BACKROOM BOYS*

How the BGA safety team analyses gliding accidents

WE RECEIVE around 170 accident/incident reports each year. The BGA archives go back to 1974 and occupy nearly 10Gb of disk space. Together with a database of key details from over 7,000 reports, they form an invaluable resource that we consult almost every day. What we learn from past misfortunes can help make our sport safer in future.

Accident and incident reporting

The BGA requires a report [1] of any accident causing injury or damage, and if the injury or damage is serious then the DfT's Air Accident Investigation Branch (AAIB) must be advised as well. We also encourage reports of any accident or incident with broader safety implications; if in doubt, please report it. Your club will welcome reports of more local consequence.

Accident/incident reports are collected by the BGA office and circulated each week (sooner if urgent) in confidence to the safety team. We read every one of them. The chief technical officer picks up airworthiness aspects, while implications for instruction, tugging, airspace, etc, are addressed by other relevant experts. We discuss any accidents that have broader implications, and they all help us build a picture of what's happening. Details of each report are entered into our database, and a brief anonymised summary is written for publication in S&G. We don't distinguish between accidents and incidents: the difference between a close shave and a serious accident is often just down to luck.

Accident investigation

Clubs do a great job of looking into the facts and causes of accidents, and we're grateful to club safety officers, CFIs and everyone else involved for their efforts. We can't respond individually to each report, but we're always grateful for this valuable work.

If an accident was, or could have been, especially serious, or was in a category that particularly concerns us (eg involving a third party or young person), or simply if we think it merits further examination, we ask one of the BGA's accident investigators to look into it [2]. This generally involves visiting the site and interviewing those involved. The BGA also investigates many non-fatal accidents on behalf of the AAIB. The aim is always to establish what happened and, crucially, why – not to attribute blame.

Some investigation reports are published on the AAIB and BGA websites, and in *S&G*, though formalities sometimes cause lengthy delays.

Accident database

Accident/incident and investigation reports identify the facts and origins in specific cases, and individual reports can also reveal snags of which we were unaware, such as new ways of mis-rigging aircraft. A recent AAIB investigation, for example, unearthed a series of unauthorised modifications that made automatic connections less foolproof [3].

More often, reports are the inspiration for more general analysis to help us set priorities and find common causes that, through changes to training, procedures or technology, we might be able to fix. Some suggestions for lines to investigate come from within the safety team; others from the broader gliding world; and clubs sometimes ask us to analyse their own safety histories.

The starting point is our database. Basic statistics allow a simple 'health check' – the number of winch launch accidents, for example, and how this year compares with previous years. Long-term statistics have also identified certain rigging vulnerabilities, as with ASW19/20, Pegase and PIK 20 elevators. However, as accidents are thankfully relatively rare, we often find that the data lacks statistical significance; and, while glaring differences should stand out, we rarely have the normalisation data to allow comparison of, say, rates per hour flown by different categories of pilot, aircraft or operation. As with all data, it's crucial to know the precision and uncertainty.

Backroom analysis

Database categorisations can lose important subtleties, so we mainly use the database to give an initial selection of archived accident

■ This topical cartoon was sent in by Kevin Clark. It is from his recently-published book *Glidertoons*. Kevin flies at Wellington Gliding Club, New Zealand, and as an Ass Cat has cleared many visiting Brit instructors to instruct at the club.

reports, which is extended or refined until we have all that are relevant. It helps hugely that we label each accident in the database by its apparent immediate cause: aerotow upset, inadvertent spin, collision, etc.

We then read the reports in detail. This can take time if they run into the hundreds, but it lets us understand what happened and ensures any figures we extract are reliable.

Sometimes, we'll find some common features behind a number of accidents: wing drop leading to winch launch cartwheels, or distraction causing low-level aerotow upsets. This can involve deeper study, tests and calculations. Revised winch launch advice [4] required new calculations of forces during rotation and energy during recovery; and we learned a lot about aerotow upsets from some brave test flights a generation ago.

