PHMSA_FAA Public Meeting on the Transportation of Hazardous Materials by Unmanned Aircraft Systems-20240822_130149-Meeting Recording

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◉ **Patrick, Eamonn (PHMSA)** started transcription

Andrews, Steven (PHMSA) 0:06

Welcome to the public meeting between the Pipeline and Hazardous Materials Safety Administration and the Federal Aviation Administration on the transportation of hazardous materials by unmanned aircraft systems. I want to let everyone know that we are recording this public meeting for the public record. My name is Steven Andrews, and I'm a Transportation Regulation Specialist at PHMSA's Office of Hazardous Material Safety. I lead PHMSA's efforts in examining the transportation of hazardous materials using highly automated transportation systems. Reading from the Federal Register Notice that we published on August 8, 2024: we stated that Section 933 of the FAA Reauthorization Act of 2024, titled Special Authority for Transport of Hazardous Materials by Commercial Package Delivery Using Unmanned Aircraft Systems, directs the Secretary of Transportation to use a risk-based approach to establish the operational requirements, standards, or special permits necessary to approve or authorize an air carrier to transport hazardous materials by UAS, providing common carriage under 14 CFR part 135 or under successor authorities as applicable based on the weight, amount, and type of hazardous materials being transported and the characteristics of the operations subject to such requirements, standards, or special purposes.

Section 933, subsection E also requires the Secretary to hold a public meeting within 180 days of the enactment of the FAA Reauthorization Act of 2024 to seek input on any changes necessary to implement Section 933. For the record, this public meeting is intended to meet this mandate in Section 933 of the FAA Reauthorization Act of 2024. Today we have members from both the PHMSA Office of Hazardous Material Safety and the FAA Office of Hazardous Material Safety. We have Bill Quade, our Deputy Associate Administrator from the Office of Hazardous Material Safety.

Eamonn Patrick is also here. He's the Acting Chief for the Regulatory Review and Reinvention Branch. Eamonn is helping us to keep this meeting running smoothly on Teams. On the FAA side, we have Atilla Akgun, the Acting Executive Director of the FAA Office of Hazardous Material Safety. In addition to Atilla, we also have Ken Miller, who's the Branch Manager for New Registrants, and Lori Ambers, who is a Hazardous Material Safety Inspector for US programs. For this public meeting, we have some remarks from both Bill and Atilla.

Then we will move to our speaker list for those who indicated they plan to speak at today's meeting. This public meeting is intended to gather stakeholder feedback from those interested in the transportation of hazardous materials by unmanned aircraft systems. The meeting is not intended to discuss any policy or policy decisions today from either PHMSA or FAA. Both PHMSA and FAA are here to listen, but we won't respond to comments or policy questions. I will also add that the meeting notes from this public meeting will be added to the docket using the docket number listed in the Federal Register Notice that announced this public meeting.

In addition, if anyone has any written comments to go along with their spoken testimonies today, please provide them to me no later than next week, and we can add them to the public docket associated with this meeting. Some have already provided those written comments, and we will place them into the docket. I can assure you that all testimony information submitted as a part of this public meeting docket will be carefully reviewed and used to guide PHMSA and FAA in any policy-making documents we issue in the future. With that, I'm going to turn it over to Bill Quade, our Deputy Associate Administrator at the Office of Hazardous Material Safety.

Go ahead, Bill.

Quade, William (PHMSA) 3:36
Thank you, Steven. And welcome to everybody and thank you for taking the time to share your thoughts with us on this important subject. As Steven mentioned, the meeting is being held to comply with Section 933 of the FAA Reauthorization Act, which asked the Secretary to convene a meeting on the movement of hazardous materials using unmanned aircraft systems or UAS. PHMSA is pleased to cohost this

meeting with our partners at the FAA Office of Hazardous Materials Safety to fulfill this statutory requirement.

This meeting aims to bring together key stakeholders to discuss the challenges and opportunities associated with the transportation of hazmat via UAS, ensuring safety and regulatory compliance. Section 933 of the Act specifically tells us to use a risk-based approach to establish the necessary operational requirements, standards, or special permits for approving air carriers to transport UAS. On the other side of things, it asks PHMSA to look at the Hazardous Materials Regulations to see if any adjustments are needed.

We are committed to exploring various ways to meet this mandate and ensuring the transportation of hazmat by UAS is conducted safely. The statutory requirement asks us to consider factors such as the weight of the hazardous material, the amount of the hazardous material, the type of hazardous materials being transported, as well as special characteristics of the operations. By taking these factors into account, PHMSA and FAA will aim to develop appropriate measures that address the unique risks associated with the transportation of hazardous materials by UAS while maintaining flexibility in how these measures are implemented.

PHMSA acknowledges the growth in this area. We've seen a lot of increased movement and interest in drones transporting materials. Our leadership has been out with some of our staff to visit various drone operations that are already moving packages. Maybe not hazmat packages, but packages in commerce to get firsthand knowledge of how those operations are running and what is involved in the transportation of these types of things. It is something that we are looking forward to hearing more from you on. Now, with respect to stakeholder engagement and collaboration, I cannot emphasize enough how important this is. We are committed to fostering open communication and collaboration with everybody—our industry partners, regulatory bodies, safety organizations, and the public. We believe that by working together, we can identify the best practices and develop innovative solutions to address the challenges that face these operations. Again, I cannot emphasize enough how invaluable stakeholder input is. Most of you know, folks that will actually be involved in developing whatever products come out of this meeting.

