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About the cover: After a globe-spanning career flying helicopters, Torbjorn “TC” Corell, chief pilot for utility Southern California Edison, begins a new chapter: HAI chairman for 2016–17. Read more about TC and his plans for the coming year in his profile on p. 20 and column on p. 4.

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HAI: The Perfect Platform

In my travels to industry events and interaction with HAI members, I hear one comment: “Why should I become a member? I get the benefits from HAI anyway.”

True, much of the work that HAI does on safety, certification, and maintenance and flight standards benefits helicopter owners, operators, manufacturers and suppliers, and industry professionals around the world, regardless of whether they are members of our association or not.

HAI works behind the scenes on a daily basis to ensure the helicopter industry is not hit by unreasonable legislative, regulatory, or political initiatives. Its staff also represents our industry on important standard-setting and rulemaking groups, such as the FAA Airspace Management Advisory Committee.

HAI staff are also active on the international front, working with groups such as the International Civil Aviation Organization Task Force on Fatigue and the Rotorcraft Maintenance Programs Industry Group, which is working to lower direct maintenance costs.

I know, committees, working groups, and afternoons spent around a conference table don’t sound exciting. But important decisions that will affect you — such as pilot duty time, transmission replacement schedules, or even what airspace you can fly in — are made there.

In many meetings, even some aviation ones, HAI staff are the only persons in the room representing the helicopter industry. And at these meetings, “if you’re not at the table, you’re on the menu.”

HAI staff members work hard to ensure that the views of the helicopter industry are heard, and I am extremely proud of their accomplishments.

This is the core of what HAI does: serving its members and making sure their voices are heard.

But what about you, your opinions, your concerns? The best way to make sure that your voice is being heard is to join HAI and become an active member.

Join one of the HAI committees representing an industry sector or interest group. These members meet throughout the year, even devoting personal time to tackle the issues we all face. Their passion, creativity, and commitment really make a difference — it’s through their work that many regulatory issues are resolved.

HAI believes that no one knows the issues better than the people in our industry who actually do the job on a day-to-day basis. As a committee member, one of your roles is to bring news from the field back to headquarters so that HAI can allocate staff and funding to meet the needs of the members.

I remember learning as a brand-new line pilot — a long time ago, by the way — that HAI was an important organization for the industry, but I did not have a clue what it actually did. I never bothered to look into the work that HAI did beyond HAI HELI-EXPO®. I was just too busy with my own career.

I urge the next generation of pilots and maintenance technicians to begin at an early stage in their careers to educate themselves about our industry. The more you learn, the more you’ll realize how much HAI is doing for us.

Look a little more closely, and you’ll see how much HAI can do for you personally. With its education, networking, and leadership opportunities, HAI is the perfect platform to equip you for the future.

At one point in my career, while researching an important issue for my then-employer, I reached out to HAI for information. I received a tremendous amount of help and was able to assist my company to achieve a positive outcome. Although a member, I wasn’t active in the association at that time, but HAI really came through for me with technical resources and other support.

This experience kick-started my interest in HAI, and I got more involved through various committees and other HAI programs.

As the chief pilot for Southern California Edison, one of the largest and oldest U.S. utilities, I deal with not only aviation-related issues but also sensitive political and regulatory agendas that affect our flight department. I see on a regular basis the effect of HAI’s powerful voice on behalf of its members. Speaking through our association, our collective voice makes a difference.

To solve the many issues we face in our industry, we need that voice to be even stronger. We need more members who are willing to stand up and be a part of HAI’s efforts to handle the ever-changing political and regulatory climate. The investment of your time in a HAI committee or other association outreach program can pay huge dividends.

Become an active HAI member. You’ll connect with others in the industry while making our voice stronger. Your involvement in HAI will make a difference for both you and our industry.

Torbjorn “TC” Corell is the current chairman of HAI’s Board of Directors and chief pilot for Southern California Edison in Chino, California.
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Put Down the Damn Wrench!

Recently I was briefing the HAI Safety Committee on HAI’s Land & LIVE program, also known as our Land the Damn Helicopter initiative. As most of you know, the program promotes a pilot’s responsibility to make a precautionary landing when the flight is not going well. This could be because of deteriorating weather, aircraft systems warnings, low fuel, illness, or any other reason that the pilot deems appropriate.

In the course of the discussion, Safety Committee member John Knotts, a pilot with the Arizona utility Salt River Project, posed an excellent question: “What about the maintenance personnel? Why aren’t we telling them to ‘put down the damn wrench’ when they are faced with things not going well?”

I did not have a good answer for John and immediately realized we absolutely should address this.

Aviation maintenance technicians are highly skilled, trained, and licensed professionals. Just like pilots, maintenance technicians have the ultimate responsibility: the lives of others are entrusted to their care.

In the aviation community, professionalism is defined as doing the right thing, even when no one is watching, and this quality is just as important in maintenance technicians as it is for the rest of the aviation team.

Just as pilots do, maintenance technicians need to constantly review their environment and activities:

- Do I have the necessary tools and equipment to safely perform the work? Is the working environment and infrastructure adequate?
- Are the current, relevant technical reference manuals readily available?
- Am I completely satisfied that the aircraft or component is ready to be returned to service? Alternatively, am I comfortable leaving the aircraft or component in service?

Any evaluation must also include a personal check-in:

- Am I feeling healthy and alert?
- Do I feel competent to perform this procedure?

If your answers to any of these questions are “No” or “I’m not sure,” then stop and put down the damn wrench!

In many instances while working on aircraft or after making an operational or airworthiness decision, maintenance technicians are subject to third-party pressures that don’t align with a safety-first culture. “When will the aircraft be ready? We’re ready to go now,” says the customer. Or when a maintenance issue is detected, the boss asks, “Can’t we do just one more flight and then ground the aircraft?”

These can be tough questions to answer, especially when the guy asking them signs your paycheck. However, saying “someone made me do this” is not a reason to do something you know is wrong.

Just as pilots are responsible for the safe conduct of a flight, maintenance technicians are responsible for confirming the airworthiness of an aircraft or component. This professional division of responsibilities is one of the foundations of our aviation safety culture — and one of the reasons our industry has prospered and grown.

When presented with difficult questions, maintenance technicians have the opportunity to confirm or deny their true commitment to safety first, above all else. If anyone — co-worker, boss, or customer — tries to pressure you into an action that betrays that commitment, my advice is to put down the damn wrench!

Believe me, you don’t ever want to get that call where you learn that an aircraft or component you worked on was involved in a catastrophic accident. Before turning your back on professionalism, think hard about the potential effects of your decision.

The rest of us in aviation need to remember that maintenance can be challenging. Much of it is done at night, while the rest of us sleep; some is done in remote areas, subject to weather conditions, with limited infrastructure and equipment.

Unlike flying, which can generate revenue for an operator, maintenance only consumes revenue. Although completely necessary to the safety and efficiency of operations, it is often just dismissed as overhead.

Maintenance personnel perform their duties in the shadows, often without recognition or appreciation. So let’s give them the respect and support they deserve. We cannot achieve our safety goals without the expertise and professionalism of our maintenance brothers and sisters, without every member of our team.

I want to thank all of the maintenance men and women whom I have had the privilege to work with over the years, both civilian and military. Everybody reading this should do the same. Hug a maintenance technician today — you will be glad you did.

That’s my story and I am sticking to it. Let me know what you think at tailrotor@aol.com.

As always, fly safe — fly neighborly. 📝

Best Regards,

Matt Zuccaro is president and CEO of HAI.
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Traveling in the Right Circles

When we look at the causes of helicopter accidents, we continue to see the same hazards over and over again. Human factors such as poor aeronautical decision-making and procedural intentional noncompliance (PiNC) usually lead the list. How can we address these issues and lower the accident rate?

Design and regulations have important roles to play in safety, but we increasingly recognize that safety, along with many other things, is driven by culture. “If you get the culture right,” says Tony Hsieh, CEO of internet retailer Zappos, “most of the other stuff will just take care of itself.”

In other words, in a culture of people who hold safety as a core value, many other safety issues will fall into place.

For organizations, culture is sometimes defined as doing what’s right in the absence of authority. From this definition, it’s easy to see how a strong safety culture would reduce the occurrence of hazards such as poor aeronautical decision-making and PiNC. Pilots, maintenance technicians, flight directors, dispatchers — everyone involved in flight operations would do the right thing, even when the boss is not in the room.

Whether you know it or not, you already have a safety culture. Within each helicopter operator, flight department, or private owner’s hangar, there exists a culture that determines how we go about our helicopter flights. The question is, how can you go about building a strong, positive one?

One way to look at this issue is to make sure your organization is traveling in the right circles. Most people are familiar with the term vicious circle. This occurs when there is a feedback loop that intensifies the original effect, leading to a worsening of the situation. Also known as a downward spiral or slippery slope, the feedback loop reinforces the initial negative results, resulting in increasingly poor outcomes.

A vicious circle can be created when we make an operational mistake or have a close call and we get away with it. We cover up our mistake. Or maybe the additional factors that would have completed the accident chain never happen and the chain does not form — this time.

A virtuous circle (as opposed to a vicious circle) exists when we make an operational mistake or have a close call and we share that information with others so they do not make the same mistake.

We like to think that having this type of close call means that we would redouble our efforts to operate safely, that after getting through a white-knuckle flight, we would become converts to rigorously following the rules. Unfortunately, human nature does not seem to operate that way.

Instead, it is common that, having broken the rules once and gotten away with it, breaking the rules becomes the new normal. At first, we start small. It worked the last time, so no one will notice, we think. And so the vicious circle begins.

When conducting accident investigations, we call this becoming complacent or the normalization of high-risk behaviors.

But there is another type of circle: the virtuous circle. In this feedback loop, a favorable result leads to more positive outcomes.

A virtuous circle exists when we make an operational mistake or have a close call and we share that information with others so they do not make the same mistake. We look at company policy and training to see where the gaps were, and we look at ways to continuously improve our processes. We make every effort to not make the same mistake again, and we let others know too, so they can avoid our mistakes.

Our willingness to face our mistakes — for as humans, there is no doubt that we make them — in turn gives our co-workers the courage to step forward and say, “Hey, I made a mistake. How can we fix it? How can we improve?”

If you are a leader in your organization, then set the example. Own up to your mistakes, and show others how it’s done.

You can call this a virtuous circle. I call it effective safety management.

When you cover up your mistakes, you create a vicious circle. You accept that accidents will happen, thereby setting yourself and your co-workers up for next one. A vicious circle indeed.

When you openly talk about your mistakes, you have the opportunity to correct the conditions that encouraged or permitted that mistake while also influencing those around you to do the same thing. You set a virtuous circle in motion, one that creates an environment where safety is truly a priority.

The difference between covering up your mistakes and sharing them is the difference between creating the conditions ripe for the development of the next accident and making your entire operation more efficient and reducing risk. R

Stan Rose is HAI’s director of safety outreach.
NO MATTER WHAT’S OVER THE HORIZON,
MILESTONE WILL BE THERE.
The 2016–17 HAI membership year began July 1. If you have not already renewed your membership, please visit rotor.org/easypay to renew online today. If you have already renewed, watch your mail: you will soon receive your 2016–17 membership card.

If you are an HAI member company (either regular, which means you operate helicopters, or associate, which means your company is a manufacturer or supplier to the industry), the official HAI membership representative from your company will also receive an HAI Certificate of Membership. We hope you will display this proudly as proof of your company’s ongoing support for HAI.

Your company’s official HAI membership representative is the only person from your organization authorized to make changes to your company’s online membership record. He or she is also the person who receives all essential HAI correspondence regarding important changes and regulations affecting the industry, as well any materials on elections for the HAI Board of Directors.

Because of the importance of the role, the HAI membership representative should be the owner, president, CEO, or other senior executive directly involved in managing the aviation operations of your organization.

HAI membership representatives should visit rotor.org/update at least annually to review their company’s membership record and verify that the contact information and other data is up to date. The information from the membership record will appear in the online HAI Membership Directory and HAI Mobile app, so make sure your contact information, aircraft, services provided, and other important information reflects what you want potential customers to see.

All employees of Regular and Associate HAI members are eligible to receive HAI member benefits, such as discounts on HAI Professional Education courses. To ensure that your staff have access to this and other HAI member benefits, the membership representative for your company should update the membership record to add or delete staff names.

We look forward to serving you in the coming year. As an HAI member, you lend power to our voice as we advocate on behalf of our 4,200 company and individual members on legislative and regulatory issues affecting the helicopter industry and address the concerns of pilots, mechanics, and technicians worldwide.

Some of the issues we continue to monitor on your behalf include initiatives to create new, or expand existing, restricted airspace; legislation to remove air traffic control from the FAA and place it under the control of a yet-to-be-formed private company that would be dominated by the airlines; and for pilots, the Pilot’s Bill of Rights 2 and the self-certification pilot medical initiative.

Thank you for your support of HAI. Please contact HAI at 703-683-4646 or member@rotor.org if you have questions or if we can be of assistance.

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Louise Martin is HAI’s director of membership.
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Government Affairs

FAA Funded for 14 Months

After much wrangling, arguing, boasting, and downright arm-twisting, Congress cleared an FAA extension at the 11th hour. The FAA Reauthorization Act of 2016 was signed into law by President Obama July 15, extending the FAA’s ability to operate for 14 months.

Lawmakers had already left town for a seven-week recess when Obama signed the bill. The action gives Congress more than a year to agree on a more comprehensive bill and revisit the failed attempt to overhaul the air traffic control (ATC) system.

“The industry dodged a bullet on user fees and the privatization of ATC, and a number of mandates key lawmakers were pushing could have placed significant financial burdens on nearly every operating segment of the industry.” — Matt Zuccaro

Neither the House nor Senate will return until after Labor Day, when they will face gun control, funding to combat the Zika virus, and government spending to fund the federal government past October 1.

Congress has now moved to require the FAA administrator to evaluate and update standards within a year for crash-resistant fuel systems for civilian rotorcraft. This is an issue on which HAI President and CEO Matt Zuccaro and his staff are working closely with the FAA and Congress to ensure that the best technical advice and counsel are used to address this serious issue.

The reauthorization act calls for establishment by April 30 of a pilot records database and for issuance of regulations within a year of enactment that require the marking of covered towers. The language applies to self-supporting structures or those supported by guy wires and ground anchors that are 10 feet or less in diameter at the above-ground base, excluding concrete footings, and extend at least 50 feet above ground level.

The bill’s Subtitle B, UAS Safety, deals with the use of unmanned aircraft systems (UAS):

- The FAA administrator is to convene industry stakeholders to aid development of standards for remotely identifying UAS operators and owners and associated unmanned aircraft.
- In consultation with the National Aeronautics and Space Administration, the FAA is to develop a program to conduct comprehensive testing or modeling of UAS collisions with aircraft of differing sizes under assorted conditions, including collisions with other UAS and with rotorcraft of various sizes and traveling at differing speeds.
- A process is to be created for applying to the FAA to operate a UAS for day or night activities beyond the operator’s visual line of sight.
- The FAA is to reach agreements with the departments of Interior and Agriculture to continue the expeditious authorization of safe UAS operations in support of firefighting and of utility service restoration. Those intentionally and recklessly operating a UAS that interferes with wildfire suppression, law enforcement, or emergency response efforts are liable for civil penalties of up to $20,000.
- The bill also calls for the FAA to continue developing a research plan for UAS traffic management, development, and deployment.

