

# Special Air-Reports

29 June 2016

Japan Meteorological Agency





# Aircraft Observations

## ➤ Obligations of States

Each Contracting State shall arrange, according to the provisions of this chapter, for observations to be made by aircraft of its registry operating on international air routes and for the recording and reporting of these observations.

## ➤ Types of aircraft observations

The following aircraft observations shall be made:

- a) routine aircraft observations during en-route and climb-out phases of the flight; and
- b) **special and other non-routine aircraft observations** during any phase of the flight.



# Special Aircraft Observations

Special aircraft observations shall be made by all aircraft whenever the following conditions are encountered or observed:

- ✓ moderate or severe turbulence
- ✓ moderate or severe icing
- ✓ severe mountain wave
- ✓ thunderstorms, without hail, that are obscured, embedded, widespread or in squall lines
- ✓ thunderstorms, with hail, that are obscured, embedded, widespread or squall lines
- ✓ heavy duststorm or heavy sandstorm
- ✓ volcanic ash cloud
- ✓ pre-eruption volcanic activity or a volcanic eruption

# Importance of Special Aircraft Observations

- Airlines are the main users of the SIGMET information. They contribute to the effectiveness of the SIGMET service through issuance of special air-reports reported by pilots to the ATS units.
- Special air-reports are among the most valuable sources of information for the MWOs in the preparation of SIGMET.  
*(From the ICAO APAC Regional SIGMET Guide)*
- Forecasters can obtain information on actual upper-air weather conditions from special air-reports.
- In particular, special air-reports are the sole source of information on clear-air turbulence for forecasters.





# Reporting of Aircraft Observations during Flight

- Aircraft observations shall be reported by air-ground data link.
- Where air-ground data link is not available or appropriate, aircraft observations during flight shall be reported by voice communications
- Aircraft observations shall be reported during flight at the time the observation is made or as soon thereafter as is practicable
- Aircraft observations shall be reported as **air-report**

From ICAO ANNEX 3

- Even when automatic dependent surveillance (ADS) is being used for routine air-reports, pilots should continue to make special air-reports.
- Pilots should compile special air-reports and disseminate to  
ATS

From the ICAO APAC Regional SIGMET Guide



# Relay of Air-reports by ATS Units

The meteorological authority concerned shall make arrangements with the appropriate ATS authority to ensure that, on receipt by the air traffic services units of:

- special air-reports by voice communications, the ATS units relay them without delay to their associated meteorological watch office.
- special air-reports by data link communications, the ATS units relay them without delay to their associated meteorological watch office and WAFCs.

