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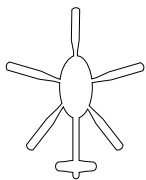
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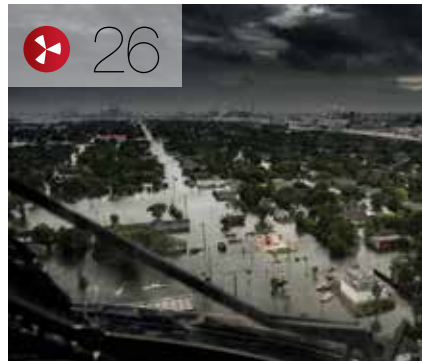
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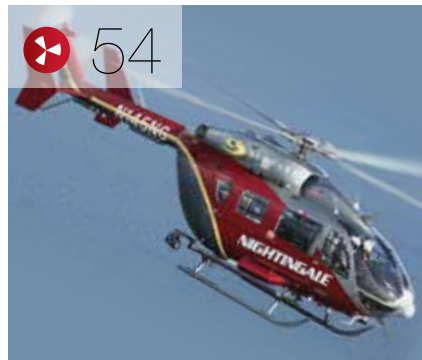
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## Cover



Close up with a University of Utah AirMed Bell 407GX. The program uses six Bell 407s, an Airbus EC145, and two Pilatus PC-12/45 aircraft.

**DAN MEGNA PHOTO**



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## The Team

### GROUP PUBLISHER

Mike Reyno ■ [mike@mhmpub.com](mailto:mike@mhmpub.com)

### GROUP PUBLISHER

Linda Reyno ■ [linda@mhmpub.com](mailto:linda@mhmpub.com)

### ASSOCIATE PUBLISHER

Derek Kast ■ [derek@mhmpub.com](mailto:derek@mhmpub.com)

### EDITOR-IN-CHIEF

Oliver Johnson ■ [oliver@mhmpub.com](mailto:oliver@mhmpub.com)

### VERTICAL 911 EDITOR

Elan Head ■ [elan@mhmpub.com](mailto:elan@mhmpub.com)

### ASSISTANT EDITOR

Ben Forrest ■ [ben@mhmpub.com](mailto:ben@mhmpub.com)

### SALES & MARKETING DIRECTOR

Tim Muise ■ [tim@mhmpub.com](mailto:tim@mhmpub.com)

### MARKETPLACE SALES MANAGER

Carla McKay ■ [carla@mhmpub.com](mailto:carla@mhmpub.com)

### CIRCULATION MANAGER

Leanne Willis ■ [leanne@mhmpub.com](mailto:leanne@mhmpub.com)

### PRODUCTION MANAGER

Jen Colven ■ [jen@mhmpub.com](mailto:jen@mhmpub.com)

### GRAPHIC DESIGNER

Kaytlyn Wismayer ■ [kaytlyn@mhmpub.com](mailto:kaytlyn@mhmpub.com)

### WEB DEVELOPER

Shawn Pieters ■ [shawnp@mhmpub.com](mailto:shawnp@mhmpub.com)

### JR. WEB DEVELOPER

Maddie Ilijow ■ [maddie@mhmpub.com](mailto:maddie@mhmpub.com)

### CONTRIBUTING EDITORS:

Jen Boyer, Jon Duke, Daniel Foulds, Lisa Gordon, Dan Megna, Skip Robinson, Hilary Romig

### CONTRIBUTING PHOTOGRAPHERS:

Jordan Castelan, Christopher Ebdon, Brian Edwards, Lisa Gordon, Will Graham, Lloyd Horgan, Livingston Lewis, Rawad Madanat, Daniel J. Martinez, Dan Megna, Edwin Montufar, Antonio Gemma More\*, Skip Robinson, Zachary Wolf



### In Canada:

500 Trillium Dr., Unit 23, Kitchener, ON N2R 1E5

### In the United States:

701 S. Main Street, Fall River, WI 53932

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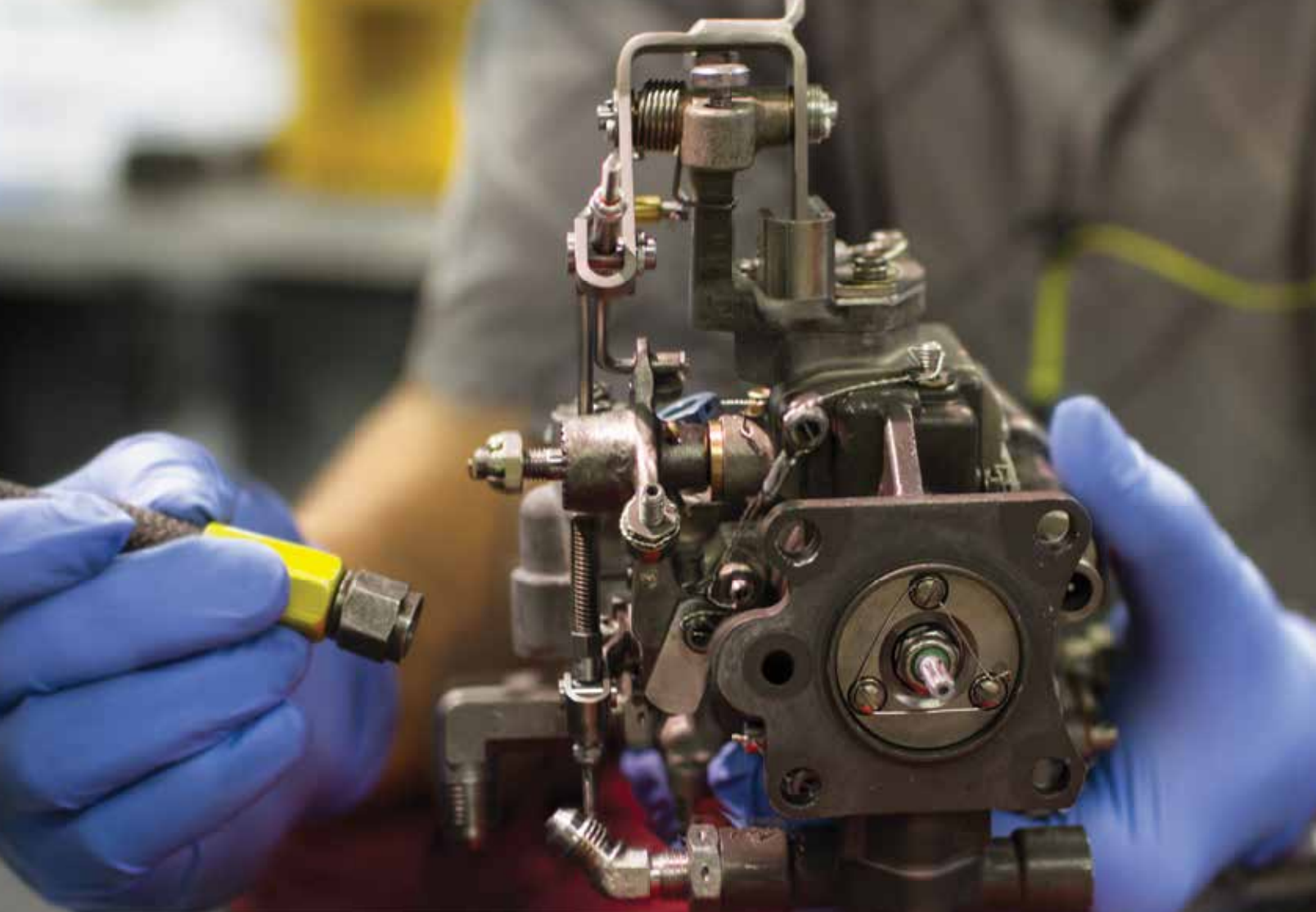
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# COLUMN

FOCUS ON PROFESSIONALISM | TONY KERN

## BEWARE THE CALM AFTER THE STORM

The 17<sup>th</sup> year of the 21<sup>st</sup> century will go down in history as one of the most demanding aviation first response years in recent history. An unprecedented wildfire season in both Canada and the Western United States — coupled with three major hurricanes (and counting) with literally tens of thousands of safe and successful rescues of civilians by land, sea, and air — give us something to be genuinely proud of.

In another month or two, this extreme high operations tempo and flurry of high-risk activities will be behind us as we sit down with our friends and families to enjoy the holidays, tell some war stories, and reflect. The return to normal operations will be viewed by many as an opportunity to finally relax after an extremely busy, profitable, and challenging season. While the desire to rest is well deserved, the tendency to let our guard down after a demanding operational period can be a lethal mistake.

Throughout history, we have seen examples of this. One of the factors that drove the airline and helicopter accident spike of the 1960s and '70s (which led to the creation of crew resource management training) was a group of pilots who came out of extreme military operations (the Second World War, Korea, Vietnam), and operated with relative disdain for the rest of their younger crewmembers and procedures.

Or have you ever wondered why military aviation accidents during wartime mostly occur in training environments, rather than in combat? Could it be that those who return from high-risk areas and high ops tempos

let their guard down and lose respect for routine operations, or have picked up bad habits they bring home with them? Could we be at risk of doing the same?

The calm after the storm is historically, and *presently*, a high-risk period for those individuals and organizations that have successfully operated through extreme environments. Here are a few thoughts and steps to make sure we maintain respect for the “routine.”

1. *Get back inside the lines of compliance.* Severe emergency environments often lead to the need to adapt and improvise outside the lines to save lives. When we return to more routine environments, we need to consciously adjust our risk tolerance and recommit to doing it by the book.
2. *Look for infections of normalized deviance.* If we fail to get back inside the lines, we can normalize noncompliant behaviors and hazardous attitudes. Take a hard look in the mirror and at your organization to ensure this hasn't happened. These are completely normal following periods of sustained high operations tempo, so I'd be more surprised if you *don't* find these pockets of noncompliance than if you do. But you certainly won't find them without looking.
3. *Recognize the risk inside the return to routine.* It is easy for those who have achieved success in hurricane rescues or intense wildfires to view the routine operational mission as a “milk run,” not worthy of our best effort or focus. No flight

or emergency response mission is ever routine, and the graveyards are full of those who forgot this and became complacent.

4. *Capture the lessons learned.* When we finally get a break from an extreme operational environment, we sleep, eat, and decompress. But after these essentials, there is tremendous value in getting together with peers and others to capture the lessons learned. What did we do wrong/right? What could have been done better? What would we tell those who haven't experienced an environment like this about how to prepare for the next one? Once these lessons have been captured, take the initiative to drive them into process, procedure, and training. The longer you wait, the less likely you will be to leverage this opportunity for personal and organizational improvement.
5. *Prepare those who did not take part for the next big push.* The best first responders are those who are dedicated to sharing what they have learned with others. True mentors are humble in their heroism, and share their mistakes, fears, and success stories in ways that shape the attitudes and future behaviors of the next generation.

On the wall in my office, I have a quote from American poet Emily Dickinson that reminds me not to take anything for granted. It's from a poem entitled *To Make Routine a Stimulus*:

“To make Routine a Stimulus  
Remember it can cease —  
Capacity to Terminate  
Is a Specific Grace —.”

Every first response mission has the “capacity to terminate.” If we keep this firmly in mind, we will avoid the dangers inherent in the calm after the storm.  
Fly smart.



“The calm after the storm is historically, and *presently*, a high-risk period for those individuals and organizations that have successfully operated through extreme environments.”





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# COLUMN

HAA CORNER | **BILL WINN**

## DECIDING WHAT IS REALLY IMPORTANT

Every organization must have a clear consensus on what is most important to their success. Or, in other words, they must have a clear definition of what success is for their company. This can be a source of major conflict within nearly any organization when there are divergent opinions between different functional departments, or even between different individuals. And, the larger and more diverse that an organization is, the more challenging it can be to reconcile the differing viewpoints held by members of the various functional domains that make up the organization.

The structure of most air medical transport provider organizations is an example of distinct functional domains that must collaborate in spite of different perspectives and interests. To keep this brief discussion simple, I will pare the functional departments of an air medical service down to only three domains: aviation, medical, and business management.

(There are at least two other essential domains, administrative support and communications/dispatch, that I won't get into now, even though they are both essential components of an air medical service. I'll also note that the aviation component includes two sub-domains, made up of pilots and aircraft maintenance technicians, respectively. And, while some organizations may own all of the functional domains in their operational structure, others may out-source one or more of these functions. For this discussion, we will ignore the additional challenges related to internal vs. out-sourced functional domains.)

The list of situations or circumstances

that can create conflict between different functional domains is long and diverse, and I leave it to the reader's imagination — and experience — to populate that list. The example that I turn to now is based on some deliberations that have taken place in my own organization recently.

Our aviation and medical components share a perception that, across the years, both aircraft performance issues and limitations due to adverse weather conditions have prevented us from accepting a significant number of patient transport requests. So we are now involved in an active process of evaluating a possible replacement for our current fleet of helicopters.

From the pilots' perspective, we feel that we need an aircraft that will perform well at high elevations, even when nearly at max gross weight. We also want the aircraft to be equipped for single-pilot instrument flight rules operations and certified for operations in moderate icing conditions. The medical team is very interested in the size of the cabin area and in a medical kit that facilitates the in-flight care of patients with acute and complex needs. While the pilots, nurses, and paramedics work to zero in on a target aircraft and medical kit, our maintenance techs are almost feverishly assessing the changes and additions to their operations that the new target aircraft will require.

The third domain in this process, our business management decision-makers, reside at a corporate level well above our air medical transport team. They won't be activated until the managers of the aviation and medical domains have compiled all the informa-

tion needed to calculate both the costs and the projected benefits of the transition to the new aircraft. We finally decided to form three committees: one to focus on aircraft selection, another to evaluate medical kit configurations, and one to determine how to sell the aircraft upgrade to corporate business management decision-makers.

This is a little worrisome, because it appears that the end result may be that the costs will exceed the gains when the final formula is applied. Even though we are a part of a not-for-profit corporation, we do not want to put pressure on other segments of the corporation to make up for our losses. This was the point when we had to ask ourselves the essential question: what is really important to our air medical transport organization? And how do we sell that perspective to the well-meaning number-crunchers in business management?

Pilots, nurses, paramedics, and aircraft mechanics easily agreed on what was most important to us. It is providing the best possible medical outcome for the patient for every flight request that we could safely accept and safely complete. And that goal requires a high-performing aircraft with an all-weather capability and the on-board facilities for optimum care of any patient.

Can we sell that to our corporate business managers, even if the bottom-line numbers are iffy? Our entire corporate structure shares our focus on maximizing patient outcomes, but any individual domain can be subject to tunnel-vision when asked to make a specific decision or recommendation. So, we don't know yet. But we are hopeful.

Either way, I'll plan on sharing the outcome — along with the details on our choice of a target aircraft and the lessons learned from this process — with you in a future issue. ✖

*Bill Winn is general manager of the National EMS Pilots Association.*

"This was the point when we had to ask ourselves the essential question: what is really important to our air medical transport organization?"



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Moving beyond just law enforcement, the Airborne Public Safety Association will focus on all agencies operating aircraft in the interest of public safety. **Dan Megna Photo**

## ALEA rebrands to embrace all public safety aviation

BY JEN BOYER

**A**s a final step in a multi-year effort to better serve all public safety airborne divisions, the Airborne Law Enforcement Association (ALEA) will become the Airborne Public Safety Association (APSA) on Jan. 1, 2018. The change is a part of an overall effort to embrace all government public safety organization aviation units as

well as expand the organization's services for its members.

"The ALEA board felt, as I have for many years, that public safety aviation expands well beyond law enforcement," said Dan Schwarzbach, ALEA CEO and executive director. "With this change we are completing a process that will allow us to become outwardly more inclusive of all who operate government aircraft for the welfare of the general public."

Until recently, ALEA and its sister organization, the Airborne Law Enforcement Accreditation Commission (ALEAC), focused on supporting and accrediting public law enforcement air support units. APSA is designed to more readily support all agencies serving a public safety interest with aircraft on local, state, and federal levels, including those in firefighting, natural resources, search-and-rescue, utilities, emergency



medical services (EMS), and even those operating unmanned aerial systems (UAS) for this work.

The move away from an exclusive focus on law enforcement at ALEA began in 2009 when the board elected to change the organization's bylaws, no longer requiring individual members to be employed public law enforcement officers assigned to air units. Any interested person could join as an individual and any company with an interest in supporting public safety could be a corporate member.

"At about the same time, we had several fire organizations approach us and ask for a fire service accreditation program as there wasn't anything of its kind out there, but they didn't want it to be done by a law enforcement organization," Schwarzbach explained. "Besides, as time has gone by, more and more public agencies have been developing air units and adding aviation assets. We needed a way to incorporate these people so we could better serve comprehensive airborne public safety."

