

**Meeting with OIRA and Commercial Drone Alliance:**  
**Operations Over People**  
**December 5, 2016**

The Commercial Drone Alliance appreciates this opportunity to meet and discuss the FAA's proposed rulemaking on Operations of Small Unmanned Aircraft Over People, which will address the performance-based standards and means-of-compliance for operation of small unmanned aircraft systems (UAS) over people not directly participating in the operation, under a covered structure or inside a stationary vehicle ("flights over people"). This rule would provide important relief from certain operational restrictions implemented in Part 107, the FAA's rule governing Operation and Certification of Small UAS.

The Commercial Drone Alliance is an industry-led, 501(c)6 non-profit association representing commercial drone end users and the broader drone ecosystem. Our goals are to reduce barriers to help enable drone technology and commercial end users understand the value and benefits of drones for commercial use, allowing for broader adoption and market growth.

**UAS Industry: Huge Potential For U.S. Economy**

We are in the very early days of deploying UAS commercially on a broad scale. Regulatory barriers still stand in the way of our ability to make use of the unlimited potential of UAS. Estimates vary, but by all measures, the economic impact is enormous: a recent [PricewaterhouseCoopers report](#) estimated the global market value of UAS-powered solutions at more than \$127 billion by 2020. [Others](#) have predicted that the U.S. share of the UAS industry will grow to be an estimated \$82 billion market in four years, and create more than 100,000 new jobs here at home.

To get there, however, our nation's regulatory framework must keep pace. The United States is behind other countries, such as [Japan](#) and Australia, in terms of enabling drone technology. Part 107 was an important step forward, but to promote American competitiveness and enable innovation to succeed, we must continue to move the policymaking forward rapidly.

**Flights Over People: Essential to Real-World UAS Applications**

To fully take advantage of the safety and efficiency capabilities of drones, operators need to be able to fly in areas densely populated with people, such as urban and suburban environments. Additionally, to be of ultimate use in disaster response, operators may need to fly near cities.

To account for this reality, the FAA must move beyond the current operating envelope so that the regulations reflect the possibility for real-world operations. Regulations that are unduly strict will have the counter-effect of encouraging businesses to flout the rules; safety will suffer as a result. The FAA's over people (OOP) rulemaking must enable real-world operations while protecting safety.

### **Flights Over People: A Proper Risk-Based Analysis**

As the FAA crafts the OOP rule, the agency must consider all types of risk factors that can be either mitigated or exacerbated by drone flight. For example, in addition to considering the kinetic energy of a small UAS hitting a person, regulators must consider the risks inherent in the dangerous tasks that UAS operations would replace. Thus, when considering the risks of flying a UAS over a film set, the agency must also consider the much larger risk of flying a helicopter over people for the same purposes. When considering the risks of a construction company flying a UAS over an active worksite to inspect a structure or an infrastructure company inspecting its towers, the agency must balance that risk against the hazards faced by the worker who would otherwise have to climb a tall ladder, or scale the roof of a building to conduct the same exact visual inspection.

The framework proposed by the Micro-Aviation Rulemaking Committee (Micro ARC) for flights over people, which the FAA used as its starting point for the OOP rule, focuses solely on kinetic energy. Focusing on kinetic energy alone as an indicator of overall risk is the wrong approach and will lead to an absurd rule that does not reflect real-world risks, and disincentivizes advancements in UAS technology that would otherwise increase safety.

The FAA must factor in operational and technical mitigations in addition to kinetic energy. Adding safety equipment and technology to a UAS – for example, propeller guards, parachutes, or padding – inevitably adds some weight (and therefore the kinetic energy potential), but they also substantially minimize the prospect of injury. Under the Micro-ARC analysis, any additional weight is penalized, even if it results in a safer vehicle. As the industry evolves, we have an excellent opportunity to incentivize innovation, whether it is through parachutes, propeller guards, audible warning system, or some other new technology, that will make them safer. An OOP rule that fails to provide these incentives will be considered a failure and will result in less safety, rather than more as intended.

