International Civil Aviation Organization

INFORMATION PAPER

TWENTY-SECOND MEETING OF THE METEOROLOGY SUBGROUP (MET SG/22) OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG)

Bangkok, Thailand, 18 – 21 June 2018

Agenda Item 5: Research, development and other initiatives

A TRIAL SIGMET COORDINATION PROJECT OVER THE SOUTH CHINA SEA COORDINATED BY THE HONG KONG OBSERVATORY

(Presented by Hong Kong, China)

SUMMARY

This paper presents the latest status of the trial SIGMET coordination project over the South China Sea and the enhancements of the regional SIGMET Coordination web platform developed by the Hong Kong Observatory.

1. INTRODUCTION

1.1 Hong Kong, China has supported the coordination of SIGMET over the airspace near the southern part and central part of the South China Sea by providing a coordination platform for the participating MWOs to have a common situation awareness and jointly issue coordinated SIGMET for the respective neighbouring FIRs (MET SG/20 – IP/14). Following the Conclusion APANPIRG/28/30 which was endorsed by MET SG/21, a trial SIGMET Coordination has been set up among Guangzhou (ZGZU), Hong Kong (VHHH), Hanoi (VVBN), Hoi Chi Minh (VVTS) and Sanya (ZJSA) FIRs to cover the airspace over and near the western and northern part of the South China Sea since November 2017. Kunming (ZPKM) FIR joined the trial SIGMET Coordination since early June 2018. Currently, the trial SIGMET Coordination covers a total of 6 connected FIRs.

1.2 MET/S WG/8- IP/08 briefly introduced the trial. This paper reports the latest status of the trial SIGMET coordination project and highlights the major enhancement with an aim of facilitating integration of several SIGMET coordination projects within the region as promoted in the 7th Meeting of the Asia Pacific Meteorological Requirements working group (MET/R WG/7) for greater harmonization of SIGMET issuance to support seamless ATM. The trial SIGMET Coordination would benefit the aviation community covering the airspace extending from the eastern part of Indo-China peninsula to the southern and southwestern part of China which was one of the most air traffic busy flight area. Other connected neighbouring FIRs have also expressed interest in joining the trial SIGMET Coordination.

2. DISCUSSION

2.1 The initial phase of the trial SIGMET Coordination was conducted during 01 to 09UTC from

Monday to Friday. It will be extended to daily operation in day time in the 2nd phase of the project beginning on 1 July 2018 to include Saturday and Sunday. Monthly teleconference meetings were held to review and discuss the effectiveness and efficiency of the coordination efforts in the past month. Through the coordination, neighbouring FIRs have successfully reached harmonized SIGMET before issuance which involved 2 or sometimes 3 FIRs. Case reviews and discussions were made in the meetings.

2.2 Before the launch of the trial, lectures and hands-on trainings on the HKO SIGMET coordination web platform were provided to all ASEAN countries with FIR during the Training Workshop on SIGMET Coordination held in Hong Kong in December 2017. Apart from lectures, hands-on exercises and experience sharing sessions, panel discussions were also arranged for the participants to voice out their needs and experience in SIGMET issuance. User feedback on the HKO SIGMET Coordination web platform were collected through a detailed users' survey. The web platform was enhanced to include some new functionalities and optimization in response to the users' feedback. Among them include:

Enhanced convection nowcast guidance with automatic alerts

2.3 An algorithm for automatic identification of significant convection area was added onto the web platform. The algorithm also provides 4 hours forecast position of the significant convection based on the advanced nowcasting techniques. This real time nowcast information provides useful guidance information for aviation forecasters in preparing WS SIGMET. Meanwhile, an improved algorithm based on satellite cloud top temperature and radiosonde data is also adopted to provide improved cloud top height estimation.

2.4 By the request of the users, the platform was enhanced with an automatic alert so that when significant convection of pre-defined size and severity enters the users' FIR, audial alert will be triggered to raise weather situation awareness. Besides, TS alert banner would also be displayed on the top of the webpage. Meanwhile, the corresponding convection area would be highlighted in Red colour. This alert prompt was found to be rather useful in reminding forecasters to consider initiating dialogue with neighbouring MWO(s) to conduct SIGMET coordination before issuance.