Although House Transportation and Infrastructure Committee Chairman Bill Shuster (R-Pa.) has pledged to continue to push a proposal to put a nonprofit corporation in charge of air traffic control (ATC), Zuccaro says he is extremely pleased with the final outcome on the FAA extension.

“Today the industry dodged a bullet on user fees and the privatization of ATC, and a number of mandates key lawmakers were pushing could have placed significant financial burdens on nearly every operating segment of the industry,” he says.

The lawmakers’ considerable attention to drone use in the national airspace will mean utilities will now be better able to use UAS. They have been using drones aggressively to inspect rural lines for damage and overgrown vegetation, but new federal guidelines presented a problem. The new law gives explicit congressional approval for infrastructure operators to use drones in compliance with the new federal rules and to respond to natural disasters, as well as backing for civilian drones to fly beyond the operator’s line of sight.

Some senators were angered with Shuster’s actions, claiming he held a number of provisions in a Senate-passed bill hostage to gain leverage and later promote an ATC privatization. The legislative items now on hold from the Senate bill include noncontroversial certification reforms and contract tower programs, among others. Expect more drama as the airlines and Shuster push harder on round two for ATC privatization.

Ann Carroll is HAI’s vice president of government affairs.
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Am I Insured? Part III: What Coverage Giveth, Conditions and Exclusions Taketh Away

You never want to hear yourself saying “I thought I was covered” after an accident. At that point, it is too late to change the facts and you are stuck with whatever outcome you work out with your insurance company or a court’s decision after a few years of litigation. So spend a few minutes now reading this article. Then go find and read your insurance policy and talk to your insurance agent to make sure you have the coverage you think you have.

Details, Details, Details
The endorsement pages in an insurance policy that limit or take away coverage usually outnumber the coverage pages by a two-to-one margin. There are numerous conditions that need to be met, such as pilot qualifications, flight time, certificates, maintenance inspections, type of operations and compensation, compliance with procedures, and so on.

There are also numerous exclusions. Some common ones are for operation outside the coverage area, operation for an unlawful purpose, unapproved passengers or crew, off-airport landing, or aerial photography.

If you fail to meet a condition or find yourself in the middle of an exclusion, there may be no coverage. While conditions and exclusions are included to control the risk the insurance company is taking, there is nothing fair or reasonable about an insurance company using a condition or exclusion to deny coverage that is completely unrelated to the loss.

Unrelated Technicalities Can Cost You
Under the laws of some states, an insurance company can deny coverage for an accident because of a breach of the policy (not complying with some policy requirement), even if that breach did not have anything to do with causing the accident. For example, if the main rotor mast snaps in flight, completely unrelated to anything the pilot did, the insurance company could deny coverage if the pilot was flying with an expired medical certificate. It all depends on which state’s law applies.

Proponents of allowing insurance companies to use unrelated technicalities to deny coverage contend that it encourages people to comply with their insurance policies. Opponents say the practice violates the concept of reasonable expectations and gives insurance companies a windfall when they can avoid paying for risks they were paid to cover.

Before an actual loss, it is tough to get a definitive coverage decision. However, you can ask your insurance agent how your insurance company handles unrelated violations. Ask your agent to give you written assurance that “the insurance company will not attempt to use a breach to deny coverage that has no causal connection to the loss.”

Agree in Advance
There is always grey area on the fringes of insurance coverage. In every insurance fight, there are experts who are fully committed to completely opposite interpretations of what is and is not covered. So how does an operator get any kind of assurance about what is covered without testing the policy by having an accident?

The best way to avoid a fight altogether is to make sure what you think is covered is the same thing your insurance company thinks is covered.
And the best way to do that is to fully explain your flight operations to your insurance agent or broker: who is flying for whom, in what, owned by whom, maintained by whom, doing what, for what, when, and where.

It is preferable to do this in writing, using what you already have available, such as operations manuals, promotional materials, and service descriptions. Then get your insurance agent or broker to confirm, in writing, that those operations are covered.

Ask your agent to give you written assurance that “the insurance company will not attempt to use a breach to deny coverage that has no causal connection to the loss.”

Yes, something as simple as fully communicating the “who, what, when, and where” that we learned about in grade school will head off virtually any type of insurance fight. The value to you is obvious: you know what is and is not covered. But there is also a huge benefit to your insurance company because they want to know as much as possible about the risk they are taking by insuring you.

Sorting through the conditions and exclusions in an aviation insurance policy is a lot like reading a flight manual that has 35 major paper revisions still wrapped in plastic. But doing it now sure beats betting your company on the coverage you may or may not have.

Jon Kettles, “Your Aviation Lawyer,” is an aerospace engineer and ex-military helicopter and fixed-wing pilot with fixed- and rotary-wing airline transport pilot and certificated flight instructor – instrument ratings who has been practicing aviation law for more than 20 years. Jon can be reached at jon@kettleslaw.com.
It used to be that to continue to fly when you had high blood pressure, you would have to get a letter from your doctor and then send it to the FAA. If everything looked good, the FAA would reissue your medical certificate. After some time had passed and you had shown good results under your medication or treatment regimen, you might be allowed to bring that letter from your physician to an aviation medical examiner (AME), who could issue your medical certificate. However, the AME would still have to forward that paperwork to the FAA. Many pilots with common medical conditions chafed under the amount of paperwork, not to mention time, needed to process their medical certifications. Sometimes paperwork would get lost. Other times, more details were needed and more paperwork needed to be submitted. Many of you have likely experienced the frustrating delays that can happen during this process.

A few years ago, the FAA implemented a great new process called CACI, which stands for Conditions an AME Can Issue. The CACI process offers the pilot community an easier, quicker way to obtain medical certificates while still ensuring their fitness to fly.

Each medical condition covered by the CACI process has a worksheet containing specific criteria for the AME to evaluate. The criteria are designed to help the AME, and by extension, the FAA, determine whether the medical condition is being appropriately managed or represents a risk to the pilot’s ability to fly safely.

If the pilot meets all of the criteria, the AME can issue a medical certificate in the office without submitting any paperwork to the FAA. The AME simply writes “CACI qualified” for the condition in question on the pilot’s application for medical certification.

Let’s look at how a pilot being treated for hypertension can use the CACI process to streamline her application for medical certification. The first section of the CACI worksheet for hypertension states the “treating physician or the AME finds the condition stable on current regimen for at least 7 days and no changes recommended.” In order to fulfill this criteria, the pilot can either provide a letter from her doctor stating that is the case or the AME can make this determination. However, you should know that most other CACI conditions do require a note from your doctor.

The next criteria to be met is a lack of symptoms related to high blood pressure, such as headaches or vision changes.

The worksheet also asks that the AME verify that the pilot’s blood pressure is less than or equal to 155/95. If you have hypertension, you know that this isn’t a great blood pressure, but the FAA is generally more worried about your blood pressure being too low than a little too high. That’s because low blood pressure can cause you to pass out or become dizzy — a bad thing to happen while flying a helicopter.

Other sections review acceptable medications for hypertension. Pilots with this condition can take up to three of any of the following...
medications: alpha blockers, beta blockers, calcium channel blockers, diuretics, ACE inhibitors, ARBs, direct renin inhibitors, and direct vasodilators. Centrally acting antihypertensive medications such as Clonidine will disqualify you from being medically certified.

The last section asks the pilot if she is having any symptoms related to side effects from her medication. If this pilot meets all of the criteria and is otherwise qualified, the AME can issue her medical certificate on the spot.

Shortly after the CACI process came out, an airline pilot called my clinic. He had been recently diagnosed with a type of colitis and was disappointed that he would have to apply for a special issuance. Hold your horses, we told him, there is a CACI for that.

With the assistance of his physician, the pilot collected the necessary information. In this case, that was a report noting his general health status, symptoms and underlying cause of his colitis, medications used to treat the condition, and a statement that he had not undergone any surgery in the past six weeks. Armed with this information at exam time, we filled out the CACI worksheet and, presto, he got his medical.

There are 16 medical conditions eligible under the CACI process, and the list continues to grow. So far, the FAA has CACI worksheets for the following conditions:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Medical Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>arthritis</td>
<td>hypothyroidism</td>
</tr>
<tr>
<td>asthma</td>
<td>migraine and chronic headache</td>
</tr>
<tr>
<td>bladder cancer</td>
<td>mitral valve repair</td>
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<tr>
<td>chronic hepatitis C</td>
<td>pre-diabetes</td>
</tr>
<tr>
<td>chronic kidney disease</td>
<td>prostate cancer</td>
</tr>
<tr>
<td>colitis</td>
<td>renal cancer</td>
</tr>
<tr>
<td>glaucoma</td>
<td>retained kidney stones</td>
</tr>
<tr>
<td>hypertension</td>
<td>testicular cancer</td>
</tr>
</tbody>
</table>

All of the CACI worksheets are available online at http://bit.ly/caci-ws. Review them before your medical exam. This will help you get a head start on obtaining the appropriate documentation, if required, from other physicians treating you, as well as any other needed supporting materials. If you have a CACI-eligible condition, talk with your local AME to learn more about using CACI to speed your medical certification.

Dr. Charles H. Mathers is an FAA senior aviation medical examiner and is board certified in Aerospace Medicine and Internal Medicine. He serves as medical director for the Aerospace Medicine Center at the University of Texas Medical Branch in Galveston, Texas, which specializes in the evaluation of pilots with complicated health conditions, fitness for duty evaluations, and monitoring of pilots in the HIMS program. He has been a private pilot since 2004.

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Dr. Charles H. Mathers

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New Chairman Brings International Focus, Commitment to Outreach

Torbjorn “TC” Corell to Lead HAI

By Rob Finfrock

Torbjorn “TC” Corell, the new chairman of the HAI Board of Directors, is someone who places great importance on being an active, working helicopter pilot. In fact, he resisted when asked to exchange his flight suit for a sport coat for some official photos.

“I’m not really a suit-and-tie type,” he says. “I am from the people, for the people. Above all, it’s that attitude that I will bring to my role as chairman.”

TC also brings an international background, as well as a strong commitment to safety and a solid history with HAI — which he wants to see expand its outreach programs.

Around the World and Southern California

Although a permanent U.S. resident, TC was born in Sweden, and his rotorcraft work has taken him around the world, including Eastern Europe, West Africa, and across the Pacific and Atlantic oceans. He’s worked since 2005 for Southern California Edison (SCE), a leading U.S. utility, whose more than 103,000 miles of transmission lines deliver power to nearly 14 million people over 50,000 square miles in central, coastal, and southern California.

The company has about 11,000 employees, but fewer than 50 work in the company’s flight operations at Chino Airport (KCNO). The flight operations department plays a critical role for SCE by directly supporting the installation, maintenance, and replacement of power transmission towers and lines, using a fleet of Airbus Helicopters AS350 B3s and EC135s, as well as a Bell 205 A1++.

A Different Kind of University

Like many in rotorcraft, TC was introduced to helicopters through military service. After college, he spent his obligatory stint in the Swedish Armed Forces training and then working as a combat medic.

“I was drawn to airborne rescue, and my first helicopter ride was in a CH-46,” he says. “I thought, This is pretty cool, and that was the beginning of my huge passion for the industry.”

After his military service in the late 1980s, TC moved to the United States to work as a flight instructor, first in New Jersey and then in Long Beach, California. However, he was quick to accept an opportunity for a more exciting adventure when it came along.

“I’d become pretty burned out with instructing, and I was hired by Columbia Helicopters in 1994 to do timber logging in Alaska,” he says.

“The next year, I was hired to fly on a mission for the United Nations [U.N.], monitoring the Serbian-Croatian border. This was before the Dayton Peace Accords, and the Serbians had agreed to provide us with a daily, two-hour window to monitor tank and troop movements.

“They were quite welcoming,” TC adds dryly. “The Serbians helpfully informed us that any time before 1 o’clock, they’d shoot us down; after 3 p.m., they’d shoot us down. Here we were, two helicopters with giant U.N. markings on them, and we could watch their surface-to-air missile installations tracking us.”

In early 1996, Evergreen asked if TC wanted to continue on another U.N. contract, this one in Côte d’Ivoire in West Africa.

“We sprayed rivers with a number of different chemicals to combat...
the parasitic Onchocerciasis [river blindness] virus," TC says. “We flew nearly every single day for one year, over terrain ranging from steppes to triple-canopy jungles. We barely had any maps to assist us, either — we used topographical maps to navigate with.

“I’m extremely grateful for the experience, which was one of the most intense flying experiences of my career,” TC says. “Travel is the biggest university in the world. I’d always had the travel bug in me — new places, new faces — and I saw opportunities in each new assignment. I also realized that I really enjoyed utility flying.”

After the Onchocerciasis project, TC moved to Alaska in 1997 to provide aerial support for U.S. Forest Service geological research and drilling operations. While he maintained the same hectic pace as before, including off-season work and a short stint in Montserrat assisting with the evacuation of islanders after the Soufriere Hills volcano erupted there, the extended assignment in Alaska brought a new sense of stability to his life, as did meeting his future wife, Snow.

“It was kind of a new concept for me, staying mostly in one place for an extended time,” he says. “I was there until 1998, when I accepted a job in Maui on a U.S. Navy contract to provide aerial support during the cleanup of the Kaho’olawe Island target range, diffusing bombs. I also flew search and rescue operations for Maui County. That was really where I felt a sense of stability beginning to settle in, especially since the environment really suited our active lifestyles. Hawaii embraced us, and both of us felt a deep-rooted connection to the islands.”

TC and Snow were living happily in Hawaii when Southern California Edison first approached him about a job in 2003. “I wasn’t interested back then,” he says. “I’d already spent time in Long Beach, and I really didn’t want to return to SoCal. Besides, leaving Hawaii for L.A was an extremely difficult decision.”

The company again approached him in April 2005 about a pilot position involving power line work, precision long-line, and high-altitude operations. The challenges were too tempting to pass up.

An Impressive Company Culture
“The first thing that really impressed me about SCE,” TC says, “was the maintenance department. The hangar was extremely clean, and I met people who’d been with the company for 15, 20, even 30 years.

“I didn’t know people in our industry could stay in one spot for that long,” he says. “Even more foreign to me was that I met pilots who would soon be retiring from their own long careers at the company. I’d never really thought about being able to retire as a pilot.

“Now, 11 years later, I still feel like I’m the new guy,” TC says. “But that’s only because some of our people are approaching more than 35 years with the company.”

TC was also impressed with the safety culture already in place at SCE — and it’s easy to see why. Just after he had started with the company, TC had a flight that required setting poles using the AS350 B3.

“Hundreds of customers had lost service, and it was an operation with a lot of people involved,” TC says. “I was a little worried about the wind, and the mechanical turbulence was very evident when I was setting the first pole.

“I had to make the decision, and I told them I was shutting down the job due to strong winds,” he says. “On my way back to base, I figured, literally, I was so fired. I didn’t know yet the kind of culture that was in place ... and I
was absolutely shocked when they told me, ‘Great job making that decision.’ That wasn’t the culture I was used to.”

Training to Be Mission Ready
About a year after TC joined the company, however, the SCE flight department was forced to deal with a fatal accident.

