建議多予支持。
- 二、於本區 ATFMU 開始運作前，必須與相關利害關係人進行說明與溝通，在啟動前詳述各種程序與規定，以利後續實際流管作業順暢。雖然這兩年透過 CTOT 的試作，利害關係人對於 CTOT 程序已有初步瞭解，唯關於 ATFMU 及 ATFM 系統的運作細節，仍需邀集利害關係人於流管席位正式運作前再次說明，希望後續能投注更多資源舉辦說明會，與航管、機場及航空公司等單位，正式傳達本區 ATFMU 的成立，將利害關係人整合在一起。
- 三、綜上，本區自行開發的 ATFM 系統已經完成 ATFM 機場端及 ATFM 航點端的兩項作業功能，雖能應付日常 ATFM 作業所需，唯仍需持續投入 ATFM 空域端、作業後分析(Post Operation Analysis)、數據庫(Data Bank)等功能研發，持續支持 ATFM 發展小組及資訊管理中心進行系統的開發有其必要性。



圖 21. EATMCG 所有與會人員於會場進行大合照

伍、附錄

LIST OF MEETING AGENDA AND DOCUMENTATIONS

No	Paper No.	Title	Presented by
Agenda Item 1 Meeting arrangements and updates of EATMCG			
1	WP/01	Agenda and time schedule	Moderator
2	IP/01	The Outcome of the Common Report Forms from 2019 to 2023	Japan
Agenda Item 2 Regional ATS Development			
3	IP/02	Review of the trial operation to change the transfer timing between Fukuoka ACC and Manila ACC	Japan
4	IP/10	Introduction of the air traffic flow in Incheon ACC	Republic of Korea
5	WP/02	Efficient traffic flow at BULAN and MOLKA	Japan
6	WP/05	Parallel Route into Fukuoka	Taipei
7	WP/06	Air Traffic Management contingency plan of the Philippines	Philippines
	WP/08	<i>Withdrawn</i>	Republic of Korea
8	WP/09	Proposal to establish new airway and reduce separation minima for traffic	Republic of Korea
9	WP/10	Reducing Longitudinal Separation minima for entering Hochiminh FIR	Republic of Korea
10	WP/11	Proposal to Reduce Longitudinal Spacing for Korea-bound Traffic	Hong Kong China
11	WP/12	Optimization of ATS routes A461, M501 and A583	Hong Kong China
Agenda Item 3 Domestic ATM Development			
12	IP/06	Digital tower system at Incheon Int'l Airport	Republic of Korea
13	IP/08	Introduction to contingency plan of consolidating ACCs in Incheon FIR	Republic of Korea
14	IP/09	UAM development Plan at Gimpo airport	Republic of Korea
Agenda Item 4 Regional ATFM Development			
15	IP/03	Coordination of Cross-border ATFM for F15 sector in Fukuoka ACC	Japan
16	IP/04	Cross-border ATFM for VVDN	Japan
17	IP/05	The update of Taipei ATFM development	Taipei
18	IP/07	Introduction to the procedure for prioritizing CTOT allocation for flights subject to curfew due to ATFM	Republic of Korea

19	WP/03	Constructing an Efficient CTO Operation Model	Taipei
20	WP/04	Consolidation on all ATFM Scenarios	Taipei
21	WP/07	The concept of Flexible MINIT Allocation	Republic of Korea
22	WP/13	Consolidating Multiple ATFM Measures to Enhance Operations	Hong Kong China
23	WP/14	GDP for Macau Int'l Airport arrivals	Hong Kong China
Agenda Item 5 Any Other Business			
Agenda Item 6 Promotion of cooperation between ANSPs and Airlines			
24	Presentation	Proposal to operate UPR procedures based on aircraft performance in Southeast Asia	Korean Air
25	Presentation	Suggestions for reducing delays and efficient operations	ALPA-K

EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG)

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 1

AGENDA AND TIME SCHEDULE

(Presented by meeting moderator)

+	<p>SUMMARY</p> <p><u>This paper</u> presents a proposed agenda, time schedule and meeting arrangements for the sixteenth meeting of East Asia Air Traffic Management Coordination Group (EATMCG/16)</p>	□
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1. INTRODUCTION

1.1 The sixteenth East Asia Air Traffic Management Coordination Group (EATMCG/16) meeting is to be held at the National Aviation Museum of Korea, Seoul, from 29 May to 31 May 2024.

2. AGENDA AND TIME SCHEDULE

2.1 The proposed list of meeting agenda and documentations are in **Appendix A**.

2.2 The proposed time schedule and order of business are in **Appendix B**

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) consent the proposed meeting agenda and documentations in **Appendix A**; and
- b) note and consent the proposed time schedule in **Appendix B**.

EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG)

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 2

Efficient traffic flow at BULAN and MOLKA

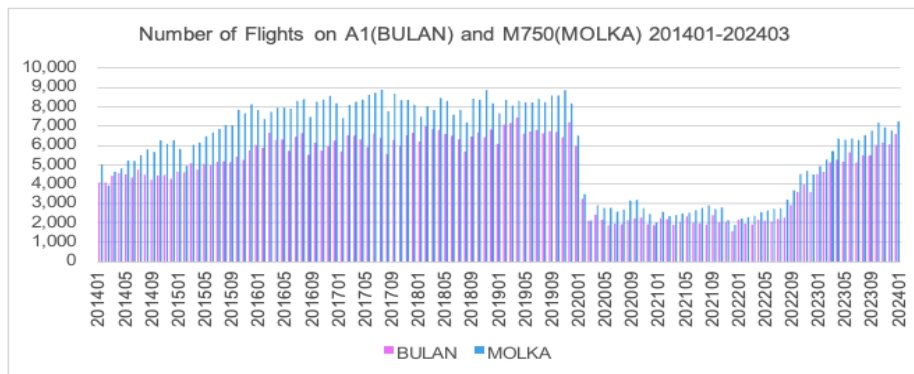
(Presented by JAPAN)

SUMMARY

This paper provides to discuss to achieve efficient traffic flow between Fukuoka FIR and Taipei FIR.

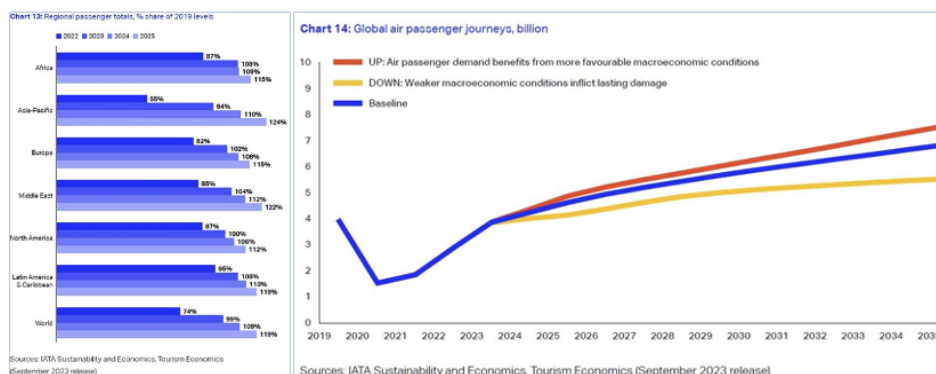
1. INTRODUCTION

- 1.1 In recent years, the impact of COVID-19 has diminished, and traffic volume has returned to pre-COVID-19 levels.



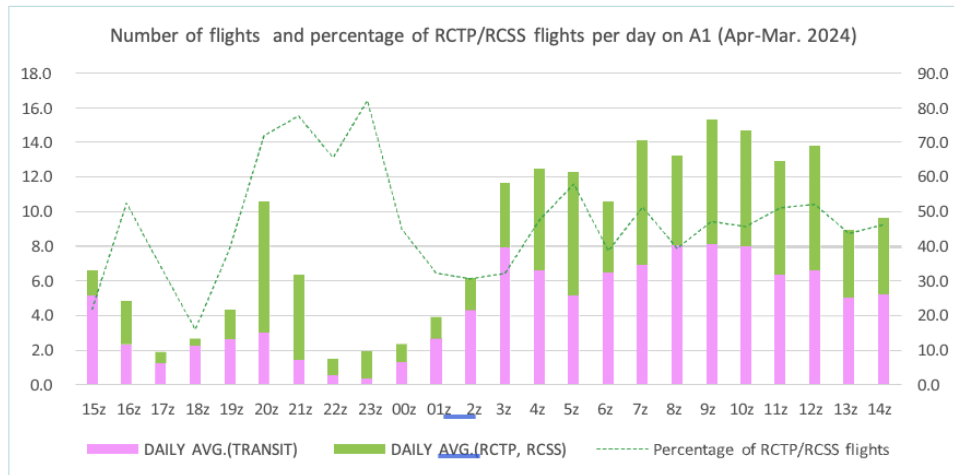
- 1.2 It is easily anticipated that the traffic volume will greatly exceed pre COVID-19 levels in the future.

The following charts are shown by IATA.

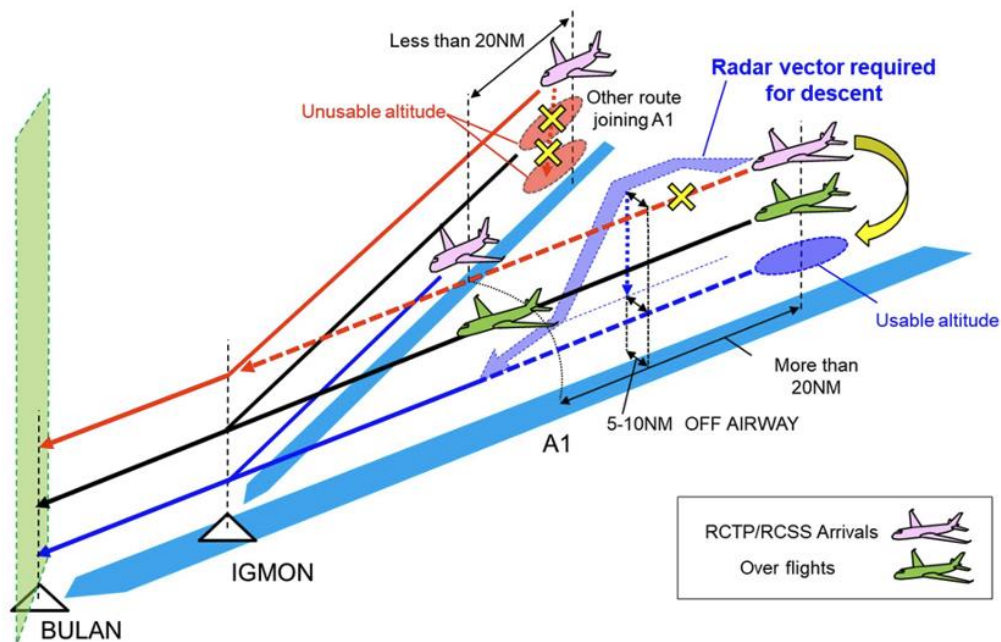


2. DISCUSSION

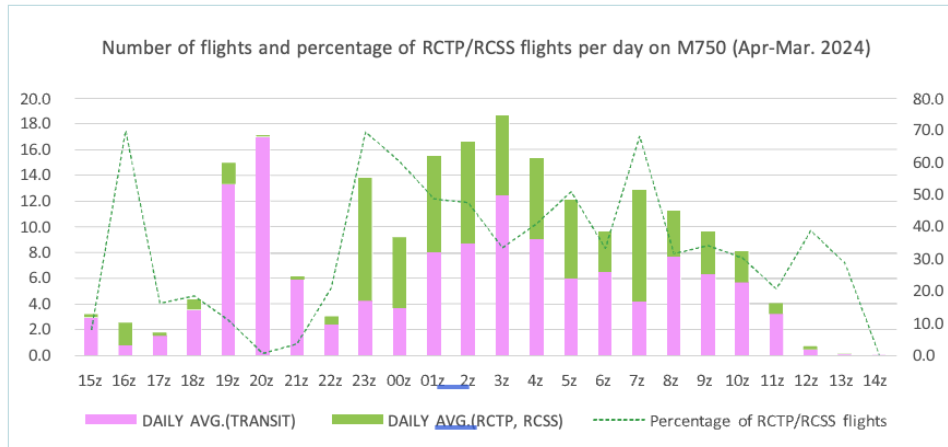
- 2.1 Traffic congestion is dramatically increasing on A1 mainly used by flights between JAPAN and North America and ROC/Hong Kong and North America. This causes aircrafts to limit their options to choose the cruising altitudes; they are more less likely to choose the efficient cruising altitude. Moreover, radar vectors are often required by ATC when changing its altitude on A1, causing ATC operations much busier. The following chart shows the number and percentage of RCTP/RCSS arrivals and transit aircrafts on A1. **RCTP/RCSS arrivals remain at high percentage of the flights on A1, averaging 49% per day.**



Recently, Fukuoka ACC is experiencing an increasing workload for instructing RCTP arrivals to descend with radar vectors. This is originated from the altitude restrictions for RCTP arrivals via BULAN. It seems like the similar cases are occurring at Taipei ACC as well. We are concerned that if any altitude restrictions for RCTP arrivals have been implemented, we would have to handle accordingly for approximately half of the flights on A1.

