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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"
April 1, 2025

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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Exploring the Use of Unmanned Aircraft Systems Across the DHS Enterprise

Statement of

Division Chief Kevin Fetterman

presented to the

SUBCOMMITTEE ON BORDER SECURITY AND ENFORCEMENT

and the

SUBCOMMITTEE ON EMERGENCY MANAGEMENT AND TECHNOLOGY

of the

COMMITTEE ON HOMELAND SECURITY

United States House of Representatives

April 1. 2025

INTERNATIONAL ASSOCIATION OF FIRE CHIEFS
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Good afternoon, Chairman Guest; Ranking Member Correa; Chairman Strong; and Ranking Member Kennedy. My name is Kevin Fetterman. I am the Division 4 Chief with the Orange County Fire Authority (OCFA) in Orange County, California. I oversee the delivery of Fire and Emergency Services in the communities of Tustin, Villa Park, and Yorba Linda. I appreciate the opportunity today to discuss Unmanned Aircraft Systems (UAS) and the role they play across the Department of Homeland Security (DHS) enterprise.

Today I am testifying on behalf of the International Association of Fire Chiefs (IAFC). The IAFC represents the leadership of over 1.1 million firefighters and emergency responders. IAFC members are the world's leading experts in firefighting, emergency medical services, terrorism response, hazardous materials (hazmat) incidents, wildland fire suppression, natural disasters, search and rescue, and public-safety policy. Since 1873, the IAFC has provided a forum for its members to exchange ideas, develop best practices, participate in executive training, and discover diverse products and services available to first responders.

America's fire and emergency service is an all-hazards response force that is locally situated, staffed, trained, and equipped to respond to all types of emergencies. There are approximately 1.1 million men and women in the fire and emergency service – consisting of approximately 300,000 career firefighters and 800,000 volunteer firefighters – serving in over 30,000 fire departments around the nation. They are trained to respond to all hazards ranging from earthquakes, hurricanes, tornadoes, and floods to acts of terrorism, hazardous materials incidents, technical rescues, fires, and medical emergencies. We usually are the first at the scene of a disaster and the last to leave.

I also would like to extend my gratitude to Orange County Fire Chief Brian Fennessy, Deputy Chief TJ McGovern, and Assistant Chief Baryic Hunter for supporting my testimony here today. As you may know, Orange County is the third-most populous county in California and the sixth-most populous in the United States. The population is larger than 21 states, and the county is the second-most-densely populated in California. The OCFA is an all-hazard regional fire service organization. Over 1,500 career firefighters and staff serve 23 cities in the county and all unincorporated areas in a 586-square-mile coverage area. The OCFA protects nearly 2 million residents from its 78 fire stations, covers over 188,817 acres of wildland, and 658,659 dwellings. The OCFA responded to nearly 183,900 incidents in 2024.

Situational Awareness

From the perspective of an incident commander, it is key to establish and maintain situational awareness at the beginning – and through the duration – of an incident. Situational awareness can be defined as the understanding of an environment, its elements, and how it changes over time or in response to other factors. As local fire departments purchase UAS and incorporate them into their operations, the UAS are becoming a significant asset in improving situational awareness on the incident scene.

For example, UAS can provide real-time data of the incident scene by providing high-resolution aerial images and videos to the incident management team to better coordinate operations. Thermal imaging by UAS can determine the spread of a fire and potential hot spots in a wildland

fire. The use of LIDAR (light detection and ranging) capabilities on UAS can be used to assess landslides and mud and debris flows. UAS also can be used in search and rescue incidents to both identify victims and provide overwatch during operations. By using a commercial common platform, incident commanders can analyze the data from UAS and make critical time-sensitive decisions to keep their personnel safe.

The UAS also can take response roles during incidents. They can be used to provide medical resources and food to responders or civilians in the field. They also can be used as Plastic Sphere Dispensers to assist with firing operations during active fire areas. In many cases, UAS can be used in dangerous or technically challenging situations instead of endangering fire service personnel.

