



*International Civil Aviation Organization*

**INFORMATION PAPER**

**EIGHTH MEETING OF THE ASIA/PACIFIC METEOROLOGICAL SERVICES WORKING GROUP (MET/S WG/8)**

Bangkok, Thailand, 21 – 23 March 2018

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**Agenda Item 3: Planning and implementation of meteorological services**

**EFFORTS IN SUPPORT OF SIGMET COORDINATION BY THE HONG KONG OBSERVATORY**

(Presented by Hong Kong, China)

**SUMMARY**

This paper presents the efforts to extend the SIGMET coordination effort and enhancement of the regional SIGMET coordination web platform developed by the Hong Kong Observatory to better support regional SIGMET coordination.

**1. INTRODUCTION**

1.1 A Regional Forum on Meteorological Services for Aviation Safety in Southeast Asia, held by the World Meteorological Organization (WMO) in April 2015, adopted the “Jakarta Recommendations on Regional Cooperation for Enhancing Meteorological Services for International Air Navigation by the WMO Member States in Southeast Asia” with the aim at establishing a mechanism for improving the SIGMET service provision in a seamless manner across the borders of the flight information regions (FIR).

1.2 Following the Jakarta Recommendation, three states, Indonesia, Malaysia and Singapore, participated in a pilot SIGMET coordination Project while Japan and Hong Kong, China were invited by WMO to provide the coordination platform. In view of the success and benefits to the aviation community, the Coordination has since transitioned to become full 24/7 operational since 1 August 2017.

1.3 To support the step-by-step integration of SIGMET coordination activities in the region, a trial SIGMET Coordination has been set up among Guangzhou (ZGZU), Hong Kong (VHHH), Hanoi (VVNB) and Hoi Chi Minh (VVTS) and Sanya (ZJSA) FIRs to cover the western and northern part of the South China Sea area since November 2017. Subsequently Vietnam joined the operational SIGMET coordination since 1 January 2018. The operational SIGMET Coordination now covers a total of 6 connected FIRs in the region.

1.4 The Hong Kong Observatory (HKO) is committed to continue to support the SIGMET coordination effort through training and enhancing the SIGMET Coordination web-based platform developed by HKO for coordination and issuance of SIGMET (HKO web platform). A SIGMET coordination training workshop was held in Hong Kong in December 2017 to introduce the HKO web

platform to other MWOs in the region. The workshop was attended by all ASEAN countries with MWOs. The participants also took the opportunity to share their respective practices, including the criteria for SIGMET issuance and issues in SIGMET provision as well as provide their comments on the HKO web platform. New features will also be made available on the HKO web platform to further facilitate the operational coordination among the participating MWO meteorologists and are presented in the following paragraphs.

## **2. DISCUSSION**

2.1 HKO collected user feedback on the functionality of the HKO web platform from user survey and during the SIGMET coordination training workshop. A handful of improvements were made to the web platform in response to the needs raised. Apart from improving the presentation style, performance aiming at enhancing the user experience, some new functionality were also added based on the suggestions by the users:

### Convection Nowcast Guidance (Fig.1)

2.2 An algorithm for automatic identification of significant convection area based on Himawari-8 satellite image and global lightning data was developed. The algorithm also tracks the past movement of the significant convection areas shown on consecutive satellite images and provides the forecast position 4 hours ahead based on the motion vectors analysed. Both the actual and the associated forecast areas are respectively highlighted by polygon with solid lines and dotted lines for ease of reference. The nowcast will be updated every 10 minutes when new satellite image is available. This real time nowcast information could provide useful guidance for aviation forecasters to issue TS SIGMET more effectively and efficiently.

### Upper air wind forecast (Fig.2)

2.3 It is learnt from the user feedback that some users prefer to have the upper air wind field shown using wind barb other than streamlines. A new zoomed level dependent wind barb is now available on the web platform. The more the user zoom-in to an area on the platform, the more wind barb for the area will show up, showing features of smaller scale. Currently, only wind barbs at 500hPa and 700hPa are available. Wind barbs for more vertical levels will be available shortly.

### WV SIGMET Coordination (Fig.3 and Fig.4)

2.4 The HKO SIGMET Coordination platform has also been enhanced for the issuance of WV SIGMET. The actual and forecast positions extracted from the VA Advisory issued by VAAC are denoted as polygons on the 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.