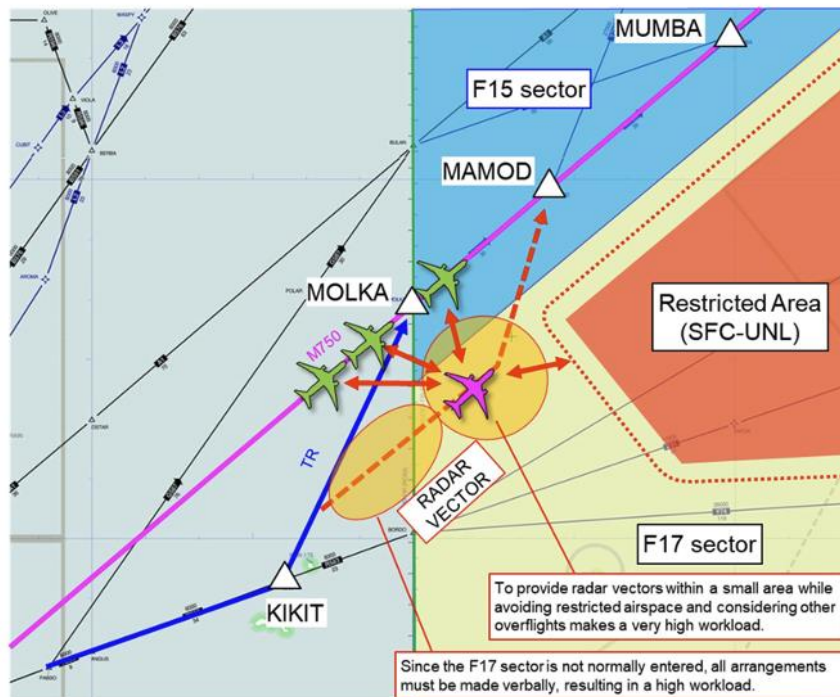


- 2.2 Similarly, the RNAV route M750, which connects between ROC/Hong Kong and Japan and ROC/Hong Kong and North America is becoming increasingly congested. The number and percentage of RCTP and RCSS departures on M750 are as follows.



Recently, there has been an increase in coordination between Taipei ACC and Fukuoka ACC for RCTP/RCSS departures at climbing phases at MOLKA, and also require radar vectors to the south side of M750. There are following concerns when vectoring south side of M750;

1. Restricted airspace in the proximity of MOLKA.
2. Close verbal coordination is required from Taipei ACC to Fukuoka ACC sector F17 since M750 is outside of sector F17's jurisdiction. Similar coordination is required from sector F15 to sector F17.



3. PROPOSAL

- 3.1 The increase in traffic is a good sign of the revitalization of the local economy. Daily coordination of air traffic control between Taipei ACC and Fukuoka ACC is crucial. It becomes more important as traffic gets heavier, the bilateral cooperation between two ACCs are keystone.
- 3.2 Fukuoka ACC proposes to hold a regular web meeting with Taipei ACC to discuss futures measures.

4. ACTION BY THE MEETING

- 4.1 The meeting is invited to discuss the proposal in this paper.

WP/03
EATMCG/16
29-31 May 2024

THE SIXTEENTH MEETING OF THE EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG/16)

Meeting 29-31 May 2024

Agenda Item 4

Constructing an Efficient CTO Operation Model to Manage Flows into Southeast Asia

Presented by Taipei

This paper proposes to construct a CTO operation model among Japan, Korea and Taipei to manage flows from Japan and Korea into South East Asia so as to pursue maximum capacity and improve demand and capacity balance at enroute fixes with Hong Kong and Philippines.

1. INTRODUCTION

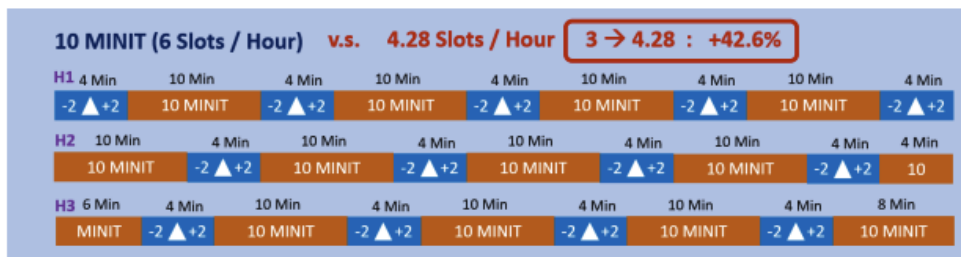
- 1.1 Have been told that in managing DCB at boundary fixes, AMNAC members tend to regulate traffic by utilizing CTOT and NARAHG members favour CTO. Taipei ATFMU as a pivot between the two ATFM groups aims at collaborating with all of EATMCG members in maximizing capacity. In order to do so, Taipei own-developed ATFM system is capable of generating CTOT or CTO based on different ATFMU's needs.
- 1.2 EATMCG members have been conducting and practicing GDP by issuing CTOT due to DCB at airport ends for several years. However, some of flow issues occurred at airway fixes require AFP to solve. **AFP CTOT** has a narrower departure window (-5 and +5 of target CTOT) than **GDP CTOT** (-5 and +10 of target CTOT) so as to gain efficiency and accuracy.
- 1.3 However, AFP CTOT might not be the best choice when it comes to slot management at airway fixes but CTO might be. Far as we know, NARAHG members have been working and studying on CTO operations for years. Japan is experienced in conducting CTO operations to regulate the traffic volume for either domestic airports or international ATFM needs.
- 1.4 Through this WP, Taipei would like to invite Japan and Korea to co-study the possibility of using CTO as the tool to manage southwest bound **flows from Korea and Japan to Southeast Asia through waypoints KAPLI, KABAM and POTIB** of Taipei FIR.

2. DISCUSSION

- 2.1 Since CTO has never been discussed among EATMCG members, Taipei would like to introduce it by articulate the disadvantages of using AFP CTOT to regulate capacity at airway fixes.
- 2.2 In the mostly seen scenario of MINIT flow control, **AFP's 10-minute CTOT window (-5 and +5 of target CTOT)** significantly consumes capacity as examples below (assume EET of FPL is trustable):



- 2.3 Through above examples, the immediate fact is that if rigid intervals of MINIT are arranged between CTOT windows, capacity is terribly wasted. So, it makes clear that AFP CTOT with 10-minute window is definitely not the option to regulate a flow control restriction for airway fixes.
- 2.4 In contrary, traditional flow control of MINIT imposed on upstream FIRs seems work better in utilizing capacity. But we prefer CTOT/CTO to MINIT because MINIT cannot provides definite delay information to airlines and passengers. Therefore, for better slot management at enroute fixes, Taipei sees more opportunities on CTO collaboration scheme with Japan and Korea.
- 2.5 If we assume that **CTO window can be narrowed down to -2 and +2 minutes**, capacity used can be largely enhanced:



If ATFMU **TECHNICALLY** reduces the 5-minute interval into 2 minutes and let some separation work go to ACC colleagues, more slots can be generated:



2.6 Apart from defining CTO window, some topics listed below also need a clearer picture:

- 2.6.1 How does NARAGH members conduct CTO Operations?
- 2.6.2 **When/How** should initiating ATFMU send out **CTO messages**?
- 2.6.3 Will the facilitating ATFMU generate **CTO departure window at airports** for

2.6 Apart from defining CTO window, some topics listed below also need a clearer picture:

- 2.6.1 How does NARAGH members conduct CTO Operations?
- 2.6.2 **When/How** should initiating ATFMU send out **CTO messages**?
- 2.6.3 Will the facilitating ATFMU generate **CTO departure window at airports** for

2

CTO flights?

- 2.6.4 Is there any achievable **CTO window at target CTO fixes**?
- 2.6.5 What should the facilitating ATFMU and ACC do if CTO flights' **ATO is earlier/later than CTO**?
- 2.6.6 Is there any earlier **notice mechanism** to share the updated ETO between initiating ATFMU and facilitating ATFMU?

2.7 In managing MINIT restrictions at boundary fixes along Taipei FIR, Taipei concerns how the capacity can be used as much as possible and how delay time can be distributed to stakeholders as early as the system can. So, if GDP CTOT and flow control are not options, CTO is definitely worth studying.

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to have Japan and Korea to share information about how to conduct CTO operations in NARAHG group.
- 3.2 Members are encouraged to discuss a refined and pragmatic CTO operation scheme to manage boundary fix capacity.
- 3.3 And to note the information contained in this paper and also discuss any relevant items as appropriate.

WP/04
EATMCG/16
29-31 May 2024

THE SIXTEENTH MEETING OF THE EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG/16)

Seoul, ROK 29-31 May 2024

Agenda Item 4

Consolidation on all East Asia ATFM Scenarios across Taipei's Airspace (Presented by Taipei)

SUMMARY

This paper lists all possible ATFM scenarios which take place regularly or should be prepared for and encourage discussion to build consensus, understandings so as to consolidate operations across all members.

1. INTRODUCTION

- 1.1 ATFM across EATMCG members have been progressing through transforming from traditional flow control measures to ATFM ones in which CTOT operations are gradually applied to manage airport demand-capacity balance.
- 1.2 Meanwhile, MINIT of flow control restrictions is commonly utilized in regulating DCB at boundary fixes and airspace. Up to date in our area, CTOT operation is only applied to VVDN arrivals through Sanya's airspace.
- 1.3 Analysis shows that using GDP CTOT operation with the -5 minutes/+10 minutes window to regulate intervals at boundary fixes is inefficient. Therefore, Taipei starts to conceive solutions with appropriate ATFM tools to manage all flow controls scenarios at our boundary fixes.

2. DISCUSSIONS

- 2.1 Taipei's role as the gateway connecting the Northeast Asia and the Southeast Asia embodies in several major boundary fixes, KAPLI with Hong Kong FIR and KABAM and POTIB with Manila FIR. During some months of the year, some flow control restrictions are imposed to Taipei at daily basis and can last for several consecutive days.
- 2.2 From north side, the flow control requests from Fukuoka FIR and Incheon FIR are rarely exercised, so Taipei's standardized schemes toward handling the situations with Japan and Korea are not firmly organized. Furthermore, such flow control requests require coordination and collaboration with upstream FIRs of AMNAC members. Longer lead time, waste on capacity and extra work at ACC's airspace are issues concerned.

- 2.3 This is why Taipei's own-developed ATFM system is designed to administer the DCB at not only airport but also boundary fixes.
- 2.4 Apart from generating CTOTs, the ATFM system is also able to issue CTO which is considered as an accurate tool to cope with traditional MINIT restrictions at boundary fixes. Another working paper of Taipei is proposing to run CTO with Japan and Korea for southwest bound streams into Hong Kong and Philippines.
- 2.5 In transition from traditional flow control to ATFM and to fulfill our geographical role , Taipei needs to make clear to all members what flow controls scenarios Taipei handles and how we handle them for now and in the future. The table below is almost a list of all scenarios in Taipei's airspace. Members are encouraged to give inputs so as to clarify ambiguities for future collaborations. The table can be refined as needed or when new scenarios arise.

Fix	Dir	Scenario	Present Measure and host by (in bold)		Future Measure and host by (in bold)		Remark/ Option
KAPLI	SW	VVDN arrivals	CTOT/ MINIT	Sanya Hong Kong	CTOT	Sanya Hong Kong	CTOT issued by Sanya & relayed by HK
		SIKOU-A202	MINIT	Hong Kong	CTOT	Hong Kong	Can Hong Kong be in charge?
		Level Blocking FL300/340 or below		Hong Kong Taipei	CTOT (Taipei) CTO/ MINIT (Korea/ Japan)	Hong Kong Taipei	Can Hong Kong be in charge?
		IKELA: extend longitudinal spacing					Can Hong Kong be in charge?
		IKELA MINIT					Can Hong Kong be in charge?
		VVTS arrivals					Hong Kong on Vietnam's behalf?
		VTBS arrivals					Can Bangkok issue CTOT?
KABAM	SW	LSWD (level blocking): FL320/360/400	MINIT	Manila Taipei	CTOT (Taipei) CTO/ MINIT (Korea/ Japan)	Manila Taipei	Can Manila be in charge?
		LSWD + MINIT					Can Manila be in charge?
		VVTS arrivals					Can Manila be in charge?

Fix	Dir	Scenario	Present Measure and host by (in bold)		Future Measure and host by (in bold)		Remark/ Option
POTIB	SW	MINIT: CNS/ATMS Ujung arrivals RPHI arrivals	MINIT	Manila Taipei	CTOT (Taipei) CTO/ MINIT (Korea/ Japan)	Manila Taipei	Can Manila be in charge?
		Extend Longitudinal Spacing					Can Manila be in charge?

