

September 21, 2023

Overcoming Fear-Driven Regulations in Advanced Air Mobility

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The excitement surrounding [air mobility](#) is palpable. San Francisco will host the [AIRTAXI World Congress](#) this year from October 2-5, 2023. Riley Safer Holmes & Cancila LLP will host its second annual [Autonomous Vehicles Symposium](#) on October 19, 2023, with a panel focusing on cybersecurity and data breach threats facing air taxi development. But the future of urban air mobility depends in large part on user adoption and the ability to clear regulatory hurdles. Both elements require the manufacturer to overcome human fear—a driving force behind reluctant users and wary regulators.

To explore the fear driving regulating bodies, RSHC's Autonomous Vehicles Team interviewed Kyle Hardy, the CEO of Hardy Dynamics, a defense consulting firm that specializes in delivering commercial AI/ML solutions to the Department of Defense. Previously, Kyle served 20 years in the defense technology enterprise, including leading major artificial intelligence and counter unmanned systems projects at the Department of Homeland Security, the U.S. Army Asymmetric Warfare Group, the Office of the Secretary of Defense, and the National Geospatial Intelligence Agency. We asked Kyle about the origins of the labyrinthine regulations applied to drones and air taxis and how to navigate these regulations to bring these products to market.

I. The Origins of a Fear-Driven Model of Regulation

Kyle opened our discussion with some context: his background in the U.S. Army Asymmetric Warfare Group, or AWG. For many years, the AWG advised combatant commands and major U.S. agencies—inside the military and out—on how to detect and [“defeat emerging asymmetric threats.”](#) Those targets changed over time, but by 2008, that meant observing commercial drone use, experimenting with military use cases, and preparing to counter anticipated drone attacks long before U.S. forces ever encountered them. The AWG deployed to various combat zones, trained units in drone recognition

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before deployment, published drone recognition guides, and advised U.S. agencies on developing drone regulations.

We discussed what it was like to identify the scope and trajectory of emerging threats, and how to devise counter-solutions before those threats became full-fledged reality. The conversation addressed the fundamental concern that technology is developing at such a rapid pace, and becoming available at cheaper and cheaper cost, that regulators need to pay more attention to the smaller technologies that can be weaponized to devastating effect.

For example, self-learning sensors form a fundamental component of building many autonomous vehicle technologies. Whether moving on the ground or through sea or sky, a self-navigating vehicle must sense the world around it, detecting inputs like light, distance, speed, and—lest it hit a lifeform—heat. The rapidly evolving world of electronic sensors, smart or not, is certainly fascinating (an [endless rabbit trail](#) for tech geeks), but its positive capabilities can be inverted for sinister and deadly purposes.

Kyle reflected on his time as part of the AWG deployed in combat zones in the late-2000's to figure out just how much of a threat drones, flown and weaponized by such sensors, might pose: "Think about 1,000 of these semi-autonomous machines suddenly coming over the hill and picking and following their own targets. It's an equalizer. The poor man's air force. It was used to incredible effect in the recent Nagorno-Karabakh war in the South Caucasus, and it's being used with devastating consequences in Ukraine right now."

Therein lies the fear.

As Kyle said, it's "incredibly scary."

AWG was tasked with anticipating these types of threats years before they ever were technological realities. While Pentagon officials were still calling drones toys, combat-theatre based AWG members were fast recognizing they were indeed a "poor man's air force."

Seeing was believing for higher-up government officials. Once unmanned systems became more prevalent in the popular conscience, the government took drone threats seriously, and the AWG's hard work, borne from the grim realities of war, "[helped justify deploying](#)

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American counter-drone systems to Iraq before terrorist drones became a lethal threat and likely saved American lives.

Indeed, the Combined Joint Task Force-Operation Inherent Resolve acknowledged that because of the AWG's work predicting the drone threat and devising cheap ways to combat it before it fully emerged, U.S. forces "had an overwhelming success rate in either repelling, shooting down, or chasing away the majority of [ISIL drones] in Iraq and Syria [from 2016 to 2018] before they could harm our personnel or do any damage to equipment or infrastructure." No U.S. military life has been lost due to ISIL drones to date.

