

Some Important Things You Should Know about the Windshear and Turbulence Warning System (WTWS)

By Captain Brian Greeves

This is a short article about the Windshear and Turbulence Warning System (WTWS). A booklet will be published shortly by the Hong Kong Observatory (HKO), which contains more detailed information. This article is, however, based on that information and thanks are due to the Observatory for its assistance in preparing this article.

There are three important points that need to be emphasised. These are phrased as questions:

What does "First Encounter-Maximum Intensity" mean?

The whole of the WTWS uses the same alerting logic as the Terminal Doppler Weather Radar (TDWR), which is part of the WTWS, and is also operational in various airports in the US. This is called the "First Encounter-Maximum Intensity". So what does this mean to you? It means that the location (Runway, 1nm, 2 nm or 3 nm for either approach or departure) will be the location at which wind shear of +/- 15 knots or greater is "First Encountered". The "Maximum Intensity" is the maximum loss or gain encountered, anywhere during the 3 nm corridor on approach or departure.

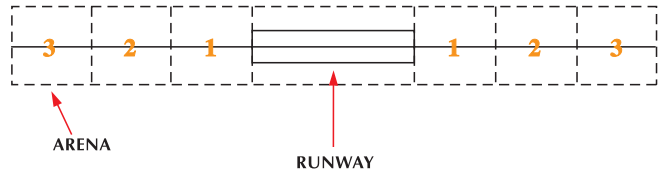
Example 1 "Caution. 25 Left Arrival. Windshear alert minus 25 knots 3 mile final."



Look at the Example 1 above. An aircraft making an approach to 25 Left encounters a windshear of minus 20 knots at 3 nm, but the maximum intensity is minus 25 knots at two miles. The alert generated is.... "minus 25 knots (maximum intensity) 3 mile final (first encounter)". This is not ideal, but it is what's available with the present technology. The important point to remember is that the maximum wind shear may be encountered anywhere from the first alerted location down to the runway (on approach) or to 3 nm (on departure.)

What is a "Microburst Alert" (MBA)?

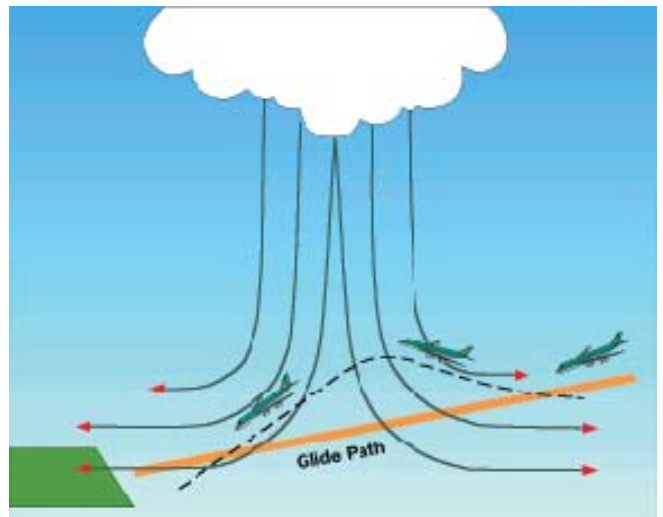
In terms of the WTWS, it means only one thing. The TDWR has detected a loss of 30 knots (-30 knots) or more in rain, somewhere along the corridor shown below (technically known as the "ARENA" -AREa Noted for Attention).



The TDWR needs particles in the air to detect the Doppler shift (that's how it works) and this is normally provided by precipitation. In Hong Kong, however, the "MBA" may be "terrain induced" and not caused by "CuNimb" clouds.

What does this mean?

When we took our "met." exam for our ATPL/CPL, the textbook told us that a microburst looked like the one below ie. a strong symmetrical downdraft coming out of a big, nasty cloud.



Well, that is the ideal theoretical world, although it can happen like this in practice, as some of us have experienced. The first point, however, is that microburst can also be

asymmetric and the second point is an “MBA” is just a terminology used to describe a very significant wind loss i.e. minus 30 knots or more in the direction of the runway. In Hong Kong, if there is a cloud around and a strong southerly flow over Lantau, there may be a MBA or WSA (windshear alert) being detected, particularly on the southern runway. The TDWR does not know, however, whether this is induced by terrain or convective activity – it is not that smart, but you are!

So, if you are carrying out an approach, you may not experience the “classic” headwind gain and lift, associated with a “text book” microburst, prior to encountering the headwind loss and sink. You will just get the headwind loss and sink and, if you are not prepared, it could be a very nasty experience. If you have not already done so, read the account of the A340, which is pinned up on the flight safety board in Cathay City

So:

1. Remember that the first encounter may not be the worst encounter!
2. Remember that an “MBA” means a minus 30 knots or more loss in the direction of the runway, and finally,

3. Remember that the “microburst” (or significant wind shear) may only have a headwind loss and sink – use the 2000 feet wind to help assess the conditions.

(Note: This article is for guidance and education and is in no way intended to replace Company SOPs)

Finally the HKO really needs your help – if you encounter wind shear or turbulence, please give a pilot report to ATC. If you don’t find it and it is being forecast and/or alerted, the HKO still needs to know, so tell ATC. Your reports and answers to the surveys have already been used to enhance the system. Thanks to all of you for the feedback – keep it coming!

For further information, read the extracts printed by Jeppesen, which are taken from the excellent guide contained in the Hong Kong AIP and the HKO Booklet, which will be delivered to your mailboxes within the next few months.

Next edition of *The Flyleaf*: “The Lidar is here!” 

