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VIA FDMS

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U.S. Department of Transportation
Federal Aviation Administration
Docket Operations, M-30
1200 New Jersey Ave., SE
Room W12-140
West Building Ground Floor
Washington, DC 20590-0001

Re: Comments of the American Farm Bureau Federation on the Federal Aviation Administration's Proposed Rule on the "Operation and Certification of Small Unmanned Aircraft Systems"
Docket No. FAA-2015-0150

The American Farm Bureau Federation (AFBF) appreciates the opportunity to comment on the Federal Aviation Administration's (FAA) Feb. 23, 2015, Notice of Proposed Rulemaking on the "Operation and Certification of Small Unmanned Aircraft Systems" (NPRM).[1] The NPRM proposes a regulatory framework that would authorize, for the first time ever, the widespread commercial use of small unmanned aircraft systems (sUAS) technology in the United States. AFBF applauds the FAA's commitment to the safe, swift integration of sUAS into the national airspace (NAS) and, in particular, for exercising sound judgment in generally declining to impose on sUAS the same standards that apply to manned aircraft.

But the NPRM can and must be improved to allow farmers and ranchers, among other stakeholders, to fully harness sUAS technology to suit their unique business needs. As detailed in our comments below, AFBF urges the FAA to rescind, relax and/or modify certain provisions of the NPRM, especially those that would prohibit sUAS operations: (1) over persons "not directly participating in" the operation; (2) outside the hours of official sunrise and sunset; and (3) beyond visual line of sight (BVLOS). Incorporating such changes into the final rule will have no adverse impact on safety, and will enable AFBF's members and other prospective sUAS users to maximize the tremendous potential of sUAS technology when the rule is finalized.

Those provisions constraining operations are unnecessarily prescriptive and will limit the benefits of sUAS technology in agriculture. AFBF encourages the FAA to enact true performance-based standards that will have the effect of enabling operations and encouraging innovation by stating objectives rather than limitations. Instead of prohibiting operations over non-participating persons, at night, and BVLOS, the FAA should allow such operations in circumstances where it is demonstrated that the sUAS can be operated safely. Privately owned

[1] *Operation and Certification of Small Unmanned Aircraft Systems; Proposed Rule*, 80 Fed. Reg. 9544 (Feb. 23, 2015).

land in contiguously rural and sparsely populated areas, such as farm and ranch land, offers a natural setting to conduct these types of operations without having an adverse impact on safety.

I. Introduction

The American Farm Bureau Federation (AFBF) is the nation's largest general farm organization, representing agricultural producers of nearly every type of crop and livestock across all 50 states and Puerto Rico. AFBF is an independent, non-governmental, grassroots organization working to enhance and strengthen the lives of rural Americans and to build strong, prosperous agricultural communities.

Farmers are constantly evolving and innovating to optimize crop and livestock production while balancing numerous environmental and economic challenges. Precision agriculture[2] – a farming management method based on observation, measurement and response to variability in crops – is one method farmers use to balance these challenges that allows them to make business decisions that are more efficient, economical and environmentally friendly.

Precision agriculture has revolutionized American farming by using detailed, site-specific information to manage production inputs;[3] for many farmers, this process is critical to maximizing yield without overusing resources. For example, today's farmers use precision agricultural techniques to inform decisions regarding the amount of fertilizer needed to purchase and apply to the field; the amount of water needed to sustain the crop; and the amount and type of herbicides or pesticides that needs to be applied (and where).[4] It is widely believed that integrating sUAS into precision agriculture will yield even greater value.[5]

Operating sUAS over American farms and ranches is the next evolution in precision agriculture. Small UAS offer the potential to enhance productivity while reducing cost and environmental impact. By providing farmers a cost-effective tool to enhance overall crop performance, delineate soil patterns, detect threats, and spray for pests and diseases, employing sUAS in precision agriculture could save farmers and ranchers significant time and resources, and by extension, all consumers of agricultural products.

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[2] The U.S. Department of Agriculture defines precision agriculture as "a management system that is information and technology based, is site specific and uses one or more of the following sources of data: soils, crops, nutrients, pests, moisture, or yield, for optimum profitability, sustainability, and protection of the environment." U.S. Dep't of Agriculture, Nat'l Resources Conservation Service, *Precision Agriculture: NRCS Support for Emerging Technologies* (Jun. 2007), at 1.

[3] George Thurston, FAA, *Notice of Proposed Rulemaking Regulatory Evaluation – Small Unmanned Aircraft Systems: 14 C.F.R. Part 107* (Feb. 2015), at 17.