A lot of us are in Washington, DC. We work for the government, and we are committed to doing the best we can, but we don't have the in-depth knowledge of these types of operations. Even with our visits, you do, so we need you to bring the real-world operational aspects into these discussions so that we can take them into account and produce a result that is best for everybody. I also want to mention that even before Congress enacted Section 933 of the FAA Reauthorization Act, PHMSA had already begun work on an advanced notice of proposed rulemaking looking at hazardous materials transportation using highly automated systems across all modes of transportation. So, whether that be ground, air, or by water, this opportunity meshes very well with that. The input we receive here can also probably work very well or be translated into that rulemaking opportunity. There will also be other opportunities through that rulemaking and perhaps other opportunities for folks to give input. And again, I will encourage you to do so.

So, with that, I will turn the meeting back over to Steven.

Andrews, Steven (PHMSA) 8:09
Thank you, Mr. Quade. We appreciate that. Up next, I'm going to send it to Atilla at FAA. Atilla, if you'd like to make some remarks, please.

Akgun, Atilla (FAA) 8:19
Thank you very much, Mr. Andrews, and thank you, Mr. Quade. Welcome, everyone.

I want to thank all of you, both our industry and government partners, for joining us today. Both the FAA and PHMSA are eager to hear from your industry on your unique perspectives. We have an opportunity here to significantly advance aviation safety by removing the risks associated with the carriage of HAZMAT aboard crewed and passenger-carrying aircraft and placing those materials on UAS and employing them for hazardous materials deliveries. As Mr. Quade noted, we've been able to observe several UAS package delivery operations, and I understand and appreciate the tremendous potential of this technology. Safety, however, is paramount, and we must proceed judiciously to ensure the continued safety of people and property, both in the airspace and on the ground, and consider the existing structure of aerospace and, of course, the safety of the public. Basically, we've got to get it right

the first time. We want these technologies to come in and just be embraced for the wonderful potential that they have.

That section 933 implementation is one of many ongoing initiatives that the FAA is working on now to progress in this space. In section 933, Congress allowed the Secretary to require UAS operators to submit safety risk assessments acceptable to the FAA Administrator, and we believe SMS, or safety management systems, is really an essential element of expanding UAS operations. The FAA also has Part 108 we're making progress on, and because it's an open rule, I can't speak to it much, but I can tell you that we're working to normalize and integrate certain low-altitude UAS operations into the national airspace system. Once finalized, we expect Part 108 to dramatically expedite the introduction of beyond visual line of sight, or BVLOS, UAS operations into the NAS.

So, thank you again for being here on behalf of both the FAA and PHMSA. We look forward to hearing your thoughts and perspective, and I will now pass it back to Mr. Andrews.

Andrews, Steven (PHMSA) 10:27
Thank you, Atilla. That was great. Those were the speakers we had from our side today. Next, we have our speakers from the stakeholders who are interested in speaking. We have set the list in order on the agenda, and first up, we have the Commercial Drone Alliance, and I believe Emily Kimball will be speaking for them.

Patrick, Eamonn (PHMSA) 10:48
Yes, and Steven, if I could just do a brief announcement for all of our presenters.

Andrews, Steven (PHMSA) 10:50
Sure.

Patrick, Eamonn (PHMSA) 10:52
So, you know, we have our list of presenters. First, we'll go with the Commercial Drone Alliance, then the Airline Pilots Association, ZipLine, UPS, the American Chemistry Council, the American Fuel and Petrochemical Manufacturers, the DGA Group, and the Small UAV Coalition. As you're coming up in the presentation lineup,

we're going to allow you to unmute yourselves. I believe our first presenter, the Commercial Drone Alliance, has some visuals that I'll also share with everyone. I don't believe anybody else has visuals. If you were expecting me to share visuals and I don't have them, please send me an email right away, and we'll try to get that taken care of. I'll also be monitoring the questions and moderating the question-and-answer functionality within the meeting. If you have a question, you'd like to ask a presenter or one of us, put it in the Q&A. I'll review it, and if it's appropriate for the general audience, I'll publish it and we'll address it. So, I really appreciate your time, and we'll get it rolling here.

Andrews, Steven (PHMSA) 11:52
Thanks, Eamonn, appreciate that. Emily, if you're ready.
please begin.

Kimball, Emily E. 12:09
There we go. I was waiting for my mic to be enabled, so thank you, Eamonn.

OK. Good afternoon, everyone. It's great to see so many engaged stakeholders who have joined this call, and I'm really looking forward to this meeting today. I see we've got 97, which I think is pretty good for the 125 that you all were expecting. So, my name is Emily Kimball. I'm the Deputy Director of the Commercial Drone Alliance. I'm also a partner at the global law firm Hogan Lovells.

First, I would like to thank PHMSA and FAA for organizing this public meeting to move the dialogue on the transport of HAZMAT by commercial package delivery UAS forward. For those of you who are not familiar with the Commercial Drone Alliance, and Eamonn, if you could go to the next slide, that would be great. We are an independent nonprofit organization led by leaders in the commercial drone industry, many of whom are package delivery companies. We work with all levels of government, including the FAA, PHMSA, DOT, the White House, and the broader executive branch, as well as Congress, to collaborate on policies for industry growth.

