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Drone Nation: Policy Considerations for Allowing Commercial Small Unmanned Aircraft Systems Into the National Airspace System

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DRONE NATION: POLICY CONSIDERATIONS FOR ALLOWING COMMERCIAL SMALL UNMANNED AIRCRAFT SYSTEMS INTO THE NATIONAL AIRSPACE SYSTEM

By Christopher Chase Poorman[†]

I. Introduction

The drones are coming!

Consumers' having the ability to order goods online and then having the goods delivered to their doorsteps has become a staple in modern America. Quick delivery within 2–5 days is available for thousands of small goods.[1] Internet shopping even has its own special day just after Thanksgiving, colloquially "Cyber Monday," that shows

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1. *Amazon Prime Shipping Benefits*, Amazon, http://www.amazon.com/gp/help/customer/display.html?nodeId=201118070 (last visited Jan. 13, 2015).

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increasing revenues every year.[2] Some companies, Amazon in particular, are planning to go a step further with near instantaneous (i.e. within thirty minutes) delivery of small items in most major metropolises in the United States.[3] The magic behind the method comes in the form of drones, which are pilotless machines capable of flight.[4] These small, airborne devices stand to revolutionize business, not just in industries related to deliveries, but across all spectrums, from farms to Amazon and many in between.[5] The major obstacle to their immediate use, however, is the Federal Aviation Administration's airspace use rules that govern small pilotless craft as they lift off and enter the national airspace while under hire or for compensation.[6]

The term "drone" is commonly included when discussing wars abroad in the post-9/11 era; the term was used by President George W. Bush and President Barack Obama when these vehicles conducted precision strikes on terrorist threats.[7] These craft, known alternatively as Remote Piloted Vehicles,[8] have strengthened the national intelligence apparatus and added powerful tools to the Department of Defense's toolbox when fighting a vague and shifty enemy.[9] However, their applications are no longer strictly limited to military use.[10] These unmanned aerial vehicles, referred to by the Federal Aviation Administration ("FAA") as Unmanned Aerial Vehicle Systems ("UAS"), a term that includes the related control equipment,[11] are now finding their way to the doorsteps of American citizens as the newest tool in commerce.[12] As the truism goes, the law often lags behind the technology it seeks to regulate.[13]

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2. Trevor Mogg, *Cyber Monday: Online Shoppers Set Single-Day Spending Record*, DIGITALTRENDS (Dec. 3, 2014), http://www.digitaltrends.com/web/cyber-monday-online-shoppers-set-single-day-spending-record/.

3. *Amazon Prime Air*, AMAZON, http://www.amazon.com/b?node=8037720011 (last visited Mar. 1, 2015).

4. *See id.*

5. *Civil and Commercial UAS Applications*, UAVS, https://www.uavs.org/commercial (last visited Feb. 14, 2015).

6. Pax Dickinson, *Entrepreneurs at SXSW: Give Us Our Drones!*, BUSINESSINSIDER (Mar. 19, 2013, 11:56AM), http://www.businessinsider.com/faa-ban-on-commercial-drones-2013-3.

7. Derek Gregory, *From a View to a Kill: Drones and Late Modern War*, 28 THEORY, CULTURE & SOCIETY 189, 189–90 (2011).

8. LAWRENCE NEWCOME, UNMANNED AVIATION: A BRIEF HISTORY OF UNMANNED AERIAL VEHICLES 1 (2004).

9. *See, e.g.*, Thor Benson, *Important Al-Qaida Member Umar Farooq Believed Dead After Drone Strike in Pakistan,* UPI (Dec. 7, 2014, 5:23 PM), http://www.upi.com/Top_News/World-News/2014/12/07/Important-al-Qaida-member-Umar-Farooq-believed-dead-after-drone-strike-in-Pakistan/2821417987264.

10. *See* NEWCOME, *supra* note 8, at 127.

11. *Unmanned Aircraft Systems (UAS) Frequently Asked Questions,* FED. AVIATION. ADMIN., https://www.faa.gov/uas/faq (last visited Jan. 14, 2015).

12. *See, e.g.*, *Amazon Prime Air*, *supra* note 3.

13. Lyria Bennet Moses, *Recurring Dilemmas*: *The Law's Race to Keep Up with Technological Change*, 2007 U. ILL. J.L. TECH. & POL'Y 239 (2007).

Domestic drone use falls by virtue of FAA regulation into three somewhat distinct groups. The first, governmental or public use, relates mostly to police action and other governmental needs.[14] Second are personal UAS for recreational uses, which generally fall into a "model aircraft" category.[15] Some personal-use UAS are priced below $50 and allow the operator to fly the vehicles as toys inside their homes, or under limited circumstances, outside.[16] Third is civil use, which includes commercial applications where the UAS are employed for compensation to perform services, such as deliveries or video recordings.[17] This third category is the subject of this Comment.

The circumstances under which commercial UAS operate in the National Airspace System ("NAS") has been a highly debated topic as it relates to their regulation and use. Commercial UAS are currently without direct rules or regulations comparable to those governing other vehicles in the NAS, such as private airplanes, commercial airliners, ultralight gliders, or even hot air balloons.[18] This gap in the law has created a colloquial "gray area" under which commercial drone operators must operate, though the FAA firmly denies any gap.[19] The FAA has historically relied on voluntary policy-guidance memoranda as binding law for the general public;[20] however, issues with this reliance arose in 2014.

Recent administrative decisions by the National Transportation Safety Board have further cluttered the regulatory airspace in which UAS operate. The debate recently shifted around whether a UAS is even an "aircraft" under Title 14 of the C.F.R., subjecting violators to civil penalties for "unsafe operation" with fines upwards of $10,000.[21] However, Congress has mandated that the FAA create separate operating rules for UAS by September 2015.[22]

This Comment aims to show that current regulation, or more precisely non-regulation of commercial UAS should be modified, and operators should be allowed to conduct commercial operations without

14. FED. AVIATION ADMIN., PUBLIC OPERATIONS (GOVERNMENTAL) (2015), http://www.faa.gov/uas/public_operations/.

15. FED. AVIATION ADMIN., MODEL AIRCRAFT OPERATIONS (2015), http://www.faa.gov/uas/model_aircraft/.

16. *See*, *e.g.*, Hubsan X4 Mini Quadcopter, RADIOSHACK, http://www.radioshack.com/hubsan-x4-mini-quadcopter-black-red/ (last visited Jan. 13, 2015).

