ADVANCED AIR MOBILITY INSTITUTE

First Responders within Advanced Air Mobility Special Report

Presented by:

Collinear Group

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Sincere Thank you to our Title Sponsor for their generous support of this inaugural Special Report.

Collinear Group brings intelligence and technology to challenges unique to highly regulated industries, helping engineers, manufacturers and operators reach new heights. Our vision is simple — seamless industry that delivers the right information at the right time.

“Public Safety personnel working on the front lines of domestic emergencies and disaster response make sacrifices daily to keep their communities safe. The Advanced Air Mobility Institute seeks to responsibly accelerate access to UAS and eVTOL technology that will directly lead to more lives saved. For Patriot’s Day 2024, we are launching this effort to honor those individuals who are leveraging new tools to bravely face both historic threats to safety as well as emerging risks as the world becomes increasingly complicated.”

—Dan Sloat
Founder & President
Advanced Air Mobility Institute

The purpose of the ‘First Responders within Advanced Air Mobility’ annual publication is to honor public safety personnel worldwide for their contributions to the emerging aviation field of Advanced Air Mobility including eVTOLs, drones, vertiports, UAS Traffic Management, policy, advocacy, and more.

Eligibility Criteria:

- Public Safety service in any nation for at least 2 full years by 4/2024
- Open to Firefighters, Law Enforcement, EMTs, and Health Care
- Current members of the AAM Institute are eligible

Setting the Bar for Safety in AAM Certification

In the dynamic realm of Advanced Air Mobility (AAM), the assurance of safety and reliability stands as a critical priority. With a focus on innovation and compliance, Collinear Group is playing a pivotal role in shaping the trajectory of urban air transportation.

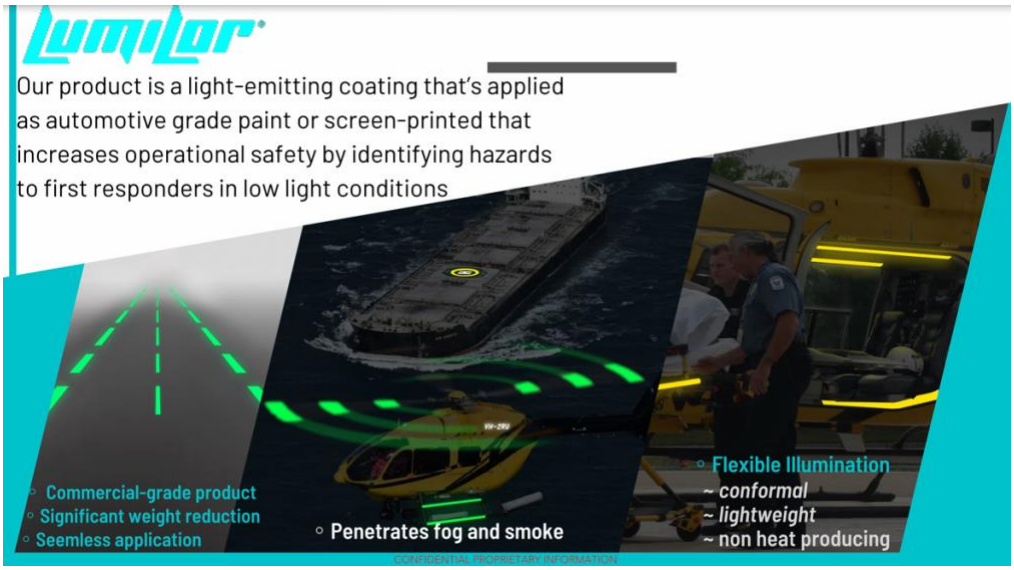
Collinear Group has emerged as a key partner for three of the top 10 AAM entrants, offering essential certification services. These services encompass a spectrum of vital functions, from crafting Qualification Plans for certification testing on cutting-edge equipment to meticulously conducting systems engineering verification and validation activities.

“At Collinear Group, our objective is straightforward: to uphold the highest safety and reliability standards in the burgeoning AAM sector,” explains Dean Rudolph, DAR-F at Collinear Group. “We recognize the significance of our role in shaping the future of urban air mobility, and we approach each project with a commitment to excellence.”

Another aspect of Collinear Group's mission is the thorough inspection of components, including parts, assemblies, special processes, and eventually electric engines and entire aircraft. These inspections are crucial in ensuring that AAM vehicles meet stringent regulatory requirements and adhere to industry norms. Additionally, Collinear Group provides valuable process consulting on manufacturing activities, guiding AAM entrants through the intricate journey toward Type Certification and Production Certification. By leveraging their expertise, Collinear Group assists companies in navigating regulatory frameworks efficiently while maintaining high standards of quality and safety.

