

# Meeting of the Special Interest Group in Aviation Meteorology (Summary)

The Special Interest Group in Aviation Meteorology (SIGAM) held its first meeting at the Royal Meteorological Society (RMS) headquarters on the 28<sup>th</sup> April 2011. The meet was attended by RMS members who consisted of airport meteorological forecasters, forensic meteorologists, meteorological advisors to airlines and airports, and pilots (both helicopter and aeroplane). Discussion focused on two topics; lessons learnt during the 2010/2011 winter weather (in particular the snow of the 17-18 December, 2010 period) and the coming summer thunderstorm season with particular reference to lightning safety during airport ground operations.

The snow storm discussion led to some interesting points. Pilots and other airport users feel that they are given inadequate information on snow-covered runway conditions for performance calculations, resulting in delays. Terminal aerodrome forecasts (TAFs) were deemed inadequate for proper planning. Close communication between meteorologists, airport operator, airlines and especially pilots, is essential in severe weather situations. Questions also arose pertaining to the amount of meteorological training and recurrent training given to airport operators and users, which led to the conclusion that closer cooperation and organized cross-training between the different aviation disciplines is needed to improve operational efficiency, situational awareness, and therefore, safety. It was noted that teleconnections played a role; there was a strong negative North Atlantic Oscillation during the record cold December and prevalence of snow.

Airside ground operations, during times when lightning is near, are not always clear to airport users. Pilots are trained how avoid thunderstorms in-flight and prevent blindness by lightning, but are not given adequate information for ground operations, aside from seeking shelter and not communicating by radio. Conversely, ground operations personnel work according to a pre-planned procedure, but these are, for the most part, unbeknownst to other airport users and can differ from airport to airport. The conclusion is that standard operating procedures, rules and regulations for ground operations at airports must be readily available to airport users, such as in the Aeronautical Information Publication airport directive (AIP AN), thereby increasing awareness of airport operations, increasing operational efficiency, situational awareness, and hence, safety.

An interesting side-note on the lightning discussion was "trigger lightning" - lightning which can occur when aircraft fly in stratocumulus cloud of depths around 1000 to 2000 feet, near the freezing level +/- 1°C. This is of particular significance to helicopter operations in the North Sea area, which frequently operate in these conditions.



*Fig. 1: Members of the SIGAM who attended the April 28 meet. From left to right: Bottom row, : Robert Lunnon, David-John Gibbs, Andrew Moys. Middle row: George Anderson. Top row: Jacob Kollegger, Michael de Villiers, John Greetham.*

## ROYAL METEOROLOGICAL SOCIETY

### SPECIAL INTEREST GROUP ON AVIATION METEOROLOGY

#### *Minutes of the April 28, 2011 Meet*

**Date and time:** Thursday 28<sup>th</sup> April 2011 09:30 BST.  
**Venue:** Royal Meteorological Society headquarters, Oxford Road,  
Reading, United Kingdom.

**Present:**

Jacob Kollegger, Bob Lunnon, Andrew Moys, George Anderson, David-John Gibbs,  
Michael de Villiers, John Greetham.

**Apologies:**

James Morrison.

**Approval of the agenda**

Approved by the attendees.

**Additions to the agenda**

Nil.

**1. Approval of the minutes of the previous meeting**

The minutes of the meeting held on (**not applicable**) were approved as a correct record of the proceedings and signed by the Chair.

**2 Matters arising from the previous minutes**

Not applicable.

**3 Items of business**

Jake opened the meeting by outlining the aims and objectives.

**3.1 “Lessons learned”: pre-Christmas winter storm.**

James Morrison provided a presentation of the weather at Liverpool that was presented by Jake. The presentation emphasized how Liverpool airport closed for 6 hours, but European airports under similar circumstances were kept open (such as Katowice) and the lack of runway information for proper take-off performance calculations.

A brief presentation was made by Michael of the general circulation during December that led to a colder than normal month and the snow disruption prior to Christmas and the possible effect of telecommunication in the form of strong negative NAO that weakened later in the winter to a positive value in February 2011.

**3.1.1 Discussion points:**

- The interpretation of charts available to flight crew and a need for better charts for flight crew. The feeling being that information is at times inadequate spatially and

timeliness. John mentioned legal cases involving thunderstorm activity and lightning and inadequate information available to pilots.

