TESTIMONY OF

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Chairman Costello, Congressman Petri, and Members of the Subcommittee:

Good morning. It is my pleasure to be here today in support of your Review of FAA Operational and Safety Programs in our nation's air traffic system. The Federal Aviation Administration is addressing the challenges presented by the introduction of new types of aircraft, including unmanned aircraft (UA) like those my company develops and manufactures. There are some significant partnering opportunities, which if taken, can foster and advance commercial applications of unmanned aircraft system (UAS) activity without compromising the safety and established operating procedures of the National Airspace System (NAS).

In September 2006, Mr. Nicholas Sabatini, Associate Administrator for Aviation Safety, testified before the Senate Subcommittee on Aviation that UAs are a part of the future of aviation. Insitu and the unmanned aircraft we build not only characterize the future but also exemplify the here and now. In 1994, a couple of pioneering scientists with a vision and a passion for aviation built the foundations of our company and in 1998 achieved a long-sought milestone: the first ever trans-Atlantic crossing by an unmanned aircraft -- on only a gallon and a half of fuel.

In 2001, in response to a compelling safety case, we were poised to replace the manned helicopters used by the worldwide tuna fishing fleet with unmanned aircraft. But then we all experienced the tragedy of 9/11 and our company turned its energies toward meeting the rapidly evolving surveillance needs of our Navy and Marine Corps men and women deployed in the Global War on Terrorism (GWOT). Today, I'm proud to report to you that our product, distributed by Boeing as the ScanEagle, has over 32,000 combat support flight hours (without a single serious personnel injury or damage to property) and over 475 successful launches and recoveries from more than 11 United States Navy and Allied warships of all sizes.

Even though the commercial off-the-shelf (COTS)-derived ScanEagle weighs only 40 pounds and is not yet a program of record with the Department of Defense, based upon flight hours, it is the third most utilized UAS system in the war. Maturing this system wasn't simple or straightforward. It was the aggregate result of our dedicated team's efforts including over 200 professional aviators, engineers and scientists who continue to deliver unmatched support to our customer -- the marine, sailor, airman, and soldier -- with a common vision – a vision that is helping define the future of aviation.

Today, even though Insitu is located in a rural HUBZone, it is one of the fastest growing companies in the United States. We are number #34 on the Inc. Magazine list of the 500 fastest growing companies. We are also ranked number one on the list of fastest growing technology companies in the Pacific Northwest by Deloitte. Our aviation-centric team boasts an aggregate of over 75,000 flight hours—garnered from commercial, private, and military aviation flight experience. I think it's safe to say that we know, understand, and have a special connection with those who share our love of flight.

There are, in fact, well over 400 small companies in the United States who are involved in UAS development and components manufacturing at various levels of sophistication. The situation is similar to the 1930s and 1940s when many airplane companies built the legacy of aviation we all enjoy today. In fact, many predict that the 21st Century will be the "century of autonomous aircraft." The increasing number of conferences, exhibitions, and tradeshows dedicated to unmanned aircraft and related components testify to the phenomenal rapid growth of this market segment. The Association for Unmanned Vehicle Systems, enjoying its 35th anniversary this year, has experienced over 35% growth in conference and exhibition participants over the last five years.

In response to this growth the FAA has already commissioned a dedicated industry working group under RTCA, Special Committee 203, which just last month completed a compilation of "recommended best practices and guidance material," a useful foundation upon which the FAA can build policy and practical regulations.

However, the market's needs are outpacing the incremental processes which create procedural or regulatory guidance. Current market analyses assess that the UAS products and services markets will grow to be $15 billion in annual revenue within the next eight years.

Indeed, the future is upon us…and we need your help to capture this global market…and with its capture, help assure U.S. leadership in aviation.

It is worthwhile to examine the benefits of unmanned aircraft. The Department of Defense refers to the missions of unmanned aircraft as those that are "dull, dirty, and dangerous." Consider the value of robotically finding survivors or lost persons in extreme, maritime, or wilderness conditions; or detecting, identifying and geolocating survivors of hurricanes, floods, and tsunamis; or of being able to fly in conditions or in areas where it is too dangerous for manned flight…such as the persistent aerial surveillance of a forest fire, an erupting volcano…or God forbid…sampling and mapping the plume resulting from a dirty bomb or other similar calamity.