“The flight operation was shut down for a period of time, and there were some discussions about keeping us grounded permanently,” TC says. “The company determined we were critical to their success, and they asked us what we needed to do our jobs better. The obvious answer was more training, which has been a focal point in our operation ever since.”

Responsible for overhauling the department’s training guidelines, TC consulted with others in the industry to create a standardized training model. At the heart of it is the company’s Aircrew Training and Standardization Manual that trains them to be “SCE mission-ready pilots,” in TC’s words.

“The ATSM is truly a living and breathing document, and it’s at the core of our pilot training,” he says. “All pilots fly differently. If you have five pilots heading to a landing zone, they will shoot five different approaches. But if we’re going to educate people the right way, we need to have the same message. New generations must receive standardized, consistent training. Otherwise, we’re going to have the same accidents over and over again, which is what we still grapple with today.”

In TC’s view, quality training is even more important in aviation: their training is what people will revert to in risky or stressful situations.

“By the nature of the machine, helicopters often work in not very nice places…. In a pinch, whenever you do something unfamiliar or even uncomfortable, you will automatically come back to a habit from your training.”

SCE also uses a flight risk assessment tool to determine risk exposure before every flight, based on a 19-point scale.

“It very quickly lets us know where our exposures are,” TC says. “For example, pairing a brand-new patrolman with a brand-new pilot would trigger 19 points: no go.

“We always want to discover red flags before we start a mission,” he says. “Our pilots initially resisted — more paperwork, really? — but the types of missions we fly are very risk intensive.”

TC and some colleagues in SCE flight operations.
exposed, with so many variables. Very early on, everyone realized that using a risk assessment process is something we needed. The program has been in place for almost 10 years and is now part of the flight release process for every mission we fly.”

**Improving Industry Safety**

It was while at SCE, in 2008, that TC first ran for election to the HAI Board of Directors. He was elected assistant treasurer in 2013 and subsequently served as treasurer, then vice chairman, before starting his term as chairman July 1, 2016.

One of TC’s concerns for the industry is to increase the number of experienced helicopter pilots and maintenance technicians. “The number of qualified personnel in our industry is the lowest it’s ever been,” he says.

TC advocates mentorship programs that pair new applicants to the industry with experienced helicopter pilots and maintenance personnel. “We have a system in the U.S. where you have a civilian pilot, fresh out of flight school, becoming a flight instructor to teach another new pilot. Flight schools need to change how they conduct business so that we ultimately have more experienced pilots as instructors,” he says. “On-the-job training is so common in this industry, but we cannot rely on that. We’re setting the pilot up for failure that way.

“I understand that it’s not practical for smaller operations to take four to six months to train a pilot before he or she is qualified — which is the SCE way, regardless of whether that pilot has 3,000 or 10,000 hours — but mentorship programs and endorsements could go a long way toward accident reduction.”

TC also believes that specialized audit programs for specific industry sectors, such as helicopter air ambulance and oil and gas production support, are highly effective tools for furthering industry safety.

“Lots of people are afraid of the term, because hearing ‘audits’ implies a negative feeling upon walking in,” he says. “You need to have an open mind to the process, though — and I love audits, because they’re always an opportunity to learn. Maybe we just need to call them something different. Benchmarking is another tool in our industry that has become critical in order to learn from each other but for smaller companies, the cost associated with it can be high.”

**Reaching Out to Teach and Learn**

TC also plans to explore the possibility of HAI outreach programs that deliver the association’s messages to groups across the country, including regional HAI gatherings with an emphasis on connecting with smaller companies unable to attend the annual HAI HELI-EXPO® trade show. “Outreach is essential,” he says. “The industry is pretty healthy, but it’s also changing a great deal. I am convinced HAI HELI-EXPO will continue growing, and it’s going to become even more important, but
we need more pilots there, not just the managers. I think an outreach program on the local level would drive more education and more of what’s important to our members who are the core of HAI and our industry.”

TC wears several SCE hats — “I’m not only a line pilot but the chief pilot for the flight department. I’m also a manager and supervisor for the company and the aviation safety manager” — and he is quick to add that these duties give him a unique and valuable perspective on the role of HAI chairman.

“Combining those hats into one job has helped bridged the gap between my department and our company,” he says. “I hope I’m also able to bridge the gap between HAI and our members. I want to learn what they expect from us, and I want to educate them about what HAI does for them.

“We must remain strong financially while also bringing something from each company to make HAI a better and stronger association,” TC says. “I embrace the chairmanship, and I look forward to meeting HAI members and learning more from them.”

Introduced to the world of aviation through a Cessna 310 ride in August 2002, Rob Finfrock has spent the past 10 years reporting on a variety of subjects in the aviation and aerospace industries. When he isn’t at his computer “flight-writing,” you may catch Rob plying the skies over the Land of Enchantment, New Mexico, in a Remos light-sport aircraft.
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HAI Welcomes 2016–17 Board

More than 100 people helped HAI welcome its new Board of Directors on June 21 as the association held its annual reception to mark the end of the fiscal year and the installation of the new board.

During the reception, outgoing Chairman Max Lyons of Hillsboro Aviation (left) passed the gavel to Torbjorn “TC” Corell of Southern California Edison, who on July 1 took over as chairman of the Board of Directors (see profile on p. 20). Also honored was Tony Burson, chief pilot for UTFlight. A former HAI chairman and director, Burson has served on the board since 2006.

Aaron, Sheard, and Stanley Join HAI Board of Directors

Stacy Sheard and Marc T. Stanley, two former U.S. Army pilots, took their posts July 1. Aerobatic legend Chuck Aaron, profiled on p. 28, joined the board in March, following the resignation of Director Lynn Malstrom.

STACY SHEARD’S AVIATION CAREER started more than 20 years ago when she served as a U.S. Army Black Hawk and Huey pilot in the United States and Middle East. She then flew helicopter tours in Las Vegas and the Grand Canyon, helicopter air ambulance flights for Children’s Hospital in Los Angeles, and aerial news and corporate flights in Los Angeles.

Sheard also worked as a test pilot for Sikorsky Aircraft Corporation, test-flying S-76 and S-92 helicopters and instructing the company’s customer pilots around the world. She is now an AW139 corporate helicopter pilot for Jet Aviation, flying in the New York and Philadelphia areas. Along the way, she has earned bachelor’s and master’s degrees in aeronautics.

In addition to presenting at industry events such as mentoring panels and career development workshops, Sheard has been a mentor and fly-in pilot for children’s STEM (science, technology, engineering, and math) events, scholarship director for Whirly-Girls International Women Helicopter Pilots, and international liaison for Southern African Women in Aviation and Aerospace.

She is the 2016 recipient of the Livingston Award, presented by the Whirly-Girls for her contributions to the advancement of women in helicopter aviation.

“I’m looking forward to getting started on the board,” Sheard says. “It is the responsibility of the professionals in this industry to make proactive and meaningful change that positively affects the future.”

MARC T. STANLEY BRINGS more than 30 years of aviation experience onto the board with him, having begun his aviation career at 16, fueling forest-firefighting aircraft in Yellowstone National Park in Montana.

Stanley joined the U.S. Army at 18 and served as a helicopter maintenance technician for nine years before attending flight school. During his 26 years of service, he earned several awards, including the Legion of Merit, Bronze Star, Air Medal, and Master Aviation Badge.

He is now a helicopter captain for the MassMutual Financial Group in Springfield, Massachusetts.

Stanley has flown on six continents and has experience in firefighting, helicopter air ambulance, VIP transportation, search and rescue, night-vision goggles, and flying overwater and in mountainous terrain. He has presented at military transition and career development workshops and written on the subject of military transition for ROTOR.

Stanley says the helicopter industry is facing many challenges, such as the privatization of air traffic control, limitations on access to airspace, and the challenges facing transitioning veterans who seek careers in civilian aviation.

“I am excited to join the HAI Board of Directors because I want to take part in finding solutions,” he says.
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Chuck Aaron has a pretty solid résumé as a helicopter pilot. In fact, he’s something of a living legend.

Aaron spent a decade as one of the most famous helicopter pilots in the world, flying the Red Bull helicopter in around 250 airshows during that time. At one time, he was the only pilot licensed by the FAA to fly aerobatics in a helicopter in the United States and one of the three in the world.

In his work with Red Bull, Aaron performed loops, rolls, climbs, and other stunts in a modified MBB BO105 specially designed to withstand the stress of the maneuvers. He was always upfront about his helicopter’s special abilities, saying, “Don’t go and try to loop with a JetRanger or roll a Black Hawk. They are not designed for it.”

While performing stunts that few other pilots could do, Aaron has never lost sight of safety: he has more than 20,000 flight hours with no accidents or incidents.

Aaron has plenty of substance behind his flashy work. He is a member of the Society of Experimental Test Pilots since 2011 and was inducted into the Living Legends of Aviation in 2013. He was also honored during the 2014 Salute to Excellence Awards as Pilot of the Year. At HAI HELI-EXPO 2016, he was awarded an HAI Lifetime Membership for his contributions to the industry.

Aaron currently operates FX Helicopters in Westlake Village, California. In addition to working as a stunt pilot — remember the helicopter scenes in Mexico City in 2015’s James Bond movie, Spectre? — he has worked with the U.S. and various foreign governments on consulting and development projects, as well as with the industry on new aviation products.

Flying is in Aaron’s blood. His father was a West Texas barnstormer in the 1930s, before serving in the U.S. Army Air Corps and later the Air Force. Chuck was taught by his father to fly fixed-wing aircraft, but a 1972 ride in a Bell 47 convinced the younger Aaron that rotorcraft was the way to go.

Forty-four years later, Aaron is still a force in the industry and sees serving on the HAI board as another opportunity to give back to the helicopter community.

While flying for Red Bull, he told ROTOR magazine in 2012 that he flew for the next generation.

“My intent is to show kids that there are still undone things in aviation that they can still dream up and do. I want kids to know that I thought outside the box,” Aaron said, adding that the point was not to fly loops but to think imaginatively in aviation “and bring more stuff to the table for the rest of the people here on Earth.”
Calendar of Events

2016

**August 21**  
World Helicopter Day  
“Celebrating helicopters and the people that operate them”  
worldhelicopterday.com

**August 24–26**  
Aeromed Australasia and College of Air and Surface Transport Nurses  
ASA+COASTN 28th Conference  
Queenstown, New Zealand  
aeromedconference.com

**August 30 – September 1**  
Western Region Safety Seminar  
Airborne Law Enforcement Association (ALEA)  
Palm Desert, California, USA  
alea.org

**September 5–8**  
42nd European Rotorcraft Forum  
La Société Savante de l’Aéronautique et de l’Espace  
Lille, France  
erf2016.com

**September 26–28**  
Air Medical Transport Conference  
Association of Air Medical Services  
Charlotte, North Carolina, USA  
aams.org/events/amtc  
Visit HAI at Booth #304

**September 29–30**  
Transformative Vertical Flight Workshop  
AHS International  
Hartford, Connecticut, USA  
vtol.org/events/transformative-vertical-flight-workshop

**October 11–13**  
Helitech International  
Amsterdam, Netherlands  
helitechevents.com  
Visit HAI at Booth #12F88

**October 12–14**  
Canadian Region Safety Seminar  
Airborne Law Enforcement Association (ALEA)  
Sault Ste. Marie, Ontario, Canada  
alea.org

**October 23**  
15th Annual Wings Wheels Rotors Expo  
Los Alamitos Area Chamber of Commerce  
Los Alamitos, California, USA  
wwrexpo.org

**October 25–27**  
2016 Rotorcraft Safety Conference  
Federal Aviation Administration  
Hurst, Texas, USA  faahelisafety.org

**October 26–27**  
17th Helicopter Military Operations Technology Meeting  
AHS International, Hampton Roads Chapter  
Newport News, Virginia, USA  
vtol.org/helmat

**November 1–3**  
Central Region Safety Seminar  
Airborne Law Enforcement Association (ALEA)  
Austin, Texas, USA  
alea.org

**November 1–3**  
NBAA’s Business Aviation Convention & Exhibition (NBAA-BACE)  
National Business Aviation Association (NBAA)  
Orlando, Florida, USA  
nbaa.org/events/bace/2016  
Visit HAI at Booth #1031

**November 8–10**  
Rotorcraft Virtual Engineering Conference  
Royal Aeronautical Society  
Liverpool, UK  
aerosociety.com/events/event-list/2051/rotorcraft-virtual-engineering-conference

**November 14–16**  
International Air Safety Summit (IASS)  
2016  
Flight Safety Foundation  
Dubai, United Arab Emirates  
flightsafety.org/meeting/iass-2016

**November 17–18**  
Fifth Asian-Australian Rotorcraft Forum  
AHS International Singapore  
vtol.org/arf

**December 6–7**  
10th Rotorcraft Symposium  
European Aviation Safety Agency (EASA)  
Cologne, Germany  
easa.europa.eu/newsroom-and-events/events/10th-rotorcraft-symposium

2017

**March 6–9**  
Exhibits Open March 7–9  
HAI HELI-EXPO 2017  
Dallas, Texas, USA  
heliexpo.rotor.org
Creating a Safety Culture that Works

By Amy Laboda

Developing a strong safety culture has the single greatest impact on reducing incidents and accidents in your organization, according to research cited by the U.S. Occupational Safety and Health Administration.

However, many in our industry still struggle with the concept. What is a strong safety culture? And how do you get one?

To answer those questions, it may be useful to look at an organization that has lost its safety culture and is now working to rebuild it: the Washington Metropolitan Area Transit Authority (WMATA), which provides 4 million customers in the Washington, D.C., metro area with bus and, via the Washington Metro system, subway service.

From Showcase to Worst Case
The Metro system was conceived as a premier transportation network in our nation’s capital, but numerous safety incidents and accidents, combined with emergency shutdowns and service interruptions, has severely damaged its reputation. Ridership is down, even as the region’s population has grown, and critics have taken aim at Metro’s safety culture — or lack of it.

The list of ways Metro has failed to provide safe, reliable transportation is large and keeps growing. Rail cars known to be safety hazards were not replaced. Tunnels were left unmaintained, collecting debris. Fifteen passengers or workers have been killed as a result of Metro operations since 2009. In one instance, a track defect detected by Metro inspectors in July 2015 — a defect that Metro officials say should have triggered an immediate shutdown of that section of the subway — was not addressed until after it caused a derailment a month later.

In its report on a January 2015 cable fire during which one passenger died of smoke inhalation and 91 were hospitalized, the National Transportation Safety Board (NTSB) cited WMATA’s failure to act on previous safety recommendations to improve equipment, procedures, and processes. Workarounds, cutting corners, unsafe decisions and judgments that compromised safety — eventually they added up to accidents that have cost tens of millions of dollars and dozens of lives.

Without a safety culture, Metro
simply wasn’t safe — not for its passengers and not for its workers. The transit authority is now under the safety oversight of the Federal Transit Administration (FTA), the first U.S. urban subway system to be placed under direct federal authority.

“From WMATA’s lack of certain safety procedures and its deviation from established ones, this accident reveals a compromised safety system and a dysfunctional organizational culture,” said NTSB Chairman Christopher A. Hart in the agency’s report on the January 2015 accident. “The NTSB concludes that WMATA has failed to learn safety lessons from NTSB studies and accident investigation reports.”

