



WEATHER Newsletter for the Aviation Community **ON WINGS**

Issue No.23 July 2005 



Help Us Help You —
**Improving weather service
through partnership**



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Issue No. 23

July 2005

HEADLINE

World Renowned Windshear Work of the Observatory	1
Hong Kong – The Hub of World Weather Information	1

FEATURE

A Long Partnership	2
General Aviation Flying in Hong Kong	4
Effective Dispatcher	6

NEW PRODUCTS AND SERVICES

Weather Information for General Aviation	7
Lightning Location Information System	8
Upgrade of Windshear Information for Pilots	8
Receiving Data from Fengyun-2C Meteorological Satellite	9
Visualizing Cloud Height from Satellites	9

WEATHER EVENTS

Dense Fog Blanketing the Airport	10
"Red Rainstorm" on 24 June	10
Catching the Eddies	11

STAFF MATTERS

Man of many talents	12
New Staff	12

OUTREACH

13

MEETINGS AND VISITS

16

In this issue - A new look with enhanced contents

To better serve different audiences and in response to readers' feedback, the original bilingual version "Weather on Wings" is now separated into two language versions - Chinese and English. The layout has also been revised to give a fresh look.

In this issue, we cover more stories from our *partners* -

"A Long Partnership" - long collaboration with Captain Brian Greeves of the International Federation of Airline Pilots Associations (IFALPA) (pages 2-3),

"General Aviation Flying in Hong Kong" - new partners from the general aviation community (pages 4-5) and

"Effective Dispatcher" - a major user group of the aviation weather services (page 6).

Through closer collaboration with partners, we hope we would better understand the user's needs and seek further advancements.

"Weather on Wings" is one of many ways in which we aim to maintain the close links we already have with many of you, and hopefully foster many more. We hope you enjoy reading it and please feel free to share with us your feedback via email: outreach@hko.gov.hk.

Editorial Board

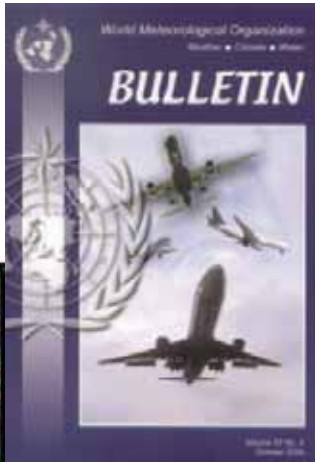
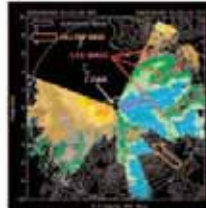


World Renowned Windshear Work of the Observatory

Published early this year, the October 2004 issue of the World Meteorological Organization (WMO) Bulletin contains an article titled "Windshear and turbulence alerting at Hong Kong International Airport" contributed by Mr. C. M. Shun, Senior Scientific Officer of the Hong Kong Observatory.

The WMO Bulletin is a quarterly official publication of the WMO. The October 2004 issue was dedicated to aeronautical meteorology. A contribution by invitation of WMO, the Observatory's article illustrates how "low-level wind shear at Hong Kong International Airport is

addressed, using a combination of science, high-end technologies and user education", the Editor wrote. This is a second time the Observatory is invited to write on its windshear and turbulence work in internationally renowned journal, the last time being the article "Ongoing research in Hong Kong has led to improved wind shear and turbulence



alerts" in the March 2003 issue of the International Civil Aviation Organization (ICAO) Journal.

"It is indeed an honour for us to be invited again to write on our windshear work in internationally renowned journals. Apart from being a vindication of our efforts in the past several years for the Hong Kong International Airport, we hope the Hong Kong experience so promulgated would be useful to other airports in the world," Mr. Shun said.

The WMO Bulletin article can be viewed on the Observatory's website at <http://www.weather.gov.hk/publica/reprint/r566.pdf>.

Hong Kong – The Hub of World Weather Information

Hong Kong Observatory Operating Websites Delivering Official Weather Information Worldwide for the World Meteorological Organization

The World Meteorological Organization (WMO) entrusted the Observatory in 2000 to design, develop and host two WMO websites on worldwide official weather forecasts and warnings, which began operation as pilot projects in 2002.



The WWIS website contains official city forecasts, climatological information and official weather observations. As of July 2005, forecasts for 1054 cities from 106 WMO Members are provided.

The two websites are respectively the World Weather Information Service (WWIS) (www.worldweather.org) and the Severe Weather Information Centre (SWIC) (severe.worldweather.org). They represent the joint effort of the national meteorological authorities worldwide to provide an authoritative source of official weather information for easy access by the public and the media through the internet.

In the recent WMO meeting in St. Petersburg in February, much compliments were received from fellow

meteorologists. The meeting decided that the two websites be declared formal operation on 23 March 2005, after a two-year trial.

The Director of the Hong Kong Observatory, Mr. Lam Chiung, said, "We are very proud to have played a central role in this successful WMO project. The HKO has demonstrated itself to be a very effective agent in bringing together the developed as well as the developing countries, to implement an information service useful to the global community."



Director of the Hong Kong Observatory (centre) and Assistant Directors announcing the official operation of two websites "WWIS" and "SWIC" at a press conference on the World Meteorological Day 2005.

A Long Partnership

Having a father in the Royal Air Force, Captain Brian Greeves wanted to be a pilot since the age of 7. He served the Air Force at 16 and began to fly in 1967. The Captain joined Cathay Pacific Airways in 1987 and shortly after that, started a long partnership with the Hong Kong Observatory (HKO). In this article, the Captain will share with us his feelings, excitements and valuable experiences.



Captain Brian Greeves in the cockpit.

The Partnership

Captain Greeves started his collaboration with HKO as early as 1993 on the Operational Windshear Warning System (OWWS).

His observation on HKO is that there is a huge amount of work put in by HKO forecasters and other staff in trying to produce good forecasts in accordance with International Civil Aviation Organization (ICAO). Many HKO staff are involved in international scenes in different groups. Recently, HKO was being asked to develop standard protocols for the aviation society, reflecting a small office being asked to take the lead and be the leader.

Captain Greeves values the chance to participate in the "Liaison Group on Aviation Meteorological Services" (of which he is a founder member) and various other projects. Not many countries have this kind of organisation as the Liaison Group that Hong Kong has. It is an extremely useful forum for every body and is being appreciated by many people.

Having an accurate forecast is vital on one hand, but having a forum, such as the Liaison Group on the other hand, will help HKO understand the customer needs, accept criticisms and modify quickly. Therefore, it won't lag behind in implementing what users really desire.

What's more important is that it produces something not created by just one party, but through team work. Over 10 years of this kind of mutual involvement and partnership, it becomes a model for airports globally.

The International Federation of Airline Pilots Associations (IFALPA) now has an "Airport Liaison Representative Programme" to provide contributions from pilot's perspective. This programme, which was built mainly on the Hong Kong experience and used Hong Kong example as a template.

The best forecast ever

Flashing back to the old days, Captain Greeves recalled an occasion when he needed to fly from Farnborough to West Freugh in the United Kingdom.

The forecast was bad weather for West Freugh. He then talked to a local forecaster in West Freugh who had been in the place for 20 years. He advised the Captain to come back around 3:30 in the afternoon, when he would stand a good chance. The Captain did, the sky opened up when he arrived for a period long enough to do the landing, and then the bad weather returned.

Captain Greeves praises for this kind of accuracy, it is only possible for people who had stayed in the place long enough to understand the area and to know the local weather. Comparing with what we have today in many countries, where forecasts are mostly done by a centralized place far away from the airport, these local knowledge or wisdom is sometimes left off by the system.

The programme is being promoted to pilots and other airports worldwide. Captain Greeves stressed that its purpose is not to be critical, but to build rapport with airport personnel and work together and to solve problems, and turn airports into what he called "**Pilot Friendly Airports**".



2nd Liaison Group Meeting on Aviation Meteorological Services in 1994 at Cathay Pacific Building (4th and 5th from right: Captain Greeves and Mr. C.Y. Lam [now the Director of the Hong Kong Observatory] respectively)

One of the best things such programme can give, is a sense of pride to the people. Take Hong Kong as an example, it has won the title of "The Best Airport" five times in a row and our captain is very proud of that. He likes to think of the Hong Kong International Airport (HKIA) as "**our**" airport and this as "**our**" achievement, and not just the Airport Authority's, but of the pilots' and all the others, who have been involved in its planning, development and operation.

