Air Pilots UAV Working Group – Report to TC 25 May 2016 – AL1

CAP 722 was re-issued in March 2015 and is an improvement. In Europe there is some movement in EUROCAE with new working groups to address issues but, the meetings are infrequent and consensus takes time to get. ICAO itself is developing standards for a Remote Pilot's Licence; meanwhile, the CAA has a range of alternative means of compliance for judging remote piloting standards. The military rules have been removed *in toto* from CAP 722.

The Authorities are vexed by the mushrooming numbers of small UAVs and particularly by how to control them. Small UAVs are defined as less than 20Kg and ones less than 7Kg (which used to be exempt) are now increasingly subject to the same rules as those of 7-20Kg. There is lots of good advice in the 165-page CAP 722 but there are few defining standards.

With the most common UAV-use being TV and video, UAV operators want to be around interesting things and to earn money from doing so. This is aerial work and if you're conducting aerial work then you have to get an approval from the CAA. The law (the ANO) now mandates proximity limits (150m from 1000-person crowds and 50m from a person) and kinetic energy limits following a 'departure' and the CAA is trying to force operators to submit safety cases before getting an approval to operate but, activities are hard to police. The last I heard there were around 200 approved UAV operators and there are many UAV experts making themselves known to the market. CAP 1361 dated 20 May 2015 – 1702 small uav (<20Kg) operators are now approved.

If a UAV is heavier than 150Kg it has to obey the EU's basic regulations. Smaller than that and there is an exemption against 'manned aircraft equivalence' but the UAV must comply with the State's rules – the ANO (including that the operator must be able to demonstrate how he is going to avoid collisions by his UAV). Above 20Kg the UAV has to have a CofA and the operator needs to be licensed. Below 20Kg you don't even need insurance let alone a CofA, unless you're conducting aerial work when you do need insurance and you do need a CAA approval too (but not a CofA).

Detect and Avoid has its own (short) chapter in CAP 722. Equivalence is sacrosanct (detect a threat; assure separation; and avoid collision) but equivalence standards (target levels of safety) are not defined (issue ducked!). Instead, there is a useful list of considerations for R&D in the UAS industry. Similarly, there is a chapter of guidance on human factors which I expect would have to be well considered for any system safety case 'proof.' Autonomy also gets its own chapter as do security and spectrum issues. Autonomy is beyond any system that yet exists - Certification Standard 1309 (system safety) applies. There are Highly Automated and High Authority Automated Systems, but these systems are big (>150kg) and will have to have a CofA. The RAF expects to get 'PROTECTOR' which will have to demonstrate equivalent safety to manned aircraft to operate outside segregated airspace. There has been a flurry of contacts on this subject from DSTL and the RAF in the past few weeks so our inference is that the military may be about to grasp the nettle (especially of sense to avoid… sorry detect and avoid). Although, once they have scoped the problem they may drop it again (!) but, if they do lead, that would probably be the fastest way forward for rule-making.

Certification of UAVs is fraught. The CAA learned from the ASTREA virtual certification process but has not laid down firm limits as guidance. Large UAVs will need to meet the relevant 1309 standards (of a comparable manned aircraft); smaller ones will have to have a robust Operational Safety Case because there isn't an equivalent standard of manned

aircraft. Defining certification limits have not been promulgated. i.e. there is no certification standard for UAVs *per se* (primarily because there is nothing comparable). It is likely the certification process will be iterative (individual operators/UAS developers will push the boundaries and the rules will start to materialise as a reaction to the safety cases submitted).

We might put the certification subject up for consideration as the next 'policy development task' but, to eat certification would actually mean eating most of the elephant. Similarly, setting pilot standards is close to many hearts (not least the heart of Air Pilots North America – driven previously by Kevin Gambold et al) but that subject is already well attended to by full-timers. The Air Pilots have already set out our stall in Detect and Avoid so there is nothing for us to add in that sector as yet.

In summary, without a big full time team at our disposal that might make a real difference, the WG recommends we wait out for the moment.

DAA
22 May 16