[4] *See* Informa Economics, *Drone as a Service for Agriculture: Economics and Use Cases* (Mar. 2015) ("Informa Study"), at 11.

[5] GRA, Incorporated, *Benefit-Cost Analyses for Integration of Unmanned Aircraft Systems into Civilian Aviation Applications* (Apr. 14, 2014), at 10, http://www.cuvr.org/Resources/Documents/Greg_Helledy_GRAInc-UASBusinessCasesRelease.pdf.

AFBF was pleased to see that the FAA included "crop monitoring/inspection" on the short list of exemplar commercial sUAS uses,[6] and that the agency's regulatory evaluation examined precision agriculture as one of four potential sUAS markets.[7] It bears emphasis that of the 214 Section 333 grants that the FAA has issued to date, nearly 40 were for agriculture-related applications[8] – and that number is expected to grow considerably as the FAA continues to process the nearly 800 petitions that are still in the queue. AFBF agrees that American agriculture can and should be one of the pioneer industries for UAS in this country, and supports a regulatory structure that would permit farmers to leverage sUAS to manage their crops and make important business decisions.

Projecting the future of UAS precision agriculture operations in this country does not require the stretch of imagination. Other countries like Australia, Canada, the United Kingdom, France and Japan are already benefiting from UAS flights.[9] Japan and Australia, in particular, are surpassing the U.S. with respect to UAS in agriculture: Farmers in those countries have been safely flying UAS to apply pesticides and fertilizer to their crops for more than 20 years.[10]

To avoid falling further behind the curve, AFBF urges the FAA to relax the proposed rules to provide for a true performance-based framework. This would be consistent with the FAA's stated approach to this rulemaking[11] and permit certain categories of sUAS operations once operators are able to demonstrate that they can be conducted safely – and without the need for lengthy exemption processes, additional rulemaking, or legislation. Flexibility and access are paramount; these principles must be institutionalized in the final rule to ensure that farmers and ranchers can take full advantage of this revolutionary technology.

II. General Comments

A. Benefits of sUAS and Applications to Precision Agriculture

There is no denying the economic boon that UAS will bring once their potential can be fully realized. Integrating UAS into the NAS is expected to create tens of thousands of jobs and generate billions of dollars in economic activity. A study conducted by the Association for Unmanned Vehicle Systems International (AUVSI) found that the UAS industry will create more than 70,000 new jobs in the first three years after they are allowed to fly in U.S. airspace, and

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[6] 80 Fed. Reg. at 9545.

[7] *See supra* note 3, at 17.

[8] *See* FAA, *Authorizations Granted Via Section 333 Exemptions* (rev. Apr. 20, 2015), https://www.faa.gov/uas/legislative_programs/section_333/333_authorizations/.

[9] *See* GAO, *Unmanned Aerial Systems: Status of Test Sites and International Developments*, GAO-15-486-T (Mar. 24, 2015), at 11.

[10] Mark Koba, *American Farmers to FAA: Hey, We Want Drones!*, NBC News (Oct. 9, 2014), http://www.nbcnews.com/tech/innovation/american-farmers-faa-hey-we-want-drones-n222296.

[11] *See* 80 Fed. Reg. at 9552 ("[t]he approach of this proposal is meant to address low risk operations; to the greatest extent possible, it takes a data-driven, risk-based approach to defining specific regulatory requirements for [sUAS] operations.").

over 100,000 new jobs by 2025.[12] The resultant economic impact will total over $13.6 billion in the first three years and is predicted to grow to over $82.1 billion by 2025.[13]

The AUVSI study concluded that the commercial agriculture market is "by far the largest segment, dwarfing all others."[14] During the 11-year period 2015-2025, UAS integration is expected to contribute $75.6 billion in economic impact by agriculture, compared to $3.2 billion by public safety and $3.2 billion by other activities.[15] Another study, conducted by GRA, Incorporated in cooperation with Booz Allen Hamilton, estimates that that annual crop savings from using drones could reach more than $200 million by 2035.[16] Accordingly, the stakes for American agriculture could not be higher.