After changing its rules on membership, ALEA went about changing its accreditation arm, ALEAC. ALEA itself originally formed under Internal Revenue Service (IRS) tax code 501(c)(3) as a tax-exempt educational organization. Under this code, it cannot provide services for compensation. The ALEAC was formed in 2002 under tax code 501(c)(6), a non-profit designation with more leeway. Under this code, it is allowed to promote the common business interests of its members, such as through running accreditation programs, and lobbying to advance and promote the common interests of its members.

Over the next several years, the organizations worked to change by-laws, missions and vision statements to remove focus from law enforcement, instead referencing public safety, Schwarzbach said.

In 2012, the ALEAC changed. It began doing business as the Public Safety Aviation Accreditation Commission (PSAAC) and developed accreditation standards for firefighting and search-and-rescue government agency air units in addition to its law enforcement standards.

As a part of the final stages of the rebranding and shift at ALEA, a brand new non-profit organization was incorporated under 501(c)(6) to serve as APSA. This new incarnation of the organization allows

APSA to not only serve all aspects of government agency public service aviation, but also expand its offerings for these members, including providing one-on-one consultations, accreditation, safety audits, lobbying efforts, trade shows, trainings, and the like.

"Before, ALEA was limited by what we were allowed to do under a (c)(3), which is why we created the commission," Schwarzbach said. "When people wanted consultation to start up a new air support unit, preparation for a safety audit, specific training, or even help lobbying, we had to refer them to outside companies. Now, we will be able to better serve our members directly."

On Jan. 1, 2018, PSAAC will dissolve, and the accreditation work will be done by APSA through its newly formed Airborne Public Safety Accreditation Commission (APSAAC), now all under one umbrella. The original ALEA corporation with its 501(c)(3) will become the Airborne Public Safety Foundation, a mainly charitable arm supporting the work of airborne public

safety, Schwarzbach said.

The slow move has opened new doors for the organization, bringing in new members, sectors of the industry, and even a few partnerships.

The Helicopter Rescue and Response Association (HRRRA) reached out to ALEA recently inquiring about how ALEA could help its members, Schwarzbach said. After meeting with Schwarzbach and learning of the changes taking place in ALEA, the HRRRA decided to merge with ALEA. Once the full rebranding and transfer to APSA takes place on Jan. 1, the HRRRA, serving individuals, companies, and agencies involved in search-and-rescue, will dissolve and all its members will automatically become members of APSA, Schwarzbach said.

As a part of the growth and expansion, Schwarzbach also hopes to announce finalization of public safety UAS accreditation standards this October at the organization's Public Safety Drone Expo in New Orleans, Louisiana.



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# Pinal County gets boost from new Cobham radios

**N**ew tactical radios from Cobham are boosting the capabilities and interoperability of the Pinal County Sheriff's Office (PCSO) Air Support Unit.

Located southeast of the Phoenix metropolitan area in Arizona, PCSO operates three helicopters — a Bell UH-1V Huey, OH-58A, and MD MH-6C — for missions including search-and-rescue, desert interdiction, and patrol support. The air unit regularly interfaces with other law enforcement agencies, but the frequency limitations of its older radios meant that communicating with those agencies was often challenging.

When the PCSO received a county grant to upgrade the radio system in its patrol cars — from a VHF to an 800 MHz trunked system — the air unit had the need and

opportunity to upgrade its radios as well. After reviewing various options, the unit selected the RT-7000 panel-mount P-25 transceiver and controller from Cobham, which also has offices in Arizona.

“From the pilot’s standpoint, we wanted the upgrade because we needed to have more frequencies to transmit on,” explained pilot Deputy Corbie Pecora.

The RT-7000 supports 29.7 to 960 MHz communication with up to three embedded and individual channels, providing the equivalent of three individual radios, in addition to supporting up to two external handheld radios.

PCSO received a grant from the Department of Homeland Security to acquire the radios, and installed them on its three helicopters earlier this summer.

Not only are they compatible with the county’s new 800 MHz system as well as its older VHF system, they “also provide operability for all surrounding agencies,” according to Pinal County radio technician Ryan Brashier.

Pecora said that the air unit’s two full-time and five part-time pilots have appreciated the radios’ simple interface and touchscreen controls. “So far they’ve been real good. The ease of use for the pilots is outstanding,” he said.

PCSO public information officer Navideh Forghani pointed out that the agency also appreciates the fact that the radios are software-defined, making them upgradeable as requirements evolve.

“It’s almost like getting a software update for your iPhone,” she said.



The Pinal County Sheriff's Office installed Cobham RT-7000 radios in its three helicopters, including this Bell OH-58A, earlier this summer. **Skip Robinson Photo**



# Drone consulting service targets law enforcement market

BY ELAN HEAD

**S**mall unmanned aircraft systems (UAS) can be a boon for local law enforcement agencies, helping them conduct search-and-rescue operations, document accident scenes, and perform other aerial missions for which helicopters might be unavailable or cost-prohibitive. However, launching a public safety UAS program can also be daunting, with stakeholders to engage, and state and federal regulations to wade through — to say nothing of selecting and operating the right aircraft for the mission.

A new consulting service, PropelUAS, aims to help law enforcement and other clients navigate these legal and operational complexities to launch their UAS programs efficiently and in full compliance with all applicable regulations. A division of the “human-centered” consulting firm Evans Incorporated, PropelUAS launched in July at the Airborne Law Enforcement Association’s 2017 Expo in Reno, Nevada.

As PropelUAS director Bob Etris explained in a press release, “The law enforcement space has continued to become more sophisticated when it comes to UAS technology and initiatives. We recognize this and see this market particularly as a place

to have an early and impactful effect on the evolution of the UAS industry as a value-added partner and expert going forward.”

PropelUAS senior unmanned systems analyst Andy Osantowski told *Vertical 911* that Evans Incorporated’s history of consulting for government agencies, including the U.S. Federal Aviation Administration, has ideally prepared it for navigating clients through the regulatory maze associated with UAS operations. By additionally focusing on strategy, operations, safety, and risk mitigation, the service aims to help clients develop UAS programs that are as robust and safety-focused as traditional helicopter programs, in much less time than it would take for agencies to set things up themselves.

As an example, Osantowski said, the firm recently assisted a sheriff’s office in the Washington, D.C., metropolitan area with integrating UAS for search operations. The agency had been using a helicopter for these operations, but because it didn’t own the helicopter itself, response time could be delayed. When it came to a UAS program, “they had a mission in mind and a vehicle they wanted to use — and that’s about as far as they got,” he said.

The team behind PropelUAS worked with the agency to analyze its mission and determine the best path forward, with the initial assessment completed within a few

weeks. The agency is now operating its UAS, and has been able to cut its average response time for that mission from 45 minutes to nine, he said.

According to Osantowski, PropelUAS is “technology neutral.” Although the service can refer clients to appropriate hardware providers, “our domain is the regulatory aspect,” he said. He also noted that PropelUAS can also help guide law enforcement agencies through the stakeholder engagement process, which can be crucial in gaining public support for a program. “There’s a lot of [public] concern with surveillance of any type,” he said, recommending that agencies be “incredibly transparent” about their programs and goals.

While UAS can be particularly valuable for agencies that are too small or cash-strapped to afford a traditional aviation program, Osantowski pointed out that current airborne law enforcement operators can also realize efficiencies by integrating UAS into their programs.

“Even just by saving some hours on the helicopter, you can streamline your organization,” he said. For agencies that have experience in aviation, but aren’t fully up to speed on UAS operations, “we can help in bridging that gap.”

# NTSB releases preliminary report for Virginia State Police helicopter crash

**T**he Virginia State Police helicopter that crashed near Charlottesville, Virginia, on Aug. 12 was spinning as it descended into trees, according to a preliminary report issued by the National Transportation Safety Board (NTSB).

The crash killed both of the Virginia State Troopers on board: aviation unit commander Lieutenant H. Jay Cullen, who was piloting the Bell 407; and the observer, Trooper-Pilot Berke M.M. Bates. Cullen and Bates had been tasked with providing continuous video coverage of the public demonstrations occurring in Charlottesville that day.

According to the report, the helicopter arrived over the city shortly after 4 p.m., and remained there for about 40 minutes, until Cullen and Bates were re-tasked to

provide surveillance for Virginia Governor Terry McAuliffe’s motorcade.

“At 1643, the helicopter crew advised the VSP [Virginia State Police] command center that they were heading directly to the motorcade, and were about 30 seconds away,” the report states. “About 1649, another helicopter advised the VSP command center that the accident helicopter had crashed.”

Preliminary radar data indicated that the helicopter was traveling north-northwest at approximately 2,200 feet above sea level before it began to turn to the right and descend rapidly. According to the report, “the preponderance of witness statements reported that the helicopter initially was hovering, began a rolling oscillation, began to spin (rotate about the vertical axis), and then descended in a 45-degree nose-



Public safety helicopters turned out in force in August to honor the memory of Virginia State Troopers Lieutenant H. Jay Cullen and Trooper-Pilot Berke M.M. Bates. **Antonio Gemma More' Photo**

down attitude, while continuing to spin until it was lost from sight below the tops of the surrounding trees.”

The eight-page preliminary report does not indicate a cause for the accident. The NTSB told reporters that the full investigation into the crash is expected to take 12 to 18 months.



A new report recommends that the U.S. Department of Transportation increase data collection and transparency to enhance its oversight of the air medical industry. **Skip Robinson Photo**

# GAO report examines helicopter air ambulance price increases

BY ELAN HEAD

**A** new report from the Government Accountability Office (GAO) highlights recent price increases in the U.S. helicopter air ambulance (HAA) industry, and calls on the Department of Transportation (DOT) to increase data collection and transparency to enhance its oversight of the industry.

The report, issued in July 2017, notes that the median prices charged by HAA providers in the U.S. approximately doubled between 2010 and 2014, from around \$15,000 to about \$30,000 per transport. That's a dramatically higher rate of increase than the 8.5 percent by which the consumer price index grew during the same period.

The price hikes have also coincided with an apparent increase in instances of balance

billing, in which HAA providers bill patients with private health insurance for the difference between the insurer's payment and the price charged (*see p.60, Vertical 911, AMTC 2015*). The GAO's investigation was prompted, in part, by media reports of patients being balance billed for tens of thousands of dollars, with "potentially devastating financial impacts."

As the GAO's report observes, HAA providers, like other medical service providers, receive payments from many sources, often at varying rates. Among these sources are Medicare and Medicaid, which prohibit providers from balance billing patients.

According to the report, average Medicare reimbursement per transport increased only slightly between 2010 and 2014, from \$6,267 to \$6,502. Meanwhile, the payments received from Medicaid and self-insured patients are often lower than those

received from Medicare.

This has led HAA providers to rely on privately insured patients for a disproportionate share of their revenue. The GAO found that the median payment per transport paid by private insurers increased from around \$15,600 in 2010, to \$26,600 in 2014. Seven of the eight HAA providers interviewed by the GAO said that privately insured patients account for a majority of their transport revenue, despite making up a minority (22 to 41 percent) of their overall transports.

The GAO report suggests several possible reasons for the surge in prices. At a fundamental level, the trend has been driven by the fact that the number of medical helicopters in the U.S. has increased substantially over the years (for example, growing from 900 in 2010 to 1,020 in 2014) while the number of transports has not increased



proportionately. This has meant fewer transports per helicopter, and thus fewer opportunities to recoup the high fixed costs of operating each air ambulance.

However, the HAA providers consulted by the GAO offered conflicting explanations for the declining number of transports per helicopter. Representatives from three providers identified a problem with oversaturation in the industry, with helicopters being added to areas with adequate existing coverage. Four other providers told the GAO that helicopters were increasingly being located in rural areas with greater need but less population density, thus dragging down the average number of transports.

The GAO found that “the large independent providers may have higher prices and be less likely to contract with insurers than hospital-affiliated providers.” According to the agency’s report, the three large independent providers it consulted reported average prices charged per transport of over \$40,000 in 2016, while five hospital-affiliated providers reported average prices ranging from around \$13,000 to \$31,000.

The report also notes that the large independent providers “generally do not have contracts with insurers, which, as noted earlier, leaves patients vulnerable to balance billing.” Because the air ambulance industry is covered under the Airline Deregulation Act of 1978, states have been limited in their ability to protect patients from balance billing through legislation.

However, the GAO was unable to determine the prevalence of balance billing in the industry, as “national data on balance billing and on the extent to which providers are contracted with insurers are unavailable.” According to its report, “despite media reports of balance billing, DOT officials note they have received very few air ambulance complaints since 2006, possibly because consumers do not think of DOT as a place to file such complaints.”

Moreover, the GAO was unable to conduct an in-depth analysis of the factors affecting HAA pricing due to a lack of basic industry data, including the costs to provide service; the number of patient transports; and information about HAA providers, including their business model types (independent, hospital-affiliated, or hybrid) and the prices charged.

As part of its investigation, the GAO asked 26 stakeholders — including HAA providers, state officials, and consumer policy and insurance groups — for their views regarding potential federal actions to address air ambulance prices. Stakeholders were sharply divided on two potential actions: Congress modifying the Airline Deregulation Act as it pertains to the air ambulance industry to allow states to have more of an oversight role; and the Centers for Medicare & Medicaid Services raising Medicare reimbursement rates for HAA transports across the board.

However, no stakeholder disagreed with a third potential action: the DOT increasing data collection for investigations, and/or increasing pricing transparency.

The GAO made four recommendations to the Secretary of Transportation:

(1) communicate a method to receive air ambulance complaints, including complaints related to balance billing; (2) take steps to make complaint information publicly available; (3) assess available data and determine what information could assist in the evaluation of future complaints; and (4) consider air ambulance consumer disclosure requirements.

According to the report, the DOT concurred with all but the third recommendation. The GAO maintains that the recommendation is justified, stating, “DOT has discretionary authority to investigate air ambulance providers but to date has not done so. Although collecting consumer complaints will help DOT identify areas for further investigation, further information will help put complaints into the context of the larger industry . . . for DOT to better understand the helicopter air ambulance industry and evaluate whether consumer complaints indicate larger patterns of unfair and deceptive practices.”

In a press release, the Association of Air Medical Services (AAMS) stated, “AAMS fully supports additional transparency and consumer protection actions on the part of the DOT along the lines of the report’s recommendations and is working to improve the industry’s transparency with regard to both costs and quality of care. AAMS and its member companies were pleased to work with the GAO in developing this report and appreciate their efforts in reviewing these issues and providing specific recommendations for addressing them.”

## ROTOR **BITS**

### VIRGINIA BEACH PD PURCHASES NEW MD 530F

**M**D Helicopters, Inc. (MDHI) has announced the purchase of a new, custom-configured MD 530F by the Virginia Beach Police Department Aviation Unit. This will be the first MD Helicopters aircraft to join the Virginia Beach Police Department since its Helicopter Operations Unit was established.

“The MD 530F is an exceptional aircraft for law enforcement operations,” said Andy Pillado, vice president, commercial and military sales and marketing for MD Helicopters. “More than just a force multiplier, this aircraft is an affordable, powerful performer that delivers reliability and increased mission versatility.”

Virginia Beach, the most populous city in Virginia, covers 310 square miles and boasts a population of 450,000. The Helicopter Operations Unit provides police aviation resources seven days a week from 7 a.m. to 3 a.m., supporting ground units in the execution of air patrol, search-and-rescue, surveillance, as well as crime scene and damage assessment. Operated by a two-person flight crew, the unit also provides assistance in dignitary transports and Project Lifesaver support as needed.

The Virginia Beach Police right-hand command MD 530F will feature the Rolls-Royce 250-C30 650shp turbine engine, extended landing gear, Fargo 21 gallon auxiliary fuel tank, and wire strike protection system. High-contrast main rotor blades, a FLIR Star Safire 380HDc electro-optic/infrared system, a new TrakkaBeam A800 searchlight, and an NVIS interior will provide enhanced visibility for both officers and citizens during low-light operations.

The all-glass cockpit features the Garmin 500H EFIS flight display, Garmin GTN650H touchscreen GPS/Navigation and communications panel, Garmin GMA 350H audio panel, Howell Instruments Engine Instruments Display, Technisonic TDFM 9300 and Garmin GTR 225 multi-band airborne radios, and Churchill ARS-600 airborne mapping system.

“It is truly an honor to be joining the Virginia Beach Police Department family,” Pillado stated. “We are excited about the role this aircraft will play in protecting the citizens of Virginia Beach, and look forward to a long and growing relationship.”