On Forecasting

Accuracy of forecast is extremely important; it affects pilots in every stage of the flight.

In terms of forecasting, it is becoming better and better in Hong Kong, but it is still challenging to do forecast for this small place.

For the windshear alerting services in Hong Kong, which started in OWWS, Captain Greeves watched it grew and evolved into now the Windshear and Turbulence Warning System (WTWS), one of the most sophisticated systems in the world. It has the Terminal Doppler Weather Radar (TDWR), the Light Detection and Ranging (LIDAR), and all sorts of other components putting together.

The system has indeed improved a lot. However, perception is that there are still many alerts and warnings not being validated. According to the Captain, with all the modern technology and science advancements, there are just a few steps ahead for us to get hold of the Holy Grail.

Looking into the Future

Significant weather chart is one of the key components of the flight document that pilots would make use of for flight planning. However, the current resolution still lacks the kind of details that pilots require. It would be desirable if it can give higher resolution significant weather information (e.g. depth of Cumulonimbus (Cb) and its movement etc.), then a much better flight planning would be possible.

The next thing to go is meteorological information uplink to the cockpit in real time and display on screen. Even though we already have radar onboard, it covers only about 60 miles in front of the aircraft. With data uplinking, the pilot can grasp what is going on in a much larger area, say 600 miles ahead of the flight route. This is an enabling technology that pilots are capable to plan alternations with respect to adverse weather way ahead instead of making large deviation of flight route when it comes near.

Regarding information still amiss in the cockpit, onboard LIDAR could be the next thing to pursue. There are already models emerging in the United States and Japan. By overlaying the LIDAR product on radar display, the pilots will be more confident in flying safely through turbulent areas, although it may still be bumpy and uncomfortable anyway.



IFALPA Clarence N. Sayen Award

Captain Brian Greeves was awarded IFALPA's highest honour - Clarence N. Sayen Award this year.

The Clarence N. Sayen Award was established in the 19th IFALPA Annual Conference in acknowledgement of the very active role played by Captain Clarence N. Sayen, who held the position of IFALPA President from 1952 to 1964. The award honours a person whose personal contribution towards the achievement of the Federation's aims and objectives has been outstanding and is intended to emphasise the personal effort of each recipient in furthering the progress of the Federation. The Award will not be given and will not accumulate for successive years should there be no suitable candidate in any one year.

Captain Greeves was first to introduce the idea of the "pilot friendly airport" to the aviation community and his ideas on how an airport should be designed are receiving worldwide recognition. The more remarkable thing about Captain Greeves' achievement is that it has almost exclusively been done in his spare time.

A challenging flight

"The most challenging flight I've done recently was during the typhoon season. Last year, we flew to Narita, Tokyo, and a typhoon was affecting Japan. It was not the super-super one, but still strong enough.

The forecast was for very bad weather with visibility lower than 1 km, but the main thing was wind, which was forecast to be close to the aircraft's crosswind limit.

When we arrived overhead, the weather was bad, we decided it was still suitable for an approach and that we would make a decision about whether to land or go-around at the decision height. Tokyo was raining then and the conditions were very bad with strong winds. We were carrying additional speed, to counter with the dynamic changes and in case we encountered severe wind shear and turbulence.

Our on board wind display was showing a 70 knots(kt) tail wind at the beginning of the approach and this turned into a 50 kt crosswind further down the glide slope. Our main concern, however, was the crosswind on the ground and the runway condition. The latter is reported in terms of Good, Good to Medium, Medium, Medium to Poor and Poor. These are reference to the likely coefficient of friction, which determines the ability of the aircraft to be stopped using brakes. The last pilot to land had reported that the situation was Medium, but this put the crosswind

outside our limits. The next pilot reported Medium to Good and this allowed us to continue the landing. The touchdown was uneventful and we taxied in.

The wind increased in strength, but then calmed down, as the eye of the storm passed over head. I suggested to the ground staff that we took this opportunity to depart, as we would be unable to do so once the wind increased in strength again.

We managed to board some 250 passengers and hurried off, departing while the wind was increasing. There were some tense moments, holding at the threshold for take-off clearance, as the wind steadily increased and got very close to our maximum take-off crosswind limit. Once we were airborne, we encountered severe turbulence, but this abated somewhat as we climbed higher. Nevertheless, the initial part of the flight was very bumpy, with seat belt sign on for around two hours. It was an afternoon, but appeared like night time, and then the sky cleared up, we could see the sunset.

*The storm and its eye were clearly defined on radar. Looking outside the cockpit, I could actually see the rain bands and the cloud wall surrounding the typhoon eye, and then there was the setting sun shone in through the cloud free areas. It felt like a movie scene in **'The Day after tomorrow!'** It was a really awe-inspiring experience."*

General Aviation Flying in Hong Kong

Local weather condition is crucial to the safety of General Aviation flying in Hong Kong. Captain Gupta, the Chief Flying Instructor of the Hong Kong Aviation Club was invited to share with us his experience of flying in Hong Kong.

Biography

Captain S. K. Gupta joined the India Air Force in the year of 1957. In the seventies, he had been lent to various places to train up pilots there. He is very fond of flying acrobatics and is now the Chief Flying Instructor of the Hong Kong Aviation Club.



Captain Gupta ready for acrobatics at the 2004 China Air Rally in ZhuHai.

Link with old Kai Tak Airport

In 1998, the opening of the new international airport at Chek Lap Kok (CLK) has resulted in the closure of the famous Kai Tak runway. Nevertheless, the Hong Kong Aviation Club, which aims to promote all aspects of General Aviation flying, continues to provide flight training, on fixed-wings and helicopters.

At present almost all flying activities of the Club take place at Shek Kong during weekends, helicopter flights may still use the Club's campus at Kai Tak. "We miss Kai Tak runway. Our Club House at Kai Tak still provides all social club activities," said Captain Gupta.

General Aviation Flying in Hong Kong

Fixed-wing flying is available for members to fly on Saturdays and Sundays from Shek Kong. To ensure flight safety and Civil Aviation Department (CAD) regulation compliance, all flights have to be performed in day time.

"A typical flight would be taking off at Shek Kong, then enter the New Town, Tolo, Mirs Bay, sometimes fly over to Waglan, Victoria Harbour, Hong Kong South and then back," he said. (Fig.2)

Helicopter flying training is conducted seven days a week from Kai Tak. On Saturdays and Sundays, helicopters also fly from Shek Kong.

Enthusiastic pilots take up aerobatic training on fixed-wings. "We are starting close formation course. We have been conducting Fixed Wing Assistant Flying Instructor Courses. On volunteer basis, our members give free flight experience to young students and the Hong Kong Air Cadets," the Captain said.

Weather — utmost concern

Local weather is crucial to flight safety. According to Captain Gupta, three weather elements that are of utmost concern to pilots in deciding whether or not to send pilots up are wind, visibility, and cloud base height.

Wind

"Over 95% of our flights make use of the Kadoorie Gap (Fig.1) as the entrance and exit. When gap wind flow increases, it gives rise to wind shear and turbulence, which makes the flight very bumpy and shaky and hence it is the major concern of our pilots," said Captain Gupta.

Based on their experience, the turbulence level is related to wind strength. "The usual thing we do is not to send students to fly through the gap whenever strong up draughts or down draughts are present," said Captain Gupta.



Fig.1 - Kadoorie Gap (to the east of Shek Kong)

Visibility

"When winds are relatively strong, visibility conditions are usually good, despite that the flight may be a bit uncomfortable and bumpy. On the other hand, when it is calm and has light wind, low visibility follows, possibly due to haze, pollution and dust, it becomes the most annoying factor," he said. "Flights are not allowed when visibility is less than 5 km. We will check the Regional Visibility Information available from the Hong Kong Observatory Website to assess the general conditions over the whole region for flight planning purpose. In addition, we will send out our own flying instructors to check the actual visibility conditions if necessary before sending students up," said Captain Gupta.

What is General Aviation?

General Aviation encompasses all aviation other than scheduled airline flights and military aviation.

