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Planning for Meteorological Information Uplink

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Agenda Item 13: MET Component of the CNS/ATM Systems

PLANNING FOR METEOROLOGICAL INFORMATION UPLINK

(Presented by Hong Kong, China)

SUMMARY

This paper presents some considerations in planning for uplinking meteorological information in Hong Kong, China.

1. BACKGROUND

1.1 Hong Kong, China began uplinking meteorological information to aircraft within the Hong Kong Flight Information Region (FIR)/Area of Responsibility (AOR) in 2001 via the data link VOLMET (D-VOLMET) and the data link ATIS (D-ATIS) services (see AN-Conf/11-WP/162 and CNS/MET-SG/7 IP/4). To facilitate planning for future meteorological information uplink, Hong Kong, China conducted a survey to find out pilots' requirement in early 2004. Based on the survey results, a plan on meteorological information uplink was developed (see CNS/MET-SG/8 IP/04). In developing this plan, several factors are involved. They are described below.

2. CONSIDERATIONS REGARDING UPLINKING OF METEOROLOGICAL INFORMATION

2.1 Availability of products:

According to the survey, the most-needed meteorological products for uplink include windshear and turbulence alert, radar image, satellite image, runway weather observations, TAF/landing forecast, METAR/TAF, etc. A majority of these products are already available. Some products, such as graphical SIGMET on tropical cyclone and volcanic ash are not yet available and have to be developed. Arrangements for uplinking the available meteorological information can be made first, while uplinking of others can be arranged when such products are developed.

2.2 Product update frequency:

Depending on the bandwidth of the data link, meteorological information, when available, may be updated frequently to the cockpit. Pilots offered two opinions. Firstly, there should be a facility in the cockpit for pilots to elect to receive meteorological information only on request, so as not to overload the data link due to repeated uplinking of unnecessary meteorological products. Secondly, windshear and turbulence alerts, being essential information for aircraft on approach and departure, should be made available as soon as

possible.

2.3 **Presentation format of products:**

ICAO has laid down standard templates for many kinds of meteorological information. These include text-based products such as METAR, TAF, SIGMET, windshear warning, as well as graphical products such as WIND/TEMP charts and SIGWX charts. The presentation format for graphical SIGMET on tropical cyclones and volcanic ash is also being developed by ICAO. These standard templates would be adopted for uplinking these meteorological products. As to radar and satellite images, standard presentation formats are not yet available. Standard presentation formats would be useful for pilots to view and interpret radar and satellite images from different sources.

2.4 **Encoding of meteorological products:**

For text-based weather products, there is no need to encode them for uplink as the file size of these weather products is generally small. For graphical products, encoding is necessary to minimize the time of transmission. Available encoding methods commonly in use include GRIB and BUFR graphical compression algorithms. Other algorithms exist such as Weather Huffman (WH) and Portable Network Graphics (PNG). The availability of standards for efficient graphical compression would facilitate the development of graphical meteorological products.

2.5 **Data link applications:**

A key element in meteorological information uplink is the availability of appropriate data link applications. The ICAO Manual of Air Traffic Services Data Link Applications (Doc 9694-AN/955) provides specifications for D-METAR and D-ATIS. It is desirable that ICAO establishes additional standards for meteorological data link applications such that common aircraft software for data communications and processing in different airspaces could be made available.

3. **ACTION BY THE GROUP**

- 3.1 The group is invited to note the information provided.