MD Helicopters plans to deliver the new MD 530F in the second quarter of 2018.

# Building a TEAAM

BY LISA GORDON



From left: Jordan Lawrence, Dr. Greg Haljan, Paul Windsor and Miles Randell were at the 2017 Abbotsford International Airshow to promote TEAAM, a new helicopter emergency medical service that will be based in Squamish, British Columbia. In collaboration with Blackcomb Helicopters, the organization aims to deliver advanced medical care to patients in remote sites that are beyond the mandate of the province's current air medical providers. **Lisa Gordon Photo**

**I**t's late in the afternoon when a worker at a remote mining operation 120 kilometers northwest of Squamish, British Columbia, goes into cardiac arrest.

The mine is isolated; the supervisor calls for help, but a BC Ambulance Service (BCAS) ground vehicle will take more than two hours to navigate the rough terrain before arriving at the site.

A helicopter dispatch is unlikely, simply because the mandate of the BCAS prevents its aerial emergency responders from landing at remote, unprepared locations.

The worker's only hope for a speedy evacuation lies with a volunteer helicopter search-and-rescue (SAR) organization, which would then be required to transfer the patient into the care of a BCAS air ambulance or land-based unit for delivery to the appropriate medical facility.

But while these organizations provide a dependable service in the province, they, too, are not mandated to respond to isolated worksites.

The patient in this fictional scenario has little chance of survival. Waiting two hours for a land ambulance while in cardiac

arrest is a story that is unlikely to have a happy ending.

It's this type of situation that is highlighted in a February 2017 report from the B.C. Forest Safety Ombudsman, Roger Harris.

The document, titled *Will It Be There – A Report on Helicopter Emergency Medical Services (HEMS) in BC*, delivers a critical analysis of the province's emergency helicopter response capability and takes the position that the location of an injured worker — or indeed, any citizen — should not impact the timeliness and quality of emergency medical attention they receive.

In fact, the report found that HEMS service in B.C. is inferior when compared to other jurisdictions with similar geography, such as Washington State or Alaska, where 99 percent of the population is within a 60-minute response time to a Level 3 trauma center.

The Ombudsman's findings are no surprise to Miles Randell and Paul Windsor.

Both are long-time experienced paramedics with BCAS. In January 2017, just a month before the report was released, the two men decided to collaborate on the creation of a not-for-profit entity that would deliver advanced medical care to patients located in British Columbia's most isolated regions.

"We realized we needed to go out on our own, create our own society, and prove the need was there," Randell told *Vertical 911* during an interview at the 2017 Abbotsford International Airshow.

## A TEAAM IS BORN

Randell and Windsor approached Blackcomb Helicopters in the town of Squamish, where they planned to base their new response unit.

Immediately, Blackcomb management saw the vision behind the paramedics' proposal and agreed to support the founding of Technical Evacuation Advanced Aero Medical, or TEAAM.

"They were so interested in the program that they jumped in with both feet and have done everything they can to support us," said Randell, who is president of the new organization.

Windsor, TEAAM's vice president, agreed. "They've gone above and beyond to help us, providing training and hoisting expertise, and donating flight time for training and for the promo video we shot."

Randell acknowledged that TEAAM's founding comes at an opportune time, when the

province's Forest Safety Ombudsman has focused public attention on the provision of HEMS in British Columbia.

The new service will be getting off the ground thanks to a number of significant industry partnerships.

"We're getting pretty solid financial support from the energy sector," confirmed Randell. "We're also building support in the forestry and marine sectors and approaching the provincial government for funding as well. We would like to build it like a P3 model, so 33 percent corporate [revenue], 33 percent government, 33 percent donations."

He said it will cost about \$2.5 million annually to provide one dedicated on-call aircraft, a Blackcomb Helicopters Airbus EC135 T2+. The helicopter is equipped with the latest advanced life support medical care equipment, including hoist and long-line capability.

"Air ambulance and volunteer SAR both do a fantastic job, but they're not equipped to get to those remote settings where a helicopter can't set down," said Randell. "Our goal is to get there, provide that advanced medical care, and then transport the patient to air ambulance or, with permission, to a medical facility."

Randell and Windsor anticipate that most calls for help will originate from the area northwest of Squamish — a remote section of the province that is home to many resource development operations. However, they will also conduct marine operations for industry partners operating in the straits between the British Columbia mainland and Vancouver Island.

The TEAAM concept has been attracting a lot of attention, including from Royal Canadian Air Force (RCAF) search-and-rescue technicians, several of whom visited the organization's display at the Abbotsford Airshow. Although the model is different from the public service provided by the RCAF, everyone sees the business case.

There's no doubt that Randell and Windsor are passionate about TEAAM.

"We're so excited!" said Windsor, shouting over the noise of an aircraft flying overhead at Abbotsford. "Now, people in remote settings and workers will get advanced care and top of the line technology to patient-side quickly and efficiently, where it just doesn't happen today."

"That's what drives us to do this. We can save lives."



## First civil customer NOLAS takes delivery of H135 with Helionix

**T**he Norwegian air ambulance operator Norsk Luftambulanse AS (NOLAS) is the first civil customer to receive an Airbus H135 equipped with Helionix. Six additional H135s with Helionix will be delivered to NOLAS in 2017 and 2018. In December 2016, the U.K. Ministry of Defence was the first military customer to receive the new H135 with Helionix.

NOLAS won a national helicopter emergency medical services (HEMS) tender in Norway in 2016, and a total of 12 bases and 17 new helicopters will be operated from June 1, 2018. All helicopters are equipped for 24/7 operations with state-of-the-art configuration for single pilot instrument flight rules/night vision imaging system operation, Aerolite interiors and the latest medical equipment. With a specially trained anesthesiologist, a pilot and a HEMS crew member, and a specially configured helicopter, NOLAS will conduct on-scene missions as well as advanced intensive care transportation in the demanding environment of Norway.

The H135 obtained European Aviation Safety Agency certification for the Helionix avionics suite in November 2016. Designed by Airbus, Helionix is a family concept with standardized features and is already available on the H175 and H145.


On top of the four-axis autopilot, Helionix offers an innovative cockpit layout intended to increase situational awareness. Designed with three large electronic displays on the H135, the cockpit is night vision goggle-compatible and includes a first limit indicator, which highlights the appropriate engine instrument data for the pilot in one indicator.

"In demanding environments and under almost all kind of weather challenges, it is great to have the support of the new technological developments that the Helionix version can offer," said NOLAS CEO Rune Midtgaard. "It reduces the pilot workload, increases the safety of the operation and in the end the ability to reach the patients in need of the advanced medical support the service can offer."

"We are proud that NOLAS trusts our helicopter and the Helionix suite for their challenging missions," said Martin Schneider, head of the H135 program.




Norsk Luftambulanse AS is the first civil customer to receive the new Helionix-equipped version of the H135. **Airbus Helicopters Photo**



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Airlift Northwest is celebrating 35 years of air ambulance operations this year.  
**Skip Robinson Photo**

# Airlift Northwest celebrates 35 years of saving lives

BY SKIP ROBINSON

**W**ith 35 years of operations now under its belt, the Seattle, Washington-based air ambulance operator Airlift Northwest continues to innovate to safely transport patients throughout the Pacific Northwest and Alaska.

Airlift Northwest's story started in 1982, prompted by a remote house fire that claimed the lives of three children in Sitka, Alaska. This tragic event profoundly impacted Dr. Michael Copass, then the director of emergency services at Harborview Medical Center in Seattle, who organized Airlift Northwest to address the region's urgent need for airborne critical care (*see p.104, Vertical, Oct-Nov 2015*).

Airlift Northwest's first official transport took place on March 17, 1982, using a Piper Cheyenne turboprop. The program began helicopter operations in 1985, soon settling on the Agusta A109 Mk.II as its standard platform.

In 2005, the program transitioned to the newer and more powerful AgustaWestland (now Leonardo Helicopters) A109E Power. In

2009, it transitioned again to a fleet of four Eurocopter (now Airbus Helicopters) EC135 aircraft, retaining one A109E Power in its fleet. The helicopters are operated for Airlift Northwest by Air Methods Corp., which also provides the pilots and mechanics.

On the fixed-wing side, Airlift Northwest contracts with Aero Air, LLC, for the operation of two Learjet 31As and two Pilatus PC-12s. These aircraft allow Airlift Northwest to fly in inclement weather conditions that prohibit helicopter flights, and can accommodate larger patients as well as transport family members when necessary. The Learjet and Pilatus based in Juneau, Alaska, provide Airlift Northwest with the ability to reach virtually every airport in the state, giving remote patients faster access to life-saving critical care.

In addition to its Juneau base, Airlift Northwest now operates from five bases in Washington state: Seattle, Arlington, Bellingham, Olympia, and its newest base on the east side of the Cascade Mountains in Yakima. Since opening in 2015, the Yakima base has significantly expanded Airlift Northwest's coverage to the east. Continuing its growth, Airlift plans to open a new rotary-wing base this fall in

Bremerton, providing care for the communities of the Olympic Peninsula.

Fully accredited by the Commission on Accreditation of Medical Transport Systems (CAMTS), Airlift Northwest operates 24 hours a day, seven days a week, 365 days a year, providing life-saving care for all of the communities within its operational area. Each flight is conducted with two critical care flight nurses trained to the highest level, backed up by trauma and emergency room physicians offering guidance and expertise on each case.

Airlift Northwest has partnered with Harborview Medical Center to form an adult specialty team, and with Seattle Children's Hospital to provide critical care and expertise to neonatal and fragile pediatric patients. Recently, Airlift Northwest has added both blood and plasma onboard all its Washington-based aircraft, and is working on adding both to the aircraft at its Alaska base.

Thirty-five years is a long time in the helicopter air ambulance industry, which isn't much older than that itself. As it looks to the future, Airlift Northwest appears to be well positioned to continue to provide efficient, quality care for decades to come.



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# PS Engineering targets helicopter operators with groundbreaking audio control system

**BY OLIVER JOHNSON**

**P**S Engineering has received a technical standard order authorization (TSOA) from the Federal Aviation Administration for its PAC45 audio control system, which allows users to place up to six radio channels in unique audio positions in a stereo headset through its patented MultiTalker technology.

Established by CEO Mark Scheuer in 1985, PS Engineering has built a solid reputation as one of the leading providers in audio controllers in the fixed-wing industry, but has remained relatively unknown among those working solely in the rotary-wing world. It hopes the debut of the PAC45 will change all that.

"In my opinion, PS Engineering has led almost all of the innovations in audio controllers since 1985," said Scheuer. "The reason we are as successful as we are today is because we innovate; and it's not just for the invention itself, but it's to solve problems in the cockpit when it comes to communications."

The company's legacy includes five patents and claims for over a dozen marketplace firsts, including being the first to provide digital recording of aircraft radio in 1992.

According to Scheuer, the DZUS-mounted PAC45 was designed with special mission aircraft in mind, with its True Dimensional

Sound technology — known as MultiTalker — allowing users to place audio channels in up to nine three-dimensional positions, making it easier to pick up the most relevant thread of audio at any given time.

For example, one channel will sound like it is being projected at the pilot's 10 o'clock position, another from directly in front, and another from their 2 o'clock. The position of the radios is set by a front panel control.

The effect, achievable through digital signal processing, was developed by Wright Patterson Air Force Base — and PS Engineering now has exclusive use of its patent.

"MultiTalker will absolutely change the paradigm on how pilots listen to their radios," said Scheuer. "We have been very successful using this in fixed-wing [aircraft], and now this is our time to make it available for rotor-wing and special missions aircraft."

Scheuer brought a demonstrator model with him to Dallas during the company's first appearance at a HAI Heli-Expo earlier this year, and said the response was hugely encouraging.

Using stereo headphones, visitors to his stand were able to hear six audio channels, including air traffic control and various emergency services, all at the same time and same volume.

"Then I would turn MultiTalker [technology]



The first installation of PS Engineering's PAC45 was performed by Complete Avionics in an EC135. **PS Engineering Photo**

on, and every single pilot that listened to it thought it was amazing," said Scheuer. "We even had a pilot who started looking around, turning left and right."

In addition to the MultiTalker technology, the PAC45 audio panel has built-in Bluetooth, and is pin-compatible with the NAT AMS series.

Australian company Complete Avionics recently completed the first installation of a PAC45 in a helicopter — an Airbus EC135 — and Bell Helicopter has just signed an order for several PAC45s for customers, said Scheuer.

After spending so long focusing on the fixed-wing market, Scheuer said PS Engineering is now ready to enter the helicopter market with a splash.

"This is an amazing marketplace to bring this technology to, so it's a real natural next step for us," he said.

# Med-Pac debuts new stretcher model

**BY HILARY ROMIG**

**M**ed-Pac, Inc., known for its medical supply products for air ambulance operators, has designed a new and improved stretcher, the Med-Pac Pro. Like its predecessor, the Med-Pac 400, the Med-Pac Pro stretcher can be installed on the Bell 429. The model 400 series is also approved for the Bell 212 and 412 helicopters. The Med-Pac Pro is awaiting FAA [Federal Aviation Administration] approval on the Hawker Beechcraft 200 and 300 series.

"Our Med-Pac Pro has been approved by

the FAA," said Ralph Braaten of Med-Pac, Inc. "It is a multi-purpose medical unit and is smaller than past products." With more oxygen components and dual inverters, the new Pro unit stands out from previous models due to its convenience and size. Though smaller, the installation and fit remain similar to the 400 model.

As of now, the company has products that have been approved for Bell 206 L3, 429, 212 and 412 helicopters. Braaten said that as demand continues to increase, Med-Pac, Inc. will be equipping more aircraft with its medical products.

In addition, he said, the company has a few other products lined up that will be debuted once officially approved. These include a cabinet with extra doors and drawers for storage that can be used to complement the Med-Pac Pro.

The Med-Pac Pro allows air ambulance operators to have more space within the cabin without compromising safety.

**Med-Pac Photo**







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# Bell completes build of V-280 Valor prototype

**B**ell Helicopter has completed the build process on the prototype V-280 Valor, and the program team is now preparing for initial ground run at its Amarillo Assembly Center in Texas, the company has announced.

The “third-generation” tiltrotor is Bell’s submission for the U.S. Army’s Joint Multi-Role Technology Demonstrator (JMR-TD) program, a precursor to the Future Vertical Lift (FVL) program to identify a replacement for the service’s existing medium-lift helicopter fleet of Sikorsky UH-60 Black Hawks and Boeing AH-64 Apaches.

The Valor will be joined by the Sikorsky-Boeing SB-1 Defiant — a high-speed rigid rotor coaxial rotorcraft that utilizes Sikorsky’s X2 technology — in competition for the program. The Army’s requirements for the demonstrator call for hot and high hover performance (at 6,000 feet and 95 F), and the ability to self-deploy 2,100 nautical miles at a speed of at least 230 knots.



Bell announced in early September that it had completed assembly of the prototype V-280 Valor. **Bell Helicopter Photo**

Powered by two 5,000-horsepower General Electric T64-GE-419 engines, the V-280 has a triple-redundant fly-by-wire control system, and is designed to carry two pilots, two crew chiefs, and 11 to 14 passengers at a cruise speed of 280 knots and a combat range of 500 to 800 nautical miles.

“This is a clean sheet tiltrotor, applying lessons learned from previous generations of tiltrotor to create groundbreaking simplicity and deliver transformational, affordable technology to alter the course of

vertical flight,” Bell stated in a media alert announcing the completion of the build process. “We remain focused on providing exceptional flexibility in an advanced aircraft with reduced weight, complexity, and cost that offers the military unmatched range, speed and payload capabilities on the battlefield.”

Bell said it will release further updates on the program shortly, with the prototype scheduled for a first flight this fall.

# Unitech delivers next-gen weapons pylon for U.S. Army Black Hawk



**Unitech Photo**

**U**nitech Composites — a Unitech Aerospace company and leading supplier of complex composite laminates, components and assemblies for the commercial aerospace and defense industry — delivered the first production shipset of Multi-Station Lightweight Armament Support Structure (MLASS) wings for use on the U.S. Army’s MH-60M aircraft.

This is the first of nine shipsets that will be delivered to the U.S. Army Special Operations Forces Support Activity (SOFSA). The U.S. Special Operations Forces (SOF)

already deploy Unitech’s Lightweight Armament Support Structure (LASS), a single-station weapons pylon for the MH-60.