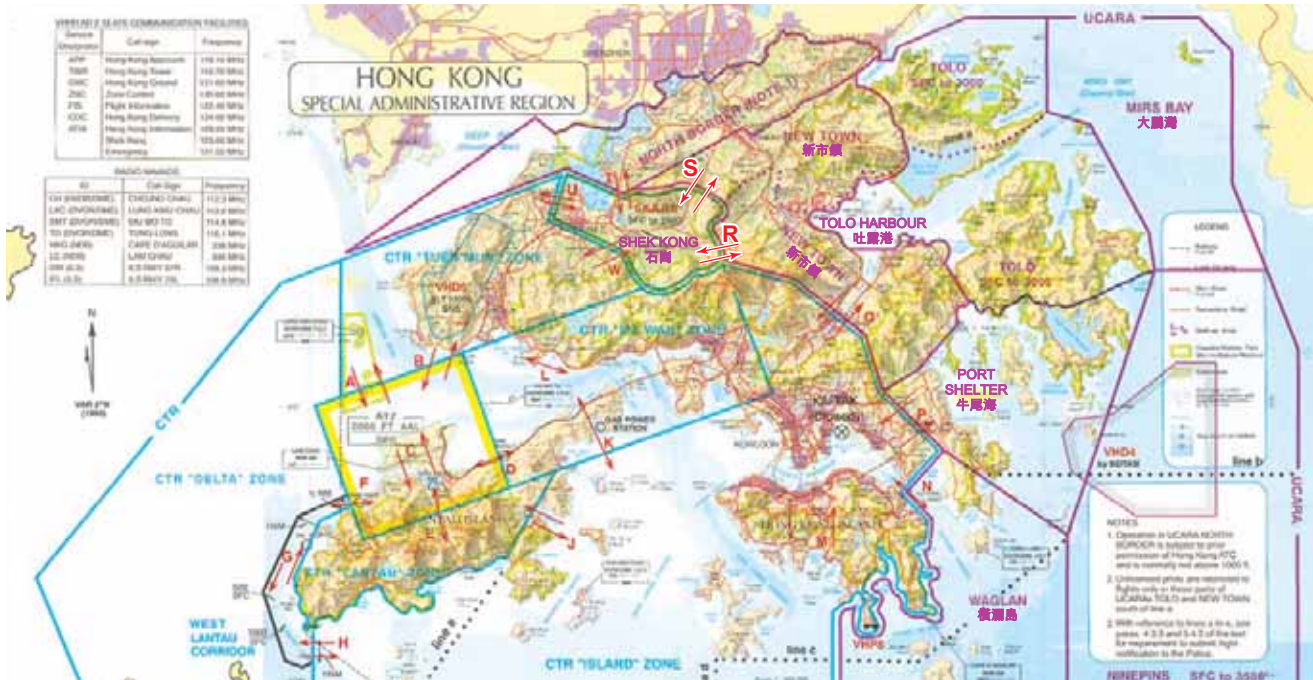


Fig.2 Aviation Club members can fly in the Uncontrolled Airspace Reporting Areas (UCARAs) which are enclosed by purple lines on the map. R - Kadoorie Gap (also see Fig.1) S - Fire Station Gap

Cloud Base Height

Condition of clouds is equally important. "As our pilots will not fly into clouds, accurate cloud base height forecast is most desirable. However, there are substantial regional differences of cloud base height even in an area as small as Hong Kong, because of the complex topography," said Captain Gupta.

Helping Hand

"Hong Kong Observatory currently provides lots of weather information for the international civil aviation. In recent years, more and more regional weather information (e.g. wind, visibility, radar etc.) have been added to provide useful reference for the local aviation communities in Hong Kong," said Captain Gupta.

With the recent set up of the "Liaison Group on Weather Information for General Aviation", regular meetings with local general aviation users provide another effective channel for them to voice out their specific requirements.

"It is envisaged that cooperation of this kind will enable the Observatory to develop more weather products that suit the need of our operations. We really appreciate that," concluded Captain Gupta.



Fig.3 Assistant Director Mr. H.G. Wai (second from the left) and other Observatory staff visited Hong Kong Aviation Club in April 2005. President of the Hong Kong Aviation Club, Mr. Alex Yan, (first from left) flew a short trip with the fixed-wing behind to let them experience fixed-wing flying.

DO NOT TAKE CHANCE WITH WEATHER

"Shek Kong Airbase is enclosed by high hills. Aircraft flying out of Shek Kong airbase depart and return to Shek Kong through "Gaps".

Last year summer time during southwest monsoon period local weather was fair for flying. One of the experienced pilots flying Cessna C-172 was airborne and flying in Port Shelter area (Fig 2). Controller of Chek Lap Kok Air Traffic Control (ATC) informed me that low cloud and rain was approaching from the southwest. I then recalled all aircraft immediately to land back at Shek Kong. The pilot flying in Port Shelter was planning to return to base. However, Port Shelter and hills around got covered with low clouds and rain. The pilot got caught up with bad weather.

With the coordination of ATC radar controller and Airport Meteorological Officer, the pilot was guided from Port Shelter to Tolo area. However, by that time Kadoorie Gap and Fire Station Gaps were covered by low cloud and rain and the pilot couldn't get through the gaps. I then instructed the pilot to remain in Tolo sector. After a long wait of about 20 minutes, Kadoorie Gap started to clear up of cloud and rain. I immediately asked the pilot

to fly in through the Kadoorie Gap. At last, the pilot landed safely at Shek Kong."

"It was really an unforgettable experience," said Captain Gupta.

Captain Gupta's advice for General Aviation pilots:

"PLAY SAFE- DO NOT TAKE CHANCE WITH WEATHER."

"General Aviation pilots should be familiar with the weather situation, seasonal changes of weather in Hong Kong. Before getting airborne, remember to check the weather trend through the Hong Kong Observatory website."



Captain Gupta is accessing the latest weather information through the Observatory's website at Kai Tak office.

Effective Dispatcher

We dispatch — in rain or shine

In this issue, we pay tribute to those working behind the scenes — Aircraft Dispatchers, making Hong Kong International Airport (HKIA) an airport of good reputation, which we are all proud of.

Messrs. Bruce Ting and Edmund Li of Jardine Aviation Services Group, one of the ground handling agents for the HKIA, have been aircraft dispatchers for years. Their main duties are to serve the customer airlines by preparing the flight plan and pre-flight documents for the flight crews. They both enjoyed their work as aircraft dispatchers and they found the work interesting. "We have the opportunity to meet pilots from all over the world and also provide them with the first-hand information on the weather conditions."

Mr. Ting and Mr. Li work on shifts to handle flights for more than 20 airlines. "We normally start preparing the flight plan and the flight documents for the flights a few hours before departure", said Mr. Li. The flight plan includes the routes the aircraft will take and the estimated fuel consumption for the flight. Of utmost concern to the pilots are the weather conditions for the departure and arrival airports as well as the weather enroute. After preparing the flight documents, Mr. Ting and Mr. Li have to brief the air crews regarding the flight plan and the weather situation.

Mr. Raymond Kwok, also working in Jardine Aviation Services Group, has been the supervisor of the dispatchers. Mr. Kwok joined Jardines since the days of the Kai Tak Airport. "I joined the field as I have deep interest in aircraft and also weather.", said Mr. Kwok. To receive training in the field, Mr. Kwok attended the "Station Operations" training in the United Kingdom, the Federal Aviation Administration (FAA) training in the United States and received the dispatcher license in the profession.

Mr. Kwok had witnessed the move of the airport from Kai Tak to Chek Lap Kok in 1998. Despite Chek Lap Kok Airport is newer and larger than the Kai Tak Airport. Mr. Kwok found that the most unforgettable time was the old Kai Tak days. "There were two runways in the Kai Tak Airport, Runway 13 and Runway 31. When Runway 31 had to be used, aircraft taking off the runway had to fly just above the crowded buildings in the Kowloon City. During those days, we needed to frequently liaise with concerned department for the off-loading of cargo in order to meet the safety requirements", remarked Mr. Kwok. "Also, there were no automatic Aviation Meteorological Information Dissemination System (AMIDS) at that time. We had to monitor and consolidate the weather phenomenon (e.g. wind direction/speed, temperature and QNH) from closed circuit



Mr. Kwok (left), Mr. Ting (right) and Mr. Li (center) explaining how they use the Observatory's information on AMIDS to prepare flight documents.

television (CCTV) - the former Met page, every half-an-hour for reference by the pilots. It was quite a tedious task. Now with the longer runway in Chek Lap Kok and technology advancement as well as the availability of the Observatory's AMIDS, our work has been streamlined and improved."

