

*International Civil Aviation Organization*



**THIRTEENTH MEETING OF THE ASIA/PACIFIC REGIONAL OPMET  
BULLETIN EXCHANGE WORKING GROUP (ROBEX WG/13) and  
FIFTH MEETING OF METEOROLOGICAL HAZARDS TASK FORCE  
(MET/H TF/5)**

Seoul, Republic of Korea, 18 March 2015

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**Agenda Item (conjoint Session) 2: SIGMET and Advisory Information**

**IMPORTANCE OF ACCURATE EN-ROUTE WEATHER INFORMATION AND  
COLLABORATIVE INFORMATION SHARING**

(Presented by Japan)

**SUMMARY**

This paper presents importance of accurate weather information for en-route hazardous weather and information sharing among aviation stakeholders to improve safety of aircraft operation.

**1. INTRODUCTION**

1.1 ICAO MET Divisional Meeting (MET/14), held at ICAO headquarters in Montreal, from 9 through 18 July 2014, agreed that it was important to assist States with difficulties in issuing SIGMETs and also recognized that there has been a long-standing and keen requirement from users like international operators. Finally, the meeting endorsed following recommendation;

**Recommendation 2/9 – Implementation of a regional  
advisory system for select en-route  
hazardous meteorological conditions**

That an appropriate ICAO expert group, in close coordination with WMO, be tasked to:

- a) expeditiously develop provisions supporting the implementation of a phenomenon-based regional advisory system for select en-route hazardous meteorological conditions consistent with the evolving Global Air Navigation Plan (Doc 9750), in considering user's long-standing requirements, especially in those States where notable SIGMET-related deficiencies persist using, as appropriate, the strategic, governance and cost-recovery assessments provided in Appendices D and E;

- b) integrate the information produced by the referred system into the future system-wide information management environment underpinning the future globally interoperable air traffic management system; and
- c) develop appropriate guidance material to support the selection criteria of regional hazardous weather advisory centres taking account of cost-effectiveness, the processes for the preparation and dissemination of the advisory information, mutual cooperation, sustainability of the existing meteorological infrastructure and use of local expertise.

*Note. – Select hazardous meteorological conditions in this context includes, as a minimum, thunderstorms, icing, turbulence, and mountain waves, but excludes volcanic ash and tropical cyclones.*

1.2 In accordance with above discussion at the MET/14 meeting, in the Asia and Pacific Region, it is necessary to establish such regional advisory system as quickly as possible to fulfill the users' requirement and to facilitate the improvement of this lack of important information for the safety and efficiency of aircraft operation.

1.3 Aircraft incidents (including severe accident) have happened mainly caused by hazardous weather condition. Last December, there was a severe turbulence accident occurred over 兪 eastern part of Japan, which have 12 cabin crews and passengers heavily injured.

1.4 For more than decades, air traffic demands have increased in the APAC region and still more growth is expected. Therefore, improvement of aeronautical information for en-route hazardous weather conditions must be an essential aspect to ensure safety of aeronautical activities in this region.

## **2. DISCUSSION**

2.1 The turbulence accident of flight AA280 flying from Incheon to Dallas F/W revealed the importance of en-route weather information. The accident also clearly indicated that it is necessary to issue enough accurate information and deliver it to the aircraft in a timely manner.

2.2 On 16 December, 2014, a glowing low pressure system accompanied with front moved north-eastward along Japan, with heavily affecting air traffic mainly over Toyo Metropolitan area, the busiest airspace around Japan (See Figure 1 in the Appendix). The flight AA280, which departure Incheon international airport at 0915UTC encountered a severe turbulence while flying over eastern part of Japan. In total, at least 12 air crews and passengers were injured in this accident, and the aircraft was finally forced to make emergency landing to Narita International Airport at 1555UTC.

2.3 During 08 UTC and 11UTC on the day, there were many PIREPs for MOD or SEV turbulence reported over the area (See Figure 2 in the Appendix). In fact, between 25000 feet and 30000 feet, about 10 PIREPs for severe turbulence were reported at the time-period.

2.4 Japan Meteorological Agency (JMA) has developed NWP model and forecast indices for en-route significant weather, such as Turbulence, Icing, and CBs. In this case, existence of turbulence and CBs over eastern part of Japan were forecasted over eastern part of Japan's main island by those NWP model and indices (See Figure 3 in the Appendix). So, the Aviation Weather Center of JMA (AWC/JMA) issued SIGMETs for Severe Turbulence for the relevant area and height, based on the analysis using those PIREPs and NWP products (See Figure 4 in the Appendix). Also

forecasters in the AWC/JMA also provided Domestic Area Forecast Chart / Analysis Chart to notify users about possible occurrence of this significant weather over the area concerned (See Figure 5 and 6 in the Appendix).

