

Safety Spotlight



Mid-Course Correction

The International Helicopter Safety Team re-targets small operators with a data-driven safety culture

By Frank Colucci

While US accident rates are down about 20 percent since 2006, the International Helicopter Safety Team (IHST) continues to implement data-driven tools to save lives and property and to reach its 80 percent accident reduction goal by 2016. The Joint Helicopter Safety Implementation Team (JHSIT) has so far issued four English-language “toolkits” covering risk assessment, flight data monitoring, training, and maintenance, and it will translate the publications into Spanish, Portuguese, Japanese and other languages for regional IHST members. The group has also created a website (www.IHST.org), produced safety videos, and formulated a social media communications plan to spread the IHST’s important safety messages. Yet while US accident rates are down about 20% since 2006, statistical trends



IHST co-chair and FAA Rotorcraft Directorate aircraft certification service manager Kimberly K. Smith.

show the decline in North America and elsewhere are too slow to meet the ambitious 10-year objective. At the fifth International Helicopter Safety Symposium (IHSS) in Fort Worth, Texas, IHST co-chair and FAA Rotorcraft Directorate aircraft certification service manager Kimberly K. Smith acknowledged, “While we’re making some progress, we’re just not making it quick enough.” Private and commercial operators with one-to-five aircraft remain the most prone to accidents, and the IHST, comprised of government and industry volunteers, seeks a mid-course correction. Ms. Smith said, “We have to find out how to get to the individual pilot and the small operators.”

Coming from a long career in big-airline cockpits, plain-spoken FAA administrator J. Randolph Babbitt acknowledged the challenges of dynamic helicopter operations. “For a commercial airline pilot, Kennedy Airport is in the same place every week,” he noted. In contrast to scheduled FAR Part 121 operations in their refined infrastructure, he noted helicopter pilots commonly fly one-off missions into unprepared landing zones. “We want to make sure helicopters provide the vast array of services they provide safely,” said Mr. Babbitt. The FAA administrator cited the fixed-wing safety contributions made by flight simulators, improved infrastructure, and Safety Management Systems (SMSs). “The whole idea of an SMS is to move from collecting data



FAA administrator J. Randolph Babbitt acknowledged the challenges of dynamic helicopter operations.

after an accident to collecting input before an accident,” he said. Mr. Babbitt also noted aviation safety above all requires an attitude of true professionalism. “We always find the safest pilot is the one who took a checkride yesterday,” he said. “How often do you give yourself a checkride?”

The work of the Joint Helicopter Safety Analysis Team (JHSAT) in North America and regional teams in Europe, Brazil, and Japan found common threads running through their mishap data. “There are no new ways of crashing helicopters. We are all doing it in the traditional fashion,” observed John Steel, European Helicopter Safety Implementation Team (EHSIT) co-chair and general aviation standards manager of the Irish Aviation Authority. Across

IHST regions, human factors remain the root cause of 70 to 80% of all helicopter accidents, and human factors are not limited to pilot errors. FAA advisor Dr. William Johnson noted an administration survey of 50,000 aviation mechanics showed maintainers average just 5.5 hours sleep per night. One of the first videos produced by the JHSIT addresses the dangers of sleep deprivation.

Dr. Patrick Hudson of the Delft University of Technology in the Netherlands addressed the human factors of helicopter safety and noted "Flying helicopters is inherently dangerous, more dangerous than fixed-wing. And you better not forget it." The speaker said most private pilots are amateurs with what he called a "pathological" response to regulation. The exciting, can-do culture of helicopter pilots also views changes with "What's in it for me?" Dr. Hudson told the IHSS audience, "If you can't answer that question, you're not going anywhere."

Helicopter operators in a depressed global economy also inevitably question Return on Investment (ROI) from safety initiatives. FAA administrator Babbitt said simply, "Safety is good for business. The reciprocal is not." Helicopter Association International (HAI) president Matt Zuccaro recounted a conversation with an aviation insurance broker who answered IHST initiatives simply, "You know what's going to get my attention? When you don't have accidents."

