



AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

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360 Albert Street, Suite 1715 • Ottawa, ON K1R 7X7 • 613-569-5668

CARAC Secretariat (via email)

27 August, 2015

Subject: CARAC ACTIVITY REPORTING NOTICE #2015-012

Thank you for the opportunity to comment on the NPA regarding small Unmanned Air Vehicles (sUAV) on behalf of the 52,000 pilots flying for 31 airlines in Canada and the US. We commend Transport Canada (TC) for the level of detail in the proposal and the clear intent to maintain the safety of the National Airspace System (NAS). This is consistent with ALPA's long-held position that all aircraft in the NAS must operate to the same high level of safety.

General Comments

We believe the proposed rules, with additional standards and with appropriate supplementary material (e.g. guidance material, training documents, advisory circulars), could be effective in ensuring that the introduction of sUAV into the NAS and flown within Visual Line of Sight (VLOS) does not pose significant unmitigated risk.

We note throughout the NPA the lateral and vertical restrictions to operations and infer a clear intent to restrict sUAVs from operating in areas in which manned aircraft are likely to be flown. However, nearly all of the aircraft that are the focus of the proposed regulations are now, and may reasonably be expected to continue to be, capable of performance that would allow them to climb to altitudes well above 400 feet above the surface as well as range, speed and endurance that would allow them to quickly fly significant distances, well beyond the operator's sight. Yet there is no requirement for any means of measuring altitude, speed or control station transmitter range and there is no requirement that any technology be employed to prevent operation above 400 feet above the surface or encroach on the airspace in which sUAV operations are prohibited. This is a significant shortcoming in the NPA and we urge TC to consider means, other than the operator's skill and intentions, to ensure the aircraft cannot be operated outside the confined area required to mitigate the collision risk. In fact, the vast majority of our concerns outlined below trace to the fact that sUAVs may, due to malfunction, lack of operator awareness or deliberate disregard for safety regulations be flown at altitudes, speeds and in geographic areas, regardless of operating restrictions to the contrary, that would make the sUAVs a hazard with a significant risk of collision with other aircraft in the NAS. Design-based mitigations of that hazard would substantially reduce the risk.

Our review of the NPA included a comparison with the recent US NPRM in an effort to maximize harmonization of rules so that our pilots know what to expect no matter where they fly. We are including a copy of our response to the US NPRM to explain our position on many issues and use it and our work on this NPA to promote harmonization.

Following are our specific comments on the NPA. Some of the comments are in an effort to clarify the focus or intent of the eventual regulations so that when the next NPA containing regulatory wording is issued the explanation of the reasoning for the chosen direction for the regulations is better understood.

No VLOS distance has been defined. We recommend that VLOS should have clearly defined limits based on current weather and visibility applicable to manned aircraft for a given airspace. A sUAV that flies far away from the pilot, while maintaining VLOS, should possess technologies that prevent adnominal flight conditions (e.g. fly-aways, lost link and unsafe auto-landings). Spatial acuity for the pilot to correctly interpret altitude, heading and speed (aircraft proximity) as it relates to flying near terrestrial objects or manned aircraft should be researched for determining safety impacts or sUAV pilot operational limitations.

1. Applicability:

A statement is made about reckless and negligent UAV use. Limiting the statement to 50 investigations understates the problem. CADORS should be queried for number of reports of suspected UAV encounters. It is likely that there have been hundreds of reports in the recent past and this should be referred to in the NPA to emphasize the need for regulation.

A statement is made about the need to consider “trade-related implications” of UAV use. This statement should be further amplified to ensure that commercial interests are not being placed above safety of the airspace.

There is a statement about Canada adopting “minimum civil aviation standards”. We believe this is a limiting statement, as opposed to one that would meet the highest level possible. The statement should be amended to “Canada will meet or exceed civil aviation standards...”

There is a statement about tethered UAVs that could be interpreted to exempt electronically tethered UAVs. We suggest alternative wording to incorporate physically tethered UAVs into the main statement to emphasize that they are still considered UAVs and that special marking and lighting standards would apply:

“...within Canadian domestic airspace. This includes UAVs operated for any purpose, including but not limited to recreational, commercial, business and academia purposes*. Physically tethered** UAVs are also included.