2.5 Additionally, in Japan, as introduced in the IP/29 at the MET DIV Meeting (<http://www.icao.int/Meetings/METDIV14/Information%20Papers/IP.30-INF.30.pdf>), aviation community in Japan have cooperated to enhance sharing of meteorological information to improve aviation safety. Especially, there are information sharing scheme for pilot reports called Common PIREP established more than decades ago, which several airline companies contributes with sharing each own reports in a same format. JMA also can use those plenty of pilot reports to improve those area analysis and forecast.

### **3. CONCLUSIONS**

3.1 Needless to say, although it is necessary to wait for formal accident investigation on how meteorological information was used by the aircraft in accident, it is clear that this accident happened under the situation where accurate forecast was provided and certain amount of pilot reports were shared among users. Accordingly, these two implications could be derived from the accident;

- Accuracy of information and technological background are essential
- Need for information sharing system and practical guidance on how to use the information

### **4. ACTION BY THE MEETING**

- 4.1 The meeting is invited to:
- a) Note information in this paper; and
  - b) Discuss any relevant matters on this issue

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-Appendix-

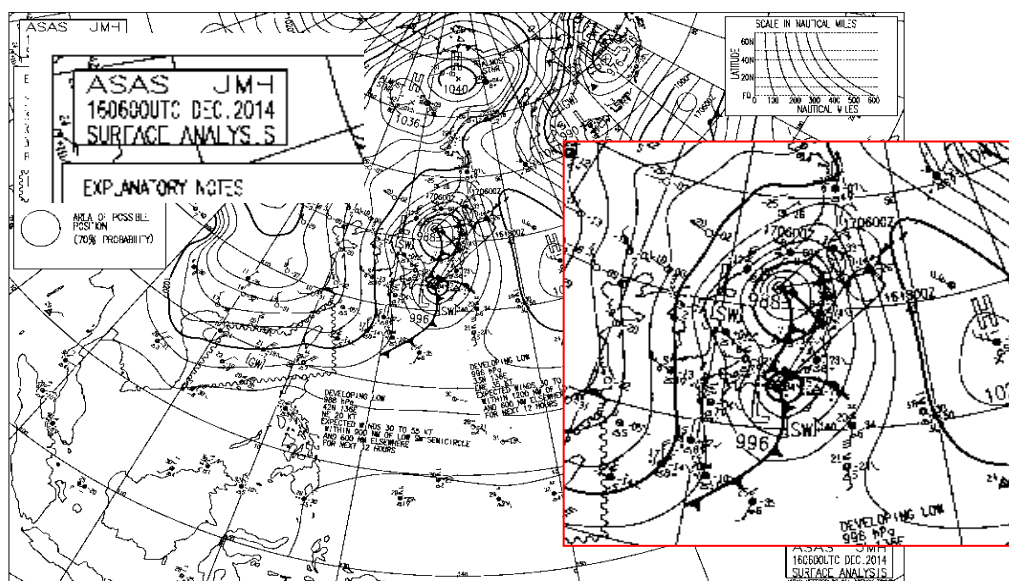


Figure 1. Analysis Chart (JMA, 160600UTC December, 2014)

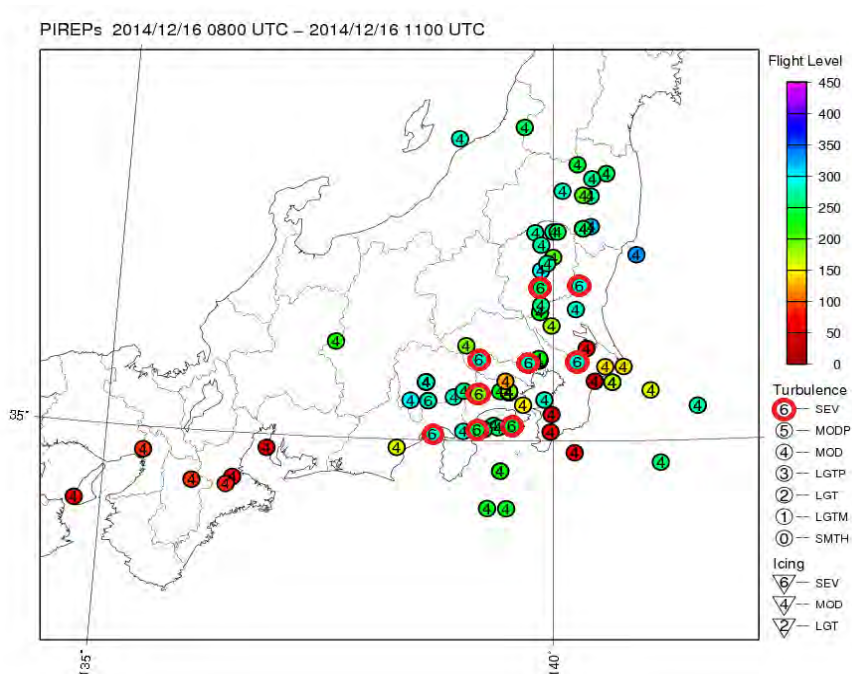


Figure 2. PIREPs reported during 08UTC and 11UTC, 16 December, 2014 (red thick circles numbered 6 are SEV TURB)