Farmers will reap benefits from UAS through their ability to perform sophisticated functions that support everyday farming and ranching activities. Authorizing widespread commercial UAS use will equip American farmers with a revolutionary, safe, and cost-effective new technology with the potential to enhance overall crop performance, identify soil patterns, detect biotic and abiotic stress such as drought check on pasture & range conditions, and spray for pests and disease. [17] Seeing a crop from the air using a high-tech camera can reveal patterns that expose everything from irrigation problems and grazing patterns to soil variation to pest and fungal infestations. [18]

Producers currently monitor their fields for problems attributable to fertility, insects, diseases, weeds, water needs, and other crop growth variance issues through field scouting (*i.e.*, walking the fields), satellite imagery and/or manned aircraft flights.[19] Yet these traditional three crop surveillance methods are labor-intensive, time-consuming and costly.[20] By the time the data is collected, processed and analyzed, it may be too late or too expensive for the farmer to treat a major problem such as a disease outbreak.

What makes UAS valuable to farmers is that they combine the best of these traditional three options – and do so at a fraction of the cost.[21] Equipped with sophisticated cameras and/or sensors tailored to the unique specifications and needs of the user, UAS can help farmers and ranchers scout and monitor crops and pastures more efficiently by capturing highly accurate,

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[12] AUVSI, *The Economic Impact of Unmanned Aircraft Systems Integration in the United States* (Mar. 2013), at 2, https://higherlogicdownload.s3.amazonaws.com/AUVSI/958c920a-7f9b-4ad2-9807-f9a4e95d1ef1/UploadedImages/New_Economic%20Report%202013%20Full.pdf.

[13] *Id*.

[14] *Id*. at 9.

[15] *Id*. at 20.

[16] *See supra* note 5.

[17] *See supra* note 4, at 39.

[18] *See id*.

[19] *See id*.

[20] *See id*.

[21] *See id*.

high-resolution images covering up to hundreds of acres in a single mission. The imagery and data gleaned from a UAS can assist in identifying the particular location where a specific treatment – be it fertilizer, water, pesticides or herbicides – is necessary. It allows the spot-treatment of sections of fields and pastures as opposed to watering or spraying the entire field. By doing this, the producer not only lowers the cost of treatment but also lowers the environmental impact.

The value of spot-treatment is exemplified during droughts. Agriculture is a water-dependent industry. Whether they are growing plants or raising animals, farmers and ranchers need water. It is no secret that the past few years have been especially difficult for farmers in Western states, particularly in California, where historically low rainfall has created an emergent crisis with no end in sight. In fact, the drought is so severe that the governor of California earlier this month introduced the first mandatory water restrictions in the state's history.[22] Although no technology could completely counterbalance effects of this magnitude, deploying sUAS above affected fields in California and elsewhere in the Western U.S. would help minimize the amount of water used. Rather than apply an inch of water on a blanket basis, for example, a sUAS could quickly scan the field to more precisely identify the areas most in need of treatment.[23]

Small UAS will also help farmers conserve another precious commodity: time. It is estimated that the use of sUAS could reduce the amount of time required to completely survey a field by 50 percent - and maybe more.[24] The swift collection of valuable agronomic information, powered by sUAS, will allow the farmer to proactively identify areas that require attention or may be susceptible to loss. The quicker the threat is discovered, the more effectively it can be addressed.

B. Performance-based standards

But these and other benefits of sUAS will not be fully realized if farmers and ranchers are deprived of the ability to operate sUAS to their full potential. The ability to operate sUAS around-the-clock, BVLOS, and over persons not involved in the operation, in particular, are areas in which the FAA should implement a genuine performance-based standard. Although the FAA has defended its reluctance to authorize these and other measures on account of its responsibility to manage the "largest, most complex aviation system in the world,"[25] the agency

[22] State of California Executive Department, Executive Order B-29-15 (Apr. 1, 2015), http://gov.ca.gov/docs/4.1.15_Executive_Order.pdf.

[23] Informa Study at 51, 64.

[24] *See* Nathan Phelps, *Experts Expect Drone Use to Surge*, GREEN BAY PRESS GAZETTE (Mar. 28, 2015), http://www.greenbaypressgazette.com/story/money/2015/03/28/drones-faa-regulations-business-applications/70559566/.

[25] *Unmanned Aircraft Systems: Key Considerations Regarding Safety, Innovation, Economic Impact, and Privacy: Hearing Before the Subcomm. on Aviation Operations, Safety, and Security of the S. Comm. on Commerce, Science & Transp.*, 114th Cong. (Mar. 24, 2015) (statement of Margaret Gilligan, Associate Administrator for Aviation Safety, FAA).

should embrace a "data-driven, risk-based approach"[26] to allow sUAS users to take full advantage of the technology without compromising safety.