2.5 The new functions are now available for trial and would be launched for operation after consulting platform users. More new features such as advanced grouping feature to allow different neighbouring MWOs to initiate coordination with selected neighbours to support the possible further extension of the SIGMET coordination effort to more MWOs as well as those based on the users feedback are on the pipe line. Interested MWOs can also approach HKO for assess account.

## **3. ACTION BY THE MEETING**

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

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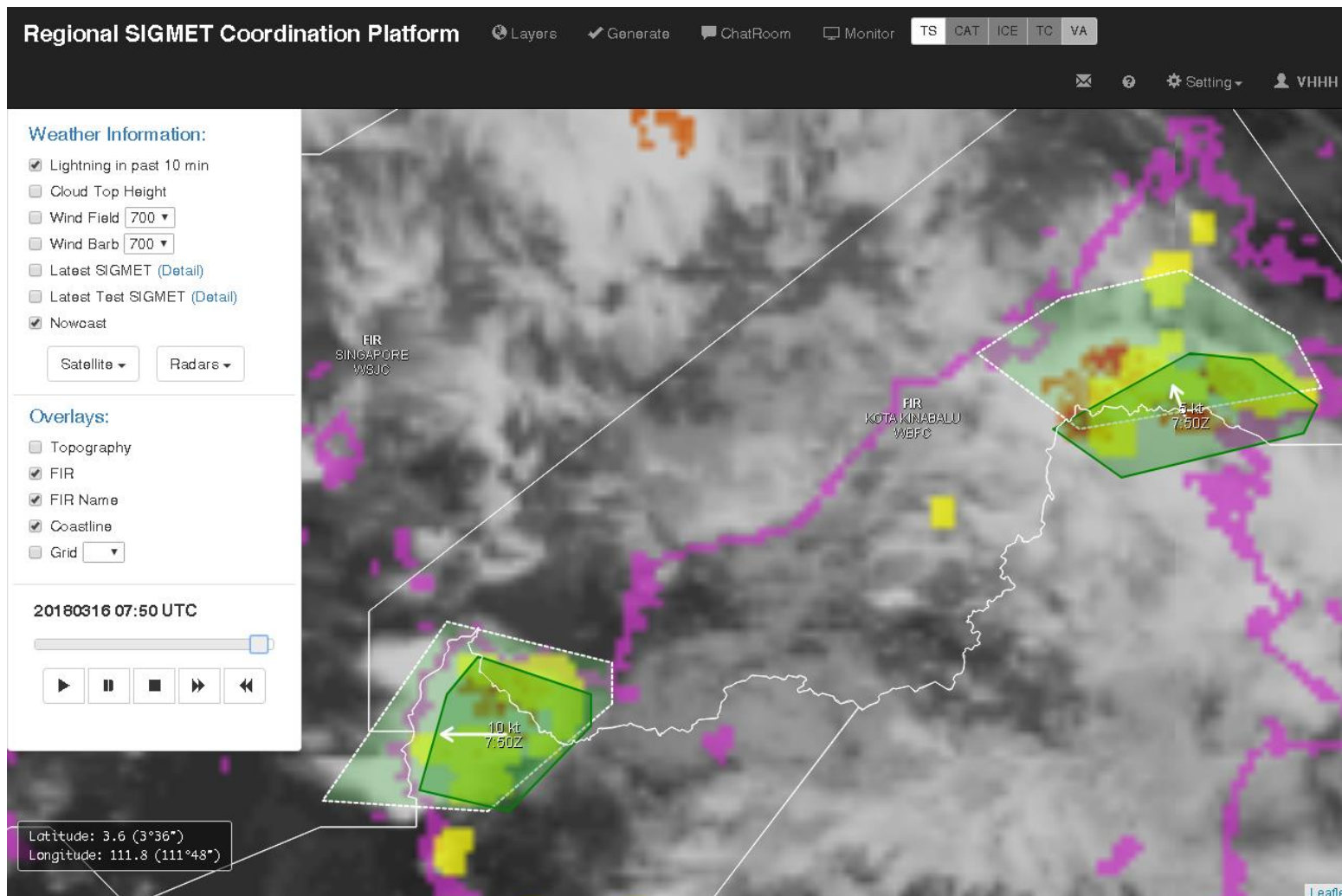


Fig. 1 Convection nowcasting available on the HKO web platform. The polygon with solid lines are the present connective areas identified by the algorithm automatically while the polygons with dotted lines are the respective forecast positions.