ELATO	SW	VHHH arrivals	MINIT	Hong Kong	CTOT	Hong Kong	
		VMMC arrivals	MINIT		CTOT		
LIPLO /SALMI	NE	RKSI arrivals	MINIT	Daegu Taipei	MDI/CTOT/ MINIT Separate flows / Hourly Volume	Daegu Taipei	Can ATMC be in charge?
	NE	RKRR Space congestion	MINIT	Daegu Taipei	MDI/CTOT/ MINIT Separate flows / Hourly Volume	Daegu Taipei	Can ATMC be in charge?
MOLKA	NE	Fukuoka ACC Space congestion	MINIT	ATMC Taipei	MDI/CTOT/ MINIT Separate flows / Hourly Volume	ATMC Taipei	Can ATMC be in charge?
		RJAA arrivals	MINIT	ATMC Taipei	MDI/CTOT/ MINIT Separate flows / Hourly Volume	ATMC Taipei	Can ATMC be in charge?
		North America flights	MINIT	ATMC Taipei	MDI/CTOT/ MINIT Separate flows / Hourly Volume	ATMC Taipei	Can ATMC be in charge?

- 2.6 the Remark/Option column of the table provides other options which may better manage respective scenario and are left to members' discussion.
- 2.7 As comprehensive CTOT/CTO operations approach in the near future in our area, consensus and consolidations on how to manage all scenarios shall become EATMCG members' common concern. Harmonization on views and actions should be set ready at the meeting.

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to note the information contained in this paper and discuss the contents and any relevant matters as appropriate.

**THE SIXTEENTH MEETING OF THE EAST ASIA AIR TRAFFIC MANAGEMENT
COORDINATION GROUP (EATMCG/16)**

Meeting 29-31 May 2024

Agenda Item 2

Constructing a Parallel Departure Route into Fukuoka FIR

Presented by Taipei

This paper proposes to construct a parallel route next to M750 as departure route. Through that, coordination for climbing across the boundary between Taipei and Fukuoka is minimized and hence safety is enhanced.

1. INTRODUCTION

- 1.1 Departures to Japan and North America from RCTP, RCSS and RCMQ have been steadily thriving through time. Flights mostly take ROBIN.R583. KIKIT. MOLKA as departure route and subsequently enter FUKUOKA FIR at MOLKA. Owing to season factor and aircraft's loading and performance, a big number of aircraft cannot reach cruising altitude by MOLKA where aircraft joins airway M750. Coordination must be made before the aircraft is released to Fukuoka.
- 1.2 The second issue is safety caused by ATC workload. As departure aircraft eventually has to join M750 at MOLKA, ATC must judge and monitor if the aircraft can level up before or after MOLKA and also ensure the separation with transit flights on M750.
- 1.3 Either from the aspect of coordination or from the concern of operation safety, the workload at MOLKA needs a solution to unload. Therefore, Taipei would like to propose a parallel route into Fukuoka FIR.

2. DISCUSSION

- 2.1 As shown in the photo below, the proposed route will generate a new transfer fix (A) about 15 NM south of MOLKA and then parallel M750 for 50NM to the second new fix (B), and subsequently link to MUMBA. This 50NM parallel segment will assure all departure flights to reach its assigned cruising level before the second new fix (B), so the vertical separation or the safety is guaranteed.
- 2.2 To make clear to Fukuoka colleagues, the new route is only available for departures from RCAA, so traffic overflying Taipei FIR are still transferred to Fukuoka via MOLKA.
- 2.3 As for the same-altitude longitudinal separation with traffic cruising on M750, Taipei will assure that the agreed 20/30 NNM separation stipulated in the LoA between Fukuoka ACC and Taipei ACC is provided between departure flight on new fix A and cruising traffic on MOLKA.
- 2.4 The new route will smooth the operation along the boundary and further elevate the safety level between Fukuoka FIR and Taipei FIR. Taipei looks forward to the collaboration with Fukuoka ACC on this proposal.

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to note the information contained in this paper and discuss the proposal and any relevant items as appropriate.

East Asia Air Traffic Management
Coordination Group

WORKING PAPER

WP/06
EATMCG/16
29-31 May 2024

EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG)

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 2

Air Traffic Management (ATM) contingency plan of the Philippines

(Presented by Philippines)

SUMMARY

This paper presents the Air Traffic Management (ATM) contingency plan of the Philippines in the northern portion of Manila FIR adjoining Hongkong, Taipei and Fukuoka FIRs. The plan details the contingency routes, flight level allocation, and communication procedures during limited or total disruption of air traffic services in the Philippine ATMC.

1. INTRODUCTION

1.1 Annex 11 to the Convention on International Civil Aviation stipulates that Air Traffic Services Authorities must formulate and publish contingency plans to be put into action in the event of disruptions or potential disruptions to air traffic services and the related supporting services within their airspace of jurisdiction. These plans should be developed with the assistance of ICAO as required and in close coordination with neighboring air traffic services authorities and relevant airspace users.

1.2 The identified vulnerabilities in the current Philippine ATMC setup and the lesson learned from the January 01, 2023 power failure incident drives the development or improvement of the level 1 and level 2 ATM contingency plans to ensure flight safety and sustained flight operations in Manila FIR, albeit limited, in the event of disruption.

2. DISCUSSION

2.1 If there is a partial or complete disruption to the provision of Air Traffic Services (ATS) and/or related support services in the Philippine ATMC, the ATM Contingency Plan will be activated to maintain the safety of air navigation in the region. The contingency measures outlined in the Plan are designed for instances of unforeseen interruptions in ATS due to natural events or other circumstances that could hinder or completely halt the provision of ATS.

2.2 The ATM Contingency Plan includes ATS communication procedures, flight level allocation scheme, and contingency route structures utilizing published ATS routes wherever feasible. These measures are designed to enable aircraft operators to navigate through the Manila FIR to reach Taipei, Fukuoka, and Hong Kong FIRs even when ATS services are limited or unavailable.

2.3 The contingency routes are established using the existing ATS routes as a foundation, and a Flight Level Allocation Scheme (FLAS) is implemented to reduce potential conflicts and restrict the number of aircraft operating concurrently in the system during periods of reduced air traffic services. Appendix A provides detailed information on the contingency route structure for international flights.

3. ACTION BY THE MEETING

3.1 The meeting is invited to ...

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

East Asia Air Traffic Management
Coordination Group

WP/07
EATMCG/16
29-31 May 2024

WORKING PAPER

EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG)

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 4

The concept of Flexible MINIT Allocation based on actual traffic proportion for N892 Southbound restriction

(Presented by Republic of Korea)

SUMMARY

This paper presents the operational concept of Flexible MINIT Allocation based on actual traffic proportion which can be applied between EATMCG members for N892 Southbound restriction.

1. INTRODUCTION

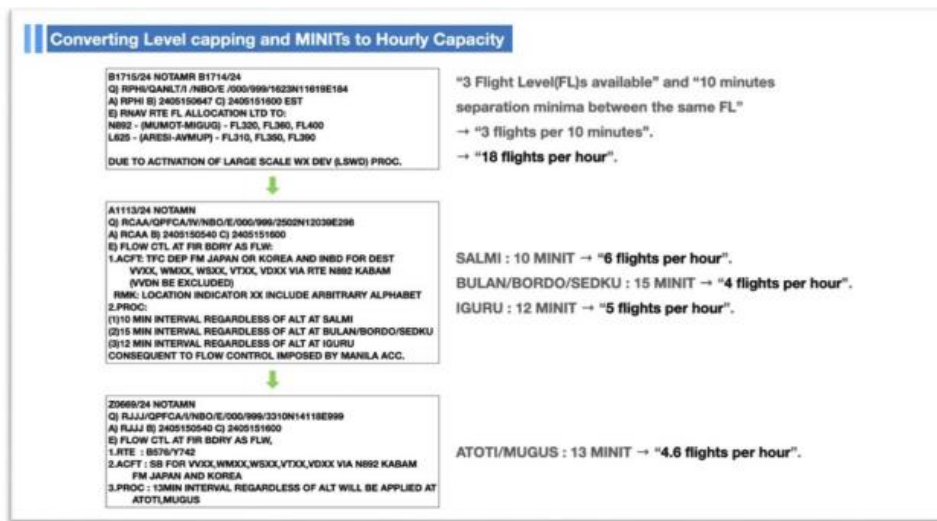
1.1 The Manila ATFMU issues level capping to Taipei ATFMU for the N892 South bound traffic during rainy season of the Manila FIR. Accordingly, Taipei ATFMU issues a MINIT to Fukuoka ATMC for each boundary FIX. Fukuoka ATMC also issues MINIT to ROK ATFMU.

1.2 Finally, ROK ATFMU is subject to the 13 MINIT, which causes large delays during every evening peak hours. N892 restrictions typically last from May through December, resulting in large, prolonged delays. Therefore, the Flexible MINIT assignment based on traffic volume ratio can be considered to improve delays.

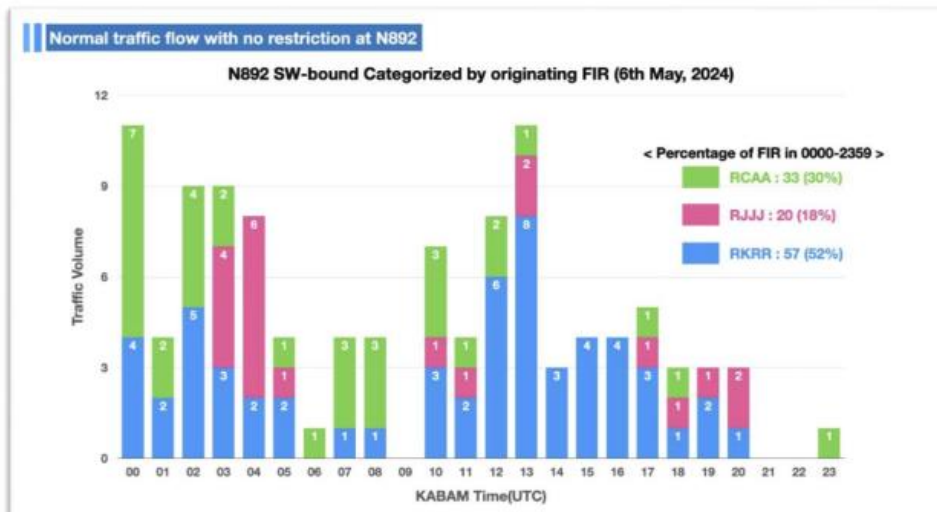
2. DISCUSSION

2.1 The Manila ATFMU issues a restriction to the Taipei ATFMU to use only 3 Flight Levels. Since the minimum separation between same Flight Level is 10 minutes, a 3 Flight Level available restriction could mean 3 flights in 10 minutes. This also could mean 18 flights in an hour.

2.2 The Taipei ATFMU issues a 10 MINIT for SALMI, a 15 MINIT for BULAN/BORDO/SEDKU, and a 12 MINIT for IGURU to Fukuoka ATMC. Converting MINITs to hourly capacity is as follows.

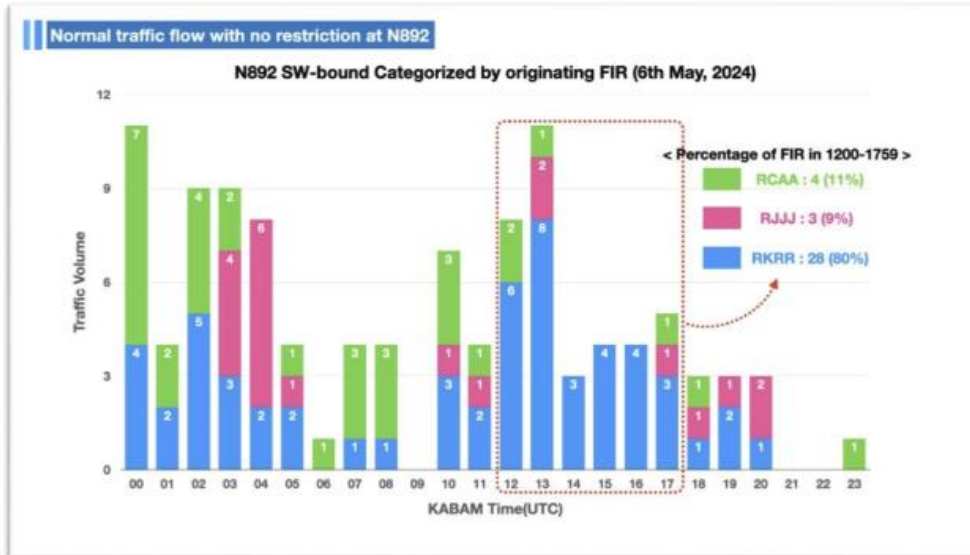


< Figure 1. Status of restrictions issued and Converting to hourly capacity >



< Figure 2. An example of normal traffic with no restriction at N892 and Percentage of FIRs >

2.3 The actual traffic percentages for N892 are shown below. The actual traffic was analysed by randomly selecting a day during normal conditions when no restrictions were issued. As it is only one day, the example below should not be used as a standard for future decision making, but it can be used as a reference for easy understanding.