Handy creation of SIGMET from existing polygons

2.5 To make the SIGMET preparation more user-friendly, the web platform was also enhanced so that encoded SIGMET message could be created from either the observed or forecast significant convection areas or from latest SIGMET. The basic attributes of a SIGMET message including the latitude & longitude of the polygon vertices, its estimated height, moving speed and direction, as well as a time series of its cloud top height change are also made available by a simple click. This speeds up the time for the preparation of a SIGMET message.

Enhanced upper air wind field

2.6 The HKO web platform can display upper level wind field as streamlines or wind barb. The wind barb layer is zoom level dependent, so that when user zoom-in to an area, features of smaller scale would be shown. The wind field is enhanced with 925hPa apart from the existing 500hPa and 700hPa level. More levels are being included according to the needs.

New module on WV SIGMET Coordination

2.7 By the requests collected from the users' survey, the web platform was also enhanced to support the display and issuance of WV SIGMET. Both the actual and forecast positions extracted from

the VA Advisory issued by VAAC are denoted as polygons on the platform. For the ease of operation, tools on issuing VA SIGMET were also available on the web platform. Aviation forecasters can assess the timing and location of the VA entering from one FIR to another neighbouring FIR so that they could issue harmonized VA SIGMET separately.

Display of pilot reports

2.8 Another enhancement of the platform was the display of special pilot reports (ARS). ARSs whenever received, are automatically displayed on the platform to facilitate data exchange and weather situation awareness. An input facility is also being developed for facilitating participating MWOs to input the ARSs which they have received and submit them onto the platform for sharing.

Integrating the different SIGMET Coordination groups

2.9 Noting the draft conclusion of MET/R to further extend the coverage of the coordination effort (para.1.2 above), the HKO SIGMET coordination web platform has also been enhanced with chat grouping feature which allows users from both the Operational and Trial Coordination platform to use the same platform to perform coordination between different groups. This feature could help connect the MWOs operating in different groups. User-friendly grouping features could easier be developed for further extension when more MWOs would like to join the integrated coordination.

2.10 The above new features would be launched in stages on the HKO SIGMET coordination webpage to support both the operational and trial coordination platforms soon after consulting the platform users.

2.11 The trial period of the SIGMET Coordination has been extended to the end of September 2018 when a concluding meeting will be arranged to summarise users' experience on coordinating SIGMET issuance. Subject to the participants' readiness, the Coordination may be transitioned into 24/7 operations by then. Other interested MWOs can also approach HKO for account assess and the details for joining the projects.

3. ACTION BY THE MEETING

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

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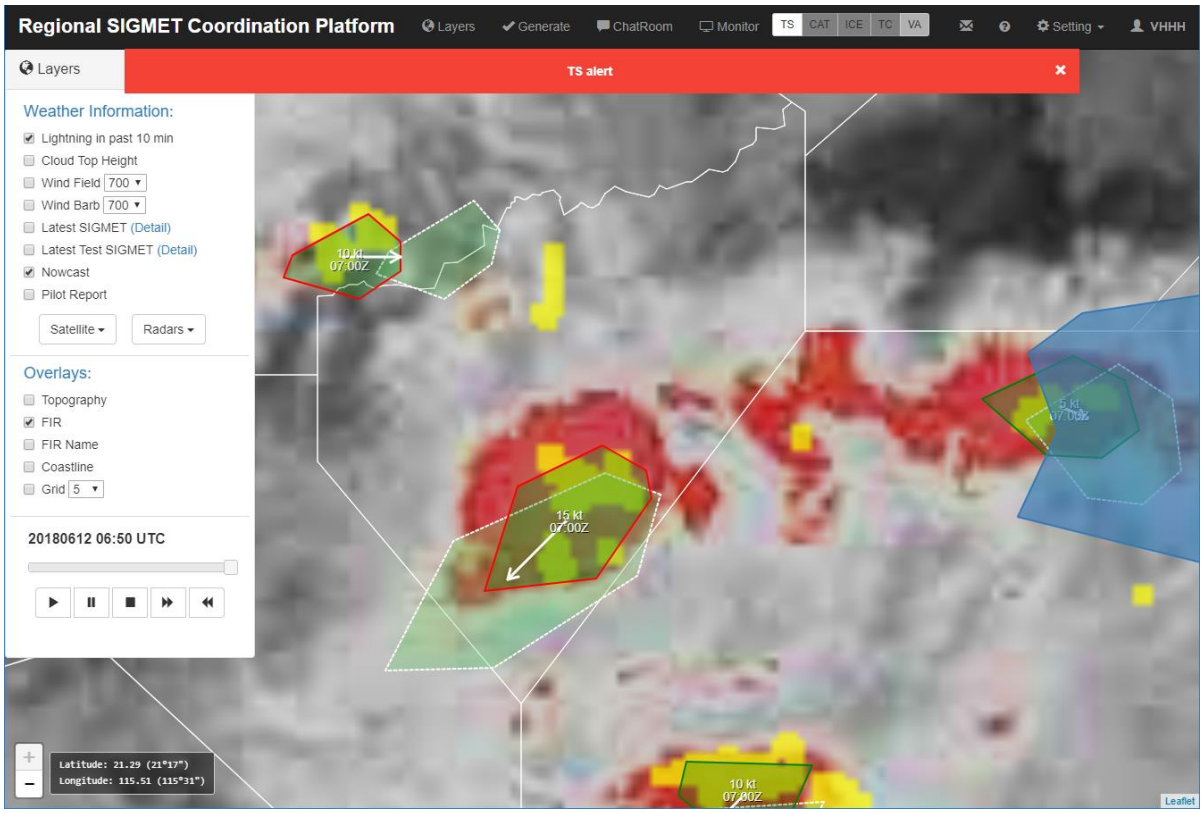

