

Reprint 651

Development of New Wind Shear Posters

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Tenth Meeting of the Communications/Navigation/Surveillance
and Meteorology Sub-group of APANPIRG (CNS/MET SG/10),
Bangkok, Thailand, 17–21 July 2006



International Civil Aviation Organization

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COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND
METEOROLOGY SUB-GROUP OF APANPIRG
(CNS/MET SG/10)**

Bangkok, Thailand, 17 – 21 July 2006

- Agenda Item 11: Other MET issues:**
3) MET support for operations of aerodromes and terminal areas

DEVELOPMENT OF NEW WIND SHEAR POSTERS

(Presented by Hong Kong, China)

SUMMARY

This paper presents an initiative to develop new wind shear posters as a joint effort of WMO, ICAO, IFALPA and Hong Kong Observatory for training and educational purposes.

1. INTRODUCTION

1.1 Over the years, a number of ICAO publications were developed on wind shear to serve as guidance material for States and/or training and educational material for pilots. These publications include the Wind Shear Circular (186-AN/122) published in 1987 which was replaced by the Manual on Low-level Wind Shear and Turbulence (Doc 9817) in 2005, and three posters related to wind shear published between 1982 and 1990 (Appendix 1).

1.2 This paper presents an initiative to develop new wind shear posters as a joint effort of WMO, IFALPA and the Hong Kong Observatory (HKO) for training and educational purposes. The meeting is invited to consider if ICAO should participate in the joint effort for the widest promulgation of the new posters to enhance aviation safety.

2. NEED FOR NEW WIND SHEAR POSTERS

2.1 Recognizing the importance of gust front and microburst as low-level wind shear hazards to aircraft, ICAO published between 1982-1990 three posters on these phenomena for training and educational purposes. These posters provide very useful information on the characteristics of the gust front and microburst and draw the attention of pilots to their hazards (Appendix 1).

2.2 In Hong Kong, China, in collaboration with IFALPA, HKO published a “Booklet on Windshear and Turbulence in Hong Kong – information for pilots” (Appendix 2) in 2002 to promulgate among pilots the latest understanding of wind shear and turbulence, alerting phraseology and alerting services at the Hong Kong International Airport (HKIA). The Booklet has been widely distributed to airlines operating at HKIA and reproduced by a number of airlines for pilot training.

2.3 In view of the positive feedback from airlines and pilots on the Booklet, HKO has explored an initiative to produce a set of wind shear posters jointly with IFALPA and WMO, with information from the Booklet simplified and tailored for the aviation users in general. The objective of the posters is to promulgate the current knowledge of low-level wind shear/turbulence hazards and their alerting techniques to pilots and meteorologists, for training and educational purposes. It is envisaged that the posters will cover the following subjects:

- ♦ Causes of wind shear (thunderstorms, terrain, sea breeze and low-level jet)
- ♦ Nature of wind shear
- ♦ Wind shear alerting techniques
- ♦ How pilots prepare for wind shear encounter

2.4 The three existing ICAO posters on wind shear were prepared two decades ago and are now due for an update. Jointly published posters by WMO/IFALPA/HKO with ICAO could be given the widest distribution within the aviation community for enhancement of safety. The meeting may wish to consider this suggestion and formulate the following draft Conclusion:

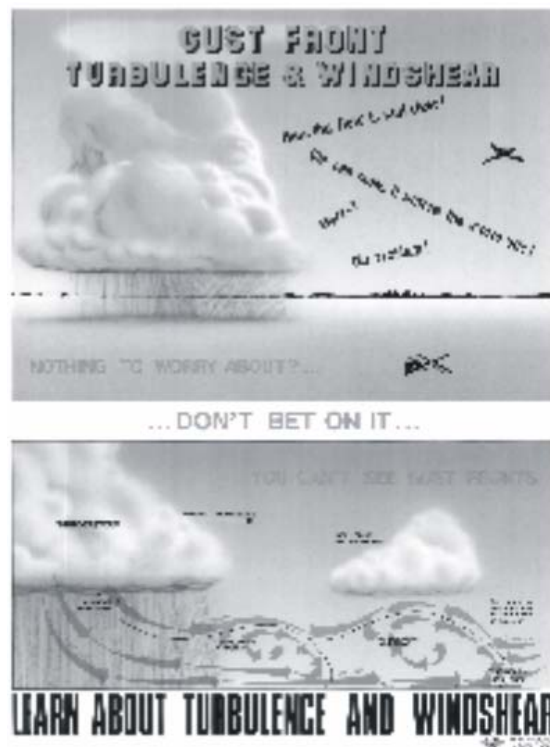
Draft Conclusion 10/xx – Development of New Wind Shear Posters