> **“Innovation in AAM is undoubtedly exciting, but it must meet rigorous safety regulations and protocols. Our Collinear Group team is dedicated to supporting innovation while emphasizing safety and reliability. We believe that through collaborative efforts with industry leaders, we can help advance the goals of our AAM clients and move the industry forward safely.”**
>
> **—Aaron Koopman**

As the demand for urban air mobility solutions continues to soar, Collinear Group remains steadfast in its commitment to safety standards and facilitating the widespread adoption of AAM technologies. Through their comprehensive certification services and unwavering dedication to excellence, Collinear Group is contributing to the evolution of transportation, one step at a time.



First Responders and Aviation

Our technology offers first responders conformal lighting that can be place on equipment or personnel to give clear visual indications of hazards in low light conditions.

LumiLor offers an illuminated coating that is the thickness of paint, that produces no heat and can be used as worn technology or applied to equipment.

First responders will be expected to interact with legacy and existing aviation platforms at night and in bad weather. This implies close proximity of responders to hazards that are increasing in number as we become more reliant on eVTOL style platforms and autonomy.

The visual identification of these hazards in low light conditions will dramatically increase operational safety and mission effectiveness.

First Responder Use Case

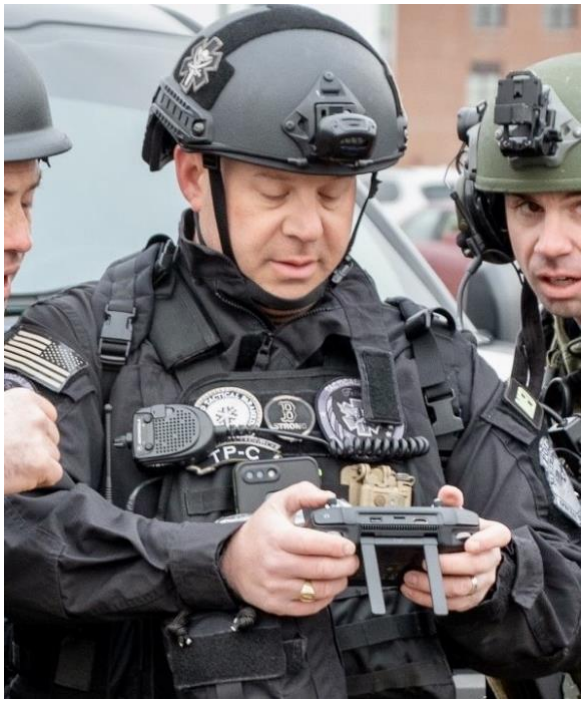
For police departments our technology dramatically increases an officers safety on the road at night making the officer clearly visible with the need for reflection.

For firefighters our technology reduces weight while providing marking that clearly penetrates smoke with no halo effect.

For EMS responders the technology offers the safety attributes listed above and multiple color options to identify patients and low power light to any location.

Clearly marking all first responder operations to the public in reduced visibility and low light conditions broadly applies, no other technology offers the same light weight conformal solution.

Chris Grazioso



Since 1988, Chris Grazioso has dedicated his career to serving as a first responder in the EMS and emergency management fields. His journey began in private EMS and hospital-based systems, where he honed his skills and passion for helping others. In 1999, Chris joined the tactical EMS team assigned to Norfolk County Special Tactics and Response, later evolving into the Metropolitan Law Enforcement Council SWAT team. His role within the team involved responding to critical law enforcement incidents, including barricaded subjects, hostage situations, and high-risk warrants, as well as providing support during large protests and SAR missions.

As his career progressed, Chris's love for aviation led him to obtain his private pilot certificate in 2011. He embarked on numerous flying adventures, including memorable trips from Massachusetts to Alaska and Florida in a Piper Warrior. However, with family commitments and a new home, Chris found himself seeking a new aviation-related hobby, which led him to discover drones. In 2015, Chris purchased his first drone, unknowingly setting the stage for a new chapter in his career. Recognizing the potential of drones to enhance situational awareness and operational efficiency, Chris approached the MetroLEC SWAT team leaders with the idea of integrating drones into their operations. His initiative and expertise impressed the leadership, leading to the establishment of the MetroLEC Tactical Drone Unit.