For many applications, unmanned aircraft are an environmentally friendly alternative to large manned aircraft. The low fuel consumption rates of unmanned aircraft directly contribute to low noise and hydrocarbon emissions. The persistence of unmanned aircraft make it affordable to aerially detect, classify, and monitor wildlife—as well as the protected environments in which they live or through which they migrate. And furthermore, as we demonstrated with the US Forestry Service last summer, unmanned aircraft can safely and persistently monitor forest fires to provide the real-time data firefighters need to effectively respond to hot spots, protect themselves, and combat the propagation of the fire.

Mission parameters and UAS economies allow for more comprehensive monitoring of critical infrastructure: gas/oil platforms, pipelines, nuclear power plants, water supplies, and the like. Miniature electronic sensors now permit the remote robotic exploration of natural resources and the persistent surveillance and resultant protection of marine mammals, ice floes, and national borders for homeland security.

The foremost challenge in achieving growth in this dynamic market is the safe, sustained access to airspace. Without access to airspace, the development and pre-delivery testing of aircraft dedicated to GWOT and commercial users, the training of safe and skilled operators, and the execution of the many governmental and commercial missions are effectively stymied. Although Insitu has civil commercial contracts, potentially worth tens of millions of dollars for ISR services in or operating out of US domestic airspace, these contracts cannot be executed because of restrictive and conservatively interpreted federal policies. The unfortunate

result is that for the foreseeable future, only those unmanned aircraft applications which originate and terminate outside of US territory can be profitably conducted at this time. However, this need not be the case.

Returning to Mr. Sabatini's testimony of last September, the FAA established an unmanned aircraft program office to develop guidance and regulations for the certification and integration of UAs into the NAS. We in the industry applaud this first step and are endeavoring to proactively collaborate with this program office, with other FAA offices, and with industry working groups and trade associations.

However, this is a significant multi-faceted challenge. Unmanned aircraft come in all shapes and sizes — from a few ounces to a those larger than a 737; they fly at varying altitudes, have a variety of endurance capabilities; and they embrace a variety of commercial business models—operations in high-density air traffic/densely populated areas and those operating in unpopulated, very low-density airspace, like Insitu UAs. Mr. Sabatini rightly points out that each different type of UA must be evaluated individually with each aircraft's unique characteristics carefully considered.

The UA market needs are rapidly evolving, exacerbating the need for practical public policy and sensible regulations. Technology is rapidly maturing and making possible even more approaches to mitigating unmanned aircraft risk and failure modes than are possible for supporting manned flight. The simple rote application of the current regulations is unlikely to be effective or successful. Neither will one succinct set of policies and regulations definitively address the breath and depth of the issues affecting unmanned flight.

Today's legacy FAA policies and regulations have changed little from its heritage of early aviation-era technologies. For example, the oft-touted "see and avoid" manned aviation paradigm is based on human visual acuity and the pilot's honed discipline to rapidly shift attention from pilotage to completing a thorough search of the forward flight environment. Although the human eye (and those regulations based on dated knowledge) are not adequate to handle the complex rapid changes (nor the acute differences in aircraft vehicle design, application, and operation) of today's modern aviation environment, technologies are evolving which can yield higher levels of safety and make possible manned-unmanned flight interoperability.

Effective rulemaking deserves ample time and consideration. Aviation experimentation is methodical but fast-paced and its needs are not addressed by simply denying access to airspace indefinitely. That approach to regulation sounds the death knell of the U.S. unmanned aircraft industry and it undermines the industry's willingness to embrace the pioneering spirit of early aviation visionaries. There are several reasons for this.

Let's consider the details of access to U.S. airspace. The FAA currently allows the UA industry only two ways to obtain permission to operate safely in our National Air Space: (1) via a public agency-sponsored Certificate of Authorization to operate or (2) after first obtaining an FAA Experimental Airworthiness Certificate. In both cases, this approach to granting access to the NAS neither encourages research & development, nor does it encourage the advancement of commercial applications that result in a self-sustaining revenue stream.