But fixing that problem was going to take a whole lot more than a companywide lecture and a night for everyone to sleep on it.

The Leadership Component
In September 2013, the NTSB convened a two-day public forum that brought together researchers, operators, and regulators to discuss their real-world experiences with trying to study, manage, and enhance safety culture. Forum participants gave firsthand accounts of implementing safety management systems (SMS) and associated programs such as operations monitoring and voluntary reporting. Participants also discussed the role of operators and regulators in promoting safety culture.

Former NTSB Chair Deborah Hersman presided over that 2013 forum on safety culture. She remembered her fellow board member Earl Weener describing how to implement a successful safety program: sweep the stairs from the top down.

“It’s a cool analogy. If you don’t start from the top, you are going to make a big mess,” she says. “Your SMS goals and metrics will be all off, as well as communication.”

Safety leadership is still a topic that concerns Hersman, who left the NTSB in 2014 to become CEO of the National Safety Council (NSC), which works to improve safety in the workplace, in homes and communities, and on U.S. roads. She says that instilling a safety culture involves more than just giving employees an inspiring talk.

“At NSC we have a workplace safety conference every year, and about 14,000 people attend. Two years ago, we asked attendees, mostly safety professionals, to rate [what] they had trouble with, and leadership was No. 1 on the list,” says Hersman.

The NSC stresses data-driven solutions to safety issues and works with businesses, governments, and the public to perform safety research. The results of that survey of conference attendees is backed up by data from employee safety perception surveys, one of the free safety tools offered by the organization.

“What we’ve found from that anonymous survey is that employees more than anyone know when someone is walking the walk,” she says. “Leaders are responsible for
establishing vision first and foremost. And if you can’t create that vision of safety, you are not going to inspire the rest of your team to hold that value.”

The new guy walking the safety walk at Metro, general manager and CEO Paul J. Wiedefeld, is taking an active role in addressing Metro’s safety culture.

Wiedefeld, who had headed both the Maryland Transit Association and Baltimore/Washington International Thurgood Marshall Airport before being recruited to lead WMATA, summed up the current state of Metro’s safety culture in a March letter to both employees and passengers: “The safety culture at Metro is not integrated with operations, nor well-rooted at all levels. Understandably, high-profile incidents have shaken confidence in the operational safety of the rail system and corrective actions are needed.”

Wiedefeld isn’t just talking about safety. He garnered some criticism last March when he shut the subway system down for 29 hours in the middle of a workweek for an emergency inspection of power cables that had been implicated in two previous fires, including the January 2015 accident. Commuters complained and critics questioned the move, but Wiedefeld made it clear that safety was his top priority.

“While the risk to the public is very low, I cannot rule out a potential safety issue,” he said in a statement. “When I say safety is our highest priority, I mean it. That sometimes means making tough, unpopular decisions…. I fully recognize the hardship this will cause.”

**Safety First, Service Second**

Wiedefeld is not done shaking up the transportation agency. Anxious to address the maintenance backlog and safety recommendations from the NTSB and FTA, he initiated SafeTrack in June.

Under this plan, three years’ worth of maintenance will be completed in one year’s time. To accommodate this ambitious schedule, the system will operate with reduced hours — many cited Metro’s extended operating hours as one reason why maintenance wasn’t getting done — and slow or suspended rail service to parts of the system.

Wiedefeld wants the emphasis at Metro to be on safety first; service comes second right now. He recently hired Patrick Lavin away from New York City Transit’s safety division, where he was deputy director of safety, and made him chief safety officer for WMATA.

Lavin’s extensive experience in operations and in accident investigation made him perfect for the job. His goals for D.C. Metro are simple. “People, processes, and equipment: those are the three things you want to focus on. It is the foundation of how you change a safety culture,” Lavin says.

SafeTrack is tough medicine for those who rely on the system, shutting stations down for days at a time and slowing service to a crawl to permit extensive track and tunnel repairs to be completed by workers, but Lavin insists it is absolutely necessary for safety. That’s the equipment part of the equation. To go along with SafeTrack, Lavin is working on fixing procedures and processes.

His top-down strategy includes being on daily morning status conference calls with his managers in the trenches, learning of issues and solving problems on the fly, which is critical for any transportation entity — people need to get where they need to go. He’s also building a safety division made up of a mixture of experts from both safety and operations.

“That’s critical,” Lavin says. “The problems that you have with many safety organizations or departments are that they are filled with only safety people. If you want to really effect positive safety changes in the system, you need a blend of both safety professionals and operation people who are truly subject-matter experts on each area that you have to analyze.”

Once the secret sauce of safety experts and operations experts completes the daily analysis, which often includes perusing the influx of data from Metro’s nonpunitive safety reporting system, they must generate solutions. And because Metro is a transportation entity operating in real time, those solutions must be applied quickly.

“If you are getting repeat failures of a certain type, you want to look at how are individual operators trained, what processes they use to identify problems,” Lavin says. “Are those processes effective, and if they are not effective, why? Is it a track access issue? Is it an issue with operator training? Is it an issue with the equipment that they use?”

“To change safety culture, you need to equip employees with the right
education, the right tools, and the right opportunities to get on the right safety track and make a difference,” says Lavin.

**Safety Culture Makes SMS Real**

A safety culture embraces SMS components; essentially tying them together and making them work. You may have the best-written safety policy, a skillfully developed risk matrix, and a robust audit system, along with a communications network like no other, but if you do not have a positive organizational culture in relation to safety, it means very little.

Lavin saw that when he first came to NYC Transit as an accident investigator. “Back in 2003, I’m the manager in charge of accident investigation at NYC Transit. About two weeks after I’m there, they have a collision in a yard where a train hits a bumping block.

“I go out and investigate and it turns out they were doing a wheel-truing operation [a procedure to restore wheels’ roundness]. As part of the process, there were a lot of lapses in the defenses…. The train operator wouldn’t always properly inspect the train after service, the car operator might not either, and the next thing you know, they are operating the train and there are no brakes and they slam into the bumper block, which is designed to keep the train in the yard,” he says.

The first incident Lavin investigated was so severe that the train almost left the yard. It toppled the block, going up an embankment at a 60-degree angle and almost through a fence that would have put it on a busy city street and eventually rolling down into the Atlantic Ocean.

“The group of accident investigators with me said, ‘Yep, it is the train operator’s fault,” says Lavin. “I said, ‘How many of these have we had in the last year?’ They said, ‘Two.’

“I said, ‘How many have we had in this location in the last three years?’ Turns out that altogether it was about six.”

Back at his office, Lavin read all six accident investigations. In every incident, they blamed the train operator. “Each incident probably cost upwards of $800,000 in damage, never mind the embarrassment to the agency that was difficult to measure,” he says.

What did Lavin do differently than

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his predecessors?

“I did not blame the operator. What I did was invest some $70,000 in hydraulic bumping blocks, which are much more robust and at impact they minimize damage,” he explains. That was the equipment part of his solution.

Lavin also looked how NYC Transit processes were contributing to the accidents. “We changed the procedures and processes of how they call for the release of cars after maintenance and how they actually inspect the trains. We added things such as fixed signage so they knew where to make safety stops, and we went from having three incidents a year costing $800,000 to when I left having had just one incident in six years, with no damage to the train,” he says.

Lavin’s analysis didn’t just stop at operator error. Instead, he implemented changes to equipment, processes, and procedures that enabled operators to conduct consistently safe operations. His solution saved NYC Transit millions...
and gave the train operators a sense of justice.

**Getting to a Just Culture**

During the 2013 NTSB forum on safety culture, David Campbell, vice president of safety and operations performance for American Airlines, detailed how his company instilled a safety culture over the course of 20 years, including working through a culturally high-risk corporate scenario, a bankruptcy.

Campbell pointed out that it took nearly 20 years for American to come to a balance of a just safety culture. The airline’s nonpunitive safety reporting program, ASAP or the Aviation Safety Action Program, started with cockpit crews, but was so successful that the program was eventually expanded to include the cabin crew and maintenance divisions.

It took a while to find the sweet spot, Campbell explained in his presentation, where employees could trust that their complaints would not get them in trouble and would be addressed. On the management side, it took a while to find the point where “just” was. There are behaviors or incidents that do get employees in hot water, whether reported through ASAP or not.

**Making Safety the Priority**

Wiedefeld’s team has a way to go, but it is clear they are steering change in the right direction. Their struggles at WMATA are no different from what we do in aviation, and a good lesson for all.

There are companies, flight departments, and operators that conduct the business of flight every day in the utmost safety; there are operations where accidents are rarities, despite inherent risks. How do they do it? These companies all have one thing in common: they have deep-running, successful safety cultures with principles that are adhered to on a daily basis, like a lifeline that is strung through the company, connecting both labor and management.

Safety culture is the way safety is perceived, valued, and prioritized in an organization. It reflects the real commitment to safety at all levels, from the guy who washes aircraft to the CEO. Its essence is what leadership and staff think about the importance of safety, including what they believe their peers and leaders think about it.

Without a vibrant safety culture, your organization is an accident waiting to happen. 

Amy Laboda has been flying since she was 15 years old. She holds fixed-wing and rotorcraft ratings and has taught flight students across the United States. She currently serves as a member of the FAA Safety Team (FAASTeam), providing aviation safety seminars for FAA-certified pilots both in the United States and abroad. She was editor-in-chief of Aviation for Women magazine for nearly 13 years before returning to her freelance writing and multimedia career.

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HAI-APS Welcomes First Class of Accredited Operators

The HAI Accreditation Program of Safety (HAI-APS) provides operators with the tools to identify hazards within their organizations and their mission profiles. The program also helps operators take steps to reduce risk, laying the foundation for safer operations. Through HAI-APS accreditation, operators can show outside parties their commitment to safety, as well as demonstrate that they exceed minimum government safety standards.

In creating this safety program, HAI listened to member operators. They needed a helicopter-centric safety program that could be scaled down to the smallest operator. Most importantly, the program needed to be affordable.

A Badge of Distinction
Helicopter safety statistics improve each year, but news reports of helicopters in accidents harm the reputation of the entire industry and can worry the public. Consequently, customers may look for something that shows a company’s commitment to safety.

HAI-APS provides the framework for operators to adopt best industry practices and to demonstrate their commitment to high operating standards. It provides them a way to prove to customers, contracting agencies, and third-party auditors, that their programs, policies, and procedures exceed minimum regulatory standards.

Operators accredited under HAI-APS can display their certificates of accreditation as a badge of distinction that shows they are operating at the highest level of safety.

Affordable Safety
As HAI President and CEO Matt Zuccaro has said, “If you think safety is expensive, wait until you see how much an accident will cost you.”

HAI-APS accreditation is offered by HAI to its members at a low cost, creating an effective, affordable accreditation safety program for the industry. As part of HAI-APS accreditation, an operator will also receive registration under the International Standard for Business Aircraft Operations (IS-BAO). The IS-BAO standards program provides an important foundation for the HAI-APS program and serves to create a solid safety management system foundation that can be used across all mission specialties.

HAI members are quickly discovering that the combined HAI-APS accreditation and IS-BAO registration is a great value. An operator can be accredited in one or more of 14 different helicopter mission-specific specialties, along with the IS-BAO registration, all for one fixed audit fee. Details on the types of mission-specific accreditations for helicopter operators are available at hai-aps.rotor.org.

Preparing for an Audit
Once operators purchase the HAI-APS program, they will be contacted by HAI-APS staff to receive training on the use of iAuditor, a cloud-based auditing program that contains the IS-BAO and HAI-APS audit standards and checklists. With access to the same materials that auditors use when conducting audits, operators can thoroughly prepare for audits without worrying that they will
be caught short by random, subjective, or ambiguous standards.

Operators are then asked to conduct an internal gap analysis, comparing their manuals, processes, and procedures to IS-BAO and HAI-APS standards. If there are any discrepancies between the operators’ materials and the program standards, operators will need to bring them into compliance with the standards.

After the internal gap analysis by company personnel, an HAI-APS representative will review the gap analysis to validate its completeness and address any operator questions. When HAI is satisfied that the analysis is complete and that the operator has addressed any identified gaps, HAI-APS staff will assign an experienced auditor with operations or maintenance experience in the operator’s mission profile.

The role of the HAI-APS staff is not to grade the operator’s performance. Rather, it’s on helping operators raise their operating standards by identifying specific ways in which they can improve their flight operations.

The Audit Process
Once an auditor is assigned to an audit, he or she reviews the operator’s internal gap analysis and completes a desk audit. The purpose of that audit is to confirm that the operator’s manuals, processes, and procedures meet APS and IS-BAO standards. The auditor will then discuss the desk audit results with the operator, including any issues discovered at this stage. The auditor and the operator will also set a date for the on-site audit.

During the on-site audit, the auditor will not sit and review each question with the operator. This was already done during the desk audit.

Instead, the on-site audit is designed to allow the auditor time to observe the operator’s daily operating procedures. Having established during the desk audit that the operator’s manuals, processes, and procedures are in accordance with HAI-APS and IS-BAO standards, the on-site audit confirms that the operator’s daily operations comply with those manuals, processes, and procedures.

At the conclusion of the on-site audit, the auditor will provide the operator with a brief of the audit results. The auditor and operator will discuss any areas needing additional attention and, if necessary, establish a corrective action plan.

About two to four weeks after the conclusion of a successful on-site audit, or after validation that the corrective action plan is in place and the operator is now in compliance with the audit requirements, the operator will become IS-BAO registered and HAI-APS accredited.

Supporting Operators on Their Safety Journey
In the box above are the operators who have completed successful HAI-APS audits as of July 2016. Within this group are large and small air tour operators, a large helicopter air ambulance operator, an aerial firefighting operator, and a VIP transport operator — further evidence that the HAI-APS program is scalable to operators of all sizes and offers mission-specific standards.

Currently, we have eight operators in the process of becoming accredited, and HAI is looking for more operators to join them and those who are already accredited.

HAI-APS offers operators an inexpensive, well-mapped, and supported path to operating at the highest levels of safety. We look forward to supporting your efforts to improve operational safety. Contact HAI at 703-683-4646 or visit hai-aps.rotor.org for more information about the HAI Accreditation Program of Safety.

Dennis Pratte is HAI’s director of safety.
HSAC Develops Guidelines for New-Build Helidecks

By Eric Shores

Members of the Helicopter Safety Advisory Conference (HSAC) recently concluded a three-year effort to develop guidelines for the design and marking of new-build offshore helidecks. The group of 115 companies and government agencies operating in the Gulf of Mexico works to improve the safety of offshore helicopter operations there. They hope the guidelines, released in May, will spur greater standardization of helideck construction and marking, not only in the Gulf but around the world.

First Standards for Helidecks with Conjoined Parking
HSAC members have in the last three years worked to develop HSAC RP 2016-1, Helideck Design Guidelines (New Builds), the first recommended practice (RP) to set standards for the design and marking of offshore

HSAC: A Proactive Approach to Offshore Helicopter Safety

HAI salutes its longtime Affiliate Member, Helicopter Safety Advisory Conference (HSAC), as it celebrates its 38th year of service. Once again, HSAC demonstrated its laser-like focus on improving safety in offshore helicopter operations when it launched its latest initiative, a recommended practice (RP) for planning and designing new helidecks.