< Figure 3. Percentage of FIRs during ROK's peak hour >

2.4 For ROK ATFMU, the 13 MINIT allows for no more than 4 flights per hour. However, during the evening peak, there are more than 8 flights, causing massive delays for those flights, which in turn cause delays for the next 3~4 hours of flights. If there is less traffic from Taipei/Fukuoka FIR during ROK's peak hours, the Flexible MINIT Allocation based on traffic percentage could be considered.

2.5 During the restriction period, we can identify sections with significant differences in traffic rates and distribute slots in proportion to their actual traffic rates. In practice, the NARAHG applied Flexible MINIT Allocation to manage the ATFM for Typhoon Detour flights in 2023. The NARAHG teams were highly satisfied, and below is a real example of its use.

Typhoon Detour Flights Restrictions table			
Created: 08.03.0600UTC			
Fix	Start(UTC)	End(UTC)	China → Korea
SADU	2300	1800	2 TDP flights in 15 minutes
	1800	2300	2 TDP flights in 20 minutes
AGAVO-W4	1800	1559	2 TDP flights in 30 minutes
AGAVO-A328	1800	1559	2 TDP flights in 30 minutes
< Flexible Split for Korea-Japan >			
Conversion to Capacity per hour for ease of calculation			
2 flights in 15 mins → 8 flights in 60 mins			
2 flights in 20 mins → 6 flights in 60 mins			
2 flights in 30 mins → 4 flights in 60 mins			
MINIT based on Korea-Japan TDP traffic ratio			
8.3.0900~8.3.1800 Korea 70%, Japan 30%			
→ Korea: 6 Slots, Japan 2 Slots			
→ Korea: 10 MINIT, Japan: 30 MINIT			
8.3.1800~8.3.2300 Korea 10%, Japan 90%			
→ Korea: 1 Slot, Japan 5 Slots			
→ Korea: 60 MINIT, Japan: 12 MINIT			
8.3.2300~8.4.0900 Korea 50%, Japan 50%			
→ Korea 4 Slots, Japan 4 Slots			
→ Korea: 15 MINIT, Japan: 15 MINIT			
(AGAVO-W4)			
8.3.1800~8.4.1559 Korea 100%			
→ Korea 4 Slots, Japan 0 Slots			
→ Korea: 15 MINIT			
(AGAVO-A328)			
8.3.1800~8.4.1559 Korea 100%			
→ Korea 4 Slots, Japan 0 Slots			
→ Korea: 15 MINIT			
Fix	Start(UTC)	End(UTC)	Korea → Japan
ONKJ	8.3.0900	8.3.1800	30 MINIT for TDP
	8.3.1800	8.3.2300	12 MINIT for TDP
	8.3.2300	8.4.0900	15 MINIT for TDP
* Expect the next update at around every 0000UTC and 0600UTC			

Typhoon Detour Flights Restrictions table			
Created: 1005.0600UTC			
Fix	Start(UTC)	End(UTC)	China → Korea
SADU	1004.0000	1007.1800	2 TDP flights in 20 minutes
AGAVO			2 TDP flights in 30 minutes
< Flexible Split for Korea-Japan >			
Conversion to Capacity per hour for ease of calculation			
2 flights in 20 mins → 6 flights in 60 mins			
2 flights in 30 mins → 4 flights in 60 mins			
(SADU)			
1005.0800~1005.2359 : Korea 90%, Japan 10%			
→ Korea: 6 Slots, Japan 0 Slots			
→ Korea: 10 MINIT			
Japan: Prior Coordination Required			
1005.0300~1005.0800 : Korea 95%, Japan 5%			
→ Korea: 5 Slots, Japan 1 Slot			
→ Korea: 12 MINIT			
Japan: 60 MINIT			
(AGAVO)			
1005.0200~1005.0800 : Korea 100%, Japan 0%			
→ Korea 4 Slots, Japan 0 Slots			
→ Korea: 15 MINIT			
Japan: Prior Coordination Required			
Fix	Start(UTC)	End(UTC)	Korea → Japan
ONKJ	1005.0750	1005.2349	Prior Coordination Required
(bound for SADU)	1005.2350	1005.0750	60 MINIT
Other Fixes (bound for AGAVO)	1005.0750	1005.0750	Prior Coordination Required
* Prior Coordination : When Japan informs Korea of the ETOT or ETO (at FIR boundary) of a TDP flight, Korea will coordinate the appropriate time range to the Japanese TDP flight.			
* Expect the next update at around 1005.0600UTC. But if there are any significant rate changes, we will update this table in advance.			

< Figure 4. Examples of Flexible MINIT Allocation based on traffic ratio >

3. PROPOSAL

3.1 It is proposed to pilot the Flexible MINIT Allocation, which identifies time periods during the restriction period that have a significant percentage change from the overall average percentage of traffic, and allocates slots proportional to the actual percentage of traffic.

4. ACTION BY THE MEETING

4.1 The meeting is invited to jointly research and improve the operation of N892 Southbound ATFM in EATMCG.

East Asia Air Traffic Management
Coordination Group

WP/09
EATMCG/16
29-31 May 2024

WORKING PAPER

EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG)

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 2

PROPOSAL TO ESTABLISH NEW AIRWAY AND REDUCE SEPARATION MINIMA FOR TRAFFIC VIA MUGUS/ATOTI

(Presented by Republic of Korea)

SUMMARY

This paper presents proposal for new route and reduced separation minima to promote air traffic flow and improve efficiency through increased airspace utilization and capacity.

1. INTRODUCTION

1.1 Entry and exit points for flights from Korea to East Asia, including Taipei, Hong Kong, Vietnam, Singapore, and the Philippines, primarily involved three fix points: MUGUS on Y711 airway, SADLI on A593, and RUGMA on Y579/A586. Over 70% of the traffic volume passes through MUGUS on Y711 airway.

1.2 According to Korea's traffic flow analysis, flights departing from Korea to East-south Asian countries are concentrated between 11:00 and 15:00 UTC. The traffic departing from Korea to fly to the MUGUS fix of the Y711 flight at this time accounts for about 72% of the total traffic. In addition, about 73 percent of departures during this time period come from Incheon International Airport, and about 16 percent come from Gimhae International Airport. About 18 percent of this traffic volume flies to Hong Kong and Taipei, while the rest 82 percent of the traffic volume flies to Vietnam, Thailand, and the Philippines etc.

2. Discussion

2.1. Incheon ACC has coordinated with the airline to reroute some flights to fly via RUGMA into Manila FIR to alleviate the congestion at the MUGUS fix of the Y711 air route. This is currently in trial operation.

2.2 We propose to establish a shortened flight route to optimize the traffic distribution effect by diverting more aircraft to the RUGMA fix. A new air route is needed to reduce traffic congestion at MUGUS fix and to increase the operational efficiency of aircraft. As discussed on our last meeting on the 15th, the proposed route is RUGMA-BIGIT-MJC. Using this route, aircraft bound for Manila FIR will shorten the distance by 17.3 miles compared to the existing route, thereby increasing the airline's economic efficiency. In addition, by efficiently utilizing the airspace and providing various flight routes, traffic distribution will be improved, enhancing aviation safety and overall efficiency.

(For example)

- **Current airway for RPLL :** RUGMA Y579 RUSAR Y27 SAKON A582 SARSI A582 KANDU DCT POLIO (1131.9 miles)
- **Using new direct route for RPLL:** RUGMA Y579 BIGIT DCT MJC DCT BISIG A582 KANDU DCT POLIO(1114.6 miles)

2.3 It is expected that the new flight route will eliminate traffic congestion on the Y711/B576 and Taipei FIR. It will reduce the separation minima for aircraft passing through MUGUS by distributing traffic.

2.4 Additionally, we propose to reduce the separation minima at MUGUS/ATOTI for southbound traffic. Taking into account the aircraft type and departure destinations from Korea, we propose to reduce the 60-mile separation to 50 miles and the 30-mile separation minima to 25-mile if the preceding aircraft is faster than the following aircraft. We also suggest readjusting the separation minima and to operate reduced separation minima from 11:00 UTC to 15:00 UTC.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

**EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP
(EATMCG)**

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 2

**PROPOSAL FOR REDUCING LONGITUDINAL SEPARATION MINIMA FOR
ENTERING HO CHI MINH FIR**

(Presented by the Republic of Korea)

SUMMARY

This paper proposes to reduce the longitudinal separation minima from 60NM to 30NM for the southbound traffic via MUGUS/ATOTI into Ho Chi Minh FIR.

1. Introduction

1.1 Current longitudinal separation minimum on MUGUS and ATOTI between Incheon and Fukuoka ACCs are applied as follows:

a) For flights via ATOTI and MUGUS:

(1) Southbound:

- 30NM separation is maintained if either one or both aircraft terminate in Taipei or Hong Kong FIR.
- Both aircraft diverge from each other within Taipei FIR, heading towards Hong Kong FIR (VHHK) or Manila FIR (RPHI).

(2) Northbound:

- 30NM separation is applied for all flights.

b) For southbound flights via ATOTI and MUGUS:

- 60NM separation is required.

For the rest of combinations except described a) (1) above

1.2 After Sanya FIR, it is divided into Ho chi minh FIR and others. The transfer of the control and handoff procedure depends on the destination airport and the routes specified in the flight plan.

1.2 After Sanya FIR, it is divided into Ho chi minh FIR and others. The transfer of the control and handoff procedure depends on the destination airport and the routes specified in the flight plan.



2. DISCUSSION

2.1 Flights from Incheon FIR to Hochiminh FIR (for example, Da Nang international airport) via MUGUS/ATOTI will be diverged from the airway of the flight into Bangkok FIR, then entering Ho chi minh FIR after Sanya FIR.

2.2 The Republic of Korea proposes to reduce the separation minimum to Ho chi minh FIR via MUGUS and ATOTI from 60NM to 30NM.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

WORKING PAPER

**EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP
(EATMCG)**

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 2

**Proposal to Reduce Longitudinal Spacing for Korea-bound Traffic
via ENVAR M750 and KAPLI G86**

Presented by Hong Kong China

SUMMARY

This paper discusses the proposal to reduce longitudinal spacing for Korea-bound M750/G86 traffic at ENVAR/KAPLI and downstream transfer of control (TOC) points to reduce ATC workload, enhance route capacity and facilitate more aircraft to operate at optimum cruising levels.

1. Introduction

1.1 At APANPIRG/32 in December 2021, all States/Administrations were urged to review Letters of Agreement (LOA) with adjacent Flight Information Regions (FIR) periodically, and enhance the required separation minima for improving ATC service levels in order to meet the expectations of the Asia/Pacific Seamless ANS Plan and the demand for traffic growth in the long run.

1.2 Hong Kong China is committed to optimizing the capacity of air routes within Hong Kong FIR and the APAC Regions. To further improve operational capacity and efficiency on every ATS route within Hong Kong FIR, Hong Kong China has been working closely with adjacent States/Administrations over the years to enhance the required longitudinal spacing at FIR boundaries to 20 or 30NM. Despite significant progress has been made on some APAC routes, there is limited progress in enhancing the longitudinal spacing for Korea-bound traffic pair from Hong Kong FIR to Taipei FIR. Meanwhile, traffic volume between Southeast Asia and Korea has returned to pre-pandemic level at certain times of the day, especially between 1700 UTC and 2200 UTC when there is a surge of Korea-bound traffic transiting through Hong Kong FIR.

2. Discussion

2.1 At present, for same level traffic transiting Taipei FIR via B576/Q11, 5 minutes time-based longitudinal spacing shall be applied at ENVAR/KAPLI. In the case of catching up, longitudinal spacing up to 15 minutes should be applied based on Mach Number Technique.

2.2 Besides major full-service airlines that deploy wide-body aircraft to operate between Korea and Southeast Asia, there are also many emerging low-cost carriers operate on these routes using narrow-body aircraft during the period abovementioned. The inherent speed differential between wide and narrow-body aircraft would significantly affect ATC's level assignment strategy, which in turn, often resulted in fewer aircraft being assigned optimum cruising levels, thus impacting on the overall operating efficiency/ route capacity. Heavy departures from Hong Kong are often unable to be assigned optimum cruising levels and flights transiting Hong Kong FIR are also often required to descend to less-optimum levels due to preceding slower traffic.