Fig. 1 Convection nowcast polygons available on the HKO SIGMET Coordination web platform. The polygons with solid lines are the present convective areas identified by the algorithm automatically while the polygons with dotted lines are the respective forecast positions. A TS alert banner would pop up on top of the screen when any of the convective areas is inside the user's FIR and the respective polygons would be highlighted in red.

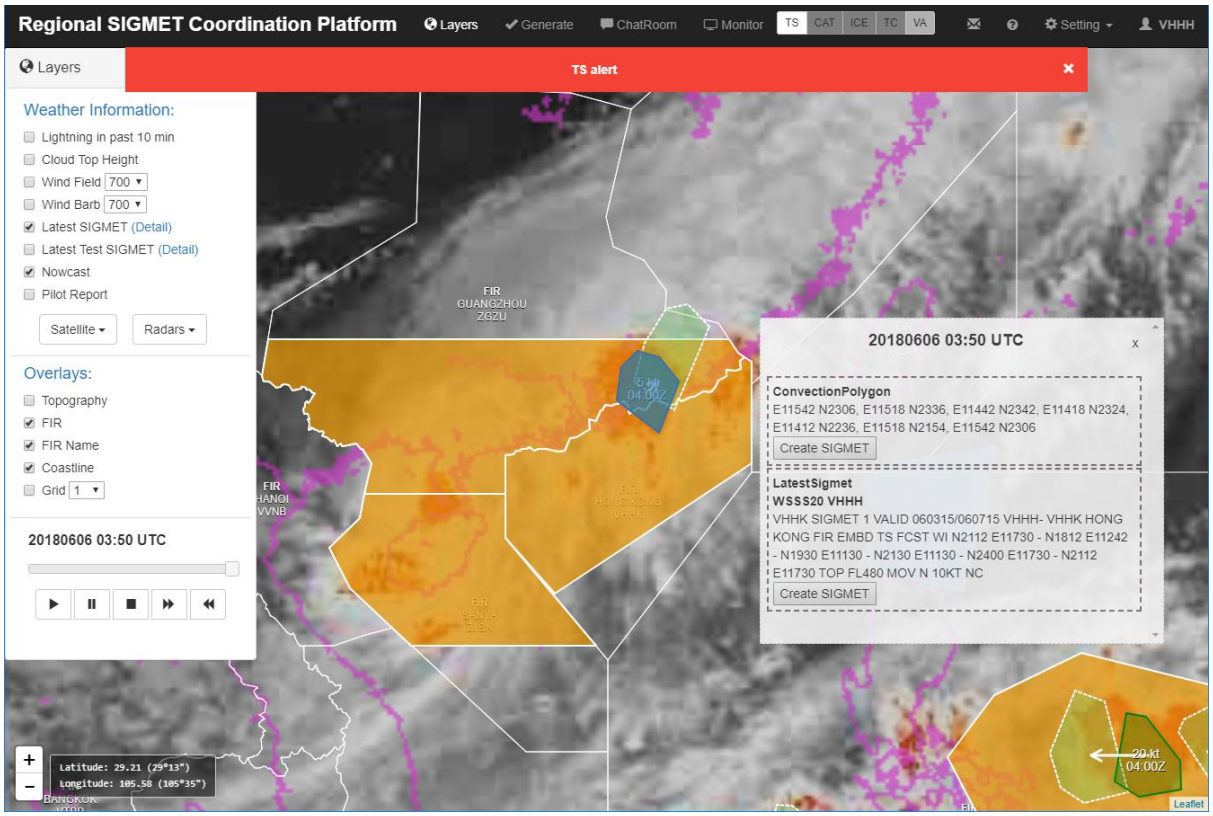

Fig. 2 A coordinated case in June 2018 regarding the TS convection related to TC Ewiniar. Details of the layers are popped up in a menu when clicked onto the map, with a function of Create SIGMET to generate an observed TS phenomenon.