CDA is focused on the safe, secure, and responsible expansion of commercial drone operations to achieve economic benefits and humanitarian gains. We bring together commercial drone end users, manufacturers, service providers, and vertical markets,

including package delivery, oil and gas, precision agriculture, construction, security infrastructure, and many more.

Today, I'd like to briefly discuss the benefits of commercial drones and some of the key challenges with the current HAZMAT regulatory framework. We've also put together five principles that we urge PHMSA and the FAA to consider as they move forward. So, the benefits of commercial UAVs are substantial, and there are many that we could discuss today, from enhancing worker and public safety to fighting wildfires, promoting infrastructure resilience, expanding equitable and efficient access to critical supplies, ensuring America's leadership in global aviation, supporting the US economy, and creating jobs.

And then, of course, relevant for today's discussion, facilitating commercial deliveries. These use cases are promising, but the vast benefits of UAS have not yet been truly realized here in the United States. This is because undue regulatory burdens continue to prevent scalable UAS operations and limit the integration of UAS into the national airspace system. Despite the best efforts of relevant offices at the FAA and across the executive branch, the UAS industry continues to be held back by the application of incongruous approaches designed for crewed aircraft, including within the regulatory framework for the transport of HAZMAT.

One of the key barriers has been the application of regulations designed for large, crewed aircraft carrying significant quantities of HAZMAT to commercial drones transporting limited amounts of consumer goods with a low HAZMAT risk. The CDA appreciates PHMSA and FAA's efforts to date to enable the carriage of HAZMAT by drones, but the one-size-fits-all approach is not effective for scaled operations. Modernization of the regulatory framework is necessary to keep up with innovation. The current framework is overly burdensome and does not account for the lower risk profile of commercial drones carrying limited quantities of HAZMAT compared to traditional occupied and larger aircraft operations.
Fundamentally, there's no differentiation between the vastly different risk profiles of these different operations. Commercial package delivery UAS are generally delivering consumer and medical supplies. Some of these consumer goods are technically HAZMAT, but in small quantities, they have low risk profiles. We're talking about everyday items like nail polish, hand sanitizer, and small consumer electronics

containing lithium-ion batteries. These are categorized as dangerous goods, but they represent extraordinarily low risk when transported in small quantities by unoccupied aircraft and in their normal commercial packaging.

We need PHMSA and the FAA to take a tailored, risk-based approach that accounts for the vast differences between the types and quantities of HAZMAT being transported by package delivery drones carrying these small quantities and the larger uncrewed aircraft, as well as traditional crewed aircraft for which the current regulatory framework was developed. For example, one of the illogical outcomes that has resulted from the lack of regulatory progress is that a drone may carry a battery-powered camera if it's used in flight without any additional regulatory burden. But that same drone cannot transport that same camera in its original packaging.

We need PHMSA and FAA to establish a streamlined HAZMAT approval process specifically for drone operations, with reduced requirements where appropriate, given the lower risks involved. To that end, we've identified five principles for your consideration as you advance the development of policy for UAS delivery of packages containing HAZMAT.

First is to utilize a risk-based approach, which we just heard Bill talk about. This approach should account for the weight, amount, packaging, and type of HAZMAT being transported, as well as the characteristics of the operations, including handling and training procedures, and the development of a local response plan as necessary. This will ensure recognition of the unique, typically lower risk profile associated with UAS delivery operations relative to large crewed and uncrewed aircraft. Commercial package delivery UAS provide inherent risk reductions in HAZMAT transportation because there are no human pilots or passengers on board with a risk of exposure to the HAZMAT during an incident or accident.

When thinking about risk profiles, we know that when drones are not used, each of these items—nail polish, hand sanitizer, iPhones—will still be moved by personal transport, entering the ground transportation systems in various quantities, combinations, and packaging.

Second, we urge the agencies to coordinate with the FAA's ongoing Part 108 effort,

which I appreciate that Attila mentioned in his opening remarks as well. Broadly enabling U.S. flights beyond visual line of sight in a safe and secure manner is critical to unlocking the aggregate safety, security, equity, and sustainability benefits of using drones for many commercial and public safety tasks. The CDA strongly supports the FAA's efforts to meet the congressional mandate to publish a proposed rule to establish a performance-based regulatory pathway for UAS to operate BVLOS. PHMSA and the FAA should ensure that the policies developed for commercial drone delivery of packages containing HAZMAT align with FAA Part 108 rulemaking, which will establish the long-anticipated performance-based, risk-based normalization of beyond visual line of sight activity.

In addition, much as the FAA has used the summary grant process for the approval of certain operations to inform its Part 108 rulemaking, PHMSA and the FAA should consider providing special permits where appropriate or simplified, self-contained policy to allow for HAZMAT carriage in a way that can provide real-world experience and data as the rulemaking process unfolds.

The third principle is that PHMSA and FAA should consider developing a tailored exception for the delivery of HAZMAT items via commercial drone operations to ensure an equivalent level of safety without inhibiting innovation. There's precedent for this already in PHMSA's rules, for example, with respect to reverse logistics operations where PHMSA has developed a streamlined set of HAZMAT requirements that account for the particular risk profile of the transport operations. In the context of commercial drone delivery, specific provisions to consider as candidates for exceptions include, but are not limited to, requirements related to shipping papers, HAZMAT training, and inspection of damaged shipments after unloading.