Unitech’s MLASS is a lightweight, corrosion resistant direct replacement for the External Stores Support System (ESSS). MLASS and LASS weapons stores interface with standard military bomb ejector racks and support a variety of weapons configurations including the M230 30 millimeter cannon, M261 rocket launcher and M299 missile launcher.

A fully configured set of MLASS wings is 270 pounds lighter, has better center-of-gravity and drag characteristics and is quicker and easier to install than a set of standard ESSS wings, the company stated.

“Thanks to MLASS, our nation’s warfighters no longer have to choose between having more fuel or having more ammo — they can have both,” said Dan Kinney, military programs business development

manager for Unitech Composites.

“We are also excited about this product because it enables the venerable Black Hawk to be a true multi-role aircraft, which we think will resonate well with many UH-60 operators.”

Unitech currently offers LASS and MLASS as off-the-shelf solutions for UH-60A/L/M Black Hawk models as well as S-70 aircraft to U.S. and international customers. Additionally, the company is skilled at converting components and systems to composites and works with customers to develop customized solutions that enhance aircraft capability and performance.

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# *Helping After*

# H A R V E Y

Four U.S. Coast Guard air crewmembers reflect on their rescue operations in the aftermath of Hurricane Harvey.

**Interviewed by Skip Robinson | Photos Courtesy of USCG**





Christopher Ebdon Photo



Hurricane Harvey made landfall on the Texas coast as a Category 4 hurricane on Aug. 25, dropping as much as 50 inches (127 centimeters) of rainfall in southeast Texas and southwest Louisiana. As flooding devastated neighborhoods in Houston and surrounding areas, U.S. Coast Guard (USCG) helicopter crews responded in force. We spoke with four of the Coast Guard personnel who helped rescue Harvey flood victims: pilot Lieutenant Commander Joe Heal, who is normally stationed at Air Station San Francisco Forward Operating Base Point Mugu; Lieutenant Daniel Crowley, assistant operations officer at Air Station Houston; and pilot Lieutenant Amanda Montour and aviation survival technician Daniel Strange, both of Air Station Houston.



Pilot Lieutenant Commander Joe Heal, left, responded to Harvey from Air Station San Francisco Forward Operating Base Point Mugu, while Lieutenant Daniel Crowley is based at Air Station Houston. Over two days of rescue operations, Heal assisted 18 people and two pets. Crowley, who also serves as the standardization officer for Air Station Houston, took part in 13 rescues.



Aviation survival technician Daniel Strange, left, and pilot Lieutenant Amanda Montour are both stationed at Air Station Houston. Montour's crew was responsible for over 20 lives saved or assisted in the aftermath of Hurricane Harvey, while Strange personally conducted 13 rescues.



**Vertical 911: How did the call come to deploy for Harvey rescue operations?**

**LCDR Joe Heal:** As I'm sure many of us were, I was following the events in southeast Texas very closely, and was surprised by how quickly the storm increased in strength. Before the storm hit, USCG Air Station Houston had requested several extra crews and helicopters from units such as San Diego, but the intense and continuous rainfall required even more support. I had dropped my kids off at their first day of school on Monday morning when the text from my commanding officer arrived, directing me and four fellow aircrew to immediately deploy to the Coast Guard Aviation Training Center in Mobile, Alabama, for further transportation to Houston.

We were made up of two pilots, two flight mechanics, and one rescue swimmer. The five of us gathered our gear — the four of them up in San Francisco and myself down in Los Angeles — and flew commercial air to Mobile Regional Airport. Tuesday found us together in a C-144 Ocean Sentry heading west to Houston through the storm. We dodged a couple heavy rain bands but made it to Houston safely, where we spent the remainder of the day checking in and getting briefed on local operations and hazards. Early Wednesday morning we were all strapping into different aircraft and heading out to assist.

**LT Amanda Montour:** I was attending our annual emergency procedure refresher and instrument procedures check course at the Coast Guard Aviation Training Center in Mobile the week prior to Harvey arriving in Houston. I made arrangements to leave Mobile a couple days early to ensure that I could be back before the storm hit. We made arrangements for my wife, Lyndsay, to evacuate to Austin, Texas, with our two dogs: Dash and Bella. I arrived back in Houston Thursday evening, just in time to help Lyndsay pack up the dogs and the car in order to head to Austin Friday morning. Throughout the remainder of the day Friday, I

made sure all of my gear was packed with a week's worth of clothes, food, and other necessities in case I needed to ride out the storm at the air station.

**V911: A great thing about the USCG is the standardization of flight crew training. You can take any pilot, co-pilot, flight mechanic, and rescue swimmer and put them into an aircraft together thanks to standardized procedures. How did this play out during Harvey rescue operations?**

**Heal:** That is definitely something that the Coast Guard does exceptionally well — training to and enforcing a certain standard. Standardized procedures allow us to quickly assimilate into new commands when we transition from one unit to another every four years or so, but it also allows us to easily operate with any pilot, flight mechanic, rescue swimmer, or basic aircrew in any situation for which we are qualified.

To illustrate this point, I flew nearly every day between Aug. 30 and Sept. 9, and never flew with any of the four I had deployed with from San Francisco. The officers running the operations department were not hampered by originating unit, matching crew rest and balancing qualifications to construct their flight schedule. Standardization enabled the schedulers to assign crews from locations as diverse as Hawaii, Alaska, the Great Lakes, and Southern California, who then flew together easily and safely.

**LT Daniel Crowley:** As the standardization officer of Air Station Houston, one of the things I was most proud of was that I felt zero trepidation knowing even our most junior qualified aircrew were heading out to perform the mission in some of the most complex and challenging conditions imaginable. Our incredible instructors and an aggressive training program have prepared our aircrew to safely manage risk in any scenario and they proved it that week.





**Montour:** Coast Guard standardization eliminates a lot of the "spool up" time it would take people that are meeting for the first time to execute the mission safely. There really isn't a need to "feel" someone out to figure out how they do things because in the most critical phases of flight — takeoff, landing, precision hovering, and hoisting — all phraseology and profiles are standard. This baseline of standards for airspeeds, altitudes, and order of operations makes it very apparent when a crew member has deviated and begs a challenge from either the other pilot, flight mechanic, or rescue swimmer. In response, Coasties are used to these challenges and rarely feel their pride is being attacked while flying. This keeps the egos in check and correctly prioritizes safety above all else.

**V911: Daniel, as a rescue swimmer, how did you feel about going onto the roofs of homes? What extra, nonstandard equipment did you carry, and what precautions did you take for going into contaminated water?**

**AST1 Daniel Strange:** In every rescue swimmer shop, we train for as many different types of situations as possible. In Houston, we do training with local fire departments on roof entry and safety. It was most definitely different deploying out of the helicopter while carrying an axe or a chainsaw. As new rescue swimmers began to show up to the air station to help out, we made sure that everybody got a quick training session on operating the equipment and what hazards to watch out for.

As for deploying into the contaminated water, it was a risk that all of us were willing to take. During my rescues, I spent most of my time wading through the water. I mainly focused on the hazards that I could see and tried to avoid them as much as possible: fire ants, fuel slicks, debris, sharp objects, animals, etc. In addition, medical had our flight surgeon and corpsmen at the base just in

case any health problems came up. And of course, we all made sure to get a good shower, clean any scratches or bites and clean off all of our gear when we got back.

**V911: Did you fly rescues at night?**

**Crowley:** We flew at night but we tried to be discriminating. The risk was high at all times, but it was especially high at night. No crew is going to want to come back when there are still cases of distress coming in, but there were times where the gain was not commensurate with the risk of hoisting through obstacles at night when there were surface alternatives available to conduct the rescue. The low cloud layers and cultural lighting also created an odd phenomenon. Often this combination creates very favorable conditions for NVGs [night vision goggles]. However, the clouds were so low that the goggles tended to de-gain significantly from the cultural lighting that was reflecting off of the clouds. Most of the SAR [search-and-rescue] cases were in areas without power and virtually no cultural lighting. When the lighted clouds remained in the field of view the goggles remained degained, making unlit towers *extremely* treacherous.

**Strange:** I did end up flying at night but had not planned on it. We had just picked up our last of at least 20 survivors off of a roof and decided to continue searching, since we still had 30 minutes of fuel left. After only a few minutes, we saw two people standing in the middle of a cul-da-sac in almost chest high water waving a towel at us. I was deployed to the street and waded over to them. While talking to them other people started coming out of their flooded houses asking for assistance. During that time, the helo radioed down to me telling me that they only had a couple minutes of fuel left.

We decided to hoist the two people that originally flagged us down, they ended up being two young teenagers that had







been separated from their family. I put both of them in the rescue basket and decided that I would stay behind and start going house to house on the street checking on everybody while the helo went to refuel. As the helo was gone it started getting dark. I found a house that had 11 people (consisting of two adult females and nine children) who had no food or water. By the time the helo got back the sun had completely set. They radioed down that they only had enough fuel to do a few hoists. I told them of the 11 survivors but that we could do it in three hoists. Somehow, we were able to fit 15 people including the crew into the MH-65D helicopter. One thing that stuck with me was when I was being hoisted back up to the helo, I looked around and saw so many spotlights being shone into the sky from so many of the houses below.

**V911: Normally you work over the ocean without many obstacles. What were your thoughts about working over city and urban overland environments?**

**Crowley:** It's a completely different animal. Many of our normal habits and safeguards are obsolete in the overland environment. Real-time risk management was crucial. Being stationed in the area, I was familiar with many of the potential obstacles. When I briefed incoming crews I really tried to emphasize that this would be one of the most challenging areas they would ever operate in, particularly at night. There are a lot of towers in the Houston area, many as high as 2,000 feet. After the storm, some were without power and thus unlit, which added to the hazard. That was what made me the most nervous through the aftermath of the storm: crews unfamiliar with the area conducting rescues over land at night. The gain was definitely worth the risk, but I do feel like we are fortunate we got through unscathed. It's a testament to those crews.

**Montour:** At Air Station Houston, we continually try to find things that are different and spend a week of focused training

toward. Ironically, one of the "Focus on Proficiency" topics we did in the past revolved around confined area landings and urban search-and-rescue; meaning, we hoisted from cars, trees, or structures while conducting landing zone touch-and-go's around Houston. For me, as a more junior pilot, that was the only experience I had to fall back on when responding to Harvey in the Houston area. Towers, power lines, and other aircraft were constant threats to operations. We were able to mitigate these close by hazards with good crew resource management, communication, and the best pilots, flight mechanics, and rescue swimmers in the business.

**V911: How did you deconflict with other rescue helicopter crews in the area, including Army, Navy, and Air Force crews?**

**Heal:** The short answer is we used see-and-avoid. When I started flying on Wednesday, the larger Houston airports were up and running, though a TFR [temporary flight restriction] kept much of the general aviation traffic away. However, when we diverted east into the tropical storm to assist Beaumont and Port Arthur, the two airports there were closed. I tried to reach tower a few times, but when I realized no one was answering I focused on the airspace in my immediate area and directed my crew to keep a close lookout for anyone that might be a factor. Some helos were better than others about making traffic calls on the tower frequency, but honestly the comms and airspace were so saturated that position reports didn't help much.

**V911: What were the environmental conditions during your operations, and how did they compare to what you would normally fly in?**

**Crowley:** The weather conditions were easily the worst I have ever flown in. Winds consistently above 25 knots gusting





as high as 50 from seemingly random directions. I saw the worst downdrafts I have ever encountered. We would establish a hover with what we anticipated was an ample power margin. However, even with a 20 percent margin the downdrafts and gusts would create momentary excursions right to our maximum torque limit.

On our first morning flying we completed a SAR case and were low on fuel. A large rain squall developed in front of our only path back to the Air Station. Visibility was no more than a quarter-mile. We could have diverted to a different airfield, but our crew was approaching our daily flight time limit, which meant that if the transit to another airfield took too long, we — and more importantly the aircraft — would be stuck there until we got a fresh crew. Being familiar with the area, I knew we could safely pick our way back to Ellington as long as we could maintain that quarter-mile, which is exactly what we did. It's not something I would try on any other day, but by doing so that aircraft was rearmed with a new crew and able to get back out on SAR in minutes instead of hours.

**V911:** *We saw you also rescued dogs and cats. How did that feel, and what were the rules on doing it?*

**Strange:** When it comes to rescuing dogs or cats, for me it depends on how many animals there are, how they are behaving, and their size. I had to tell two people that I couldn't take their dogs because they had eight of them, so they decided to stay behind. But I also hoisted a couple of small dogs in the basket with their owners. It all depends on the situation.

**Heal:** Policy states that the rescue of pets is at the discretion of the pilot-in-command, and that it is allowed only if it can be done without the pet becoming a hazard to others in the aircraft. I would not want to put my crew at risk to rescue an animal, but I think most of us would choose to do what they could to recover the

pets safely if possible. My crew rescued two pets. We all felt good about rescuing the animals — these rescues were a bright spot in an otherwise sobering day.

**V911:** *Now that the operations are over, what are your thoughts on helping Americans in their worst of times?*

**Heal:** First, I want to thank the others who would have gone in a heartbeat, but stayed back and stood extra duty for those of us who went. Second, I want to express my admiration for the members of CG Air Station Houston. These men and women were themselves affected by Harvey — many were retrieved or rescued by their shipmates from their own flooded homes and neighborhoods — and they all worked incredibly long hours for days on end to serve others in need.

Last, I'd like to say how proud I was to see and hear of the many residents, volunteers, and local first responders who came together during and after the storm to help each other. It was pretty incredible to fly over these small towns and see neighborhood after neighborhood canvassed by small boats, trucks, and volunteers, all helping each other to safety.

**Crowley:** Twelve years ago, while still in the Navy, I flew rescues in the aftermath of Hurricane Katrina. The opportunity to assist in some way in the wake of that disaster was one of the most impactful events of my naval service and is a major reason why I applied for the direct commission transition to the Coast Guard a few years later. It's crazy to think how that decision put me in a position to assist during Harvey. You never want to see this type of devastation and distress anywhere, but it affects you even more when it happens to your neighbors in a place you've called home for the past three years. I'm just grateful we were able to help.

*These interviews have been edited and condensed.*







Senior Airman Austin Hellweg, 129<sup>th</sup> Rescue Squadron special missions aviator, carries a dog and leads a family into an HH-60 Pavehawk for extraction to a safer location during the relief effort for Hurricane Harvey, Aug. 31 in Beaumont, Texas. **USAF SSGT Jordan Castelan Photo**



A Pararescueman from the 38<sup>th</sup> Rescue Squadron carries a basket to help move an evacuee in the Houston area on Aug. 30. **USAF TSGT Zachary Wolf Photo**

South Carolina Helicopter Aquatic Rescue Team Delta operates over Port Arthur, Texas, Aug. 31. **ANG SSGT Daniel J. Martinez Photo**



Sailors and Marines support Hurricane Irma relief efforts in the U.S. Virgin Islands, Sept. 11. **U.S. Navy MC2 Rawad Madanat Photo**



A Customs and Border Protection (CBP) Black Hawk crew rescues flooding victims in Port Arthur, Texas, in the wake of Hurricane Harvey.  
**Edwin Montufar Photos**



CBP officers load bottled water for distribution in the aftermath of Hurricane Harvey. **Will Graham Photo**



CHI Aviation provided a Sikorsky S-61N to Air Methods to support Hurricane Harvey relief efforts in the Houston area. **CHI Photo**





Naval Aircrewman (Helicopter) 2nd Class Logan Parkinson, assigned to Helicopter Sea Combat Squadron (HSC) 22, prepares a patient's family for evacuation during relief efforts in the wake of Hurricane Maria in the U.S. Virgin Islands, Sept. 21. **U.S. Navy MC3 Livingston Lewis Photo**

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# Still Going **STRONG**

With new aircraft and a new operations partner, University of Utah AirMed sees a bright future as it moves into its fifth decade of service.

**Story & Photos by Dan Megna**





Dusk falls over downtown Salt Lake City as a Bell 407GX, operated by University of Utah Health Care's AirMed program, approaches the rooftop helipad at the University of Utah Hospital.



Download this as  
a wallpaper [here!](#)





Flight paramedic Bryson Westbrook and flight nurse Brian Simpson unloading a patient at the UUHC rooftop helipad.

No state in the union can match Utah for its remarkable geographic diversity. In the west, the Great Basin encompasses nearly half of the state. It's sparsely inhabited with vast arid deserts, expansive salt flats and rolling sand dunes.

To the east, high desert landscapes and magnificent red sandstone formations are home to iconic outdoor adventure destinations like Moab, the Colorado River and Utah's "Mighty Five" national parks. Bisecting the state are the Wasatch Mountains. Their peaks tower to over 11,000 feet, providing year-round recreation and what's touted as "the greatest snow on earth."