AFBF encourages the FAA to avoid setting artificial limitations on sUAS operations, as to "minimize any disincentives to develop new technologies that achieve the regulatory objectives at lower cost."[27] The FAA rightly emphasizes in the NPRM that regulations that are framed to achieve "desired outcomes (*i.e.,* 'performance standards') are generally preferable to those that specify the means to achieve the desired outcomes (*i.e.,* 'design' standards)."[28] Whereas design standards "have a tendency to lock in certain approaches that limit the incentives to innovate and may effectively prohibit new technologies altogether,"[29] performance standards "give the regulated parties the flexibility to achieve the regulatory objectives in the most cost-effective way" and are "particularly important where technology is evolving rapidly, as is the case with small UAS."[30] Simply put, a final rule that may take 18-24 months to finalize[31] cannot be based solely on the snapshot of sUAS technology as it exists today.

Farms are tailor-made for application of performance-based UAS standards; with their privately owned, contiguous and sparsely populated fields, they offer a natural setting to conduct UAS operations without adversely affecting safety. Instead of prohibiting operations such as those that are conducted over non-participating persons, at night, and BVLOS, the FAA should implement performance-based standards to authorize such operations in circumstances where it is demonstrated that the sUAS can be operated safely. Just as the FAA expressly endorses the performance-based standards in some contexts of the proposed rule, such as loss-of-positive-control risk mitigation measures,[32] the agency should consistently apply them to other important aspects of the rule to ensure that the agency's entire sUAS regulatory framework is flexible and forward looking, rather than excessively prescriptive and cemented in time.

The fact remains that the United States lags behind several other countries in this area.[33] A recent GAO report documents not only the fact that several foreign countries allow commercial UAS operations, but that they "have done so for [many] years."[34] UAS regulations have been in effect in Canada and Australia since 1996 and 2002, respectively.[35] In Japan, the agricultural industry has used UAS weighing less than 220 pounds to apply fertilizer and

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[26] 80 Fed. Reg. at 9552.

[27] *Id.*

[28] *Id*.

[29] *Id*.

[30] *Id*.

[31] GAO, *Unmanned Aerial Systems: Efforts Made toward Integration into the National Airspace Continue, but Many Actions Still Required,* GAO-15-254T (Dec. 10, 2014), at 2.

[32] *Id*. at 9561-63.

[33] *See* GAO, *Unmanned Aerial Systems: Status of Test Sites and International Developments*, GAO-15-486-T (Mar. 24, 2015), at 11.

[34] *Id*. at 10.

[35] *Id*.

pesticide for many years.[36] And several European countries have reportedly granted operating licenses to more than 1,000 operators to use UAS for safety inspections of infrastructure, including to support the agriculture industry.[37]

C. Aspects of the Rule AFBF Supports

1. *Operator, Airworthiness and Aircraft Certification Issues*

AFBF supports the FAA's proposal to require sUAS operators to obtain a newly created "unmanned aircraft operator certificate" instead of requiring them to hold a private or commercial pilot certificate.[38] This is a sensible approach insofar as the required aeronautical knowledge testing and sUAS training programs are specifically geared toward sUAS operations. Compared to manned aircraft, sUAS are significantly easier to control, maneuver and land.[39] Imposing on sUAS operators the same or similar airman certificate qualification and training standards currently applicable to pilots of manned aircraft would disenfranchise an entire generation of sUAS pilots perfectly capable of flying sUAS – and prevent American farmers and ranchers from achieving the benefits that sUAS can provide.

AFBF also agrees that no FAA medical certificate should be required for sUAS operations. The primary reason for medical certification is "to determine if the airman has a medical condition that is likely to manifest as subtle or sudden incapacitation that could cause a pilot to lose control of the aircraft or impairs the pilot's ability to 'see and avoid.'"[40] But as the FAA has already determined in granting more than 214 exemptions for commercial sUAS operations, a traditional airman medical certificate is not warranted.[41]

AFBF supports the FAAs proposal that refrains the requirement for sUAS to comply with current airworthiness or aircraft certification standards that apply to manned aircraft: "because UAS-associated technologies are rapidly evolving at this time, new technologies could come into existence after this rule is issued or existing technologies may evolve to the extent that they establish a level of reliability sufficient to allow those technologies to be relied on for risk mitigation."[42] Airworthiness certification would be unnecessary for sUAS subject to this proposed rule and would likely have the effect of stifling innovation, particularly with respect to UAS manufacturing. As is the case with any rapidly evolving technology, the UAS products that are being manufactured are likely to be woefully outdated five years from now. In this regard, the FAA's decision to exclude sUAS from traditional airworthiness certification requirements due to their "low-risk operational characteristics,"[43] the fact that they "come in a variety of

[36] *Id.*

[37] *Id.*

[38] 80 Fed. Reg. at 9558.