II. Applying Fear-Driven Regulation to the Commercial Sector

These literal war stories help explain why regulators are so cautious; at the same time, would-be market participants are struggling under the weight of red tape generated by a heavy, sometimes confusing, fear-based patchwork of state and federal regulation.

A. Expectation Management

We asked Kyle about this tension: "How do you bridge the gap between the regulator and the regulated?"

He did not hesitate. "Expectation management. That's number one." Many regulators in this area have personal combat experience and emerging threats loom large. To complicate matters, several agencies at all levels of government have overlapping arenas of responsibility, the scope of which is often not clear even to the agencies themselves.

Regardless of its *intended* use, a single sensor technology, depending on its capabilities, might be classified as a weapon and subject to the purview of a half-dozen agencies. And if the project has been funded or backed in any way by international joint efforts, expect even more agency involvement.

For example, DarkHorse announced its completion of approval for exporting a "dark-pulse sensor technology" that "provide[s] a data stream of critical metrics for assessing the health and security of infrastructure for applications in border security, pipelines, oil and gas, aviation and aerospace, mine safety, and renewable energy." With global export of a product that can be used in defense systems, a product like DarkHorse Technology would

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be subject to International Traffic in Arms Regulations (“ITAR”) and approval with the U.S. Department of State Bureau of Political-Military Affairs.

Other common technologies in the autonomous vehicles space involve applications, approvals, and compliance with the Security and Exchange Commission, Federal Aviation Administration, Federal Communications Commission, National Transportation Safety Board, National Highway Traffic Safety Administration, state departments of motor vehicle regulation, and more.

It is an inescapable fact for the foreseeable future that developing autonomous vehicle technologies will require laborious efforts in navigating state and federal regulation.

Although that’s a hard truth, regulators recommend knowing the various interplay between all relevant agencies before engaging with any particular one. Even the regulators need help understanding this maze—the AWG developed “smart cards” that helped even the agencies themselves navigate state and federal laws governing drone development and learn the primary contacts for their counterparts at other agencies.

B. The Primacy of Credibility—Overcoming Imposter Syndrome

In addition to expectation management, Kyle offered another piece of advice for understanding the regulator mindset: the motto, “beware of snake oil in counter-UAS defense.” As much as governmental officials desperately want counter-drone technologies developed, they are also filtering out massive amounts of fake products, overpromising and under-delivering.

The desire for cheap, effective solutions to drone threats keeps regulators up at night—and it keeps them from approving products they perceive as counterfeit, even if, at the end of the day, that means keeping long shots out.

C. Courage and Distilled Necessity

“So how do we move forward?” RSHC’s Autonomous Vehicles Team asked our AWG contact. “We’ve talked a lot about fear today. What do opposite principles, like courage, tell us about resolving tensions between regulators and regulated in emerging autonomous technologies?”

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We explained our concept of courage—doggedly fighting for regulatory approval—to our AWG interviewee. “It’s not courage if it’s distilled necessity,” he replied. In the battlefield, developing counter-drone-warfare technologies in real-time sometimes required the AWG to deploy “[MacGyver-like work in spotting nuances in enemy threats and connecting dots across the combat theater](#).” For example, a member of AWG’s predecessor, the counter-IED group, “[disarmed \[an Iraqi IED\] with his Leatherman multi-tool](#).” Now that’s distilled necessity.

Applying that type of courage, or distilled necessity, in the commercial sector will look like “expend[ing] the necessary resources” to “tackle” a problem before it occurs, AWG’s former team member said. It turns out that courage for the regulated means an unflagging determination to get a product to market, overcoming extensive regulatory barriers, which means finding the right advisors to navigate the system. It requires developing what Harvard’s Norm Champ calls “[constructive engagement](#)” with regulating agencies to forge common alliances and convincing regulators that your product is not “snake oil,” and the societal gains it promises are worth the risk of the product falling into the wrong hands.

In other words, you have to do what drives entrepreneurs in the first place and live a variation of the AWG motto: anticipate the problem, adapt to the realities of regulation, and don’t back down until you’ve brought your product to market.

This article is part of an interview series by RSHC’s Autonomous Vehicles Team exploring answers to tough issues facing our clients in the courtroom and the boardroom as they develop autonomous and connected vehicle technologies that preserve, protect, and better our society.