2. Model Aircraft:

A statement is made about TC's intent to consider all unmanned aircraft to be UAVs. We applaud TC for this because it makes it clear that there are safety issues that need to be addressed no matter where, how or for what purpose UAVs are flown.

There is an attempt to define a lower limit where no, or at least minimal, regulation would be applied to very small UAVs. This would be an appropriate location in the document to acknowledge, as has been the case so far in working group deliberations, that this is a difficult issue because energy is the risk that must be addressed. For example, a very small UAV can do significant damage to an aircraft travelling at 250 knots, especially if it enters a turbine engine or impacts a windscreen. We believe that there should not be any lower limit in size, mass or speed unless there are provisions built into the systems (e.g. geo-fencing, altitude limiters) or location of activity (e.g. indoor) to ensure that these UAVs remain outside of airspace used by manned aircraft. Maintaining control of model aircraft and avoiding collisions has traditionally involved keeping them close enough to visually confirm attitude and direction of flight, which has kept most models within a reasonable distance from the pilot and within a distance where the pilot can watch the airspace surrounding the UAV for other aircraft. Dependence on VLOS only for separating very small UAVs from manned aircraft is no longer sufficient because of the capabilities for many very small UAVs to fly beyond a distance from the pilot at which attitude and direction can be discerned and yet it can still be kept in control through some level of automation. While Advances in technology have made it more difficult than ever to define a safe lower limit, other new technologies such as geo-fencing, altitude limiters and no-fly zones may limit these risks.

“traditional modellers” are mentioned without definition. We believe that the introduction of multi-rotor and other similar UAVs that have some automation to assist in stability and control, as well as the development of electronics for traditional models have taken modeling well beyond what should be considered traditional and certainly made this form of recreation more attractive and affordable to more people; in particular those with little or no relevant experience. In terms of the variety of activities that now occur and the access that people now have to this form of recreational activity, the time has come to require more knowledge and demonstrated skill for even the simplest form of recreational UAVs. To this end, we recommend that the first sentence on page 11 concerning model aircraft should be amended to: “The objective of this portion of the proposed rulemaking activity is to define a regulatory approach that will permit safe recreational use of most sUAVs, including those weighing up to 35 kg, to continue to be conducted with minimal regulation. However, recognizing the rapid advancement of affordable technology, the time has come for additional management provisions to be introduced in order to ensure that recreational flight activities are safe.”

While we acknowledge that the intent is to continue with the upper limit of 35 kg for model aircraft while setting 25 kg for non-recreational small UAVs, there should be an explanation provided for the apparent ambiguity that is caused by, for example, permitting less onerous rules to apply for a 30 kg UAV used recreationally versus non-recreational.

Approach 1 has merit, although requiring everyone to be a member of a recognized organization would create a number of issues, including which organizations would be acceptable, in terms of their ability to manage a growing number of members conducting a wide variety of activities, and how best to ensure that their guidelines adequately mitigate the risks. With no real control over these organizations, such as would be the case with operating certificates, it would be difficult to ensure safety. We would like to see more discussion on the approval process and safety guidelines before this approach would be acceptable to ALPA.

The first sentence of Approach 2 contradicts the statement on page 10 about all unmanned aircraft being considered as UAVs. For clarity, the sentence should be amended to “Transport Canada may consider sUAVs equipped with a camera payload, excluding first person view (FPV) devices, to no longer be a model aircraft and therefore subject to the sUAV rules”. Having said this, we do not believe that using cameras as a defining line is the best choice. For example, a new concept for electronically tethered flight of a camera (see Lily Camera <https://www.lily.camera>) would not be considered a model under Approach 2 even though it appears to have significant capabilities to limit its area of operation much better than many model aircraft and it appears to be “aimed” only at the recreational market.

Given the rapid development of concepts like Lily Camera and others yet to be conceived, it would be difficult to effectively develop a defining line for recreational activity that would stand the test of time. For this reason, Approach 2 is not a viable option.

