

Safety Bulletin 10

Welcome to the first Safety Bulletin of 2017 which addresses the issue of flying in cloud. This is a tricky subject. The rules are clear: VFR outside controlled airspace below FL100 requires 5km flight visibility, 1500m horizontally from cloud and 1000ft (305m) vertically from cloud. So, we are not permitted to fly in cloud. In competition, flying in cloud can lead to disqualification. Moreover, it is also potentially dangerous, actually very dangerous. The correct safety response is simply to state – don't do it! Mike Cavanagh contradicts this straightforward assertion, ' ... everyone should fly in cloud'. I disagree with Mike on this and at risk of seeming like Frodo Baggins bollocking Gandalf, I'll explain why.

Many, if not all pilots, will at some stage find themselves in cloud. Anyone who has not experienced flying in cloud will have trouble imagining the speed and extent of the disorientation particularly if it is unplanned and unintentional. This will be compounded by physical and mental discomfort; wet, cold and scary and, in the event of strong conditions, violently rough. Pilots will do well to prepare themselves for the eventuality of accidental immersion in cloud. Part of this preparation, for some more confident and experienced pilots, may be to experiment by flying in cloud in suitably benign conditions under their own terms. Some pilots will never have the desire to enter a cloud deliberately, nor should they. If that's how a pilot feels, and several have expressed this view, good! We all fly for our own reasons, there is no pressure. However, all pilots should know what to expect, how to cope and how to escape should they find themselves in the white room.

It's useful to consider cloud flying under the three most likely Lake District scenarios; a fly down through an inversion, flying in cloud whilst on an XC and ridge soaring in orographic cloud.

The Fly-down.

The forum discussion was kicked off by a flying report posted by Ken Gamble.

<http://www.cumbriasoaringclub.co.uk/forum/viewtopic.php?f=17&t=4193> supported by a video by Phil Kew <https://vimeo.com/190263338> . Phil's flight provides a perfect case study. This is the context; three experienced pilots with excellent knowledge of the local terrain had a feasibly safe plan-to fly out from the hill on a predetermined bearing in benign conditions confident in the knowledge that cloud base provided sufficient height for the final visible phase of the flight. Three pilots enjoyed an excellent day in the fells. However, two were reported missing in action, one of which experienced the negative side of cloud flying. The following suggestions are intended to make such ventures safer.

1. Be certain of the cloud base height. It can change. If there is any uncertainty, be in contact with someone on the ground.
2. Be confident your glide will get you to your intended landing area. Met conditions can change, have a plan B.

3. Know your instruments, using preset locations will allow you to monitor the key elements of your flight; necessary glide angle, altitude, bearing (actual and intended) and airspeed. Continually monitor your instruments, it's not as if you'll be enjoying the view.
4. Ensure your plan allows for pilot separation. A mass launch is a bad idea. Agree an order of launch taking into account individual glider performance.
5. Ensure everyone is working to the same plan and understands it.
6. Use radios if available. If not, be prepared to shout!

XC Flight.

XC flight is taken to include all flying that takes place away from the ridge whether a big XC or a boat-about in front of Blease.

1. Know your day and the clouds associated with it. Some days and some clouds you don't mess with. Things can change midflight, so constantly be monitoring and reassessing. Don't go into clouds you aren't happy with.
2. Understand clouds. Get to recognise the dangerous ones. Beware of especially strong lift which can increase near to base. Move to the best escape edge.
3. If entering cloud (do the planning BEFORE) it's important to fix a course and fly straight before you enter the cloud. Entering a cloud whilst still turning will lead to instant disorientation. This especially applies if there are other gliders in the vicinity. If possible, radio your intentions. The best direction if with others is downwind, or no more than 45 degrees from that. Turning back upwind is unwise unless you are completely on your own.
4. Do not go into cloud if there are sailplanes around.
5. The fastest method of getting out of the cloud is generally to fly fast and straight. Big ear if the lift is very strong. (But see notes on big ears and wet gliders below) Avoid spiraling, it will add to the stress and disorientation.
6. Navigation. Keep it simple and practice with whatever system you intend to use. A magnetic compass has the attraction (!) of simplicity and does not suffer from battery problems but beware – it does not necessarily show your heading. You could be moving 180 degrees to the direction shown. A stand-alone GPS or a GPS based vario will show your actual heading and/or track as well as other useful information. Some pilots recommend following your snail-trail on the zoomed-in map screen. Experiment and select your preferred system and practice these skills beforehand. Be very sensitive with your course adjustments, we have an innate tendency to overcorrect.