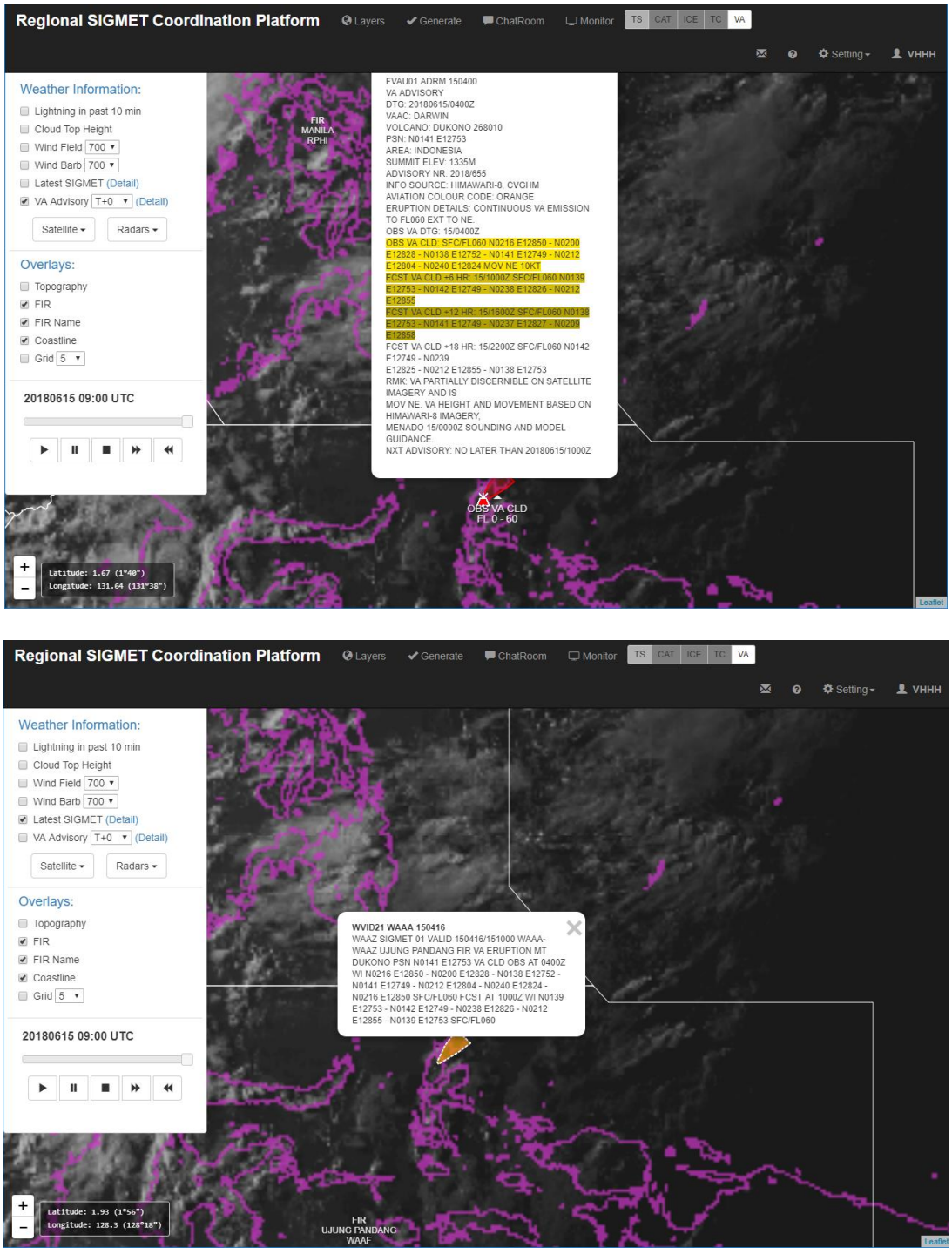

Fig. 3 VA advisory (top) and latest WV SIGMET (bottom) displayed on the platform.