[39] *See* 80 Fed. Reg. at 9568 (describing why the flight proficiency and aeronautical experience requirements that apply to manned aircraft pilot certificates are mitigated in the sUAS context).

[40] *Id.* at 9571.

[41] *Id.*; *see also, e.g.,* Exemption No. 11335 in Docket No. FAA-2014-1106 (Voler, Inc.).

[42] 80 Fed. Reg. at 9552.

[43] *Id.* at 9576.

forms"[44] and the likelihood that the sUAS market "will continue broad innovation until designs emerge that are well balanced against the tasks found to be best served by this segment of aviation"[45] was a balanced and reasonable one.

2. *Micro UAS classification*

AFBF also supports the FAA's proposal to create a "micro UAS" classification to authorize and establish a separate set of rules and operating limitations for less than 4.4 pound sUAS. In particular, AFBF applauds FAA's decision to allow micro UAS to operate directly over people not involved in the operation, and to establish a different type rating for the operation of such aircraft pursuant to which no knowledge test would be required.[46]

III. Comments on Specific Aspects of the NPRM

A. Proposed Section 107.1 – Applicability

1. *Air carrier certification*

While AFBF understands that the sUAS rulemaking raises novel, complex questions as to the appropriate regulatory framework that should apply to unmanned operations, the NPRM's ban on sUAS operators transporting property for compensation or hire[47] is problematic because it would effectively treat sUAS operators no differently than traditional "air carriers." The FAA has already determined that "the risk associated with [sUAS] would be significantly reduced when compared with other categories of aircraft that weigh more, fly higher, and faster."[48] Requiring a sUAS operator to obtain a standard "air carrier certificate" would "not take into account the considerations associated with civil small UAS"[49] and "impose an unnecessary burden for many small UAS operations."[50] This would create an arbitrary distinction in the context of sUAS operations that could severely limit their utility in agriculture with no corresponding safety benefit. For example, the proposed rule would prohibit a third party sUAS operator with whom a farmer has contracted from using its sUAS to carry the farmer's property from one side of the field to the other.[51] This is not a safety issue. The FAA should clarify this provision to give farmers the flexibility to hire sUAS operators to conduct the exact same operations that a farmer could conduct on his or her own.

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[44] *Id*. at 9574.

[45] *Id*.

[46] *Id*. at 9557.

[47] *Id*. at 9586.

[48] *Id*. at 9576.

[49] *Id*. at 9549. "An unmanned aircraft airman certificate would be a new type of airman certificate that would be created by this proposed rule specifically for UAS operators to satisfy the statutory requirement for an airman certificate." *Id*. at 9558.

[50] *Id*. at 9550.

[51] 80 Fed. Reg. at 9553.

The FAA already permits certain commercial operations to be conducted without an air carrier certificate. For manned aircraft, various types of "aerial work operations, crop dusting, banner towing, and ferry or training flights, are excluded from the certification requirements of Part 119…[and]…are thus permitted…under the less stringent operating rules of part 91."[52] If the FAA ultimately determines that some type of "air carrier certification" would be required by statute,[53] the agency could easily satisfy that technical requirement. For example, the FAA created the new "unmanned aircraft operator certificate"[54] to address the statutory requirement that all "aircraft" be operated by a certified pilot.[55]

2. *External load operations (§ 107.1(b)(3))*

As currently drafted, the NPRM would exclude "[a]ny aircraft conducting an external load operation" from coverage under the rule.[56] If strictly construed, this provision could arguably disqualify a host of sUAS applications that the FAA has already acknowledged, explicitly or otherwise, as being in the public interest and/or integral to sUAS integration (*e.g.*, aerial photography, precision agriculture, search and rescue/law enforcement, and bridge inspection).[57] To illustrate, any camera or sensor package that is not fully integrated into the sUAS's fuselage would arguably meet the definition of an "external load" insofar as such cameras are "carried . . . outside of the aircraft fuselage."[58] It seems doubtful that the FAA intended to prohibit such commonplace sUAS operations. AFBF is concerned that the ban on so-called "external load operations" is overbroad, impractical when applied to agricultural sUAS applications, and would limit the potential benefits of this technology. This provision should be eliminated or clarified.