2.3 Since Korea-bound aircraft from Southeast Asia enter Hong Kong FIR at 20NM (or 40NM for chasing traffic pairs) at IKELA from Sanya FIR, the task to widen the spacing from 20NM/40NM to 5-15minutes as well as to incorporate Hong Kong/Macau China departures into a single stream at ENVAR/KAPLI has always been difficult and imposed heavy workloads to ATC.

2.4 Although it is understood from previous EATMCG meetings that the bottleneck of the B576 traffic flow is at the segment between SALMI and ATOTI where surveillance is not well covered, it is envisaged that improvements in CNS/ATM systems such as Automatic Dependent Surveillance-Broadcast (ADS-B) could facilitate application of more efficient ATC separations and spacing between FIRs. As a result, more aircraft would be able to operate at optimum cruising levels and achieve better fuel efficiency. Operators' economic performance could be improved when the required longitudinal spacing is enhanced while maintaining flight safety and IATA is always in support to this initiative.

3. PROPOSAL

3.1 Hong Kong China encourages all States/ Administrations concerned to study the feasibility of enhancing the longitudinal spacing between Korea-bound traffic pairs at ENVAR/KAPLI and downstream TOC points. To expedite the progress, Hong Kong China proposes to conduct an operational trial for Korea-bound traffic at ENVAR/KAPLI, to apply:

- i. 20NM spacing for non-chasing traffic pairs; and
- ii. the current spacing requirement as stipulated in Hong Kong/Taipei LOA for chasing traffic pairs.

3.2 This trial implementation will allow concerned States/Administrations and IATA to gather valuable operational data and experience to assess the operational benefits and effectiveness of the proposed 20NM longitudinal spacing and provide valuable feedback with a view to determining the way forward.

4. Action by the Meeting

4.1 The Meeting is invited to:

- (a) note the information contained in this paper;
- (b) provide feedback and status updates of the development of surveillance coverage between SALMI and ATOTI;
- (c) consider the feasibility to enhance the longitudinal spacing for Korea-bound traffic at ENVAR/KAPLI and downstream TOC points;
- (d) develop strategic plans to resolve traffic congestion of Korea-bound traffic at early morning hours to enhance operating efficiencies; and
- (e) discuss any relevant matters as appropriate.

East Asia Air Traffic Management
Coordination Group

WP/12
EATMCG/16
29-31 May 2024

WORKING PAPER

EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG)

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 2

OPTIMISATION OF ATS ROUTES A461, M501 AND A583

(Presented by Hong Kong China and the Philippines)

SUMMARY

This paper presents the progress of enhancing the minimum longitudinal spacing on ATS routes A461, M501 and A583 between the Philippines and Hong Kong China.

The implementation of 30NM minimum longitudinal spacing on ATS routes A461 and M501 was successfully accomplished in Q1 2023. Further work is ongoing to explore the feasibility of applying 30NM minimum longitudinal spacing between aircraft without CPDLC equipage on the two routes. Meanwhile, Hong Kong China continues to collaborate closely with the Philippines for the trial application of 30NM minimum longitudinal spacing on ATS route A583.

1. INTRODUCTION

Since EATMCG/13, Hong Kong China has been working closely with the Philippines on enhancing the minimum longitudinal spacing on ATS routes A461, M501 and A583 from 50NM to 30NM to further improve operational capacity and efficiency on these routes. Under the SMS regime, the joint project has been mutually agreed between the two sides for progressive implementation and review in 3 phases. This initiative has been well acknowledged by IATA. The enhancement on the longitudinal spacing requirements on ATS routes A461 and M501 was successfully accomplished in Q1 2023 as planned.

2. DISCUSSION

Phases 1 and 2: Implementation of 30NM Minimum Longitudinal Spacing on A461 and M501

2.1 Phase 1 and 2 implementation of 30NM minimum longitudinal spacing on A461 and M501 has been accomplished in February 2023. The enhanced spacing is applicable to non-catching up traffic pairs with RNP4-capability and CPDLC equipage at FL290 or above. Also, depending on aircraft destination aerodromes, 50NM/10MIN will continue to be applied for catching up traffic pairs.

2.2 The operation has been smooth since implementation. Not only has the capacity of ATS routes A461 and M501 been significantly increased, but also more aircraft could operate at optimum

cruising levels. This has significantly improved operators' economic performance and reduced overall carbon footprint with positive feedback from IATA. Relevant outcomes have been shared with members in various ICAO meetings.

2.3 Considering sufficient VHF and surveillance overlapping coverages have been provided in the vicinity of NOMAN (Transfer of Control Point between Hong Kong FIR and Manila FIR on A461/M501), Hong Kong China and the Philippines have initiated a trial since February 2024 to apply 30NM minimum longitudinal spacing between aircraft without CPDLC equipage, with a view to maximizing the operational benefits and simplifying the requirements on the application of the enhanced 30NM longitudinal spacing on A461/M501. Depending on the trial's outcome, Hong Kong China and the Philippines will further explore if other requirements such as RNP4 compliance can also be withdrawn.

Phase 3: Implementation of 30NM Minimum Longitudinal Spacing on A583

2.4 With satisfactory implementation of Phases 1 and 2, Hong Kong ATCC and Manila ACC have proceeded to Phase 3 trial of applying 30NM minimum longitudinal spacing between all RNP4-compliant aircraft on ATS Route A583.

2.5 An Addendum to the Letter of Agreement between Hong Kong ATCC and Manila ACC has been signed in March 2024 to kick off the trial. The spacing requirement is applicable to non-catching up traffic pairs with RNP4 capabilities, CPDLC and ADS-C equipage at FL330 or above.

2.6 Moreover, depending on aircraft destination aerodromes, 50NM/10MIN will continue to be applied for catching up traffic pairs.

2.7 The trial is proposed to last for three months initially, a detailed review would then be conducted to evaluate the trial results before consideration be given for full implementation.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

East Asia Air Traffic Management
Coordination Group

WP/13
EATMCG/16
29-31 May 2024

WORKING PAPER

EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG)

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 4

Consolidating Multiple ATFM Measures to Enhance Operations

(Presented by Hong Kong China)

SUMMARY

Implementing ATFM measures is the primary means of balancing demand and capacity. In the Regional ATFM framework for Asia Pacific where the concept of Distributed Multi-Nodal ATFM network was adopted, there may be occasions when cross-border flights are subjected to multiple ATFM measures. This working paper aims at proposing a “Single CTOT” solution whereby multiple ATFM measures can be consolidated so as to ensure smooth and efficient operations.

1. INTRODUCTION

1.1 A common Regional ATFM framework for Asia Pacific was endorsed by the 26th Meeting of the ICAO Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/26) in 2015. Since then, the framework has been further developed into the 3rd edition and published in August 2017.

1.2 Unlike Europe and United States where the concept of ‘centralized ATFM’ was adopted, the Asia Pacific region has adopted the concept of Distributed Multi-Nodal ATFM network for cross-border ATFM. Through participation of multi-national stakeholders in the collaborative decision-making process to plan and implement cross-border and networked ATFM, the performance of ATM system as a whole could be improved, with the needs of individual ATM community members balanced.¹ In order to develop and implement the concept of Distributed Multi-Nodal ATFM network, the Asia-Pacific Cross-Border Multi-Nodal ATFM Collaboration (AMNAC) was formed.

1.3 Although the Regional ATFM framework has already considered the difference in pace of ATFM development undertaken by various States/Administrations in the region², there are still challenges faced by stakeholders in the region in adopting the Regional ATFM framework in a smooth

¹ ICAO Asia/ Pacific Framework for Collaborative Air Traffic Flow Management, Version 3.0, 2017, p.15

² ICAO Asia/ Pacific Framework for Collaborative Air Traffic Flow Management, Version 3.0, 2017, p.6

manner. One of the challenges of the regional ATFM operations is cross-border flights being regulated by multiple ATFM measures initiated by various ATFMUs.

1.4 This working paper aims at proposing a “Single CTOT” solution which ATFM measures can be consolidated so as to ensure smooth and efficient operations of distributed multi-nodal ATFM in Asia Pacific Region.

2. DISCUSSION

2.1 ATFM measures such as GDP (Ground Delay Programme) and AFP (Airspace Flow Programme) are occasionally initiated by ATFMU of ANSP when there is an imbalance between demand and capacity in the aerodrome and/or airspace/waypoint within their FIR respectively. Both GDP and AFP involve the issuance of CTOTs. Given the fragmentation of airspace in Asia Pacific Region, cross-border flights may transit multiple FIRs managed by different ANSPs before reaching their destinations. Thus, it is possible that flights are subjected to multiple CTOTs, especially during extreme weather conditions.

2.2 When there is an imbalance between demand and capacity, initiating ATFMU may issue CTOTs to regulate the demand. Downstream ATFMUs are usually not being notified and not involved in the process. Subsequently when any of these downstream ATFMUs initiate any ATFM measures by sending out CTOTs, a flight could be subjected to multiple CTOTs.

2.3 Multiple CTOTs for a single flight cause confusion and additional coordination between stakeholders, especially when the initiating/facilitating ATFMUs are required to resolve the situation, which increase the workload and may affect compliance.

2.4 Distribution of CTOTs for cross-border flights among all concerned stakeholders could be the first step to address the issue. Initiating ATFMU should not only notify upstream stakeholders, but also all downstream ATFMUs about the issuance of CTOTs. This is to ensure that all stakeholders are on the same page. The information could be shared via email, Slot Allocation Message (SAM) via AFTN, or common information sharing platform (e.g. System Wide Information Management, SWIM) in the near future.

2.5 If a single cross-border flight is subjected to multiple CTOTs, it is proposed that a single coordinated CTOT should be issued by the most upstream ATFM unit to resolve multiple CTOTs situation. The ATFM system should have the capability to consolidate all ATFM measures or CTOTs into a single CTOT. In this regard, downstream ATFMUs should provide a flow rate at FIR boundary fix to upstream ATFMU, or a CTO at boundary, or a CTOT for the most upstream ATFMU to consolidate all ATFM requirements.

3. PROPOSAL

3.1 CTOTs issued for cross-border flights should be shared among all stakeholders concerned, including all downstream ATFMUs.

3.2 In case of multiple ATFM measures for cross-border flights, downstream ATFMUs may provide a flow rate at FIR boundary fix to upstream ATFMU, or a CTO at boundary, or a CTOT for the most upstream ATFMU to consolidate the ATFM measure requirements and issue a single coordinated CTOT to subject flights.

4. ACTION BY THE MEETING

4.1 The meeting is invited to:

- (i) note the information of this paper;
- (ii) provide comment and feedback on the proposed handling method for multiple CTOTs;
- (iii) discuss any relevant matters as appropriate.

East Asia Air Traffic Management
Coordination Group

WP/~~14~~
EATMCG/16
29-31 May 2024

WORKING PAPER

EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG)

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item ~~4~~

Ground Delay Programme for Macao International Airport, Macao China Arrivals

(Presented by Hong Kong China)

SUMMARY

Comparing to traditional ATFM measures, GDP minimizes airborne delay by reducing network wastage and improves flight predictability. It is proposed that Hong Kong ATFM Unit may consider initiating GDP whenever there is imbalance between demand and capacity at Macao International Airport (MIA) due to inclement weather or other circumstances.

1. INTRODUCTION

1.1 With the continual traffic recovery in Asia-Pacific region, Macao International Airport (MIA) is handling around 70% of pre-COVID traffic volume in Q1 2024. In order to better prepare for full traffic recovery and future traffic growth at MIA, suitable ATFM measures should be in place during inclement weather operations so as to ensure safe and efficient traffic flow of MIA arrivals within Hong Kong Flight Information Region (FIR).

1.2 Since MIA operates under the Hong Kong ATFM Unit node, timely initiation of ATFM measures with adequate lead time is essential to minimize overall disruption and ATFM delay.

1.3 Over the years, traditional ATFM measures such as Minutes-In-Trial (MINIT) at HKFIR boundary entry points have been used to regulate traffic flow into and out of MIA. Nevertheless, it is commonly understood that network wastage is always induced by using traditional ATFM measures.

1.4 Among other ATFM measures¹, Ground Delay Programme (GDP) is the most efficient measure to manage imbalance between capacity and demand of a specific aerodrome (for both arrivals and departures) or airspace aiming to reduce network wastage, especially when the coverage is sufficient.

¹ Manual of Collaborative Air Traffic Flow Management (ATFM), ICAO Doc 9971, 3rd Edition, 2018

2. DISCUSSION

2.1 Level 2 and 3 members of Asia-Pacific Multi-Nodal ATFM Collaboration (AMNAC) are already capable of complying with CTOT generated by Level 3 members, whenever a GDP is initiated to address a demand and capacity imbalance. Nevertheless, collaboration with EATMCG members could further extend the coverage of the GDP for MIA to maximize network capacity and minimize total airborne delay.