Chris's role as the team lead and sole drone operator paved the way for the unit's growth to 14 members with over 20 drones available for deployment. Under his leadership, the Tactical Drone Unit became an invaluable asset in law enforcement operations, search and rescue missions, and emergency response efforts. In addition to his work with the MetroLEC SWAT team, Chris played a pivotal role in advancing drone technology through his position with the MassDOT Aeronautics Drone Program. Starting as a part-time drone operator, Chris rose to the position of Director of UAS Operations in 2022, and later Chief of UAS Operations in April 2024. In these roles, he oversaw a wide range of drone initiatives, from aerial mapping and inspection to emergency response and research and development.

Beyond his operational expertise, Chris is a passionate educator and advocate for drone integration in public safety. He has taught hundreds of public safety personnel across the nation and presented at prestigious conferences, sharing his knowledge and expertise in search and rescue, night flying, flying at critical incidents, indoor flying and thermal sensor usage. He generously dedicates his time to public outreach efforts as a DronePro affiliated with the Boston FSDO. Looking ahead, Chris envisions a future where drones play a pivotal role in emergency response, from integrating with FEMA US&R teams to facilitating medical deliveries of life-saving supplies. His dedication, leadership, and unwavering commitment to public safety make him a driving force in the advancement of drone technology for the greater good.

Bobby Kimbrough Jr.

Forsyth County Sheriff Bobby F. Kimbrough Jr. stands a beacon of innovation in the realm of Advanced Air Mobility (AAM), spearheading North Carolina's inaugural Drones-as-First-Responders (DFR) initiative within the expansive borders of Forsyth County. With its population of 400,000 scattered across 417 square miles, the region posed unique challenges that Sheriff Kimbrough, a seasoned veteran of law enforcement with four decades of diverse experience, was determined to address.

He envisioned a future where autonomous flight would become an indispensable tool in safeguarding public safety by integrating drones into law enforcement vehicles. His visionary approach culminated in the establishment of the Real Time Intelligence Center (RTIC), a pioneering hub dedicated to gathering, analyzing, and leveraging intelligence to bolster law enforcement efforts.

At the heart of the Forsyth County Sheriff's Office's (FCSO) strategy lies a commitment to identifying and implementing best practices. Recognizing the transformative potential of autonomous drones, Sheriff Kimbrough embarked on a comprehensive DFR pilot program aimed at furnishing responding deputies with crucial situational awareness. Armed with real-time video feeds, streamed directly from the scene, deputies gained invaluable insights, enabling them to calibrate their responses judiciously, often mitigating escalation and enhancing overall efficacy. The exigencies of law enforcement demand swift and informed decision-making, particularly in high-stakes scenarios. The introduction of DFR has had an immensely positive impact on response times and incident resolutions, curbing unnecessary resource deployment and fostering de-escalation. In a poignant illustration of its efficacy, a domestic violence incident at a bustling restaurant saw deputies leveraging DFR technology to pinpoint the suspect's location, effecting a swift and safe arrest without endangering bystanders.

Such success stories underscore Sheriff Kimbrough's conviction in the transformative potential of DFR. By mitigating risks, fortifying safety, and furnishing responders with actionable intelligence, the program epitomizes a paradigm shift in law enforcement operations. Sheriff Kimbrough's vision extends beyond Forsyth County, with plans to scale the DFR program throughout the country, earning plaudits from peers and industry stakeholders alike. Sheriff Kimbrough's leadership epitomizes a blend of creativity, foresight, and decisive action.

By forging strategic partnerships with industry leaders like AeroX and navigating regulatory landscapes, he secured groundbreaking Beyond Visual Line of Sight (BVLOS) approvals, propelling the DFR initiative to the forefront of innovation. His unwavering dedication to leveraging technology as a force multiplier that underscores a steadfast commitment to serving and safeguarding the citizens of Forsyth County. As Uncrewed Aerial Systems (UAS) and AAM technologies continue to evolve, the FCSO stands poised to sustain its legacy of innovation. Sheriff Kimbrough's pioneering strides have laid a sturdy foundation for future advancements, ensuring that Forsyth County remains at the vanguard of public safety innovation for years to come.

Wade MacPherson

Wade MacPherson is an Advanced Care Paramedic working in the County of Renfrew in Ontario, Canada. Mr. MacPherson specializes in point-of-care ultrasound, utilizing this technology both in and out of the hospital environment. Beyond traditional EMS roles, Mr. MacPherson also serves as a Community Paramedic, providing primary care medicine to families, seniors, and isolated individuals within the county. In addition to his medical duties, Mr. MacPherson is deeply involved in the county's remotely piloted aircraft systems (RPAS) program. He works in a specialized role as an advanced drone pilot, utilizing thermal-equipped RPAS to assist in a variety of missions such as wilderness search & locate, emergency management and situational awareness, rural fire suppression support, and supporting police tactical operations on request. As a licensed private pilot, Wade found the intersection of passion and profession, combining aviation with paramedicine where he continues to find innovative ways to address challenges in the field.