Similarly, PHMSA and the FAA should evaluate the relevance and applicability of traditional HAZMAT rules to commercial drone delivery operators, including types of drones used, CONOPS, and delivery mechanisms which, as both PHMSA and FAA staff have seen, can vary quite significantly across the industry. A tailored exception for commercial UAS package delivery operations would offer opportunities for reduced compliance costs without any decrease in safety.

The fourth principle that we have here is that we support streamlined testing and clear identification of data needs. PHMSA and the FAA should evaluate what data gaps exist, if any, and afford industry the opportunity to share both quantitative and qualitative data that may address any perceived gaps. We encourage the agencies to articulate the specific data and testing needs necessary for approval and allow drone operators to provide data demonstrating the safety of their operations and packaging methods, rather than imposing prescriptive testing requirements that may ultimately be ill-suited for drone deliveries. Given that packages are often sold within their own layer of overpack that already meets separate HAZMAT requirements, the CDA believes there's an opportunity for drone carriers to leverage existing overpacks provided with products. PHMSA and the FAA should work with industry to streamline testing to identify the highest risk HAZMAT relative to a carrier's operations in order to avoid the testing of every potential product or every potential class of HAZMAT that might be carried by commercial package delivery UAS.

Finally, we urge PHMSA and FAA to establish and publish clear timelines for conducting reviews and evaluations necessary to authorize UAS commercial delivery operations involving HAZMAT. Providing clear timelines and standardizing the "will carry" technical review process will facilitate timely review and, where appropriate, approval of these operations and eliminate any of the pain points experienced to date. We also suggest an iterative approach where methods may be trialed and expanded upon that could start within three months, while more broad policy is developed.

Thank you very much for the opportunity to provide these remarks. We look forward to the discussion this afternoon.

Andrews, Steven (PHMSA) 22:54
Thank you, Emily. I appreciate the comments from the Commercial Drone Alliance. Up next on our agenda, we have, I believe, Chris Sidor from the Airline Pilots Association. Please let me know if Chris is unmuted.

Sidor, Chris, ADO Group Chair 23:10
There we go. I'm unmuted now.

Andrews, Steven (PHMSA) 23:12
Good. Go for it.

Sidor, Chris, ADO Group Chair 23:12
Good afternoon, and thank you for your time. My name is Chris Sidor, and I serve as the chair of the Aircraft Design Operations Group with the Airline Pilots Association. This association represents over 74,000 pilots across more than 40 airlines in the United States and Canada, advocating that 'safety is the schedule.' As a safety-focused organization, the Airline Pilots Association has engaged with Unmanned Aircraft Systems (UAS) and the secure transport of dangerous goods (DG) via UAS for several years. We were instrumental in establishing the Drone Advisory Committee and the Advanced Aviation Advisory Committee. Additionally, we hold positions in various other organizations, including the SEG-37 Lithium Battery Packaging, the ICAO Dangerous Goods Panel, and the DOT Lithium Battery Air Safety Advisory Committee.

The Airline Pilots Association believes it has four different stakes that should be taken into account as these regulations are developed. These include the stipulation that current, or Part 135, UAS operations should comply with existing regulations until additional regulations can be established and implemented. We also believe the FAA should convene an aviation rulemaking committee to address the new risk profile of transporting hazardous materials by UAS. Our third point is that we believe PHMSA, and the FAA should require the development of safety management systems for UAS. Our fourth point is that we believe PHMSA, and the FAA should establish a safety risk management panel to address the new risk profile for hazardous materials transported by UAS. As we transition from crewed to uncrewed aircraft, we are removing one of the largest safety components and sensors on board the aircraft, which is the pilot.

The pilot is unable to sense, see, smell, and hear additional risks that could be presented by UAS or by DG on board UAS and uncrewed aircraft. We are concerned with the removal of the pilot from being on board the aircraft to a remote position where they are no longer able to sense the additional danger or risk that could arise from a DG event on board an aircraft. ALPA is also concerned with the continued use of special permits, including waivers and exemptions, instead of permanent

rulemaking for UAS and the carriage of DG on board the UAS. UAS are new and novel aircraft, and as previously stated, the pilot is relocated from being on board the airplane to a ground station, thus removing that primary safety sensor from the aircraft. Furthermore, these aircraft feature new and novel technologies, and we have a limited understanding and experience with their capabilities and the risks they introduce into the national airspace system. This represents an additional risk profile that must be considered as these regulations are developed and as we progress with this issue.

The Airline Pilots Association was involved with Part 108 Beyond Visual Line of Sight ARC back on March 20, 2022, and we dissented from the final report from the ARC. Based on these four different considerations that I have previously brought up; I want to underline the important fact that removing the pilot from being on board introduces a new level of risk that must be mitigated and taken into consideration as these regulations are developed and move forward through the rulemaking process. We do support rulemaking for the carriage of DG on board UAS, but we believe there should be a measured approach. For example, the crawl, walk, run approach ensures that as we introduce DG carried aboard UAS, we are appropriately analyzing and mitigating the additional risks from this new method of transportation. Several new variables are in play. By introducing this new way of carriage of DG aboard UAS, we believe that safety needs to be addressed as it is paramount in everything we do. Taking the measured crawl, walk, run approach assures that safety is considered the utmost priority as we move forward with these regulations. Thank you.

Andrews, Steven (PHMSA) 28:21
Thank you, Chris, for your comments. Appreciate it. Next on the agenda, we have Zipline, and representing Zipline should be Mr. Ben Berlin.