That, ICAO be invited to consider updating the wind shear posters for training and educational purposes, based on the posters being developed by Hong Kong, China in collaboration with WMO and IFALPA.

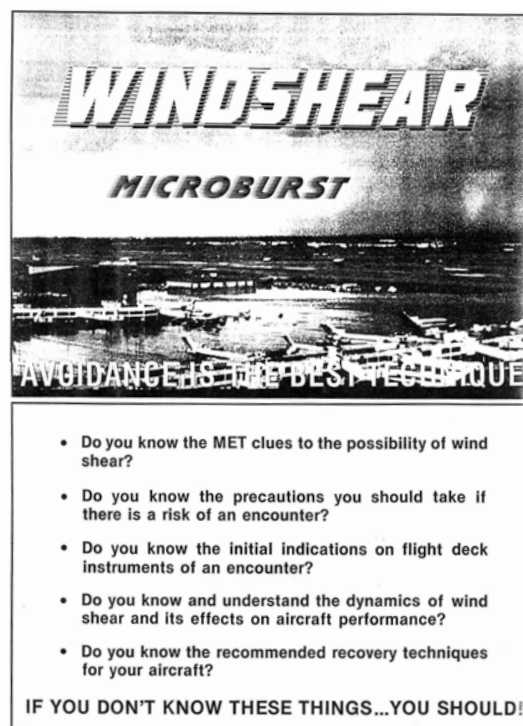
3. ACTION BY THE MEETING

3.1 The meeting is invited to:

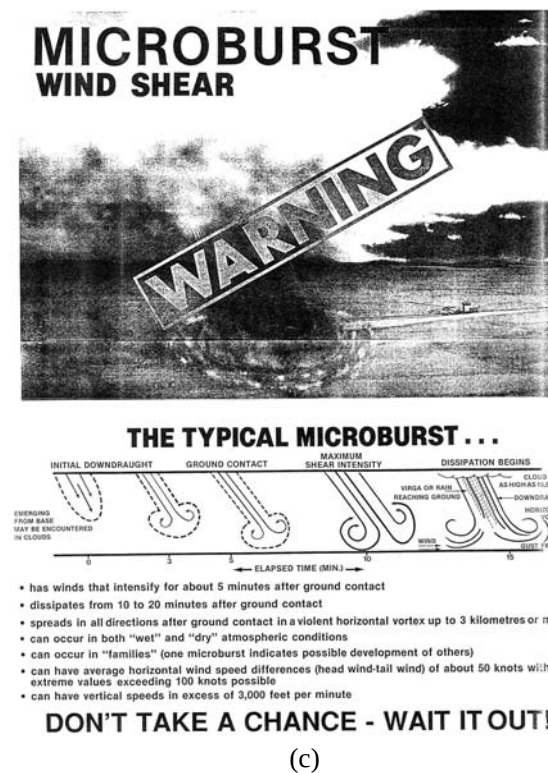
- (a) note the information in this paper; and
- (b) agree on the proposed draft conclusion.



