

**Meeting Subject:** AC VLOS DESIGN STD. for Consultation - Place Holder

**Meeting Date:** 2019-01-24 10:30 AM

**Location:** TC CONF ON Ottawa - 330 Sparks - 27 - 2736 (VC) CONF TC

**Participants:**

TCCA RPAS Task Force & Industry representatives

TCCA presented attached slides.

Opened the floor to questions:

1)

Q: Will the presentation slides be made available?

A (TCCA): Slides will be made available after the briefing.

2)

Q: Commenting on the AC vs. the Standard. How do they comment on the standard? Can it be changed?

A (TCCA): Yes, standard can be improved.

3)

Q: Question about circulating the AC?

A (TCCA): There is no restriction for sharing the draft AC with industry. It will be out by the end of the week through CARAC notification process which will include contact information to submit comments; there is no need to be a standing member of CARAC to submit them; comments will be handled by RPAS TF.

Timeframe for feedback: 30 day consultation period extended to 60 days; the target date for the initial issue of the AC is June 1<sup>st</sup>, 2019.

Industry expressed concerns with the availability of the AC and the coming into force of the regulation having the potential for adverse commercial impact considering that the bulk of the RPAS operations occur in the summer months.

4)

Q: According to current draft, what is the current expectation for showing compliance for each product line vs each model variant?

A (TCCA): Need a declaration for each model variant.

5)

Q: For operations near people and over people; can you elaborate the methods of evaluation for showing compliance with respect to risk.

A (TCCA): Referred to FAA Assure research using the head injury criteria (HIC) for defining injuries. The criteria defined in the draft AC is based on those studies; this work is performed in harmony to that of other CAAs. Reliability/probability: Two main considerations: (1) that the machine is incapable of inflicting severe injury or worst, and (2) is the machine is reliable enough that the probability of hurting someone is remote.

6)

Q: Understanding of model variation. Manufacturers may change model variations based on cosmetic features that don't impact reliability.

A (TCCA): Yes... declaration has some flexibility. Cosmetic changes shouldn't have an impact on the technical evidence supporting a declaration. You can declare all or part of a model family.

7) Section 4 Part 1 Cumulative probabilities per flight hour:

Q: Table B2 and B3 is differentiating between size of aircraft and failure rates. Is this segregating aircraft within the ranges?

A (TCCA): We wanted to delineate the required reliability in different weight classes. Heavy aircraft will always cause severe injury, so they really do need more reliability. The probability numbers defined in the draft AC uses the principles of FAA AC 23.1309-1E but appropriately scaled for RPAS of 25 kg and less.

8)

Q: Do you have a number for impact energy, joules?

A (TCCA): As part of the CARAC process, it had been proposed that 12J/cm<sup>2</sup> of transferred energy will result in a severe injury. That's the number used in the AC currently. Appendix C is based on the automotive industry. Jose: TC is developing injury criteria with FAA Assure; the Canadian industry is invited to participate in the elaboration of the criteria.

9)

Q: Mentioned harmonizing requirements with other CAA around the world. What is the approach?

A (TCCA): Continual discussion with the FAA, JARUS, and ASTM; bilateral discussions are taking place.

10)

Q: Section 5.6 on manufacturing. What is the expectation with the focus looking towards smaller manufacturers who are more system integrators?

A (TCCA): Expectation is that the system integrator is responsible for showing compliance. Working with suppliers, working with products received. The objective is to foster the collaborative relationship between manufacturers and integrators. A manufacturer may choose to market for basic operations to gather in-service data; evidence gathered via a structured approach may be used to substantiate reliability numbers.

11)

Q: Three Categories. Barrier to entry in Controlled area is pretty low. Near and Over people are much more complex. Overall the draft AC has lots of "MUST". It would be better if the requirements were split between the three categories. So it was clear what you wanted to see for each. The concern expressed is that the draft AC may impart a perception that operators must procure new equipment that meets the intent of the rule.

A (TCCA): We are not intending to force operators to buy new equipment to continue operations past June 1st. The point is noted, the draft AC will be reviewed with the objective to ensure a better delineation of "must have" versus the nice to have.

12)

Q: New declarations, will the operator's/flight manual need to be submitted?

A (TCCA): No, just retain information, make it available to TCCA on demand only.

13)

Q: For existing fleet operating under an SFOC, as industry is updating their operator's/flight manuals for the date of coming into force of the regulation, should the industry provide the updated manuals to their operators as they get updated?

A (TCCA): Operators may continue to operate under their existing approvals, distribution of updated manuals in the meantime is at the manufacturer's discretion.

14)

Q: We have done operations recently with TCCA present (having been audited)... We have non-declared systems that are capable of certain work while compliant systems may not be capable to perform the work they need. There is concern about an expectation to re-jig fleet; he begs to differ. They're moving to currently non-compliant systems for hydro work and need to be in controlled airspace. The concern is that they could have to cancel contracts or bench the fleet after June 1st.