HSAC was founded 38 years ago in response to an accident in December 1977 that claimed 17 lives, when a helicopter collided with a crane near an offshore platform. Since then, this group of helicopter operators, oil companies, offshore service companies, manufacturers and vendors, and government agencies has worked to improve offshore flight safety in the Gulf of Mexico.

The HSAC slogan is “Safety through Cooperation.” The group promotes communication on safety issues, the development of recommended practices and guidelines, and most of all, a proactive approach to resolving safety issues.

The helideck RP released in May was the result of a significant three-year collaboration involving a host of experts from industry and government, the FAA, and military services and state agencies. These included some old friends like John Leverton from Leverton Associates International, Bill Schroeder from Chevron, and Bob Williams from ExxonMobil, all of whom have worked closely for years with HAI and the International Federation of Helicopter Associations on the ICAO Heliport Design Working Group.

Some participants in creating the RP were new to us, like Eric Shores, an operations manager at PHI and an HSAC member, who volunteered to write an article explaining this new safety document for ROTOR. We extend a special thanks to him.

Again, HAI salutes — and thanks — HSAC and all the people and organizations involved in this important safety project.

— David York

HAI vice president for regulations and international affairs
helidecks with conjoined helicopter parking areas.

This type of helideck is becoming more common as deepwater drilling technology developments spawn facilities that are farther apart. On a helideck designed for one aircraft with no parking area, an aircraft that shuts down for a long period or that has maintenance issues prevents other aircraft from using that helideck. A parking area goes a long way to solving that problem.

**HSAC RP 2016-1 is a one-stop shop for guidance on new-build helideck planning, design, marking, lighting, fuel stations, and equipment for weather reporting, communications, and emergency response.**

Guidance on improvements in construction materials is also included. For example, there was no design guidance for aluminum helidecks prior to this document. While more costly than steel construction, aluminum offers advantages in decreased weight, increased corrosion resistance, and reduced paint requirements that in turn greatly lower maintenance costs.

**Guidelines for Helideck Markings**

From an operational standpoint, one of the greatest improvements the RP offers is a clear, concise, and standardized method of marking both the helideck and parking areas. Prior to this, there existed four different, often conflicting guidelines for marking and designing helidecks.

To illustrate how detrimental this can be, imagine a world where road signs change from one town to the next. A stop sign in one place is a green triangle, and in the next town, a brown square, and yet something else a few miles down the road. As you can imagine, this would be a hazardous driving environment.

To pilots, helideck markings are their road signs. They tell pilots dimensions, weight capacity, and communication frequencies. They identify hazards that may not be...
These illustrations from RP 2016-1 show detailed standards for clearances for a helideck with a conjoined parking area (top) and the recommended markings for a medium-sized rectangular helideck (bottom). Visit http://bit.ly/hsac-helideck to see more recommended practices for new-build helidecks.
obvious from altitude — hazards that pilots need to know about before they approach. Helideck markings enhance pilots’ ability to safely operate to and from that location — but only if they both understand and believe in the markings.

Markings currently vary from facility to facility depending on local guidelines. To compound the issue, when vessels from overseas enter the United States, they often utilize other variations. While compliant with the standards of whatever country the ships hail from, these markings are utterly alien to local pilots. In the worst cases, helideck markings convey a meaning opposite of what they were intended to — like driving in a country where red means go and green means stop.

Where the helideck markings were intended as an aid to pilots, they instead became a detriment. As a consequence, over time, many pilots have developed a general distrust of helideck markings.

In an effort to return helideck markings to their status as a valuable resource for pilots, HSAC has spent a great deal of time and effort in creating a clear, concise, and practical method of marking helidecks, with a focus on aligning as much as possible with international guidelines. The goal is to get all helidecks in the world to follow the practice so that we have one set of “road signs” for pilots to follow.

Members of HSAC have actively been working with the U.K. Civil Aviation Authority (CAA) and the International Civil Aviation Organization (ICAO) in an effort to make a worldwide helideck marking standard. The CAA is expected to release in 2017 a new version of CAP 437, its guidance for offshore helicopter landing areas, which will adopt some, if not all, of the helideck marking standards found in RP 2016-1. ICAO is also expected to release revised guidelines for offshore helideck design that will incorporate some of the HSAC recommendations for helideck markings.

HSAC encourages all owners and operators in the Gulf of Mexico to proactively adopt these new standards in an effort to enhance safe operations in the offshore environment. Furthermore, in those countries where the aviation authority has no published standards for offshore helidecks, we hope that regulators and operators see the value of having one worldwide standard and adopt HSAC RP 2016-1 in its entirety.

**Safety through Cooperation**

HSAC RP 2016-1 was the result of collaboration among many stakeholders in the offshore oil and gas industry. Special effort was made to ensure that contributions from a wide array of industry experts, including owners, facility operators, aviation service providers, engineers, and regulators, would guarantee a document that is supportable and effective in enhancing safety at all offshore facilities.

Organizations that contributed to the RP include Chevron, Engineering Development Group, ExxonMobil, Shell, PHI Inc., Leverton Associates International, and numerous others. Contributions were also obtained from regulating bodies such as the FAA, the Interior Department’s Bureau of Safety and Environmental Enforcement, the U.S. Coast Guard, and the Louisiana Department of Transportation and Development.

Having one single standardized method of designing and marking helidecks adopted both nationally and internationally would help all offshore helicopter operations take a major step toward the goal of zero accidents, zero injuries, and zero avoidable incidents. For more information on HSAC RP 2016-1, visit hsac.org or go to http://bit.ly/hsac-helideck.

Eric Shores has 20 years of experience in aviation and began his career as a U.S. Army aviator. In 2008, he joined PHI Inc., where he eventually became an instructor and check airman in the S-76 and S-92. Shores joined PHI’s management team as an area manager in Alaska before becoming an operations manager. He has been a member of the HSAC RP workgroup for five years and also works with the American Petroleum Institute.

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Lessons to Learn, Not Relearn

By Nate Parks

In March of 2016, at HAI HELI-EXPO in Louisville, Kentucky, I completed my first recertification as a certified flight instructor (CFI). As I prepare to make the transition out of active duty and into life as a part-time soldier in the U.S. Army Reserve, I thought it would be an investment in my future civilian flight career to experience recertification just as a civilian would.

As a U.S. Army warrant officer, I obtained my initial ratings through an army UH-60 Flight Instructor Course. Although I had the option to recertify by bringing my military flight records to my local FAA flight standards district office, I felt the civilian-lead CFI course would be an invaluable experience.

Sitting in a classroom with about 50 pilots, I noticed a stark difference between myself and the rest of the group: the experience in the room was remarkably lopsided.

I have been flying for more than seven years. Through conversations over the next couple of days, it appeared that most of the other instructor pilots in the room had been flying for at least three times that long.

If you pay any attention to aviation news, you are aware that the industry will soon be facing a severe pilot shortage. But the need to recruit more pilots into the industry is not what this article is about.

The shortfall that I’m writing about is the shortage in pilot experience. What lessons will newer pilots have to relearn because we did not clearly hear the voices of the more experienced pilots all around us?

As the formation started to get tighter all around him, this pilot began to experience vertigo. Upon recognizing his ailment, he quickly transferred the controls to his co-pilot. Just as he made the transfer, the second lieutenant saw that his aircraft was too close — way too close — to another ship in the formation.

Prior to this moment, the man told me, he did not fully realize the extreme importance of trusting the co-pilot sitting next to him. As his teammate took those controls and flew out of that dangerous situation, promptly saving the lives of everyone involved, his respect for that pilot solidified into a trust that has remained unbreakable.

“Sometimes you need to just let go of the controls,” he said, “and trust your copilot.” For the rest of my flying career, I will remember this story and its lesson about what is possible when trust and respect connect a crew.

I have a few intentions for writing this article. First, to the more experienced pilots, I say a heartfelt, well-deserved “Thank you.” Thank you for blazing a trail in the aviation industry and helping to make it possible for me to do something I so passionately love.

Second, if you are a highly skilled and experienced pilot, please be a mentor.

Third, I say to the newer pilots: find a mentor! Build relationships with those who have been in the field for some time. Take them out to lunch. While there, do more listening than talking. You will not impress someone with more than 20 years of aviation experience with your 1,500 hours of flight time.

We must not allow these men and women, some of whom have been aviation pioneers, to retire without first learning everything we can from their hard-learned lessons, many of which were written in blood, sweat, and tears. Too many aircraft have been destroyed, and too many lives have been lost — the only way in which these sacrifices make sense is if we learn from them.

The generations of pilots must work together to learn from past mistakes so we can fly into the future safer, together.

Nate Parks is a dual-rated helicopter CFI/CFII ATP pilot. He’s a graduate of Virginia Tech’s business school, where he also played four years of college baseball. Parks served for eight years in the U.S. Army, including a combat tour in Afghanistan with the 101st Airborne Division and as an instructor pilot in the Military District of Washington. He continues his military service as an Army Reserve pilot in the Dallas–Fort Worth area.
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Getting the Lead Out of Avgas

By Tim Kern

The scruffy guy holding a sign that declares “The End Is Near!” is a cartoon staple. And we’ve all seen a version of him in aviation proclaiming the same thing about leaded aviation fuel.

Eventually, though, he will be right, for the end of 100LL is, in fact, near.

Tetraethyl lead (TEL, or [CH3CH2]4Pb) has been in gasoline since 1921, when Charles Kettering’s team found the 1854 German formulation raised octane and reduced detonation, a problem exacerbated by ever-higher cylinder compression. Concerns over the toxicity of lead, and therefore TEL, led to its gradual removal from U.S. mogas, or pump gas, beginning in the 1970s — it was banned outright in 1986 — but it remains in aviation’s 100LL.

Now that the ground fleet runs on unleaded fuel, lead from avgas is the single largest contributor to lead emissions in the United States. The FAA and the Environmental Protection Agency (EPA) are partnering to approve a lead-free alternate fuel for piston-engine aircraft. But experts across the industry agree that the transition to a new unleaded fuel is a complex undertaking.

New Fuel or New Engine Design?

One factor that complicates the removal of lead from avgas is that, unlike cars and trucks, aviation engine designs cannot be changed just because better engineering is available. And the general aviation (GA) market is simply too small to warrant the considerable development and certification costs of reengineering engines to use lead-free fuel.

In addition, because of both the initial investment and regulated maintenance schedules, there tends to be less turnover in aircraft when compared to the ground fleet. An outright ban of 100LL would effectively ground tens of thousands of legacy aircraft.

“The fleet that we fly today — both workhorse and recreational — is about 50 times larger than annual new aircraft production and is based on technology designed around avgas properties,” says Michael J. Kraft, president of Lycoming Engines. “We cannot abandon the existing fleet.”

The FAA agrees. One of the agency’s stated goals for the transition to lead-free avgas is that “all aircraft can continue to fly.”

What an Engine Really Needs

Because the engines for piston aircraft won’t change, we need to figure out how to remove the lead from the fuel. The challenge is that no known substitute can be added to gasoline to yield the exact same performance and properties that TEL does.

As the piston compresses the gas-air mixture in the cylinder, it gets hotter, and it can consequently ignite independently of the ignition system. Diesels operate this way, but compression ignition is not suited to gasoline engines, because it leads to excessive cylinder pressure and heat,
and engine failure.

TEL allows higher compression ratios, yielding more horsepower. In fact, that is its only advantage.

According to Mike Busch, 2008 National Aviation Maintenance Technician of the Year, “There is no problem with running without lead in the fuel — that’s just an old wives’ tale. Teraethyl lead boosts octane, but everything else is bad news. It contaminates spark plugs and combustion chambers with metallic lead deposits, especially at low power settings. It forms tiny insoluble lead particles that blow past compression rings, contaminating the oil-control rings and engine oil.

“We can’t use full synthetic oil in 100LL piston aircraft engines because synthetics don’t hold these lead salts in suspension, so they form lead sludge that ruins engines,” Busch says. “Remember the Mobil AV-1 debacle in the 1990s? A viable unleaded substitute for 100LL will allow use of all-synthetic oils, reducing wear and perhaps doubling our oil-change intervals.”

Bill Brogdon, former chief engineer at Continental Motors and a leading authority on piston engines, says we have alternatives for 100LL now, but none is a solution. “The easiest work-around is to reduce compression ratio,” he says, “but that reduces power.” Roughly speaking, each point of compression changes horsepower by about 5 percent.

Turbocharging can help with new-design engines, but our legacy normally aspirated engines have low pressure in the intake and higher pressure in the exhaust. When both intake and exhaust valves are open during “overlap,” the exhaust pressure does two bad things: it keeps the fresh charge from entering the combustion chamber, and it keeps heat in the cylinder.

A turbo can force the new charge in, displacing the latent hot gas. It is a simple solution but one that is not always possible from an engineering standpoint. It’s certainly economically unfeasible to replace all existing piston engines with turbocharged models.

Separately from engineering and certification, manufacturers’ improvements can lead some owners’ lawyers to assert that the iterations sold during the improvements’ development and certification contained known faults. “That is what stifles progress. We’re locked in by certification and limited by the size of the market,” says Brogdon.

**Mogas No Substitute**

Ethanol-laced automotive gas delivers the requisite octane to cars. This cures the problem, right?

Brogdon says it isn’t that simple. “All mogas has a relatively high vapor pressure. At altitude, fuel can boil, resulting in engine stoppage from vapor lock in the fuel lines. Worse, the components in mogas that boil off earliest have higher octane than the lower vapor pressure components, reducing the octane of the remaining fuel.”

Ethanol introduces additional problems. “It has a high vapor...
pressure, evaporates and leaves deposits rapidly, causes corrosion, and degrades many elastomers,” says Brogdon.

Lycoming’s research supports this, as its service instructions all eschew ethanol in concentrations above 1 percent, not just because it is unpredictable in engines, particularly given the vagaries of storage, but also because it is unfriendly to many airframe and fuel system components.

Additionally, Lycoming, which has authorized non-100LL in some models, notes in a service instruction that EPA-mandated blended fuels change seasonally, making mogas unpredictable. “Automotive fuels usually have Reid vapor pressure (RVP) values between 7 and 9.3 psi in summer [and] …as high as 15 psi in the winter. In some geographic regions, there is no upper limit to RVP in the winter season. As vapor pressure increases, the tendency for vapor lock will increase as well as fuel ‘boil off’ at altitude.”

The Lycoming service instruction goes on to say that “it is also possible that ethanol-based fuels could not be compatible with some fuel system components. In cases of material incompatibility, deterioration of metallic and nonmetallic components can occur.”

And — not a trivial consideration for airframers and aerodynamicists — ethanol does not weigh the same or produce the same energy output per volume or weight as gasoline. “If we all agree that airworthiness by design is the primary objective, pump gas cannot be an option for the existing fleet of aircraft,” says Lycoming’s Kraft. “You achieve airworthiness by design, not by luck. Using pump gas from the corner gas station is achieving airworthiness by luck.”

Unleaded Avgas Already Here for Some Rotorcraft

Along with Shell, Swift Fuels has been selected by the FAA as a finalist in the PAFI Phase 2 engine and testing program, which is scheduled to continue through 2018.

In the meantime, the U.S.-based firm offers UL94 avgas, an unleaded gas for use by lower-compression, lower-octane-demanding piston engines. According to the company, the following helicopters are able to use UL94: the Brantly B-2, Hiller UH-12E and OH-23D, and Sikorsky 269A, 269A-1, and 269C-1.

