

Chairman Vitter, Ranking Member Shaheen, and distinguished Members of the Committee, thank you for the opportunity to testify today about our experiences in Commercial UAS development and operations, and working with the FAA.

At Physical Sciences Inc., which is a small business, I have the privilege of leading a group of talented technologists focused on the development and application of a multipurpose small unmanned aircraft system we call InstantEye®. While initially we solely supported the military, today our customers include not only the military but also: law enforcement, first responders and a growing list of commercial users.

Working with the military we broke new ground to push the technology to those most in need of it - the individual warfighter. This required significant innovation to make the system easy to operate, extremely rugged, adaptable to mission needs, and low cost. This technology was developed under SBIR sponsorship. It is being used by our military, in the theatre, providing game-changing situational awareness to our warfighters. This technology and many other SBIR technologies are contributing to our national security, and hope you will make this great program permanent. We created a Program of Instruction to train operators in the use of InstantEye®, including emergency procedures, and how to service the equipment. Operators who pass the two-day course are able to effectively use and maintain the system. Much of the

technology developed, and experience gained-~~has~~ been successfully transitioned to the commercial sector.

Today, supporting commercial customers is one of our greatest growth areas. As we have expanded into these markets we worked closely with the FAA to obtain the necessary certifications to conduct commercial operations.

Teamed with a commercial customer in the power and gas industry we applied for and received a Special Airworthiness Certificate for InstantEye<sup>®</sup> so we could test its efficacy as an inspection tool. We also applied for and were granted a Section 333 Exemption allowing InstantEye<sup>®</sup> to be used in a large number of commercial operations. Today our systems are used to inspect: powerlines, pipelines, wind turbines, solar arrays, endangered species habitats – the list grows weekly!

The process used by the FAA for both the Special Airworthiness Certificate and the 333 Exemption was to take regulations developed for manned aircraft and apply them to our unmanned system. When regulations did not quite fit, we applied for and were granted exemptions which kept the safety intent of the rule but modified its implementation so that it made sense for our small UAS. The interaction almost always started with “how can this rule be modified to be appropriate for your system and still maintain an equivalent level of safety?” While the process was painstaking, we always felt that the

FAA was anxious for us to succeed, but they did not want to do anything that would break the system – safety came first.

We understand that today the FAA is seeking to develop rules that are specific to UAS and their operations instead of continuing the approach of taking existing manned aircraft regulations and modifying them through exemptions – we applaud these efforts. We firmly believe that for this process to move quickly, and to ensure that safety is not compromised, it needs to be a collaborative effort between the FAA and the UAS industry. Over the last 90 years the FAA and its predecessor organizations have created an airspace architecture that today is the safest we have ever known – that experience will be invaluable as we enter this next era of aviation. Equally important is the knowledge and experience of the UAS industry. We know our systems and their limitations, we are forever finding new applications for the technology, and we can use this knowledge to help suggest regulations that are appropriate for this industry, maintain safety, and allow it to grow and thrive.

We also believe that in developing UAS regulations - one size does not fit all. Rules and operator requirements must be appropriate for the system being used and operations being conducted. An approach based on the engineering “risk” model will likely be the most successful methodology. Evaluating “risk” encompasses a number of items including: failure analysis, probability of injury, and probability of property damage. This will allow us to collect combinations of system type and intended commercial activity into groups to

which we can apply safety requirements, and ultimately derive rules. Lower “risk” activities will require fewer rules on the operator and the system while higher “risk” operations will require the operator to have greater demonstrated skills and the system to have additional capabilities to ensure that an “equivalent level of safety” is met.

Not only does this approach build on the existing FAA rule architecture for manned aircraft – a sport pilot flying a sport aircraft does not have the same rule burden placed on their activities as does an Airline Transport Pilot flying a commercial airliner – it will also drive innovation. Clear rules, thoughtfully developed and applied, will allow healthy competition by virtue of a level playing field, and will encourage creative companies to invent innovative solutions that both adhere to the rules and also create the “better mouse trap.”

In summary, the commercial UAS industry represents an immense opportunity for our country. It is creating jobs, it is driving innovation, and each day we discover yet another application for the technology. To realize its full potential, and to ensure that the United States is a world leader in this area, will require a close collaboration between the FAA and the UAS industry. The rules and operator requirements that are put in place must ensure safety and protect privacy to garner public trust – this is essential for success! Chairman Vitter, Ranking Member Shaheen, Members of the Committee, thank you for your time.