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Testimony of Bryan Farrell to the Subcommittee on Border Security and Enforcement and the Subcommittee on Emergency Management and Technology for joint hearing "Exploring the Use of Unmanned Aircraft Systems Across the DHS Enterprise"
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Good day Chairman Guest, Chairman Strong, Ranking Members Correa and Kennedy and the honorable members of the Subcommittee on Border Security and Enforcement and the Subcommittee on Emergency Management and Technology.

I want to thank you and your staff for welcoming me here today to discuss UAS, or Drone technology, as it pertains to needs for the Department of Homeland Security and more broadly our domestic security and resiliency.

My name is Bryan Farrell, and I am the interim director for the Raspet Flight Research Laboratory at Mississippi State University. I am also the principal investigator for Project JUSTICE or the Joint Unmanned Systems Testing in a Collaborative Environment. Project JUSTICE is a program housed within DHS Science and Technology under the Air, Land, and Ports of Entry portfolio. The primary mission of JUSTICE is to serve the operational entities within DHS through research, development, testing, integration, and evaluation of UAS and related technologies. Mississippi State University is also the chair of the Federal Aviation Administration's Center of Excellence for UAS known as the Alliance for System Safety of UAS through Research Excellence, or ASSURE, where Raspet collaborates with 32 other universities and many UAS test sites to execute the research necessary for integration of UAS into the national airspace system (NAS) as well as develop and deliver first responder UAS training. Raspet has a proud 75-year history in Aerospace research and development with keen focus these last 15 years on the newest frontier of aviation, UAS. Raspet maintains a fleet of UAS and manned aircraft including the largest UAS in academic use, the NASC Teros. Raspet leverages MSU property and external partnerships to operate at a myriad of test locations to include restricted airspace and 75,000 square miles of COA airspace. Through our designations and expertise, we serve industry and government partners to advance UAS technologies for their mission.

In the spirit of today's hearing titled "Exploring the Use of Unmanned Aircraft Systems Across the DHS Enterprise" I hope to be able to provide insights into not only the benefits and use-cases of UAS as a tool, but also an understanding of the considerations and efforts that support the integration of this technology. UAS have become a ubiquitous feature in

daily operations across many industries and certainly within the DHS mission set. These aircraft augment and enhance capabilities and provide perspectives that operational units may not always be able to access. UAS also provide situational awareness paramount to individual safety and security, whether that be in the execution of a high-risk law enforcement activity or in the aftermath of a disaster where life-saving operations are underway.

DHS being a complex organization, components will utilize drones in very different ways. The component's mission will require integration of different UAS platforms, sensors, and operational parameters. Even within a single DHS component such as Customs and Border Protection you could see vastly different UAS types and uses. As an example, a platform capable of the necessary endurance and operational distance required for broad area border surveillance in remote regions would not be a UAS platform beneficial for something like tactical operations where an agent may need to physically carry the UAS and deploy into confined environments. In addition to the UAS selected for the mission, the component may need to establish protocols or authorizations for integration of the aircraft into the national airspace system, understand the types of sensors available for that platform and how the data will be viewed, stored, or distributed as well as make a decision based on the costs associated with procurement and maintenance of the aircraft versus other platforms or processes. All these considerations exist within a backdrop of policy and legal constraints around where the device, or critical components within the device, are manufactured.

These are just some of the variables that underpin the conversation about how UAS get employed within the DHS enterprise. Why UAS get deployed comes down to efficiency and safety. Let us take the two examples above to highlight where efficiencies and safety exist. Traditional broad area surveillance may require expensive manned aircraft operations, a network of sensors that are costly to deploy and potentially come with their own technical risk and challenges, or advanced geospatial solutions that are not always available. A UAS by contrast can integrate into the operational envelope of the agents on the ground at a lower initial and operational cost point while potentially having greater endurance and a higher quality data feed. As an example of enhanced safety let's examine the needs of the tactical community where portability and maneuverability are paramount when executing things like high-risk warrants or attempting to bring peaceful resolution to hostage situations. A small UAS with the ability to be carried and deployed inside a structure to provide situational awareness is crucial for informed decision-making.

During this past hurricane season there were countless examples of UAS utilized for response and recovery efforts. In the Federal Emergency Management Agency's (FEMA) Region 4 where MSU and Raspet are located, we have worked with the Region 4 UAS/Remote Sensing Coordinator and other stakeholders to explore the usage and integration of large UAS for disaster response. Raspet's largest aircraft, the Teros, has the capacity to operate all day with distributed video and imagery to stakeholders. This was the first time that in the immediate aftermath of a large disaster, FEMA and other stakeholders were able to view live aerial imagery and communicate mission assignments with the aircraft in mid-flight. This live broadcast, facilitated by Project JUSTICE, was disseminated to an extensive network of stakeholders. We were notified that the White House was observing the live coverage of the damage, significantly expediting the damage assessment evaluation process. Beyond Raspet operations, first responders and other government agencies leveraged UAS for search and rescue, damage assessment, ingress/egress, critical infrastructure assessments, medical or supply delivery, and multiple other uses. It is in situations such as this that UAS showcase, very publicly, their value to the American people. The disaster response use-cases do not stop at natural disasters either. There are many examples where a first responder may want to leverage a UAS during situations that are man-made. If we look at Chemical, Biological, Radiological, and Nuclear (CBRN) type events, the advantage of a standoff distance as well as complex sensors can minimize risk to the first responder while increasing situational awareness and provide decisions such as triage or evacuation planning. These examples of use-cases and technological innovations highlight only a few of the many uses of UAS within DHS.

Raspet is quite fortunate to engage deeply in all aspects of UAS. The complexities associated with operationalizing the technology from both a regulatory and technical perspective provide us with a good vantage point to understand those pesky "it depends" scenarios that often arise around UAS. I look forward to engaging more deeply about our work at Mississippi State University and providing greater insights into the benefits of UAS for DHS and the needs associated with integration of this technology.

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