Owners and operators of these rotorcraft can purchase a supplemental type certification (STC) from Swift Fuels that will allow them to operate using UL94. Below is some additional information from Swift Fuels about the STC and UL94; learn more at swiftfuels.com.

Q. What is included in the STC?
The STC packet you would receive in the mail includes an STC cover letter, a fuel placard to be placed near each fuel filler cap, Instructions for Continued Airworthiness, installation instructions, a supplement to your Pilot Operating Handbook (POH)/Aircraft Flight Manual (AFM), and an FAA Form 337 to be filled out and submitted to the FAA by your local A&P mechanic.

Q. Do I have to flush the fuel system for first use or any subsequent use, or will any mix of 100LL and UL94 work?
No, you do not have to flush the fuel system. UL94 and 100LL are 100 percent intermixable in any percentage.

Q. Once I start using UL94, will I be able to continue to use 100LL?
Yes! Because UL94 is essentially 100LL without the lead, you can safely alternate between the two fuels or operate on any blend thereof.

Q. Is the weight identical?
Because UL94 is basically unleaded 100LL, the weight of the two fuels is essentially identical.

Q. Are there any notations to the POH? Density altitude restrictions? Fuel burn changes at any power setting? Takeoff/climb performance changes? Other performance changes?
As stated above, you will receive a supplement to your POH outlining any changes, which, in this case, are the addition of UL94 to the list of approved fuels and the listing of the new fuel placards to be installed on the wings.

UL94 does not negatively affect the performance of the aircraft in any way; all POH performance/fuel burn charts remain unchanged.

In fact, because you will be operating on an unleaded fuel, you will notice at your next regular maintenance cycle that the interior of your engine’s fuel system, including intake, cylinders, valves, seats, exhaust manifold, etc., may be cleaner because you will no longer be depositing lead compounds onto those surfaces.
The industry and FAA, starting in 2010, assembled qualified parties to find a solution under the congressionally funded Piston Aircraft Fuels Initiative (PAFI). The industry-government collaboration is charged with evaluating unleaded replacement fuels and identifying those best able to satisfy the needs of the existing aircraft fleet.

Members of the PAFI Steering Group are drawn from government (FAA), industry (the American Petroleum Institute), and five of the general aviation associations: Aircraft Owners and Pilots Association (AOPA), Experimental Aircraft Association (EAA), General Aviation Manufacturers Association (GAMA), National Air Transportation Association (NATA), and National Business Aviation Association (NBAA).

The collaboration among industry and government regulators is necessary, say those involved, because of the complexity of the project.

“PAFI was designed from the outset to tap the best minds of the aviation and petroleum worlds and move those industries forward in concert with aviation and environmental regulators,” says Doug Macnair, vice president for government relations at EAA.

“Having the FAA work with us is critical,” he says. “They are the only entity that has the capability to evaluate the impact of new fuels on the entire general aviation fleet and issue wholesale authorization to use them. It is impossible for industry alone to move the entire aviation and petroleum industry through this transition.”

Macnair also has kind words for the government agency behind the move to replace 100LL. “The EPA doesn’t want to shut down the industry or ground our fleet. They want us to get the lead out,” he says. “We’ve been open and honest with EPA concerning the challenges, while making it clear we are working diligently toward solutions.”

Macnair also believes that the industry’s proactive approach to the issue has paid off. “In the absence of the robust industry-government collaboration driving toward an unleaded future for GA, some of the doomsday predictions concerning EPA regulation might have already come to pass, with great disruption to our industry,” he says.
Details, Details
“We have spent two decades looking for the ‘drop-in’ replacement for 100LL, an unleaded fuel that would be identical in every respect to 100LL,” says Macnair. “The fact is, there is no such fuel. Obtaining the high octane needed without the use of lead requires wholesale changes to the chemistry itself.

“The best possible fuel for today’s fleet is … 100LL,” he says. “It’s the fuel for which our aircraft and engines were designed. The next fuel for general aviation will not be exactly the same as 100LL. The question for PAFI is, ‘How close can we get?’”

Others involved in PAFI agree: finding a substitute for 100LL is no small task.

Walter Desrosier, vice president of engineering and maintenance for GAMA, points out that PAFI’s process is the reverse of how engineering is normally done. “The traditional [design] approach relies on a known fuel…. The challenge we have is using a known fleet and looking for a fuel.”

“We could not answer the question of what the engines and aircraft actually required, only that they worked with 100LL,” Macnair says. “Now we’re turning that question around, asking ‘What does the fleet need out of a fuel?’ Extrapolate that question to every possible fuel characteristic as it relates to every aircraft and engine in the fleet and you begin to get a picture of the complexity of this challenge.

“Octane is but one of dozens of parameters,” he says. “Materials compatibility, hot and cold start, vapor pressure, fuel density, carburetor icing, altitude behavior, storage stability, and impact on the fuel production and distribution networks all have to be understood, among others. Changing a fuel affects everyone and everything in the existing aircraft fleet: certification, operating procedures and limitations, manufacturing, maintenance.”

“We’re focusing on all significant performance parameters on aviation gasoline, to determine eligibility. This has not been done before, and a lot of necessary things can be done only by the FAA. For instance, there is no known process for this kind of certification, which has always been done on a ‘make and model’ basis,” Macnair says.

Testing … Testing
In early 2016, the FAA selected two unleaded fuels for engine and aircraft testing, produced by Shell and Swift Fuels. This allows PAFI to move on to actively test those fuels in aircraft and engines. The aircraft to be used include a Robinson helicopter, a high-performance Piper Malibu, a classic Cessna 150 and Piper Archer, a Cirrus SR22, and a North American T-6 Texan with a radial engine, among others.

“We now are doing practical testing of 19 engines and 10 aircraft,” says Ron Wilkinson, PAFI industry co-lead and former vice president of engineering at Continental. “This is one of the largest such programs, ever, and the coordination is amazing. We
know we can’t afford any mistakes.”

“We’ll test normally aspirated and turbo engines, big engines, smaller engines, something representative from Rotax, which was designed to operate on unleaded fuel, and other critical engines,” says David Oord, senior director of regulatory affairs at AOPA. “We want the data and the confidence in the data, so that, by the end of 2018, when the PAFI program concludes, the FAA will have the data necessary to authorize fleetwide use of either or both the designated Shell and Swift Fuels solutions.”

And it’s not just the new fuel’s engine performance that needs to be examined. PAFI also must consider the production, distribution, cost, availability, and environmental issues involved in transitioning from 100LL to the new fuel.

“How will these fuels mix with 100LL? Will we have to clean and flush aircraft, storage tanks, handling and transportation equipment? We’re going to find out,” says Oord.

“The materials compatibility testing included all the materials used, from FAA to the airframers, to FBOs, fuel transporters and their equipment,” says Desrosier. “Airframes, high and low wing. Helicopters. Storage, in tanks and aircraft, open and sealed systems. There is also fuel systems testing: pumps, hoses, tanks and trucks — everything that touches gasoline, in or out of an aircraft.”

Is the End in Sight?

So when will 100LL go away?

“We don’t have an answer for that,” says Desrosier, “But we know that PAFI and its congressional funding are set to close by 2018. Based on that, the FAA will issue a fleetwide declaration.”

“Bottom line, we are driving to the best possible solution available in unleaded fuel technology,” says Macnair. “Remember, we haven’t been able in 70 years to formulate anything better than 100LL. To replace those few grams of lead, everything about the fuel must change.

“Our job in PAFI is to do everything we can to evaluate and manage those changes, keep our fleet flying, and above all ensure that everyone remains safe.”

Tim Kern is an aviation writer whose work has appeared in more than 50 aviation publications. He is a private pilot and holds an MBA in finance and operations from Northwestern University. He has extensive experience in machining and both motorcycle and auto racing, and was CEO of an airplane engine company in the early 1990s. Kern is the only journalist to complete the ALEA Accident Investigation course or to have earned NBAA’s CAM (Certified Aviation Manager) certification.
When Seeing Is Harder than Believing
The Challenges of Night Flight

By Steve Sparks

Flying helicopters at night delivers some memorable experiences for passengers, pilots, and crew members. The smooth air and shimmering lights can leave a lasting impression that’s hard to beat. However, despite these simple pleasures, flying at night can increase pilot workload considerably compared to flying the same mission during the day.

At night, preflight inspections become more challenging, visual acuity decreases, fatigue creeps into cockpits, and wires along with other obstacles shroud themselves in the cloak of darkness. The additional risks associated with night flight can be unforgiving, causing the margin of safety to evaporate.

Night Stats
The U.S. Helicopter Safety Team, part of the International Helicopter Safety Team (IHST) recently analyzed 49 night helicopter accidents that resulted in 13 fatalities. Fifteen of these accidents were directly attributed to visibility and controlled flight into terrain (CFIT) scenarios, whereby night conditions played a significant role in the outcome. Several of the pilots involved in these accidents were not instrument rated or were not night proficient.

Many of the pilots involved in these accidents had less than 100 hours of total night flight experience. From these examples, it can be argued that night experience in helicopter pilots should play a significant role in determining overall risk associated with night flights.

In countries other than the United States, pilots are required to obtain additional experience and training in night operations prior to serving as pilot-in-command on night flights. This additional training typically extends beyond the regular currency requirements helicopter pilots are required to maintain for conducting similar flights during daylight hours.

The following accident reveals several factors involving night flight that can substantially elevate levels of risk. Even though many night flights are conducted in safety, helicopter pilots must be aware of the unique factors that impair safety when darkness fills the sky.

Dark, Cloudy Night
On July 27, 2013, a deadly night accident occurred in Pennsylvania involving a light turbine helicopter that ultimately killed five people, including the commercial pilot who had approximately 350 hours of total flight experience with no instrument rating. In addition to being extremely dark that evening — the moon was below the horizon — instrument meteorological conditions (IMC) were forecasted to prevail along the intended route of flight.

The private Part 91 flight departed under visual flight rules (VFR) around 10:30 p.m. EST from Endicott, New York, before proceeding toward its destination. As the flight continued over a sparsely populated wooded area, the helicopter encountered worsening weather conditions.

Shortly into the flight, the pilot, who was receiving flight following from air traffic control, indicated, “We’re inadvertent IMC, reversing” and asked air traffic control for a heading to the nearest airport. To confirm the pilot’s dire situation, air traffic asked the pilot if he still wanted vectors to the nearest airport and also if the flight was still in instrument conditions, but there was no reply. The controller provided a heading of 091 degrees to the nearest airport, but again, the pilot did not respond.

Seconds later, the controller once more advised the pilot of the nearest airport. The pilot immediately responded that he was “having trouble
maintaining control here.” The controller informed the pilot that the nearest airport was on a heading of 068 degrees and 8 miles.

Shortly thereafter, radio and radar contact was lost. The helicopter descended into trees and terrain in a heavily wooded area.

There was no record that the pilot received an official weather briefing. However, a text message sent by the pilot to a friend approximately one hour before the flight departed stated they were “waiting out weather to fly back to [Ocean City, Maryland] tonight.”

A weather observation obtained near the departure point nine minutes before the flight departed indicated winds were from 190 degrees at 8 knots, the visibility was 2.5 miles with moderate rain and mist, and there were broken clouds at 600 feet and 1,400 feet, and overcast clouds at 7,000 feet. The temperature and dew point were 19 and 18 degrees Celsius, respectively.

Approximately one hour before the accident, a surface observation from the Wilkes-Barre/Scranton International Airport (KAVP), in Scranton, Pennsylvania, located approximately 18 miles southeast of the accident site, reported winds were from 220 degrees at 4 knots, visibility 10 miles with light rain, scattered clouds at 7,000 feet, broken clouds at 8,000 feet, and overcast clouds at 10,000 feet. The temperature and dew point were 22 and 18 degrees Celsius, respectively.

The National Transportation Safety Board determined the probable cause of the accident was the pilot’s decision to continue VFR flight into night instrument meteorological conditions, which resulted in spatial disorientation and a loss of control of the helicopter.

**Night Preparation**

Helicopter pilots who approach night flying using a defensive mentality often experience less stress and greater satisfaction in knowing they haven’t left much to chance. As is often the case, actions well thought out on the ground often yield positive results when decisively executed in flight. Whether a particular night flight involves a local flight or cross-country trip, the amount of preparation is usually reflected in the overall results.

A great habit before any night flight is to mentally rehearse the event from start to finish. Think through the flight as planned, but develop contingency plans should the flight have to change because of weather, mechanical problems, or any other factor. Contingency planning eliminates a lot of the pressure on pilots and can increase the level of safety significantly.

An excellent way to prepare for unexpected influences at night is to develop a mindset of expectation: Before each flight, mentally tell yourself *Tonight is the night that I’m going to experience an engine failure or an unusual situation.*

Research reveals that it can take as much as seven seconds or more for helicopter pilots to properly respond
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Distraction Management
Managing distractions while flying at night is also critical. With state-of-the-art avionics, sophisticated alert systems, and other attention grabbers finding their way into cockpits, helicopter pilots must be vigilant to keep their attention on what matters most: maintaining aircraft control. The mitigation of loss-of-control accidents caused by spatial disorientation and distractions is a top priority as it’s one of the largest contributors to both fatal and nonfatal helicopter accidents.

Tunnel vision or fixation at night often translates into degraded performance. Situations that demand pilot attention for prolonged periods of time will often have an adverse effect on other aspects of flight. While some situations require more focused attention on a particular area or task, others require pilots to divide their attention among several different activities.

Auditory distractions cause the most harmful impact on pilot attention because they can capture attention for long periods of time. Pilots are more likely to attend to auditory distractions because of the amount of attention required to capture, process, and respond to such events.

Flight alert systems such as enhanced ground proximity warning systems (EGPWS) use digitized voice commands to capture attention, causing pilots to respond more rapidly and sometimes with haste. “Whoop Whoop Terrain Terrain Pull Up” is designed to get pilots’ attention.

**Checklists and SOPs**
Standard operating procedures (SOPs) can also help prevent unfortunate circumstances from occurring at night by preparing pilots to efficiently handle situations in the cockpit. As most pilots would agree, anything to help lighten the workload at night is beneficial.

Unfortunately, many helicopter pilots allow the habit of using checklists and SOPs to fade over time. Remember, though, appropriate checklist usage and following SOPs are resources to improve performance, enhance safety, and reduce workload. It’s as simple as that.

When Experience Is Critical
Total flight hours should not be the only variable used to assess pilot capabilities at night. Total hours logged does not preclude any pilot, regardless of experience, from making errors at night. However, accident statistics reveal that experience flying at night can have a significant influence on the level of risk associated with night accidents.

It’s not unusual for helicopter pilots to have much lower levels of experience of night flying when compared to their overall flight experience. Couple low night-flight experience with low experience in the
make and model of helicopter being flown, and the level of risk increases dramatically — sometimes by as much as a factor of seven.

**In the Muck**

Surprisingly, helicopter pilots don’t have to be in the middle of a cloud or fog bank to find themselves in instrument metrological conditions. Losing spatial orientation can easily occur on perfectly clear nights. As shown by the accident shared in this article, flying over sparsely lighted areas can quickly lead to vertigo and loss of positional awareness. These nerve-wracking situations are especially frightful if pilots are not confident and proficient in controlling their aircraft by reference to their instruments.