(a)



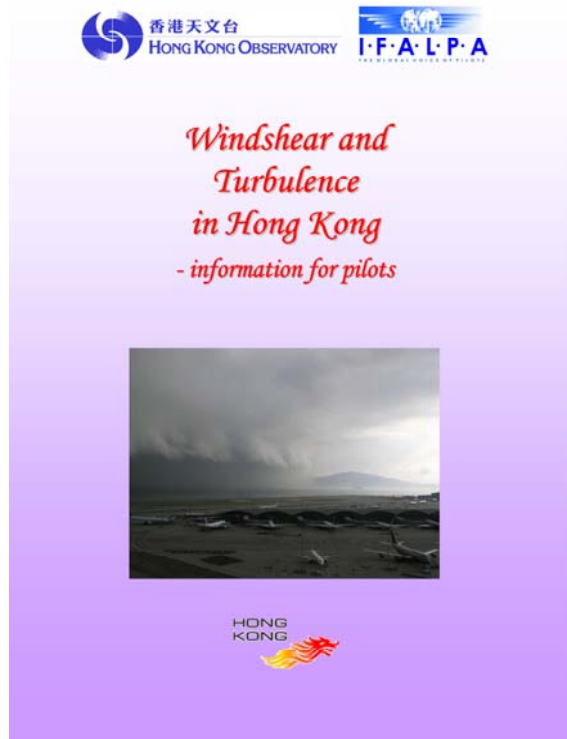
(b)



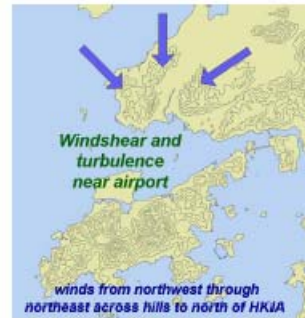
(c)

ICAO Wind Shear Related Posters:

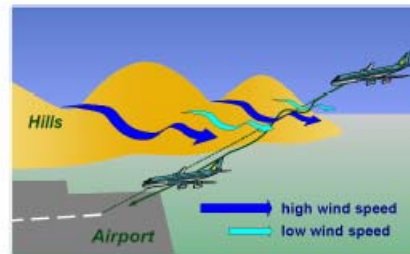
- (a) Gust Front Turbulence and Windshear (P621) – 1982
- (b) Windshear – Microburst (P683) – 1988
- (c) Microburst – Wind Shear (P686) – 1990



(a)



On windy occasions, such as the approach of a tropical cyclone, air streams of high wind speed may emerge from mountain gaps. Lying between these high-speed air streams are air streams of lower wind speed. Aircraft, traversing through alternating high-speed and low-speed air streams, may encounter headwind losses and gains at different locations along the approach and departure corridors (refer to the first example on page 14).

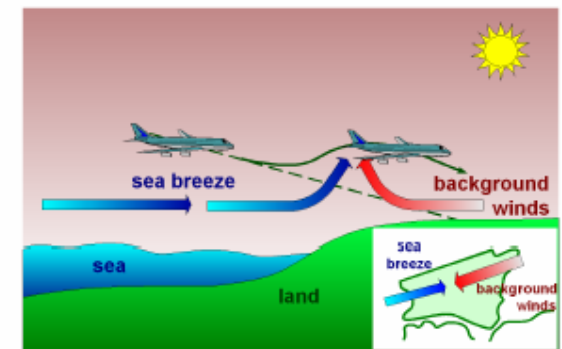


(b)

What is 'sea breeze'?

Sea breeze usually develops under fine weather and light wind conditions. At HKIA, the onset of sea breeze is typically characterized by winds turning westerly over the western part of the airport. With prevailing easterly winds blowing in the background, significant windshear in the form of headwind gain to an aircraft may develop along the runways.

While not frequent, windshear of 20 knots or greater associated with sea breeze may occur under background easterly winds of 10 knots or higher. This weather phenomenon occurs more in winter and spring. Turbulence, in addition to windshear, is known to occur in a sea breeze.



(c)

HKO/IFALPA Booklet on Windshear and Turbulence in Hong Kong – information for pilots:

- (a) Cover page of second edition (2005)
- (b) Schematic on wind shear induced by terrain
- (c) Schematic on wind shear induced by sea breeze