Of Utah's three million inhabitants, most are concentrated throughout a swelling urban metropolis emanating from the state capital, Salt Lake City (SLC). In recent decades, Utah has experienced tremendous growth, earning a reputation as one of the best states for business. In fact, in 2016, Utah owned the distinction of being the fastest-growing state in the country. As a result, there has been considerable residential and commercial development along a 120-mile Interstate corridor extending north and south from SLC.

Beyond the growing metropolis, large ranches and small rural communities dot the landscape, separated by large swathes of public lands, extending for hundreds of miles in every direction.

The geography of the state presents tremendous challenges to those responsible for medical care throughout the region, and in particular, for those living and recreating far beyond the urban emergency medical services (EMS) catchment areas.

### A TRADITION OF SERVICE

Since first opening its doors in 1965, University of Utah Health Care (UUHC) has been a leader in innovating solutions for these challenges and advancing medical services, not only for residents of Utah, but for neighboring states as well.

One such solution was launched in June 1978, when UUHC embarked on what was, at the time, a relatively new business model: utilizing aircraft to facilitate patient transport. The AirMed program was established initially in partnership with Key Airlines — a small regional commuter and charter company based in Idaho — becoming only the seventh such program in the country.





With perhaps the largest geographical EMS catchment area of any air medical program in the nation, AirMed routinely transports patients from not only their home state of Utah, but also Colorado, Wyoming, Nevada, Montana and Idaho.



From left, a light moment with flight respiratory therapist Cory Thompson, flight nurse Melanie Thelin, pilot Chris Mackle and flight nurse Windi Bray.

In 1985, Englewood, Colorado-based Air Methods assumed operation of the fleet. Over the next three decades, the partnership thrived, with the operator and UUHC together developing infrastructure for improving service and expanding coverage.

From its inception, AirMed was brand loyal to Bell Helicopters. Over the years, the program operated light single-engine Bell 206s, and more recently 407s, for most day-to-day missions. Bell medium twins — a Bell 222 and later a 430 — were acquired for missions requiring heavier loading or longer distances. As the program grew, it also brought aboard a pair of Pilatus PC-12/45 fixed-wing aircraft for long hauls and instrument flight rules (IFR) missions.

In 2011, AirMed began evaluating aircraft to replace its aging Bell 430. After careful consideration of a handful of twin-engine aircraft, including the Bell 429, the longstanding loyalty to Bell ended. Instead, the program chose the Eurocopter (now Airbus Helicopters) EC145 as the aircraft most capable of meeting its requirements for cabin size, performance and capabilities.

“The EC145 has been a great aircraft,” said Jason Brown, who joined AirMed in 2000 as a pilot with Air Methods and was



Thelin, Thompson and Bray load a neonatal transport incubator aboard the EC145.



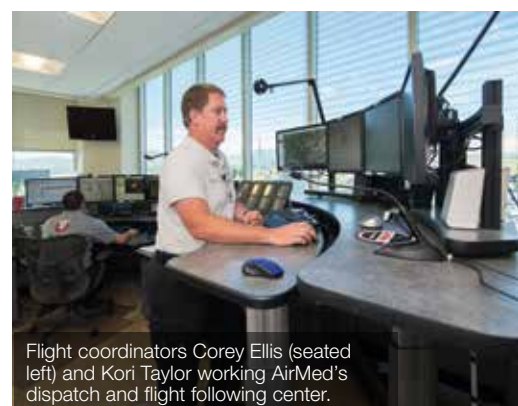
AirMed's EC145 was acquired in 2012 to replace an aging Bell 430. The primary missions for the EC145 are high-risk obstetric and neonatal cases.



From left, pilot Jake Bass, flight paramedic Jesse Lang, flight nurse Judy Maas, pilot John Matthews, flight nurse Lisa Brasher, and flight paramedic Wade Spivey.



From left, maintenance technicians Brandon Jensen, Eric Unck, Ron Webster, Mat Mits, Clay Allison, and Trevor Ransdell.



Flight coordinators Corey Ellis (seated left) and Kori Taylor working AirMed's dispatch and flight following center.

instrumental in the evaluation and acquisition of the EC145. "Some people talk about it being a little slow, and it is a slower aircraft. But in the distances we travel it doesn't make any difference. A majority of our flights, with that particular aircraft, are an hour or less. But it lifts our heavier loads and does really well in the high-and-hot environment, which was of critical importance to our mission."

In the fall of 2016, after nearly 30 years under Air Methods' umbrella, the aircraft operations torch was passed. Metro Aviation, based in Shreveport, Louisiana, successfully bid UUHC's request for proposal and was awarded the AirMed contract. Nearly the entire crew of pilots and maintenance personnel chose to stay with the AirMed program and joined the ranks of Metro Aviation.

Brown, who assumed the role of aviation site manager for Metro, said, "From the aviation side, I think the transition went very smooth and very quick. Metro was very proactive to make that transition happen in a short period of time and the previous vendor was also very supportive and helpful."

The transition to Metro brought more than a just a new operator name. It also ushered in a new standard of state-of-the-art technology that streamlined flight planning and improved aircraft monitoring and communications.

AirMed pilots were introduced to the Electronic Flight Bag (EFB), an iPad-based system integrating Complete Flight and ForeFlight software for flight planning/management, en route data/weather and flight documentation.

AirMed was especially enthusiastic about the Outerlink IRIS system aboard Metro's aircraft. This provides an advanced level of safety with voice, video and flight data monitoring and recording of all cockpit indications and operating parameters. It also provides real-time flight tracking and satellite based push-to-talk capabilities for direct voice and data communications with Metro's operational control center. Brown said, "With IRIS, Metro has gone well beyond the newly implemented [14 Code of Federal Regulations 135.607] requirements for helicopter air ambulance flight data monitoring."

"The transition to Metro Aviation has exceeded our expectations," said AirMed program manager Frankie Hurst. "Metro's commitment to safe operations and installing the IRIS program on all of our aircraft will enable our program to focus on safety through quality improvement initiatives. The flight data monitoring system and program that Metro has in place to process the data is leading the air medical industry. During this time of more operators and more aircraft in every area, we cannot accept less than being as safe as possible with the most current equipment."



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## STRATEGIC COVERAGE

Today, AirMed operates a total of nine aircraft from seven bases in two states. The main base is UUHC, where the EC145 is located. Its primary missions are high-risk obstetric and neonatal cases.

Five Bell 407s (two first-generation and four of the newer GX models) are strategically located at satellite bases surrounding SLC: Park City, Tooele, Layton and Nephi. A sixth base is located out of state, 155 miles northwest of SLC in Rock Springs, Wyoming, with a 407 and a PC-12/45.

A sixth 407 (a spare aircraft) and the second PC-12/45 are based at Metro's maintenance facility at SLC International Airport. The overall fleet ownership is split between Metro and UUHC.

"The 407 is really the staple of this program," said Brown. "It does really well, even in these high, hot environments. The university starts at 5,000 feet at the pad, and Park City is 6,600 feet. I'd say we consistently are landing on scene flights at 8,000 to 9,000 MSL. Now you add temperatures into that and you're running DAs [density altitudes] 10,000 to 11,000 feet easy. It's a very challenging environment for the pilots, for the crews, for patient care... But the 407 does a good job."

The helicopters operate strictly single-pilot visual flight rules (VFR) and utilize night vision goggles after dark, typically covering a 160-mile radius from the base. They average 1,700 to 2,200 medical calls annually, with 30 percent scene calls and the balance interfacility transports.

All throughout AirMed's flying environment, conditions are highly demanding and pilots and crews must be prepared for extreme and rapidly changing conditions. Brown said, "We can

take off today on a mission and land in the snow at 10,000 feet. The next mission we might be out in the desert on an ATV accident. So it's greatly varied terrain, which makes operating here a real challenge."

While AirMed crews do not perform "rescue" missions, they do often perform "search-and-assist" missions: transporting search-and-rescue (SAR) assets — even canines — and aiding in aerial searches. This capability is especially valuable in the steep mountains where the threat of avalanche is an ever-present danger during periods of heavy snow accumulation.

A new SAR tool recently adopted by AirMed for winter search missions is the Recco system. This is a lightweight hand-held device that uses sophisticated radar technology to locate avalanche victims. The system can quickly scan a large avalanche field and detect victims equipped with Recco reflectors.

These small, lightweight, battery-free transponders have become popular with skiers and snowboarders. They're affixed to helmets, ski boots or clothing, and provide location signals to the detector.

AirMed medic Cory Cox noted, "The 2016/2017 ski season was the first season in 17 years Utah did not have an avalanche fatality." In spite of the historic snows throughout the season, Cox suggested it was the quality of the snow that kept the slopes stabilized.

## COMMITTED TO EXCELLENCE

The AirMed program is staffed by 155 dedicated folks. One hundred and eight of them are medical personnel, dispatchers and support staff who are UUHC employees. Metro's personnel include 34 pilots (two of whom provide on-site management)





Flight paramedic Jesse Lang (looking out window) and flight nurse Marzena Blundell tend to an OB patient aboard the EC145. Photo courtesy of Jesse Lang

“

**“WE CAN TAKE OFF TODAY ON A MISSION AND LAND IN THE SNOW AT 10,000 FEET. THE NEXT MISSION WE MIGHT BE OUT IN THE DESERT ON AN ATV ACCIDENT.”**

**— JASON BROWN**

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and 13 aircraft maintenance technicians. Six technicians staff Metro's main maintenance facility, while the balance are assigned to the satellite bases.

Aircraft and crews are available 24/7 and routinely transport patients from throughout Utah as well as Colorado, Idaho, Montana and Nevada. They have the distinction of serving one of the largest geographic regions of any air medical program anywhere in the country.

UUHC has an esteemed reputation as one of the top research and teaching hospitals in the nation. Co-located with the University of Utah in a picturesque campus setting in the foothills east of SLC, UUHC is a Level 1 trauma center and home to a number of notable specialty institutes including the Intermountain Burn Unit, Moran Eye Institute and Huntsman Cancer Institute. UUHC has also expanded throughout metro SLC as a regional health care system consisting of four hospitals and 10 neighborhood health centers.

Additionally, in 2016, after seven consecutive years of Top 10 rankings in a prestigious national Quality and Accountability Study, UUHC earned the number-one ranking for quality, safety and accountability.

In recent years, as UUHC expanded into the suburbs and rural communities, AirMed also expanded its operations. In the past

five years, the program has added two new bases and started to provide advanced neonatal transport capabilities. It also expects to add hand-held ultrasound to each aircraft.

While recent changes in healthcare have affected the AirMed program, Hurst believes the overall impact has been quite positive: "The increased emphasis on quality has given us the opportunity to evaluate and adopt practices that contribute to better outcomes for our patients."

With an abundance of natural, unspoiled grandeur, active outdoor lifestyle and alluring business climate, Utah's future growth will continue to embrace innovation and technology to improve all aspects of public services.

For the region's emergency medical services, it's clear UUHC and AirMed will be striving to set the standard for medical care throughout the Intermountain region. Hurst said, "The care that we provide, the safety of our team and the communities we serve, are the top priorities for AirMed."



**Dan Megna** | Dan served nearly 20 years of a 30-year law enforcement career as a helicopter tactical officer, pilot, and flight instructor with a large Southern Californian sheriff's department. He has been a regular contributor to *Vertical* since 2004.



The Bell 407 is well suited to the challenges faced daily by AirMed crews, providing performance and versatility to work in high and hot environments, and into/from confined areas.





A subsidiary of Thailand's largest healthcare provider, Bangkok Dusit Medical Services, Bangkok Helicopter Services is Thailand's first and still only provider of helicopter emergency medical services.





# THAI

P R O V I D E R



A decade after its launch, Bangkok Helicopter Services remains the only helicopter air ambulance operator in Thailand.

**Story by Jen Boyer | Photos by Anthony Pecchi**



BHS operates a brand-new Airbus H145 as well as an older EC145.

Unseasonably heavy monsoon downpours hit southern Thailand last January, causing tremendous flooding that affected nearly a million people in 10 provinces. Medical emergencies became critical as many villages were left partially submerged, cutting off access to hospitals, clinics, and medical personnel.

Thailand's only helicopters equipped for emergency medical services (EMS) literally came to the rescue. For four days, Bangkok Helicopter Services (BHS) — known locally as Sky ICU — flew medical supplies and personnel to stranded citizens, also providing medical evacuations to critical patients.

"When flooding happens in Thailand, many villages are cut off with no transportation, except maybe boats," said BHS managing director Kirati Kraiprasit. "We work with hospitals and organizations to transport the supplies and medical staff the people in villages need, as long as there is a safe place to land.

This year was bad, but it wasn't the worst. Five years ago, rains in the north flooded much of the country and we were very busy for two months helping in many provinces."

A subsidiary of Thailand's largest healthcare provider, Bangkok Dusit Medical Services (BDMS), BHS is Thailand's first and still only provider of helicopter emergency medical services (HEMS).

The helicopter operator began contracting with Bangkok's largest medical facility, Bangkok Hospital, in 2007, with a Eurocopter (now Airbus Helicopters) EC145 to provide 24/7 day and night, visual flight rules (VFR) and instrument flight rules (IFR) HEMS to Thailand and surrounding countries.

In 2016, the operator expanded, adding a brand-new Airbus H145. Both aircraft are completed with EMS conversion kits and can carry up to two patients. Onboard advanced life-saving equipment includes the Braun Perfusor Space Infusion



Pump, Dräger Oxylog 3000 ventilator, Weinmann Accuvac Rescue suction pump, Schiller Argus Pro LifeCare 2 (defibrillator, pacemaker, patient monitor, and 12-channel ECG) and a Newport HT-50 ventilator.

The aircraft operate with two pilots and typically carry an aviation doctor (emergency medicine doctor or specialist with HEMS training), and one to two flight nurses or paramedics depending on the severity of the patient.

“We’re equipped to transport all kinds of patients who need further treatment in higher level medical facilities,” Kraiprasit said. “However, most transfers are trauma, cardiac, neonatal, burn patient care, and other types of emergency cases.”

The aircraft are equipped with glass cockpits (including the Helionix flight deck in the new H145), autopilots, and weather radar.

“We are one of the only operators allowed to fly at night here,” Kraiprasit told *Vertical 911*. “More than half of our operations are at night, usually VFR or special VFR. Though we can fly IFR. However, the IFR routes aren’t convenient for the places we fly.

They’re set up between airports only.”

When an emergency call comes in, the helicopter is set to launch at a moment’s notice with pilots based with the aircraft at Don Mueang International Airport, a 10-minute flight north of Bangkok Hospital. After a quick trip to the hospital to collect medical personnel, it is off to the scene.

BHS helicopters boast a 2.5-hour endurance and a more than 150 miles per hour cruise speed (246 kilometers per hour), allowing the aircraft to reach areas as far as 75 miles (123 kilometers) from the hospital in 30 minutes.

## EXPANDED SERVICE

While aircraft are based in Bangkok, the service is set up to support any hospital or patient who makes a request. In addition to operating throughout Thailand, BHS has conducted EMS flights in Cambodia, Laos, and Myanmar (Burma).

“We are here to support whoever needs the service,” Kraiprasit said. “Of course, that is dependent on our ability to get to the patient.”



The BHS aircraft are equipped with glass cockpits, including the Helionix flight deck on the new H145.



The aircraft are based just a 10-minute flight north of Bangkok Hospital.



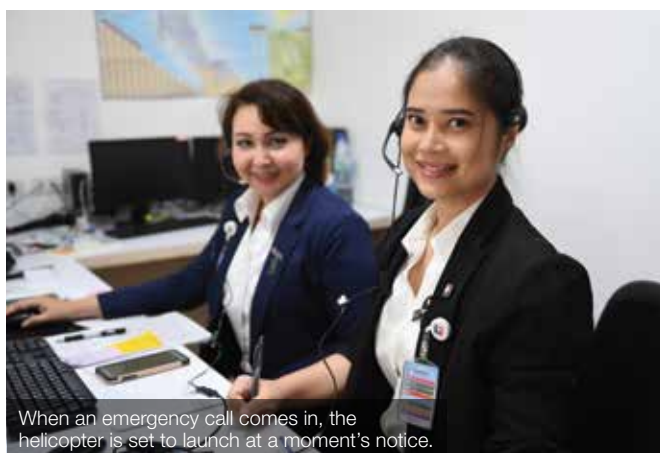
Most of the program’s transfers are trauma, cardiac, and other types of emergency cases.



Each BHS flight typically carries an aviation doctor and one to two flight nurses or paramedics depending on the severity of the patient.



