Short Course in Applied International Aviation Meteorology

Course Description and Objectives

Fuel prices have sky rocketed in recent with airlines and militaries around the world rigorously seeking ways to minimise fuel consummation in efforts to save money. In addition to innovative ways to reduce weight, a skilful exploitation of weather (i.e., utilising the jetstream, strategic use of flight path diversions) will also provide significant savings in fuel. In addition to fuel savings, improved knowledge of weather will also lead to other financial savings. As an example, NASA's Aviation Safety program estimates the cost to the airlines from encounters with turbulence runs more than $100 million (USD) a year, with one airline estimating that each encounter of severe turbulence costs an average of $750,000 (USD). In addition to the direct costs, an encounter with adverse weather may result in flight deviations, increased fuel consumption, passenger inconvenience, and possible passenger accommodations and expenses. Besides financial considerations, an improved knowledge of weather can also improve safety. In addition to accidents and fatalities, there are numerous injuries to flight crews and passengers due to weather occurrences (e.g. turbulence) each year. For example, NASA's Aviation Safety programme estimates that airlines encounter severe turbulence nine times a month, resulting in an average of 24 injuries per month.

Weather is not just important to pilots and cabin crews; it is of utmost importance to the safety of ramp workers, baggage handlers, and others - particularly in regards to high winds, severe weather, and lightning. Weather is also a major consideration for airport operators, and air traffic services with it impacting traffic capacity in the airspace system during all phases of flight, and placing increased workload on controllers to manage the safety of aircraft and traffic flow through the airspace system. As an example of the impact of weather on the air traffic system, some studies (including one by the US National Research Council in 1995) showed 40 to 65 percent of delays experienced by US domestic airlines were attributable to adverse weather, at an annual cost estimated in the range of $4 to 5 billion (USD). Recent figures cited by the University Corporation for Atmospheric Research (UCAR) in 2005 showed weather accounted for 76 per cent of all air traffic delays in 2004. With current projections, the impact will only increase with commercial air traffic predicted to increase three to four times over the next 10 to 20 years.

Calls for improved meteorology training and weather interpretation skills, at all levels and areas of the aviation industry, have become more frequent as the result of the numerous studies and investigations of weather occurrences. With the rapid development of technologies, improved scientific understanding, advancements in weather forecasting processes, dissemination and presentation of weather related data in the last 20 years, there is an increasing need to improve training programmes beyond that of the 1960s to take into account these recent changes. This course will improve knowledge of meteorology and develop practical interpretation skills of traditional and modern technologies, including numerical weather prediction models, with an international focus. The course is aimed to encourage participants to develop a systematic method of assessment of weather trends and forecasting; a method that has a scientific basis but one which can also be applied to real-time situations where there are heavy workloads and severe time constraints.

Who should attend?

Pilots and dispatchers, supervisors, and training personnel of airlines, air charter, freight and cargo services, military, corporate, and government flight operations.

Participant Prerequisites

It is assumed that all participants have a satisfactory knowledge of material set out in their country's ATPL meteorology syllabus (i.e., FAA, Transport Canada, JAA, Australian CASA, South African CAA), or its equivalent for military personnel.

Course Outline

This is an operational course and will embed interpretation of satellite, ground radar, analysis charts (i.e., surface, 500 hPa), METARs, TAFs, TTFs, Numerical Weather Prediction models, and Aerological diagrams (i.e., Skew-T) for greater understanding and application in flight operations. Real examples from accidents and incident, and significant weather events will also be used.

Day One:

Cost of Weather in Aviation
Weather Hazards
Weather Risk Control Systems (Wx-RCS)
Decision Making and Human Factors Considerations in Long-Haul Operations
Introduction to Numerical Weather Prediction (NWP)
Weather Analysis and Self-briefing Procedure and Checklist
Conducting Weather Briefings
Low Ceilings and Obstructions Visibility

Day Two:

Thunderstorm Primer

- Severe thunderstorms (including Case Studies)
- Air mass Thunderstorms
- Multicell Thunderstorms
- Supercell Thunderstorms
- Gust Fronts, Microbursts and Marcobursts
- Lightning and Hail
- Prediction of Convective Winds
- Operational Application of Aerological Diagrams
- Operational Application of Stability Indices

Day Three:

Turbulence (Low-Level, Turbulence In and Near Thunderstorms, Mountain Waves)
Low Level Wind Shear
Icing