2.2 GDP also brings advantages to stakeholders. Since CTOT will be sent out at least 90 minutes prior to EOBT under normal situation, and in all other circumstances, not less than 60 minutes before EOBT, it provides improved predictability of flight for airline operators as well as facilitating ATC units. Comparing to traditional ATFM measures, ATC workload during GDP may also be reduced.

3. PROPOSAL

3.1 In the event of demand and capacity imbalance at MIA, GDP may be initiated by Hong Kong ATFM Unit.

3.2 ATFM Daily Plan (ADP) will be published with the GDP period (i.e. the start time and end time of the GDP).

3.3 CTOT will be sent in batches to EATMCG members for flights destined to MIA by Slot Allocation Message (SAM) via AFTN and by email.

3.4 If EATMCG members cannot comply with any CTOTs, please kindly contact Hong Kong ATFM Unit for a revision.

4. ACTION BY THE MEETING

4.1 The meeting is invited to: -

- (i) note the information of the paper;
- (ii) discuss any relevant matters as appropriate.

INFORMATION PAPER

**EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP
(EATMCG)**

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 2

**Review of the trial operation to change the transfer timing
between Fukuoka ACC and Manila ACC.**

(Presented by JAPAN)

SUMMARY

This paper provides information about the trial operation to change the timeframe of sending transfer messages between Fukuoka ACC and Manila ACC.

1. INTRODUCTION

- 1.1 Transfer messages between Fukuoka Area Control Center (ACC) and Manila ACC are still being sent verbally.
- 1.2 At the last meeting of EATMCG15 which was held on March 2023, Fukuoka ACC proposed to change the transfer timing from 30 minutes to 20 minutes before the estimated time at the FIR boundary in order to prevent transfer errors and discuss with each other in detail on the regular web meeting. Manila ACC have agreed to the proposals.

2. DISCUSSION

Progress

- 2.1 Fukuoka ACC and Manila ACC held the online meeting to discuss in detail regarding the trial operation on May 2023. Both ACCs acknowledged that by conducting a trial operation would be beneficial for both parties.
- 2.2 Fukuoka ACC and Manila ACC have agreed to start the trial operation from December 1st 2023.
- 2.3 An MOU was signed to initiate the trial; the MOU stated that the trial would be reviewed by the end of March 2024.
- 2.4 There were no troubles have been reported on both sides after the trial operation.

Review of Trial and Conclusion

- 2.5 Fukuoka ACC and Manila ACC held the online meeting on Mar 26th 2024 to review the trial. Fukuoka ACC and Manila ACC determined that the trial is beneficial to both parties and move forward to full operations.
- 2.6 The content of the MOU will be incorporated into the LOA between Fukuoka ACC and Manila ACC in June 2024.

3. CONCLUSION

- 3.1 The meeting is invited to note the information contained in this paper.

East Asia Air Traffic Management
Coordination Group

IP/03
EATMCG/16
29-31 May 2024

INFORMATION PAPER

EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG)

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 4

Coordination of Cross-border ATFM for F15 sector in Fukuoka ACC

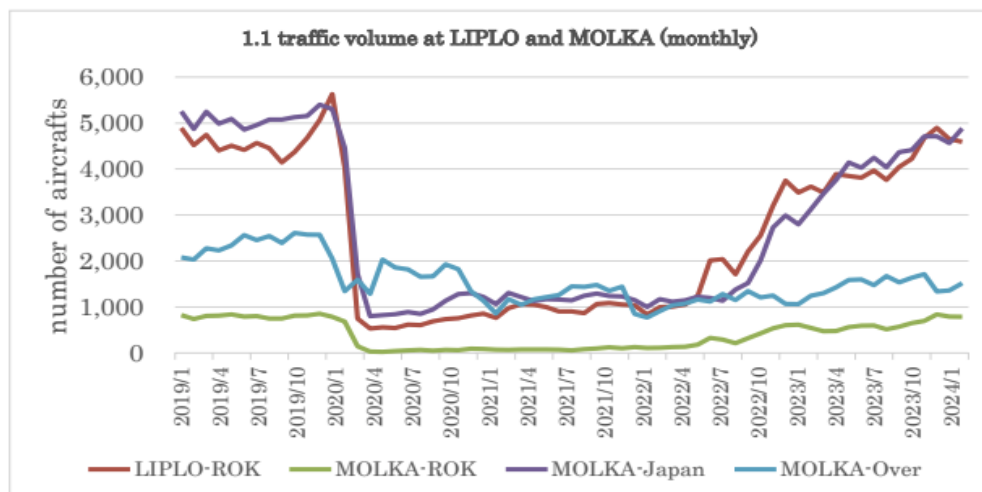
(Presented by JAPAN)

SUMMARY

This paper reports on coordination of cross-border ATFM for F15 sector in Fukuoka ACC.

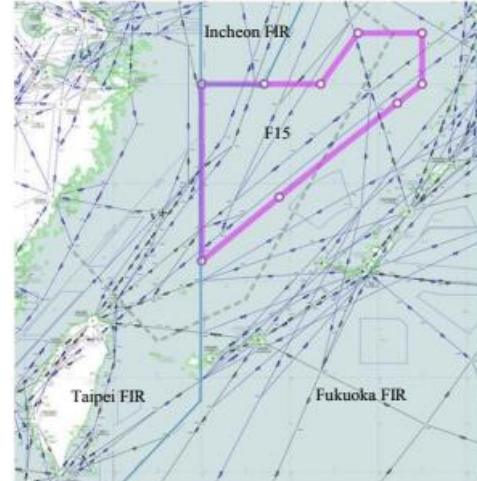
1. INTRODUCTION

- 1.1 Due to the decrease in traffic from 2020, there was little need for cross-border ATFM in Fukuoka FIR, but due to the increase in traffic from late 2022, the number of cross-border ATFM in the FIR has gradually increased.



- 1.2 International traffic is expected to increase after the summer of 2023, and cross-border ATFM will be necessary when traffic volume exceeds airspace capacity, or when traffic flow exceeds airspace capacity due to concentration of traffic on a particular airway due to bad weather during rainy season (mainly summer), but cannot be handled by aircraft departing from domestic airports. We report on coordination of cross-border ATFM between FIRs.

- 1.3 The location of F15 sector is shown in Figure 1.2. Since there are no airports in its airspace, this sector handles only transiting aircraft, and mainly handles traffic flow between Incheon FIR, Fukuoka FIR, and Taipei FIR. The sector is also affected by traffic volume when flight planned routes are changed due to bad weather, etc. The LSWD system is also in operation between Incheon and Taipei FIRs.

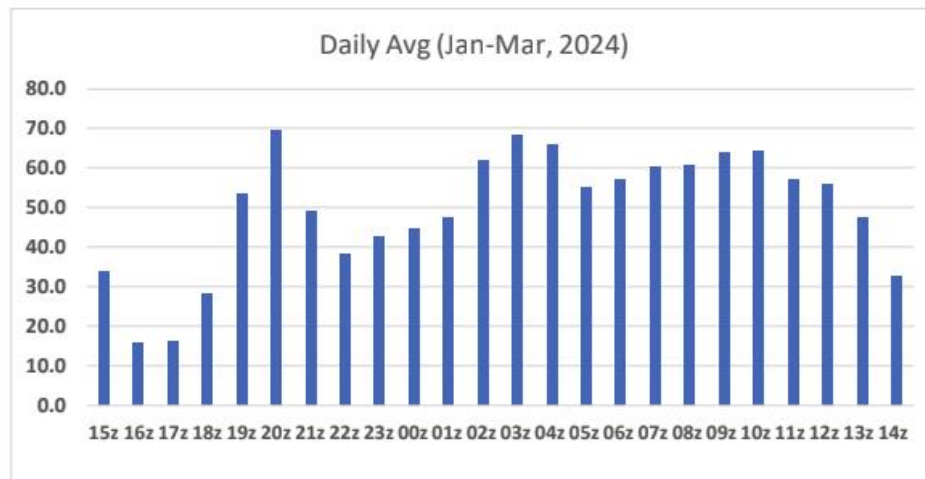


2. DISCUSSION

2.1 Cross-border ATFM based on LOA with Taipei ACC

2.1.1 Coordination with Taipei ACC

From 1930UTC to 2130UTC, when traffic in F15 sector of Fukuoka ACC increases, the number of aircraft per hour exceeds 70. Since the type of traffic is dominated by arriving aircraft from Southeast Asia to Japan and transit to ROK, it will be necessary to accommodate these aircraft if capacity is exceeded.



1.3 Number of aircraft per hour in F15 sector (daily avg.)

Currently, the effective cross-border ATFM methods are GDP and MDI for aircraft departing from Vietnam VV**, Thailand VT**, and Hong Kong VHHH airports, which have many

departures at certain period of time. Therefore, based on the LOA with Taipei ACC, we will consider requesting MINIT at MOLKA for aircraft departing from Hong Kong to Japan, MINIT at IGURU for aircraft departing from airports other than Hong Kong to Japan, and MINIT at LIPLO for aircraft departing from Hong Kong to ROK and from airports other than Hong Kong to ROK, respectively.

(Example1)

Departures from VHHH to Japan, X1 minutes at MOLKA regardless of altitude

Departures from VV** and VT** to Japan, X2 minutes at IGURU regardless of altitude

Departures from VHHH to ROK, X3 minutes at LIPLO regardless of altitude

Departures from VV** and VT** to ROK, X4 minutes at LIPLO regardless of altitude

2.1.2 Coordination with Hong Kong ATFMU

Normally, aircraft departing from VHHH to Japan via ENVAR, aircraft transiting Hong Kong FIR to Japan via KAPLI, and aircraft departing from Hong Kong and transiting Hong Kong FIR to ROK via ENVAR, so separate aircraft departing from Hong Kong and transiting Hong Kong FIR and request MINIT at ENVAR and KAPLI via Taipei ACC. Consideration to request MINIT at ENVAR and KAPLI via Taipei ACC.

(Example2)

Departures from VHHH to Japan, Y1 minutes at ENVAR regardless of altitude

Departures from VV** and VT** to Japan, Y2 minutes at KAPLI regardless of altitude

Departures from VHHH to ROK, Y3 minutes at ENVAR regardless of altitude

Departures from VV** and VT** to ROK, Y4 minutes at ENVAR regardless of altitude

*Y1-Y4, Taipei add buffer to cater for catch up

2.1.3 Coordination with Manila ACC

Consider requesting MINIT for aircraft departing from RP** airports with a large number of departures at certain period of time and entering Taipei FIR via POTIB.

(Example3)

Departures from RP** to ROK, Z1 minutes at LIPLO/MOLKA regardless of altitude

Departures from RP** to ROK, Z2 minutes at POTIB regardless of altitude

*Z2, Taipei add buffer to cater for catch up

2.2 Expansion of cross-border ATFM is a future issue, including revision of LOA or MOU

2.2.1 LOA Amendment with Taipei ACC

Coordinating information sharing between FIRs and expansion of ATFM measures through ADP exchange by revising LOA or signing MOU.

2.2.2 MOU Amendment with Hong Kong ATFMU

Revise the CTOT Trial Procedure to allow CTOT operations to be conducted in both directions.

2.2.3 Signing of LOA with Manila ACC

Realization of information sharing and cross-border ATFM through ADP exchange by concluding LOA.

2.2.4 Establishment of regulations with other ATM institutions

If necessary, enter into regulations with ATMU that are not adjacent to Fukuoka FIR.

3. CONCLUSION

- 3.1 Note the subject matter contained in this paper.
- 3.2 Discuss any relevant matters as appropriate.

East Asia Air Traffic Management
Coordination Group

IP/04
EATMCG/16
29-31 MAY 2024

INFORMATION PAPER

EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG)

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 2

Cross-border ATFM for VVDN

(Presented by JCAB)

SUMMARY

This paper provides the status of cross-border ATFM for VVDN.

1. INTRODUCTION

In April 2023, cross-border ATFM departing from Korea was shifted to specifying CTOT, so the report is divided into two parts: before April 2023 and after May 2023.

2. DISCUSSION

2.1 Status before April 2023

2.1.1 ATFM details

Taipei ACC request ATMC 10-minute intervals regardless of altitude at SALMI, ATMC request Daegu ATCC 13-minute intervals regardless of altitude at ATOTI/MUGUS.

2.1.2 Number of ATFM

Since there were approximately 20 flights per day from Incheon FIR to Taipei FIR, MINIT was conducted daily. Since there were only 0 to 1 aircraft per day departing from airports in Japan, no GDP was conducted for departing aircraft.

2.1.3 Issues, etc.

When transferring from Incheon FIR to Fukuoka FIR, coordination between ACC/ATMC and Taipei ACC was burdensome when 13-minute interval was not available.

2.2 Status after May 2023

2.2.1 ATFM details

ATFM for aircraft departing from Korea was shifted to designate CTOT. No coordination was made with Taipei ACC regarding cross-border ATFM, as there was only one scheduled flight per day from Japan and no competition was expected. However, due to occasional irregular operations and instances where the 30-minute interval between Taipei FIR and Hong Kong FIR was not available, it was decided to coordinate cross-border ATFM between Taipei ACC and ATMC after January 2024. Traffic from Fukuoka FIR to Taipei FIR only via IGURU at 30-minute intervals regardless of altitude.