According to Mr. Kwok, the task of the aircraft dispatcher is most challenging during tropical cyclone situations. "Many flights would be cancelled with the approach of the typhoon. However, we would still get enquiries from the airlines and the air crews for the latest information on the typhoon and also on the local weather conditions. We need to monitor closely the weather radar pictures and wind conditions provided by the Observatory and even call the Airport Meteorological Office directly for the latest assessment of the weather situation during the time", said Mr. Kwok. "Each type of aircraft will response differently to the wind conditions. We have to calculate the effect of the strong winds, in particular cross wind, on the aircraft. We also classified the 'Tropical Cyclone Conditions' cautiously in order to advise Headquarter Dispatch Office prior to making operational decision", Mr. Kwok continued. "However, with the departure of the typhoon and the cancellation of tropical cyclone signals, many flights that have been cancelled/delayed will resume in a short period of time and the air traffic will increase significantly. We have to prepare all the flight documents for many airlines almost non-stop at the same time. Dispatchers will be most busy during that time. However, the hectic work would soon be over and replaced by satisfaction. After all, it is meaningful to provide air crews with information which are crucial to air safety".



Director of the Hong Kong Observatory Mr. C.Y. Lam (second from right) gave representatives of the local aviation community a warm welcome to the first meeting.

Weather Information for General Aviation

First Meeting of the Liaison Group on Weather Information for General Aviation

In view of the increasing demand on weather information for general aviation in Hong Kong, the Hong Kong Observatory established a "Liaison Group on Weather Information for General Aviation" to collect requirements and views from the local aviation community. Representatives from different sectors of the community, including helicopter companies, the Government Flying Service and the Hong Kong Aviation Club, were invited to join the liaison group.

The first meeting of the liaison group was held on 6 May 2005 at the Hong Kong Observatory Headquarters. Through regular meetings with the clients, new initiatives and ideas to further improve the weather services for general aviation could be explored.

Weather Information for General Aviation

During the first liaison meeting, weather information for general aviation in Hong Kong was highlighted.

(1) Aviation Meteorological Information Dissemination System, best known as AMIDS:

(a) Visibility readings in Hong Kong Waters



What is General Aviation?

General Aviation encompasses all aviation other than scheduled airline flights and military aviation.

(b) Regional wind information



Newly added wind stations : Tap Mun, Tate's Cairn, Ngong Ping, Tai Mei Tuk, Kai Tak, Bluff Head and 3 weather buoys (WB1, WB2, WB3) around the Hong Kong International Airport.

(2) New "Dial-a-weather" System (DAWS) - 1878200

The new DAWS provides wind reports over various regions of the territory. This new service facilitates those who are having outdoor activities.

The public can access the regional wind information by calling the DAWS at "1878200" with a tone dial phone and selecting channel "322".

(3) Aviation Sports Webpage on Internet

The Aviation Sports webpage includes Thermal Index and the Soaring Index which provide indication on the amount of lifting due to upward air currents.



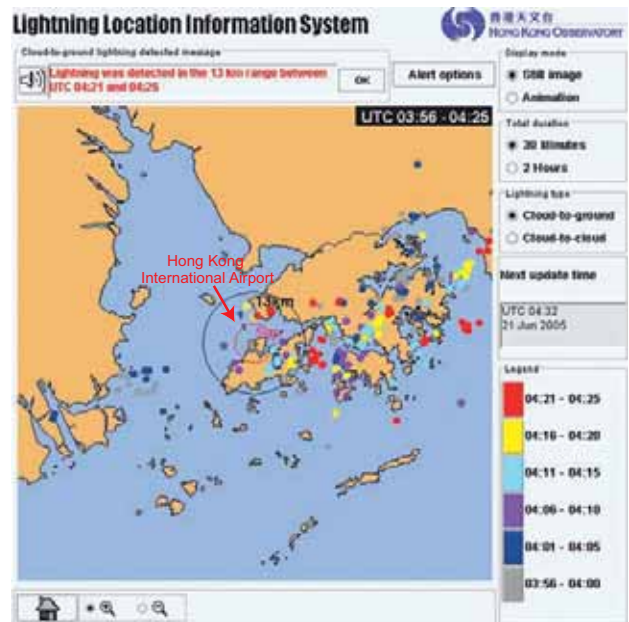
<http://www.weather.gov.hk/aviat/soaring>

Lightning Location Information System

(Addy Fu)

The Hong Kong Observatory has recently developed a Lightning Location Information System (LLIS) and has put it into operation. With the support of the meteorological authorities of Guangdong and Macao, parts of the system have been installed in Guangdong San Shui and Macao. This enables the area of coverage of the system to encompass the entire Pearl River Delta, including the whole of Hong Kong and the Hong Kong International Airport (HKIA), hence greatly facilitating lightning protection in the region.

To cater for the interest of aviation users, a specialized application is launched on the Observatory's Aviation Meteorological Information Dissemination System (AMIDS). Aviation users will be able to obtain first hand lightning information around the airport through the on-line system. Different colours displayed indicate different timing of lightning detection, through which the movement of the lightning activities could be envisaged. The figure shows the thunderstorm lightning event which affected the HKIA on 21 June this year.



Lightning location information on the AMIDS.

Upgrade of Windshear Information for Pilots

(S.T. Chan)

The windshear warning, when issued by the forecaster for broadcast on the Automatic Terminal Information Service (ATIS) of the Hong Kong International Airport, used to apply to all approach and departure corridors. With the introduction of more advanced windshear detection facilities and improved alerting techniques, the forecaster is now able to tell more precisely the location of windshear occurring at the airport. Taking effect from January 2005, only the approach/departure corridors affected by windshear will be warned. For example, users will hear on the arrival ATIS broadcast "Significant Windshear Forecast 07R" when windshear is expected to only affect the approach to runway 07R (i.e. the western approach to the south runway). Such runway-specific warnings are much desirable as the windshear sometimes affects certain but not all the corridors.

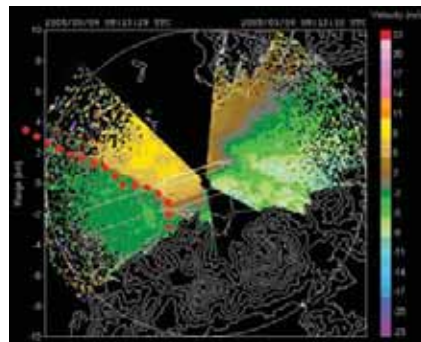


Fig. 1 A low-level LIDAR scan taken at 0813 UTC (4:13 p.m. local time) on 6 March 2005. The red-dotted line marks the location where windshear occurred. A warning was issued for the western approach but not the eastern one.

One example is illustrated in the LIDAR (Light Detection And Ranging System) imagery during a windshear episode caused by sea breeze where only the western corridors were affected (Fig.1). This prompted the duty forecaster to issue a windshear warning valid for the western approach corridors only. The warning was later validated by six aircraft landing over these corridors.

At the same time on ATIS, we also adopt the latest international practice in windshear and turbulence phraseology to qualify a warning as 'FORECAST' when it is

based on meteorological assessment of the forecaster. If the warning has been validated by pilot reports, it will be qualified as 'FORECAST AND REPORTED'.

In response to users' request, the hill top wind on Lantau Island south of the airport will also be given in the arrival-ATIS as "2,500 ft estimated wind" when it reaches a speed of 35 knots or more. This is to help pilots get prepared for the possible wind changes expected on approach.

It is expected that the more specific windshear information on ATIS could

enable the pilots to perceive the windshear conditions at the airport more easily. For airline operators and flight dispatchers, the windshear information is also available in the local routine reports in the Observatory's Aviation Meteorological Information Dissemination System (AMIDS).

