



“Opportunity Rising: the FAA’s New Regulatory Framework for Commercial Drone Operations”

Testimony of:

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Subcommittee on Investigations, Oversight and Regulations

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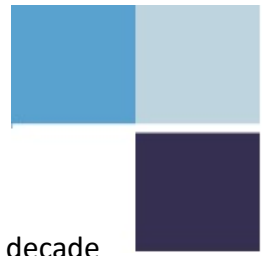
Good Morning Chairman Hardy, Ranking Member Adams and members of the Committee. Thank you for hosting this hearing, and for your invitation to provide testimony at as an expert witness. My name is Jonathan Daniels, and I am honored to be here today. I am the Co-Founder and CEO of Praxis Aerospace Concepts International, Incorporated (PACI), a service-disabled veteran-owned small business headquartered in Henderson, Nevada.

I would like to provide some additional background about myself, as historical context, before describing the efforts of Praxis Aerospace. I spent over 23 years in the Army, retiring to my home in Boulder City, Nevada in December of 2011. During my period of service, I organized, programmed, trained, maintained, operated, employed and directed manned and unmanned reconnaissance equipment, teams and detachments during over 23 years of combined enlisted and officer experience as UAS pilot/sensor operator, aviator, project manager, tactics specialist and operations analyst. I have 16 years' direct aviation experience in six different manned rotary/fixed-wing airframes (rated/nonrated crew-jumpmaster) and over a decade of experience with nine military UAS on six continents in the full-spectrum of positions (pilot-sensor operator-technical observer-instructor/examiner). My final military assignments were to the Joint Unmanned Aircraft Systems Center of Excellence (JUAS COE) at Creech AFB, Nevada and as inaugural Chief of the US Army Europe Unmanned Aircraft Systems Training and Standardization Center of Excellence in Illesheim, Germany.

I cofounded PACI in 2011 with a four amazing female veterans; all of whom had experience in aviation operations, unmanned systems and military intelligence. We had known each other for years, and had maintained our connection throughout multiple organization changes and combat deployments. We decided to take the same skill sets and experience that we used in the military and create a company that would be the leading edge of a very disruptive commercial technology: robotics.

Praxis Aerospace provides practical solutions for multi-modal (ground-air-sea-industrial) robotics and unmanned systems. Praxis Aerospace is dedicated to the expert practical application of technologies, equipment, robotic systems and concepts that support manned, unmanned and teleoperated customer missions.

We are best known for our activities involving civil unmanned aircrafts systems, which has included flight as public aircraft, under Section 333 and Part 107, as well as our work with several FAA UAS Test Sites and industry standards associations. Praxis Aerospace was a proud participant in NASA's UAS Traffic Management (UTM) demonstration of 22 simultaneous UAS test flights at seven locations conducted in April 2016. Praxis Aerospace is a proud partner with the Clark County Fire Department, and currently assist the fire department in managing its Public Safety Blanket COA. We work cooperatively with the City of Boulder City, home to the Eldorado Droneport- the world's first public airport dedicated to UAS. We are currently building a prototype cargo sUAS in our Nevada facilities as part of a collaborative effort between Local Motors, Inc. and Airbus.



Great Relationship with the FAA

First, I want to say that I have a great relationship with the FAA that dates back a decade to the early days of the Unmanned Aircraft Program Office. I am very thankful and appreciative of the work that they do. After spending years attempting to coordinate flights within European airspace, in and outside of the European Union, I find the FAA to be responsive, accommodating and very open-minded.

As an industry, we hoped for a regulatory structure for UAS that would be affordable for users and safe for communities on the ground and in the sky. Many of our peers and competitors have publicly derided the FAA for their perceived inertia and misunderstandings. I did not then, and do not now, share their views. I am grateful for the crawl-walk-run process and its preservation of the safety of the national airspace system (NAS).

Section 333 Exemptions are a good example of why this method works. While the initial number of approved exemptions were time consuming and expensive (ie, crawl), once the FAA implemented the summary grant process (ie walk) the tempo of issued approvals was astounding. I am still amazed at the fact that the FAA approved over-5500 333 petitions in the less than two-year time period before Part 107 took effect.

The B4UFLY mobile device app and the Part 48 Online sUAS Registration portal are also excellent examples of how the FAA is providing aviation tools for the UAS industry. This year has witnessed many improvements and overhauls of the methods that the FAA provides for legacy manned aviation operations as well. I am happy to say that I no longer need the electric typewriter that we purchased for the sole purpose of filling out the carbon-copy Form 8050-1 Aircraft Registration Applications now that an online and downloadable version is available.