3. Terminology and Definitions:

We agree that UAS should be used as the overarching term and that two sub-categories be created: RPAS and Autonomous. We also agree that the NPA should focus only on RPAS. The current NPA is somewhat confusing because it recognizes the need to use more internationally acceptable terms and yet continues with UAV throughout the document. For the sake of consistency between our comments and the NPA, we are using the same terms but recommend a move to the proposed terms for any future NPAs and other publications. We recommend adoption of the terms used in ICAO Circular 328 http://www.icao.int/Meetings/UAS/Documents/Circular%20328_en.pdf

4. Categorization of the Regulatory Structure

We agree that there should be a category for operations with increased risk such as those cited in the NPA and that the most comprehensive set of requirements would apply to this category. We also agree that less onerous regulations should apply in locations where the risk can be demonstrated to be lower. However, categorizing them as complex or limited can be misleading and difficult to understand for the non-aviation people who may engage

in this activity. It would be much simpler and less risky to define distances from built-up areas and aerodromes within which an SFOC would be required.

While at some point in the future, when experience has been gained with very small RPAS, it may be possible to more accurately define a lower limit, we believe that the NPA's suggested limits are arbitrary, especially when a fast moving manned aircraft is considered.

5. Small UAV (complex operations)

We question the ability for TC to adequately control complex operations without some means, such as an operating certificate, to restrict if necessary. While we recognize that the current SFOC process could become over-taxed with requests for permission to operate close to built-up areas and aerodromes, until there are sufficient detect and avoid capabilities in place, these more risky operations are best managed through the SFOC process, including developing more comprehensive guidance material for operators and inspectors.

We believe that all sUAVs should be registered with TC, as simple as filling out an online form, and have installed a robust means to link them back to the owner.

It is important to consider all sUAV operators as pilots in order to give proper emphasis to the need for training and experience in order to safely operate an aircraft in the airspace.

Requiring adult supervision only for those less than 16 is not sufficient. The responsible adult must have appropriate aviation training and experience.

We favour TP15263 as an alternative to the knowledge subject areas mentioned in the NPA.

We believe that if flight training units or schools are not certified, there still needs to be extensive guidance material to ensure that training adequately covers all facets of operation and maintenance.

Night operations should not be permitted at this time. As with trying to define a lower limit for very small UAVs, it could be possible in time to permit night operations but not until experience is gained with this class of UAVs.

The note under Airworthiness regarding the intent of a design standard is acceptable only if the UAVs remain in the intended area and not stray into other airspace or near people/buildings etc to pose a hazard. Reliable geo-fencing would mitigate this risk.

The general operating rules referred to on pages 19 and 20 of the NPA should apply to all sUAVs, not just complex operations. In addition to Class A and B airspace, sUAVs should also never operate in Class C, D and E airspace unless there is an SFOC and suitable sense and avoid technology in place.

In addition to never taking off with snow or ice on the aircraft, unprotected UAVs should also not fly in known or forecast icing conditions. Also, UAVs must remain in VMC at all times

6. Small UAV (Limited Operations)

Since even during limited operations there is risk of encounters with manned aircraft at aerodromes and in class G airspace where manned aircraft will be, it is not sufficient to simply expect that pilots of sUAVs will understand the risks they may be putting on others when they make decisions on where and when they fly. Since these operations will be non-recreational, uninformed pilots may be motivated by other than safety in the decisions they make about where and when to fly. For this reason alone, all pilots of sUAVs who fly for other than recreation must undergo formal training and have at least a permit.

Approach 1 is acceptable only if it specifies all controlled airspace, including all control zones and at least 5nm from all other aerodromes but we reiterate that in order to fully understand where pilots are operating (reading of charts etc) pilots of sUAVs require formal training and at least a pilot permit.

7. Very Small UAV (lower Threshold)

Consistent with our comments on the US NPRM, we do not support any lower threshold until such time as experience is gained with these aircraft.

8. Special Flight Operations Certificate

We agree with this section of the NPA but suggest that there be statement made about an intent to develop regulations for greater than 25 kg, which may address the need for SFOCs in some circumstances in the future. As currently stated, one is left with the impression that the sUAV regulations may be the end state.

9. Foreign Operators

We support maintaining consistency with current rules pertaining to aircraft registration eligibility by limiting operation to Canadian citizens/corporations, except through an SFOC. However, since we do not support a lower threshold for sUAVs at this time, we do not support the proposal to permit foreign operators of very small UAVs to operate outside of the registration requirements. Also, as mentioned earlier, we do not understand how “trade-related implications” is related to safety.

Summary

We look forward to further dialogue leading to the development of sUAV regulations.

Yours truly

Kevin Psutka
Safety and Security Representative