17. FED. AVIATION ADMIN., CIVIL OPERATIONS (NON-GOVERNMENTAL) (2015), http://www.faa.gov/uas/civil_operations/ (last visited Jan. 13, 2015).

18. *See* 14 C.F.R. §§ 23.1, 25.1, 31.1 (2015).

19. FED. AVIATION ADMIN., BUSTING MYTHS ABOUT THE FAA AND UNMANNED AIRCRAFT, Myth #3, http://www.faa.gov/news/updates/?newsId=76240 (last modified Mar. 7, 2014).

20. *See* FED. AVIATION ADMIN., U.S. DEP'T OF TRANSP., AC NO. 91-57A, MODEL AIRCRAFT OPERATING STANDARDS (2015).

21. 14 C.F.R. § 91.13 (2015); Pirker Decisional Order, Docket CP-217, Attachment 1 (NTSB Nov. 17, 2014), http://www.ntsb.gov/legal/alj/Documents/5730.pdf [hereinafter *Pirker*].

22. FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 332(a)(3).

subjecting UAS to the high standards of other "aircraft." Per Congress's mandate, the FAA should immediately create and enforce practically sound standards for small-scale, commercial UAS that operate inside the NAS while avoiding unnecessary and costly administrative burdens.[23] Congress should modify the currently voluntary standards, instead of mandating that operators adhere to specific commercial use guidelines without requiring an arduous approval process for commercial flight, such as the current Special Airworthiness Certificate and Section 333 exemption.[24] This Comment will not address the issues facing larger, interstate drones that will operate outside of the visual sight or immediate area of the operator.

II. The History of UAS and Their Commercialization in Modern America

The evolution of drone use comes from a rich military history beginning just before the First World War, just as manned aviation took flight.[25] With the birth of civil aviation in the early 20th century, a market for military applications soon followed.[26] Inventors sought a way for these new aerial vehicles to operate unmanned and possibly unpiloted, from takeoff to landing.[27] Such operations required the creation of three critical technologies: automatic aircraft stabilization, remote control, and autonomous navigation.[28] Elmer Sperry was the first to attempt integration of these technologies together onboard a flying machine.[29] Acceptance and implementation was less than immediate, however, after several early crashes occurred while operating an Army test platform aircraft.[30] The aircraft was designed solely for straight and level flight without the aid of a pilot, but did not perform as intended.[31] The Navy also distanced itself from the poor results, stating that such technology could never substitute for the experience of an actual pilot.[32]

As war broke out in 1914, governments looked to advanced armament design.[33] Twenty years prior, Nikola Tesla, the father of modern electrical design, conceived of a pilotless flying bomb, an idea he conveyed to fellow inventor Peter Hewitt.[34] Hewitt later associated pro-

23. *Id.* at § 332(a)(1).
24. Fed. Aviation Admin., Civil Operations (Non-Governmental) (2015), http://www.faa.gov/uas/civil_operations/.
25. *See* Newcome, *supra* note 8, at 1–4.
26. *See id.* at 15–16.
27. *See id.* at 20–21.
28. *Id.* at 15.
29. *Id.*
30. *Id.* at 16.
31. Newcome, *supra* note 8, at 16.
32. *Id.*
33. *Id.*
34. *Id.*

fessionally with Sperry, and their combined work created the design for the aerial torpedo, a major precursor to all modern unmanned aerial craft.[35] In 1916 and 1917, there were many successful, albeit imperfect, demonstrations of an automated piloting system shown to the United States Government, which subsequently poured many more dollars into the research.[36] From this funding came the highly successful demonstration and integration of a pilotless remote control system in 1924 by the Naval Research Laboratory.[37] Each subsequent war saw great advances in the use of the unmanned aerial vehicles ("UAS"); variations of weaponized or patrol UAS appeared in World War II,[38] Vietnam,[39] and the First Gulf War.[40]

Moving forward to the 21st century, the United States government in 2003 spent over $1 billion on unmanned aircraft for the department of defense alone, a number that continues to grow in excess of $3 billion per year.[41] By the end of the wars in Afghanistan and Iraq after 9/11, UAS had evolved into a staple of the military reconnaissance and strike strategies.[42] In addition, as war advances tend to do, these new technologies found themselves also seeping into American commercial concepts.[43]

The viability of using commercial UAS increased when model aircraft were modified with cameras and other capabilities.[44] From this evolved multiple niche markets for the application of drone technologies. Their uses included agricultural spraying, photography, delivery services, industrial inspection, and ground mapping.[45]

The most high-visibility example of commercial drone use came when Amazon announced its plans to implement Amazon Prime Air, an extension of their popular quick-delivery program, Amazon Prime.[46] A demonstrative video on the Amazon website shows that this future delivery method will allow a user to select a good online (presumably limiting this selection to smaller items), and then select a thirty-minute Prime delivery option upon checkout.[47] The merchan-

35. *See id.* at 16–18.
36. *See id.* at 18–21.
37. NEWCOME, *supra* note 8, at 38.
38. *Id.* at 49.
39. *Id.* at 83–91.
40. *Id.* at 97.
41. JEREMY GERTLER, CONG. RESEARCH SERV., R42136, U.S. UNMANNED AERIAL SYSTEMS 14, Figure 2 (2012).
42. *Id.* at 1.
43. *See, e.g.*, *Amazon Prime Air*, *supra* note 3.
44. *See, e.g.*, *Phantom Drones*, DJI, http://www.dji.com/product/phantom (last visited Sept. 9, 2015).
45. Joseph Dussault, *7 Commercial Uses for Drones*, BOSTON (Mar. 14, 2014, 4:01 PM), http://www.boston.com/business/2014/03/14/commercial-uses-for-drones/dscS47PsQdPneIB2UQeY0M/story.html.
46. *See, e.g.*, *Amazon Prime Air*, *supra* note 3.
47. *Id.*

dise will then be packaged in a small plastic box, transported down a conveyer belt, and attached to an awaiting rotary drone.[48] The drone then will take to the skies and fly to the customer location with a sound similar to a mosquito. Upon arrival it will make a precise landing, deposit the small box on the consumer's property, and fly back to the Amazon shipping facility.[49]