Fire Traffic Areas

In order to successfully utilize UAS on incident scenes, they must be integrated with Fire Traffic Areas (FTA). The FTAs were established as interagency airspace management tools for standard communication protocols. In California, it is the interagency standard for aerial firefighting. The FTA can be further defined as airspace with a five nautical mile radius from an incident during suppression operations.

FTAs are a layered approach to aeronautical management. Within FTAs, coordination takes place with helicopters, fixed-wing tanker aircraft, command and control aircraft, intelligence-gathering aircraft, as well as UAS used by public safety. When recreational or non-public safety UAS encroach upon FTAs or areas covered by the Federal Aviation Administration's (FAA) Temporary Flight Restrictions (TFR), they create a significant danger for the fire service aircraft and personnel.

The September 2024 Airport Fire

These lessons and the validation of the benefits of public safety UAS were clearly proven on the Airport Fire in early September of 2024. I was one of the Unified Incident Commanders for the 23,519-acre Airport Fire in Orange County. It burned aggressively between both Orange and Riverside counties, with, unfortunately, more than 160 structures being lost. It also coincided with the Lines Fire in San Bernardino County and the Bridge Fire in Los Angeles County.

At the beginning of this incident, we were able to deploy OFCA's fleet of UAS to establish situational awareness as a first step to the response. During the incident, we were able to use federal, county, and local UAS with infrared sensors to determine the extent of the remaining hotspots. This incident provided a great example of how federal, state, and local interagency collaboration can successfully manage a dangerous incident. The OCFA is continuing to use its UAS fleet in collaboration with local academia to monitor for mud and debris flows in these same fire areas.

2025 Southern California Wildfires and the Importance of UAS

The beginning of 2025 brought some of the most challenging environmental conditions we have ever seen in Southern California. On January 7, the devastating wildfires that we saw in cities

like Malibu, Altadena, Pasadena, and other localities impacted the lives of hundreds of thousands of people. The 2025 Southern California wildfires will have a lasting impact for us all.

For many Californians, the 2025 Southern California wildfires were the first time they recognized that UAS could play a role in wildland fire response. Due to extensive media coverage of this event, citizens watched as UAS assisted first responders in their efforts to manage the incident. The UAS were able to provide up-to-date data and information in real-time, including through thermal imaging. The combination of UAS and common UAS operation platforms provided the capability for first responders to save more lives.

Proper procedures, such as FTAs and FAA TFRs, went into effect as the incident got underway. These safety procedures were put into place to mitigate the risk of recreational UAS interfering with the work of first responders. Unfortunately, many Southern Californians were either not aware of the FTA/TFRs or they simply chose to ignore them.

Recreational UAS Incursions

In the state of California, we say "if you fly, we can't." Two of the pillars that ensure successful UAS operations are communications and coordination. Often the response to a wildland fire can be chaotic. When the non-public safety UAS encroach upon the airspace, it can create dangerous situations and accidents.

The beginning of 2025 brought some of the worst air space deconfliction issues we have seen. There were more than 700 UAS intrusions into the Palisades Fire TFR/FTA by more than 400 different UAS between January 7th and 25th. The highest UAS flight was even noted as high as 20,000 feet.

In one instance, a California resident used his personal UAS to survey the fire damage during an active TFR. He launched the UAS from a parking garage in Santa Monica. After flying the UAS more than a mile away from his location, he lost track of the UAS' position. It crashed into a Canadair CL-145 fixed wing, Canadian Super Scooper, which was engaged in fire suppression operations. It was one of the two Canadian Super Scoopers deployed to the fires.

Solutions to Discourage Recreational UAS Incursions During Emergency Events

This challenge of UAS incursions creates an extreme risk factor in situations such as fires, disasters, or at the border. There are many steps that can be taken to reduce/eliminate UAS incursions from incidents such as wildfires. These following suggestions are ways in which UAS operations can be strengthened for first responders:

- Develop and enact legislation that would thwart pilots of UAS incursions into FTAs/TFRs. Legal protections should be in place to maximize the ability of first responders to save lives

- Formulate and implement clear UAS mitigation procedures. Identifying federal law enforcement personnel and processes for eliminating threats to public safety UAS operations.

