

MANAGING THE UNPREDICTABLE



The seminar shared insights on how weather can impact aviation.

As the old adage goes, “the only thing predictable about the weather is its unpredictability.” Since the 1950s, it has been found that adverse weather conditions have caused or have contributed to around 30% of aviation accidents on commercial flights. With global climate change bringing about a significant increase in extreme weather conditions in recent years, aviation experts agree that weather is not something we should leave to chance.

Participants including air traffic controllers and pilots gathered at Singapore Aviation Academy on 26 November to gain insights into the latest developments and technologies that are being introduced to manage the impact of weather on aviation safety. Three experts shared their different perspective on the topic at this seminar:

- Magnus Teo, Air Traffic Control Manager, Civil Aviation Authority of Singapore (CAAS) presented the challenges that weather poses on air traffic management (ATM);
- Captain Adrian Amaladoss, Safety and Security Manager for Singapore Airlines, gave a pilot’s perspective on weather hazards that concern pilots and how they manage these hazards during pre-flight planning and en-route phases;
- Lim Lay Eng, Senior Inspector of Meteorology, CAAS, provided an overview of the provision of aviation meteorological services.

A common theme in all speakers' presentations was the importance of prevention through avoidance, or what Teo termed "defensive control". Giving a list of high profile air crashes and near misses resulting from adverse weather conditions such as fog, haze, volcanic ash, lightning strikes, rain, hail, turbulence and windshear, Teo outlined the cost of delays through diversion. He also noted that timely and accurate weather information was a crucial factor in determining when to apply "defensive control" measures.

Captain Adrian agreed that avoidance, or the protocol of ATM: Avoid, Trap, Mitigate, was the key in managing risks. He echoed Teo's closing comments that training and experience were a crucial part of the equation. He cited the need for pilots to understand the limitations of their equipment, including radar, and welcomed technical advances such as automatic radar tilt. However, he cautioned that pilots still need use their experience and training to conduct manual scans rather than rely fully on automation. He added that a pilot's understanding of weather, pre-flight and in flight, and how it impacts flight safety, was paramount.

Lim advocated that apart from the need to have accurate and timely weather reports, they must also be integrated into ATM (Air Traffic Management) and agreed that training of all personnel involved was crucial. She also presented the latest amendments and the International Civil Aviation Organization (ICAO)'s Aviation System Block Upgrade (ASBU) plan for integration of meteorological information with ATM. This list of updated standards and regulations recently implemented by ICAO seeks to tighten procedures and improve aviation safety, especially in relation to the impact of weather.

The changes included additional global weather forecast products; the requirement for all potentially active volcanoes to be monitored; simplified weather reports for pilots, to address complaints of too much pre-flight information to digest; and most importantly the requirement for all reports to be issued in Extensible Markup Language (XML) format in preparation for future interoperability within the industry. Space weather information will be available from 2016 from the monitoring of solar flares, which have an impact on navigation instruments.

Lim emphasised that weather is an important factor affecting aviation. She opined that more needs to be done to look at how the delivery of information could be improved, especially as extreme weather systems are becoming more frequent in light of global warming.

This seminar was organised as part of the CAAS Safety Series to promote a strong safety culture through greater engagement with the aviation community. For more information, please go to [CAAS Safety Series](#).