Projections for the future of commercial UAS in America show a major upward trend. Some sources project expenditures of over $91 billion over the next decade for commercial UAS alone.[50] Commentators have projected uses far beyond the typical photography and delivery roles.[51] These commentators see the possibility of providing Internet service to remote geographical areas; tracking and documenting animal growth patterns; and even conducting full-scale unmanned search and rescue missions.[52] In 2002, with approximately 2,400 unmanned vehicles in use around the world, Japan used nearly 65% of its UAS for agricultural purposes tending to 10% of their rice crops.[53] One estimate even suggests that one drone may have replaced the efforts of fifteen farmers in these fields.[54]

Since 2002 major technological advances have developed. These advances have further allowed expanded drone use. As remote control interfaces are updated UAS can be controlled from longer distances or may require no control inputs from an operator at all once it leaves the ground. Energy technology advances will also allow for longer flights, depending on use, and may even permit a five-year flight time for monitoring weather or acting as a navigational aid.

III. The NAS, the FAA's Ban, and Current Regulations

A. *Brief Explanation of the National Airspace System*

The NAS is a highly complex system of extensively trained personnel, including controllers, technicians, and equipment that control all airspace over the United States.[55] The NAS evolved from dangerous cross-country trips without assistance into a series of complex airways

48. *Id.*

49. *Id.*

50. *Teal Group Predicts Worldwide UAV Market Will Total $91 Billion in Its 2014 UAV Market Profile and Forecast,* Teal Group (July 17, 2014, 11:01 AM), http://www.tealgroup.com/index.php/about-teal-group-corporation/press-releases/118-2014-uav-press-release.

51. Dussault, *supra* note 45.

52. *Id.*

53. Newcome, *supra* note 8, at 127.

54. *Id.*

55. *See generally* Fed. Aviation Admin., Pilot's Handbook of Aeronautical Knowledge, 14-2–14-3 (2008), http://www.faa.gov/regulations_policies/handbooks_manuals/aviation/pilot_handbook/media/FAA-H-8083-25A.pdf (better known as "PHAK") [hereinafter PHAK].

at multiple altitudes managed by controllers who have a real-time view of aircraft traffic.[56]

The NAS is most well-known for its classes of airspace, which range from A to G, with F omitted.[57] Class B is generally the busiest, usually around the nation's busiest airports and often "resemble upside-down wedding cakes" stacked in layers that expand in size with altitude.[58] UAS operation of any kind within Class B airspace is prohibited; in fact, only certain types of aircraft are permitted in this class due to the higher possibility of an incident with a commercial airliner.[59] Class G is uncontrolled by Air Traffic Control, relying solely on Visual Flight Rules as a means to keep aircraft safe in these areas.[60]

The airspaces are currently controlled by a legacy air traffic control system, based on ground-based navigation aids and controller instructions.[61] However, under guidance of Congress, the FAA implemented NextGen, a more flexible system that aims to transition air traffic control to a satellite-based system.[62] This upgrade does not currently include provisions for UAS integration within the system and will likely present an issue in the future as long-distance UAS regulations are enacted.[63]

B. *Small UAS FAA Regulations, Memoranda, and Circulars*

The applicability of current regulations to commercial drone use in the NAS is not entirely clear. Current federal regulations do not explicitly identify the requirements with which commercial drone operators must comply and Title 14 of the C.F.R., relating to Aeronautics and Space, does not mention unmanned aircraft systems or similar terms.[64] The FAA has instead relied on internal memoranda and circulars issued over a nearly thirty-year period as *per se* regulation of UAS in American airspace.

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56. *See* FED. AVIATION ADMIN., *A Brief History of the FAA,* https://www.faa.gov/about/history/brief_history/.

57. PHAK, *supra* note 55.

58. *Id.* at 14-2.

59. FED. AVIATION ADMIN., FACT SHEET-UNMANNED AIRCRAFT SYSTEMS (Jan. 26, 2014), http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=14153 ("UAS operations are currently not authorized in Class B airspace").

60. PHAK, *supra* note 55, at 14-3.

61. FED. AVIATION ADMIN., AIR TRAFFIC NEXTGEN BRIEFING, http://www.faa.gov/air_traffic/briefing/ (last modified Sept. 18, 2014, 9:36:14 AM).

62. *Id.*

63. Adam Clark Estes, *FAA's New $5 Billion Air Traffic Control System Forgot About Drones*, GIZMODO (Sept. 26, 2014, 10:11 AM), http://gizmodo.com/faas-fancy-new-5-billion-air-traffic-control-system-fo-1639463748.

64. *See generally* 14 C.F.R. pts. 1–199 (2015).

The Sections of Title 14 C.F.R. relating to aviation regulations are Federal Aviation Regulations, or FARs, its former official title.[65] The various sections are referred to as "parts," each part encompassing a certain aspect of aviation regulation.[66] For example, C.F.R. Section 91.13, Subsection (a) of Title 14, relating to civil liability for reckless operation of an aircraft, is more commonly referred to as a rule under FAR Part 91.[67]

In FAA Policy Notice 07-01, issued in 2007, the FAA outlined its historical and current policies regarding UAS use in United States airspace.[68] The notice covers the authority under which unmanned systems may fly under the three categories: public, civil, and recreational.[69]

Public UAS fly under special provisions or waivers.[70] The FAA may issue a Certificate of Authorization or Waiver for uses including law enforcement, firefighting, border patrol, disaster relief, search and rescue, and other governmental missions.[71] The Authorization-Waiver application is submitted online and will typically receive a response within sixty days, allowing certain airspace use for a period of approximately two years.[72] As a condition of use, some UAS may require transponders that show altitude, direction, and speed to controllers if they enter certain airspace.[73] There may also be a "chase-plane" requirement in some situations.[74]

For civil use, the notice dictates that operators obtain an experimental certificate, without a specific reference to the FAA policy requiring such a certification.[75] If the certificate is granted, the operator may not use the UAS for commercial means; specifically, they may not carry people or property for compensation or hire.[76] But they may conduct research.[77]

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65. FED. AVIATION ADMIN., AIRPLANE FLYING HANDBOOK, 1–1 (2004), https://www.faa.gov/regulations_policies/handbooks_manuals/aircraft/airplane_handbook/media/FAA-H-8083-3B.pdf.