2.2.2 Number of ATFM

The GDP for aircraft departing from Japan was carried out only once (on two aircrafts) until April 15.

2.3 Issues, etc.

Interval setting for Da Nang-bound traffic at Fukuoka ACC is no longer required, only monitoring at ATMC.

3. CONCLUSION

3.1 The meeting is invited to note the information contained in this paper.

IP/05
EATMCG 16
29-31 May 2024

**THE SIXTEENTH MEETING OF THE EAST ASIA AIR TRAFFIC
MANAGEMENT COORDINATION GROUP (EATMCG/16)**

Seoul, ROK 29-31 May 2024

Agenda Item 4

The updates on ATFM development in Taipei FIR

Presented by Taipei

SUMMARY

This paper introduces the present stage of the ATFM development in Taipei and the ongoing and the upcoming agendas.

1. INTRODUCTION

1.1 Taipei's ATFM Development Group was teamed in November 2022 and commissioned to construct ATFM infrastructure in Taipei FIR. Progresses were shared with the IP4&5 at EATMCG/15 meeting.

1.2 In the wake of the meeting, actions and progresses in four areas that we worked on were exhilarating:

- ATFM system development
- ATFM operation penetration within Taipei FIR
- ATFM international coverage
- ATFM staff training

1.3 Despite a very tight schedule, hereby Taipei proudly announces to all EATMCG members that our ATFMU is going to be in service starting from 1st July 2024 through a test run in the period from July to September. Subsequently and after evaluations, Taipei's ATFMU will move to official operation at later date.

2. DISCUSSION

2.1 ATFM System Development

2.1.1 Taipei's own-designed ATFM system, the co-product of Taipei ACC and Information Management Center of Air Navigation and Weather Services (ANWS), is planned to have 3 major function areas:

- ATFM Airport (only for RCTP)
- ATFM Fixes (all boundary fixes)
- ATFM Airspace

Auto-Logging and **ATFM Data Bank** are accessory functions to be developed after the establishment of ATFMU.

2.1.2 With numerous algorithm examinations, database & HMI modifications, and functionality validations, the **ATFM Airport** for RCTP is now undergoing the confidence tests for conclusion which will hopefully be accomplished by the end of May.

2.1.3 Meanwhile, most features for **ATFM Fixes**, which is mostly related to ATFM operations in East Asia, have also been programmed. Tests and validations will be carried out in May and June. Nevertheless, to smoothly integrate regional ATFM collaborations, some details and definitions of collaboration through our ATFM system need to be clarified at this meeting.

2.1.4 As for **ATFM Airspace**, Taipei has to wait till next year because of research capacity. In fact, the whole ATFM system including other accessory functions is a huge infrastructure which will last for several years according to our ATFM Development Master Plan.

2.1.5 The 3-month test run of our ATFMU will be an essential process of tests, adjustments and modifications on the ATFM system and will also validate ATFM procedures by facing the most challenging season of the year, the rebound of traffic after COVID and Taipei's brand-new ATFM participants, namely ATCs, airport operators, airlines and lastly our ATFM managers.

2.2 ATFM Penetration within Taipei FIR / ATFM International Coverage

2.2.1 Domestically, the ATFM Development Group held several ATFM workshops in four major international airports including RCTP, RCKH, RCMQ, and RCSS which had then all engaged in the CTOT trials, and all local stakeholders were successively affiliated to ATFM family.

2.2.2 To facilitate ATFM immersion, Taipei has broadened the collaboration with more stakeholders with less frequent but wider-scaled trials. In East Asia, the cooperation among all EATMCG members has continued and the outcome profoundly contributed to Taipei's ATFM development. Furthermore, Taipei

has commenced CTOT trials with Thailand and Singapore since last September to increase the Taipei ATFM coverage.

2.2.3 Major ATFM promotions and trial facts are as follows:

Fig.1 Milestones of Taipei ATFM promotions since EATMCG/15

Date	Content
2023/03/21	ATFM workshop in RCKH.
2023/09/04	Taipei started CTOT trials with Thailand and Singapore.
2023/09/04	CTOTs were first disseminated in ICD format through AFTN/AMHS.
2023/10/23	RCKH started CTOT trial.
2023/12/08	ATFM workshop in RCSS.
2023/12/27	RCSS started CTOT trial.
2024/01/11	ATFM workshop in RCMQ.
2024/01/23	RCMQ started CTOT trial.

Fig.2 Statistics of the CTOT Trials (Jan. 2023 - Mar. 2024)

FIR	CTOT Flights	Complied Fights	Overall Compliance Rate
R J J J	226	195	86.3%
R P H I	105	94	89.5%
V H H K	82	81	98.8%
V T B B	30	20	66.7%
W S J C	15	10	66.7%
R C A A	124	119	96.0%

No. of trials: 16

No. of airports: 19 (RJAA 、RJBB 、RJCC 、RJFF 、RJGG 、ROAH 、

VHHH 、VMC 、RPLL 、RPVM 、RPLC 、VTBS 、

VTBD 、VTCC 、WSSS 、RCTP 、RCKH 、RCSS 、

RCMQ)

2.3 ATFM Staff Training

- 2.3.1 In preparation for the formal operations of Taipei ATFMU, the training program of ATFM staff is our main agenda this year. Senior Controllers from Taipei ACC are recruited and trained into Flow Managers between April and June 2024. Once the training session is completed, Taipei ATFMU will run 24-hour operations to accommodate all ATFM events in the region. Taipei looks forward to having firmer collaborations with each ATFMU/stakeholder.

2.4 Conclusion

- 2.4.1 According to the agenda, Taipei ATFMU will start to operate in later date of 2024. At that point, it would be crucial to have all EATMCG members' support and cooperation.
- 2.4.2 Before the launch of Taipei ATFMU, we genuinely appreciate any experience sharing or advice from every EATMCG member to alleviate the mistakes in the beginning and to consolidate the ATFM across East Asia.

3. Action by the meeting

- 3.1 The meeting is invited to note the information contained in this paper and also discuss any relevant issues as appropriate.

INFORMATION PAPER

**EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP
(EATMCG)**

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 3

**Enhancing Safety and Efficiency at Incheon Int'l Airport
through Digital Tower System**

(Presented by Incheon International Airport Cooperation)

SUMMARY

This paper introduces digital tower system currently being deployed at Incheon airport apron tower. This system applies digital tower technologies such as AI, AR, Voice Recognition, and Video Recognition into the existing control tower, integrating control data. It enhances the situational awareness capabilities of air traffic controllers and aids in decision-making.

Enhancing Safety and Efficiency at Incheon Airport through Digital Tower System

1. INTRODUCTION

1.1 Incheon Airport operates main ATC tower responsible for the maneuvering area and two apron control towers responsible for the apron areas, effectively managing the entire aircraft movement area. Each control tower is strategically positioned to have visual surveillance of all aircraft movements. However, in certain areas, visual monitoring becomes challenging due to physical buildings, including terminals, obstructing the view, leading the situations where aircraft may not be visible to the controllers, especially in low visibility conditions such as fog.

1.2 The Digital Tower not only replaces the traditional physical control tower but also provides new functionalities that were not present in the physical tower. The infrastructure such as cameras, displays, and other advanced technologies such as AI, AR, Voice Recognition, and Video Recognition, can provide new functionalities in air traffic control. This allows air traffic controllers to strengthen their surveillance of aircraft and reduce human errors, leading to an even more improved air traffic control service.

1.3 Incheon Airport is currently implementing the digital tower system, which apply digital tower technology into the existing physical apron tower. Through this system, the airport ensures the stability of the physical control tower while leveraging the additional advantages offered by the digital tower system.

2. DISCUSSION

2.1 Incheon Airport's digital tower system is a unique project that differs from the common digital tower, which typically convert the physical tower into a digital remote tower. Instead, this system adds digital tower technology to the existing physical control tower that is currently in operation.

2.2 Incheon Airport's digital tower system installs displays on top of the existing control room consoles, allowing air traffic controllers to have a visual surveillance of aircraft through the physical tower windows while also referencing the digital tower displays when necessary. Digital tower system display is configured as follows:

- a) **Panorama View:** Utilizing the camera feed from the top of the control tower, the system provides a panoramic video of the entire control area. It displays aircraft identification and utilizes AR technology to show obscured aircraft. The system also offers an infrared mode for enhanced visualization in low visibility condition.
- b) **Gate View:** To monitor the status of the gate, individual cameras are installed at each gate. Instead of displaying the entire gate simultaneously, the system automatically switches departure and arrival gate on the display.
- c) **Digital Twin:** The entire area of Incheon Airport is digitized into a digital twin, which provides real-time support for air traffic control tasks.

Panorama view

2.3 Utilizing stitching technology, the real-time video feed from the cameras is combined to present the entire control area in a panoramic view.

2.4 Within the Panorama View, various air traffic control information that controllers require is integrated and displayed. This includes aircraft positions and callsigns, aircraft types, as well as information about the status of gate using icons and colors. Additionally, the display shows weather conditions, aircraft schedules, and restricted area of airspace.

2.5 In addition to providing regular real-time video, the system offers an infrared mode. Furthermore, by leveraging AR technology, virtual outlines are displayed on aircraft, terminals, taxiways, and other airport facilities. This enables precise tracking of aircraft positions even in obscured or low visibility conditions, ensuring accurate awareness during such situations.

2.6 The system utilizes pan-tilt-zoom cameras to provide a function that rapidly zooms in and automatically tracks aircraft that require continuous observation. By improving the interface compared to manually operating binoculars or CCTV, this feature reduces the workload for air traffic controllers.

Gate view

2.7 To monitor the operational status of the gate, the system provides video feeds from each gate camera. Instead of displaying all gates at the terminal, the system automatically switches and displays either the departure or arrival gate, as needed.

2.8 The system displays general information such as gate number and aircraft type, along with operational status details like departure schedule, arrival schedule, and occupancy status. It overlays TSAT, TOBT, and TTOT data to provide air traffic controllers with rapid access to A-CDM information.

2.9 By utilizing AI video recognition from the cameras, the system recognizes all objects within the gate, including boarding bridge, towing car, and ground handling personnel. It correlates this information with aircraft movements and provides air traffic controllers with relevant details such as departure readiness and arrival preparedness status.

2.10 The system recognizes all ground service equipment individually and displays the current status of ground operations. In the future, this data will be integrated with A-CDM to improve on-time performance of aircraft.

ATC Assistance Tool

2.11 The system converts the communications between air traffic controllers and pilots into text format and displays it on the screen. Moreover, in the event of any errors in the pilot's read-back, an alert is provided to the air traffic controller, thereby preventing potential miscommunication.

2.12 The system monitors the Hot-spot areas where aircraft and Ground Service Equipment (GSE) roads intersect separately. In the event of potential collisions between aircraft and ground vehicles, alerts are provided to air traffic controllers to prevent accidents.

3. CONCLUSION

3.1 Incheon Airport's digital tower system is planned to be carried out in two phases, Phase 1 and Phase 2. The ongoing Phase 1 project, which involves establishing the system for the control area of the Second Apron Control Tower, is scheduled to be completed in September 2024.

3.2 The phase 2 of Incheon Airport's digital tower system is planned for an expansion covering the entire airside includes the control area of the First Apron Control Tower and the maneuvering area. The project aims to incorporate additional functionalities applicable to the maneuvering area, such as detecting runway incursions and monitoring runway occupancy.

3.3 Based on the operational experience of the digital tower system, Incheon Airport is considering the option of implementing a fully digital remote tower instead of constructing a new physical control tower for the Terminal 3 area, as part of the ongoing master plan.

East Asia Air Traffic Management
Coordination Group

IP/07
EATMCG/16
29-31 May 2024

INFORMATION PAPER

EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG)

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 4

Introduction to the procedure for prioritizing CTOT allocation for flights subject to curfew due to ATFM

(Presented by Republic of Korea)

SUMMARY

This paper presents the procedure for prioritizing CTOT allocation for flights subject to curfew due to ATFM. Additionally, it emphasizes the need for inter-ATFMU cooperative slot operations to incorporate nationally established unique operating procedures into the Multi-Nodal ATFM Concept.

1. INTRODUCTION

1.1 Many airports in the Asia-Pacific region operate curfew during the night, causing significant inconvenience to passengers' journeys when flights are subject to curfew, resulting in long delays, cancellations, and other disruptions. Last year, numerous overnight departures to Southeast Asia experienced significant delays due to restrictions on the N892 route, and situations arose where flights departing from curfew airports were subject to curfew due to delays caused by ATFM.