- Clarification of the meaning of PROB30 and PROB40 in TAFs.
- In spite of the efforts of WMO and ICAO there is still a lack of uniformity between different countries. For example, the difference in braking action values. What may be adequate in one country is poor in another and the differences between TAFs and METARs in different countries, particularly those runway values in Russia.
- The TAF is inadequate for present day flight operations, especially in view of modern technological that is available, such as the Internet and sophisticated data transmission methods directly to cockpits while in flight and on the ground.
- Andrew emphasized the importance of one to one communication. The lack of close communication between flight crew and met forecasters as opposed to the closer communication that exists at RAF and RN airports and was available in the past.
- Lack of relevant information was emphasized by flight crew and lack of support at airports. In particular an adequate runway warning service. George pointed out that an obligatory aviation warning service was offered by the UK Met Office.
- It was pointed out that efforts are being made to promote better co-operation and understanding between flight crew and met forecasters. For example, Eurocontrol MET service to ATM (Air Traffic Management) workshops.
- For many, training ends at the point of qualification and relies on self training.
- The question of airport (ground) operator training and the level of training was raised. However, this could not be explored, due to the absence of anyone present from this discipline. Contribution is needed from other members.

### **3.1.2 Decisions**

- The overall belief is that there needs to be closer co-operation and organized cross-training between the different aviation disciplines.
- Improved relevant and uniform format information available to flight crew, airline dispatchers and airside operators, especially with respect to severe weather warnings.

### **3.2 Lightning and airport ground operations: aspects worth informing of and training**

Jake gave a presentation on technical aspects, when and where lightning can occur and avoidance, such as avoid by 10nm, most between +10C and -10C, temporally blinded, raise luminosity of instruments, Kevlar and glass fibre is not lightning tolerant, not all damage is visible. Engine flame-out, engine malfunction (Full Authority Digital Engine Control – FADEC), airframe is a Faraday cage. JAR Section 9 has very few questions on lightning and forms a very small proportion of the MET examination and are very basic. Jake discussed before and after take-off and in-flight documentation with respect to operation in the vicinity of thunderstorms. He emphasized that little ground operation information is given.

Bob raised the point about trigger lightning in layer cloud (SC) of sufficient depth (1000-2000ft) at the freezing layer at +/-1C. EG North Sea helicopter operations. David (helicopter pilot) said that this needs more investigation, especially during winter operations.

### 3.2.1 Discussion points:

- In-flight weather radar use and the best procedure to adopt to identify lightning areas in flight and lightning avoidance, was discussed, such as, 3° downward tilt in order to determine storm positions in the abundant reflective water-covered ice/hail level and a formula to determine the level being scanned. Also avoidance distance and avoidance decision distance.
- Inadequate ground warning procedures. This includes actions by flight crew (such as ground crew communication, start up, taxi and take-off), when refueling should cease, aircraft.
- Airfield operations do not only concern refuelers, but also include airfield electricians, avionics personnel, loaders, flight crew and passengers.
- Examples of ceasing operations were given; lightning within 10 kilometres- refueling may cease, lightning within 5 kilometres- ramp personnel take shelter.
- Reference was made to the difficulty in obtaining regulatory information. One source that could be found was; when lightning is within 5 km all outdoor operations, such as aircraft refueling, loading and unloading and passenger movement to and from aircraft should cease (Federal Committee for Meteorological Services and Supporting Research. *Weather information for Surface Transportation*. FCM-R26-2006. . Office of the Federal Coordinator for Meteorological Services and Supporting Research: Silver Spring, MA, 2006, August, pp 4 and Appendix B-6 pp 2).
- Uncertainty about when to give the all clear after the passage of thunderstorms and lightning. George stated that the time when the all clear is given depends on the type of convection thunderstorm and lightning, such as, heat air mass, frontal. Essentially there are no definitive rules, but the forecaster might consider the following aspects in making a decision:
  - 1) speed of movement of the CB,
  - 2) the size (e.g. small wintertime CB compared with deep summertime convection large CB,
  - 3) whether the CB is low-level, or medium-level (e.g developed from AC castellanus) and embedded in other cloud.
- Warnings: George mentioned the UK Met Office issues warnings of impending thunderstorms at an airport. There is a list of operators/personnel who must be informed. It basically involves monitoring observations, radar, satellite imagery and lightning detection equipment. The RAF and RN also have a warning system for their operations RAF/RN warnings are graduated from moderate to high risk and when it is best to refuel and not to refuel. Moderate risk: observed or are expected to develop within 40km but not expected in immediate future. High risk: expected at airfield within next 15 minutes. (George and Andrew).
- More information is needed from airside operator members

**3.2.2 Decision:**

There is a need for making standard procedures, rules and regulations for airport ground operations during thunderstorms/lightning available to the airport users, in order to increase awareness of said procedures and thereby increasing operational efficiency/safety.

**4 Presentations summary of what was discussed and items for consideration.**

This was read from the rough draft minutes.

**5 Any other business**

Nil.

**6 Conclusion, and introduce ideas for subjects for the next meeting.**

List to be sent to members for recommendation and decision.

**7 Date of Next Meeting**

To be notified.

There being no further business, the Chair thanked everyone for attending and declared the meeting closed at 15:00 BST.

Chair: \_\_\_\_\_

Date: \_\_\_\_\_