Positive effect of Part 107

The FAA release of 14 CFR Part 107 effectively opened the skies and lowered the barrier to entry for civil UAS. The rules brought clarity to an industry described by many as “the Wild West”. By delineating the difference between Part 101 hobbyists and Part 107 Remote Pilots, we now have a very simple structure that is obviously based on a century’s worth of aviation practice.

The rules have thoroughly codified the lessons learned through the Section 333 process. Part 107 establishes the same basic operational restrictions that are comparable to Part 103, Ultralight aircraft. In fact, Part 107 is more permissive because it also permits commercial flights for sUAS which are prohibited for ultralights.

After years of debate, Part 107 answered the “pilot vs operator” debate and formally established the new Remote Pilot certificate for individuals.

The UAS Office continues to provide assistance to the industry as it relates to Part 107. Understanding the desire of the industry to expand beyond the constraints, the FAA released a

series of performance-based standards as guidance for requesting waivers. I have participated in the collaborative work the FAA is doing with ASTM and Part 107 waiver process towards developing industry consensus-based standards that will improve the certification process. I am confident that the next eighteen months will continue to be positive for the community.

Issues with Part 107 as Published or Implemented

As mentioned earlier, there has been a long-term debate about whether the terms “operator” and “pilot” applied to UAS. The NPRM used operator and then updated to the internationally recognized “remote pilot” upon release. The problem remains that operators are not addressed or accommodated in the new rules. In legacy manned parlance, operators are the company that “operates” the aircraft, while pilots are the individuals who perform crew duties. As an example, “Eastern Airlines” is the operator and Bill is the pilot. The new rules changed the term, but not address the operator issues.

Initially we were unable to request a Part 107 waiver as an organization, as the online portal only supported an application tied to an individual’s Remote Pilot certificate and specific aircraftⁱ. I appreciate this as a preventative measure, stopping the commoditization of Part 107 waivers by corporations that only exist on paper; however, it does have an unintended effect on the company that actually owns and insures the sUA in question. I am happy to say that the FAA updated the portal to allow an organizational application within the first 30-days.

Removal of Military Competency from published Part 107

The final rule on the Operation and Certification of Small Unmanned Aircraft Systems removed a very key component of the proposed draft from the 2015 Notice of Proposed Rulemaking (NPRM). The NPRM proposed allowing pilots with military experience operating unmanned aircraft to take the recurrent knowledge test in lieu of the initial knowledge test in order to be eligible for an unmanned aircraft operator certificate with a small UAS rating.

In the final rule, the FAA stated that “The levels of training and certification for unmanned aircraft differ greatly between branches of the armed services, and therefore there is no consistent training the FAA can use as a comparison to its requirements in order to credit military UAS pilots.”ⁱⁱ. This conclusion is erroneous: while there are variations between services for UAS training, there is a minimum standard that the FAA could use as a common reference..

Chairmen of the Joint Chiefs of Staff Instruction (CJCSI) 3255.01, Joint Unmanned Aircraft Systems Minimum Training Standards, was first published on 17 July 2009 and last updated on 4 September 2012. CJCSI 3255.01ⁱⁱⁱ established a minimum set of UAS pilot requirements and standards for all Department of Defense UAS pilots.

In the final rule, the FAA also stated that “Further, many of the required knowledge areas for the part 107 initial knowledge test, such as airspace classification, airport operations, and radio communications, are not consistently covered in training across all branches of the U.S. military.”^{iv}



“The qualification standards meet or exceed existing manned aircraft Federal Aviation Administration (FAA) standards to facilitate UAS access into the National Airspace System (NAS)”

While many military remote pilots are officers with an aeronautical designation, the vast majority are enlisted soldiers, sailors, marines and airmen who do not meet the Part 61.73 requirements. The US Army trains 2000 new enlisted remote pilots annually, at both its Fort Huachuca and at remote locations worldwide^v. The current rules discount these veterans, and potentially limit their entry into the job market.

A solution for this could be as simple as treating a military sUAS remote pilot in the same manner as a Part 61 manned pilot. This would still require them to complete the online course (Part 107 small Unmanned Aircraft Systems (sUAS), ALC-451) located within the FAA Safety Team (FAASafety) Web site (www.faa.gov) and receive a completion certificate. Any number of FAA representatives (ie, Flight Standards District Office, Designated Pilot Examiner or FAA CFI, which includes manned Certified Flight Instructors who do not hold a Remote Pilot certificate) could validate the veteran’s records (ie, DD-214 and/or military training files) on the FAA Integrated Airmen Certificate and/or Rating Application (IACRA) system.

Enforcement actions of Part 107

At the beginning of this testimony, I briefly mentioned the “Wild West” mentality and desire for a regulatory structure that use of UAS that would be affordable for users and safe for communities on the ground and in the sky. I believe that Part 107 provides the latter, but still needs clear enforcement actions to contain the black market UAS service providers.