66. *See generally* FED. AVIATION ADMIN., U.S. DEP'T OF TRANSP., FAR/AIM 2015: FEDERAL AVIATION REGULATIONS/AERONAUTICAL INFORMATION MANUAL (2015).

67. *See* FED. AVIATION ADMIN., FAA REGULATIONS, https://www.faa.gov/regulations_policies/faa_regulations/ (last modified June 30, 2014, 7:25 PM); *see also* 14 C.F.R. § 91.13 (2015).

68. Unmanned Aircraft Operations in the National Airspace System, 72 Fed. Reg. 6689 (Feb. 13, 2007) (to be codified at 14 C.F.R. pt. 91).

69. *Id.*

70. PUBLIC OPERATIONS, *supra* note 14.

71. *Id.*

72. *Id.*

73. Unmanned Aircraft, *supra* note 68, at 6689.

74. *Id.*

75. *Id.* at 6690.

76. *Id.*

77. *Id.*

The authority for recreational operators of model aircraft is found in a 1987 advisory circular, AC 91-57, which offered *voluntary* safety rules for model aircraft that are often cited as current binding regulation for commercial UAS.[78] The circular offered several suggestions for modelers in the interest of public safety.[79] The suggestions include: staying away from populated or noise sensitive areas; avoiding spectators until a model aircraft is proven airworthy; keeping the model aircraft at or below 400 feet and notifying air traffic control when flying within three miles of an airport; and always giving right-of-way to full-scale aircraft.[80] The FAA also created a brief website summarizing the contents of the Policy Statement that addresses the use of UAS in the NAS.[81] The FAA's website specifically states that it prohibits civil non-recreational operations of unmanned aircraft systems for hire because they require an experimental designation, which does not permit commercial uses.[82]

The *Pirker* decisions from the National Transportation Safety Board ("NTSB") demonstrate how the enforceability of these provisions as a matter of law is unclear. The case, first heard before a single administrative judge and later before an en banc administrative appeal, addresses whether commercial UAS are subject to experimental certificates, qualify as model aircraft, or even have a legal duty to operate in a non-reckless manner.[83]

In 2012, Congress granted a small exception to the FAA's effective commercial drone ban.[84] Section 333 of the FAA Reform and Modernization Act of 2012 ("FAARMA") granted the FAA authority to bridge the gap between the current lack of drone regulations and commercial drone use in the United States.[85] The FAA administrator may issue exemptions to drone operators based on size, weight, speed, operational capability and proximity to airports and populated areas. The administrator also considers whether operation within line-of-sight creates a hazard to the public or users of the NAS, and whether this operation poses a threat to national security.[86] As of March 17, 2015, the current approved exemption list includes 48 companies,

78. MODEL AIRCRAFT OPERATING STANDARDS, *supra* note 20.

79. *See id.* at 1–2.

80. *Id.* at 2–3.

81. FED. AVIATION ADMIN., MODEL AIRCRAFT OPERATIONS (2015), http://www.faa.gov/uas/model_aircraft/ (a separate and distinct online source from AC 91-57, *supra* note 20).

82. *Id.*

83. *See* Fed. Aviation Admin. v. Pirker, No. EA-6730, 2004 WL 8095629 (Nov. 18, 2014).

84. FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 333(b).

85. *Id.*

86. FED. AVIATION ADMIN., SECTION 333, https://www.faa.gov/uas/legislative_programs/section_333/ (last modified Aug. 21, 2015, 2:22 PM).

while approximately 766 petitions await public comment and approval.[87] This process appears to be very slow in nature.

The FAA has issued an interpretation regarding Section 336 of the FAARMA.[88] This interpretation, to be discussed in depth later in the Comment, was issued as a response to the first of two *Pirker v. Administrator* decisions.

IV. Commercial UAS and FAA Intervention

A. *Early Occurrences*

As higher volumes of unmanned aircraft systems ("UAS") enter national airspace, many are finding themselves on the wrong end of the FAA's unclear regulations. The FAA's primary method for asserting their authority over commercial drone operators is through cease-and-desist letters.[89] The letters reference the requirements created in FAA Policy Notice 07-01, which include experimental certificates for civil use and mandatory provisions for UAS use in the NAS.[90] The content of the letters shows that regional FAA drone safety inspectors scan the internet and local articles, and receive input through the complaint process to find instances of commercial drone use, regardless of any harm caused, and issue the cease-and-desist letters.[91]

A headline example of the process arose when the FAA grounded Lakemaid Beer's drone delivery service.[92] The delivery service was offered by a local brewery based in Stevens Point, Wisconsin.[93] The business, which coins its product as the "fisherman's lager," had plans to deliver cases of its beer to ice-fisherman across frozen lakes via drones.[94] Many northern lakes have combined bait-beer shops on the shore, similar to Lakemaid, which would be the base of operations for the beer drone.[95] Lakemaid's managing partner, Jack Supple, sought to stay below the 400-foot limit suggested by Advisory Circular 91-57

87. *Id.*

88. *See* FAA Interpretation of the Special Rule for Model Aircraft, 79 Fed. Reg. 36172 (proposed June 18, 2014) (to be codified at 14 C.F.R. pt. 91), http://02b954f.netsolhost.com/docs/Interpretation_extension_of_comment_period_071714.pdf.

89. Matthew Shroyer, *FAA Cease and Desist Letters Show Agency's Attempts to Control Drone Use in the US*, Robohub, http://robohub.org/faa-cease-and-desist-letters-show-agencys-attempts-to-control-drone-use-in-the-us/ (last visited Sept. 7, 2015).

90. *Id.*

91. *Id.*

92. John Biggs, *The FAA Shuts Down Beer-Delivery Drone*, TechCrunch, http://techcrunch.com/2014/02/04/the-faa-shuts-down-beer-delivery-drone/ (last visited Sept. 7, 2015).

93. *Id.*

94. LakemaidSpotter, *Lakemaid Beer Drone Delivery*, YouTube (Jan. 24, 2014), https://www.youtube.com/watch?v=qmHwXf8JUOw.