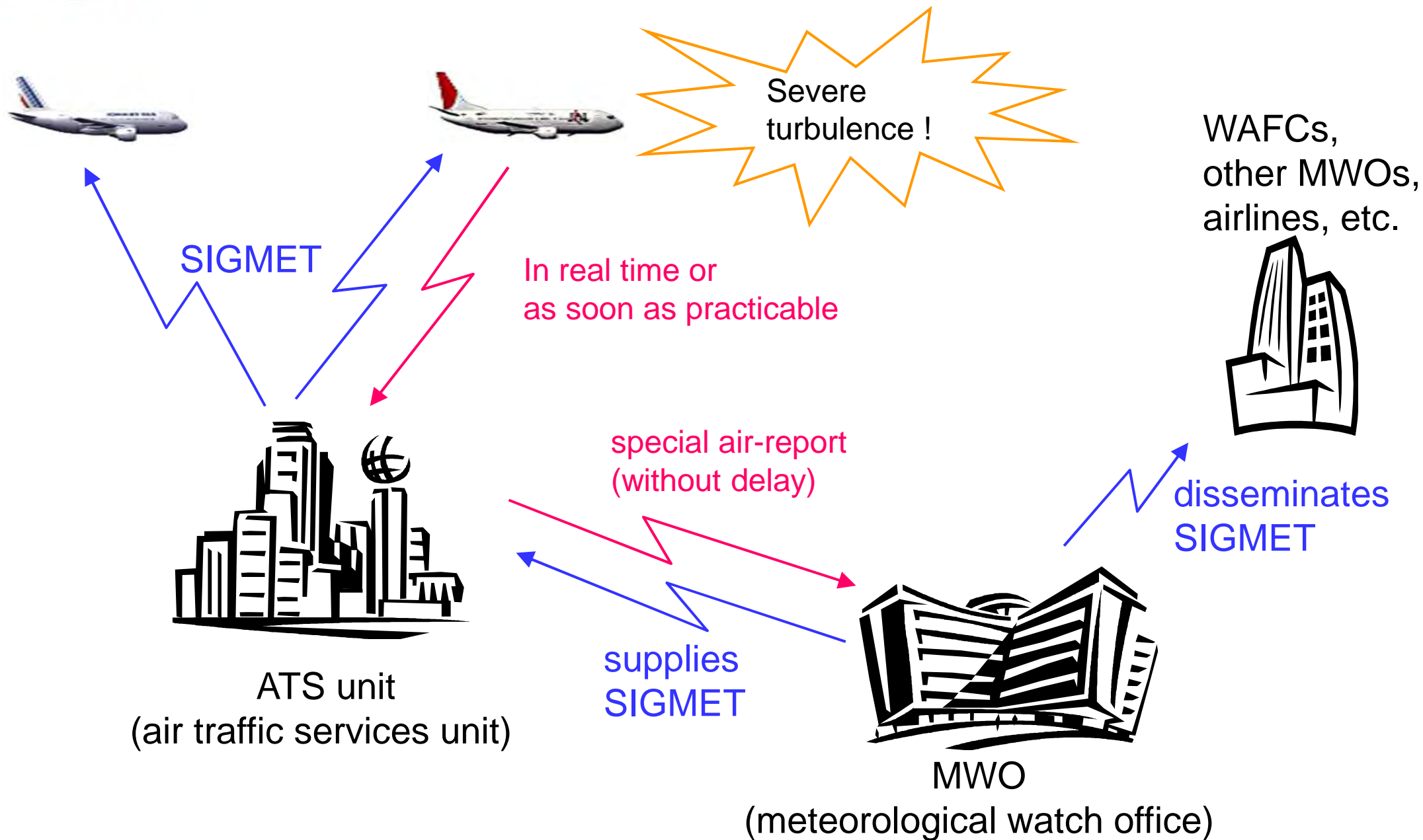
From ICAO ANNEX 3

- The ATS units concerned should also transmit to aircraft-in-flight the special air-reports received, for which SIGMET has not been issued. Once a SIGMET for the weather phenomenon reported in the special air-report is made available this obligation of the ATS unit expires.

From the ICAO APAC Regional SIGMET Guide



# Information Flow





# Elements of Special Air-reports (Air-ground Data Link)

Message type designator

Aircraft identification

## *Data block 1*

- ✓ Latitude, Longitude
- ✓ Level
- ✓ Time

## *Data block 2*

- ✓ Wind direction, Wind speed
- ✓ Wind quality flag
- ✓ Air temperature
- ✓ Turbulence (if available)
- ✓ Humidity (if available)

## *Data block 3*

- ✓ Condition prompting the issuance of a special air-report  
(e.g. SEV TURB, SEV ICE, SEV MTW, TS, VA CLD)





# Elements of Special Air-reports (Air-ground Data Link)

*Example:*

ARS VA812 2020N07005W 1215 F180 MTW SEV

Meaning:

Special air-report from VIASA\* flight number 812. Report refers to position 20 degrees 20 minutes north and 70 degrees 5 minutes west at 1215 UTC, at flight level 180. Severe mountain wave has been encountered.

\* Fictitious operator





# Elements of Special Air-reports (Voice Communications)

Message type designator

*Section 1 (Position information)*

- ✓ Aircraft identification
- ✓ Position or latitude and longitude
- ✓ Time
- ✓ Level or range of levels

*Section 3 (Meteorological information)*

- ✓ Condition prompting the issuance of a special air-report

# Special Air-reports for Volcanic Activity

Recording and post-flight reporting of aircraft observations of volcanic activity

- ✓ Special aircraft observations of pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud shall be recorded on the special air-report of volcanic activity form.
- ✓ A copy of the form shall be included with the flight documentation provided to flights operating on routes which, in the opinion of the meteorological authority concerned, could be affected by volcanic ash clouds.