As an industry, we have a problem with misfeasance and malfeasance. Misfeasants perform legal acts improperly- this could be as simple as someone who has a Remote Pilot certificate but registered their sUA recreationally and not for commercial use. Malfeasants are the outlaws and black marketeers who willfully refuse to follow the regulations- even if their flights would be authorized under Part 107.

Unfortunately, the list of both misfeasants and malfeasants include large corporations, small businesses and sole proprietors alike. The internet is full of illegal promotional videos, obviously flown over people, in close proximity to airports or beyond visual line of sight. My flight crews have encountered other subcontractors on a job site who were using consumer-grade sUAS without a Section 333 authorization. I have consulted about university faculty who were using Part 101 rules for funded research and couldn’t understand why their clients were asking for a COA. I have spoken with numerous enthusiasts who entered the event photography business without understanding the FAA requirements.

My concern is twofold. First, there is a culture perception of premium for the cost of compliance that has deflated the market. My overhead is much greater than a black marketer

who does not have insurance, permits and bonds; even if our labor costs were the same, my company is at a disadvantage. Second, the public will not discriminate between a legal and illegal operations when the inevitable accident occurs. When you consider that 80% of all commercially registered sUAS are also the most popular consumer sUAS, this presents a significant potential problem for the industry.

“Droneport”

PACI has been involved in the development of the Eldorado Droneport in Boulder City, Nevada since the summer of 2015. I want to state that we are thankful for the positive support and assistance we are getting from UAS Office and Airports Division. However, during this process, we have encountered some issues as the regulatory structure does not address UAS activity on airports.

There is a need for additional regulatory improvements. The National Plan of Integrated Airport Systems 2015-2019 discussed a forecast of 7500 UAS within five years, and only summarized UAS activity over two pages ^{vi}. Airports are categorized by the number of passenger boarding's or by tonnage of cargo- this metric does not work with the current limitations of UAS operation. UAS do not count towards the number of based aircraft, and there are no acceptable standards for traffic patterns for any size UAS.

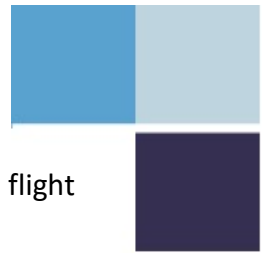
With the implementation of Part 107, the industry is now able to rapidly expand. Large corporations are now able to easily enact enterprise solutions nationwide. This will cause a shift from unscheduled to scheduled flights much like the early days of aviation. A good example of this shift is an Amazon distribution center delivering to a neighborhood mailbox- we are all roughly familiar with the time of day that each courier service delivers to our offices or homes.

Part of the issue stems from a preconceived notion of an airport that does not reflect the different types; airports include helipads and seaplane bases, and then grow into the larger, urban airports that we are more familiar with.

The most effective way for a community to realize the benefits of unmanned aircraft services is by developing or permitting the development of places where unmanned aircraft can land and takeoff. While droneports can be large and elaborate, most are not. In many situations, a wind sock on a grass area with clear approaches is sufficient to provide an effective and safe droneport.

This minimal facility may be adequate as a private use droneport, and may even suffice as the initial phase in the development of a public use droneport capable of serving the general aviation segment of the unmanned aircraft community. Once the daily activity exceeds 10 operations per day, exceeds thirty days in duration or occurs more than three days in a week, 14 CFR Part 157 requires 90-day notice for an airport.

I am frequently asked – “Why do you need a droneport? Can’t you just operate from anywhere?”. My answer is threefold and directly related to safety:



- 1) We need operating approval as an airport in order to gain access to real-time flight information systems. Without operating approval or designation, we cannot participate in programs such as the Digital Notice and Awareness System (D-NAS) operated by Airmap and endorsed by the American Association of Airport Executives (AAAE)^{vii}. We cannot receive ADS-B from the FAA-contracted Harris Corporation that could be used to assist remote pilots in flight planning or operators in flight following.
- 2) We need to be depicted on aeronautical charts as an area of high UAS traffic. This depiction would provide manned pilots with notice that there is UAS activity and improve their situational awareness since Part 107 removed the need for NOTAMS for UAS operations. Operating approval as an airport would facilitate that change.
- 3) We need operating approval as an airport in order to protect the airspace around the property. Boulder City and the joint development intends to construct runways, taxiways and facilities on the Droneport for public use. Without the same long term assurances as any public airport receives, funding these developments through public-private partnerships is nearly impossible.

Next Steps

The FAA addresses aviation safety in three key areas: personnel, equipment, and operations. I would like to discuss our views on the future needs for UAS regulations.

While the Remote Pilot certificate for small UAS is a great start, we would like to encourage the FAA to develop the next step: UAS that are larger than 55lbs. We also recommend that the FAA use the CJCSI 3255 as a reference for the remote pilot certification for “not small” UAS as it was developed with the specific task of integrating UAS into the NAS.