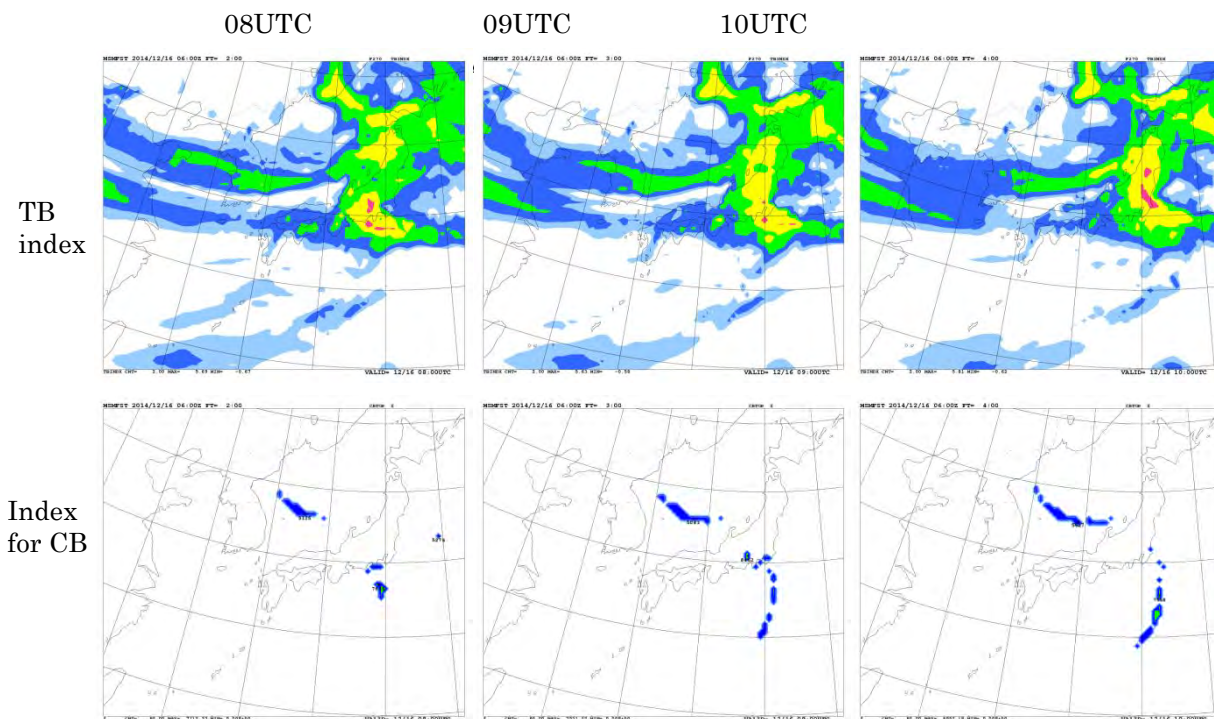


Figure 3. NWP products (initial: 06UTC, December 16, 2014)  
Upper : TB index (possibility of occurrence of turbulence)  
Lower : CB index (forecast for top height of CBs)

