

Questions asked of Mike Wilson, FAA - Aviation Safety *connectU TEAM / UAS Outreach* – These questions were inspired by the special presentation he made for the SCAUWG audience April 13, 2021 – questions have been assembled by SCAUWG member Ed Story, and gratefully answered by Mike.

1. How many validated collisions of civilian UAS with manned aircraft have occurred in the past 2-3-4 years or so? Are these collisions pursued by the NTSB as are mishaps of significance re manned aircraft?
  - a. Collisions have been pursued by NTSB in each case as Bill English and his team have the technical equipment to determine if it was a UAS or a bird or some other object. There have been several reports but only one or two actual UAS collisions. One was undetermined and others were birds.
2. How does the FAA track non-compliant UAS? Is this left to local law enforcement?
  - a. We keep very detailed data reports on UAS violations, same as for manned operations. Based on UAS registration, pilot certification, and collaboration with local law enforcement, including now with Federal security partners, we can track, investigate, and enforce non-compliant UAS. Only in areas of privacy violations or local ordinances for takeoff and landing violations would we defer to local law enforcement or legislators, where we have no jurisdiction. Once a UAS gets into the air, then we have jurisdiction.
  - b. If, by “tracking” you mean the physical act of monitoring a violating UAS while flying, we are only beginning to employ DAA (Detect and Avoid) technology such as that used on DJI aircraft or used by FBI, CIA, and other vendors creating the technology. It’s a “work in progress.”
3. If there is no signal from the UAS, how can it (or should it) be tracked? And at night, even the operator would want lights on it, one would think; but if there ARE no lights or lights are out...Basically, I’m inquiring about the amount that the FAA is depending on technical and operator compliance to maintain safety.
  - a. That’s the whole point of the Remote ID rule and identifying transmitters. It was born out of the fear of not being able to identify UAS nor being able to track them if required. With Standard RID or Broadcast Module RID, we’ll improve that tracking, because it also requires not only commercial but also recreational users to employ the systems.
  - b. Our NAS was founded on the principles of operator compliance and manufacturer/industry technical innovation. The FAA doesn’t build airplanes, but by law, we oversee them. We are also now doing the same with UAS.
4. How do our regulations, many of which I believe you and your team(s) have developed, compare with those created by EASA? Broadly speaking, are our philosophies different from EASA’s or virtually the same? Is EASA further down the road or are we?
  - a. Good question and one for opinion, not fact. EASA rules, by comparison, are more lenient than the FAA’s, hence the increased operation and research in Europe. Remember that our National Air Space is the safest airspace in the world, and for a reason. We’re slow by design, in order to maintain that high level of safety.
  - b. Philosophies between EASA and FAA/the US are different in that EASA puts all the liability on the operator, where the FAA assumes some of the risk based on regulatory requirements. Only in a Public Aircraft operation in the US does an operator assume all the risk. As a cynical comment, EASA requires their operators pay a fee for a license, and that’s the end of it. You assume the risk and the accident/injury lawsuits.
5. I was gratified to see that CAT 4 UAS required certification. Questions are:
  - a. CAT 2 & 3 are “impact” measurements; is that based on weight, speed, altitude, and/or what combination, etc. How is that calculated. Essentially, what does “11 lbs impact” or “25 lbs impact” actually mean?
    - i. It’s all based on injury risk developed from kinetic injury, i.e. the bigger and faster the UAS, the more injury inducing it is.  $K=1/2 MV^2$ , so the faster the UAS (velocity squared), the more the injury risk.
  - b. How developed is the certification for CAT 4?
    - i. Right now we have about a dozen applications going through the pipeline, and are nearing the first approved airworthiness statement which will lead to a full Type

- Certificate. We did two Restricted Type Certs for our first commercial op in Alaska to collect data, and although we have approved a few SAC-EC's (experimental), we do not allow commercial ops with an EC, only research and demonstration.
- c. For instance, is there any requirements regarding reliability of the electric motors used on any of these UAS (even CATs 2 and 3)? Or with regard to whether they are flyable if one or more motors quit? BRS?
    - i. Primarily we have adopted a performance based requirement, rather than a prescriptive requirement of a specific radio, turbine, propeller or the like. We're confident there will be an industry standard determined by RTCA or ASTM, but nothing yet. All that being said, we do require mitigations for each risk through a Risk Management panel, and certainly system failures would come under that.
  6. A bit off the wall question: given that a large number of UAS are produced in the PRC, tell me what you can about the cooperation (or lack of cooperation) between the U.S. and China on requirements for the UAS produced there. Does the our government still ban certain Chinese manufacturers for use by U.S.G?
    - a. Good question, but politically based, not regulatory based, so I can offer only my opinion. Both the House and Senate passed their versions of the American Security Act last year with language to prohibit PRC UAS from being imported to the U.S. due to security issues, and I'm sure you read about the Army's decision to ban them. Unfortunately (read: somehow) none of that language made it into the National Defense Authorization Act for FY21. Subsequent to that failure, a White House Executive Order was issued to require a review (but not outright ban) any of a foreign country's effort, not just PRC's, to sell their UAS in the U.S. Here is a pretty good article on that from DroneLife: <https://dronelife.com/2021/01/21/the-latest-executive-order-on-drones-the-ban-on-chinese-and-covered-country-uas-expanded/>

So I hope this answers your questions, and I always enjoy the dialogue. Let me know if there are any other questions, and I'd be happy to talk again in the future to the SCAUWG. I look forward to our meeting eventually with you, Pat and others.

Best// mike

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