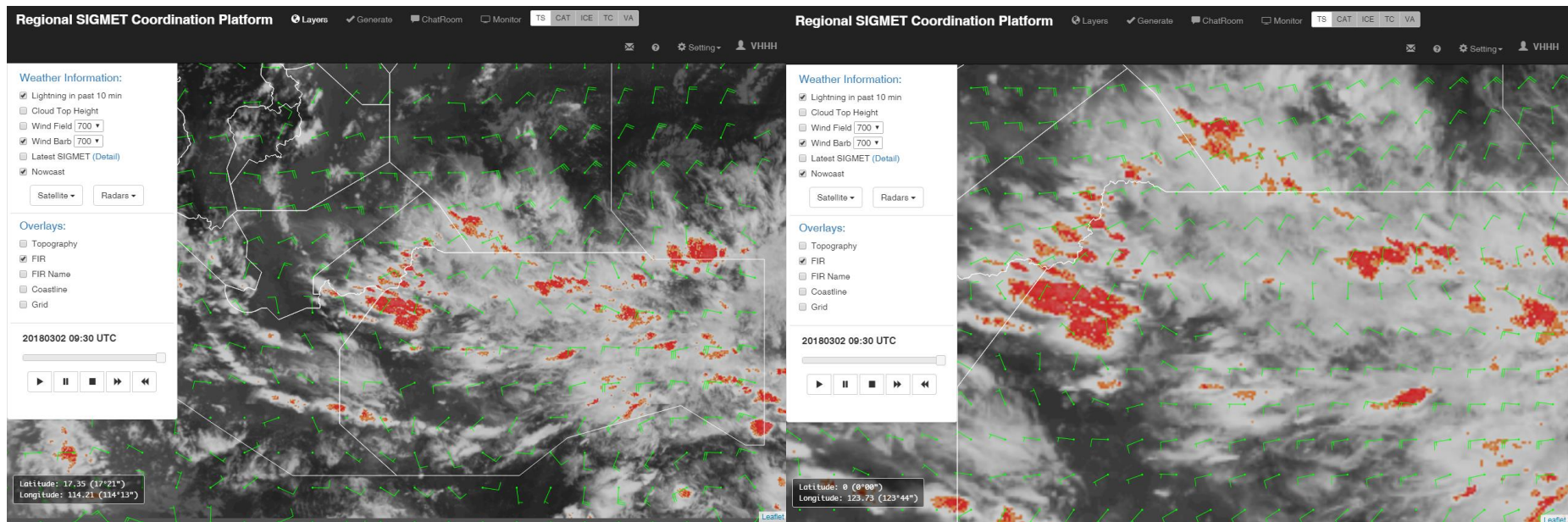


Fig. 2 Wind barb showing upper air wind at different zoom levels.  
 Features of smaller scale can be shown by zoom-in to a particular area (right).



The screenshot displays the Regional SIGMET Coordination Platform interface. The main map area shows satellite and radar imagery with various overlays. Two information panels are open:

**Left Panel (VA Advisory):**

- Weather Information:**
  - Lightning in past 10 min
  - Cloud Top Height
  - Wind Field
  - Wind Barb
  - Latest SIGMET (Detail)
  - VA Advisory  (Detail)
- Overlays:**
  - Topography
  - FIR
  - FIR Name
  - Coastline
  - Grid
- 20180316 08:10 UTC**

**Right Panel (WV SIGMET):**

- Weather Information:**
  - Lightning in past 10 min
  - Cloud Top Height
  - Wind Field
  - Wind Barb
  - Latest SIGMET (Detail)
  - VA Advisory  (Detail)
- Overlays:**
  - Topography
  - FIR
  - FIR Name
  - Coastline
  - Grid
- 20180316 08:10 UTC**

**Map Data:**

- Top-left: Latitude: 3.35 (3°21') Longitude: 131.35 (131°21')
- Bottom-left: FOST VA CLD +6 HR EL: 20
- Bottom-right: Latitude: 1.25 (1°15') Longitude: 128.11 (128°07')