Patrick, Eamonn (PHMSA) 28:45
Yeah, took me an extra click there, but Ben, you should be able to unmute yourself now.

Benjamin Berlin (Zipline) 28:52
Can you all hear me now?

Andrews, Steven (PHMSA) 28:53
Yes, Sir.

Patrick, Eamonn (PHMSA) 28:54
Yes.

Benjamin Berlin (Zipline) 28:55
Alright, wonderful. Thanks, Steven.

So, my name is Benjamin Berlin, and I serve as Aviation Regulatory Counsel at Zipline. I'd like to thank PHMSA and FAA for the opportunity to provide comments at today's public meeting and for the speed with which you all have moved to implement Section 933 of the FAA Reauthorization Act. First, some background on Zipline. Zipline designs, manufactures, and operates UAS that deliver medical supplies, healthcare goods, and other consumer products. Zipline is transforming the way goods move so that every human on Earth has access to exactly what they need when they need it, no matter where they live. We started by delivering blood to health and hospital systems in Rwanda in 2016 and have grown to operate in seven countries across three continents, including the United States. Zipline has flown more than 118,000,000 autonomous miles and has made more than 1,000,000 deliveries to customers to date. On average, someone receives a Zipline delivery every 70 seconds, and on a typical day, Zipline flies more than three times the circumference of the Earth.

Zipline has two delivery platforms: Platform One, our long-range system, which is currently in use in commercial operations, and Platform Two, our home delivery system, which Zipline intends to launch in commercial operations this year. Both platforms are highly automated electric UAS designed for commercial package delivery. Platform 2 features significant innovations in aircraft propeller design and is intended to provide safe, quiet, fast, and precise delivery directly to customers' homes. When the Platform 2 uncrewed aircraft arrives at its delivery destination, it hovers safely and quietly above, while lowering the fully autonomous delivery Droid down the tether. The Droid steers itself to the correct delivery location and gently drops off its package to areas as small as a patio table or the front steps of a home.

The addition of Platform 2 to Zipline services will enable Zipline to serve more customers and communities with reliable access to safe, sustainable instant delivery services. Unlocking the true societal benefit of UAS delivery will require updating the hazardous materials regulations (HMR for short) based on these three principles.

First, updates to the HMR should take a risk-based approach that accounts for the low risk of transporting hazmat via UAS. And let's remember, we're not talking about carrying nuclear waste. We're talking about consumer goods and medical products. Carrying small quantities of hazmat in unpressurized environments over relatively short distances is vastly different from transporting pallets of hazmat in traditional transport category aircraft.

Additionally, the updated rules should account for the fact that UAS delivery mitigates the risks of traditional final mile delivery. Each package containing hazmat delivered by UAS is one less package on a delivery truck or driven home by a consumer. Second, while PHMSA and FAA navigate the rulemaking process, they should create exceptions for UAS delivery and extend existing exceptions granted to other modes of transportation. An example of the latter would be extending to UAS the exception provided to the carriage of patient samples via motor vehicle by private or contract carriers found in 49 CFR 173.134. Third, PHMSA and FAA should leverage existing means of collecting data from industry that protects the confidentiality of a company's input to obtain the information needed to update the HMR.

These efforts should happen well in advance of issuing an NPRM to allow industry stakeholders the time necessary to plan and collect the information. I'm confident that others participating in this meeting will provide additional recommendations on how PHMSA and FAA can carry out the congressional intent behind Section 933. As a UAS operator, Zipline would like to focus on the public benefits that UAS delivery of materials containing hazmat can bring to the American public.

With more than six years of global operating experience, Zipline sees every day the impact that UAS operations at scale can have, including providing communities with safe, fast, and reliable access to goods, including life-saving medicines, eliminating unnecessary waste, and improving the efficiency and resiliency of supply chains.

Several recent studies have highlighted the health impact of Zipline's service. The first, published in The Lancet, showed that Zipline's service resulted in a 67% reduction of blood wastage across Rwanda, contributing to greater access to the life-saving product. The second, which was funded by the Bill and Melinda Gates Foundation, found that Zipline is increasing health access and equity across the health system in several ways, including that vaccine stockouts are 60% shorter at Zipline-served facilities than at non-Zipline-served facilities. And the third study, published by researchers at Wharton, found evidence of improved blood inventory management and improved health outcomes as a result of drug delivery provided by Zipline. Specifically, the report found a reduction in Rwanda of in-hospital maternal deaths due to postpartum hemorrhage of 51% as a result of Zipline's work.

The issues Zipline is addressing in its international operations are not unique to those countries. That's why we're excited to partner with American healthcare systems to bring the same service to communities here in the US. In the US, Zipline has partnered with leading healthcare providers like Michigan Medicine, the Mayo Clinic, OhioHealth, Memorial Hermann, and Cleveland Clinic to enhance patient care and outcomes, reduce logistics costs and delays, and achieve sustainability goals. A prime use case of Zipline UAS is the transportation of labs and diagnostics. By partnering with Zipline, OhioHealth will move lab samples and supplies between OhioHealth facilities, allowing them to reduce diagnostic turnaround times. This will give physicians the information they need to make informed decisions faster. The ability to rapidly deliver medical supplies, including life-saving medications, directly to healthcare facilities can significantly enhance patient care. In emergency situations where every minute counts, UAS can bypass traffic delays and other logistical challenges, ensuring that vital healthcare goods reach their destination in the shortest possible time. This can be particularly beneficial in underserved areas, whether rural, urban, or suburban, where access to medical resources is limited. UAS technology can bridge the gap in healthcare access, especially for those with mobility challenges.