- Enhance Remote ID Requirements and reducing Remote ID bypasses.

- Establish formal coordination plans with all relevant local, state, and federal stakeholders.

- Implement effective public awareness campaigns and develop continuing education for the public about the safe operation of UAS.

- Encourage UAS manufacturers to develop solutions that universally support the emergency operations of American first responders.

Conclusion

In closing, I would like to express my sincere appreciation for the opportunity to testify about the use of UAS across the DHS enterprise. A greater number of fire and EMS departments are deploying UAS to assist with their emergency operations. They are finding that UAS can improve situational awareness, deliver resources, and provide specialized capabilities for search and rescue and other specialized missions. However, the public must use UAS in a responsible manner and not be allowed to interfere with emergency operations or endanger the lives of the public or first responders. The IAFC looks forward to working with the committee to incentivize the available use of UAS for local public safety agencies, while also ensuring their safe operation by the public.

WRITTEN STATEMENT FOR THE RECORD

Testimony of **Jerry H. Hendrix,** Executive Director

RSESC Performing Autonomous Aerospace Research

University of Alabama Huntsville

Huntsville, Alabama

Before the Committee on Homeland Security

Subcommittee on Border Security and Enforcement and the Emergency Management and Technology Subcommittee

United States House of Representatives

For the hearing titled "Exploring the Use of Unmanned Aircraft Systems Across the DHS Enterprise"

April 1, 2025

Introduction

Good morning Chairmen Guest and Strong and the Ranking Members and members of the Border Security and Enforcement and Emergency Management and Technology Subcommittees. On behalf of myself, our 130 center employees who are all cleared and US Citizens, and the University of Alabama in Huntsville, I bring you greeting from Alabama. Thank you for inviting me to testify today April 1, 2025 on "Exploring the Use of Unmanned Aircraft Systems Across the DHS Enterprise"

My name is Jerry Hendrix and I serve as the Executive Director of one of our 17 University research centers focused on performing autonomous aerospace research at the University of Alabama in Huntsville (UAH). Our center is part of a tier 1 research university that ranks 6th in federal investment in aeronautical and aerospace engineering research. The center specializes in autonomous research focusing on uncrewed systems and counter-uncrewed systems. Our unmanned aircraft system (UAS) disaster research has been recognized nationally by the Commercial Drone Alliance in testimony to the House Space, Science and Technology Committee in 2023. UAH's research was specified as the one of the top 8 UAS programs to "bring benefit to the American People." That research was focused on "UAS Use in Natural and Human Disasters".

Over the past 20 years, I have been involved in UAS development, operations, training and policy development. I have been involved in over 4,000 separate UAS operations in testing, exercises and disaster responses working across several academic institutions and government agencies. While at Texas A&M University, I served as the Air Wing 1 Commander for the state

of Texas and the Federal Emergency Management Agency (FEMA) Texas Task Force 1 for disaster response while also serving as the Executive Director of the Texas Federal Aviation Administration (FAA)-designated UAS Test Site. While at UAH, I recently completed my term as President of Huntsville's Pathfinder Chapter of the Association of Uncrewed Vehicle Systems International (AUVSI) and led our UAS research at UAH. That research includes UAS use in disasters research and exercises, deployment of UAS to real border operations and real disasters, uncrewed threat analyses, development of uncrewed systems as threat replicas and development of uncrewed systems used by the DOD. Our center has supported the Department of Homeland Security (DHS) in evaluating and using UAS as a viable technology and evaluations of counter insurgency systems. The university holds a Cooperative Research Agreement with NOAA for UAS use in disasters. A majority of our center's staff are currently FEMA trained for disaster response.