The county of Renfrew comprises 7419 km^2 and has a population of roughly 90,000 people so it imposes geographical constraints on its emergency services. Located in Eastern Ontario, Renfrew County sees over 100 in (250 cm) of snow annually and temperatures in Winter regularly drop below -4 °F (-20 °C), while temperatures in July can exceed 95 °F (35 °C). These challenges underscore the critical need for adaptable and responsive emergency services. In these situations, Mr. MacPherson's expertise in both traditional EMS and drone operations is invaluable.

The RPAS program plays a pivotal role in overcoming these obstacles by providing real-time information that can drastically alter the course of an operation and offers an additional tool for the EMS team to improve the well-being of Renfrew County's residents. The list of unique operations in which Mr. MacPherson has deployed RPAS to assist his colleagues and provide additional capabilities is endless. Whether it is using a drone to deliver aid to elderly individuals who are trapped in their homes due to flooding, providing an eye in the sky when a tractor-trailer rolls over into a frozen lake, or assisting the Canadian Armed Forces in locating their crew members following a helicopter accident, Wade is always ready to deploy and aid in the operation. His previous background as a photographer has taught him the value of documenting events so he can pass on the lessons learned from each mission to other members of his team and those in the first responder community. His team has investigated the use of drones to deliver automated external defibrillators (AEDs) to residents in rural areas, finding that the drones can reach an individual in need faster than first responders, increasing the probability that they survive a cardiac event.

While Wade is the person being recognized, others within the Renfrew EMS team have greatly contributed to the RPAS program. A fellow paramedic Scott McLeod founded the program and retired deputy chief Brian Leahey played a big part in its success. Renfrew County has one of the top first responder RPAS programs in Canada and without these individuals and Chief Michael Nolan’s leadership, the program would not be where it is today.

Andrea Carla Spinelli Miranda

Andrea Carla Spinelli Miranda is a dedicated and passionate professional in the field of primary emergency response. Since the beginning of her career in 2010, when she obtained her registration as a primary emergency responder in Caracas, Venezuela, she has demonstrated an unwavering commitment to the safety and well-being of the community.

Andrea has faced significant challenges in natural disaster scenarios. In 1999, during the tragedy of Vargas in Venezuela, she bravely contributed to the rescue efforts of survivors and the deceased, as well as the transport of deceased bodies amidst the devastation. This experience marked the beginning of her commitment to emergency response. Additionally, in 2016, she provided her services during the tornado that struck the city of Dolores, Uruguay, demonstrating her ability to act effectively and cohesively in crisis situations.

In 2023, Andrea was selected to participate in the professional drone pilot course organized by FIA Region IV under the direction of Nicolas Brieger. After successfully completing the course, she set out to tackle an even greater challenge: establishing the first school for professional drone pilots in Paraguay, through the Touring and Automobile Club Paraguayo, where she currently works. Andrea has taken on a prominent role in leading training sessions for the police forces of Paraguay in the effective use of drones for police operations. Most notably, she conducts these trainings individually, demonstrating exceptional dedication and a unique ability to lead and motivate others.

Her commitment and leadership have resulted in the training of 32 new drone pilots from January 2024 to date, who now play a crucial role in combating crime, drug trafficking, and smuggling in Paraguay. In February 2024, Andrea received a recognition plaque from the National Police for her constant collaboration with the police forces. Additionally, her training program continues to expand to reach all law enforcement agencies in the country, thereby strengthening the nation's response capacity and security. Recently, Andrea was nominated to participate in the Second International Police Drone, held in Foz do Iguacu, Brazil, from March 26th to 28th, 2024. During this event, she shared her knowledge and experiences in the use of drones for search and rescue, as well as anti-terrorism activities, once again demonstrating her commitment to innovation and excellence in emergency response.

Andrea Carla Spinelli Miranda is an inspiring example of dedication, leadership, and service in the field of emergency response. Her tireless commitment to the safety and well-being of the community, coupled with her ability to lead individual training sessions for police forces, makes her a highly deserving candidate for recognition in this program.

Jason Day

Jason Day is the Director of Unmanned Aircraft at the Texas Department of Public Safety, bringing with him a wealth of experience from his 27-year tenure military, civilian, & public safety aviation. Widely recognized as a subject matter expert in the UAS community, Jason specializes in public safety UAS operations & administration.