By enabling the prompt delivery of prescriptions and medical supplies, UAS can help ensure that patients in these areas receive the care they need without delay. This is especially critical for patients with chronic conditions who rely on regular medication deliveries to manage their health. UAS have the potential to reduce the carbon

footprint associated with the transportation of healthcare goods. By replacing ground vehicles with UAS for certain deliveries, we can decrease emissions and contribute to a more sustainable healthcare system.

Moreover, the use of UAS can reduce the risks associated with the transportation of hazardous materials by minimizing the need for human intervention and potentially dangerous situations. In conclusion, Zipline strongly supports the implementation of Section 933 and the development of a risk-based regulatory framework for the transportation of hazmat by UAS. We believe that the public benefits of using UAS delivery, especially for healthcare, are significant and will meaningfully contribute to improved patient outcomes, increased access to care, enhanced operational efficiency, and greater environmental sustainability.

Most importantly, we can achieve these benefits without any adverse impact on safety. We urge the Secretary, PHMSA, and FAA to continue moving swiftly to implement Section 933 and to consider the benefits of UAS delivery while developing the operational requirements, standards, and special permits necessary to approve the carriage of hazmat by UAS. Thank you for your time.

Andrews, Steven (PHMSA) 37:25
Thanks, Ben. Thank you for those comments from Zipline. We had UPS next, but I believe they actually do not have any speaking notes for this meeting. So, we're going to move to the next person on the agenda from the American Chemistry Council.
We have Kat Khosrowyar.

Khosrowyar, Kat 37:43
Hi, good afternoon, everyone. I'm Kat Khosrowyar. I'm the Associate Director of Regulatory and Scientific Affairs for the American Chemistry Council, or just ACC. Thank you for the opportunity to address this public meeting. ACC represents the leading companies in the business of chemistry, which are integral to the nation's economy and security. As we discussed, the regulatory framework surrounding the transportation of hazardous materials by Unmanned Aircraft Systems (or from here on out, I'll just say UAS) underscores the critical need to ensure the safety and security of our nation's infrastructure. Our facilities, which include chemical plants, oil

refineries, and energy production sites, are not only vital to the nation's economic well-being but also to its security.

The potential risks associated with unauthorized drone activity over these sites are quite significant. Drones carrying hazardous materials, or even those with the capability to surveil or disrupt operations, pose a serious threat to both public safety and national security. These risks include potential accidents, security breaches, and even malicious activities that could have devastating consequences. As we gather to discuss the implementation of Section 933 of the FAA Reauthorization Act of 2024, it is important to emphasize the balance we must strike between fostering innovation and ensuring safety.

This act, signed into law by President Biden on May 16th, 2024, underscores this balance by directing the Secretary, the Secretary of Transportation, to develop a risk-based approach for authorizing the transport of hazardous materials by UAS. Section 933 provides a critical framework for ensuring the hazardous materials transported by UAS under 14 CFR part 135 or any successor regulations are managed with the highest safety standards. This section calls for a risk-based approach to establish operational requirements, standards, or special permits which are tailored to the unique challenges posed by the transportation of hazardous materials by UAS.

Section 2209 of the same legislative package offers a mechanism for addressing these concerns by allowing DOT to establish procedures for applicants to petition the FAA to prohibit or restrict drone operations near fixed site facilities. These facilities are explicitly defined to include critical infrastructure such as energy production, transmission, and distribution facilities, as well as chemical plants and refineries.

The designation of these sites as fixed site facilities under Section 2209 is a crucial step in protecting them from unauthorized drone activity. By restricting drone operation near these sensitive areas, we can mitigate the risk of potential accidents, security breaches, or malicious activities. However, to effectively implement these restrictions, it is imperative that the FAA work closely with industry stakeholders, including those represented by the American Chemistry Council, to ensure that the regulatory framework is robust and enforceable.

We must ensure that the procedures for obtaining these fixed site designations are clear, efficient, and responsive to the evolving threats posed by unauthorized drone activity. In carrying out its mandate under Section 933, the Secretary must consider the safety of the public and users of the national airspace system. This includes taking into account the unique risks posed by the transportation of hazardous materials by UAS, such as differing weights, quantities, and packing group classifications of these materials.

Moreover, mitigations must be in place to address the specific risks associated with the hazardous materials being transported, as well as the characteristics of the operations involved. Given the complexities and potential risks, it is crucial that any regulations or standards developed under Section 933 also align with the protections afforded under Section 2209. This will ensure a cohesive and comprehensive approach to safeguarding our critical infrastructure from the threats posed by unauthorized drone activity.

The American Chemistry Council strongly supports the FAA's efforts to involve stakeholders in this process. We believe that by working together, we can establish robust standards that will protect our facilities, our infrastructure, and the public from the potential risks associated with UAS operations involving hazardous materials.

In conclusion, while the FAA Reauthorization Act of 2024 sets the stage for significant advancements in UAS technology, it is critical that we do not lose sight of the need for strong safety measures and protections for our nation's most critical infrastructure. The American Chemistry Council is committed to collaborating with the FAA, PHMSA, and all other stakeholders to ensure that the final regulations reflect these priorities.