An Overview of Research/Operations Results

Applied research focused on the DHS domains has resulted in many observations documented within this testimonial statement. The broad base of our experience researching and operating UAS is with FEMA, DHS Science and Technology, CBP and in some cases supporting critical infrastructure protection. In UAS, our center trains DOJ agents in UAS operations, develops UAS for DOD including threat replicas, performs multiagency threat analyses and supports the FAA and the National Oceanic and Atmospheric Administration (NOAA) research applications. This testimony will focus on these areas based on lessons learned supporting the DHS enterprise.

There are several primary areas of concern with UAS Operations in the DHS Enterprise:

1. Operational discipline across the UAS domain especially when it comes to operational procedures compliance and controlling the operational environment;
2. Overburden of regulations and processes imposed by multiple agencies in training and operations;
3. Protection of our own assets and infrastructure from unwanted and sometime nefarious UAS incursions;
4. The cost of systems at large based on the industrial complex costing models;
5. The challenges of introducing new technology and capabilities that are mission focused, low cost and expendable or maintainable.

Lessons Learned from the Use of UAS Across the DHS Enterprise

For the next couple of minutes, I would like to discuss the lesson learned from over 4000 UAS missions and operations of which a large number relate to the DHS mission set.

Technology and Common Operational Challenges

- Our research found that the current status is referred to by existing UAS operators as the "Wild West". This is because of the presence of untrained UAS operators and non-cooperative UAS operators who appear during operations supporting disasters or missions.

- Operational discipline is extremely important. Consistent operational procedures including checklists, checklists and even more checklists must be used for any operation and response. This will ensure a safe and effective operation. The training and credentialing of operators to a standard set of Minimal Operational Proficiency Standards (MOPS) would be extremely valuable. The following 7 areas of proficiency are highly recommended:
    1. Communications – Understanding terminology and its appropriate use for command operations;
    2. Pilot Dexterity and Skills – Proficiency in the skill, precision and finesse of flying;
    3. Visual Acuity – Competence in using UAS for area scan searches using different techniques;
    4. Airspace Operations – Understanding regulatory frameworks (Federal, State and Local) and limitations;
    5. Understanding Command Operations – How to operate with an Air Boss and FEMA's established Incident Command Structure (ICS);
    6. Performance of Safety and Risk Analysis – Institutionalized safety practices and an identification process for risks and mitigation strategies;
    7. Knowledge of UAS, Sensors and Data Products – Understanding which UAS and sensor sets best fit the mission need and which data products are needed immediately and to be stored for possible future actions.
- UAS development and fielding costs should continue to go down over time as technology evolves unless regulatory restrictions force unnecessary constraints. Autonomy, swarming (multi-aircraft operations), Artificial Intelligence/Machine Learning (AI /ML), Beyond Visual Line of Sight (BVLOS) operations, special purpose solutions and other technology uses offer the ability to respond more rapidly and effectively. Research is needed to incorporate these technologies while regulations must be adjusted to safely allow their introduction. Such technology insertion research could be a part of a National Security and Technology Innovation Program to identify novel UAS technology that is simple, low cost, highly productive to mission needs and rapidly reconfigurable to adjust as the mission adjusts and Made and Manufactured in America! The result would be highly capable, low cost UAS, mission-focused solutions.
- Regulations are most necessary for UAS operations but hinder UAS for both disaster response exercises and DHS training and operational exercises. We need to train and plan as we operate! Federal agencies might violate a law if they do any detection or mitigation against a drone without specific authorization. Those authorizations should be streamlined. I have provided those regulations in my references.
- Overall, the use of mechanisms to control the airspace (such as an Automated Air Boss when DHS is operating) would prohibit unwanted UAS operations for hobbyists or non- cooperative entities.

- Fleet control and an understanding all communications systems and operational frequencies must be known by the incident command structure and Air Boss.
- One of my concerns is the vulnerability of our nation's airports, highways, maritime transportation systems, railways and mass transit, and pipeline systems to an unwanted UAS drone attack. If we recall the total paralysis that the nation experienced after 9-11, it's not hard to imagine the impact of a successful UAS attack on any major airport or transportation system in the country. Consider the possibility of an attack on the Mississippi River systems. Our transportation network could be brought to its knees by a single strike. Therefore, the effectiveness of counter uncrewed and UAS systems is of the extreme importance. Counter UAS systems need to be tested and validated against certified threats by independent agents. The testing methods and standards should be established by the independent agents and paid for by equipment vendors.