The FAA has already determined that "small UAS operations subject to this proposed rule would not create a hazard to users of the NAS or the public."[59] The agency has also defined a sUAS "as an unmanned aircraft weighing less than 55 pounds, including everything that is on board the aircraft."[60] While there may indeed be some "external-load" operations – like towing other aircraft or objects – that warrant "evaluation of the aircraft frame for safety performance impacts,"[61] a blanket prohibition would curtail the potential benefits of sUAS with no corresponding safety benefit. The FAA should eliminate this prohibition or, alternatively, clarify

[52] Letter from Mark W. Bury, Assistant Chief Counsel for International Law, Legislation, and Regulations, to Rebecca B. MacPherson (Aug. 13, 2014), at 2, n. 3 (*citing* 14 C.F.R. § 119.1(e)(4)).

[53] *Id*. at 9554 (*citing* 49 U.S.C. § 44711(a)(4)).

[54] 80 Fed. Reg. at 9588.

[55] *Id*. (*citing* 49 U.S.C. § 44711(a)(2)(A)).

[56] *Id*. at 9586; *see also* 14 C.F.R. § 1.1 ("[e]xternal load means a load that is carried, or extends, outside of the aircraft fuselage).

[57] 80 Fed. Reg. at 9578.

[58] *See supra* note 55.

[59] *Id*. at 9576.

[60] *Id*. at 9556.

[61] *Id*.

that it only applies to what are actual "towing operations" or those that would cause the weight of the unmanned aircraft to exceed 55 pounds.

B. Proposed Section 107.31 – Beyond visual line of sight operations

The proposed rule should be modified to allow BVLOS operations in certain conditions and/or settings, particularly in remote, flat topographic environments (*e.g.*, farms, ranches, etc.) where the risk to other airspace users, however minor, can be easily and adequately managed. It is the ability to safely conduct BVLOS operations that will help realize the full potential that sUAS offer for precision agriculture and other suitable industries and applications. The FAA can accomplish this by establishing a flexible, performance-based framework for BVLOS operations that, at a minimum, allows a subset of sUAS operations to be conducted safely over large swaths of land without requiring the operator to maintain visual line of sight (VLOS) capability at all times.[62]

Imposing a blanket prohibition on BVLOS operations contravenes the FAA's stated preference for performance-based standards.[63] As the FAA emphasizes in the NPRM, "[sUAS] generally pose a significantly lower risk to people and property on the ground than manned aircraft."[64] And while the FAA's determination that so-called sense-and-avoid technology "has not matured to the extent that would allow small UAS to be used safely in lieu of visual line of sight without creating a hazard to other users of the NAS or the public, or posing a threat to national security,"[65] the agency's imposition of a one-size-fits-all, blanket prohibition on BVLOS operations is precisely the type of rigid regulatory approach that the agency rightly avoided in other aspects of the proposed rule.

While some farms only consist of several acres and could be fully surveyed within-VLOS sUAS mission, many more farms do not fit this description. For these larger farms, in particular, the importance of being able to conduct BVLOS operations is magnified. Owners and operators of large farms need to survey and apply weed, insect, and disease control products to huge plots of land to protect their crops from threats.[66] As drafted, the FAA's rule would require farmers with large acreage to fly multiple, potentially redundant missions to cover the necessary ground. Instead of capturing the imagery and collecting the relevant data all at once, these farmers would be forced to expend precious additional resources into stitching together maps and synthesizing data. This would be highly inefficient – both in terms of manpower and time – and could nullify the potential time and cost savings that make sUAS so attractive with little corresponding safety benefit.

The proposed BVLOS prohibition is also incongruous with the FAA's recognition in the NPRM that "crop monitoring/inspection" – an activity that inherently involves surveying a large

[62] *See id*. at 9547.

[63] *Id*. at 9552.

[64] *Id*. at 9565.

[65] *Id*. at 9551.

[66] *See supra* note 4, at 59.

amount of territory – is one of the "societally beneficial applications" of sUAS use.[67] Large field crop farms have the most to gain from sUAS precisely because of the large acreage sUAS can cover in one mission.[68] But the BVLOS restriction will hamper the ability of sUAS' potential to be fully realized in the agricultural context, particularly on large farms. This aspect of the rule will affect countless farms in the U.S. that are interested in using sUAS to replace or complement their current crop monitoring methods.