95. *Id.*

and thought the operations seemed far less dangerous than Amazon's longer-ranged plans.[96]

The FAA disagreed with Lakemaid's plans and called the company to inform it of its violation of FAA rules.[97] The FAA alleged that Lakemaid broke four or five regulations including the operators' failure to earn a proper rating and improper use of airspace.[98] As a matter of definition, this implies that the UAS were not operating as model aircraft, because they were for commercial use; therefore, per the FAA's interpretation, the UAS was operating civilly and required an experimental certificate, which is not issued to commercial operations.[99] Therefore, Lakemaid, like other commercial attempts, falls into a black hole from which commercial UAS may not currently escape without administrator approval.

B. *Pirker*

The ambiguity of FAA regulatory authority over UAS came to a climax in a series of administrative decisions—known collectively as the Pirker Orders—where a commercial drone operator found himself accused of violating rules that had not previously been recognized as applicable to commercial UAS.[100] The ruling on appeal further recognized UAS, regardless of commercial or non-commercial use, as "aircraft." The ruling, therefore subjects UAS to civil liability for operations and subjects the drone aircraft and operators to the possibility of extensive regulatory requirements.[101]

The case arose when Raphael Pirker was offering commercial drone services around the University of Virginia campus in Charlottesville, Virginia.[102] Pirker used his Zephyr II drone—with an attached high definition camera—to take aerial photography for clientele including Lewis Communications.[103]

According to the Order, Pirker controlled the drone during commercial operations into several areas, including: into a tunnel used by cars; within 100 feet of an active heliport near a person on a sidewalk (causing the person to move to avoid being struck); near a crane; near a train track; and, generally, throughout the campus between altitudes of 10 feet and 1500 feet. Pirker did not account for possible nearby

96. Bill Chappel, *Beer Drone Can Buzz the Skies No More, FAA Says,* NPR (Jan. 30, 2014), http://www.npr.org/blogs/thetwo-way/2014/01/30/269039542/beer-drone-can-buzz-the-skies-no-more-faa-says.

97. *Id.*

98. *Id.*

99. FAA Interpretation, *supra* note 88, at 10.

100. *Pirker*, *supra* note 21.

101. *See* Pirker Opinion and Order, Order No. EA-5730 (NTSB Nov. 18, 2014), http://www.ntsb.gov/legal/alj/Documents/5730.pdf [hereinafter *Pirker Opinion*].

102. *Pirker*, *supra* note 21.

103. *Id.*

aircraft.[104] In the initial order of assessment, the FAA Administrator alleged that these actions constituted a violation of 14 C.F.R. § 91.13(a) for careless or reckless operation of an unmanned *aircraft*.[105] In accordance with the C.F.R., Pirker was assessed a $10,000 civil penalty.[106]

Pirker appealed the FAA's Order of Assessment to Judge Patrick Geraghty, an administrative law judge with the NTSB.[107] Judge Patrick Geraghty ruled for Pirker, dismissing the FAA's complaint as a matter of law, setting aside the $10,000 penalty, and ruling that the UAS did not qualify as an aircraft.[108] However, Judge Geraghty's opinion was not limited solely as to the legality of the FAA's imposing a penalty on Pirker; the opinion contained a list of findings having much larger implications for FAA commercial drone policy in the NAS.[109]

Judge Geraghty's opinion included five findings.[110] First, the term "aircraft" as defined by the FARs and 49 U.S.C. Section 40102(a)(6) could include model aircraft.[111] Second, the model aircraft used by Pirker, although the incident was under hire for commercial photography operations, was only subject to Advisory Circular 91-57's voluntary safety guidelines.[112] The footnote for this finding noted that allowing the FAA to consider any object capable of flight as an "aircraft" per either section would result in *reductio ad absurdium*; more precisely, it would allow for an absurd result that paper airplanes or children's toys could be subject to the FAA's regulation and penalty.[113] Third, FAA Policy Notice 08-01 and its predecessor 05-01 were issued as internal guidance and therefore do not present a jurisdictional basis for asserting the Part 91 FAR penalty.[114] Fourth, FAA Policy Notice 07-01 also does not grant jurisdictional authority because it either (a) is internal guidance similar to 08-01 and 05-01 and non-binding on the public, or (b) is not a proper attempt to make legislation as it violated specific rulemaking authority.[115] Fifth, because there was no valid FAA rule or FAR regulation applicable to Pirker's air vehicle as a model aircraft or UAS when he operated his drone for commercial operations, he could not be liable for the $10,000 penalty.[116]

104. *Id.*
105. *Id.*; 14 C.F.R. § 61.121 (2015).
106. *Pirker*, *supra* note 21
107. *Id.* at 1.
108. *Id.* at 8.
109. *Id.* at 7–8.
110. *Id.*
111. *Id.* at 7.
112. *Pirker*, *supra* note 21, at 7.
113. *Id.* at 7 n.24.
114. *Id.* at 8.
115. *Id.*
116. *Id.*

On appeal, the board of three judges partially reversed Judge Gergaghty's ruling.[117] The appeal addressed two issues: (1) whether the model aircraft used by Pirker was an aircraft under either 49 U.S.C. § 40102(a)(6) or 14 C.F.R. § 1.1, and (2) whether the model aircraft, as an aircraft under either legislative definition, subjected Pirker to penalty under Section 91.13 C.F.R.[118] The panel first applied a plain-language analysis to the definition of aircraft, finding that model aircraft are not an independent category of aircraft, but instead are a subset.[119] Further, model aircraft, such as Pirker's Zephyr or any other object that flies, are aircraft under the FARs, subject to Part 91 regulations relating to safe operation.[120] The panel did not determine whether Pirker had actually violated Part 91, but instead the panel remanded the case to the lower court for further proceedings.[121]

In between the administrative law judge decisions, the FAA stepped in with an interpretation of FAARMA, which falls into line with the latest Pirker decision, specifically addressing Section 336 regarding their ability to regulate model aircraft.[122] First, they recognized that all UAS are aircraft, but only some are model aircraft, depending on the usage of the aircraft at the time.[123] The FAARMA specifically prohibited the FAA from further regulating aircraft classified as model aircraft.[124] However, this interpretation delineated that commercially operated UAS were, in fact, not model aircraft when not flown for hobby or recreational purposes.[125] The interpretation covered several other provisions that a model aircraft must meet in order to actually qualify as such and become exempt from FAA regulations.[126]

V. POST-*PIRKER*

Out of the muddled rulings and regulations over UAS, few things are clear. However, in the wake of the *Pirker* decisions, commercial operators should be aware of several likely implications.