In his role as Director, Jason oversees one of the largest public safety UAS program in the nation with over 300 remote pilots & unmanned aircraft. His primary responsibilities include ensuring compliance with FAA regulations & maintaining the highest standards of safety in the department's UAS program. Texas DPS stands out as one of the most active UAS programs in the United States conducting 50,000 flights in 2023 & a remarkable 12,000 flight hours. Operating within the Aircraft Operations Division of Texas DPS, Jason has actively participated in high-profile UAS missions, including disaster response, tactical operations, overwatch missions, & border operations.

Recognized for his expertise in joint manned/unmanned aircraft operations, Jason holds a crucial seat in the Texas Air Operations Center, coordinating UAS operations during declared disasters in the state. As a key member of the Texas HB2340 Committee, Jason played a pivotal role in developing policies, procedures, & training standards for UAS use by public safety agencies during disasters. Additionally, he contributes as a voting member of the Texas Advanced Air Mobility Committee, shaping recommendations for the implementation of AAM & UAM in the State of Texas.

Jason developed & implemented the UAS Remote Pilot in Command training program for the department, earning recognition in Air Beat Magazine & serving as a template for various federal, state, & local public safety agencies. He has assisted countless public safety agencies across the world in establishing their UAS programs, emphasizing safety, compliance & transparency. Jason's contributions extend to numerous publications on topics related to public safety UAS operations. Actively engaged in the UAS community, Jason is a member of numerous UAS & cUAS working groups & servers on multiple boards. He is the founding member of the Texas Public Safety UAS Working Group, comprising over 100 public safety agencies across Texas.

Additionally, Jason serves as an instructor for the Airborne Public Safety Association & is a sought-after guest speaker for organizations such as DRONERESPONDERS, AXON, & the FirstNet Alliance. With a strong rapport with the Federal Aviation Administration, Jason was recently appointed as a member of the FAA's UAS Detection & Mitigation Aviation Rulemaking Committee. As a valuable member of the Texas DPS cUAS committee, he authored a white paper on the Threat of Weaponized Drones & is recognized as a subject matter expert on drone detection. Jason orchestrated the deployment of multiple UAS detection sensors across the state, enhancing airspace situational awareness for both public safety manned & unmanned aviators.

Anton Partalev

Anton Partalev joined Cave Rescue Bulgaria as a rescuer in 2003. Since then, he has participated in numerous trainings and courses, focusing on reaction and SAR protocols for various environments, including medical emergencies, mountainous terrain, fast waters, sea rescues, snow incidents, and urban disasters. Since 2017, Partalev holds the position a senior instructor. By the end of 2024, he will graduate as a paramedic of the third degree. Reflecting on his experiences, Anton Partalev shares, "In 2023, our team was among the first responders to react and join SAR operations following a 7.8 magnitude earthquake in Turkey. My group was deployed to one of the most devastated regions – Hatay, Antakya. For our efforts, I received personal recognition from Bulgarian President Rumen Radev for displaying exceptional professionalism, as well as the Seraphim 2023 award for civil honor. One of the invaluable lessons from this mission was the utilization of SAR drones for support and safety. The aerial perspective provided by the drones proved invaluable in surveying collapsed buildings and searching vast areas efficiently."

"Later that same year," he continues, "there was a massive flood in the near region of my hometown Burgas, coastal city Carevo. I was involved as a coordinator and manager of volunteer teams engaged in the recovery operation. Utilizing the only available drone in this SAR operation enabled us to locate missing persons and to plan better all actions." In conclusion, Partalev emphasizes, "Drawing from these practical lessons, I am dedicated to promoting the use of specialized drones among all emergency response structures, be it officials or volunteers. Drones have proven to be indispensable tools in enhancing the efficiency and effectiveness of search and rescue operations."

Charles Werner

Chief Charles L. Werner (Ret.) has served 50 years in public safety. Charles served 37 years with the Charlottesville VA Fire Dept., serving the last ten years as fire chief. Charles has served in numerous leadership roles at the local, state, national and international level. Presently serves as Founder/Director, DRONERESPONDERS. DRONERESPONDERS has become the largest and leading nonprofit program to advance public safety UAS with over 9200 members with participation from 89 countries and focused on drones for good, countering UAS, UTM and AAM.

Charles serves as public safety representative on the Virginia Advanced Air Mobility Alliance to establish strategies for advancing AAM. Charles' public safety focus on AAM is for Drone as a First Responder, heavy lift UAS for wildfire operations (logistical movement of equipment/fire suppression), air ambulances, transport of drugs to underserved communities. In 2023, Charles joined the Virginia Department of Aviation as aviation technology advisor to work on the public safety areas of UAS, CUAS and AAM. In this role Charles was a contributor to the soon to be released report on Minimum Viable Infrastructure for AAM.