1.2 Accordingly, The Republic of Korea ATCC and all national airlines engaged in discussions to minimize such damages. As a result, a procedure prioritizing CTOT allocation for flights subject to curfew due to flow management factors was established. Based on the draft of this procedure, a trial will be conducted for two months from May to June, followed by final discussions to formalize the operational plan, with the intention of implementing it starting from July.

2. DISCUSSION

2.1 The procedure for prioritizing CTOT allocation for flights subject to curfew due to ATFM is as follows (hereinafter referred to as the Curfew Procedure).

Scope

2.2 The Curfew Procedure applies to flights affected by curfew due to CTOT issued by ATFM. It includes flights departing from domestic airports subject to curfew and flights departing from

domestic airports then connected to flights affected by curfew at foreign airports. This applies when CTOT issuance due to flow management is the main reason for curfew application.

Conditions for Application

2.3 The Curfew Procedure applies when certain actions cannot be performed, such as slot exchange within the same airline or deviation to alternative routes within a 10% increase in flight time.

Implementation

2.4 A. For flights departing from domestic airports subject to curfew

ATCC confirms the eligibility during CTOT allocation, discusses measures with the concerned airline if necessary, and assigns the flight to the slot just before the curfew if agreement is not reached.

2.5 B. For flights departing from domestic airports then connected to flights affected by curfew at foreign airports.

Airlines confirm eligibility upon receipt of CTOT, perform necessary measures, and if not feasible, submit the prescribed form to ATCC and notify them. ATCC then assigns the flight to the slot just before latest take off time that allows the connected flight to operate normally.



Monitoring

2.6 ATCC publishes monthly performance of the Curfew Procedure on the ATFM Web Portal, checking the appropriate selection of targets by airlines and the proper execution of measures.

Penalty

2.7 Airlines with repeated instances of inappropriate cases may face suspension of the Curfew Procedure after three or more consecutive occurrences over 365 days.

3. CONCLUSION

3.1 Currently, in the ROK, the proportion of CTOT issuance to comply with MIT/MINIT is higher than that of Multi-Nodal CTOT. In such cases, since we can fully manage CTOT operations within our institution, there is no difficulty in applying state's operational procedures like Curfew procedure.

3.2 However, in the Multi-Nodal ATFM concept, the execution of procedures relies on mutual understanding between the initiator and facilitator regarding slot operation requirements that incorporate the facilitator's procedures. For the Multi-Nodal ATFM concept to mature further, it's essential to consider harmonious slot operations between the initiator and facilitator rather than unilateral slot operations by the initiator.

3.3 Now, it's time for us to consider harmonious CTOT management between nations, moving beyond the initial stages of CTOT issuance and compliance.

East Asia Air Traffic Management
Coordination Group

IP/08
EATMCG/16
29-31 May 2024

INFORMATION PAPER

EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG)

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 3

Introduction to contingency plan of consolidating ACCs in Incheon FIR

(Presented by ATMO, ROK)

SUMMARY

This paper presents the process of consolidating Daegu ACC and Incheon ACC to prepare contingency situation. Daegu ACC can take over Incheon ACC's area when Incheon ACC is unable to offer ATC services, vice versa. Relevant information about contingency plan consolidating ACCs in Incheon FIR will be shared with meeting members.

1. INTRODUCTION

1.1 To provide uninterrupted en-route ATC service in Incheon FIR, Daegu ACC and Incheon ACC cover each other as an alternative facility.

1.2 ATC facilities have contingency plans preparing for fire, earthquake, etc. It is important to understand other facilities' contingency plans for discussing interstate contingency plans in the future. Because close coordination with the air traffic services authorities responsible for the provision of services in adjacent portions of airspace is needed to develop contingency plans.

2. DISCUSSION

2.1 Daegu ACC is in charge of north eastern part of Incheon FIR and Incheon ACC is in charge of south western part of Incheon FIR respectively. But both ACCs have a similar ATC environment each other. As well as both ACCs contracted to the same manufacturer (Leidos) for their ATC system, same radio sites are connected to both ACCs at the same time. Also, both ACCs shares every flight plan data continuously. So, if emergency occurs to any ACCs, there is no problem for other ACC to take over failing ACC immediately.

2.2 For example, When Daegu ACC falls into operation suspension, Incheon ACC take over Daegu ACC AOR (Area of Responsibilities). Incheon ACC controllers will set the same frequencies as Daegu ACC. So, Incheon ACC controller will communicate with pilots through the same radio channel that Daegu ACC controllers used.

2.3 The tough things are that AIDC and Direct voice lines with other adjacent ACCs become inoperative. AIDC and Direct lines are connected to a individual ACC respectively. For example, AIDC and Direct voice lines between Daegu ACC and Fukuoka ACC can't be utilized to Incheon ACC in the beginning of contingency. To make AIDC and Direct lines possible to be utilized for Incheon ACC, ATC system mode should be changed from separated mode to consolidated mode. Normally, Daegu ACC and Incheon ACC stay in separated mode to provide ATC services to its different AOR.

2.4 Regular trainings for actual consolidating other ACC are planned every quarter in 2024. For the safety of training, it will be occurred in the mid-night when the traffic volumes drop sharply. Thanks to Fukuoka ACC's assistance, first quarter training completed successfully without any aviation safety concerns. ATMO request close coordination to meeting members, especially Japan, and any requests are welcome for each member's contingency plan.

3. CONCLUSION

3.1 Consider the subject and share the information regarding contingency plans or relevant information with meeting participants.

East Asia Air Traffic Management
Coordination Group

INFORMATION PAPER

IP/10
EATMCG/16
29-31 May 2024

EAST ASIA AIR TRAFFIC MANAGEMENT COORDINATION GROUP (EATMCG)

SIXTEENTH MEETING

Seoul, 29 to 31 May 2024

Agenda Item 2

AIR TAFFIC FLOW IN INCHEON FIR DURING THE EARLY MORNING

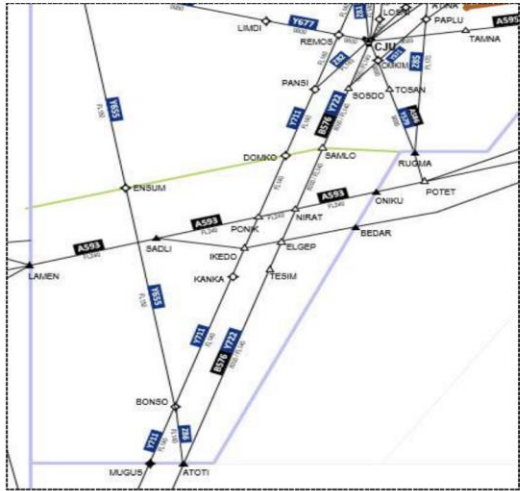
(Presented by Republic of Korea)

SUMMARY

This paper introduces the air traffic flow on Y722 and Y590 airway and the reason why Incheon ACC restricts the altitude block of FL390 to aircraft passing at ATOTI in the early morning.

1. INTRODUCTION

1.1 The Jeju South sector, one of the Incheon ACC’s sectors, has four main ATS routes including MUGUS and ATOTI which aircraft from Incheon FIR to Southeast Asia’s FIR pass by. Y711 and Y722 routes flying south-north were established as double track to alleviate the congestion of B576 airway since June, 2012, and A593 and Y590 routes flying east-west were established as double track in March 2021 to enhance safety and efficiency. These airways intersect in the southern airspace of Jeju island and converge at four points [PONIK, NIRAT, IKEDO, ELGEP] in the Jeju south sector.

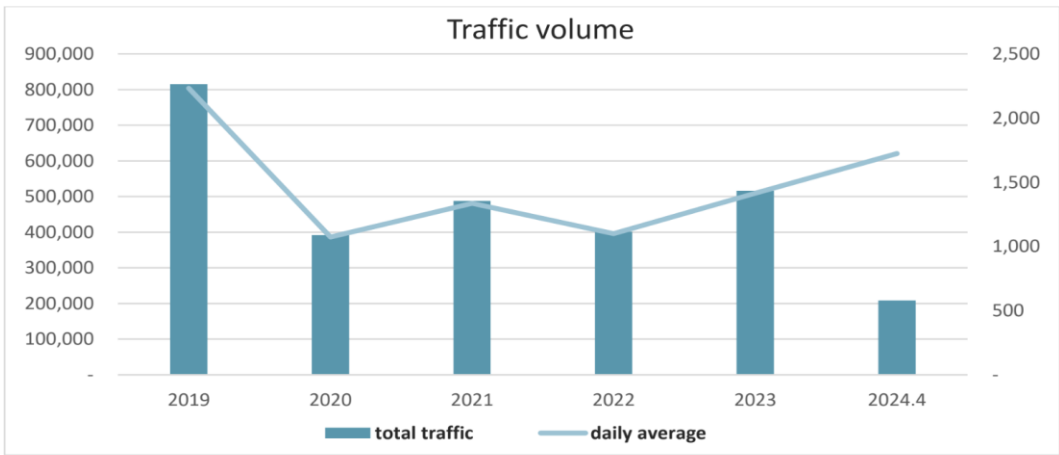


1.2 Incheon ACC is proactively strengthening radar surveillance monitoring to mitigate collision risks in the cross-section of the southern airspace of Jeju Island. This effort aims to maintain smooth air traffic flow and ensure aircraft are provided with the required altitude through close cooperation among relevant facilities.

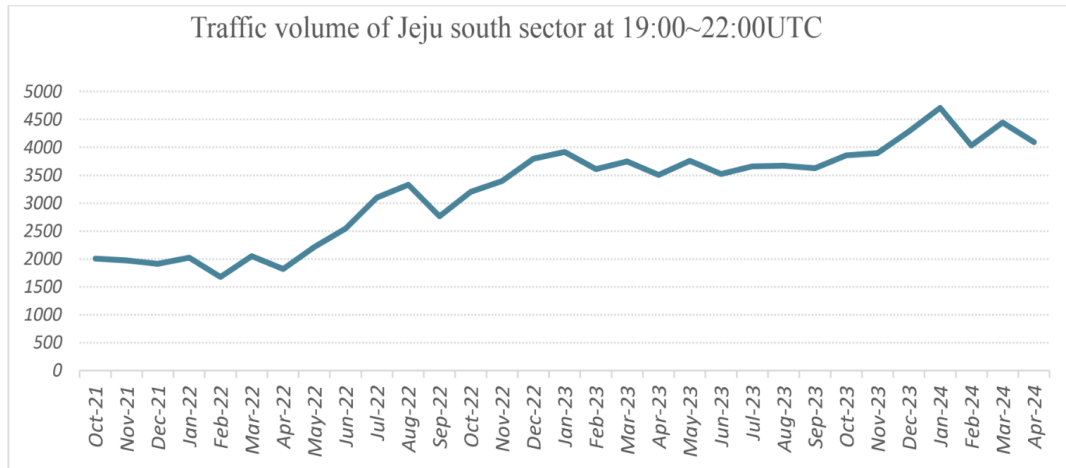
2. DISCUSSION

Traffic Volume

2.1 Despite a significant decrease in traffic since 2020 due to the impact of COVID-19, traffic has gradually increased since the second half of 2023. Currently, traffic has recovered to 70% of the pre-COVID level, and we anticipate further increases in the future.



2.2 According to the air traffic flow analysis result in Incheon FIR, congestion occurs during a specific time due to the concentration of aircraft flying to land in Incheon FIR via the ATOTI of the Y722 airways. This time zone is from 19:00 UTC to 22:00 UTC in Incheon FIR. As a result, the traffic volume of the Jeju South sector, where the Y722 flight passes through ATOTI, is also steadily increasing.



2.3 During this early morning time (from 19:00UTC to 22:00UTC), approximately 22% of traffic on the Y590 airway has been assigned altitude for FL390. However, since this time frame (19:00~22:00UTC) is a vulnerable and prone human error by controllers and potential miscommunication with pilots, there is a heightened risk of safety issues. Therefore, Incheon ACC is implementing flow management that restricts FL390 for incoming aircraft through ATOTI to ensure safety in advance. Except for dangerous weather conditions, Incheon ACC is issuing the current flow management restrictions to comply with the separation minima outlined in agreements and to ensure the safety of the aircraft with same altitudes within the airspace of Jeju South sector to the extent that it does not affect the delay at the departure airport.

2.5 However, traffic is expected to continue increasing in the future, prompting us to plan improvements in managing capacity more efficiently. We aim to adjust air traffic flow effectively to prevent sector capacity overrun and minimize increases in controller workload.

2.6 Through the CDM between Incheon ACC and Daegu ATCC, the CTOT operation will be issued for aircraft entering Incheon FIR. Analysis of efficiency and delay in issuing CTOT will also be necessary. Therefore, this operation for issuing CTOT is required, and an efficient capacity management plan also will be prepared through analysis of capacity management and delay by issuing CTOT at 19:00 to 22:00UTC (Dawn time).

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) Note the information contained in this paper; and
- b) Discuss any relevant matters as appropriate.