# Volcanic Activity Form

## VOLCANIC ACTIVITY REPORT

Air-reports are critically important in assessing the hazards which volcanic ash cloud presents to aircraft operations.

OPERATOR:		A/C IDENTIFICATION: (as indicated on flight plan)			
PILOT-IN-COMMAND:					
DEP FROM:	DATE:	TIME, UTC:	ARR AT:	DATE:	TIME, UTC:
ADDRESSEE			AIREP SPECIAL		
<b>Items 1-8 are to be reported immediately to the ATS unit that you are in contact with.</b>					
1) AIRCRAFT IDENTIFICATION			2) POSITION		
3) TIME			4) FLIGHT LEVEL OR ALTITUDE		
5) VOLCANIC ACTIVITY OBSERVED AT (position or bearing, estimated level of ash cloud and distance from aircraft)					
6) AIR TEMPERATURE			7) SPOT WIND		
8) SUPPLEMENTARY INFORMATION			Other _____		
SO <sub>2</sub> detected    Yes <input type="checkbox"/> No <input type="checkbox"/>					
Ash encountered    Yes <input type="checkbox"/> No <input type="checkbox"/>			(Brief description of activity especially vertical and lateral extent of ash cloud and, where possible, horizontal movement, rate of growth, etc.)		
<b>After landing complete items 9-16 then fax form to: (Fax number to be provided by the meteorological authority based on local arrangements between the meteorological authority and the operator concerned.)</b>					
9) DENSITY OF ASH CLOUD	<input type="checkbox"/> (a) Wispy	<input type="checkbox"/> (b) Moderate dense	<input type="checkbox"/> (c) Very dense		
10) COLOUR OF ASH CLOUD	<input type="checkbox"/> (a) White	<input type="checkbox"/> (b) Light grey	<input type="checkbox"/> (c) Dark grey		
	<input type="checkbox"/> (d) Black	<input type="checkbox"/> (e) Other _____			
11) ERUPTION	<input type="checkbox"/> (a) Continuous	<input type="checkbox"/> (b) Intermittent	<input type="checkbox"/> (c) Not visible		
12) POSITION OF ACTIVITY	<input type="checkbox"/> (a) Summit	<input type="checkbox"/> (b) Side	<input type="checkbox"/> (c) Single		
	<input type="checkbox"/> (d) Multiple	<input type="checkbox"/> (e) Not observed			
13) OTHER OBSERVED FEATURES OF ERUPTION	<input type="checkbox"/> (a) Lightning	<input type="checkbox"/> (b) Glow	<input type="checkbox"/> (c) Large rocks		
	<input type="checkbox"/> (d) Ash fallout	<input type="checkbox"/> (e) Mushroom cloud	<input type="checkbox"/> (f) All		
14) EFFECT ON AIRCRAFT	<input type="checkbox"/> (a) Communication	<input type="checkbox"/> (b) Navigation systems	<input type="checkbox"/> (c) Engines		
	<input type="checkbox"/> (d) Pitot static	<input type="checkbox"/> (e) Windscreen	<input type="checkbox"/> (f) Windows		
15) OTHER EFFECTS	<input type="checkbox"/> (a) Turbulence	<input type="checkbox"/> (b) St. Elmo's Fire	<input type="checkbox"/> (c) Other fumes		
16) OTHER INFORMATION (Any information considered useful.)					

Model VAR

From ICAO Doc 4444 – PANS ATM



# Responsibilities of MWOs

- The meteorological watch office shall transmit without delay the special air-reports received by voice communications to WAFCs.
- The meteorological watch office shall transmit without delay special air-reports of pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud received to the associated VAACs.
- When a special air-report is received at the meteorological watch office but the forecaster considers that the phenomenon causing the report is not expected to persist and, therefore, does not warrant issuance of a SIGMET, the special air-report shall be disseminated in the same way that SIGMET messages are disseminated.