Chief Werner serves on the Virginia Innovation Partnership Corporation (VIPC) Unmanned Systems Board of Advisors, the Airborne International Response Team Board of Directors, the VIPC Public Safety Innovation Center Advisory Board, the NestGen Advisory Board, a SME on UAS and AAM for MITRE, has a 3 year NASA Space Act Agreement (through DRONERESPONDERS) to work on safety issues in the areas of UAS, UTM, AAM. DRONERESPONDERS also has a 3-year NIST grant to further expand the use of the NIST Standard Test Lanes to teach and measure public safety remote pilot maneuvering skills.

Chief Werner was the only public safety representative invited to the White House AAM Summit in 2022. Charles attended the August 2023 AUVSI AAM Summit and was a co-presenter in October 2023 with Mark Bathrick, "How Public Safety will lead the way to UAM" for the AUVSI Business of Automated Mobility Forum. Charles also presented on Drone as a First Responder for NextGen24 Virtual International Conference. Charles was one of the original thought leaders for the Virginia Flight Information Exchange (FIX) to develop a scalable framework to facilitate critical information for flight coordination and provides the means for public safety to provide information from emergency incidents that may impact and help to provide guidance for safe flight operations. This initiative now has over 10 states participating and pivotal for next steps of UTM/AAM.

He serves on the International Fire Chiefs Technology Council, the NFPA 2400 Technical Committee on Public Safety UAS, the IACP Aviation Committee, the XELEVATE Center of Excellence Advisory Board, F38 and E54 ASTM Committees, and facilitated the DRONERESPONDERS Drone as a First Responder National Working Group. Chief Werner is an internationally respected presenter and author on public safety aspects of UAS, CUAS, UTM, AAM, UAM, DFR, BVLOS, DAA, automation and artificial intelligence. Chief Werner received the 2023 ANSI Meritorious Award for his work on standards development in the field of unmanned systems.

Michael Hill

Considered one of the world's leading subject matter experts (SME) on drone technology, Michael serves as the principal strategist for Uncrewed Aerospace. In his role, he counsels organizations through the challenges of bringing UAV "drone" solutions into their respective industries which range from equipment and software procurement to pilot vetting and recruiting, regulatory support, and system integrations.

Most recently, Michael worked with a global UAV integrator where he orchestrated a historic cross-border middle-mile UAV cargo operation for an auto manufacturer, an off-shore UAV resupply project for a major oil and gas partner, as well as provided training, integration, and various drone solutions for organizations and public safety agencies globally. A UAV pilot certified in 3 countries, US FAA Part 107, UK CAA RPAS, and CA RPAS Pilot. He has accumulated over 6000+ hours of UAS flight time with 7800+ incident-free missions as remote Pilot-in-Command. Named the 2021 Tech Titans Technology Advocate, he holds safety and industry certifications from FEMA, OSHA, NIST, and USI.

As a drone industry advocate, he served as chairperson for the North Central Texas Council of Governments (NCTCOG) UAS Taskforce, Legislative & Policy Committee, where he was appointed to both the Texas HB2340- Public Safety UAS and the Texas SB763- AAM Committees. This allowed him to educate public safety agencies, politicians, government officials, and large businesses on AAM policies while reforming UAV regulations in Texas.

As a 2nd Lieutenant and Director of Unmanned Operations (DOU) for the Texas Wing of the Civil Air Patrol, Michael became a certified Search and Rescue Drone Pilot covering FEMA disaster missions while training and mentoring his fellow first responders to become certified remote pilots. Michael served on the leadership team for the North Texas Public Safety Unmanned Response Team (NTXPSURT) where he helped establish an organizational presence and offered his experience to help law enforcement, fire departments, and emergency management teams on tasks from event surveillance to flight training.

As a sought-after speaker and industry influencer, Michael shares his expertise on the advancements of UAV technology for operations on the land, in the air, and at sea. His experience ranges from aerial mappings, telecom, and wind turbine inspections to oil and gas, critical infrastructure inspections, search, and rescue missions, state, and federal regulatory involvement, and beyond.

Dean Rudolph

Dean Rudolph is a seasoned professional deeply committed to serving his community through the fire service. With over 13 years of dedicated fire service experience and nine of those years in leadership roles, Dean has become a trusted, reliable and knowledgeable leader within North Hays County Fire Rescue, the largest Combination Department (Career and Volunteer) in Central Texas.