The BHS aircraft operate with two pilots.



When an emergency call comes in, the helicopter is set to launch at a moment's notice.

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**WE DO A LOT OF PUBLIC RELATIONS, BUILDING GOODWILL AND LAYING GROUNDWORK FOR OPERATIONS IN AREAS THAT HAVE NEVER HAD ACCESS TO HEMS. WE HAVE TO DO A LOT OF EDUCATION TO ASSURE WE CAN OPERATE, AND OPERATE SAFELY.”**

**— BHS MANAGING DIRECTOR KIRATI KRAIPRASIT**

In addition to distance, BHS's team must overcome additional obstacles to HEMS, including mountainous terrain, landing site identification, government agency permissions to fly and land, and even some areas of political unrest where the helicopter could be targeted by ground fire.

“When we know a region, hospital, or community wants access to our service, we go out in advance to identify obstacles and train first responders, help identify safe landing zones, and gain permissions to operate and land,” Kraiprasit said. “We do a lot of public relations, building goodwill and laying groundwork for operations in areas that have never had access to HEMS. We are a life-saving operation and people understand that. We have to do a lot of education to assure we can operate, and operate safely.”

The program has made significant inroads. When at all possible, BHS will call ahead and receive permissions to land and navigate airspace. However, emergency response doesn't give the operator the luxury of time. BHS has negotiated several agreements through which paperwork can be filed after the fact in instances where emergency life-or-death situations require immediate launch.

Despite its growing popularity, the service still remains the only HEMS provider in the country, 10 years later.

“There are fixed-wing transport services in Thailand and surrounding countries, but we're still the only HEMS operator,” Kraiprasit said. “It is very expensive, and a great deal of work must be done behind the scenes to make it successful. Having a large parent company is what makes it possible in Thailand.”




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BHS has negotiated several agreements through which paperwork can be filed after the fact in instances where emergency life-or-death situations require immediate launch.

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## FINANCING HEMS

Dr. Prasert Prasarttong-Osoh is a majority shareholder of BDMS, a public company that manages the Bangkok Helicopter Network. He encouraged adding helicopter emergency medical services to BDMS and Thailand.

“Dr. Prasarttong-Osoh had a mission that there should be this kind of equipment available to support the hospital and the people,” Kraiprasit said. “He and the hospital had been receiving requests from people in Thailand — patients who needed to be transported, insurance services, and even other hospitals. Sometimes the request is for transport to Bangkok, and sometimes it was to transport a specialist to a remote area with medical equipment.”

Being the largest hospital system in Thailand, Bangkok Hospital Networks was in a position to support bringing HEMS to the country.

Bangkok Helicopter Services Co., Ltd., was created as a privately owned company within BDMS to serve Bangkok Hospital and its surrounding network.

Through a three-year, renewable contract, BHS provides HEMS to Bangkok Hospital, greater BDMS facilities, and any other hospital or patient requesting HEMS transport — scene to hospital, hospital to hospital, and even airport to hospital to retrieve patients flying in via fixed-wing EMS transport.

The HEMS service is basically funded through guaranteed revenue from Bangkok Hospital to assure basic operating costs are met to maintain the operation, while the hospital

directly bills patients and insurance companies to recover costs. The guaranteed revenue covers the service's annual 300 to 350 flight hours per helicopter as well as public relations and training with hospital and emergency personnel.

When it comes to serving other hospitals and regions for patient transport, funds are pre-authorized to assure payments.

“This service is a very small percentage of BDMS's overall revenue so it becomes feasible for the system to support it,” Kraiprasit said. “One person in a remote area isn't going to be able to pay the price to cover an emergency transport. This type of service wouldn't be possible without the support of a large parent company.”

While the aircraft are first and foremost on call for EMS, their EMS conversion kits can be quickly removed should one of the aircraft be needed for commercial operations such as VIP transport, aerial filming, or newsgathering.

“It takes about 20 minutes to reconfigure the aircraft for non-medical uses,” Kraiprasit said. “Being able to offer these services helps supplement our basic revenue guarantee from Bangkok Hospital to support the aircraft.”



**Jen Boyer** | Long-time communications professional Jen Boyer is a 1,500-hour helicopter pilot with commercial instrument, flight instrument and instructor instrument certificates. When not flying, writing or spending time with her husband and two kids, Jen mentors current and future Whirly-Girls.





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# TEAM Players

Sentara Healthcare's Nightingale Regional Air Ambulance program has taken an innovative — and effective — approach to integrating pilots and med crews.

**Story Elan Head | Photos by Antonio Gemma More'**



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Based at Sentara Norfolk General Hospital in Virginia, the Nightingale Regional Air Ambulance program serves the Hampton Roads metropolitan area at the mouth of Chesapeake Bay.



**M**any air medical programs face a dilemma when it comes to sharing aviation knowledge with medical crews: how much is too much?

Educating nurses and paramedics about topics like weather, navigation, and aircraft systems can make them more valuable partners in crew resource management. But some pilots worry that such training only leads clinicians to doubt their pilots' judgment, encouraging them to interfere in matters they don't fully understand. Their concern reflects a fundamental distrust between medical crewmembers and the people who fly them, with crewmembers too often suspecting that their pilots are trying to kill them, and pilots suspecting that their crewmembers are trying to get them fired.

For Sentara Healthcare's Nightingale Regional Air Ambulance program, based in Norfolk, Virginia, this dilemma simply doesn't exist. Nightingale's position is simple: the more knowledge they can give their crewmembers, the better. And so, when new nurses and paramedics come on board, their pilots don't simply brief them on how to open the doors and fasten their seatbelts. Instead, they lead them through a comprehensive aviation ground school, covering subjects including aerodynamics, flight physiology, weather, regulations, navigational procedures, and more.

Once that ground school is complete, new clinicians undergo an orientation period by riding along with an experienced nurse and paramedic, observing and participating in patient care while continuing to learn about the helicopter. Their education doesn't end when this initial training is complete — aviation subjects are constantly revisited during standard crew shift change briefings and reinforced with monthly cockpit quizzes.

Flight nurse Lisa Scott recalled that when she joined the Nightingale program, "I said, 'Wait a minute, I'm a nurse. I don't know anything about aviation.'" But she found that the training increased her comfort level with the aircraft and her flight crews. Now, she said, "I feel that anyone who's going to work in the machine should have some kind of knowledge about it."

This doesn't mean that she's telling the pilots how to do their jobs. "We know our limits — we're not pilots," emphasized program manager and flight nurse Denise Baylous. Instead, Nightingale's focus on aviation knowledge has increased the mutual respect between pilots and crewmembers, making for an effective, close-knit team that sets an example for the rest of the industry.

## SERVING THEIR COMMUNITY

The Nightingale Regional Air Ambulance program is based at Sentara Norfolk General Hospital, located at the center of the Hampton Roads metropolitan area at the mouth of Chesapeake Bay. The area is home to Naval Station Norfolk and the Norfolk Naval Shipyard, where the U.S. Navy's massive carrier ships and submarines are built and maintained.

Earlier this year, the Nightingale program celebrated its 35<sup>th</sup> anniversary, having performed its first flight on Feb. 25, 1982. The single-aircraft program is small, but it has made a big impact in its community, with more than 20,000 accident-free missions to its credit over the past three-and-a-half decades.

Nightingale launched its operations with a Bell 206L-1 LongRanger helicopter. In 1984, it upgraded to a twin-engine



MBB Bo.105, which it refurbished in 1991. Five years later, it replaced the Bo.105 with its larger cousin, a Eurocopter (now Airbus Helicopters) BK117. Today, the program flies an Airbus EC145, which Sentara Healthcare acquired in 2011 following a two-year community fundraising campaign by the Sentara Foundation. The aircraft is operated by Metro Aviation, which also performed its completion, working closely with the Nightingale





team to tailor the helicopter to their specific needs.

"It was fun for us to be able to sit down and do that," Baylous recalled. The result, she said, was a carefully laid out, "fully functional critical care unit" that provides crewmembers with the space and tools they need to do their jobs. Essential medical equipment includes a CareFusion ReVel ventilator, two Zoll Propaq MD monitor/defibrillators, and three BodyGuard

ABOVE: Program manager Denise Baylous estimated that around 30 percent of Nightingale's calls involve trauma, and another 30 percent cardiac events, with strokes and other medical and pediatric emergencies constituting the remainder.



“

**THE HELICOPTER IS WIRED SO THAT MEDICAL CREWMEMBERS IN THE LEFT SEAT AND THE CABIN CAN HEAR ALL TERRAIN ALERTS AND EMERGENCY GONGS. “WE WANTED THAT,” EXPLAINED PILOT JIM GARROW. “WE BELIEVE THIS IS FIRST A HELICOPTER AND SECOND AN AMBULANCE.”**





infusion pumps with up to six critical drips. The helicopter also carries some specialty equipment, such as a portable ultrasound machine with chest and abdominal probes, an intra-aortic balloon pump, and an IntuBrite video laryngoscope for difficult intubation cases.

The two medical crewmembers — a flight nurse and paramedic — fly with a crew iPad loaded with references, policies, and procedures; a radio frequency list; a list of all designated landing zones in their coverage area; and the Flight Vector mapping app. En route to calls, crewmembers alternate who sits up front with the pilot, giving all of them valuable experience with operating the GPS and talking to ground units on the radio. The cockpit is equipped with Garmin GNS 530 and 430 GPS units, GTX 330 transponder, GMX200 weather radar, a Technisonic TDFM-7000 transceiver, and a SkyConnect satellite phone for talk and text in emergencies. Nightingale also plans to integrate the Outerlink IRIS system for satellite tracking and flight data monitoring.

The helicopter is wired so that medical crewmembers in the left seat and the cabin can hear all terrain alerts and emergency gongs. “We wanted that,” explained pilot Jim Garrow. “We believe this is first a helicopter and second an ambulance.”

With the EC145, the program can cover a 125-mile radius without refueling, although the average flight is around 25 to 30 minutes each way. And there are a lot of flights. Last year, with just a single helicopter, the program performed more than 740 transports, of which approximately 60 percent were interfacility transports, and 40 percent scene calls.

The Nightingale program is staffed by four pilots and two mechanics employed by Metro Aviation; and six full-time nurses, 11 part-time paramedics, and six dedicated dispatchers employed by Sentara. (All of the paramedics also work on ground ambulances, which helps the program keep up rapport with local fire departments and other first responders.) Turnover in the program is low, and hiring standards are high. Paramedics who apply to Nightingale are required to have at least five years of active experience at the paramedic level in a high-volume EMS system, while flight nurses must have at least five years of critical care experience — although new hires often exceed these minimums.

OPPOSITE TOP: Nightingale does a number of ride-alongs for nursing and paramedic students, nurses, physicians, and resident physicians. “When I was a brand-new nurse, I did a ride-along, and I was hooked,” recalled Lisa Scott.

OPPOSITE BOTTOM: En route to calls, crewmembers alternate who sits up front with the pilot, giving all of them valuable experience with operating the GPS and talking to ground units on the radio.

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Pilots, meanwhile, are required to have at least 2,000 hours of flight time, and hold a commercial pilot certificate with an instrument rating. The proximity of Naval Station Norfolk and other military installations means that military pilots are disproportionately represented in the hiring pool; of Nightingale's current pilots, two are former Navy, one is former Coast Guard, and one is ex-Army.

That proximity to military installations means that Nightingale regularly interfaces with Navy and Coast Guard units that may have occasion to land at the Sentara Norfolk helipad. The program conducts regular training with Navy and Coast Guard crews to help ensure safe, efficient patient handoffs. When hospital construction disrupted normal operations, Nightingale brought in representatives from local air units to see the changes



Nightingale currently operates from the base of Sentara Norfolk General Hospital, but a vertical expansion currently underway includes plans for a rooftop helipad with a dedicated elevator to the trauma center.



and discuss new procedures. The program even developed an information sheet for military pilots to keep on their kneeboards. "It's all about breaking down silos and barriers," said Baylous.


Sentara's dispatch center has also integrated with Navy and Coast Guard

dispatch centers — and dispatchers are as much a part of the Nightingale team as its pilots and clinicians. "I think this program has worked hard to make them part of the team," said Lisa Scott. "We trust [them] with our safety."

Four full-time dispatchers work three 12-and-a-half-hour shifts per week; another two dispatchers are employed on a part-time basis. "It's a small group, so [we've] got to be flexible and have each other's backs," noted dispatcher George Pettit. Everyone who comes to work in the role has previous dispatch experience, which is critical during busy, high-stress calls. "There's a lot for us to do in a short time if we get a flight — especially if it's a short flight," said Pettit.


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## NEW CAPABILITIES

According to Baylous, the Nightingale program has benefited from the unwavering support of Sentara Healthcare. Nightingale operates at a financial loss (US\$1.2 million in 2014), but Sentara continues to invest in new technologies and capabilities for the program. “They see us as a community service,” Baylous explained. “They are very, very supportive in anything and all we’re doing.”

The program is now tackling a major upgrade to its capabilities by transitioning from a visual flight rules (VFR)-only program to an instrument flight rules (IFR)-capable one. Nightingale began exploring the transition once it acquired the EC145, its first IFR-certified helicopter.

Baylous said the program has taken a “crawl, walk, run” approach to adopting IFR, wanting to ensure that crewmembers fully understand and accept it. As paramedic Jeremy Miller recalled, initially “there was some hesitation” among crewmembers, just because the concept was new to them. But the Nightingale pilots’ prior military instrument flying experience provided a comfort factor. “What makes a difference is the caliber of the pilots we have here,” he said.

Sentara has been working with Hickok & Associates to develop instrument approaches for its various hospitals and freestanding helipads, aiming to have eight approaches in total. According to Jim Garrow, because winter freezing levels preclude IFR during many of the worst weather months, IFR operations will probably make

up a fairly small percentage of the program’s total flights. However, having IFR capability will also allow Nightingale to perform some flights in marginal weather more safely than they could under VFR.

And safety will always remain the priority for Nightingale, which developed its innovative approach to crewmember training as a response to safety problems in the wider helicopter air ambulance industry. “I know when I first came here we weren’t as integrated as we are now,” observed Baylous, crediting former Nightingale pilot Richard Fedoriowicz with leading the initiative. By bringing crewmembers deeper into the world of aviation, “we pushed ourselves slightly outside of our comfort zones,” Baylous said. Now, however, they wouldn’t have it any other way.

Scott remarked that when she speaks with people from other helicopter air ambulance programs, she’s often surprised at the lack of interaction and partnership between medical and flight crews. Having flown with only one program, Nightingale, she only has one model for the relationship between pilots and clinicians — and it’s a positive one.

“You have to be comfortable with the person you’re working with,” she said. “You have to have that trust.”



**Elan Head** | An award-winning journalist, Elan is also an FAA Gold Seal flight instructor with helicopter and instrument helicopter ratings, and has held commercial helicopter licenses in Canada and Australia as well as the U.S. She can be reached at [elan@mhmpub.com](mailto:elan@mhmpub.com).



Nightingale will auto-launch in response to certain set criteria. The program does not charge for the call if the flight is aborted or the patient is not flown.