Special air-report  
(uplink)



## Elements of Special Air-reports (Uplink)

- ✓ Message type designator
  - ✓ Aircraft identification
  - ✓ Phenomenon
  - ✓ Observed time
  - ✓ Location
  - ✓ Level
- 
- *Special air-reports should be uplinked for 60 minutes after their issuance.*
  - *Information on wind and temperature included in automated special air-reports should not be uplinked to other aircraft in flight.*



# Example of a Special Air-reports (Uplink)

*Example:*

ARS VA812 SEV TURB OBS AT 1210Z N2706 W07306 FL180





## Dissemination of Special Air-reports (Uplink)

- WMO header:  $T_1T_2A_1A_2ii$  CCCC YYGGgg [CCx]
  - ✓ Data type designator ( $T_1T_2$ ) : UA
  - ✓ Level designator (ii):
    - 60-69 Special aircraft reports, except for volcanic ash
    - 70-79 Special aircraft reports, related to volcanic ash
- AFTN Priority indicator - FF



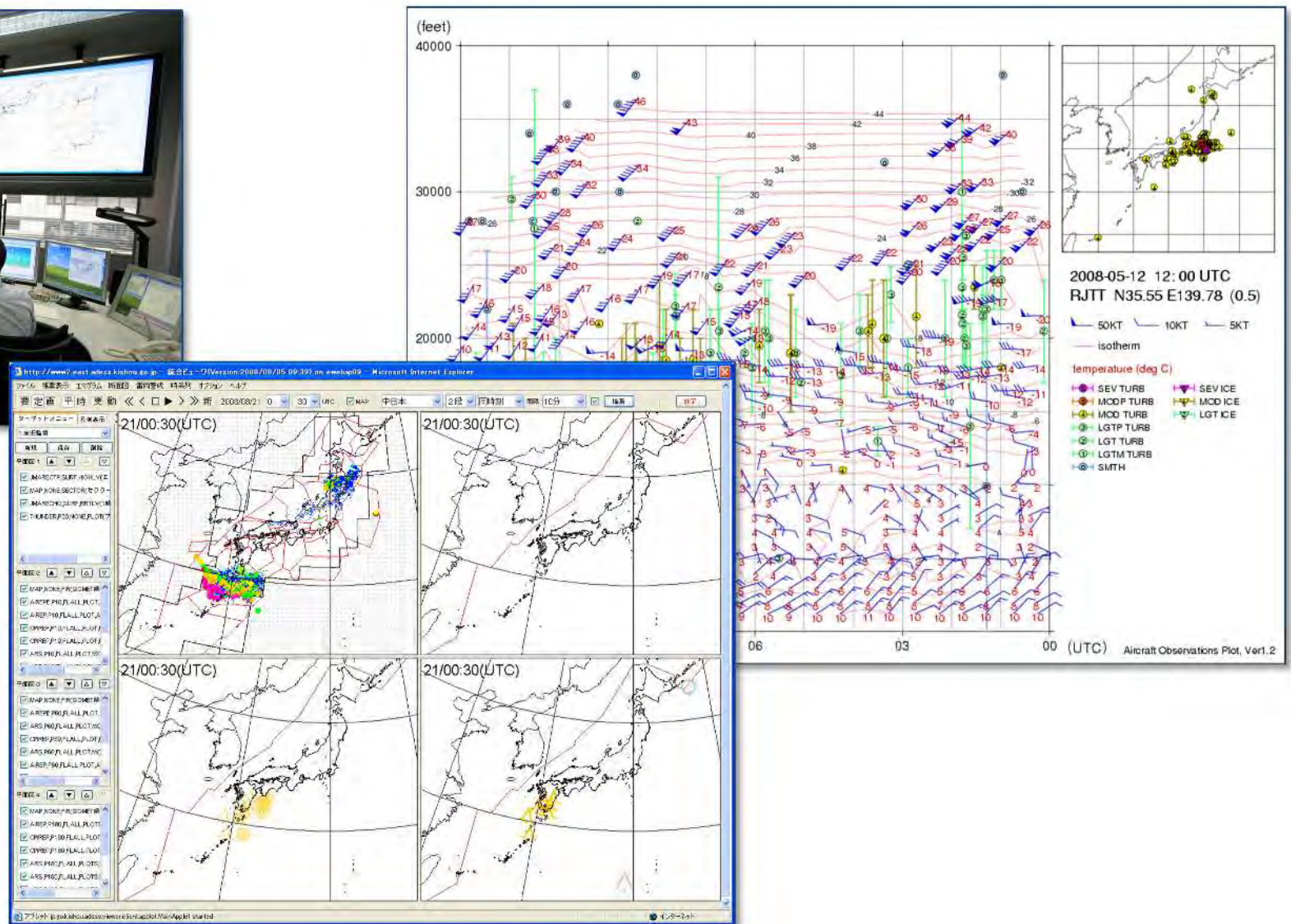


## Further Information

- ICAO ANNEX 3
- ICAO Doc 4444: PANS ATM
- ICAO Doc 8896: Manual of Aeronautical Meteorological Practice
- ICAO APAC Regional SIGMET Guide

# Utilization of Special Air-reports

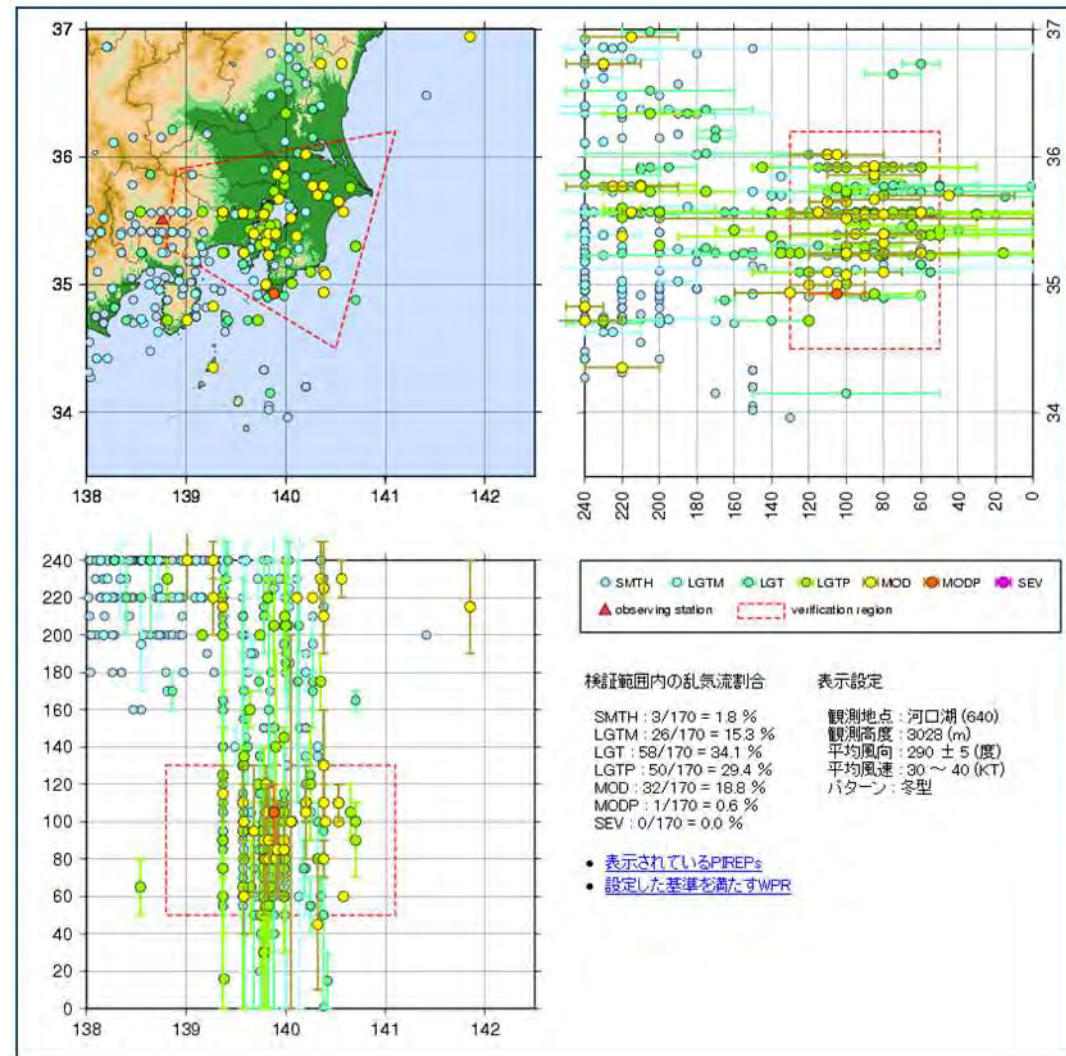
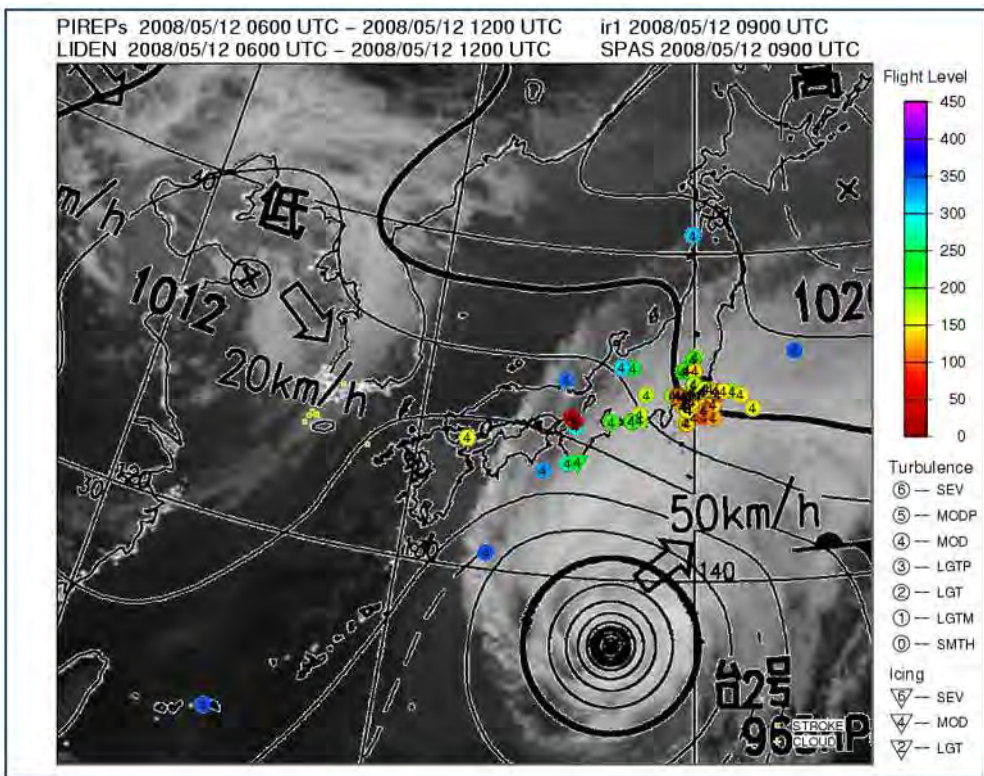
## ➤ Monitoring of weather conditions