A. *There are no explicit binding regulations specifically for commercial UAS.*

When Judge Geraghty listed his findings, it was a damning moment for the FAA's marginal attempt to regulate drone entry into the UAS.

117. *Pirker Opinion*, *supra* note 101, at 12.
118. *Id.* at 4.
119. *Id.* at 5–7.
120. *Id.* at 8–11.
121. *Id.* at 12.
122. FAA Interpretation, *supra* note 88, at 1.
123. *See id.* at 11.
124. *Id.* at 6–7.
125. *Id.* at 9.
126. *Id.* at 11.

Geraghty specifically ruled that neither AC 91-57 nor any of the internal policy memoranda were binding authority on the general public.[127] Each of the publications was deficient in one or more ways, and, therefore, not law.[128] The original model aircraft advisory circular specifically includes that the standards are voluntary safety standards, and not mandatory.[129] The standards have been voluntary since their initial publication in 1981, and there have been no changes by the FAA. However, although not mandatory, the standards are strongly encouraged for model aircraft operators as a proper standard of care when operating their devices in the NAS. Commercial UAS previously did not qualify under this standard. The Comment addresses this point in the subsequent section.

On appeal, the panel of judges only addressed the sections of Judge Geraghty's opinion relating to UAS as aircraft under the FARs or the USC, and the aircraft's liability for acting in a reckless or careless manner.[130] The panel left the explicit findings related to the FAA's lack of jurisdiction undisturbed. Therefore, the lack of jurisdiction is likely still binding law or dicta on the current regulatory reality.

In addition, with the FAA interpretation, the focus was on whether a UAS could be considered a model aircraft under the FAARMA. What the interpretation did not cover was what kind of regulations non-recreational commercial UAS fall under. Are they to be considered civil aircraft? Do they fall into a gray area where no regulations exist at all? Alternatively, is there a chance they are somehow still model aircraft?

B. *Commercial UAS May or May Not Currently Qualify as Model Aircraft*

Unmanned aircraft systems, regardless of commercial or non-commercial use, may still currently qualify as model aircraft. Both *Pirker* opinions refer to Pirker's Zephyr II drone, even while under hire for commercial use to photograph the University of Virginia campus, as a model aircraft.[131] The appellate panel specifically determined that Pirker's drone was an aircraft, as used in Part 91, by finding that model aircraft such as Pirker's were a subset of aircraft, and are therefore included in the meaning.[132] The latest *Pirker* decision also came after the FAA's interpretation, potentially overruling the regulation, albeit possibly inadvertently.[133]

127. *Pirker*, *supra* note 21, at 4.
128. *Id.*
129. *Id.*
130. *Pirker Opinion*, *supra* note 101, at 4.
131. *Id.* at 11.
132. *Id.* at 10–11.
133. *Id.* at 1.

C. *Commercial UAS may be subject to civil aircraft FARs as "aircraft."*

Although the authorities historically used to govern the operation of UASs in the United States were struck down, the panel of administrative law judges on appeal defined all UAS as aircraft.[134] This potentially, as a matter of default if they are no longer model aircraft, subjects UAS to the set of regulations for civil aircraft, which are the basis for current commercial aircraft operations.

For example, C.F.R. Section 91.7 of Title 14 requires that civil aircraft be maintained in an airworthy condition.[135] To that end, civil aircraft must maintain an "airworthiness certificate."[136] The FAA requires that in order to keep this certificate, owners must meet an approved design, keep the aircraft in a condition for safe operation, and meet stringent maintenance and preventative maintenance standards in accordance with multiple sections of Title 14 of the C.F.R.s. Among other factors, such as make and model, the FAA considers completeness of maintenance records and overall condition of the aircraft to determine if the aircraft is in a safe operating condition. Aircraft also have several technical system requirements such as anti-collision lights, airspeed and altitude instruments, and a magnetic direction indicator.

Another set of staunch requirements for civil aircraft flying in the United States are the requirements for pilots. Part 61.3 of 14 C.F.R. requires that any person operating a civil aircraft in the United States follow strict rules, including obtaining a pilot certificate through an intensive training syllabus and a medical exam evaluating the pilot's ability to operate an aircraft.[137] Student pilots as well as balloon and glider operators are exempt from the medical evaluation requirement.[138]

Further, because the UAS are operating commercially, they may also be subject to the commercial-rating requirements. These rating requirements set specific limits for those who operate aircraft for hire.[139] To obtain this rating, pilots must already possess the private pilot certificate and complete training that is even more rigorous.[140] One company estimates the upgrade cost at $8,000; this is in addition to the $8,000 cost for the private pilot license.[141] Such requirements are extremely involved and costly for any person, possibly even more

134. *Id.* at 12.
135. 14 C.F.R. § 91.7 (2015).
136. *Id.* § 91.203.
137. *Id.* § 61.3.
138. *Id.*
139. *Id.* § 61.133.
140. *Id.*
141. *Commercial Pilot Pricing*, TNG AVIATION, http://www.touch-n-goes.com/commercial/commercialpilotpricing.html (last visited Sept. 12, 2015).

for a drone operator who may have spent less than a $1,000 for a craft capable of only relatively simple aviation tasks.