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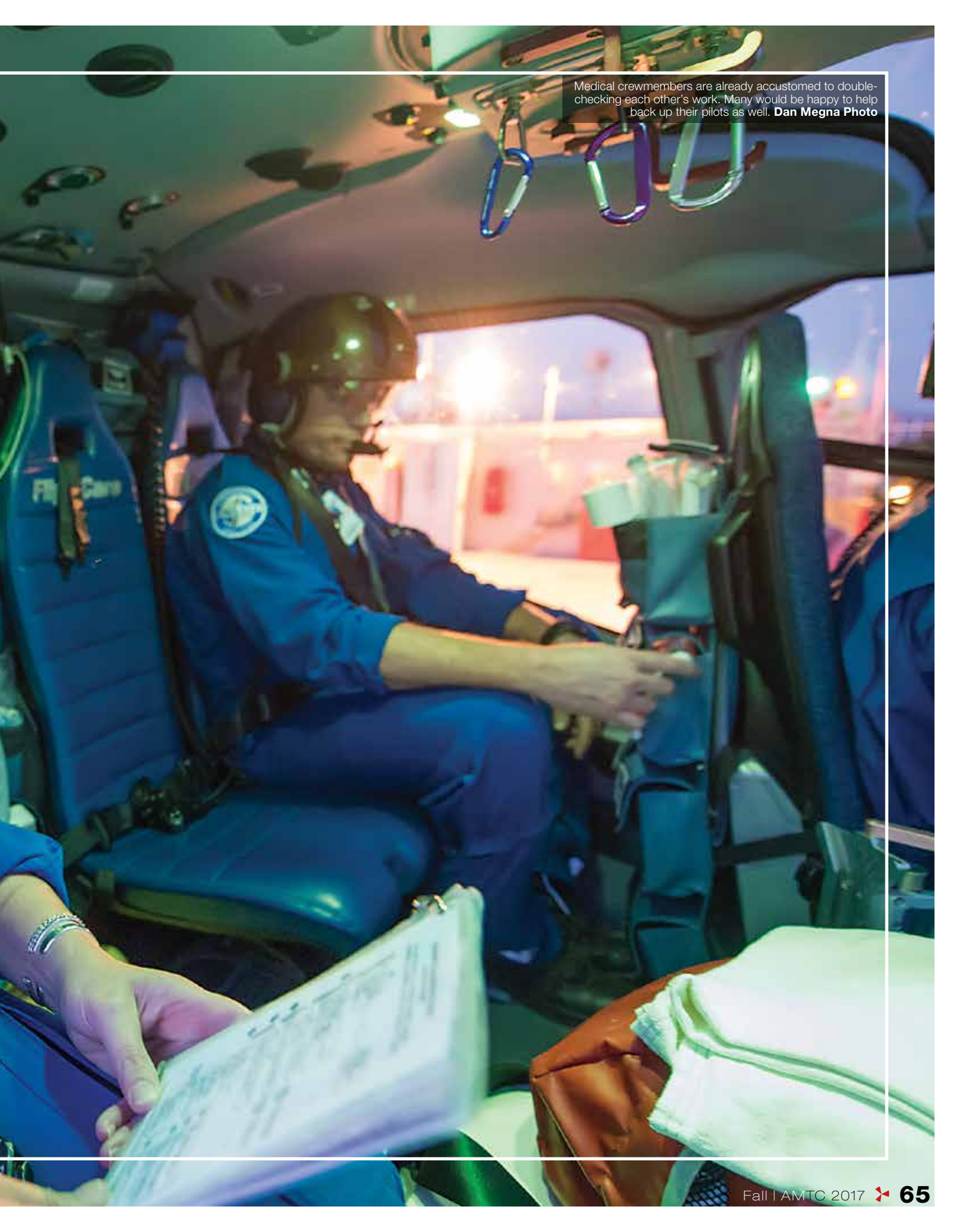


# CHALLENGE RESPONSE

Should medical crewmembers assist with pre-takeoff departure checks in single-pilot EMS helicopters? The author of a new position paper on the subject presents his case.

**By Daniel Foulds**





Medical crewmembers are already accustomed to double-checking each other's work. Many would be happy to help back up their pilots as well. **Dan Megna Photo**

*I wish I could say that it was my idea.*

I wish I could say that having a medical team member call out checklist items prior to takeoff was something I cooked up. It wasn't.

I thought perhaps it was my old paramedic friend Les Langdale's idea — he was the safety representative at the base in Charleston, South Carolina, where I first encountered the practice while filling in for a pilot who was out sick.

I called Les and he told me it wasn't his idea. They were doing it at Meducare Air, the program owned by the Medical University of South Carolina, when he started there in January 1988 — so it must have been someone who started the program in July 1987.

I had to reach back further, to a pilot who started that base and this industry.

I looked on my phone's contact list and there he was: 75-year-old retired helicopter pilot Dave Andrews. I gave Dave a call. "Dave, do you remember who it was that had the idea of posting some checklist items in the aircraft on a placard?"

"Oh! Let me think... You know, it was probably me!" He then told me some stories about the early days of helicopter emergency medical services (HEMS). Two or three pilots flew on a contract.

Pilot shifts covered a full 24-hour day — or more.

They called it helicopter emergency medical evacuation services (HEMES) then, and the rules for HEMES are still in the Code of Federal Regulations; a vestigial reminder of how things have changed. There were no operational control centers and no need for a flight release. There was less scrutiny. After killing so many people and destroying so many aircraft, we have evolved how we operate. We continue to evolve to prevent our extinction.

Dave mentioned that all across Omniflight, pilots were starting helicopters from memory. There often wasn't a checklist in the aircraft. Just a flight manual — a thick book situated under or behind a seat. He said, "We printed a checklist on paper, but it kept getting lost. So finally we had a placard made and posted it on the instrument panel. That worked fine right up until we had to send the helicopter back to Omniflight for some modifications. An FAA [Federal Aviation Administration] inspector had to come look at the mods, and when he saw that placard he had a fit."

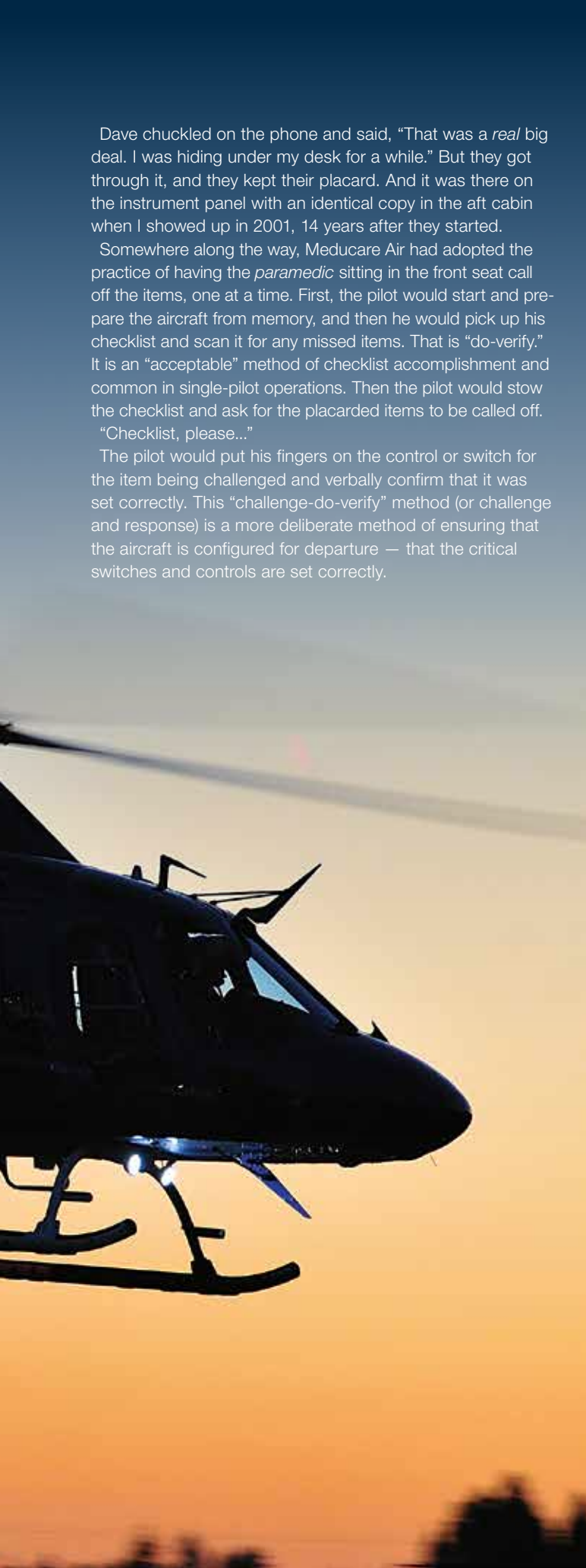
The FAA guy said, "DOES THAT MATCH THE INFORMATION IN THE ROTORCRAFT FLIGHT MANUAL? HOW ARE YOU GOING TO UPDATE CHANGES ON THAT?"



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The extent to which medical crewmembers are integrated into aviation procedures varies by program. While some people in the air ambulance industry believe in keeping the focus on the pilot, others, including the author, argue for involving clinicians in critical pre-takeoff checks. **Skip Robinson Photo**





Dave chuckled on the phone and said, “That was a *real* big deal. I was hiding under my desk for a while.” But they got through it, and they kept their placard. And it was there on the instrument panel with an identical copy in the aft cabin when I showed up in 2001, 14 years after they started.

Somewhere along the way, Meducare Air had adopted the practice of having the *paramedic* sitting in the front seat call off the items, one at a time. First, the pilot would start and prepare the aircraft from memory, and then he would pick up his checklist and scan it for any missed items. That is “do-verify.” It is an “acceptable” method of checklist accomplishment and common in single-pilot operations. Then the pilot would stow the checklist and ask for the placarded items to be called off. “Checklist, please...”

The pilot would put his fingers on the control or switch for the item being challenged and verbally confirm that it was set correctly. This “challenge-do-verify” method (or challenge and response) is a more deliberate method of ensuring that the aircraft is configured for departure — that the critical switches and controls are set correctly.

They didn't have every checklist item on this placard, only the ones that would kill you or destroy the aircraft. They added “drugs and mission equipment” because on more than one occasion they had departed without something needed to care for a patient. The medical team is human, too.

So it wasn't the Charleston ship that took off with the fuel transfer pumps in the *off* position and the instrument lights *on* early one morning shortly after sun-up. It was an Omniflight ship in Texas.

The day pilot had arrived just as a flight request was coming in, and he decided he would take it. The night pilot had left the instrument lights on, making the master caution and warning and caution panel segment lights virtually invisible. In his haste, the day pilot forgot to turn on the transfer pumps. The aircraft's engine supply tanks ran dry in flight with the mains almost full. The engines quit and the landing was “hard.” That pilot was paralyzed.

A pilot forgetting to switch on transfer pumps that fill supply tanks has happened more than once. It happened in a medical BK117 in New Zealand in 2014. It apparently happened in a Police Scotland EC135 in 2013. If we don't change how we operate, it's going to happen again.

In November 2002, an Agusta pilot in Texas attempted to take off with one motor at ground idle. From the National Transportation Safety Board (NTSB) report, “In an interview, the pilot reported that ‘he attempted a rolling takeoff . . . with an incorrect power setting (selection switch) which resulted in an emergency (hard) landing on the roof of an adjacent automobile parking garage due to insufficient engine power to maintain flight.’”

While flying a Dauphin at State College Pennsylvania in 1999, I did the same thing — minus the hard landing. I got in a hurry, I was trying to beat some taxiing traffic, and I did a rolling takeoff with one motor at ground idle. Shortly thereafter, my friend at another base did the same thing. A good and smart pilot, he got a Dauphin up in the air and over wires before realizing that one of the motors was set to ground idle.

Krista Haugen, a co-founder of the Survivor's Network for Air Medical Transport, has first-hand experience with this issue. She lived through a crash near Seattle that occurred because her pilot took off with one motor at ground idle.

I know of three crashes with pilots attempting to take off in AStar helicopters with hydraulic switches set incorrectly. In two of the three, people were killed. In each of these cases, the pilot failed to properly configure the aircraft for takeoff. This problem cuts across all lines of attitude, age, and experience.

We can look at all these accidents and say, “Well, that pilot was inferior. He made a mistake I would never make.” That's invulnerability talking. On the other hand, we can recognize that humans, by our very nature, make mistakes. Our personalities are composed of the cognitive, the emotional, and the behavioral. Three chances to get things right. Three chances to get things wrong. We get in a hurry, we get distracted, we get complacent or we get tired, and we miss something. They did it. I did it. And you or your pilot might do it too.

After filling in at Charleston in those early years, I brought up the practice of challenge and response at a monthly safety meeting at my home base in Savannah, Georgia. I explained what they did in Charleston, and why they did it. My aviation base manager, Dutch Martin, looked around the room and said, “This sounds like a reasonable idea. It's not instead of, it's in addition to. Do you all want to do this here?”

Lifestar Savannah adopted the practice. When Omniflight expanded our service and opened a base in Vidalia, Georgia, the practice went there, too. It's all they ever knew. No one thought

twice about it. None of those bases ever had a problem related to missing a switch or control. Everyone on board knew when the aircraft was going to take off; everyone was "in the loop." More than once a mistake was caught — before takeoff.

I discussed using a medical team member for challenge and response with the director of flight operations of a large air medical company three years ago. He said he endorsed the idea and would take it up with the chief pilot. But nothing was done and the crashes in that company continue.

Another DO told me that the medical side of the business has intruded into the aviation side enough — that the answer is training and standardization for the pilot. I don't think you can train the human out of a standard pilot. But you can add a layer of

safety to account for the human factors at play.

Is any safety layer perfect? Does any practice or procedure absolutely prevent disappointment or disaster? No. I know about the Swiss-cheese model and slipping through the cracks. But if making a change eliminates a majority of mishaps, if we can save a life or two or a helicopter, shouldn't we keep our minds open to the idea of change?


A National EMS Pilots Association friend noted that many programs have never had the issue of taking off with a switch or control in the wrong position, and it's not fair to ask them to change how they operate. It is impossible to tell people how to feel about something. But I would like people in our industry to consider my proposal. After all, many programs have a perfect

history, right up until the minute they have a crash. Were they good? Or were they lucky?

Some have suggested I delay and perfect this proposal before putting it out. That I conduct surveys. That I do research. I have all the information I need now. It's in the NTSB reports.

I published a position paper about this on my blog at HelicopterEMS.com, and linked it to the Facebook page with the same name. At last check, 15,536 people have read my proposal. It's been shared 52 times. People are interested in this idea.

It's probably the medical folks at your base who hope and pray that you never make a mistake. If you are their pilot; they like you, and they trust you. But like you, they are human and subject to error. They know this. They double check medications, dosages, and intervention plans with each other. They help each other avoid a mistake. They would be happy to help ensure you don't make a mistake as well.

Many programs already incorporate some form of challenge and response. If yours doesn't, I hope you will consider it. 

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**Daniel Foulds** | Dan Foulds began his flying career in the United States Army in 1985. He volunteered for duty with the 160th SOAR in 1989, serving as a flight lead and instructor pilot. After retiring from the Army in 1998, he spent 17 years flying EMS helicopters across the U.S. with several different operators, as a line pilot, base-lead pilot, and training captain. Dan began teaching CRM/AMRM in 2011 after a friend crashed and killed his crew and himself. Dan is an author, a multi-year instructor at Air Medical Transport Conferences, and a member of NEMSPA's board of directors. Contact him at foulds.daniel@gmail.com.



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Spain's maritime search-and-rescue region is approximately three times the size of its national territory. A large aviation fleet is essential to providing adequate coverage for the region.





# Saving Lives *in Spain*

For the helicopter crews of Spain's Salvamento Marítimo, rescuing people on their worst day is all part of the job.

**Story by Jon Duke**  
**Photos by Lloyd Horgan, Vortex Aeromedia**

The people of Spain have a rich heritage of dependence upon the ocean and its bounty — along with a commitment to assist those who brave its depths, and find themselves at its mercy. *Vertical 911* recently visited the helicopter crews of the Salvamento Marítimo in Valencia, on Spain's southeastern coast, to learn more about how they help those in peril on the sea.

The story of Spain's maritime search-and-rescue (SAR) organization starts in Hamburg, Northern Germany, in 1979, at the SAR '79 convention of the International Maritime Organization.

It was the first time that an international plan had been developed to coordinate the rescue of persons in distress at sea. It divided the world's oceans into contiguous but non-overlapping SAR regions, and it vitalized Spain's efforts to consolidate its approach to maritime emergency response.

With a coastline of over 8,000 kilometers (5,000 miles), Spain's SAR region covers 1,500,000 square kilometers (approximately 580,000 square miles); three times the size of its national territory. It is divided into four main areas: Atlantic, Strait of Gibraltar, Mediterranean and Canary Islands.

By 1989, Spain had established its National Maritime Rescue and Pollution Control Plan, bringing together civilian and Navy vessels, along with the aerial assets of the Spanish Army that already made up Spain's airborne search and rescue service.



The dual winch system is clearly visible as the winch operator grabs the cable before attaching it to the rescue swimmer inside the aircraft.

“

**HELICOPTERS HAVE BEEN  
INTEGRATED INTO SASEMAR'S  
CORE SINCE ITS INCEPTION.**



Training is extremely important for the crews, and this extends to the physical and mental preparation for their task.



In 1992, the Ports & Merchant Navy Act established the Sociedad de Salvamento y Seguridad Marítima (SASEMAR); literally translating as the Maritime Safety and Rescue Society, usually abbreviated as the Salvamento Marítimo. It commenced operations on Jan. 1, 1993 with unequivocal aims: save human life at sea and protect the marine environment.