In addition, the BVLOS prohibition is redundant in the agricultural context when considering the safety mechanisms already available and installed on many sUAS, especially when combined with the remote, uncongested airspace over most farms. Small UAS can be controlled via proven operational safeguards such as geofencing, visual observers, flight termination mechanisms, and others that either exist now or will in a short time frame. AFBF also supports the use of risk mitigation procedures to notify manned aircraft that an sUAS is operating in the vicinity. But imposing a blanket BVLOS prohibition given the availability of recognized risk mitigation measures and rapidly developing sUAS technology is unnecessarily prescriptive, particularly in the open environment of a farm where the chances of sUAS harming general aircraft or persons on the ground are significantly reduced.[69] Indeed, the FAA notes in the NPRM that "most manned aircraft operations take place above 500 feet" – even those over uncongested areas.[70]

AFBF separately urges the FAA to act consistent with its pledge to continue to make the exemption process available for sUAS operations that fall outside of the rule, including those that "may involve the use of more advanced technologies that are not yet mature at the time of this rulemaking."[71] But the FAA should nonetheless "relax operating restrictions on small UAS equipped with technology that addresses the concerns underlying the operating limitations of this proposed rule," whether that be "through some type of deviation authority (such as a letter of authorization or a waiver)"[72] or otherwise. The rule must be flexible and forward-looking to accommodate constantly evolving UAS technology.

C. Proposed Section 107.29 – Daylight operation

The FAA has proposed to prohibit the operation of sUAS outside of daylight hours "due to the relatively small size of [sUAS]" and the perceived "difficulty in being able to see it in darker environments."[73] But the adverse effects of this blanket restriction outweigh any safety

[67] 80 Fed. Reg. at 9545.

[68] *See supra* note 4, at 67.

[69] The BVLOS prohibition should not ban sUAS operations in certain agricultural environments, such as apple orchards or fruit farms, that contain trees or tall plants that temporarily interfere with the operator's ability to maintain line-of-sight. See 80 Fed. Reg. at 9560. The risks associated with any such temporary obstructions would be adequately mitigated by the small size of the sUAS and the use of visual observer (as applicable), as well as the other operational safeguards discussed above.

[70] 80 Fed. Reg. at 9547.

[71] *Id*. at 9552.

[72] *Id*.

[73] 80 Fed. Reg. at 9561.

justification, especially given the availability of risk mitigation measures. Farming is a labor intensive enterprise that requires around-the-clock care and monitoring of the crop; in fact, the optimal time for many farmers to treat their crop is after sunset. The proposed daylight-only restriction will unnecessarily hamstring farmers' ability to tailor the sUAS operations to fit their existing work rhythms.

A less burdensome approach would be to allow farmers and other operators to use sUAS in remote, uncongested environments during non-daylight hours so long as such sUAS are equipped with strobes or other lighting systems that allow the operator and/or visual observer to readily track its location. AFBF notes in this regard that FAA-certified aircraft lighting systems are already well-developed and readily available at a reasonable cost.[74] And the FAA has already proposed to "provide manufacturers with flexibility…[to]…install parts that are FAA-certificated, have received PMA, or are TSO-authorized for manned aircraft, provided the small unmanned aircraft remains under 55 pounds after the installation of the part."[75] Combining this flexibility with some of the various other operating limitations and/or risk mitigation measures described in the proposed rule (*e.g.*, 500 feet maximum altitude,[76] ATC authorization,[77] etc.), the FAA could use a performance-based standard to determine that nighttime or low-light sUAS operations "would not create a hazard to users of the NAS or the public."[78] At a minimum, the FAA should consider relaxing this operating restriction through "some type of deviation authority (such as a letter of authorization or a waiver)."[79]

D. Proposed Section 107.39 – Operation over people

The proposed rule's ban on sUAS operations over persons who are either "not directly participating in the operation" of the sUAS or "not located under a covered structure that can provide reasonable protection from a falling small unmanned aircraft"[80] is also overly prescriptive. This requirement is especially problematic for farmers, as it could lead to the perverse result of banning sUAS missions that pass over a single farmer on his or her tractor in the middle of a 500-acre cornfield in Nebraska. Crop fields are sparsely populated with workers even during peak harvesting periods. The risk of a sUAS endangering a consenting individual working in the field who is not directly involved in, but is aware of, the operation is simply too remote to justify a blanket prohibition.

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[74] *See, e.g.*, AIRCRAFT SPRUCE & SPECIALTY CO., Whelen LED Position Lights – Model 71105 Series, http://www.aircraftspruce.com/pages/el/positionlights/whelen71105.php (FAA-approved unit weighing less than one pound that is available for approximately $200).

[75] 80 Fed. Reg. at 9566.

[76] *See id*. at 9588.

[77] *See id*. at 9587.

[78] *Id*. at 9576.

[79] *Id*.

[80] *Id*. at 9563.