Thank you for your time, and I look forward to continued collaboration on this important issue.

Andrews, Steven (PHMSA) 43:04
Thank you, Kat, for your remarks. I really appreciate that. Next up on the agenda, from the American Fuel and Petrochemical Manufacturers, we have Matt Fuller.

Matt Fuller 43:16
Yeah, can you hear me? Hello.

Andrews, Steven (PHMSA) 43:17
Yep, we can hear you, Matt, go ahead.

Patrick, Eamonn (PHMSA) 43:18
Yes.

Matt Fuller 43:19
Alright, thank you. Good afternoon. I'm Matt Fuller, regulatory affairs policy analyst at American Fuel and Petrochemical Manufacturers Association or AFPM. AFPM represents refining and petrochemical industries across the US. AFPM welcomes regulations that support the growth and advancement of new technologies in a manner that enhances safety and ensures the security of our critical infrastructure. To start, we fully support the risk-based approach and drafting this rule. However, any regulation authorizing the use of UAS to transport hazardous materials must include appropriate safety risk assessments by operators flying over critical infrastructure and precede a rulemaking implementing restrictions to prohibit flights over eligible critical infrastructure, such as refineries and petrochemical facilities.

API members were early adopters of US using this technology at their facilities to conduct security surveillance, equipment safety checks, monitoring emissions, and responding to emergencies. Our Part 107 license pilots are trained so that our designated flight paths do not interfere with the complex functions that typically go on into refinery, such as equipment blowdowns and startups. Overflight of our facilities by third parties' risks instances of malfunction or negligence causing our operations to be shut down, a potent with potential catastrophic harm to our facilities and personnel. As personal commercial use of drones in the US expands at a rapid rate, critical infrastructure operators are experiencing an increase in both in nefarious and irresponsible drone operation in around their airspace. The ability of third parties to use UAS to gather data or disrupt facility operations creates major security risks and the potential to damage facilities and our employees and surrounding communities. If allowed to carry unknown hazardous Materials these drones will pose even greater threats and potential damage.

All it takes is one look at the chaos in Ukraine and Russia to understand the potential harm rogue or weaponized drones can do to our critical infrastructure. As recently as June, four major Russian refineries were attacked and coordinated drone strikes, causing casualties and extended shutdowns. So, as you draft special authority for transport of hazardous materials by commercial package delivery by UAS, AFPM urges you to provide regulatory protection for critical infrastructure that to-date have not been sufficiently incorporated into UAS regulations. Section 2209 of the FAA Extended - Extension Safety and Security Act, which provides authority to restrict airspace for qualifying fixed site and critical infrastructure, has been pending since the initial enactment in 2016. A legislative provision was included in the FAA Reauthorization Act of 2024 requiring a rule implementing section 2209 be noticed within 90 days of enactment. However, the 90-day deadline to draft the proposal was missed and the legislative requirement to regulate use of the UAS over critical infrastructure continues to languish. AFPM supports additional authorities for commercial UAS flights, but PHMSA and FAA must adopt regulations that safeguard our complex, critical facilities by restricting air flights over designated facilities and requiring the safety risk assessments addressed in subsection C of Section 993 and FAA reauthorization, that's part of their operator certification process for operating UAS with HAZMAT over non-restrict - restricted critical infrastructure. If this risk assessment is properly, appropriately implemented, drone operators can properly address flight risks and minimize the threats we previously identified. In conclusion, as you draft the rule for hazards material carriage AFPM asks for:

1) A section 2209 rulemaking be published before enactment of a Hazardous Materials UAS Carriage Regulation and 2) mandated safety risk assessments for operators that plan to carry hazardous materials over nonrestricted critical infrastructure. AFPM appreciates this opportunity to speak, and we hope to maintain a close working relationship with all agencies regarding UAS. I'm happy to answer any questions.

Andrews, Steven (PHMSA) 47:01
Thank you, Matt for your comments. We're going to move on to the last person on our official agenda here from the DGA group representing the small UAV coalition we have, Gregory Walden.

Gregory Walden 47:16

I thank you and glad to make this presentation. Batting cleanup I assume. I want to first thank PHMSA and FAA for holding this meeting. Yes, it is required by statute, but you met that deadline so great for that, and also want to agree with the presentation Emily made on behalf of the Commercial Drone Alliance and Ben Berlin's very strong testimony on behalf of ZIP line, Zipline, a member of the Small Drone Coalition. We've long advocated for regulatory framework to allow drones to carry hazmat for the benefit of government, businesses, and individuals. Unfortunately, when part 107 was issued in 2016, there was a categorical prohibition, not even a waiver could be granted to conduct a transport of hazmat for hire. Well, now we have some part 135 operations going, but the HAZMAT transport has also been - not that smooth. There's a lot of burdens that have been placed on part 135 operators if they want to carry hazmat because we do not yet have that risk-based principle and approach for drone operations of HAZMAT, just agreeing with the testimony that it's going to be risk based.