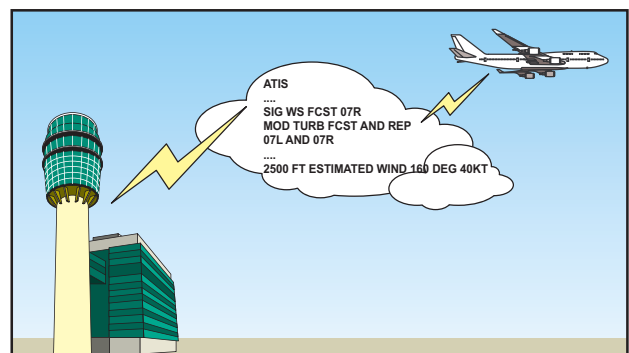
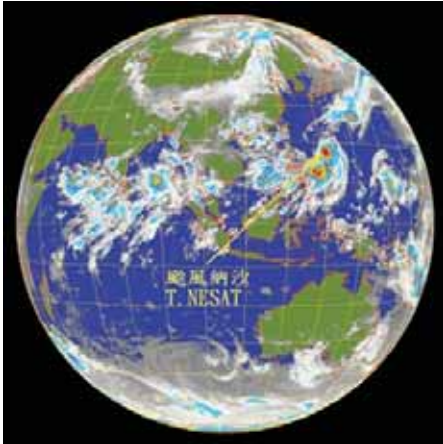


Fig.2 The pilot receives through ATIS (a) windshear and turbulence warning; and (b) the hilltop wind.

Receiving Data from Fengyun-2C Meteorological Satellite

(L.O. Li)



A picture by Fengyun-2C on 5 June 2005, on which Typhoon Nesat was captured clearly.

The Fengyun-2C meteorological satellite was successfully launched at the end of last year by the China Meteorological Administration. The Observatory is now receiving meteorological data broadcast from the satellite. Aviation users can access the cloud pictures captured by this satellite on the Observatory's Aviation Meteorological Information Dissemination System (AMIDS). The satellite is located at about

36,000 km over the equator at longitude 105°E. It will send back cloud images 24 hours a day over Asia, Western Pacific, Australia, Indian Ocean and part of Eastern Africa. These satellite images enable pilots and flight planners to get hold of the weather change along the flight route, and are especially useful for flights to the African and European countries.

Visualizing Cloud Height from Satellites

(C.K. So)

In preparing the flight plan, the pilots are probably most concerned on the weather situation near the flight routes — in particular, whether there are strong convection on the flight routes which will affect flight safety.

Currently, the Hong Kong Observatory is receiving satellite images from the two Earth Observing System (EOS) satellites. The images taken by the satellites can help to observe the cloud distribution and convective activity. These satellites are operated by the U.S. National Aeronautics and Space Administration (NASA), and are encircling around the Earth at a height of 700 km. The Observatory is receiving the multi-channel high resolution images from the satellites 4 times a day. These images can help to provide information on the cloud type, coverage area and the cloud top heights, etc.

Figure 1 is a 250-metre high-resolution true colour image taken by the EOS satellite at 11 a.m. on 10 June 2005. It can be seen that the north-western part of the Philippines

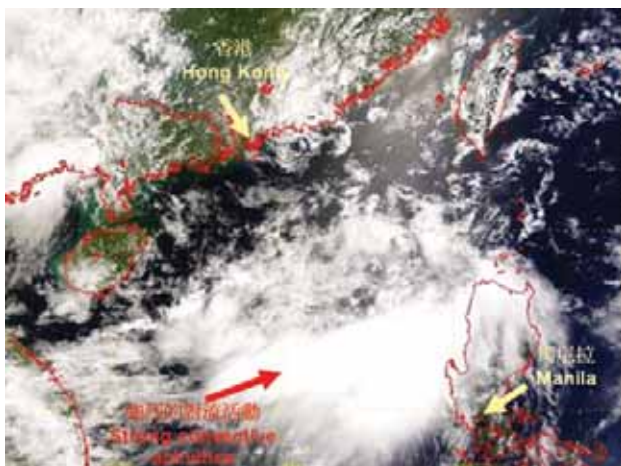


Figure 1: True colour image taken by the Earth Observing System (EOS) satellites at 11 a.m. on 10 June 2005.

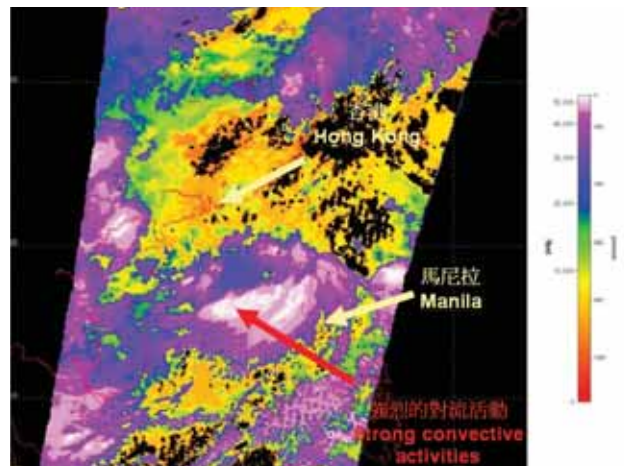


Figure 2: Cloud-top height image prepared from the multi-channel data from the Earth Observing System (EOS) satellite at 11 a.m. on 10 June 2005.

was affected by a broad band of high cloud associated with severe convective activities.

Figure 2 is the cloud-top height image at the same time. It can be seen that the individual cloud top (in purple-white) near the Philippines extended to a height of above 45,000 feet (15,000 m). A Cathay Pacific flight CX906 departed from Manila at 11a.m. encountered turbulence during its flight to Hong Kong. The encounter position was about 100 nautical miles (190 km) from Manila near the periphery of this region.

The Hong Kong Observatory is planning to disseminate the corresponding images on the Aviation Meteorological Information Dissemination System (AMIDS) during the third quarter this year, with the aim of providing useful weather information to the pilots and those involved in flight planning.

Dense Fog Blanketing the Airport

(S.Y. Lau)



Fig.1 Photo of HKIA in dense fog, taken at 7:30 a.m. 25 February 2005, looking to the south from the control tower.

When considering impact of weather to air traffic, one might think of severe weather such as tropical cyclones and thunderstorms. However, adverse low visibility conditions can also produce major disruption

to air traffic. Take the case of the poor visibility episode on 24 and 25 February 2005, the poor visibility had resulted in 23 diversions. This was more than the total number of diversions due to severe weather during the whole of 2004.

A maritime airstream brought humid and foggy weather to Hong Kong on 24 and 25 February (Fig 1). At the peak of the episode, in the morning of 25 February 2005, visibility at the Hong Kong International Airport (HKIA) dropped to a minimum of 200 m. This was the lowest ever observed at HKIA, breaking the previous record set on 9 April 1997.

With the runway visual range below 200 m over the north runway in the early morning of 25 February, all arriving aircraft had to land on the south runway leading to significant delays. 46 flights were delayed or diverted due to the poor visibility. The Airport Emergency Centre had to be activated to coordinate the rescheduling of aircraft movements. The fog finally lifted around 11 a.m. upon the arrival of an easterly monsoon.

At HKIA, low visibility is usually associated with fog, mist, haze and rain. Ignoring poor visibility due to rain, in the first quarter of 2005, there were 47 hours when visibility was below 1500 m. This was significantly higher than the 9 and

6 hours recorded in the first quarter of 2004 and 2003 respectively.

At HKIA, mist/fog usually occurred in spring (January to April) and between 3 a.m. and 11 a.m. Typical weather patterns bringing fog to HKIA include cold front/trough lingering around Hong Kong, the passage of cold front/trough and convergence between the easterly and northerly monsoonal winds. For continuous monitoring of the visibility condition at HKIA, the Observatory had installed 6 sets of Runway Visual Range Transmissometers and 6 Forward Scatterers along the runways to provide real-time runway visual range and visibility readings to the air traffic controllers and aircraft.



Fig. 2 Forward Scatterer(right) and Runway Visual Range Transmissometer(left) near RWY 25R touch down zone, for monitoring respectively the visibility and runway visual range over the airport.

Runway Visual Range (RVR):

The range over which the pilot of an aircraft on the runway can see the runway surface .

RVR may be determined by an observer or by means of Runway Visual Range Transmissometers.