First Responder Challenges

- It is critical to offer appropriate assistance in the event as agreed to and tasked by Incident Command. Those tasking may include collecting data for the tax assessor or assisting FEMA evaluators to determine storm surge or even assisting in active Search and Rescue events. The right UAS strike team, technology (UAS and Sensors) are critical to success.
- Exercises and training should include the integration of UAS Strike Teams within the response organizations reporting to Incident Command as documented in the FEMA ICS construct.
- First responders can gain efficiency if they can exercise realistically by employing BVLOS operations, Special Government Interests (SGIs) and Temporary Flight Restrictions (TFRs) just as they would in a real disaster or emergency response. This is not currently allowed.
- Rapid field data assessment is needed in a concise and consistent manner.
- Authority to approve special emergency Certificates of Authorization or Waiver (ECOAs) or UAS Disaster Operations should be allocated to Incident structures using Pre-approved TFR training and processes as opposed to using the FAA's System Operations Support Center (SOSC) which may take days.
- Airspace approvals must be done in a timely manner and approved operations with limited interference must be done more efficiently. Refer to findings based on research, interviews, and exercises in the Alliance for System Safety of UAS through Research Excellence (ASSURE) A52 FAA Final Report, Reference 2.
- Technology like electromagnetic systems must control the response areas keeping unwanted incursions from happening. Operations must gain approved spectrum usage and airspace operational limits. Incidents of UAS operations around manned aviation has been seen in fire and flooding responses.

- Although Standard Operating Procedures (SOPs) are helpful, MOPS would greatly improve response. However, funding is lacking to institutionalize MOPS across all first responders
- Operations in extreme temperatures may impact the reliability of UAS and Sensor operations and certainly impacts operator's ability to respond effectively. Research is needed in this area of disaster-focused UAS.
- Utilization of tools like mobile internet, social media, signal chat and Android Team Awareness Kit (ATAK) are beneficial in performing airspace deconfliction and resource management in disparate response areas like in the North Carolina Mountains.
- The ability to conduct BVLOS operations is a must for first responders. This can be accomplished through the use of a global network, such as an Automated Air Boss, which overlays the disaster area with the locations, altitudes, speed and direction of aircraft and drones.
- Our research led us to build a Beyond Part 107 for First Responders booklet to help first responders interpret the Part 107 law.

Border Challenges

- Border operations would be better executed if allowed to exercise realistically using national airspace training locations like the UAS and CUAS Test Range at Huntsville International Airport (HSV) with appropriate approvals/waivers from the FAA, Federal Communications Commission (FCC), and Department of Justice (DOJ).
- Technological advances like automated Air Boss using AI/ML overlaid onto existing solutions like ATAK would expedite emergency responses and provide airspace control to "non-cooperatives".
- UAH operates an open-source threat analysis for several federal organizations. We produced an open source threat report on the southern and northern borders and augmented it with UAS use on the border. Some of the results are as follows:
    - Fiber Optic controlled UAS sometimes referred to as "tethered drones or Dark Drones" use fiber optic communications. These UAS are not susceptible to jamming with radio signals and can only be destroyed by blinding the fiber or cutting the tether. Some are small in size but have control fibers thousands of kilometers long. The process originated in the Ukraine-Russia war and now is available on line. Terrorist organizations have begun or will begin to use this technology shortly.
    - Another technique now being employed by cartels also came from the Ukraine-Russia war and that is the ability for small agile UAS known as weaponized drones to drop bombs and other incendiary devices.
    - In addition, cartels and drug lords are using their own drones for surveillance of border agent movements and cargo deliveries

Conclusion – Support is needed for more effective and efficient responses

In conclusion, I ask for these committees' assistance in allowing our DHS enterprise including our agents, first responders and supporting partners more leeway and freedom to research, test and conduct of exercises. Changing regulations for this support and allocating resources for more research into supporting technology will allow more effective and efficient responses.