# Utilization of Special Air-reports

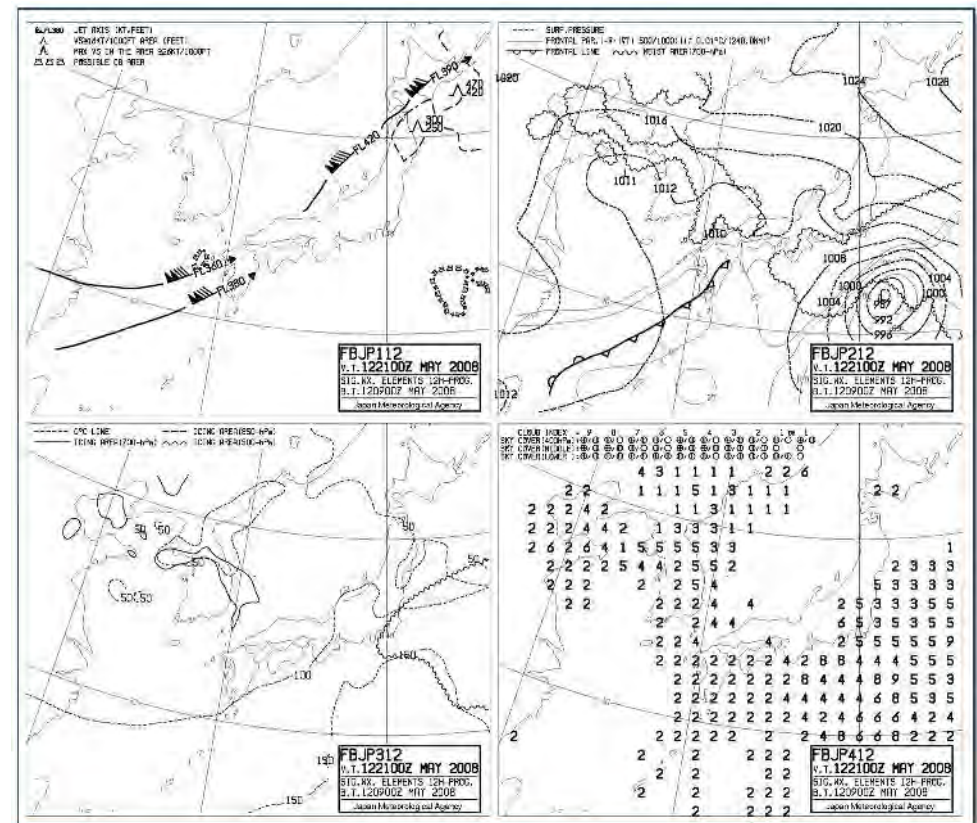
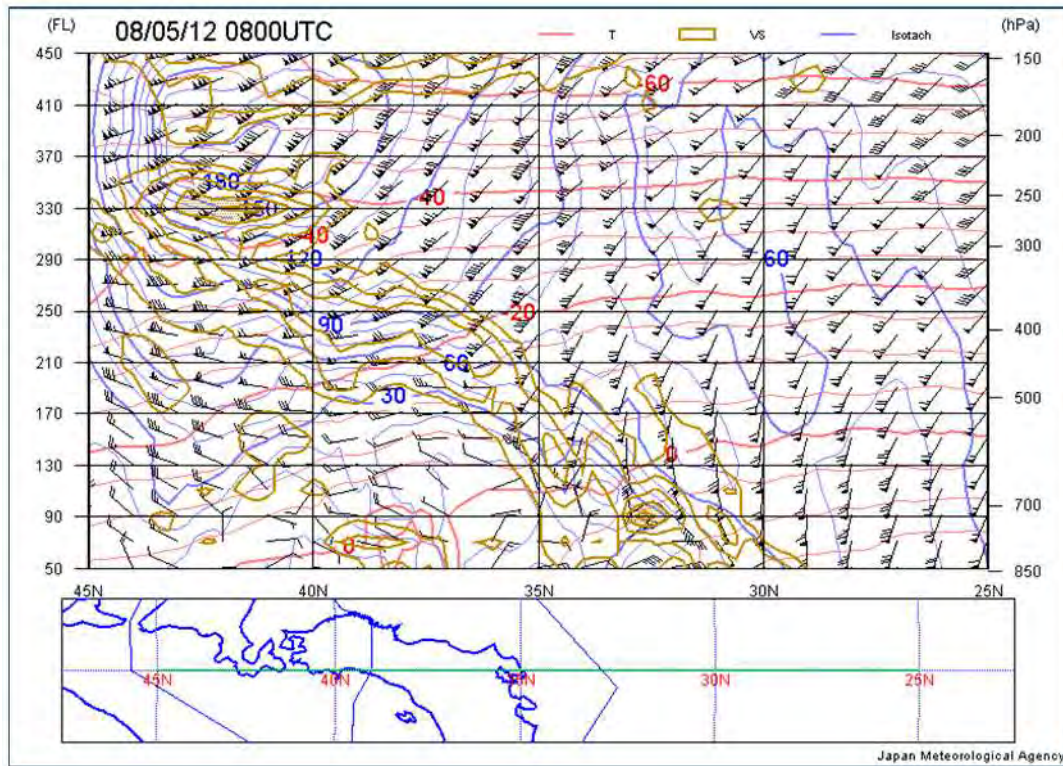
## ➤ SIGMET improvement – case studies