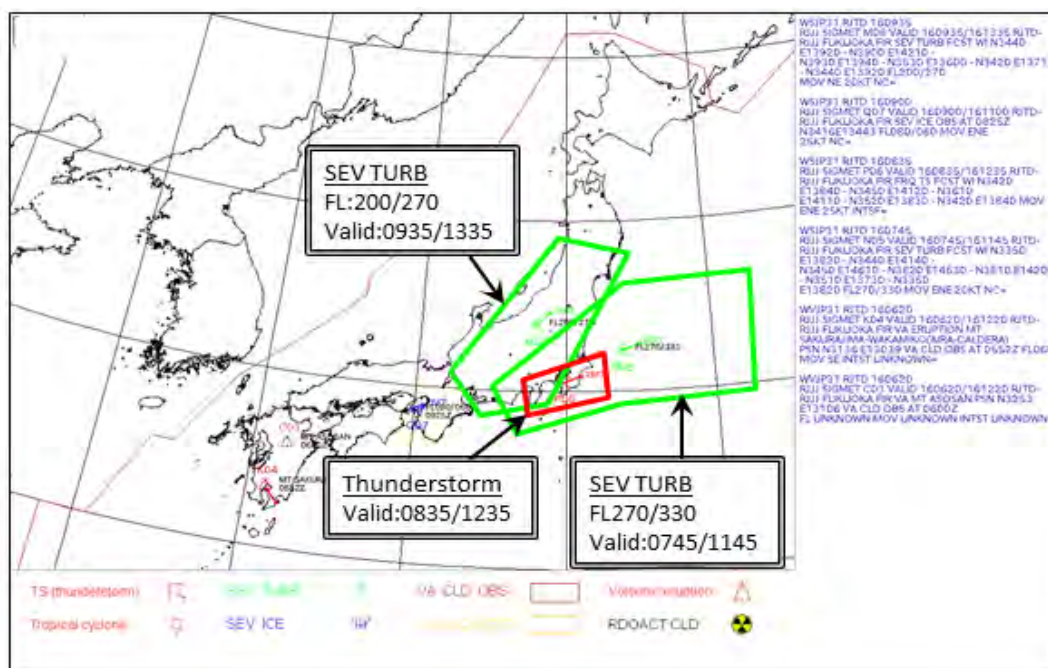


Figure 4. SIGMETs issued by AWC/JMA at 0935UTC, December 16, 2014

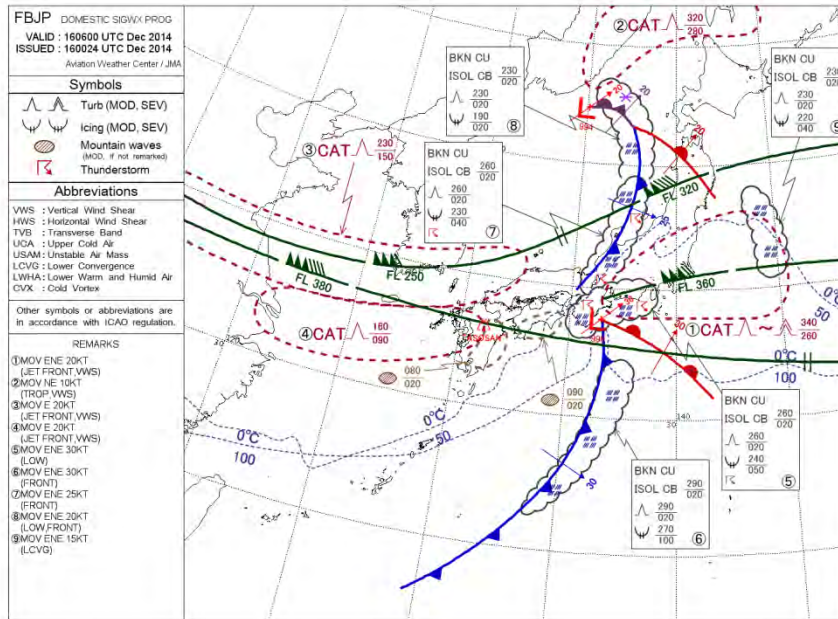


Figure 5. Domestic SIGWX Prognostic Chart issued by AWC/JMA, at 06UTC, December 16, 2014

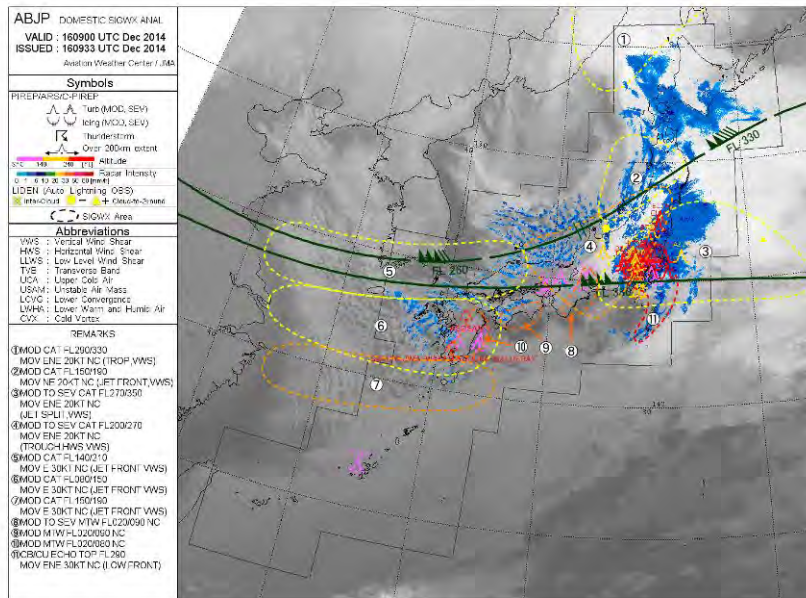


Figure 6. Domestic SIGWX Analysis Chart issued by AWC/JMA, at 12UTC, December 16, 2014