Day Four:

High Altitude Meteorology

- Upper Level Winds and Temperatures
- Jet streams - Northern Hemisphere
- Jet streams - Southern Hemisphere
- Clear Air Turbulence

Group Weather Flight Planning Exercise - International Flight using live data

Day Five:

Participants' analysis of the accuracy of the pervious day's Wx exercise (including giving a Weather Briefing)
Analysis of Weather Events using archived data (including giving a Weather Briefing)

Take home

- Comprehensive course notebook
- Industry examples and solutions
- Flight Planning checklists and algorithms
- Certification of completion

Instructors

Martin Babakhan is a meteorologist based in New South Wales, Australia. He has a Graduate Diploma in Meteorology from the UN's World Meteorological Organization (WMO). He worked as a meteorologist for 17 years for the Royal Australian Air Force (RAAF). He retired at the weather office at RAAF Base Williamtown; just north of Newcastle, NSW, Australia.

After the RAAF, he joined the Department of Aviation (now the School of Psychology) at The University of Newcastle (Australia) teaching Air Transport Meteorology (incorporating the Australian ATPL) and Advanced International Aeronautical Meteorology. Following 12 years as an Aviation Lecturer, Martin (in late-2005) retired and is currently a Conjoint Lecturer in the School of Psychology at The University of Newcastle (Australia).

In addition to lecturing, Martin was the weather forecaster for the Australian Broadcasting Corporation (ABC) Radio in Newcastle for many years.

Martin currently works as a meteorologist for a large international airline based in the Australasian region.

Martin regularly works with Dutcher Safety & Meteorology Services developing and teaching Aviation Meteorology. John Dutcher also worked with Martin on number of operational meteorology research projects. With Martin, John also developed the Meteorology in Aircraft Accident Investigation (METI) course for the Southern California Safety Institute (SCSI).

John Dutcher has a Bachelor of Science (Aviation) from The University of Newcastle (Australia) where he specialised in Human Factors and Aviation Meteorology. Following his degree John mentored under meteorologist Martin Babakhan of The University of Newcastle (Australia) for three years. He completed training in weather forecasting (i.e., marine, aviation) in both hemispheres, aviation meteorology for long-haul international and regional flights, short-term mesoscale forecasting, applied satellite and radar meteorology, and the use of Numerical Weather Prediction (NWP) models. John has a Canadian Flight Dispatcher Licence, Glider and Private Pilot Licences. In Australia he has a Commercial Pilot Licence (frozen), and has completed Australian Air Transport Pilot Licence (ATPL) ground school, as well as flight planning for the B727-200, B1900D and SA227.

John has authored the Weather Investigation chapter in the upcoming ICAO Aircraft Accident Investigation Manual – Part III (in press). With Martin Babakhan, John developed the Meteorology in Aircraft Accident Investigation (METI) course for the Southern California Safety Institute (SCSI). He has taught meteorology for regional airline pilots for QBE Insurance Group (Aviation) in Australia. John has taught meteorology and Human Factors to pilots of the Canadian Owners and Pilots Association, the Civil Air Search and Rescue Association (CASARA) in Halifax, Canada, instructor pilots for Transport Canada, and Occurrence Investigators of the South African Civil Aviation Authority in Johannesburg. He has taught Human Factors in ramp and maintenance to personnel from Northern Air Cargo, Northern Air Aviation Services, the Medallion Foundation, and Conco-Phillips in Anchorage, Alaska for SCSI. He has also taught maintenance technicians from Honeywell Aerospace - Aftermarket Aviation Services. In addition, he has taught Human Factors to meteorologists of the South African Weather Service (SAWS) in Pretoria.

Besides consulting, John works as a Human Factors researcher in the Department of Psychology at Saint Mary's University in Halifax, Canada. Here, he has worked on projects in OH&S, safety culture, health care and for the Meteorological Service of Canada exploring decision making and forecasting processes of expert weather forecasters. He also has completed operational meteorology research with Martin Babakhan (including an analysis of high-altitude ice crystal icing events in the Australasian region for Boeing). He has published several academic and operational papers, reports, and articles and has presented his work in Australia, Canada, South Africa, and the USA.

Course Particulars

- **Course Duration:** 5 days.
- **Fee:** $2100.00 CAD, with bulk rates available for companies.
- **Location:** Various locations – In-house available.

Queries

For more information please contact:

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