



AERODROME METEOROLOGICAL OBSERVATION AND FORECAST STUDY GROUP (AMOFSG)

EIGHTH MEETING

Melbourne, Australia, 15 to 18 February 2010

Agenda Item 5: Observing and forecasting at the aerodrome and in the terminal area 5.1: Aerodrome observations

WIND REPORTING AT TOUCHDOWN ZONE WITH MULTIPLE ANEMOMETERS

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SUMMARY

This paper discusses the reporting of wind at touchdown zone with non-uniform wind distribution due to low-level wind effects of buildings when readings of multiple anemometers are available.

1. INTRODUCTION

1.1 In para. 4.1.1.2 in Appendix 3 of Annex 3 — *Meteorological Service for International Air Navigation*, it is recommended that “Sensors for surface wind observations for local routine and special reports should be sited to give the best practicable indication of conditions along the runway and touchdown zones. At aerodromes where topography or prevalent weather conditions cause significant differences in surface wind at various sections of the runway, additional sensors should be provided.”

1.2 Based on the experience at the Hong Kong International Airport (HKIA), significant differences in surface wind not only occur at different sections of the runway (which are typically separated by a couple of kilometres or so), but may also occur within a touchdown zone (TDZ) of the runway. Such variations may be related to the low-level wind effects of the nearby buildings.

1.3 To measure the wind distribution within the TDZ concerned, a number of anemometers have been set up/planned to be set up at different locations within the TDZ. Based on the actual wind data and the computer simulation results of the airflow associated with the buildings, significant wind differences are found within a particular TDZ. This raises the question of how to provide a “representative” wind report for the TDZ. This matter is discussed in the present paper.

2. DISCUSSION

2.1 With the presence of more than one anemometer within the same TDZ, there arises an issue about how to use the data from the various anemometers in the reporting of the wind for the TDZ when the wind observations from these anemometers are significantly different, say by more than 10% from each other. Discussions on this issue have been made with the aviation stakeholders concerned, making reference to experience at some other international airports.

2.2 Out of the above discussions, the following proposal to report the wind for a TDZ based on multiple anemometers is formulated considering flight safety and user’s perspectives: when data from more than one anemometer are available at the same TDZ, only a single set of mean wind speed, mean wind direction and gust is to be reported to the users based on the readings from the multiple anemometers. The single set should be taken as the maximum of the mean wind speeds from the anemometers, the corresponding mean wind direction of the anemometer recording the maximum mean wind speed, and the maximum of the gusts from the anemometers.

2.3 It is noted that, given the proposed approach above, the anemometer used for reporting the mean wind speed and direction and the one used for reporting the gust for the TDZ concerned could be different. For instance, the anemometer further away from the buildings may record a higher value of the mean wind speed because of less blockage, but the anemometer closer to the buildings may record a higher gust because of its proximity to the turbulent flow associated with the buildings.

3. ACTION BY THE AMOFSG

3.1 The AMOFSG is requested to:

- a) note the content of this paper; and
- b) consider the proposed approach to report the wind for a TDZ based on multiple anemometers in para. 2.2, and if supported by the group, formulate a draft amendment to Annex 3 for incorporation in Amendment 76.

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