A close examination of the paradox posed by the FAA's proposed use of Experimental Airworthiness Certification from manned aircraft for UAS applications reveals this approach:

- applies only to a single aircraft – not to a product line
- does not apply to volume aircraft production processes
- does not establish any acceptance standards…and has insufficient provision for engineering evaluators within the government
- does not establish standards for ground stations, launchers, retrieval systems, or data links that are integral components of UAS operations
- has no concept of using network connectivity, ground-based radar, or ADS-B type solutions to augment the separation of manned air traffic from UAs
- relies on human observers…defeating the purpose of unmanned solutions and rendering many UA markets infeasible or unsafe.
- has not defined "equivalent level of safety" to assess which operations might have "de minimus" risks that are acceptable to aircraft and/or property, for example similar to ultra-light unmanned aircraft (FAA's regulations known as Title 14 Part 103)

I can tell the committee that, due to the small size and weight of our UAVs in conjunction with the predictability of our trajectories, a mix of several UAs and some manned aircraft in a given volume of airspace is inherently safer than the same total number of only manned aircraft attempting to perform the same mission. We have demonstrated this in Iraq and elsewhere and believe this to be the case with some of the commercial missions we have been commissioned to perform.

The recent February promulgation of FAA policy guidance in the Federal Register is viewed by our industry as an attempt to create regulations by policy inference -- of defining industry performance parameters without first encouraging the industry to demonstrate its level of performance. This is comparable to the classic "Catch 22" paradox.

In short, we can't achieve progress rapidly or confidently on the current path. The United States UA industry sometimes casts an envious glance at the regulatory practices of U.S. allies and trading partners (like Australia and Canada) which encourage UA experimentation with a flexible risk assessment, continuous data collection, and continuous improvement.

The process of evolving cogent and practical regulation from a foundation of sound public policy can be improved. I would like to share five suggestions that will be helpful to industry, to the FAA, and to our nation.

1. Provide the FAA with sufficient personnel and financial resources for Unmanned aircraft System (UAS) policy exploration and development.
2. Encourage the FAA to rapidly field a mechanism to conduct experiments, collaborate with industry, and collect data. The compilation of utilization, safety, training, and business-model data from both Civilian and Military operators of unmanned aircraft is essential for sound policy and rulemaking.
3. Re-introduce the use of **civil** Certificates of Authorization (COAs), which can be issued to commercial companies with appropriate FAA safety case reviews and monitoring. This is needed for infrastructure support of government customers for experimentation, production testing, and training. However, this mechanism must also include the capacity for the operator to fly for hire, else a self-sustaining business model is not possible for the industry within the US.

4. Encourage the FAA to embrace that a variety of approaches will be needed to address huge variations in unmanned aircraft types and risk factors. Specifically, ultra-light UA operations in low-density flight regimes are inherently different than large UAs interoperating near crowded airways over congested cities.
5. Discourage the current regressive practice of regulating via policy promulgation and instead ensure regulatory activity in consonance with the rule of law

In conclusion, although our unmanned aircraft system industry is small, it is exciting with a huge potential to benefit mankind. UAS technology and business applications may seem unlimited in the US, but are in reality severely restricted by their need to access airspace and operate with proven practices akin to those of our general aviation counterparts.

Safe access to the airspace will continue to be a challenge of technology, policy and regulation: it will require judicious and reasonable experimentation. U.S. allies and trading partners are offering increasingly attractive development environments and threaten to draw domestic product development and manufacturing off our shores.

We encourage Congress to increase FAA funding applied to the UAS applications and provide public support for this technology. This funding will equip the FAA with the tools and incentive to encourage military and civil experimentation. That will equip us all to wisely invest in our future.

We also ask that this committee support the FAA to provide sound policy that guides safe development and production while the necessary rules and regulations are developed based upon knowledge of distinct UAS classes, current technology, and industry needs.

We will continue to work closely with our industry colleagues, the FAA, and, of course, with our Members of Congress. Mr. Chairman, this concludes my testimony. I would be happy to answer any questions you or members of the Committee may have.