"Red Rainstorm" on 24 June

(S.Y. Lau)

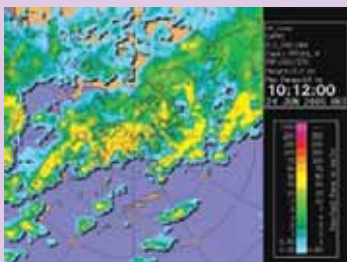


Figure 1 Radar picture at 10:12 a.m. on 24 June 2005

Red Rainstorm Signal

The rainstorm warning system in Hong Kong is designed to alert the public about the occurrence of heavy rain which is likely to bring about major disruptions, and to ensure a state of readiness within the essential services to deal with emergencies.

There are three levels of warning: AMBER, RED and BLACK.

Red Rainstorm Signal signifies heavy rain has fallen or is expected to fall generally over Hong Kong, exceeding 50 millimetres in an hour, and is likely to continue. It warns the public of heavy rain which is likely to bring about serious road flooding and traffic congestion. They will trigger response actions by Government departments and major transport and utility operators.

The intense thunderstorms in the morning of 24 June 2005 brought havoc to the airport causing delays to close to 90 flights. Two arrival flights were also diverted due to inclement weather. The heavy rain also necessitated the issuance of the first Red Rainstorm Warning Signal and Landslip Warning of the year.

The widespread thunderstorms were caused by a trough of low pressure which had been lingering around the South China Coast causing severe thunderstorms 4 days in a row. At around 10:00 a.m., a train of intense thunderstorm edged near HKIA and was overhead at around 10:12 a.m. (Figure 1) causing the gust to pick up to 35 knots. As a result of the heavy showers and thunderstorms, the prevailing visibility dropped to 1300 m.

Catching the Eddies

(P. W. Chan)

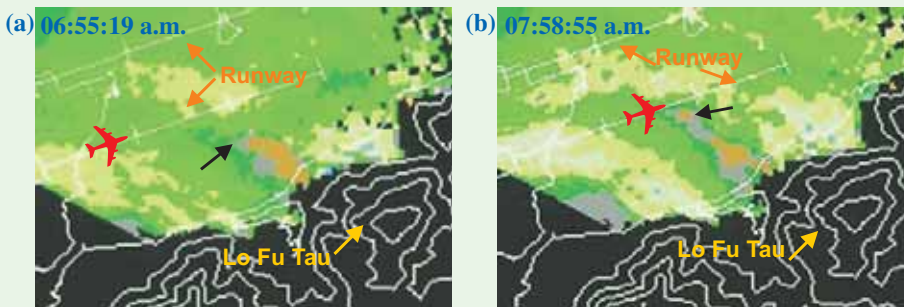


Figure 1: The horizontal scan image of the LIDAR in the morning of 19 January 2005. Left:(a) Eddy appears downstream of Lo Fu Tau, as indicated by a black arrow. Right:(b) When the eddy touched the eastern approach/departure corridor of the south runway, the change in wind could bring windshear to the aircraft.

The air is disturbed as it flows over the hilly terrain, just like the water disrupted by a stone in a river. Such airflow disturbances take on many different forms. There could be waves propagating from the hilltops. There could be streaks of high winds coming out from the valleys. Let's examine another interesting type of airflow disturbance: **eddies**.

Terrain-induced eddies are generally associated with the occurrence of a "temperature inversion" in the lower atmosphere. Temperature normally decreases with height. But under certain weather conditions and at some heights above the ground, the temperature could increase with height. Such an "inversion" of the temperature acts like a cap to block the motion of the air across it. When it occurs below or at about the same height of the hilltop, the air is mostly forced to go around the hill and eddies may be generated downstream of the hill.

The Doppler Light Detection and Ranging (LIDAR) system operated by the Observatory clearly captures the occurrence of such eddies in the vicinity of the Hong Kong International Airport. An example occurs in the morning of 19 January 2005 (Figure 1(a)). East to south-easterly winds prevailed around the airport on that day, as shown in the generally towards-the-LIDAR radial velocity (green/blue) in the horizontal scan images. Embedded in the prevailing airflow, there was also an

area of opposite (or "reversed") wind direction just downstream of a hill named Lo Fu Tau (465 m high), showing up as away-from-the-LIDAR radial velocity (brown). The LIDAR images revealed that eddies occasionally formed downstream of Lo Fu Tau and moved north-westward following the background wind across the eastern approach/departure corridor of the south runway (Figure 1(b)). On average, each eddy lasts for 15 minutes or so and its size is around 500 m and within the length

scale of windshear in aviation which is typically from several hundred metres to several kilometres.

The event was also studied using a computer model with a single layer of fluid flowing across a model terrain. Though the model is a simplified setup, it successfully simulates the occurrence of the eddies over the eastern approach/departure corridor of the south runway.

As shown in Figure 1(a), if an aircraft departs from the south runway, it would experience headwind all the way on departure. However, when the eddy occurred (Figure 1(b)), there was a change of the wind direction along the flight path. The aircraft would first experience headwind on the runway but would then encounter tailwind when flying through the eddy. This change from headwind to tailwind over several hundred metres could bring windshear to the aircraft. In between the eddies, however, the aircraft may not experience windshear.

The wind change associated with the eddy may lead to windshear. The rather short life-time and small size of the eddy clearly illustrate the transient and sporadic nature of terrain-induced windshear. The Observatory would continue to apply the latest technology to capture these airflow disturbances and enhance the windshear alerting services.

At around the same time, the Terminal Doppler Weather Radar (TDWR) also detected the presence of windshear associated with the thunderstorms and issued windshear alerts to warn aircraft on approach to the airport. Figure 2 shows the rain echoes and areas of windshear detected by the TDWR.

The newly installed Lightning Location Information System (LLIS) had proved itself to be an invaluable tool for timely issuance of thunderstorm warnings. Figure 3 shows the cloud-to-ground lightning strokes captured between 9:55 a.m. and 10:24 a.m. on 24 June. To better serve the aviation community, the Observatory launched a Lightning Location Information System on the AMIDS on 21 June (see article on page 8).



Figure 2 Display showing windshear ("bandaid"-shaped areas in red) and rain echoes detected by the Terminal Doppler Weather Radar at 9:55 a.m. on 24 June 2005.



Figure 3 : Cloud-to-ground lightning strokes captured between UTC 01:55 to 02:24 (Hong Kong Time 9:55 a.m. to 10:24 a.m.) by the Lightning Location Information System on 24 June 2005.

Man of many talents



It's an exciting experience to "land" at a remote weather station site

Joe (Chan Chuen Kit) joined the Observatory in 1999 as a Radar Specialist Mechanic and was posted to the Aviation Meteorological Instrument and Observation Division a year later. Joe, being a big fan of outdoors and water sport, cares not to conceal his excitement when talking about his work. "I like my job very much because I get to fly in helicopters to work at out-stations or travel by boat to the weather buoys". But he also remembered the day when poor visibility caused cancellation of a scheduled flight forcing him to make his way to the remote designation on foot. Joe likes to quote what our Director used to say, 'We deploy the most primitive means of transportation (our own feet!) to the destinations, in order to keep the world's most advanced meteorological system running'.

Recently, Joe participated in the shooting of the "Meteorology Series III" which recorded his skills in a balancing act when working on a weather buoy.



Joe is checking the weather equipment on a weather buoy



Joe is tuning the weather equipment

Back in his office Joe and his four colleagues have to assemble electronic systems from basic components because not many products available in the market could meet the required working conditions. "It is like playing with Lego, it's great fun", said Joe with a sense of achievement when talking about his creations. He also stressed on the importance of team work as he recalled the completion of these projects could not have been made by him alone. "Not a single person has all the knowledge required for a project assignment, we help each other all the time", he explained.

Joe concluded that the work had caused him a lot of sweat but he understood that weather monitoring is a fundamental step towards a better aviation forecast. And he is pleased to see that the instruments under his charge provide accurate weather information for the weather service and the smooth operation of aircraft.



New Staff

Ms. Sandy Song, Acting Senior Scientific Officer of the Observatory, joined the aviation weather services team in October 2004. This is her second time to enter the field of aviation weather services since her post changed to public weather services in 1997. She is currently leading the development of aviation meteorological services and products, including the much appreciated Aviation Meteorological Information Dissemination System (AMIDS). Ms. Song welcomed the new assignment : "The new task offers me lots of opportunity to interact with aviation users and understand their needs on weather services. Participation in ICAO seminars also widens my international view on aviation weather services." She pledged to work closely with her colleagues to meet the changing needs of aviation weather services users.

