International Civil Aviation Organization

THE FOURTH MEETING OF ASIA/PACIFIC METEOROLOGICAL HAZARDS TASK FORCE (MET/H TF/4)

ICAO Regional Sub-Office, Beijing, China

19 – 21 March 2014

Agenda Item 2 : SIGMET and advisory information

e) Other SIGMET/advisory related business

DEVELOPMENT AND USE OF KOREA TUBULENCE GUIDANCE

(Presented by Republic of Korea)

SUMMARY

This paper presents the information of forecast guidance that developed Korea Turbulence Guidance data and used it to issue area forecast and the SIGMET information by Korea Meteorological Administration (KMA).

1. INTRODUCTION

1.1 Korea Meteorological Administration (KMA) set up the SIGWX forecast system in 2008, KMA issues area forecasts for mid-level and low-level in chart form changed from a GAMET area forecast in Incheon Flight Information Region according to international recommendations.

1.2 After the development of the SIGWX forecast system, KMA researches and develops guidance about elements in area forecasts. KMA developed especially Korea Turbulence Guidance (KTG) that applied characters of weather phenomena in Korea and forecasters are using this to issue area forecasts and SIGMET now. It helps prevent aircraft accidents and weather disasters to provide turbulence information more accurately and rapidly.

1.3 It is advancing to research and developing forecast guidance continuously about weather phenomena hazardous to flight like icing, reduced visibility and so on, not just turbulence.

2. KOREA TURBULENCE GUIDANCE (KTG)

2.1 Unfortunately, it is one of the regions which the jet stream is moving, people can frequently experience turbulence during the flight over Incheon FIR. As air transportation industry over Korea and Eastern Asia were increased recently, it is increased possibility that aircraft accidents happen by aviation turbulence. Investigation and forecasting of turbulence would provide invaluable information to pilots, dispatchers, and forecasters to maintain air flight safety and to reduce the

amount of unexpected damage from aviation turbulence. KMA researched and developed The KTG to provide more accurate turbulence information.

2.2 The KTG forecast data is made four times (00, 06, 12 and 18UTC) per day at intervals of 3 hours with a lead time of 24 hours coverage by using the numerical weather prediction model in KMA. This is classified by altitude of flight levels and its intensity (light, moderate and severe) covering East Asia and Incheon FIR, its horizontal resolution is 12km. The KTG system forecasts the aviation turbulence operationally since 19 January 2012. KMA tries to improve the performance of forecast through validation using data reported by pilots (It is called PIREPs).

2.3 KMA validated the KTG forecast data with data reported by pilots during the past two years (from June 2011 to May 2013), performance of forecasting turbulence was improved. Additionally, the longer the lead time became, the worse performance of forecasting was. However, KMA could see the KTG data was useful and invaluable because AUC (Area Under Curve) value was higher than 0.8.

2.4 KMA developed the new KTG system considering different causes of turbulence according to season, the performance forecasting turbulence by the seasonal KTG system was better than that by operational KTG system.

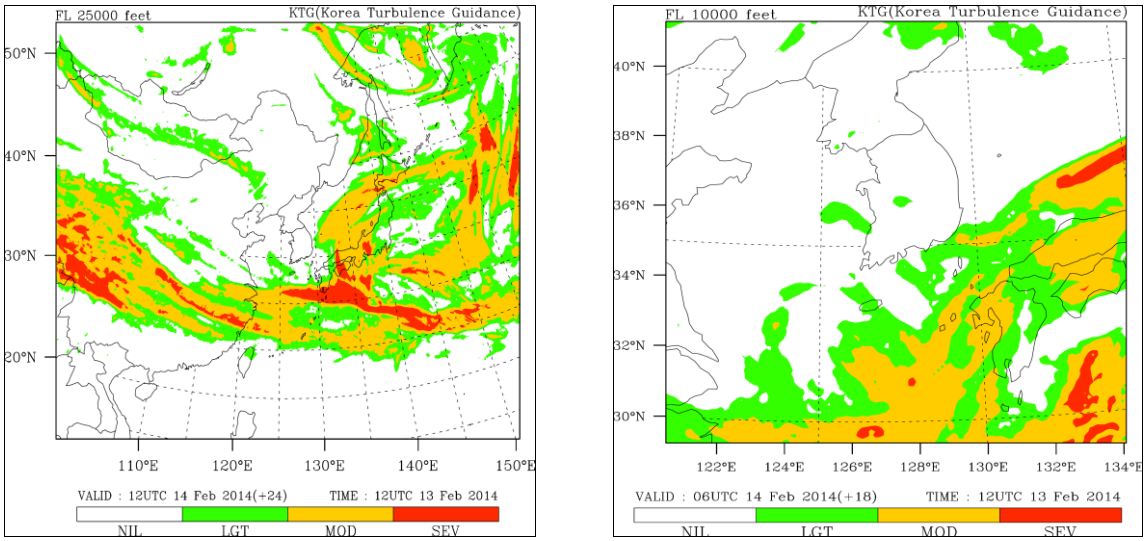

Fig.1 Korea Turbulence Guidance(KTG) forecast data, East Asia(left) and Incheon FIR(right)

3. USE OF KTG FORECAST DATA

3.1 Forecasters in KMA issue possible areas and altitudes using the KTG forecast data that there will be turbulence in mid-level (10000-25000ft) and low-level (below 10000ft) area forecasts according to the recommendation of ANNEX 3. Furthermore, KMA issues SIGMET and AIRMET information about moderate turbulence, using satellite images and analysis data as well as the KTG.

3.2 KMA provides the KTG data through our website for the relevant services units like flight control center, airlines, etc.

4. FURTHER PROCESS

4.1 The KMA is planning the KTG data for more detail such as the horizontal resolution to be denser from 12km to 1.5km and the time intervals from 3 hours to 1 hour in and around Incheon FIR. Doing that, KMA expects to provide more improved KTG forecast data for the safety of air navigation. In addition, KMA will validate the KTG forecast data applied the seasonal specialties of weather conditions and use this data operationally.

4.2 KMA will develop the KTG forecast data-based automatic system to generate SIGMET and AIRMET information, and would like to provide the turbulence information more rapidly.

4.3 In addition, KMA is planning to develop and provide forecast data about hazardous weather like icing, reduced visibility and so on based on the numerical weather prediction model to issue area forecasts as KTG forecast data.

5. ACTION BY THE MEETING

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

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