Agents and responders could benefit from a MOPS-like program to establish and standardize consistent safe and effective UAS operations that is focused on mission objectives.

I also want to point out that establishing a National Security and Technology Innovation program that may mimic what has transpired in the DOD would generate technology specified by DHS. This program would be laser focus on applications that are simple, low cost, highly productive to mission needs and rapidly reconfigurable and Made and Manufactured in America!

And lastly, I would like to offer the concept of testing of any counter systems by using certified developed threats that replicate the threats we see today across peer nations and adversaries.

Thank you for your attention and consideration. I look forward to continued discussions and want to assure you that UAH will continue to support research to protect our citizenry, assist our soldiers and agents, get disaster victims on the road to recovery, and save lives.

Please note my references and resources as documented.

References & Resources

1) FAA Memorandum dated February 29, 2024: "Updated FAA Priorities – New Test Plan for A11L.UAS.090, Evaluation of Unmanned Aircraft Systems (UAS) Integration Safety and Security Technologies in the National Airspace System (NAS) Program (A60)", Matt Novak and Tricia Fantinato

2) UAH FAA A52 Final Report, "ASSURE A52: Phase II - Preparation for Disaster Preparedness and Response using UAS in the NAS with Coordination Across First Responders", October 2024. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://assureuas.com/wp-content/uploads/2021/06/A52-Final-Report-V13_FINAL.pdf

3) UAH FAA A62 Final Report, "ASSURE A11L.UAS.68_A62: Disaster Preparedness and Emergency Response Phase III", March 2025 chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.assureuas.org/wp-content/uploads/2022/03/ASSURE_A11L.UAS_.68_A62_Final_Report_v3.pdf

4) NewsNation Report March 21, 2025 "US Unprepared for Dark Drone"

5) "How the U.S. is confronting the threat posed by drones swarming sensitive national security sites", CBS News, "60 Minutes," originally broadcast 3/16/25. https://www.cbsnews.com/news/drone-swarms-national-security-60-minutes-transcript/

6) Detection: The Pen/Trap Statute, 18 U.S.C. §§ 3121-3127, criminalizes the "use" or "installation" of a "device" or "process" that "records," "decodes," or "captures" non-content information like dialing, routing, addressing, or signaling ("DRAS") information. See Interagency (DOJ, DOT, FCC, DHS) "Advisory on the Application of Federal Laws

to the Acquisition and Use of Technology to Detect and Mitigate Unmanned Aircraft Systems" dated August 2020.

7) Detection: The Wiretap Act (also known as Title III), 18 U.S.C. §§ 2510 et seq., prohibits, among other things, "intentionally intercept[ing]" the content of "any . . . electronic communication[,]" unless it is conducted pursuant to a court order or a statutory exception applies. See Interagency (DOJ, DOT, FCC, DHS) "Advisory on the Application of Federal Laws to the Acquisition and Use of Technology to Detect and Mitigate Unmanned Aircraft Systems" dated August 2020.

8) Mitigation: 18 U.S.C. § 31(a)(1), The use of non-kinetic or kinetic solutions may implicate federal criminal prohibitions against, among other things, intercepting and interfering with communications, damaging a "protected computer," and damaging an "aircraft." The term "aircraft" refers to "a civil, military or public contrivance invented, used, or designed to navigate, fly, or travel in the air." See Interagency (DOJ, DOT, FCC, DHS) "Advisory on the Application of Federal Laws to the Acquisition and Use of Technology to Detect and Mitigate Unmanned Aircraft Systems" dated August 2020.