Administered and directed from its headquarters in Madrid, its efforts are coordinated by 19 Maritime Rescue Coordination Centers (MRCCs). These direct and coordinate SASEMAR's surface fleet, as well as its aviation assets, which include a fixed-wing fleet of four CASA CN-235-300 maritime patrol aircraft. SASEMAR's mixed-type rotary-wing fleet comprises nine medium-lift Leonardo AW139 helicopters, plus a Sikorsky S-61N and an Airbus Helicopters EC225 fulfilling heavy-lift and long-range duties.

## NEW FOLLOWS OLD

Helicopters have been integrated into SASEMAR's core since its inception. Rather than rely on Spanish Air Force Allouettes and EC225s as in the past, it was recognized that a fleet of dedicated SAR aircraft was necessary. This would ensure their suitability for the maritime SAR role, and their availability in the event of other emergencies. In 1993, SASEMAR took delivery of its first S-61N helicopters.

The fleet was dubbed "Helimer" — a contraction of Helicopter Merchant Navy. The aircraft are provided and maintained by Inaer, a Babcock company which was only the second in Europe to establish a search-and-rescue fleet of this kind, when it began its operation with SASEMAR (see p.38, *Vertical 911, HAI 2016*). Five bases were established: in Galicia, the Canary Islands, Andalucía, Cantabria and Valencia.

Crewmembers prepare to drag the AW139 out from the hangar for an afternoon training sortie with a civilian vessel off the coast of Valencia.





The winch operator, Guillermo Peñuelas, was previously a rescue swimmer and now instructs both winch operators and rescue swimmers. Next year will see him celebrating 25 years in the service.

Despite the S-61N's distinguished track record, it did not take long for SASEMAR to pursue more modern aircraft. In 2006, the organization sought a new medium helicopter, and the AgustaWestland (now Leonardo) AW139 beat competition from the Sikorsky S-76 and Eurocopter (now Airbus) AS365 N3 for the contract. SASEMAR wasn't entirely ready to retire its workhorse, and still maintains a single S-61N in its fleet. However, now with a predominantly medium helicopter fleet, the organization was able to increase its basing locations to 11, with a concomitant increase in availability and reduction in response time.

It is no surprise that the AW139, having been developed some 40 years after the aircraft it replaced, achieves greater speed, range and thrust-to-weight ratio. In fact, it can perform to Cat A/ Performance Class 1 criteria at maximum takeoff weight up to 40 C at sea level, which greatly increases the safety margin when hovering over inhospitable terrain or approaching confined landing areas.

In common with its contemporaries it features a glass cockpit (in this case the Honeywell Primus Epic) coupled to a full authority digital engine control (FADEC) and Mark XXII enhanced ground proximity warning system (EGPWS). The integrated mission system features SAR-specific functionality including pre-programmed search patterns and automated let-down profiles, making use of the four-axis digital automated flight control system (DAFCS) and Primus 701A weather radar, which incorporates a beacon detection system.

Additionally, a crewman winch control allows the winch operator a degree of fine hover control — particularly useful during challenging boat transfers where the pilot has reduced visibility. For flights in icing conditions, the aircraft is equipped with a full icing protection system (FIPS). The AW139's SAR-specific role-fit for SASEMAR features a Spectrolab Nightsun SX-5 Starburst, a FLIR Systems electro-optic/infrared (EO/IR) camera and two hoists.





White and red stripes is a livery that has become somewhat iconic amongst AW139 SAR operators in Europe.

## VALUES AND SPIRIT

SASEMAR aircrews consist of two pilots (the SAR commander and co-pilot), a winch operator, and a rescue swimmer, who is trained to operate away from the aircraft hoist in the sea. Their equipment is a mix of flying clothing and diving equipment, comprising a trilaminate dry suit, life jacket, helmet, goggles, snorkel, fins and lights/flammables for aids to location. They also have an Axnes Polycon UHF wireless intercom and a VHF Icom radio.

Training is extremely important for the crews, and this extends to the physical and mental preparation for their task. There are around 20 currency items

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Rescue swimmer Ruben Santamaria is winched back up to the AW139 from a shipping vessel.



One of the two base mechanics works on the dual hoist system fitted to the AW139.

that need to be completed by each person every month. Most of these are conducted at night. Collaborative and cooperative training is conducted with SASEMAR rescue boats, merchant vessels or ships belonging to the Red Cross and other agencies.

SASEMAR is a civilian service, but many of its members have a military background. Regardless, there is a strong sense of duty to assist others. "We all share the same values and spirit of helping those in need," said SASEMAR pilot and SAR Commander Captain Javi Lozano, who is based at Valencia.

Crews are rostered for a week of day duties followed by a week of night duties, always at 15 minutes' readiness. When the call comes from an MRCC, the on-duty SAR commander conducts the necessary planning while the crew ready the aircraft and equipment for the mission.

Their most regular tasks are at sea, involving illness or injury on cruise ships or merchant vessels. That said, lack of sea awareness is a perennial and ubiquitous problem that leads to a dramatic increase in the number of incidents over the summer months, as tourists flock to the region. Figures from 2016 showed more people assisted from June to September than in the rest of the year in total.

Many of these will be unwary beachgoers swept out to sea by rip currents. While a common occurrence, they are often rescued by boat and only sometimes require assistance from the Helimer crews. More suited to the helicopters' capabilities are those who manage to get themselves stuck on cliff faces. These are often a challenge for helicopter crews as not only must they maneuver their aircraft close to the rocks, but the downwash from their aircraft exposes the survivors to high wind speeds. Often already fatigued, there is a real risk of them becoming dislodged.





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**— CAPTAIN JAVI LOZANO**

**”**



Winch operator Guillermo Peñuelas and rescue swimmer Ruben Santamaria stand in front of the AW139 at their base in Valencia.



## EXTREME ROUTINE

While inland rescues are less common, Lozano remembers one in particular, when his crew were called to rescue two people from a car. Heavy rains had washed it from the road, and it had been dragged to the mouth of the river and lodged there. The elderly couple were trapped inside as the water threatened to engulf their vehicle.

"It was risky and exciting, dangerous for the rescuer," Lozano recalled, suggesting the possibility that it is precisely these kinds of unique challenges that motivate and drive him and his colleagues.

The hardest tasks, he said, involve stricken boats in rough seas. Without the means to maneuver, they are unable to position themselves for favorable winching conditions and can even pose a threat to the rescue swimmer. "This requires dexterity," he said, "not only of the rescue swimmer but also of the rest of the helicopter crew."

While sinking boats are relatively rare, they offer possibly the ultimate expression of both elements of the SAR mission. Without their vessel, lone sailors are little more than a head bobbing in the vast empty expanse of inhospitable ocean. With people in the water, time is always critical — both to find them and effect the rescue, and also their onward transport to critical care.

Lozano recalled one mission that involved just such a situation, his crew being tasked to find and recover a lone sailor whose boat had sunk.

"After many hours of searching I could see a small light," he said. That small light was the dim glow from the sailor's flashlight as its batteries gave their last. "He was grabbing the bow [of his boat] and that was the only thing left floating. It was amazing to be able to see and locate a man that was in such an extreme situation."

## DIFFERING PERSPECTIVES


That particular rescue and others like it are thankfully not an everyday occurrence, standing out not only in the memories of the SASEMAR crews but naturally also those delivered from their fate, for whom their rescuers are heroes.

On this, Lozano is plain-spoken and pragmatic. "Heroes only exist in comics," he said. "We are just a team that strives every day to make things better and better. The risks in this work are inevitable, but with much training and passion many critical situations or accidents are avoided."

His modesty and professionalism is typical of SAR operators worldwide, but it should not diminish the dedication and effort that they pour into their work. The incessant training to maintain their proficiency and the constant call for their expertise results in a skewed perception of the everyday. Because, while the application of their skill might appear routine for them, it is a life-

changing moment for those who need to call upon it.

Many survivors donate objects connected to their rescue, with messages of profound gratitude. "We just keep some lifejackets and life-rings," Lozano said with modesty. "But no more."

From their floodlit viewpoint high above the scene of the rescue, these objects are nothing more than functional items of their trade. But from the perspective of a sole survivor in the water, they are symbols of salvation, at the hands of another mortal soul. 



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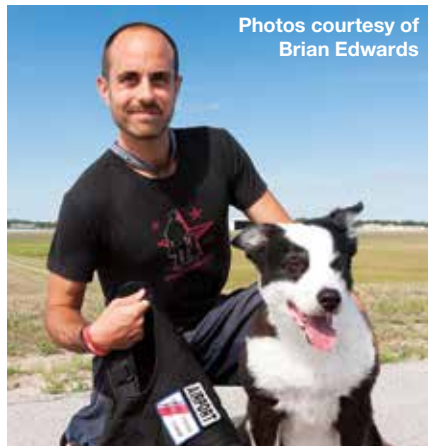
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## BRIAN EDWARDS

HANDLER, CHERRY CAPITAL AIRPORT K-9 TEAM



Photos courtesy of  
Brian Edwards

### **Vertical 911: How did you and Piper get started?**

**Brian Edwards:** I've been working at the airport since '08. My title is airport operations supervisor; I'm one of six. We're a small commercial airport, so we do it all. That could be plowing the runways and taxiways, mowing in the summertime, building maintenance... you name it, we pretty much do it. Part of that is wildlife control. And really what it boils down to is that I added my personal dog to help me with that small portion of my job.

I had read about the use of border collies at the Fort Myers Airport in Florida, so that was always in the back of my head. When I got Piper a few years back, first of all I just wanted to be selfish and somehow figure out a way I could bring him to work with me, and this happened to be the avenue to give it a shot. So after I got him, we started training, and the rest is history.

### **V911: Can you tell me a bit about the training process and what's involved with that?**

**BE:** Piper's my first dog. I've never had a dog before; I'm not a dog trainer by trade. So like a lot of people do these days, I watched YouTube videos and read as much as I could. We mostly worked on off-leash obedience work. At that time, when he and I were training, I was running a lot of obstacle races and endurance races, and he was my training partner for

that stuff. And once I made the decision to try to bring him to work with me, then we started doing obedience work while we were out training for those races.

This was all in our free time. I hadn't talked to my boss about it at that point, because he likes ideas that are fully fleshed out by the time that you bring them to him. It took about a year-and-a-half to get to the point where I thought, well, I really can't go any farther outside of the airport environment. After we got to that point, then I asked my boss and he said, "Yeah, let's give it a shot." We brought Piper to work in August of '14, and that was for just a month trial run, to see if he was going to be good around the planes and the different noises and the things that happen there.

### **V911: Did he take pretty naturally to working around aircraft?**

**BE:** To jets and prop planes yes, that was never really a bother to him. I'm just hypothesizing here, but my guess is that's because planes have more of a smooth sound signature. Helicopters thump, and especially if they're larger, they thump more, and that took longer to get used to. He was not a fan of our Coast Guard helicopters at first. But just by positive reinforcement and showing him that there's nothing to be afraid of, we got past that.

We get military visitors semi-regularly in the summer; they'll come over here and shoot different approaches on the runways and get fuel and whatnot. We would see [UH-60s] and [CH-47s]. Those thump a lot more, and those took more time. He eventually got used to the 60, and then the 47 was the last to come, because he sees those the least and they're the most thumpy. So helicopters on a whole definitely had to take more socialization training, but now it's not a big deal.

### **V911: What is a typical day at work for Piper?**

**BE:** I have to fit Piper into my responsibilities. Right now we're working the morning shift, which is 4 a.m. to 2:30 p.m. on a rotating day schedule. So when we get to work, I'll read through emails from the previous day, and then we'll go out on

patrol, typically until 7 o'clock. I've got to go do my duties by checking the airfield, making sure everything's up to snuff before our commercial departures for the morning. And so while I'm out checking the runways and taxiways and doing a perimeter check, we'll be doing patrol work with Piper. What we're looking at night for typically is fox and deer. It's usually a daily cat-and-mouse game with the fox, we've just got to find him — we'll launch Piper out to go chase him, he loves doing that stuff.

After 7 o'clock we'll come in, get some breakfast. And after that, it really just depends on how much that phone rings. If we were to have a pilot fly in and [see wildlife] on the runway, or on the approach, they'll relay that to the control tower, which will then call that phone I carry around and say, "Hey, we've got this that and the other thing out there." Obviously that's a life safety issue, so that takes priority over most everything. So Piper and I will go load up in the truck and respond to it and take care of it.

The other part of what we try to do during the day is be proactive. That's when we'll be driving around the taxiways, and he'll be out running next to the truck. Piper's not necessarily looking for birds when we go into that type of mode; he's sniffing out stuff in the ground. We're talking moles, voles, ground squirrels, gophers, you name it. If he finds them, he'll try to dig them up, and the whole point of doing that is getting rid of the food source for the larger things, like foxes and hawks. We don't care if a plane hits a mole, because that's really not going to cause any damage, but if it hits a fox that's hunting the mole, or a hawk that's circling to hunt that thing, then we have a problem.

If I have to be taking care of other stuff, then we can't be out doing as much proactive work. If I know that I have to go someplace for a meeting, then I'll just leave him in our maintenance building and our maintenance guys will kick him the ball and it will be a good time for him to catch a little catnap in between going out and working.







**V911: I think you've described him as "chief morale officer" at the airport. I imagine he's pretty popular around there?**

**BE:** Yeah, definitely. I just wanted to bring my dog to work with me every day, and we found something that obviously is not a gimmick, that we can make a difference in. But there's so many other things that have spawned because of bringing him to work, and that's definitely one of them.

In our maintenance building there's six supervisors, and 12 maintenance employees, so we're a really small shop. He'll be at the door — we have a long sidewalk coming up to our front door, it's glass, so he can see through there — he'll sit there and whine and wag his tail when he recognizes who's coming to the door. And not everyone's a dog person; we definitely have a couple of guys who I don't think would have a dog at home. But since Piper is really well behaved and doesn't bother everybody they'll still pet him and say, "Hi, Piper." He's one of the guys. It's been a lot of fun to have him accepted as another employee at the airport.

**V911: It seems like you have a great relationship with the Coast Guard Air Station, too?**

**BE:** The Coast Guard has been so supportive of us. Anytime I've asked for help or a favor they've been there to help us out, and we've just been very, very fortunate to have a great relationship with them. They have a boat that they contract with out on our bays to do hoisting practicing, and any time we want we can go out on the boat with them, and we'll do that a couple times a year just to keep Piper used to the noise and everything, and a different type of noise.

First of all he's on a boat, so he's all suited up in all his gear, and the boat is rocking; he's getting sprayed with rotor wash and getting wet. The helicopter is above him, the basket is coming down, banging all over the deck. We do that just to make sure he can manage the stress, but we would have never had that opportunity if we hadn't built such a great relationship with the Coast Guard. That's just one example of how good they have been to us. I just can't describe enough how they've helped us a lot along the way.

**V911: I really love what you do on social media and how you've built up that community. What is it like with Piper being famous?**

**BE:** Well, to me he's not a celebrity, he's just Piper like he has been the whole time. But add that to the list of the things I never thought would happen when I started this. It's been a lot of work — taking images, and editing them, and

coming up with something to say — but obviously the response has been great. And people have been very good to us, with really positive comments. One of the most rewarding things, as far as the social media goes, is to hear people on a regular basis say that they look forward to our posts because they're positive in a not-so-positive world right now.

People love Piper, even though they'll never meet him, they'll never see him in person, they have no vested interest in him other than a couple of posts a week. That to me is just really incredible. Obviously I love Piper, so to be able to share him and our experience together and how we've grown throughout the past couple of years has been a lot of fun.

**V911: What advice would you have for other people who are interested in doing something like this at other airports?**

**BE:** I think it's hard. The reason why there's not a lot of dogs working at airports is because there are a lot of hoops you have to jump through. When you're dealing with governments, usually the first question is money. With us being a small airport, we're never going to have the discretionary funding to purchase a dog that's trained for this and have a yearly operating budget to continue it on, so the reason why Piper works at our airport is because he's my dog, so it doesn't cost the airport anything. If you are having to go before a board, a commission, it's really hard to show a return on investment on this kind of stuff. I can't say people are flying in because they feel safer because they've seen Piper on the job. The hordes of tourists aren't flying in just to see Piper — it's impossible to show a return on investment.

In our case, what we had to get over is now you have an employee bringing in his own tool for a work function. Even though I don't think of Piper as a wrench, in the eyes of liability and everything he is. So how to make me liable and to skirt liability away from the airport, that took, like, three months of lawyering to figure all of that out. There's so many pieces that have to come together to make it work. If you've followed us online you've probably seen that I post almost all the time how lucky we are to be doing what we're doing, because everything has to go right to make it work.

*Follow the Cherry Capital K-9 Team on Instagram and Facebook @airportk9.*

*This interview has been edited and condensed.*





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