Several symposium speakers reminded the audience of the human cost and the human contribution associated with every helicopter accident. "It's not just about the individuals," observed National Transportation Safety Board (NTSB) vice chairman Robert Sumwalt. "Humans are part of an organizational/regulatory system." The NTSB has investigated four helicopter accidents in the last two years, including the loss of a New Mexico State Police A109E in June 2009 when a dedicated state trooper-turned-chief pilot was called back to duty, after a full day of flying, to search for a lost hiker. The pilot initially declined the call but soon changed his mind and took off with an untrained trooper-observer in daylight and clear weather. He landed



National Transportation Safety Board (NTSB) vice chairman Robert Sumwalt.

his aircraft on an 11,000 ft mountain and dismounted to search on foot. The pilot and the observer ultimately carried the female hiker ½ mile back to the aircraft and took off in darkness and Instrument Meteorological Conditions (IMC) only to crash in the mountains outside Santa Fe. Without adequate rest, inadvertent IMC training, or pre-mission risk assessment, a selfless pilot, husband, and father died with the hiker he sought to rescue. "We don't want heroes flying aircraft," said Mr. Sumwalt. "When you push mission completion before safety, bad things happen."

Safety Culture

Throughout the IHSS presentations, speakers focused on the cultural changes needed to improve helicopter safety and the communications essential to spread safety messages. BP safety and operational risk lead investigator Hooper Harris told the IHST audience, "What we have to do is affect a change of heart in this community. . . . Accepting helicopter accidents as normal is inertia-at-rest. It's not the nature of the business."

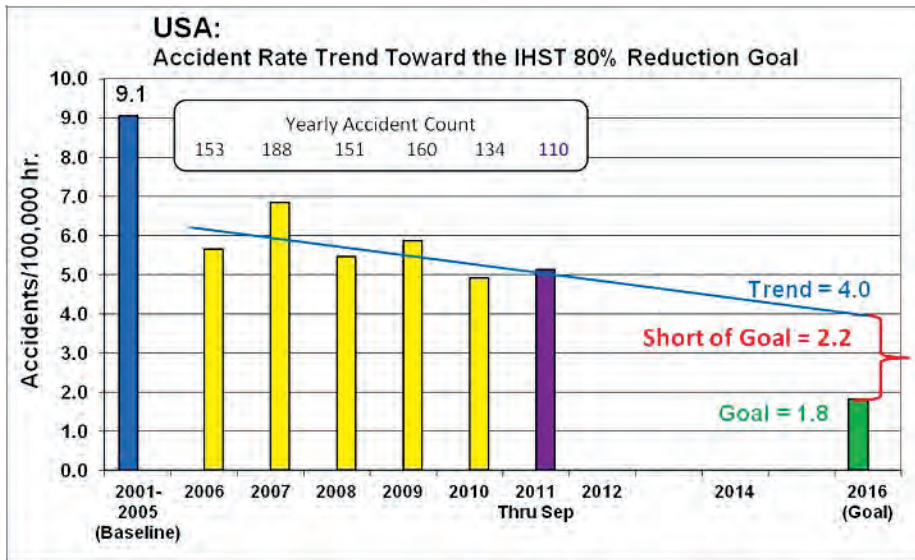
Significantly, the biggest oil industry fleet operators log 10 – 11% of all civil helicopter flight hours but suffer less than 1% of the accidents. CHC president and chief executive officer Bill Amelio told the IHSS audience how his company integrated Safety Management Systems with a comprehensive safety culture. Lean Six

Sigma quality disciplines typically used in manufacturing are applied to maintenance operations. BOSS – the Behavior Observation Safety System – gives anyone who sees an unsafe practice the authority to intervene immediately. Flight Data Monitoring makes for more consistent operations. CHC tools, systems, and processes are all meant to make leaders accountable and give every team member a voice in safety. They are also backed by a corporate willingness to replace those who fail to embrace a safety culture. "When you have a great safety record, people want to work for you," Mr. Amelio explained, "You attract talent."

PHI president Lance Bospflug told the IHSS about Destination Zero, his company's collective safety effort aimed at zero flight accidents, personal injuries, and preventable occurrences. "It's an attitude, an attitude you bring with you every single day," said Mr. Bospflug. "It has helped us create a common language for safety goals and aspirations." He added, "You have to over-communicate and talk about these issues time and time and time again."

Bristow Group president Bill Chiles described Target Zero, his company's integrated safety culture. The Bristow Group has some 3,500 people and flies 260,000 hours a year in oil and gas operations alone. In pursuit of Target Zero, the company sold-off 53 single-engine helicopters, fielded the Appareo ALERTS flight data management system, and implemented a Just Culture that learns from accidents and incidents rather than simply punishing those involved. "You can have the greatest technology in the world," said Mr. Chiles. "If you don't have the culture, you'll find ways to put crews into the ground."