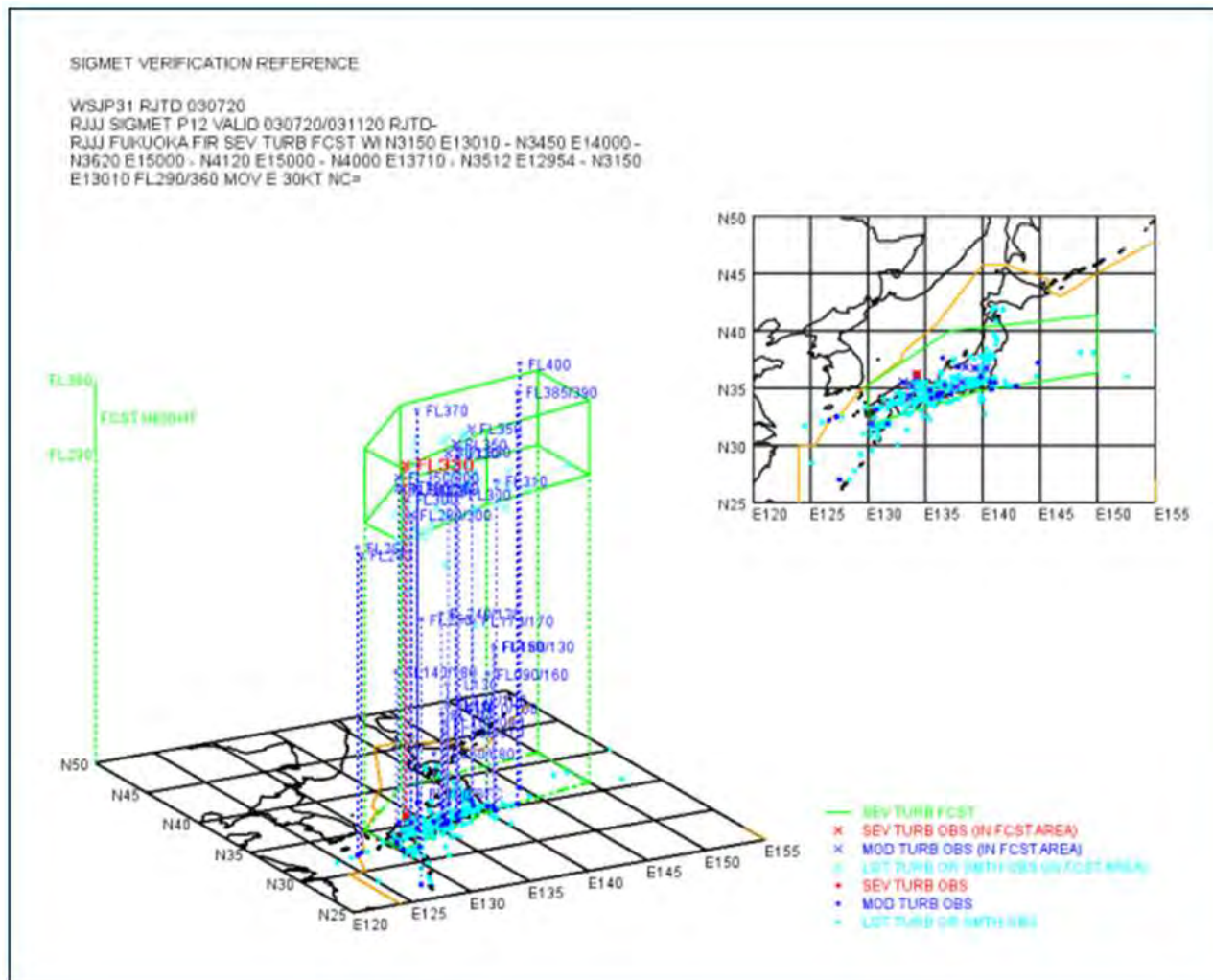
# Utilization of Special Air-reports

## ➤ SIGMET improvement – NWP model input



# Utilization of Special Air-reports

## ➤ SIGMET improvement – verification



Thank you !