Dean’s expertise is underpinned by a myriad of advanced certifications, including Fire Officer, Instructor, Swiftwater Rescue Technician, Wildland Firefighting, Structural Firefighter and multiple National Incident Management System courses. His training and experience have been pivotal in managing diverse emergency scenarios, notably earning him recognition such as a Life Saving Award for his role in administering CPR and successfully resuscitating a patient.

Dean's contributions have garnered broader recognition, including Special Congressional Recognition from Congressman Lloyd Doggett's office for his "exceptional and indispensable service to the community". Within the department, his commitment to excellence has been consistently acknowledged, culminating in the recognition from his peers as Firefighter of the Year. In addition to his operational prowess, Dean has showcased his dedication to enhancing organizational effectiveness and fostering community engagement by serving as the President of the Board of Directors and other Board positions for North Hays County Volunteer Fire Department for several years.

Dean Rudolph's impact extends beyond traditional firefighting methods. As North Hays County Fire Rescue embraces drone technology, Dean supports initiatives utilizing drones for scene size-up, situational awareness in wildland incidents and swift water rescues, search and rescue missions, and thermal imaging and operational evaluations during structural firefighting. His support also includes leveraging drone footage for comprehensive operational training and process improvement. Outside of his Fire Service activities, Dean has over 20 years of experience in the aerospace industry, primarily in Operations, Quality and Engineering and as a Designated Airworthiness Representative, Manufacturing on behalf of the FAA.

He is currently the AAM Practice Lead for Collinear Group leading teams delivering engineering and certification support to 3 of the top 10 AAM companies. He has guided multiple varied organizations in achieving their certification goals, from next generation fuel cells and electric powerplants to combat helicopters. Dean is passionate about advancing the innovation and safety of the aerospace sector and empowering his team and customers with his expertise and leadership.

Giancarlo Silvestri

With a background of over 20 years in commercial aviation, operational and regulatory expertise with a strong focus on safety, innovation and net zero, Giancarlo Silvestri took a vital role during his time as Regulatory Affairs Manager at a leading Advanced Air Mobility (AAM) Infrastructure provider. Identifying the critical need for industry to address the complex safety and technical challenges around new technologies, Silvestri took the leadership of EUROCAE WG112 (VTOL) SG5 (Ground) to help solve industry specific issues such as the safe management of lithium-ion thermal runaway, other fires and their effects on eVTOL (electric vertical take-off and landing) aircraft within the highly recognized aviation technical standards association based in Paris, France.

With the effort and technical expertise of different institutions and persons such as Jeremy Hartley (UK Civil Aviation Authority), Martin Gauer & Soren Schramm (Fraport AG), University of Warwick, Midlands Aerospace Alliance and others, they have managed to shape as a group the problematic, potential solutions, safe management and coordination in order to draft the first approved standard to be accepted by global regulators, safety agencies and industry to mitigate and provide a robust guidance on the safe management of fire in aircraft operated by electric batteries such as eVTOL aircraft. Silvestri additionally stated that "being able to address as an industry with highly recognized individuals such an important challenge as fire response and the procedures recommended for first responders by the AAM industry is something that we should all feel proud of, recognizing that all new technologies impose many exciting challenges but that thinking out of the box, working together collaboratively not only helps but provides a clear message to the general public that eVTOL aircraft are not only here to stay but to provide a safe, reliable, sustainable and clean method of transportation for people and goods in urban and remote environments of the World."

Air Ambulance eVTOL Design

The National Aerospace Conceptual Design Competition (NACDeC), organized by The Aeronautical Society of India's Design Division, is an annual event aimed at nurturing aerospace design among engineering students. Since its establishment in 2017, NACDeC has successfully conducted six editions, focusing on challenging aerospace design problems relevant to India's needs. The competition fosters inter-organizational idea exchange, professional growth, and knowledge augmentation in the aerospace sector, serving as a platform for students to apply their skills to real-world challenges.

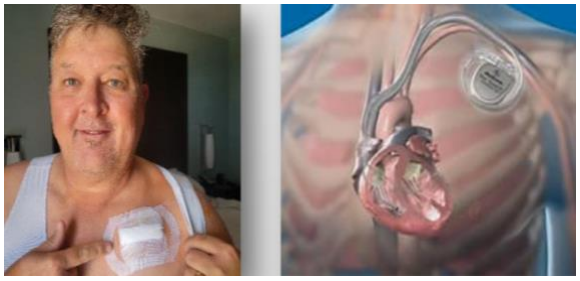
About the VI edition of NACDeC: To design a VTOL ambulance to cater to the emergency locations within 100 km range in the suburban regions of India, capable of accommodating 2 passengers (patient + paramedic), (considering other design constraints available in the problem statement).