WRITTEN STATEMENT FOR THE RECORD

Testimony of Michael Ledbetter, DBA
Chief Operating Officer
COLSA Corporation

JOINT SUB-COMMITTEE HEARING

Emergency Management and Technology and Border Security and Enforcement

BEFORE THE U.S. HOUSE OF REPRESENTATIVES
HOMELAND SECURITY COMMITTEE

Homeland Security Committee

Tuesday April 1, 2025

Introduction

Good morning, Chairs Strong and Guest, Ranking Members Kennedy and Correa, and members of the subcommittee. I am Mike Ledbetter, Chief Operating Officer for COLSA Corporation, a Huntsville, AL-based engineering services firm and drone manufacturer. On behalf of our sole proprietor and 30-year Army veteran, Mr. Frank Collazo, I am pleased to testify before your subcommittees today to discuss the importance of promoting innovation and security in the unmanned aircraft systems (UAS) industry. COLSA began designing, developing, and manufacturing small UAS in 2019 was awarded an Other Transaction Authority (OTA) through the Vertical Lift Consortium (VLC) of the Aviation & Missile Technology Consortium (AMTC). Since then, we have manufactured and delivered over 1400 UAS to the Army, developed software to swarm large numbers of UAS, and recently developed a line of commercially available UAS.

Lessons from Assessing the Threat

The concept for COLSA's original OTA was developed as lower cost systems with increasing capability began flooding the commercial market. At the same time, the threat from swarms of UAS was becoming better understood. Some of these risks include:

- Saturating air defense systems causing the use of expensive interceptor missiles on inexpensive drones
- Coordinated attacks at multiple sensitive sites simultaneously
- Distributed and redundant operations that can withstand losses of individual drones without disruption of the attack mission
- Electronic warfare capabilities, able to jam communications, disrupt radars, or spoof the location of enemy systems

Following the successful completion of the OTA, COLSA was awarded a contract that transitioned into a Program of Record pathway. Through these contracts, COLSA has designed and developed highly reliable and resilient UAS, and manufactured thousands of units currently deployed worldwide. We also developed software to coordinate UAS swarming. COLSA is now a leading provider of low-cost, non-developmental, deployable Group 1 and Group 2 Swarm UAS. As the Prime contractor, the primary objective of drone program is to provide realistic responses to emerging battlespace threats from UAS by rapidly designing, manufacturing, producing, and delivering representative threat capabilities. These systems support unit training and operations at Combat Training Centers (CTCs) and aid in testing Counter-UAS (C-UAS) technologies at Army Test and Evaluation Command (ATEC) ranges. The program also provides soldiers with a low workload, easy-to-use command and control system, enabling a single operator to control a swarm of up to 100 UAS simultaneously. This capability significantly reduces personnel workload, acts as a force multiplier for UAS operations, and enhances coverage and persistence (time-over-target).

In 2023, COLSA invested in an Internal Research and Development (IR&D) program to leverage our extensive domain expertise and talent pool to develop UAS designs that are better suited for commercial and civil agency applications such as disaster response, search and rescue, law enforcement and security, surveillance, infrastructure inspection, precision agriculture, surveying and mapping, utility and transportation monitoring, insurance assessments, and construction. We are now positioning our systems and services for commercial sales and for contracts with civil agencies in addition to our continued support of Department of Defense (DoD) clients.

In fact, we have designed our commercial systems to address a number of emergency response and border security use cases such as:

- Delivering Medical and Humanitarian Supplies – UAS are able access difficult terrain and dangerous areas with greater speed and less risk to first responders.
- Search and Rescue – Our systems can carry advanced thermal sensors to find missing people, fugitives in hiding, or illegal migrants in low visibility conditions.
- Disaster Assessment – UAS can carry LiDAR sensors to derive high-resolution 3D mapping of the environment following natural disasters.
- Communications Resiliency – UAS can carry equipment to create temporary mobile networks when infrastructure is damaged.
- Ports of Entry Security – Swarms of UAS using AI can patrol and react to threats at land, air and maritime ports.
- Nighttime Operations – UAS can deploy high-output lighting to illuminate nighttime rescue operations from overhead.

