

APPENDIX 2 - Scenario 1

CBs affected air traffic flow around approach control area of Tokyo International Airport (18 August, 2015)

1. Overview

A developing squall line was moving eastward along the coast of Tokai and Kanto Region of Japan. It caused many deviations from the planned air-routes and holdings in and around the terminal area, for aircraft approaching from west to Tokyo International Airport (RJTT). The Air Traffic Management Center (ATMC) reduced air traffic capacity (CAPA) in the affected ATC sectors, such as sector T09 and T14, and executed air traffic flow controls for aircraft flying in / heading to the air space. In addition, because some westbound aircraft departed from RJTT were forced to enter into neighboring sectors, such as sector T12 and T13, to avoid developed CBs of the squall line, ATMC finally conducted capacity reduction and flow controls for those ATC sectors to prevent possible conflicts between eastbound and westbound aircraft within those sectors (See Fig. 1 and Fig. 2).

This case shows how MET forecasters and ATM officers collaboratively dealt with this adverse weather condition described above, which occurred around a congestive international airport.

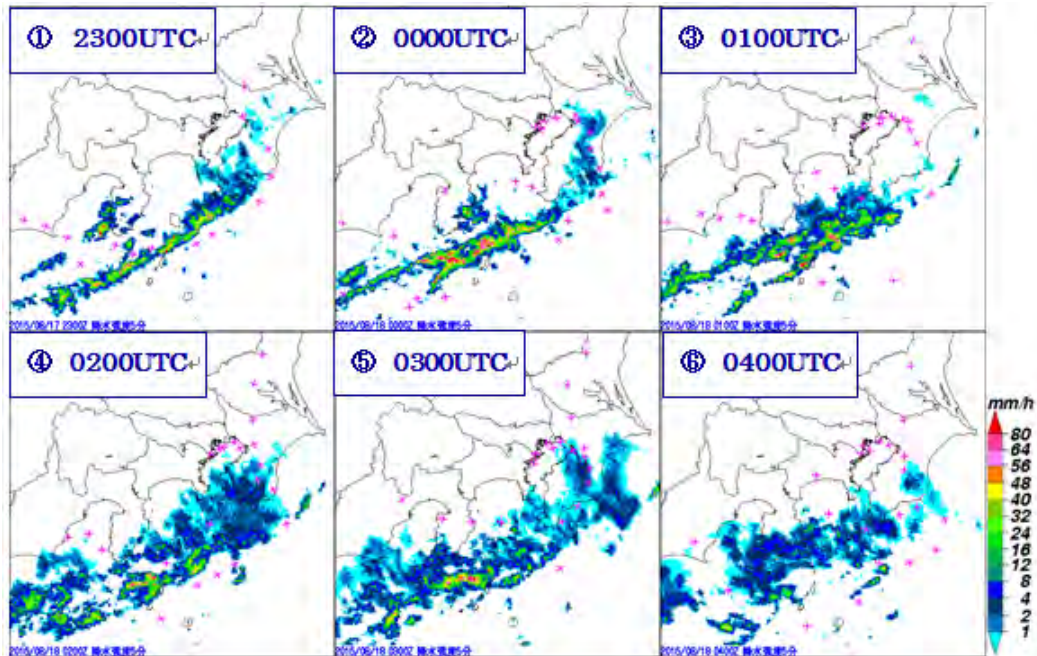


Figure 1 Radar echo intensity from 23:00 UTC 17th August to 04:00 UTC 18th August. Airplane-shaped marks indicate aircraft positions.