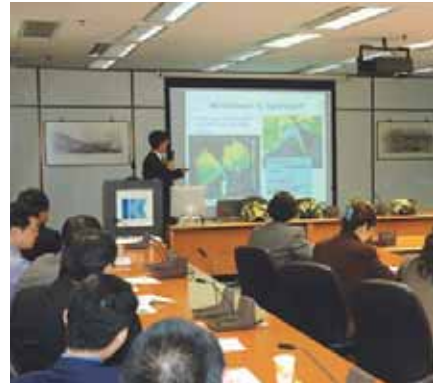


Windshear Briefings - Interacting with Users

(S.T. Chan)

This year we delivered a series of five sessions of Windshear and Turbulence briefings to airline representatives, pilots and the air traffic control (ATC) personnel in late March and early April. Representatives from some 17 different airlines and pilot associations attended the briefings this year. The briefings, being organized yearly around the peak windshear season in the springtime, serve as a forum for regular exchanges between the Observatory and the users of experience and knowledge about the windshear and turbulence occurring at the Hong Kong International Airport.

At the request of the Civil Aviation Department, three additional sessions were provided to air traffic controllers on different shifts this year so that most of the operational staff could receive the latest information and understand the new procedures. The "Questions and Answers (Q&As)" sessions at the end of the briefings were particularly useful to enhance our communications with the users and provided very good opportunities for us to obtain users' feedback in seeking further improvements to our service. Read further below for highlights of the Q&As.

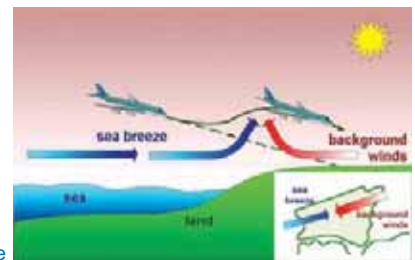


Mr. S. T. Chan conducting the briefing to a group of around 25 airline representatives and pilots on 21 March 2005.

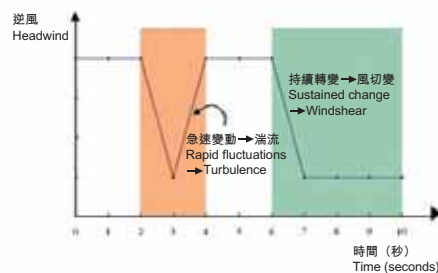
Windshear Q&As

Q: Historically, windshear was expressed in wind speed change per given vertical distance, e.g. XX knots per 100 feet. Does it mean that windshear is solely caused by wind changes in the vertical?

A: While windshear could be caused by wind changes in the vertical such as when an aircraft flies through a low-level jet, in many cases, windshear is caused by wind changes mainly in the horizontal dimension. Examples are gust fronts and sea breeze fronts.



Schematic diagrams of windshear brought by sea breeze



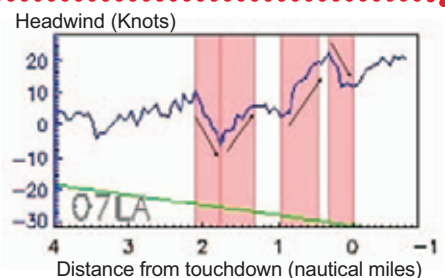
Difference between windshear and turbulence

Q: Windshear refers to "change in the wind direction and speed for more than a few seconds resulting in a change in the headwind or tailwind and hence the lift encountered by an aircraft". If the wind change occurs over one or two seconds only, would it be considered a significant windshear event as well?

A: A windshear event is significant only when both the rate of change of the headwind or tailwind and the magnitude of the shear are significant. In general, rapid fluctuations of the headwind or tailwind encountered by the aircraft for less than a few seconds are "turbulence" whereas a sustained change of the headwind or tailwind of 15 kt or more for more than a few seconds is significant "windshear".

Q: There have been occasions during which the pilots conducted go-around after experiencing a significant headwind gain, whereas the HKO automatic warning system kept generating alerts of headwind loss. Why is there such a discrepancy?

A: All too often both headwind gain and headwind loss co-exist over the same runway corridor, in particular during the cases of terrain-induced windshear. The pilots may report the headwind gain which has directly led to the go-around, or they have actually missed the headwind loss that followed before activating the go-around procedures. In both scenarios, the pilots will probably only report the headwind gain. As headwind loss will cause an aircraft to lose altitude and hence considered more hazardous than headwind gain to aircraft on approach or during take-off, the automatic warning system will invariably generate alerts for headwind loss only in such cases for clarity sake. This system feature has been published in the Aeronautical Information Publication (AIP) of the Hong Kong International Airport (HKIA) for pilot's information since the early days of the system operation.



Distance from touchdown (nautical miles)

Co-existence of headwind gains and losses along the approach path to Runway 07L as derived by Doppler LIDAR in the afternoon of 14 Feb 2005



Highlight of the Open Day - Weather forecasters explaining the science behind weather forecasting.



The Director Mr. C.Y. Lam sharing a moment with his fans.

Hong Kong Observatory's Open Day

During the Observatory's Open Day on 19 and 20 March, staff of the Hong Kong Observatory warmly received a record-breaking 17,000 visitors at the Observatory Headquarters. In a tour lasting an hour or two, the visitors were explained the various facets of work of the Observatory.

"TAICHI" and "KAPOK" Won the Tropical Cyclone Name Nomination Contest

The Hong Kong Observatory (HKO) and the "Happy Daily" of Radio 1 of the Radio Television Hong Kong (RTHK) had jointly organised the "Tropical Cyclone Name Nomination Contest".

The contest received good response from the public. More than 25,000 nominations were received and some of the names were nominated by more than one person. There were about 10,000 groups of names participating in the contest.

Among all the nominations submitted in the contest, the judging panel selected "TAICHI" and "KAPOK" as the winning names.

The Hong Kong Observatory will submit the winning names at the annual meeting of the ESCAP/WMO* Typhoon Committee to be held at the end of this year to replace two current tropical cyclone names provided by Hong Kong.



The judging panel of the contest comprises of well-known personalities in the society, including Mr. C.Y. Lam, Director of the Hong Kong Observatory (second on the right), Ms Kelly Chen (second on the left), Mr Lee Yee (third on the left), Ms Bernadette Tsui (first on the right), and Assistant Director of RTHK (Radio) Mr. Shiu Lo Sin (first on the left).

* ESCAP - United Nations Economic and Social Commission for Asia and the Pacific
WMO - United Nations World Meteorological Organization.

Meeting with Airlines



◀ The 23rd meeting of the "Liaison Group on Aviation Meteorological Services" was held at the Observatory's headquarters on 24 February 2005. The Director of the Observatory, Mr. C. Y. Lam, welcomed the airline representatives to the meeting.

▼ Observatory staff visited Dragon Air on 5 July 2005 to collect users' feedback on the Aviation Meteorological Information Dissemination System (AMIDS). Mr. Lau, Flight Operations Superintendent (center) discussed with our staff on recent enhancements of the system.



▲ Observatory staff visited Cathay Pacific Airways on 13 April 2005 to discuss the meteorological requirements for flight planning. Mr. Danny Tang, Flight Despatch Manager (first on the right) introduced their flight operations to our staff.

▶ Mr. W. H. Lui (second from right) of the Hong Kong Observatory visited Jardine Aviation Services Group on 24 June 2005. Mr. Ting (first from left), Mr. Kwok (second from left), Mr. Ho (third from right) and Mr. Li (first from right) discussed with Mr. Lui regarding the meteorological requirements for flight planning.