Along with other industry stakeholders, HAI is spearheading several initiatives aimed at reducing spatial disorientation accidents in the helicopter industry. Drawing from the statistics, more than half of all night-related helicopter accidents result in at least one or more fatalities, a rate significantly higher compared to all other general aviation accidents. A common factor in many of these accidents was the pilot’s decision to press on into worsening conditions.

Helicopter pilots are encouraged to acquire on a regular basis flight time under simulated instrument conditions with a qualified instructor or safety pilot. Because helicopters are predominately operated in VFR conditions, and since most helicopters are not certified under instrument flight rules, instrument skills can get rusty in a short period of time. Remember, seconds truly count when trying to escape disorienting conditions at night in helicopters.

If you are not instrument rated, make the investment. Instrument training enhances aeronautical decision-making and vastly improves piloting skills for dealing with night conditions.

If caught in deteriorating conditions, pilots are urged to stay on the ground, divert, or make a precautionary landing.

As the old saying goes, a good offense always starts with a good defense. Never assume other pilots, air traffic, ground personnel, or even Mother Nature is looking out for your safety.

**Night Task Management**

Especially at night, helicopter pilots are tasked with concurrent events competing for their attention on a near-constant basis. The ability to handle concurrent tasks at night is essential, but at times, it is difficult because these events often present themselves unexpectedly, with little to no warning.

When trying to sort through priorities at night, pilots should consider the level of urgency, the criticality of the event, and the amount of time a situation is going to require.

![Which one is the best pilot?](image)

**Which one is the best pilot?**

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for bringing resolution. These factors are consciously and subconsciously considered by pilots each time their priority schedule changes.

Research indicates that if an ongoing task requires considerable mindful resources, it is nearly impossible to effectively perform a secondary task simultaneously with good effect. If an ongoing task is interrupted by a lower priority event, the subject must learn how to allocate his or her attention in handling both tasks concurrently or deal with each task separately when time permits. Preoccupation with one priority is most likely to be detrimental to the efficient and successful completion of another.

The Rest of the Story
Additional factors that all helicopter pilots should be aware of in planning their next night flight include paying attention to details and doing the “right thing.” It involves taking the time to run the appropriate checklists, obtain adequate rest, conduct a meaningful preflight, seek input from others, and make sure nothing is left to chance. “Trust but verify” serves as the right mindset for helicopter pilots preparing for night flight.

Running into a cloud bank or a low-visibility situation for a VFR-only rated helicopter pilot is an extremely high-risk situation that may lead to loss of control. These situations call for decisive decisions to be made sooner rather than later. A helicopter on the way to lift an injured person may find that night and reduced visibility make it necessary to move the patient to a safer landing zone instead of risking the helicopter, medical team, and pilots.

Flying at night involves many factors that pilots and crews must consider before launching into the darkness. When we least expect it, we sometimes find our careful preparations for nighttime operations lacking.

Pilots must remember their responsibilities as pilot in command and understand how dangerous it can be when the urge to complete a mission trumps safety. Everyone involved in the decision-making process about a flight needs to understand and embrace the reality that when safety raises questions about making that flight, “No-Go” is often the best answer.

Dr. Steve Sparks is an aviation safety inspector with the FAA’s General Aviation and Commercial Division, specializing in human factors, helicopter operations, and educational outreach initiatives. He serves as coordinator for the U.S. Helicopter Safety Team (USHST) and is also the chairman of the General Aviation Working Group for the International Society of Air Safety Investigators (ISASI).
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Market Trends

Compiled by Curtis Bradley, HAI
Data provided by Aerodex Evolution

U.S. TURBINE SALES, APRIL–JUNE 2016

U.S. PISTON SALES, APRIL–JUNE 2016

NON-U.S. PISTON AND TURBINE SALES, APRIL–JUNE 2016
Gregory Gilliland was always mechanically inclined and loved working on cars throughout high school. After graduation, he decided to attend the aviation program of the Pennsylvania College of Technology in Williamsport. While there, Gilliland interned at CJ Systems Aviation Group in West Mifflin, Pennsylvania, working in its Part 145 repair station under the supervision of licensed airframe and powerplant (A&P) technicians. He graduated from the Pennsylvania College of Technology in 2008 with a B.S. in aviation maintenance technology and a minor in management.

Gilliland wanted to pursue a career in helicopter maintenance, but his limited job experience made it difficult to land a position. He knew having factory training would give him invaluable experience and help in his job search. In 2008, he applied for and won the first-place award for the HFI Bill Sanderson Aviation Maintenance Technician Scholarship. With the scholarship money assisting with travel and lodging expenses, Gilliland was able to attend the maintenance factory course of his choice: the one for the Airbus AS350 B2. He chose to study maintenance for that model because of its widespread use and the corresponding plentiful job opportunities.

Gilliland considers himself a lifelong learner and has continued to pursue studies related to his career. He holds current FAA A&P ratings, an FAA inspection authorization, and an FCC general radiotelephone operator license with a radar endorsement. In addition to the AS350 B2 course, he has also attended the Eurocopter EC145 initial airframe course and Turbomeca’s Arriel 1 line maintenance course.

In 2014, Gilliland graduated from Embry-Riddle Aeronautical University with an M.S. in management with a focus on aviation/aerospace industrial management. Since 2009, he has worked for Metro Aviation, one of the leading helicopter air ambulance operators in the United States.

Gilliland is currently the lead technician for Metro’s Sentara Nightingale contract in Norfolk, Virginia. Prior to that position, he was a field technician for the company’s Allegheny General Hospital contract in Pittsburgh, Pennsylvania. Gilliland joined the HAI Technical Committee in 2014 as a way to help address issues facing the maintenance side of the helicopter industry. A side benefit to his participation in the committee “was the tremendous experience I gain from networking with maintenance managers from other facets of our industry.”

When asked about his future plans, Gilliland said he will “continue working to gain experience as a manager and helicopter technician. In the future, I see myself working for a helicopter operator in a maintenance manager role.”

In an industry where it can be hard for entry-level technicians to get a job, Gilliland says, “Never give up on your goals.” Through hard work and dedication, anything is possible.

Allison McKay is vice president of Helicopter Foundation International.
Good times don’t provide an opportunity to take the real measure of an association. The true test is how an association responds to adversity, as the Australian Helicopter Industry Association (AHIA) has demonstrated over the past few years.

When ROTOR magazine last looked at AHIA two years ago (Summer 2014, p. 68), everything was going well. A previous group for the industry, the Australian Helicopter Association, had gone out of business five years earlier because of financial problems. There was an obvious need for a new association, as regulators were switching to an EASA-type regulatory scheme, and AHIA was able to step into the gap.

The new HAI affiliate was still stretching its wings then, riding a two-decade run of steady growth in the Australian helicopter industry. The aviation regulator for Australia, the Civil Aviation Safety Authority (CASA), had just registered the country’s 2,000th helicopter. The economy was humming along, fueled by healthy commodity prices and expansion of offshore energy development activity spurred by a seemingly insatiable Chinese appetite for oil.

In 2014, AHIA had just held its first biennial trade show and exposition, Rotortech, which was a huge success. While 150 had been expected to attend, 300 persons showed up. The 30 booth spaces provided by event planners were sold out 90 days before the event.

Economy Falters
The economic environment has changed dramatically during the past two years, however. AHIA President Peter Crook told this year’s Rotortech meeting, held May 27–29 in Brisbane, Australia, that the last two years have been tough on the industry.

“With falling commodity prices, our flying effort has decreased dramatically in the oil, gas, and mineral industry, with around 25 percent of the offshore helicopters taken out of service, mothballed, and pilots being transferred to land-based operations or taking extended leave,” Crook said.

The problems didn’t stop with the offshore support sector.

“The continuing drought in the northern half of our country is having a grave effect on the mustering industry,” he continued. “The last two fire seasons were less than forecast and did not require the previous levels of flying effort. Also, on-demand charter was almost nonexistent.”

Finally, Crook pointed to CASA’s ongoing effort to reform the country’s aviation regulations as another reason why the past few years have been difficult ones for the Australian helicopter industry.

“The painfully slow CASA regulatory reform process has made the launch of any aviation business development project very difficult. Several helicopter flying schools have closed, and maintenance organizations have been retrenching staff or, worse still, closing their doors,” he said.

Confident for the Future
Despite economic and regulatory pressures, Crook and AHIA are still optimistic about the future of helicopters in Australia. With 2,150 helicopters, 3,500 helicopter pilots, and 2,600 engineers, the country has one of the largest rotorcraft fleets in the world.

“Our industry is very resilient and has suffered similar downturns in the past. It will get better,” he said to Rotortech 2016 attendees.

Despite the economic downturn, AHIA’s Rotortech 2016 was an outstanding success. Attendance was up, and the number of exhibitors nearly doubled to 50.

Rob Rich, AHIA’s events manager, who coordinated preparations for Rotortech 2014 and 2016, says he has already received expressions of interest from 70 companies for the 2018 event. Rich has begun to talk about expanding Rotortech into one of the world’s largest helicopter trade shows because of Australia’s proximity to Asia and its awakening aviation market.

On the regulatory front, AHIA has from the start represented the helicopter industry effectively in
various committees and working groups, such as CASA’s Part 61 Solutions Taskforce, which is looking at standards for flight-crew licensing and training. AHIA also represents the Australian helicopter industry on government-industry groups such as the General Aviation Action Group, Aviation Industry Consultative Council, and Industry Skills Reference Committee.

AHIA is increasingly optimistic about its ability to work with CASA to improve regulations. Just recently, it reorganized to strengthen its volunteer executive team by adding a new vice president, Ray Cronin, a recognized expert in helicopter flight training who has an excellent working relationship with CASA. Cronin is the founder and manager of a leading helicopter service provider and contractor in emergency and firefighting services and specialized transport.

Former AHIA Vice President Mark Scrymgeour has stayed active as the communications director. He, Crook, and Cronin have been joined by Bridgette Hastings as secretary/treasurer, Colin Clarke as compliance officer, and Cheryl Tillman as membership secretary.

As an example of AHIA’s ability to work on behalf of its members, Crook points to the association’s contribution to the progress being made by the Part 61 Solutions Taskforce. According to Crook, the task force’s proposed rationalization of flight reviews and instrument proficiency checks could save helicopter operators thousands or millions of dollars annually, and AHIA has been at the forefront of these changes.

Optimism and Working Harder
When AHIA had its first taste of adversity over the past two years with lower commodity prices, unexpectedly slow fire seasons, and puny orders for on-demand flights, coinciding with a heavy dose of bad-tasting regulatory medicine, the association didn’t give up or go away. Instead, AHIA expanded and enhanced its executive support team to improve delivery of services. It strengthened its advocacy team to ensure that regulators would be able to hear the collective voice of the Australian helicopter industry.

As a result of this hard work and optimistic spirit, AHIA’s trade show has prospered, its advocacy work shows signs of paying dividends, and its membership has continued to grow.

When the association started out in 2013, it had a dozen member companies and tentative commitments from a dozen more. Today, AHIA has 100 member companies and 100 individual members. Events manager Rich might be right when he says, “It seems we are here to stay for a while yet.”

David York is HAI’s vice president of regulations and international affairs.
Real-World SMS: Risk Control

By Bryan Smith and the USHST SMS Workgroup

The issue of aviation safety spurs no end of debate, but we can all agree that we need to have the best safety program possible. A modern safety management system (SMS) is one way to achieve that.

Still, use of SMS generates substantial debate. Does it work? Is it worth it? There are even those who argue it makes matters worse. Although operators may engage in this debate, for those of us on the International Helicopter Safety Team, there is no confusion: organizations using an SMS reap significant safety benefits.

To effectively improve operational safety, though, an SMS must be properly implemented. We often see organizations build a great SMS “engine” but fail to start it up or properly maintain it.

In addition, most experts believe full implementation of an SMS takes one to three years, even when done correctly. Implementing SMS is a marathon, not a sprint, and conclusions about SMS performance are often made too soon in the process to be valid.

This is the third in a series of Rotor articles aimed at helping operators effectively implement an SMS in the real world. In our first article (Summer 2015, p. 58), we introduced an SMS model based on an engine (figure 1) and discussed how hazard reporting “feeds” the SMS process. In the second (Winter 2015, p. 88), we showed how to use a risk assessment to prioritize the identified hazards, “bleeding off” the low-risk items so higher-risk hazards can be targeted for action.

Now it is time to create specific, measureable controls to manage those risks.

Systemic Problems, Systemic Solutions

While there are many hazard analysis models, they are all based on the idea that safety issues involve both direct and latent factors.

A hazard’s direct factors are the obvious, final acts or omissions that connect (or can potentially connect) the hazard to the undesirable outcome. Some examples are a pilot’s failure to put in the correct control input or a mechanic’s overtightening of a bolt. Unfortunately, these are often the only elements we look at, which limits the potential to prevent future accidents.

Does a hard landing by a 5,000-
hour pilot mean he does not know how to land? Probably not. So making that pilot execute 100 landings with the chief pilot or FAA inspector does not really attack the root cause. Are we missing something in our effort to control the risk of future hard landings?

Usually, the answer is yes. When we review safety incidents, we see that 80 to 90 percent of them are related to not just the direct factor — the mistake, action, or omission that directly led to the incident — but also to latent factors present in the system, such as the organization’s policies, procedures, or safety culture. When you only address the direct factor, you are missing the opportunity to treat the latent systemic factors that are just as complicit in creating the incident.

Looking for latent factors requires brainstorming — the very fact that they are latent means they aren’t immediately obvious or connected to the incident — and this is definitely a case where you see better results when working in a group. While no safety officer has all the answers, a well-structured safety committee usually does.

**Building a Better Safety Committee**

Creating a safety committee for your organization is an essential element of an SMS but, as is the case with other aspects of SMS, there is often debate about the committee’s structure and purpose.

There is no single best safety committee structure. However, your committee should be configured to accomplish two main purposes.

First, the safety committee must include people with knowledge and experience in every major aspect of your organization, not just pilots. You should include, for example, maintenance staff, other aircrew members, and office staff members. They provide the committee with the knowledge and perspective of what is really happening in day-to-day operations. These folks often understand nuances of communication, hierarchy, and process that are not spelled out in policy manuals.

Second, the safety committee’s proposals must produce real change. The committee may recommend revisions to policies or procedures or ask for additional equipment, personnel, or training — all areas of responsibility that fall outside of the safety officer’s domain. This means that the people with these job responsibilities should be on your safety committee. At the least, the committee needs direct access to them.

Without the power to make the changes needed to reduce risk, the safety program will merely identify safety problems and maybe pass on a bit of information — and your SMS program will fail.

Part of what makes SMS such an effective approach to improving safety is that it takes a systematic approach to your organization’s safety. To make effective changes to a system, you need the help of both the people who work...
in the system (the day-to-day folks) and the people who have the ability to change the system (the managers and accountable executives).

In small organizations, the whole company can be the safety committee. Rather than seeing this as a disadvantage, it is actually the ideal — to have every single person in the company actively thinking about building a safer operational environment. Single-person owner/operators can use other local operators, contract maintenance personnel, flying friends, or anyone they regularly work with to make up their committee.