VI. Going Forward

The FAA did allow for exemptions from the current regulations for drone experimentation; a path Amazon is currently pursuing so that it may continue its commercial pursuits within the United States without fear of penalty. The letter written by Amazon to the FAA suggests a strong point about commercial drone operators as a whole, versus casual model aircraft operators, stating that:

> [G]ranting this request will do nothing more than allow Amazon to do what thousands of hobbyists and manufacturers of model aircraft do every day, and *we will abide by much stronger safety measures than currently required for these groups by FAA policies and regulations*. In this petition for exemption, we seek to engage in essentially the same type of small UAS operation that the FAA would permit us to currently–but for the fact that Amazon is not a hobbyist or manufacturer of a model aircraft. (emphasis added).[142]

In essence, the letter points to the elephant in the room, assuming commercial drone operators are or will be subject to any regulatory authority of the FAA. Recreational drone operators may fly in any manner they so choose, so long as they are not reckless or careless as mandated by Part 91. Because the Advisory Circular is, and has always been, voluntary, model aircraft operators are not bound to operate under the suggested 400-foot ceiling, call nearby airports, or even assure that their model aircraft is airworthy. Essentially a recreational operator, with no profit motive, may operate his or her drone without regard for any rules so long as they do not pose a threat of harm to others. However, commercial operators, like Lakemaid Beer Delivery and Pirker, who have very specific rules and limits on operation, are unable to take to the air solely because there is an exchange of money for a delivery service. Lakemaid and Pirker have a profit motive, and are bound by threats of liability that could affect their bottom lines.

Lakemaid was in the midst of a well-developed testing plan, ensuring that there were no safety issues or a chance for the loss of product or drone, which are both major liability issues. Lakemaid completed short-range testing, and sought delivery to distances not to exceed a half-mile. Further, the business operated in a remote area over a frozen lake, never exceeding the voluntary 400-foot altitude suggested for the often more hazardous recreational operations. Lakemaid stands as a shining example of the conditions under which commercial drone operators can, should, and do operate.

142. Paul Misener, *Amazon Petition for Exemption*, Amazon (July 9, 2014), http://g-ecx.images-amazon.com/images/G/01/rowland/AmazonPetitionforExemption_July92014.pdf.

Now, to say that UAS are entirely safe would be an overstatement. The technology is not yet perfected, and amateurs often operate UAS with little to no training. In January 2015, a man accidentally landed his drone inside the grounds of the White House after he apparently lost control of the device.[143] Both operator and drone manufacturer pointed fingers for the malfunction, related to the man's drinking and failure to follow drone safety feature protocol and to a possible major glitch in the drone software for when control is lost.[144] Regardless of the cause, the incident highlights that major accidents can and do happen with drone use.

Moreover, accidents resulting in injuries have occurred. During Fourth of July celebrations in Key West, Florida, a drone was recording a video of the fireworks.[145] As the show ended, the drone lost control and careened towards a crowd of spectators on private property.[146] The rotors on the drone ended up cutting a man, and police were called to the scene.[147] These incidents beg the question, what regulations will allow small commercial UAS to safely occupy the sky without threatening those airborne with them as well as those on the ground?

A. *FAA Policy Suggestions for Small Commercial UAS Short-term*

In the short term, UAS cannot operate in a regulatory void where operators are unsure what limits they should not exceed, and what administrative hurdles they must move past in order to operate safely in the skies. However, subjecting drone operators to the strict rules required for commercial aircraft operators is also highly unreasonable. The cost alone to meet such a standard may exceed the cost of a drone by a factor of eight. With the FAA stating that the regulations coming with the September 2015 deadline will only be minimal, there must be another step that will at least allow small regional commercial drone operators, like Lakemaid, to operate their businesses without fear of repercussion from the FAA.

As a basis for a short-term fix, the FAA need not look any further than Advisory Circular 91-57; its voluntary policy has governed model aircraft use for nearly twenty years. With a few small tweaks and additions, the FAA could effectively govern small UAS use, make the policy mandatory through the proper regulatory channels, and allow more small-scale UAS into the skies for business uses. As a further

143. Micheal D. Shear, *Man Lost Contact With Drone Before It Sped to White House, Friend Says*, N.Y. TIMES (Jan. 29, 2015), http://www.nytimes.com/2015/01/30/us/man-lost-contact-with-drone-before-it-sped-to-white-house-friend-says.html?_r=0.

144. *Id.*

145. Ricky Boettger, *Drone Crash at Fourth of July Fireworks*, KONK LIFE (July 29, 2014), http://konknet.com/konk-life/columns/the-big-story/2014-07-29-11.

146. *Id.*

147. *Id.*

benefit, the circular need not address the penalties for when UAS fail to operate properly, as the operators are now subject to the requirements of 14 C.F.R. 91, which states they must not operate their aircraft in a reckless and dangerous manner. By immediately instituting the manner in which these UAS may operate, the FAA will have essentially created a "per se" negligence standard that all small commercial drone operators must follow, with the real possibility of a $10,000 penalty in failing to do so.

The Author suggests the following policy changes for immediate implementation: First, the new policy must recognize the hybrid nature of commercial UAS as neither civil nor model aircraft. These "commercial small UAS" are particularly unique, as they do not operate with the power or abilities of even the smallest civil aircraft while arguably operating under stricter limits than a model aircraft operator would. Moreover, because this new class of craft is commercial in nature, it falls outside the FAA's ban to regulate model aircraft pursuant to Section 336 of the FAARMA.

Second, in order to properly define what UAS qualify as commercial small UAS, the FAA should consider a slightly modified version of the model aircraft definition. The hobby or recreational use element should be discarded. However, the 55-pound limit should be retained as an absolute upward size limit with no ability to obtain a community-based design waiver. Model aircraft are also required to operate in accordance with community-based safety guidelines and within the program of a national hobbyist organization. Again, it is likely this requirement will not translate well to a commercial UAS. Instead, the FAA may consider a relatively short and cheap training package administered online. This would allow a uniform standard of operation across the United States. Additionally, it would encourage small commercial operators to avoid operating in a reckless manner that will put them in a position like Pirker. Notice of this requirement should be required within every drone purchase as part of the informational packet. Another addition to the rules may also concern an insurance or bond requirement, offered publicly through the FAA or privately.

Third, as far as actual operating standards go, the FAA should take a page from Advisory Circular 91-57. Keeping in mind that commercial operators stand to lose far more than a modeler, it stands to reason that the safety standards suggested for modelers in Section 3, including the 400-foot altitude limit, giving way to full scale aircraft, and giving proper notice to control towers when flying in proximity to airfields, would be adequately safe. The FAA may seek to add further requirements in light of the new technologies, requiring that UAS do not go further than one mile from the operator in rural areas, and maintaining constant line of sight within city limits. The FAA does not

currently recognize remotely streaming video from a drone to the controller as meeting the line of sight standard.