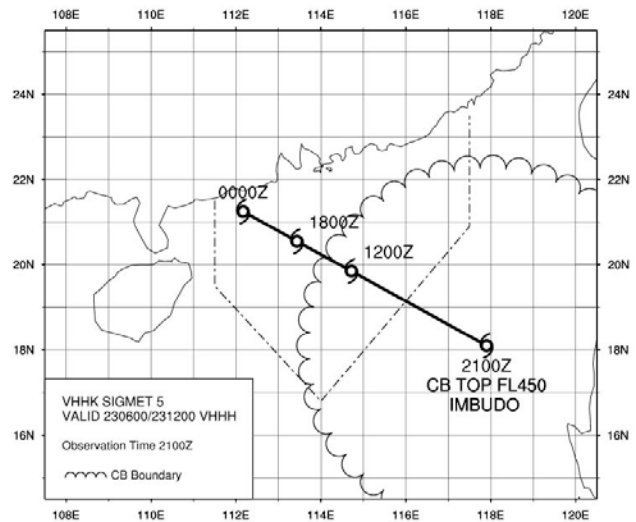


Contributing Towards the Development of Worldwide Standard for Aviation Society

The Hong Kong Observatory contributes to formulate the standard template of graphical tropical cyclone SIGMET for uplink to aircraft. The International Civil Aviation Organization (ICAO) Meteorological Information Data Link Study Group (METLINKSG) 8th Meeting held at Montreal in February 2005 recommended the template to be included as a worldwide standard for the whole aviation society.

Hong Kong Observatory is also tasked by ICAO to develop model graphical windshear and turbulence products for inclusion in the Annex 3 to the Convention on International Civil Aviation in order to drive future development of uplink applications.

"We are pleased that the Observatory is able to contribute towards the advancement of the aeronautical meteorological service for the world." said Mr. Wai, Assistant Director of the Hong Kong Observatory (Aviation Weather Services).



Graphical tropical cyclone SIGMET sample (the data of Typhoon IMBUDO on 23 July 2003 was used).

First Glimpse of a Wake Vortex Sensor

(C.M. Shun)



Mr. C.M. Shun (right) and Dr. Kaku Nobuyuki of ENRI next to the wake vortex LIDAR equipment shelter.

In late March, I spent a couple of days in Japan visiting a new wake vortex sensing facility at the Sendai Airport. The visit was hosted by the Electronic Navigation Research Institute (ENRI) of Japan. ENRI is responsible for conducting studies, researches and development of prototype electronic navigation systems for airports in Japan.

At Sendai Airport, a Doppler Light Detection and Ranging (LIDAR) system was recently set up to study the behaviour of wake vortices generated by aircraft during take-off. Data collection is ongoing and the target of the study is to understand how quickly the aircraft generated wake vortices and associated turbulence would dissipate and move away from the runway. When this understanding is established, there would be scope for reduction of the separation

between successive aircraft so that the capacity of busy airports could be further increased.

Studies of wake vortices have been ongoing at airports in Europe and U.S. in the past several years. It is very useful for us to get first-hand information on such developments in a neighbouring Asian country. In particular, it is the first time ever that we physically see how a LIDAR system similar to the one we are now using for windshear detection could be applied to another important aviation application.



Wake Vortex

Just as a ship leaves a wake behind it in the sea, an aircraft leaves a wake in the air. An aircraft's wake is in the form of two counter-rotating swirling rolls of air that trail from the wings of the aircraft.

Why do wake vortices matter? It is a question of safety. The rapidly swirling air in a vortex can catch the wings of a following nearby aircraft with potentially disastrous results.

Fostering a World System

(C.M. Shun)

I attended the ICAO's World Area Forecast System Operations Group (WAFSOPSG) for the first time in March 2004 in the capacity of permanent advisor to the representative of China — Mr. Xu Jianliang. Mr. Xu is the Deputy Director of the Meteorological Division, Civil Aviation Administration of China (CAAC) from Beijing.

In the current system, two World Area Forecast Centres (WAFCs) provide upper-air wind and temperature charts and en-route significant weather charts for meteorological offices to prepare flight documentation for international flights. The March meeting decided that these charts would be replaced by forecasts in digital format between July 2005 and December 2006. The use of the digital forecasts will enable meteorological offices to produce customized flight documentation tailored to users' needs.



Mr. C.M. Shun (first on the right, third row) with members of the WAFSOPSG. Also in the picture are (front row): Mr. Xu Jianliang (first on the right), Mr. Olli Turpeinen (second on the right), Chief of ICAO Meteorology Section and Mr. Dorinel Visoiu, Chairman of WAFSOPSG (middle).

Apart from moving into the digital era, the Group also formulated important plans to strengthen the world system further. For example, forecasts of turbulence, icing and convective storms, which could be hazardous to flights, will be generated directly by numerical weather prediction models with higher resolution. In time, this will enable airline operators and pilots to plan flights which will be safer, more efficient and more comfortable.

My debut in this important meeting was a memorable experience. Through active discussions, we have highlighted the importance to seek further

developments of the world system, which was first conceived back in the 1980's, while at the same time to adequately address the needs of developing countries in coping with the changes. We are very glad to be part of the international team.

Aerodrome Meteorological Observing Systems Study Group



Experts from around the world met at ICAO Headquarters to discuss matters related to aerodrome weather observations.

The International Civil Aviation Organization (ICAO) is preparing for the revision of the standards and recommended practices in relation to meteorological service for international air navigation for implementation in 2007. Among others, there will be changes related to weather observation at aerodromes. This subject matter was discussed by the ICAO Aerodrome Meteorological Observing Systems Study Group — a group of experts in airport weather observations from various States, at its fifth meeting in Montreal this April. Dr. C.M.Cheng (second on the right, first row) of the Hong Kong Observatory participated in this meeting. The group discussed a number of proposals. These include, among others, the use of automatic observing systems for airport weather reporting and the forecasting period of airport weather forecast.

Partnership with Airport Authority

The annual meeting with Airport Authority Hong Kong (AAHK) to review the aviation weather service agreement was held on 26 April 2005. During the meeting, ways to improve communication between the two parties as well as future development effort were discussed.

Mr. H.G. Wai (second on the right) and Miss Sharon Lau (first on the right) introduced to Mr. C.K. Ng, Acting General Manager of AAHK – Airfield (third on the right), and his colleagues the operation of the Central Forecasting Office after the annual review meeting.



Secretary for the Civil Service appreciates the achievements of the Airport Meteorological Office

Mr. Joseph W P Wong, Secretary for the Civil Service, visited the Airport Meteorological Office (AMO) on 6 June 2005. He met staff of the Office to gain an insight into the day-to-day challenges faced by the staff. Mr. Wong was impressed by the aviation weather services provided by the Department, in particular the world-renowned success in developing a wind shear alerting system for the airport.

During the Secretary's visit, our duty Weather Observer Mr. C.H. Chow gave him a brief description of weather observation. The Secretary was very much amazed by the "calibrated eyeball" of the Observer who by simply looking could determine the cloud base height and cloud type by studying various visual features of the cloud. "I am very touched by SCS's visit and the interest he expressed on our work and welfare." said Mr. Chow after meeting SCS.



"The cloud we see now are mainly altocumulus at about twelve thousand feet", the duty Observer Mr. C. H. Chow explained to Secretary for the Civil Service Mr. Joseph Wong (second from left), Mr. C. Y. Lam (second from right) and Mr. H. G. Wai (first from right).



Visit of Japan Meteorological Agency Experts

Two experts from the Japan Meteorological Agency, Mr. Kenji Akaeda (centre) and Mr. Masashi Kunitsugu (second from left), visited the Hong Kong Observatory in April. During the visit, we shared our experience in aviation weather forecasting, windshear alerting and the operation of remote sensing equipments installed at the Hong Kong International Airport.



Mr. C.Y. Lam, Director of the Hong Kong Observatory (centre) in a tree-planting ceremony to commemorate the 10 years of "Co-ordinated Weather Monitoring in Pearl River Delta region" between Guangdong, Hong Kong and Macao. Also in the photograph are: Mr. H.G. Wai (with spade), Dr. Fong Soi Kun (first from the left), Director of the Macau Meteorological and Geophysical Bureau and Mr. Yu Yong (second from the left), Director of the Guangdong Meteorological Bureau.

19th Guangdong - Hong Kong - Macao Technical Seminar

The seminar is held annually in Guangdong, Hong Kong and Macao in turn to discuss the latest developments of weather forecasting technology. In this year's seminar organized by Guangdong Meteorological Bureau at Yangjiang on 2 - 3 March 2005, the Observatory made a total of 9 presentations, including 3 papers on aviation meteorology. There were active discussions during the presentations and the seminar



Mr. H.G. Wai (left), Assistant Director, Aviation Weather Services, of the Observatory, chaired a presentation session of the seminar.

successfully achieved the objective of experience interflow among the meteorologists of the three places.