**Text Content in Panels:**

**VA Advisory (Left Panel):**

```

0000109800
647
FVAL01 ADM 160656
VA ADVISORY
DTG: 201803160700Z
VAAC: DARWIN
VOLCANO: DUKONO 268010
PSN: N0141 E12753
AREA: INDONESIA
SUMMIT ELEV: 1335M
ADVISORY NR: 20180308
INFO SOURCE: HIMAVARI-8
AVIATION COLOUR CODE: ORANGE
ERUPTION DETAILS: VA EMISSION TO FL080 EXT SE.
OBS VA DTG: 180700Z
OBS VA CLD: SFC FL080 N0141 E12751 - N0142
E12753 - N0118 E12830 - N0059 E12807 MOV SE
15KT
FOST VA CLD +6 HR: 161300Z SFC FL080 N0142
E12751 - N0142 E12753 - N0118 E12831 - N0059
E12807
FOST VA CLD +12 HR: 161300Z SFC FL080 N0142
E12753 - N0104 E12824 - N0052 E12797 - N0142
E12751
FOST VA CLD +18 HR: 170100Z SFC FL080 N0142
E12752 - N0142
E12753 - N0051 E12811 - N0049 E12740
RMK: VA IS NOT IDENTIFIABLE ON CURRENT
SATELLITE IMAGERY DUE
TO UPPER-LEVEL MET CLOUD IN THE AREA
HOWEVER ASH STILL
EXPECTED IN THE AREA. VA LAST OBS AT 160200Z
EXT SE.
HEIGHT MOVEMENT BASED ON HIMAVARI-8
IMAGERY. MENADO 160000Z
SOUNDING AND MODEL GUIDANCE
NXT ADVISORY: NO LATER THAN 20180316H1300Z

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**WV SIGMET (Right Panel):**

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WWD21 WAAA
WAAZ SIGMET 06 VALID 160700Z161300 WAAA-WAAZ
LUJUNG PANGAS FIR VA ERUPTION MT DUKONO
PSN N0141 E12753 VA CLD OBS AT 0700Z W/ N0141
E12751 - N0142 E12753 - N0118 E12830 - N0059
E12807 - N0141 E12751 SFC FL080 MOV SE 15KT
FOST AT 1300Z W/ N0142 E12751 - N0142 E12753 -
N0118 E12831 - N0059 E12806 - N0142 E12751
SFC FL080

```

Fig. 3 VA advisory and latest WV SIGMET displayed on the platform

**Regional SIGMET Coordination Platform** Layers Generate ChatRoom Monitor TS CAT ICE TC VA

Tool: Ruler

Convective Phenomenon:

VA parameter

Area of Responsibility: VHHK

Encode Area Preview

MOVEMENT FCST PSN

Option 1:  
 VHHK SIGMET 0 VALID  
 090300/090900 VHHH- VHHK  
 HONG KONG FIR VA  
 ERUPTION MT TMS PSN  
 N2224 E11406 VA CLD OBS AT  
 0300Z WI N2212 E11606 -  
**N2048 E11518 - N2218 E11400**  
 - N2212 E11606 SFC/FL050  
 MOV SE 10KT FSCT AT 0900Z

Option 2:  
 VHHK SIGMET 0 VALID  
 090300/090900 VHHH- VHHK  
 HONG KONG FIR VA  
 ERUPTION MT TMS PSN  
 N2224 E11406 VA CLD OBS AT  
 0300Z NW OF LINE N2212  
 E11606 - N2048 E11518 -

Longitude: 110.09 (110°05')

Please make your changes below:

MOVEMENT FCST PSN

FCST PSN OP1 FCST PSN OP2

VHHK SIGMET 0 VALID 090300/090900 VHHH- VHHK HONG KONG FIR VA  
 ERUPTION MT TMS PSN N2224 E11406 VA CLD OBS AT 0300Z WI N2212 E11606 -  
 N2048 E11518 - N2218 E11400 - N2212 E11606 SFC/FL050 FSCT AT 0900Z WI  
 N2054 E11536 - N2018 E11418 - N2218 E11400 - N2054 E11536 SFC/FL050

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Fig. 4 WV SIGMET created on the platform