We can also examine individual accidents in more detail. Reports nowadays can be accompanied by video or logger recordings, which are sometimes invaluable in working out what happened and why. Video can show instrument readings, control movements and aircraft attitude and replay the pilot's mutterings, and logger traces can reveal not only the glider's path but in some cases its configuration.

At glider speeds it's crucial to correct GPS velocities for wind if a glide computer hasn't already done so: accident reports and meteorological records can supply the needed data. The absence of an engine, on the other hand, means that the total energy can be a useful measure as the airspeed changes: in one case, we could tell that the pilot had mistaken the flaps for the airbrakes.

Discrepancies between instruments can tell us about more than wind corrections. In one case, reports of Dutch-rolling (yaw rolling) on aerotow were supported (though not proved) by periodic differences between the GPS and barometric altitude, though the slow logging rate was unhelpful. Indeed, sparse data, incomplete reports and complex situations mean our analyses aren't always conclusive.

Safer gliding

If we're lucky, our analysis may then suggest ways to mitigate some accidents. It's said that there are no new accidents in gliding, but they can manifest themselves differently and there's always room for new solutions.

We try not to reinvent the wheel, so we look at solutions elsewhere in gliding, aviation and the wider world. We increasingly find ourselves up against human factors and, while education, training and testing can help, we often need more imaginative ways to tackle human shortcomings. Changes of procedure or technology are easier.

It takes a while for small-number statistics to reveal changes, but we can be reasonably sure of two safety improvements. The 2005 Safe Winch Launch initiative [4] has been followed by a four-fold reduction in fatal or serious injuries from winch launch accidents, and approaching 10 lives have so far been saved. The adoption of FLARM over the same period has all but eliminated collisions between equipped aircraft, with no glider-glider collisions in the past five years.

Other benefits

Our accident data has other beneficial uses. Policy ideas, among both regulators and insurers, often stem from a hunch and our solid statistics can be very influential. One pilot avoided an aerobatics exclusion in his life insurance thanks to a BGA statement of the low historic risk; and we've headed off similar concerns by showing that clubs are managing the risk as pilots get older. We'll only provide aggregate statistics, though – nothing that could identify pilots or clubs, or bias insurance premiums. Confidential reporting is a crucial part of a 'just culture'.

The main purpose of accident analysis though is to make gliding safer. Your accident/incident reports make this possible. Please keep reporting – do include all the details, let us know about close shaves and, if in doubt, please report it. Feel free to set your loggers to record at 1s intervals too!

Tim Freegarde and the BGA safety team

■ Clubs can obtain printed copies of Safety Briefings from the BGA Office.

■ For more information, see the Safety section of the BGA website [5], where you'll find the accident report form [6] and the latest annual accident review [7].

✱ We need backroom girls, too. Drop us a line if you're interested.

[1] BGA Reporting an Accident, Incident or Occurrence *https://tinyurl.com/flyright2012*
[2] BGA Post Accident/Incident Process *https://tinyurl.com/flyright2013*
[3] AAIB Investigation G-CKLR *https://tinyurl.com/flyright2014*
[4] BGA Safe Winch Launching *https://tinyurl.com/flyright2015*
[5] BGA Safety website *https://tinyurl.com/flyright2016*
[6] BGA Accident Report form *https://tinyurl.com/flyright2017*
[7] BGA 2019 Accident Review *https://tinyurl.com/flyright2018*

PREVIOUS 'FLY RIGHT' ARTICLES

The Perils of Distraction (Apr/May 19)
Keeping Safe in Thermals (June/July 19)
Why It Is Good to Think Ahead (Aug/Sep 19)
The Effects of Wind Gradient (Oct/Nov 19)
A Fun but Safe Introduction (Dec 19/Jan 20)
Stop the drop (Feb/March 20)
Avoiding Upset (Apr/May 20)