Innovation is Outpacing Legislation

One of the challenges the industry faces is balancing the availability of new UAS, components, and features that address genuine needs with the ability to obtain independent third-party compliance assessments. As the committee is aware, federal government agencies are restricted from procuring or operating UAS or UAS components manufactured by covered foreign entities. The dilemma however is that there are very few certifying bodies that can assess UAS and ensure they meet the strict security and compliance standards, including those outlined in the National Defense Authorization Acts (NDAA) and American Security Drone Act (ASDA). Further, the organizations that do exist operate with resources too limited to maintain pace with UAS innovation.

In August of 2024, the Defense Innovation Unit (DIU) held a Blue UAS Refresh Challenge with the purpose of verifying the submitted systems compliance with the supply chain restrictions and cybersecurity best practices. There were 369 submissions to participate in this once-a-year Refresh Challenge but only enough resources to accept 23 platforms and 14 other components (DIU Updates Blue UAS List, Framework With 23 Drones & 14 UAS, February 18, 2025). The Association for Uncrewed Vehicle Systems International (AUVSI) launched the Green UAS program in 2023 to address non-Department of Defense (DoD) needs. However, in two years

there have only been seven platforms cleared for Green UAS certification (IAW the AUVSI website, 24 March 2025). These rates do not match the pace that American drone manufacturers are producing new systems or developing advanced technologies that could support emergency management or border security use cases. The U.S. Customs and Border Protection, law enforcement agencies, and state and federal emergency management agencies are all examples that would benefit from reliable solutions in these areas.

The impact is that federal and state agencies who had previously invested in fleets of UAS manufactured in restricted nations now have very few and increasingly expensive options for bringing their UAS operations into compliance. COLSA and other companies like ours are well-structured to do business with these Government agencies. A company of our size with a successful track record in federal contracts makes the support to these agencies low risk. However, there is a challenging process to be evaluated and certified for sales to either defense or civil agencies.

Evolution of Industry Technology

In the coming years, major areas of technological enhancement will certainly focus on the concept of empowering autonomous mission execution. For UAS to be able to reach their potential to seek injured persons after a natural disaster, for example, technologies that support Beyond Visual Line of Sight (BVLOS) operations must mature. BVLOS requires long-range communication links to maintain control of the UAS over extended distances, potentially using cellular networks, satellite links, or high-frequency radio signals. Reliable data links are necessary for real-time data transmission, including video feeds, sensor data, and control commands to the ground station.

BVLOS relies on autonomous navigation capabilities, allowing drones to follow pre-programmed routes or respond to real-time commands without constant human oversight. To accomplish this, resilient Global Navigation Satellite System (GNSS) or alternative navigation methods, resistant to jamming, are crucial for accurate positioning and tracking.

Finally, Artificial Intelligence and on-board processing must progress so that UAS can detect and avoid obstacles, self-determine route planning, and make mission-driven decisions during BVLOS operations.

Battery technology has come a long way, but this area must also evolve. Current battery technology struggles to provide the necessary power for extended flight times without being excessively heavy. Research into new battery chemistries and materials is crucial to increasing the amount of energy that can be stored in a given volume and weight. Every ounce of weight affects flight time. More sophisticated sensors are likely to increase the overall power draw, too. China still manufactures 70-80% of the world's lithium-ion batteries. Developing faster recharging systems and batteries that maintain optimal performance across a wider temperature range are also important areas of improvement in battery technology.

Conclusion

We thank Congress for securing the UAS technology supply chain through the ASDA and other NDAA provisions. We believe it is an essential step to shore up vulnerabilities from foreign exploitation. We also acknowledge the work of DIU and AUVSI to create certification pathways by vetting UAS platforms and technologies. These actions enable agency confidence when procuring systems and enhance the domestic UAS and component manufacturing base.

To maintain capacity and allow for greater competition in the market, we must open the aperture in approving compliant UAS technologies and platforms for both defense and civil agency use. This could be achieved through streamlined evaluations, additional certifying bodies, and automation.

Finally, we hope you will support research and development in the technology areas that support BVLOS operations, improve domestic production capacity, and improve battery technology.

I greatly appreciate the opportunity to address this committee and would be happy to take questions.