**Finding Latent Hazards**

Now that we’ve cleared up who should be on your safety committee and why, let’s go back to looking at how the committee contributes to risk control: by looking for latent hazards, the ones that are often overlooked because they stem from issues with the operating environment, such as policies, procedures, or culture. There are numerous models available to do this, but some are quite complex. Let’s look at a few that, while simple, can be quite effective.

The PAVE method separates factors that could be associated with a hazard into those related to the Pilot, Aircraft, enVironment, and External pressures:

- **Pilot (Persons):** experience, training, fatigue, illness, the I’M SAFE checklist. Please note that some refer to this category as Persons and extend the assessment to all people involved with the flight, such as crew members and dispatch and maintenance personnel.
- **Aircraft:** known maintenance issues, performance limitations, fuel status, avionics updates.
- **enVironment:** both present and forecasted weather, flight or mission type, air traffic control, obstructions, time of day, other air traffic.
- **External pressures:** recent changes in personnel, management insistence, difficult customers, consequences of cancelling flight.

One of the best things this model does is remind us to consider the entire operating environment — and not just the obvious mistake that was made — when reviewing an accident or incident. By reviewing how these four areas contribute to hazards, you’ll be quickly reminded of factors that were not immediately obvious.

Another method is called the Rule of Five Whys. This method consists of just asking why an incident occurred, or why a hazard could lead to an accident, until you arrive at its root cause or causes (you could also call it the Toddler Method).

Although it’s called the Rule of Five Whys, don’t stop there. Ask as many whys as you need to get to the underlying causes of a hazard. Then, whether you have uncovered one, five, or 15 causes, take a look at how you can mitigate some of those factors.

For example, one agency had a hazard report filed that the first-aid kit needed to be restocked. Instead of just restocking the kit and moving on, they did a quick five-whys analysis, which took five minutes. They realized that the kit had not been restocked because it was not listed on the facility safety inspection form.

The real issue was that the kit was not on the list of items to be regularly inspected and thus regularly restocked. During this process, they found a few other things that had also been omitted from the form. By adding the first-aid kit and these other items to that list, the issue is resolved not for just this one occurrence but on a regular basis.

This is an example of treating a...
“system” problem with a “system” answer to obtain better results than the more conventional answer — “the kit is empty, so restock it” — would have offered. The Rule of Five Whys prompts you to think beyond the simple fact of a hazard to why that hazard occurred in the first place. The hazard or incident does not need to be a major problem; this process works just as well for smaller problems.

If you are ready to take on a more complex method of hazard analysis, you can try the Bowtie Model. This model is a method of visually mapping a hazard and the relationships among the threats or risks that it poses, the consequences, the different methods of controlling that risk, escalation factors that reduce the effectiveness of risk controls, and methods to control those escalation factors. The resulting diagram resembles a bow-tie (figure 2).

**The Rule of Five Whys prompts you to think beyond the simple fact of a hazard to why that hazard occurred in the first place.**

Besides its ability to visually show incident or accident sequences, the Bowtie Model also illustrates a broad spectrum of risks and helps users to assess and prioritize the risk controls used. A recent European Helicopter Safety Team toolkit called MARIA (My Assessment of Risks for Incidents and Hazards) is based on the Bowtie Model; visit http://bit.ly/EHEST-maria to download this free safety tool.

**Addressing the Risk**

Once you uncover the direct and latent factors, the next step is to develop a proposal to control the risk. Some safety solutions are simple, easy, inexpensive fixes. But many times the safety committee’s proposal must address a combination of policies, procedures, equipment, staffing, and training.

Remember, because of the risk analysis you performed earlier in the
SMS process, you were able to “bleed off” any low-risk hazards. At this point, you are dealing with hazards that pose sufficient risk to your organization that they warrant such steps as policy or procedure revisions, additional training or staff, or the purchase of equipment.

However, just publishing a new policy or procedure or buying a new piece of equipment will not on its own spur operational change. This is especially true for emergency procedures that must be enacted by personnel under stress. Sometimes we issue a new safety rule and just walk away, assuming that 100 percent of the staff will use or follow it 100 percent of the time. That’s not a realistic view of how humans accept change.

If you are asking people to change how they do things, then you must conduct some training. This is also why your safety committee must include an administrator and training manager. The training may be as simple as a quick morning briefing on the new change, how to do it, and why.

Besides training, you should engage in ongoing promotion of your safety program. One of the foundations of SMS is safety promotion, but it is frequently poorly integrated with the other three, which are safety policies, safety risk management, and safety assurance. Too often, an organization’s efforts at safety promotion fall flat.

The information broadcast in emails, posted on bulletin boards, or provided in safety presentations often seems to be picked at random or as a knee-jerk response to the latest major event in the industry. Employees often just ignore these materials or half-heartedly participate in training and the use of new procedures.

Safety promotion, though, is part of effective risk control. You want your co-workers to change and adopt the new policy or procedure or use the new equipment.

Again, this is why you should involve representatives from each department or operational area in your safety committee. Because each department was involved in creating a solution, you will have more buy-in when you implement it. The safety committee members should act as ambassadors for your SMS program within their department.

Tying together unit training, information from a safety program, and hazards that have been identified and targeted for action will increase the relevance of your safety promotion efforts. Employees will more readily give their time and effort to control the risks of real-life hazards that are a demonstrated threat to them, their co-workers, or their livelihood.

Setting Measurable Goals
When developing risk controls, your committee should set a specific, measurable target of reducing the probability or severity of the hazard. This is the only way to gauge if the change you are proposing was effective in lowering the amount of risk faced by your organization.

If a negative event is happening a certain number of times a year, set a
goal for that number to be reduced or eliminated in the next 12 months. If you are proposing an increase in a particular kind of training, you may decide to have all of the training completed in six months or a certain percentage of staff trained in four months. If a certain piece of protective equipment or clothing is only being used 20 percent of the time, your goal could be to have it used 80 percent of the time within six months or 100 percent in a year.

Why all the numbers? We want to be able to know if a risk control is effective, instead of just putting it in place and assuming that it worked. You can’t control what you don’t measure.

For an example, let’s look at an effort to reduce the hazard of bird strikes. Remember, the overall risk of any hazard is a combination of its likelihood, or the probability that the hazard will occur, and its severity, or the significance of the resulting problem.

Changing a route to avoid an area with lots of birds, such as a garbage landfill, can lower the likelihood of strikes. The committee can monitor how many times pilots fly by the landfill before the proposed route change and how many times they fly by it over the next several months. The committee can also work to lower the severity of a bird strike. Wearing a helmet with the visor down or installing polycarbonate windshields are two ways to protect the pilot’s face and eyes and thus lower the risk of him or her losing control of the aircraft in the event of a bird strike. The committee can determine whether the organization has the proposed equipment and how often it is being used, as well as propose changes to policies and procedures and conduct training on using the new equipment and routes.

Next Steps in SMS
Up to this point, through our SMS process, we have gathered information about hazards, analyzed them to determine actual risk levels, and evaluated higher risk items for direct and latent factors so as to create realistic, effective risk control. We have also set goals for controlling these hazards, goals that can then be used to track the organization’s safety performance.

The next step is this: how do we evaluate the safety performance of our organization, and how do we respond to the results? The next article in the Real-World SMS series will focus on risk assurance, the process by which we ensure that our SMS engine is meeting our safety objectives.

Bryan Smith is a member of the U.S. Helicopter Safety Team (USHST) — part of the International Helicopter Safety Team — and serves on the USHST SMS Workgroup. He is also the safety program manager for the Airborne Law Enforcement Association (ALEA). Bryan is a full-time pilot for a sheriff’s office in central Florida, where he flies a variety of public-safety missions.
She thought she was going to be a history teacher. Then, in 1972, Sally Woolfolk — a young woman barely into her 20s — mailed in her army commissioning papers, setting her on a course to become the first female U.S. military helicopter pilot.

During her U.S. Army career, during most of which she used her married name of Murphy, she served with distinction, rising to the rank of colonel. “I turned to the army as a first step to financial independence and an adventure of my very own,” she says. And Murphy talks about these adventures in this month’s HFI Heritage Series interview.

No Girls Allowed
According to Murphy, growing up in the 1950s and ’60s was different. Although she was “a tomboy,” schools in the Kansas City suburbs, where her family lived, had no sports for girls. However, she learned from her parents that “I could do anything as long as I worked to make it happen.”

She went to Kansas State College, her “hometown” college, heading for a teaching career. At that time, women’s opportunities after college were pretty limited to nursing, secretarial work, and teaching, Murphy says. Then she saw a recruiting brochure, entitled Begin as an Executive, which spurred her to apply for the Women’s Army Corps (WAC).

“The early ’70s, women were still excluded from being directly in the army,” she says. But that was about to change.

The Door Opens
Murphy became a WAC officer in intelligence, taking the military intelligence basic officer’s and tactical intelligence courses at Fort Huachuca, Arizona. Also attending the first course was Capt. Dan Murphy, a Vietnam-era helicopter pilot.

The two became close, and Dan encouraged her to apply for flight school. She describes him as her “cheerleader in bucking me up through many other challenges in the years to come.”

Dan and Sally married in 1974. Their son, Sean Murphy, followed both parents into the army and served in Afghanistan and Iraq before his death in 2009, following a parachute failure in a training mission.

During Murphy’s initial intelligence training, the army flight program was opened to female candidates. Picked by military intelligence and aviation to attend the first session of initial rotary-wing instruction that was open to females, Murphy ended up the only woman in the class at Fort Rucker, Alabama. After graduating, she became the first woman Army helicopter pilot.

She started training on the Hughes TH-55 Army training helicopter. The two-person craft was so small it was often described as being made by toymaker Mattel, but Murphy soon

Learn More …
Go online to read Martin J. Pociask’s entire interview with Sally Murphy at helicopterfoundation.org/Murphy. More interviews with aviation pioneers can be found at helicopterfoundation.org/pioneers.
moved up to UH-1 Hueys. She later switched to the U-21 Beechcraft Queen Air, a turboprop with enough room for the equipment for signals intelligence work.

It was at this time that Murphy crossed paths with Jean Ross Howard Phelan, the founder of the Whirly-Girls, an organization that promotes women in helicopter aviation and HAI affiliate, and someone who Murphy regards as a role model.

“The commander of Fort Rucker, Maj. Gen. [William J.] Maddox, was a friend and strong supporter of her activities. Jean was on post for public relations purposes and she provided me with my membership credentials. I had not heard of this wonderful group of women helicopter pilots until then,” Murphy says.

“Over the years, I … became increasingly flattered to be considered a Whirly-Girl,” she says. “Several of their speakers rank among the best I have ever heard.”

An Army Career
Over the course of her career, Murphy had a wide range of assignments, which she discusses in detail in her interview.

She flew RU-21 aircraft on the border between East and West Germany while conducting signals intelligence missions for the 330th Army Security Agency Company. A later assignment took her to Fort Riley, Kansas, where she worked to prepare U.S. forces to fight with NATO forces against any Soviet attack. She worked on force modernization both at Fort. Riley and with V Corps.

After an European assignment, Murphy returned to the United States, where her responsibilities included the Army’s just-beginning UAV program. “I wrote, staffed, and received approval for the first Joint requirements plan for unmanned aerial vehicles,” Murphy says.

Her later posts included service with the IX Corps in Japan, where she was the corps aviation officer.
and commanded the 78th Aviation Battalion (Provisional). She later served as the chief of the Army Intelligence Master Plan and director of intelligence, futures.

After promotion to colonel, Murphy knew future assignments would not include aviation duties. She chose her final flight carefully. “I selected a Huey flight in Japan with a very good friend because it was most probable that it would be my last one forever.”

Murphy retired from active duty on July 1, 1999, after nearly 27 years of service, and moved on to a job in defense contracting.

Looking to the Future
Murphy’s advice for those starting a helicopter — or any — career is simple: get up every day and do the best you can.

“Set goals, but don’t limit yourself by adherence to a strict plan because the unexpected … can often present better opportunities and satisfaction,” she says.

As someone who broke through barriers to women in the military, Murphy says, “If you chose a career that is male dominated and historically closed to women, don’t be surprised when it is often harder than you think is fair.

“Never believe those who tell you something can’t be done or has never been done before, because that is looking to the past and you are the future.”

Martin J. Pociask
is curator for Helicopter Foundation International.
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Charles Thomas Aaron

Charles Thomas Aaron, 35, a helicopter pilot and the son of Chuck Aaron, world-famous Red Bull aerobatic helicopter pilot and member of the HAI Board of Directors, was killed June 13 in a motorcycle accident in Malibu, California.

Like his father, the younger Aaron was passionate about flying helicopters.

HAI President and CEO Matthew S. Zuccaro called Charles “a consummate professional in the exercise of his duties and activities as a helicopter pilot.

“More important is the fact that he was a true gentleman and wonderful person, always offering his assistance to those in need. Charles exemplified all that is good within the helicopter community. The helicopter industry has suffered a true loss in Charles’s passing.

“On behalf of the international helicopter community I want to express our sincere sympathy and condolences to the Aaron family and let them know that Charles is and will always be in our prayers and thoughts,” Zuccaro said.

Jim McCrory, a former Aaron coworker at Aspen Helicopters in Oxnard, California, described him as “a careful, conservative pilot” who “loved what he did.”
Wanda Lee Rogers

Wanda Lee Rogers, former chairman of HAI’s Board of Directors and the longtime president and CEO of Rogers Helicopters, in Clovis, California, passed away last month at the age of 83.

Rogers, who died May 26, founded the company in 1962 with her husband, Harry Rogers, and with a Hiller UH-12E and a Hiller UH-12A, “minimal capital and a banker who believed we could be successful,” she told Rotor in 2002.

Rogers Helicopters is still owned by the Rogers family and is now one of the largest helicopter operators in California, working in utility, powerline construction, external-load operations, firefighting, government assistance, oil production and exploration, logging, helicopter air ambulance, and filming. Its fleet of 31 rotary- and fixed-wing aircraft includes four Eurocopter AS350 B2 AStars, two Eurocopter AS355 F1 Twin Stars, seven Bell 206B-3 JetRangers, three Bell 206L-3 LongRangers, seven Bell 212s, three MD 500s, and two MD 530s.

In addition to serving as chairman of the board, Rogers’s HAI activities included service on the Government Contracting Committee and as vice president and treasurer of the board. She was recognized as an honorary Whirly-Girl and served as president of the Commercial Helicopters Operators Council. She was also a member of the Radcliff College Amelia Earhart Committee.

Rogers was a founding member of the Foundation for Clovis Schools and served on the boards of Kaman Helicopters and the San Joaquin College of Law.

“It was my distinct honor and privilege to have served with Wanda on the HAI board,” HAI President and CEO Matthew S. Zuccaro said.

“She was a true pioneer within the helicopter industry and also a positive influence as well. She will be missed by us all,” he added.

Rogers was preceded in death by her husband, who died in 2014, and son Rory. She is survived by son Robin and two grandsons, Robby and Randy.
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HAI will select the winning photographs. Winners will be announced in the Winter 2017 issue of ROTOR (distributed at HAI HELI-EXPO 2017). Winning photos will be displayed at HAI HELI-EXPO 2017.

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• All photos must be the original work of the entering photographer.
• All entries must be uploaded to photo.rotor.org by midnight ET on Dec. 1, 2016.

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