The current focus has been on pilots. Much the same as in the manned aircraft sector, we need a repairman certificate for UAS. Part 107 places all responsibility on the remote pilot, yet the knowledge tests have minimal requirements for maintenance skills or knowledge. Simultaneously, the FAA recognizes that manufacturers do not have standardized requirements for maintenance, service and continued airworthiness.

We recommend a graduated rating similar to the Experimental/Amateur-Built Repairman Certificate ^{viii} as the baseline for operations beyond Part 107. Unlike the 18-20 month course for Airframe and Powerplant Mechanics, the Experimental/Amateur-Built Repairman certificate requires proof that the applicant built the majority of the aircraft by themselves. Alternatively, the Light Sport Aircraft Repairman certificate only requires 3 weeks for completion and should be considered an acceptable minimum for UAS that exceed Part 107.

I would like to continue to encourage the FAA on supporting the droneport initiative. We have offered to partner with the FAA and use the Eldorado Droneport as a location for a potential Focus Area Pathfinder project. This project would require no funding from the FAA

and would be conducted in concert with a UAS Test Site and the UAS Center of Excellence. We would gladly share the information and practices gained through such an initiative with the FAA.

I would also ask the Subcommittee consider including a proposed definition of droneport into the regulatory structure, as the simplest method of remedying the current discrepancies related to scheduled UAS activity.

Droneport - *An airport whose physical design characteristics, visual aids, navigation aids, and infrastructure are created to support safe and effective unmanned aircraft systems operations in and out of densely populated urban areas as well as to and from rural areas.*

The FAA does not have the authority to prescribe point-of-sale registration for sUAS. I would ask that this Subcommittee consider engaging the Federal Trade Commission and require a transfer of registration at the time of sale for all UAS that are larger than .55lbs.

Due to the larger influx of international UAS manufacturers, I would also ask that the Subcommittee consider engaging Custom and Border Protection in ensuring the proper classification of these imports. Many UAS used in commercial operations are imported under the HTSUS classification under Chapter 95 as “Toys” or “Models”. This may have an economic effect on the domestic manufacturing base in the future, and skews the Department of Commerce’s Bureau of Industry and Security census. BIS is currently unable to accurately track the number of UAS imported into the US due to no tariff differentiation from toys.

Conclusion

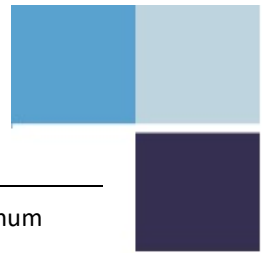
The approval and implementation of Part 107 was a watershed moment for UAS in the United States. The new rules provide a substantial foundation for small business to use as an entry point into the multimillion dollar UAS industry. Part 107 should be viewed as an outstanding success.

We look forward to another ten years of collaboration with the FAA. As with any new technology, there are growing pains for all stakeholders and we (at PACI) are patient enough to accept that. We are appreciative of the FAA for not conceding the safety of our National Airspace System to the pressure of large corporations and their lobbyists.

Thank you, and I look forward to your questions.

ⁱ Request a Waiver/Airspace Authorization, Small Unmanned Aircraft System (sUAS)
https://www.faa.gov/uas/request_waiver/

ⁱⁱ Final Rule on the Operation and Certification of Small Unmanned Systems,
http://www.faa.gov/uas/media/RIN_2120-AJ60_Clean_Signed.pdf



ⁱⁱⁱ Chairmen of the Joint Chiefs of Staff Instruction (CJCSI) 3255.01, Joint Unmanned Aircraft Systems Minimum Training Standards, http://www.dtic.mil/cjcs_directives/cdata/unlimit/3255_01.pdf

^{iv} Final Rule on the Operation and Certification of Small Unmanned Systems, http://www.faa.gov/uas/media/RIN_2120-AJ60_Clean_Signed.pdf

^v UASTB largest UAS training center, 'pilots' unique mission By Amy Sunseri, https://www.army.mil/article/39475/UASTB_largest_UAS_training_center___039_pilots__039__unique_mission

^{vi} Report to Congress, National Plan of Integrated Airport Systems 2015-2019 http://www.faa.gov/airports/planning_capacity/npas/reports/media/npas-2015-2019-report-narrative.pdf

^{vii} <https://www.airmap.com/airmap-and-aaae-launch-uas-notice-system-dnas/>

^{viii} FSIMS, CHAPTER 25. CERTIFICATE REPAIRMAN FOR EXPERIMENTAL AIRCRAFT, available at http://fsims.faa.gov/WDocs/8300.10%20Airworthiness%20Insp%20Handbk/Volume%202/2_025_00.htm