Fourth, and most importantly, the new regulations must unequivocally bind a very distinct subset of commercial UAS users to these specific rules. Because the FAA now considers any object that enters the air an aircraft, even model aircraft are subject to general FARs relating to reckless operations for all aircraft. However, because the FAA does not see commercial UAS as model aircraft, and subjecting them to the stringent requirements of other civil aircraft would be absurd, the FAA must hold these UAS to an alternate standard as a matter of law. By outlining the specific UAS that qualify for these regulations, the FAA would remove the ambiguity under which commercial UAS currently operate without adding unnecessary administrative burdens for larger and more powerful UAS and civil aircraft alike.

B. *Proposed FAA Rules and Suggestions*

As an interesting twist during the writing of this Comment, the FAA surged forward unexpectedly with their drone regulations.[148] On February 15, 2015, the FAA inadvertently released the draft version of small commercial UAS rules. Rather than backpedal, the FAA decided to release a draft of the proposed rules for public comment.[149]

The proposed rules consider an exhaustive list of issues relating to small commercial UAS operation in the NAS. The suggestions fall to major categories: operational limitations, operator certification and responsibilities, and aircraft requirements.[150] A large part of the proposed rules fall in line with the author's suggestions, including size, speed, and range limitations, a general necessity for operator knowledge; and creating a special class of small UAS that may conduct commercial operations in the NAS.[151] However, other parts of the proposed rules do not consider the current trends for small UAS or create undue burdens for operators.

For example, the rules require the operation of small UAS solely under Visual Line of Sight ("VLOS") rules.[152] This requires that at all times the person controlling the craft must be able to visually identify the aircraft without any aid, corrective lenses excluded.[153] The current

148. Gregory McNeal, *Leaked FAA Document Provides Glimpse into Drone Regulations*, FORBES (Feb. 14, 2015, 3:40 AM), http://www.forbes.com/sites/gregorymcneal/2015/02/14/the-faa-may-get-drones-right-after-all-9-insights-into-forthcoming-regulations/.

149. Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. 9544-01, 9544 (proposed Feb. 23, 2015) (to be codified at 14 C.F.R. pts. 21, 43, 45, 47, 61, 91, 101, 107, 183).

150. *Id.* at 9546.

151. *Id.* at 9546–47.

152. *Id.* at 9546.

153. *Id.*

trend in small UAS, however, allows a user to operate the UAS with a first-person camera that transmits live video and other data back to the operator.[154] Some of the additional data includes: airspeed, altitude, heading, distance from the operator, and GPS position;[155] this is certainly more information than provided by visual means alone, as required by the proposed rules.

The current technological aspects of operator control systems could easily amend such a limitation. The FAA should instead consider permitting operators to fly within a one-mile radius of their position, as displayed by the control station. In order to operate under such a rule, the craft should likely require the live video feed and several of the data points available. As a minimum, velocity, headings, and altitude should accent a live video feed with enough information for a controller to have a clear picture of the UAS's position and happenings. In the alternative, the FAA should consider adding an "instrument rating" similar to those offered for larger fixed and rotary wing aircraft, which allows a pilot to fly in conditions where visual reference is unavailable.

Another example is the need for a small UAS operator to earn a type rating, through an official FAA testing facility, with a biannual knowledge test.[156] The rules purport to exempt a special "micro" category from this requirement by allowing operators to "self-certify" with the same aeronautical knowledge as would be required for the small UAS category.[157] However, normal small UAS operators are required to walk a gauntlet of administrative tasks in order to legally operate a commercial drone.[158] This process is expected to cost somewhere between $5,700 and $6,800, quite a large expense for any license and not far from the same cost of obtaining a private pilot's license to operate a larger fixed wing aircraft.[159] This cost includes an extensive background check by the Transportation Security Administration, costing in excess of $1,000.[160] As a reminder of the costliness of commercial UAS operations, note that operators must take a knowledge test every twenty-four months, which the FAA estimates at a cost of $2,500.[161]

Taking a step back to consider the situation, this requirement seems unreasonable. A UAS operator, acting in a non-commercial manner, would be able to operate the UAV in the NAS cost free, and without

154. *DJI Phantom 2 Vision+*, DJI, http://www.dji.com/product/phantom-2-vision-plus/feature (last visited Sept. 5, 2015).

155. *Id.* (referred to as flight parameters).

156. Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. 9544-01, 9546 (proposed Feb. 23, 2015) (to be codified at 14 C.F.R. pts. 21, 43, 45, 47, 61, 91, 101, 107, 183).

157. *Id.*

158. *Id.* at at 9549–51.

159. *Id.* at 9578–79.

160. *Id.* at 9579.

161. *Id.*

regulation per the FAAMRA. That same UAS would have no applicable restrictions for altitude, speed, or line of sight. Instead, they are only limited by rules requiring that they operate in a non-reckless manner.

That same UAV, under hire for example to photograph an area, must fly under certain altitude and speed restriction, within a very close distance, and after spending an amount of money that eclipses even those most expensive of UAS systems. Such a rule not only discourages those from entering the UAS commercial market, as it is cost-prohibitive, but also encourages commercial operators to avoid the long and arduous process when their net proceeds may be significantly less.

Instead, the FAA should offer a knowledge base for UAS operators without the unnecessary testing at an FAA facility, or at such a high cost. The rules themselves offer significant protection during UAS operation, limiting several aspects of the operation; far more than a recreational UAS operator must endure.

As a summary, the operational limitations seem mostly sound, if not behind current technology a bit. But the administrative burdens seem excessive, and may even discourage the growth of commercial UAS operators by the sheer magnitude of the cost relative to gain.

VII. Conclusion

In conclusion, the FAA is heading in the right direction by removing the effective ban on commercial UAS operations in the NAS. Unmanned flying machines have a long, rich history for many purposes and show even greater promise going forward. However, to encourage this promise the FAA must not overly burden commerce related to their use with excessive or unnecessary administrative costs and limitations. Instead, operational limitations on the UAS themselves are their strongest tool to ensure that small operators, like Lakemaid Beer, operate in a safe manner that poses no risk to the NAS or national security. By following the policy as suggested in this Comment, the FAA can ensure a safe, yet prosperous UAS market that allows ice fisherman (among others) to safely receive their beer by UAS. What could be better?