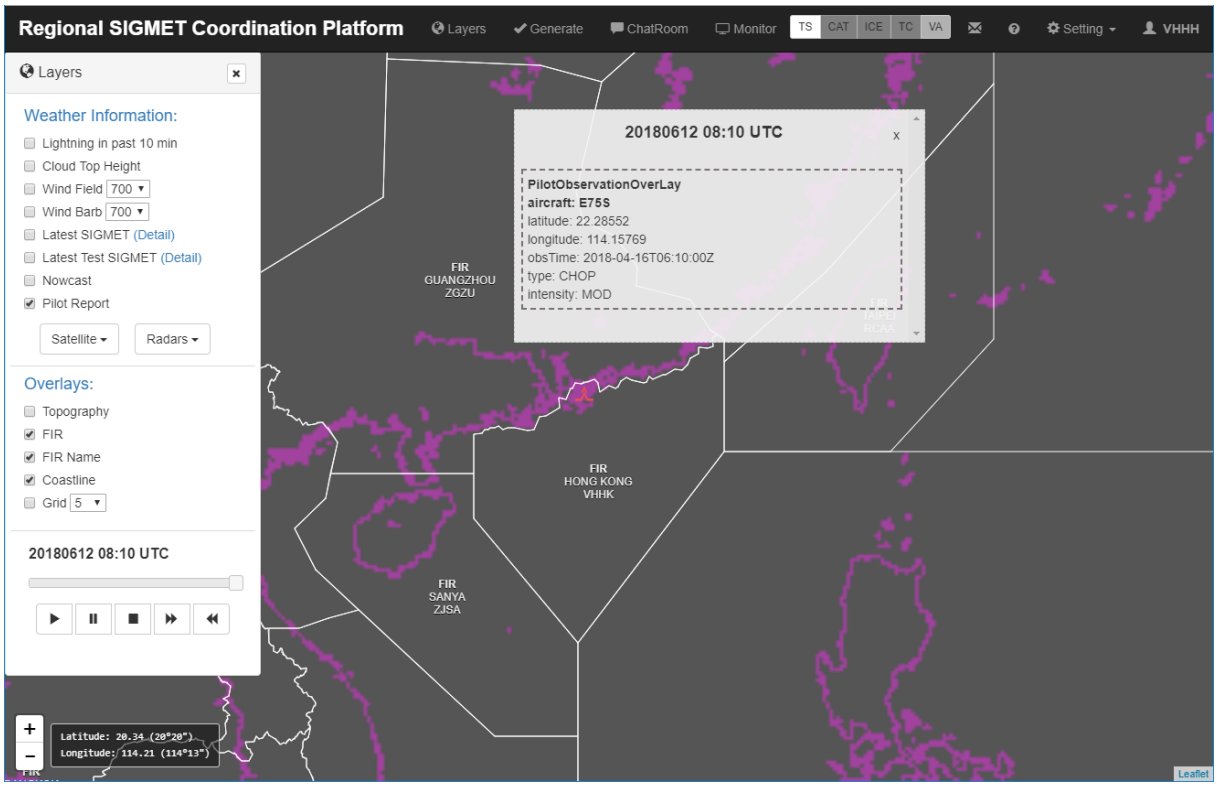

Fig. 4 A sample turbulence ARS near Hong Kong and its related attributes.