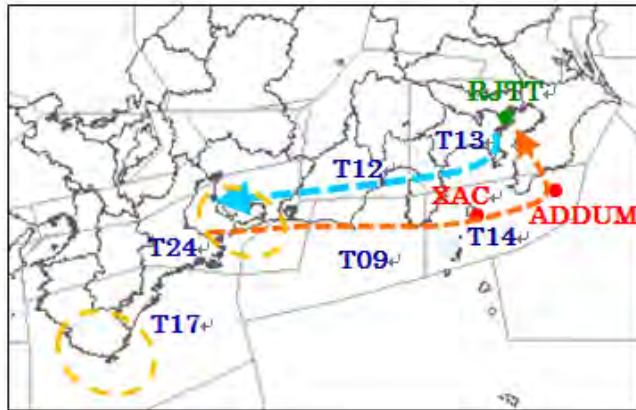


Figure 2 Name of ATC sectors (blue text) and reporting points (red text)

- Yellow circle: Holding area for aircraft flying to RJTT
- Orange arrow: Regular air-routes for aircraft approaching from western Japan to RJTT
- Light blue arrow: Regular air-routes for aircraft flying from RJTT to western Japan

2. MET/ATM collaboration

Described below is the collaborative actions taken by MET forecasters and ATM officers in this case (MET: Air Traffic Meteorology Center, Japan Meteorological Agency (ATMetC/JMA), ATM: Air Traffic Management Center, Japan Civil Aviation Bureau (ATMC/JCAB))

17th August 2015

20:00 UTC Special briefing was provided by MET

MET: "Echo top height of the CB clouds would reach more than FL460 in sector T09."

MET: "CB clouds will approach sector T14 around 21 UTC and then Tokyo Approach Control Area (ACA) around 22 UTC."

20:40 UTC Latest status of air traffic was reported by ATM

ATM: "Deviations have occurred in sector T17 and T09, because of CB clouds. We are now watching the situation of these CB clouds carefully."

21:00 UTC Special briefing was provided by MET

MET: "The CBs in sector T09 will approach XAC (reporting point) around 22 UTC and then ADDUM (reporting point) around 23 UTC "

ATM: "When will the CBs go away from Tokyo ACA?"

MET: "It will be after 00 UTC of 18th."

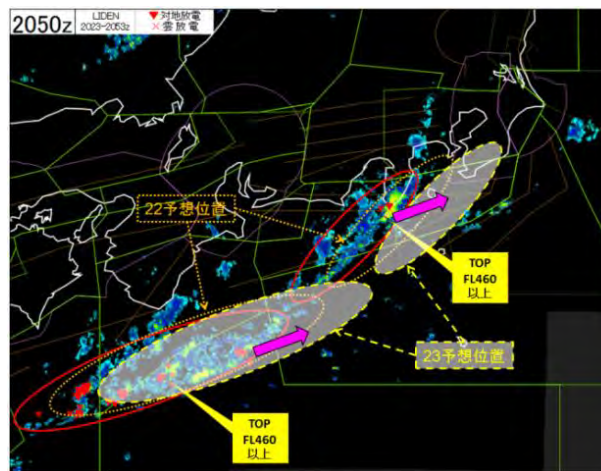


Figure 3 Material for non-regular briefing at 21:00 UTC on 17th August

21:20 UTC EDCT¹ was issued for flights heading to RJTT from west

22:00 UTC CAPA² was reduced to 93% in sector T09

22:10 UTC EDCT was issued for flights heading to RJTT through sector T09

23:08 UTC Special briefing was provided by MET

MET: "The CBs near XAC are now moving east and will approach ADDUM around 00 UTC."

MET: "The CBs newly developed around sector T09 will move to the eastward. Then it will be merged with CB cloud area of the east."