Everyone agrees it should be risk based, but we let's look and the fact that PHMSA has for decades recognized the lower risk by any mode of transportation of limited quantities and consumer commodities. When you couple that lower risk with the lower risk posed by drone - small drones - but not necessarily small, by the part 107 definition - but not transport category aircraft, it's very clear that those - hazmat can be safely operated by a drone with just a policy change, or perhaps a special permit process that the Congress is directed PHMSA to consider. Uh, as a short-term stopgap before there is, the rulemaking. We all know rulemaking takes two to three years and I think that we don't need an aviation rulemaking committee, an ARC, for this. I think there's enough data that can be collected in a short period of time through special permits, waivers, and exemptions to authorize to inform rulemaking. That could be done fairly quickly. This is not an argument that any hazmat should be transported by drone. It is an argument that the lower risk hazmat that identified - Emily identified at the start, but also reflected in that PHMSA's treatment of consumer commodities and limited quantities should be applied. Um, just want to say that the that the Section 933 talks about risks and we offer a few points here. Drone delivery operators already comply with package size and weight limitations, and so they'll consider any increase in weight due to packaging requirements if the

packaging requirements are imposed for the transport of these commodities Hazardous materials that do constitute a limited quantity and consumer commodity involves so much less risk. They're well suited to be carried by drones right now, as Section 933 suggests. As for risk mitigation, drone air carriers already are subject to the HAZMAT training requirements in 14 CFR 135.503 through 507 And any regulation of the drone transport of HAZMAT should be properly scoped to this lower level of risk that the transport of hazmat poses considering the amounts and weight of drones. Uh. As for altitude, commercial drones are currently limited, generally speaking, to operations under 400 feet AGL. The lower altitude of drone delivery HAZMAT reduces the risk of collision with legacy aircraft as well as the extent of damage in the event of a collision with a structure. Other types of drone operations may warrant additional or different requirements based on the considerations listed in Section 933. I would say that that of the use of special permits and or waivers or exemptions.

Those short term nonregulatory options is what PHMSA and the FAA should embark on. I think that's what Congress is calling for in section 933 and I think that is what would provide the data to support a rulemaking that starts at some later point. If you look at the record, the safety record of drones operating under waivers and exemptions since 2015 or 16, it's exemplary by any, by any count, and we would believe that we believe that drones carrying limited quantities and consumer commodities of HAZMAT through a very tailored special permit process will continue to be safe and secure and lead the way to a rulemaking where, uh, hazmat transport can be done pursuant to certain regulatory requirements as an everyday matter. And I thank you for the opportunity to speak.

Andrews, Steven (PHMSA) 53:10
Thank you, Gregory. We appreciate that. So those were all the individuals that we had that had signed up to officially speak. We have some more time, but if anybody else would like to speak and provide some commentary, raise your hand and Eamonn can let us know who was first or who would like to speak. Anybody else? David Weilert. Eamonn, can you get him in?

Patrick, Eamonn (PHMSA) 53:47
Yes. David, you should be able to unmute.

Andrews, Steven (PHMSA) 54:03
Yeah. He may still be muted.

Patrick, Eamonn (PHMSA) 54:16
Yeah, David, you have the ability to unmute, but you'll you'll still need to unmute yourself on your teams.

Andrews, Steven (PHMSA) 54:36
Umm.

Patrick, Eamonn (PHMSA) 54:39
Yeah, maybe we could move on, if there's anyone else who has a comment that they'd like to provide. And then we could come back.

Andrews, Steven (PHMSA) 54:54

Emily raise her hand Eamonn.

Patrick, Eamonn (PHMSA) 55:07
Go ahead, Emily.

Kimball, Emily E. 55:11
Thanks, Eamonn. Can you all hear me? Great.

Andrews, Steven (PHMSA) 55:13
Yep.

Patrick, Eamonn (PHMSA) 55:13
Yes.

Kimball, Emily E. 55:14
Thank you so much. I appreciate the opportunity to just make one more remark before we close out if that's where we're headed. I just wanted to, in response to some of the comments we heard about implementation of Part 2209, reiterate that

the CDA 100% supports the implementation of the 2209 Rulemaking, which of course is now 8 years delayed and we certainly share the concerns expressed by ACC and AFPM about protecting critical infrastructure. But what we're talking about here today is the authorized drone operations, carrying consumer goods in an authorized way, which is distinct from sort of the concerns that we heard about rogue drones and unauthorized operations. Again, we see that as an unrelated issue and very much support the 2209 rulemaking to address that, but that that should not impede the legal delivery of commercial goods. You know, just like all roads shouldn't be closed to truck delivery trucks, so long as the trucks are following the regulations. So just wanted to reiterate CDAs support for 2209, but also distinguish that from the authorized operations that we're talking about here. Thank you.

Andrews, Steven (PHMSA) 56:38
Thank you, Emily. OK. Any last hands before I wrap this up? Yeah, if not. As I mentioned earlier in the meeting, if you have not already sent us anything in writing that you want us to submit to the docket and place into the public docket for this meeting, please do so as soon as possible. If you send it to me and Eamonn, we'll make sure it gets into the document itself. Other than that, I want to thank everybody for attending. We'll also produce a transcript of this meeting and place that in the docket as well. So again, thank you. Thank you for everybody attending and looking forward to keep working with any of you in the future on any other rulemakings or things we put out in the future on the UAS subject. Thank you very much.

Patrick, Eamonn (PHMSA) 57:36Thank you everyone. I'm going to stop the recording and as Steven said we do plan to make the recording and the transcript available to everyone. So, thank you for your time today.

Andrews, Steven (PHMSA) 57:45
Thanks all.

◉ **Patrick, Eamonn (PHMSA)** stopped transcription