A (TCCA): Well received/heard. We have been discussing internally what processes are available to operators who have a high level of experience and for whom we have a high level of confidence. Reminder that they should prompt manufacturers to proceed with the required declarations. There may be some other regulatory tools available for certain exceptional situations.

15)

Q: Follow up question on the ability to fly in controlled airspace; one could strap a GPS to the drone.

A (TCCA): Yes; but the operator would have to declare the systems and take responsibility for it (i.e. become a systems integrator). Again, operators should reach out manufacturers.

16)

Q: In the scenario where there are third part modifiers (e.g. adding a GPS, etc.), how could they reasonably meet the requirements for the manufacturing control that is detailed in the AC?

A (TCCA): The modifier has to meet the SAFE standards, do the necessary testing, and retain the necessary compliance evident keep. Need to be cognizant of the risks the modifier is taking on when making a declaration. You have to have adequate information about the system being modified. The modifier's responsibilities are no different than those of a system integrator or manufacturer. The modifier must also assure that the stated performance characteristics and limitations remain valid after modification.

17)

Q: Suggesting that in the modifier scenario, is the modifier need to buy 1000 units and test them to make a declaration of quality?

A (TCCA): Will add clarification to the AC with respect to modifiers and quality control.

18)

Q: Centered around Quality Assurance, Configuration Management, and Continued Airworthiness post sale. Once in operator's hands, not every operator has licensed personnel (AME). What are TCCA's realistic expectations for the Real Estate Agent who owns a fleet of 8 drones for taking pictures?

A (TCCA): Within Part IX regulations, we identify the responsibility of operators to maintain the systems IAW the Manufacturer's instructions. We expect them to comply with those instructions. We understand that escapes may occur. We will continue to evaluate the state of operators as incidents occur and update our surveillance program accordingly.

19)

Q: Section 6.4 paragraph 5, for RPAS that have significant history... there may be evidence to support compliance. What was the intent of including this?

A (TCCA): Drawing from concept of in-service history from the aviation industry; manufacturers may take credit for the in-service history of their products. If a manufacturer is able to get credible data from their operators on flight hours, history, failures, etc. that track record can be used to show satisfactory reliability for use in advanced operations. TCCA wants to account for the efforts expended by operators and manufacturers aimed at improving safety.

20)

Q: DJI is definitely engaged with TCCA to show compliance on their products. The question is about operations near people and the way the circular describes the MOC for this aspect. The AC refers to Safety Assessment and SAE ARP 4761. What are the expectations for showing the reliability of the aircraft?

A (TCCA): TCCA appreciates that ARP 4761 is not recognized outside of aviation circles. The data we expect from manufacturers is a demonstration that the design has been evaluated and the manufacturer understands the failure modes and failures propagation. The manufacturer would be expected to follow robust processes for capturing/tracking/resolving design issues and substantiate the reliability numbers achieved by their products. SAE ARP 4761 is the gold standard though it is not the only acceptable means of showing compliance; ASTM standards may be appropriate. TCCA will entertain other means of compliance proposed by the manufacturer.

Discussion: Day to day work on full size experimental aircraft, SSA work is important. Issue is getting credible data to support the reliability numbers; in some instances, the numbers will be educated estimates.

A (TCCA): Intention is not to perform a full blown ARP 4761 analysis but to show that the manufacturer has follows adequate processes and procedures to understanding their design, how failures propagate and can lead to injury.

21)

Q: Question about when there is an incident, how do you separate operator error from design flaws?

A (TCCA): We appreciate that there may be arguments over where the responsibility rests. We are stressing for education and training for operators, need to know regulations and understand the characteristics of their machines. Equipment must be operated and maintained in accordance with the manufacturer's instructions.

22)

Q: Is TCCA expecting to use CADORS for incidents reporting?

A (TCCA): Yes, we will evaluate options based on the volume received.

23)

Q: How soon can manufacturers file their declarations?

A (TCCA): imminently. We hope to have the portal running within the next couple of weeks.

24)

Q: A proposition to improve the portal to make it clearer that even though there isn't a declaration today, the manufacturer intends to file one. Currently it is written as if there will never be a declaration if there isn't one now.

A (TCCA): We will take suggestion under advisement, though a statement of intent wouldn't bound a manufacturer to follow through with it.

25)

Q: A proposition to consider reissuing registration certificates after a manufacturer files a declaration.

A (TCCA): yes, the manufacturer's portal is coordinated with registration, a new certificate is released to all registered owners when the declaration is made.

Meeting adjourned at 12:05

Actions:

- 1) TCCA: Provide copy of slides with speaker notes, and
- 2) TCCA: Provide information for submitting comments on the draft AC,