Winning Team: Krishnakanth Mohanta; Siddhartha Agarwal; Jayesh Sharma; Tanzil Lohani; and Rinisha Nikhade (M. Tech students from Defence Institute of Advanced Technology Pune)

Advanced Air Rescue: Emergency Response with AED Delivery

Last summer, my dear friends Joanne and Anthony took their sons on vacation to Old Town San Juan, PUERTO RICO. Little did they know that the day they chose to hike to an old Spanish Fortress was almost Anthony's last day. The otherwise healthy and fit father of two collapsed without warning, and miraculously, a bystander grabbed a nearby AED[1]; within 3 minutes, Anthony's heart was shocked back to life, making him one of the less than 1 percent of survivors. Research shows that the chances of survival from cardiac arrest decrease by 10% with each passing minute without defibrillation (Cheskes et al., 2020). Therefore, rapid delivery of AEDs can significantly increase survival rates and reduce the risk of long-term complications.

Heart attacks affect over 805,000 people in the USA each year, according to the American Heart Association (AHA) statistics. Out of these cases, around 605,000 are first-time heart attacks, and approximately 200,000 are recurrent attacks.[2] Like Anthony, cardiac arrest can strike suddenly; rapid response and access to life-saving equipment, such as Automated External Defibrillators (AEDs), is critical. The use of drones in delivering AEDs to heart attack victims represents a groundbreaking advancement in emergency medical services. Drones offer the potential to drastically reduce response times, especially in situations where traditional ambulances may face challenges due to traffic congestion or remote locations. Several studies and real-world implementations have demonstrated the effectiveness of drone-enabled AED delivery. For example, a study published in the Journal of the American Medical Association (JAMA) Cardiology highlighted that drone-delivered AEDs arrived more quickly than traditional emergency medical services in simulated scenarios. This underscores the potential impact of drones in improving response times and ultimately saving lives (Cheskes et al., 2020; Fisher et al., 2023).



The concept of advanced air mobility (AAM), which encompasses using drones and other aircraft for various civilian purposes, holds immense promise for transforming emergency medical services. Imagine a network of drones equipped with AEDs strategically stationed across urban and rural areas, ready to be dispatched within minutes of a cardiac emergency. Companies like Jump Aero[3], a California-based aviation manufacturer, are building the world's fastest sustainable personal aircraft to enhance first responder operations in rural communities. Zipline and Wing are also drone companies already deploying drone delivery systems for medical supplies in several countries. Advanced Air Mobility is about to become a reality in the US, and could extend beyond AED delivery to include the rapid transport of paramedics and other medical personnel to the scene of an emergency. This integrated approach, leveraging cutting-edge technology, has the potential to revolutionize emergency response systems and save countless lives. It is crucial for policymakers, healthcare providers, and innovators to collaborate in harnessing the full potential of drones in emergency medical services, ultimately making communities safer and more resilient in the face of cardiac emergencies. With the benefits of Advanced Air Mobility Rescue, we can all enjoy more time with our dear friends like Anthony.

[1] AEDs are portable devices that can deliver an electric shock to the heart to restore its normal rhythm during sudden cardiac arrest

[2] https://www.heart.org/en/about-us/heart-and-stroke-association-statistics

[3] https://jumpaero.com/

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Author: Tracy Lamb, AAMI Board Member and personal friend of the Pezza family.

References:

- Fischer, P., Rohrer, U., Nürnberger, P., Manninger, M., Scherr, D., von Lewinski, D., ... & Kolesnik, E. (2023). Automated external defibrillator delivery by drone in mountainous regions to support basic life support–a simulation study. Resuscitation plus, 14, 100384.
- Cheskes, S., McLeod, S. L., Nolan, M., Snobelen, P., Vaillancourt, C., Brooks, S. C., ... & Drennan, I. R. (2020). Improving access to automated external defibrillators in rural and remote settings: a drone delivery feasibility study. Journal of the American Heart Association, 9(14), e016687.
- Mackle, C., Bond, R., Torney, H., McBride, R., McLaughlin, J., Finlay, D., ... & McEneaney, D. (2020). A data-driven simulator for the strategic positioning of aerial ambulance drones reaching out-of-hospital cardiac arrests: a genetic algorithmic approach. IEEE Journal of Translational Engineering in Health and Medicine, 8, 1-10.

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