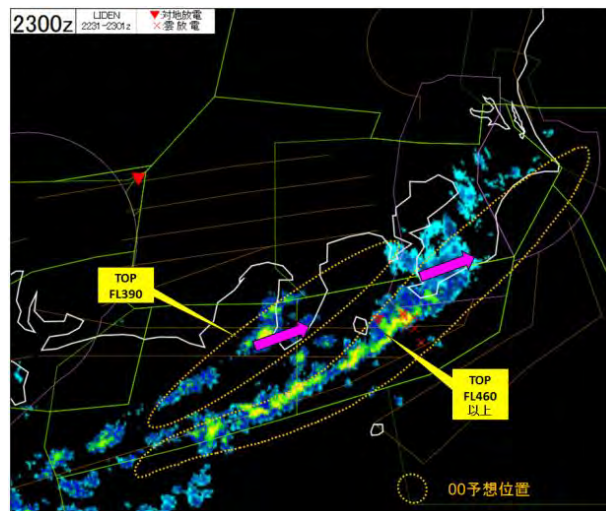


Figure 4 Material for non-regular briefing at 23:08 UTC on 17th August

¹ *Expected Departure Clearance Time (EDCT)* is assigned for the flights to certain aerodrome or airspace when air traffic volume is expected to exceed the ATC capacity of the aerodrome or the airspace.

² *CAPA* is an acronym for the ATC capacity of an aerodrome or an ATC sector.

- 23:10 UTC Entrance Interval was reduced for sector T09
23:30 UTC CAPA was reduced to 88% in sector T12, 89% in sector T13
23:35 UTC Departure Interval was reduced for sector T12
23:40 UTC EDCT was cancelled for flights heading to RJTT through sector T09

18th August 2015

- 01:10 UTC Special briefing provided by MET

MET: "Developing CB area in T14 and T09 sectors will move to the northeast or the east-northeast and the peak of the development will continue until around 03 UTC."

MET: "A part of the CBs may spread to sector T12 and T13, but it would not be expected to spread largely to the north. CB clouds in T17 sector will move to the northeast or the east-northeast and spread into T09 sector around 09 UTC, but it will eventually weaken from around 06 UTC."

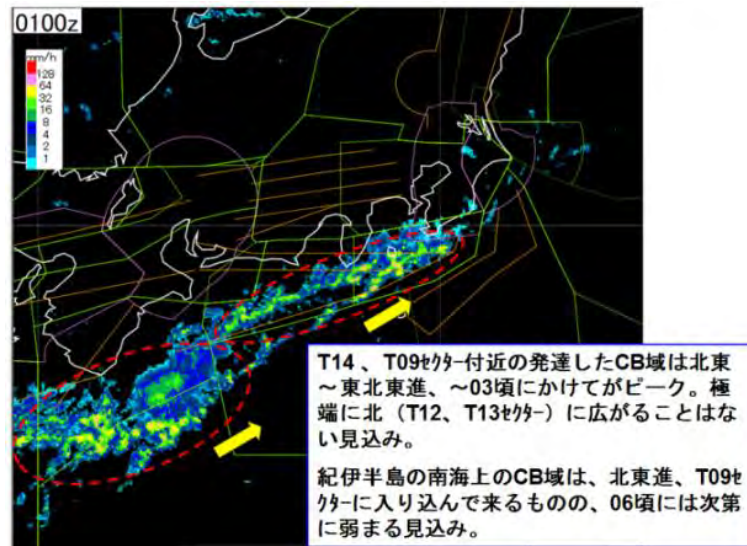


Figure 5 Material for non-regular briefing at 01:10 UTC on 18th August

- 02:00 UTC Entrance Interval was restored for T09 sector
06:00 UTC Departure Interval was restored for T12 sector
09:30 UTC EDCT was cancelled for flights heading to RJTT from west

3. Summary

In this case, ATM officers shared the latest situation of air traffic flow with MET forecasters and on the other hand, MET forecasters provided special briefings for ATMC with regard to prediction of CB clouds which affected ATC sectors, such as T09 and T14. Additionally, MET forecasters paid attention also to the situation of CB clouds developed in T12 sector, because a number of westbound aircraft departed from RJTT flew into T12

and T13 sectors and, as a result, significant conflicts between eastbound and westbound aircraft were anticipated in those sectors. Based on such interactions, ATMC officers appropriately managed air traffic flow with frequent special briefings from MET forecasters.

This case shows how mutual coordination between MET forecasters and ATM officers will improve the efficiency and the safety of air traffic flow under adverse weather conditions.