



ICAO

International Civil Aviation Organization

**Tenth Meeting of the Asia/Pacific Air Traffic Flow
Management Steering Group (ATFM/SG/10)**

Video Teleconference, 04 – 08 May 2020

Agenda Item 4: Review of Current CDM/ATFM Operations and Problem Areas

**PROGRESS OF PRE-DEFINED COORDINATION PROCEDURE
FOR SEVERE WEATHER**

(Presented by Republic of Korea)

SUMMARY

This paper presents progress of establishing pre-defined coordination procedure and ask to cooperation for detour route consultation and documentation of flow management procedures between the three countries.

1. INTRODUCTION

1.1 Northeast Asia is a region constantly affected by typhoons throughout summer and autumn. Most typhoons occur in Southeast Asia, approaching Northeast Asia, and have a significant impact on the movement of aircraft departing from South Korea, china and Japan.

1.2 At the 9th NARAHG meeting held in Korea in December last year, ROK submitted working paper 'Establishing Pre-defined Coordination Procedure for Severe Weather.' After meeting, further discussion was made for foundation of T/F team between the Korea, China, and Japan flow management authorities. And discussed for roadmaps of procedure, such as detour route analysis, procedure establishment, paper trial, and training/supplementation.

2. DISCUSSION

Impact of Typhoon to ATFM measures

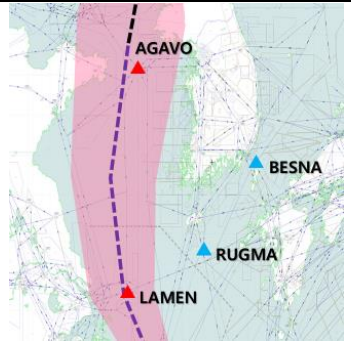
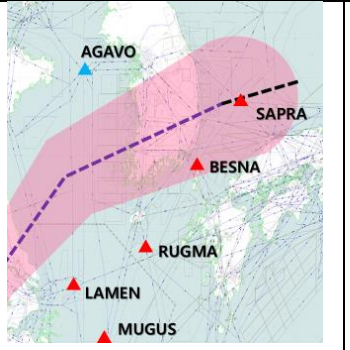

2.1 Based on movement of typhoon, many flights departing from Korea to South Asia use alternate routes via China or Japan, instead of the usual routes. These changes increase workload on ATFM and ATC in each country, thus additional ATFM measures are issued to alternate route using aircraft. When additional ATFM measure are issued, Airline operators frequently changes route plan according to its impact. This activity makes demand prediction and airspace optimization more difficult.

2.2 However, the typhoon is a kind of predictable phenomenon, and if pre-defined cooperation process is established between relevant countries, situation is expected to be improved.

Alternate route analysis based on past typhoon

2.3 ATMO categorized the types of typhoons that passed to the Incheon FIR in 2019, and collected past data of alternate air routes used by aircrafts from major domestic airports (Incheon and Busan, 6 ROK nationality airliners) to Southeast Asia.

2.4 Typhoons are categorized in 3 types, and alternate routes selected by airliners were different depending on the movement of typhoon.

	1. Northwest via West sea	2. Penetrating peninsula	3. Crossing Korea Strait
Typhoon Route			
Affected (Red)	AGAVO, LAMEN	SAPRA, MUGUS, BESNA, RUGMA, LAMEN	SAPRA, BESNA, RUGMA
Alternate (Blue)	BESNA, RUGMA	AGAVO	LAMEN, AGAVO

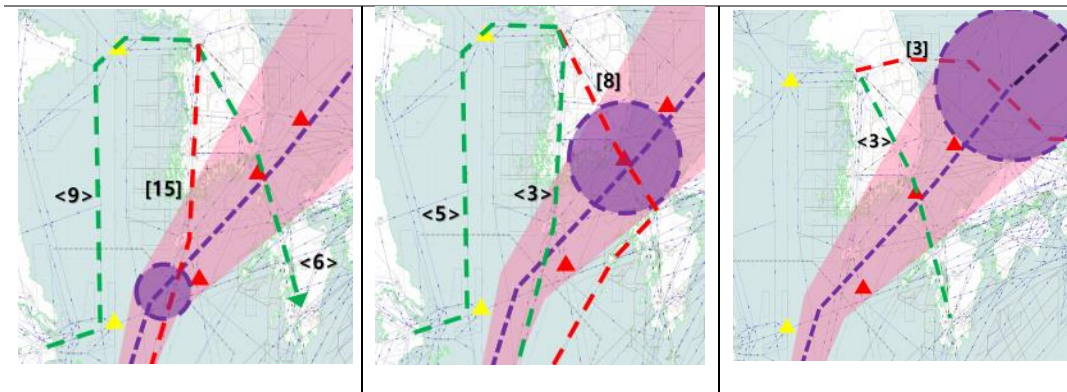
2.5 In the table above, in case of typhoon route ①, ②, at early stage of the typhoon moved to northeast Asia, many airliners used alternate route using AGAVO and LAMEN. After typhoons approached near Incheon FIR, they changed alternate route to east via BESNA or RUGMA. In case of route ③, alternate routes were divided into LAMEN or BESNA depending on the progress of the typhoon, and some flights used route via AGAVO.

2.6 Since there is no pre-defined plan to operate alternate route, airliners repeatedly changes route plan. It causes additional workload to all stakeholders, increased flight distance and flight time. Additional costs expected by this situation in 2019, by 3 typhoons, is in the following table.

Additional Distance (average)	Applied ATFM measure	Affected Aircrafts	Delays		Expected Additional Costs
			average	Maximum	
462NM	120 measures	462 flights	28.5 Min	264 Min	2,000 \$ per flight

2.7 To operate the pre-defined alternate route efficiently, business procedures between domestic and foreign ANSPs and airlines will be required, which are expected to be as follows.

1. Selection of typhoon pattern according to expected route
2. FPL reception based on alternate route plan, based on selected typhoon pattern
3. Information sharing for demand / capacity analysis in alternate routes
4. CDM for capacity distribution and ATFM measure planning
5. Notifying the result to all stakeholders and commence relevant activity (FPL amend, etc.)



- PURPLE CIRCLE : POSITION OF TYPHOON
- Red Line : Usual route in normal situation, Green Line : Alternate route
- Number : [] – Demand of usual route, < > - Capacity of alternate route

<Example of alternate route>

Future plan

2.8 ATCC contacted China and Japan to establish a T/F team for analyzing the typhoon types of the Incheon FIR and surrounding airspace. And the team will share the analysis results like identified the major typhoon type, available alternate routes, capacity determination, according to typhoon type. And more technical discussion is expected about CDM process development and documentation procedures.

2.9 However, the effectiveness of coordination procedure would be limited, if these activities are performed by three NARAHG members only.

2.10 Therefore, in the future, it is considerable to expand a coordination procedure for the Asia-Pacific region, not limited to Northeast Asia. ROK expects APAC state`s interest and active participation for further development.

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.

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