To the extent that the proposed OOP rule does rely on kinetic energy as an indicator of risk, kinetic energy-based injury calculations need to accurately reflect how UAS impacts or collisions happen. The FAA should consider Dr. David Arterburn's

research at the University of Alabama in Huntsville, which, as stated in the Micro ARC Report:

“...UAS were found by ASSURE to deflect and tumble on impact, resulting in only an average 38% kinetic energy transfer during an impact, and therefore a significantly lower expected severity of injury compared to shrapnel impacts that were the basis of those prior estimates of harm, taken from studies of explosives and ordinance effectiveness.”

### **Flights Over People: Incorporating Consent**

At the outset of when the FAA first began authorizing commercial UAS flights under the “Section 333” framework, the FAA correctly recognized that flying over people who have consented should be treated differently than flying over members of the public, and that different regulatory frameworks should be established for both situations. Under the FAA’s Section 333 exemption framework, the FAA authorized nearly 500 companies to operate over people in a “closed set” filming context, where “participants” had consented to the risk of UAS over-flight. Participants were defined as people associated with the filming production that acknowledged and accepted the risks associated with the UAS operations. See FAA Order 8900.1, Volume 3, Chapter 8, Section 1, Issue a Certificate of Waiver for Motion Picture and Television Filming at ¶ 3-213(B)(1):

#### **B. Definitions.**

1) Participating Person/Authorized Person. All persons associated with the filming production must be briefed on the potential risk of the proposed flight operation(s) and they must acknowledge and accept those risks. Nonparticipating persons are the public, spectators, media, etc., not associated with the filming production.

The first Section 333 exemption ever issued by the FAA authorized flights directly over consenting people on a film set. See Condition and Limitation No. 15 in the FAA’s Section 333 exemption issued to Astraeus Aerial (Docket No. FAA-2014-0352) (Sept. 25, 2014):

15. The UA may not be operated directly over any person, except authorized and consenting production personnel, below an altitude that is hazardous to persons or property on the surface in the event of a UAS failure or emergency.

In this first-ever Section 333 exemption issued by the FAA, and in every other exemption issued thereafter, the FAA has never looked to kinetic energy as the sole indicator of overall risk posed by small UAS to people on the ground.

Key to this entire issue is the FAA's definition of "directly participating" under Part 107. Under the current § 107.39, a UAS may be operated over a person who is directly participating in the operation of the UAS. Also under Part 107, however, the category of individuals deemed to be "directly participating" is narrower than the category of persons which have historically qualified as participating persons in the context of section 333 exemptions issued for closed-set filming. In the Preamble to Part 107, the FAA clarified that the term "directly participating" only extends to UAS crewmembers operating the UAS:

The term "directly participating" refers to specific personnel that the remote pilot in command has deemed to be involved with the flight operation of the small unmanned aircraft. These include the remote pilot in command, the person manipulating the controls of the small UAS (if other than the remote pilot in command), and the visual observer. These personnel also include any person who is necessary for the safety of the small UAS flight operation. For example, if a small UAS operation employs a person whose duties are to maintain a perimeter to ensure that other people do not enter the area of operation, that person would be considered a direct participant in the flight operation of the small UAS. Anyone else would not be considered a direct participant in the small UAS operation. 81 FR 42128 (June 28, 2016).

Under this narrow definition of a "participant," personnel engaged in related activities that the UAS is being used to assist in are nonparticipants, just as if they were any other member of the general public. For example, workers on a job site, where a UAS is being flown overhead to perform an inspection, are considered nonparticipants, and the UAS cannot be operated over them. In many scenarios it is more difficult to control the movement of all people on the ground than to take measures to mitigate the risk associated with drone flight.

The FAA's OOP rule should broaden the definition of a "direct participant" to include personnel engaged in related activities that the UAS is being used to assist. Similar to the approach taken by the FAA with the exemptions issued for closed-set filming, the OOP rule must provide flexibility to permit flights over people that are aware of, and have consented to, the UAS flight. Under the Section 333 framework, those companies who took extra operational steps for safety – including preparing a special manual with company operating procedures to ensure safety – and were then allowed to fly any authorized vehicle under 55 pounds directly over participating people. The

FAA's OOP rule must allow for the same operational flexibility in similar contexts, using the 333 exemption framework as a guide.