As with the other proposed restrictions addressed in this Section III, a complete ban on operating sUAS over nonparticipating persons is incongruous with a performance-based approach to safe sUAS integration. Accordingly, AFBF urges the FAA to modify or, alternatively, clarify this provision to expand the meaning of "direct participati[on]" to include individuals who have been made aware of the presence and approximate flight path of the sUAS in their vicinity. Otherwise, the FAA's "operation over people" prohibition, as currently drafted, would require all workers to leave the field during sUAS operations, which conflicts with the benefits of using sUAS.

E. Proposed Section 107.13 – Registration and Marking

AFBF takes no issue with the FAA's decision to extend the statutory civil aircraft registration requirements to sUAS.[81] But the registration process should be easy, quick, and inexpensive. Recognizing that sUAS "can easily be obtained for as low as several hundred dollars" and "are significantly smaller assets than manned aircraft,"[82] under no circumstances should sUAS owners "be required to provide additional information" beyond what is currently required of manned aircraft, including amateur-built aircraft.[83] The FAA should also consider establishing a simple online registration system to ensure that administrative hurdles do not stand in the way of a farmer being able to acquire and register an sUAS and begin operating it over farm and field as soon as possible.

F. Proposed Section 107.51(b) – Operating Limitations for Small Unmanned Aircraft

The FAA has proposed a vertical boundary of 500 feet above ground level (AGL) for sUAS operations "to create a buffer" between sUAS and "most manned aircraft flying in the NAS," noting that "most manned aircraft operations take place above 500 feet" – even those over "uncongested" areas.[84] Given the remoteness of most farms and the uncongested airspace over them, there is no reason why the 500 foot ceiling could not be lifted under certain circumstances. For example, such operations could be limited to certain times and classes of airspace and subject to the operator obtaining a certificate of waiver or authorization.[85]

Operating over 500 feet AGL could provide significant benefits for farmers in certain circumstances. The higher the sUAS is permitted to operate, the higher the vantage point for the camera and/or sensor package and, as a result, the greater the square footage of crop that can be filmed/captured within a certain period of time. At a minimum the FAA should "relax operating restrictions…through some type of deviation authority (such as a letter of authorization or a waiver)."[86]

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[81] *Id*. at 9549 (*citing* 49 U.S.C. § 44101(a)).

[82] *Id*. at 9574.

[83] *Id*.

[84] *Id*. at 9547.

[85] *See* FAA, *Unmanned Aircraft Systems: Civil Operations (Non-Governmental)* (rev. Mar. 17, 2015), https://www.faa.gov/uas/civil_operations/.

[86] *Id*. at 9552.

G. Privacy and Data Collection

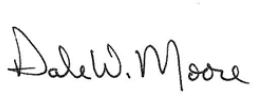
While AFBF fully supports sUAS technology and its swift, smart integration into the NAS, it notes that many farmers and ranchers are apprehensive about the potential for sUAS to be put to nefarious use with respect to privacy and the unauthorized dissemination of data. As the FAA states in the NPRM, such issues are beyond the scope of the instant rulemaking.[87] AFBF submitted comments on these issues on April 20, 2015 in the National Telecommunications and Information Administration (NTIA) rulemaking and incorporates those comments herein by reference.

IV. Conclusion

The FAA's long anticipated adoption of rules to permit the widespread commercial use of sUAS have the potential to equip American farmers and ranchers with a revolutionary, safe, and cost-effective new technology that will enhance their everyday activities. AFBF commends the FAA's efforts to integrate UAS into the NAS – the safest aviation system in the world. But the "relatively low risk"[88] presented by sUAS can be managed through an appropriate combination of operating limitations, risk mitigation measures and performance based standards. The agency can and must do more to maximize the full economic potential of this revolutionary new technology. The FAA should, at a minimum, revise or clarify provisions relating to operations that are BVLOS, daylight-only, and over non-participating persons. As the FAA has said, "because a small unmanned aircraft is significantly lighter than a manned aircraft, in the event of a mishap, the small unmanned aircraft would pose significantly less risk to persons and property on the ground."[89]

Farmers and ranchers should not be forced to wait years to fully unlock the potential of sUAS for helping them plow, plant, fertilize, or apply pest or disease control substances. In order for American agriculture to maintain a competitive advantage, it is imperative that the FAA's final rule be sufficiently flexible to allow them to leverage "rapidly evolving"[90] sUAS technology safely and without delay.

Sincerely,



Dale Moore
Executive Director
Public Policy

[87] *Id*.

[88] *Id*. at 9565.

[89] *Id*. at 9548.

[90] *Id*. at 9552.