7. Note cloud base altitude and use it as a reference altitude when in cloud.
8. Note position of sun. Sun is also useful as it glints off water (rivers, tarns, lakes etc). These reflections remain surprisingly visible even well into cloud - they provide a friendly visual reference.
9. On a sunny day and at height, the cloud shadows can provide a useful map of the clouds, their size and distribution. Recognise your cloud. It gives you some idea of its size, movement, best escape and the next cloud.
10. Only cloud fly IF you feel happy and confident to do so. If doing it for the first time pick your cloud with care. Avoid cumins at all costs! KNOW THE RULES!!!

Ridge Soaring.

There will be days when orographic cloud forms along a ridge. Sometimes it will form a thick, dense band of clag; sometimes it is a transient phenomenon, forming and dissipating along the ridge interspersed with periods of good visibility. The temptation to fly in clag should be resisted, the risk of a mid-air or ground impact is simply too great. As Ed Cleasby points out, it is the action of nutters. The latter situation requires more subtle treatment but the same general cloud-flying advice applies. Disorientation can be instant and potentially intense.

1. If conditions suggest the likelihood of orographic cloud forming, be prepared. If, or preferably before, being engulfed by cloud commence your escape. Head out at 90 degrees from the ridge. Knowing this bearing before the situation arises is essential, faffing about doing calculations in zero visibility whilst flying towards a rocky outcrop is too late.
2. Constantly monitor any other gliders. If any glider disappears into cloud take avoidance action by flying away from that cloud. You cannot assume the hidden glider will maintain its course.
3. Do not soar an unfamiliar ridge.
4. Do not risk flying with too many other gliders. 'Too many' depends on the ridge, the conditions, and the skill levels and experience of all the pilots. It might well be as low as none.

Flying a Wet Glider.

Pilots will all be aware of the inherent risks of flying a wet glider. Flying in cloud risks moisture condensing on the wing even to the point that it drastically alters the flight characteristics of the glider. Mike Cavanagh advises that in such circumstances you should not do anything radical with your wing including major brake inputs. 'Fly straightish with little brake input until you are happy the wing has dried out.' An article in Cross Country Magazine (177 page 54) states that recent observations show that modern gliders are more susceptible to parachutal and full stalls in wet conditions. The view is that the clean, wrinkle free leading edge of the latest gliders allows water to bead on the surface leading to airflow separation. In such circumstances, do not apply big ears or otherwise collapse parts of the wing as this adds drag and increases the likelihood of a stall, parachutal or full. Clearly this can cause a dilemma for the pilot needing to escape cloud in a hurry!

Summary.

This article deals with the safety issues associated with flying in cloud. It does not recommend this inherently hazardous practice but accepts that it will happen either deliberately or accidentally and it is better to have an open discussion beforehand rather than a post-accident investigation.

Returning to the event that kicked off the discussion, Ken's amusing and typically self-effacing report mustn't conceal the fact that he was extremely fortunate to get away with it.

Lastly, let's prepare for the new flying year on a high; well about 6,800 ft as it happens! For any pilot who has not read Richard Butterworth's description of his experience at the Mynd in 2010 read it now. <http://www.cumbriasoaringclub.co.uk/kb/perils.html>

And finally.

As usual, this bulletin comes with a disclaimer. It does not represent the policy of the CSC or indeed anyone else. It is a distillation of the collected views of pilots who have chosen to contribute to the discussion. The discussion is not closed, anyone who wishes can engage with the topic on the forum or by contacting the CSO.

That's it for now. Next issue, how to reduce your electricity bills.

Fly lots, fly safe!
CSO