With 3,700 fixed- and rotary-wing aircraft accumulating around 1 million flight hours a year, the US Navy works continuously to mitigate non-combat accidents that parallel those of big commercial fleet operators. SH-60 pilot Capt. John Nettleton, now force safety officer for the Commander, Naval Air Forces, noted human factors is the main cause in 80% of naval aviation mishaps. He observed, "If you want to get rich, give me something that can measure fatigue in 30 seconds, like a breathalyzer



Although the trendline shows a significant reduction in accidents in the U.S., IHST needs to reach the smallest operators to have the biggest impact.

for fatigue, and I'll solve a lot of problems." The Navy now promotes a safety culture among pilots similar to that implemented by large commercial operators, although Capt. Nettleton admitted, "We don't have a union. We just tell them what to do." Like commercial Flight Data Management, Military Flight Operations Quality Assurance (MFOQA) collects hard mission data from aircraft sensors. "MFOQA is a very good way to keep people honest." The Aviation Safety Awareness Program (ASAP) meanwhile enables aviators to record their perceptions after every flight and directs risk mitigation. ASAP comments, for example, led to runway and taxi markings being repainted at Corpus Christi Naval Air Station for greater visibility and safety.

The safety cultures of big helicopter fleets are also taking root with smaller operators. Halo Flight in Corpus Christi, Texas has just three Bell 407s but over time implemented a Safety Management System that has employees identify hazards, mistakes, and risk mitigations. Executive director Tom Klassen explained, "You really have to involve the staff in the management of change."

Gary Spender, chief pilot for charter operator London Helicopter Services in the UK noted the high accident rate among self-fly-for-hire pilots and observed, "Working on your own is the easiest way to kill yourself, because

there's no one to looking over your shoulder." He independently analyzed UK accident data and he was driven by simple self-preservation — "The only person stopping me from killing me is me."

HAI safety director Stan Rose outlined the IS-BAO – International Standard for Business Aircraft Operations – which will be available to helicopter operators in 2012. The scalable, performance-based mentoring process is an industry accreditation rather than a regulatory certification. Third-party IS-BAO audits made business jet operators safer and use of this tool can potentially give the helicopter industry a higher bar to promote and document a safety culture. According to Mr. Rose, "They tell you what needs to be done, not how to do it." A member of the audience noted a large-fleet operator is already audited about 30 times a year, and HAI hopes the IS-BAO process can be integrated with existing inspections.

Technology, Infrastructure, and Training

The IHSS exhibitors were able to conduct a rapid-fire "shoot out" (exhibitors were given two minutes to describe their products and services before the entire IHSS audience) and afterwards attendees were invited to visit their booths in the exhibit hall. The exhibitors presented a

range of safety technologies from the familiar Bristol/Magellan Wire Strike Protection System and Tanis aircraft pre-heaters to advanced flight following and data management systems. SkyNet Satellite Communications showed an Aeronautic Information System (AIS) able to convey flight following, scheduling, weather, and realtime maintenance information up to the floor of the Automatic Dependent Surveillance-Broadcast (ADS-B) system. Outerlink Corp. presented a new Iridium-based satellite datalink for worldwide automatic flight following. Appareo Systems added a cockpit image recorder to its ALERTS flight data management system. Sandel showcased a Helicopter Terrain Awareness and Warning System (HeliTAWWS) designed to eliminate distracting false alarms.

New avionics and the NextGen air traffic control system reportedly promise helicopter pilots a safer working environment, but according to Tom Judge of the JHSIT, a safer rotorcraft infrastructure will require the kind of commitment and funding given scheduled airline operations. For example, there is currently no recognized inspection and audit process for heliports. Also, common heliport lighting is incompatible with Night Vision Goggles.

Several IHSS speakers addressed infrastructure improvements for rotary-wing airspace. Ralph Petragnani of Belfort Instrument talked about expanding the NADIN II (National Air Space Data Interchange Network) to provide expanded cockpit access to weather reports. Around 750 Automated Surface Observing Systems (ASOS), 200 Automated Weather Observing Systems (AWOS), and 100 Automatic Weather Sensor System (AWSS) stations are already on NADIN. However, only 600 of 1,163 non-FAA AWOS sites share the network. Revising regulations and accepting the non-AWOS III stations could fill gaps in coverage.

David Manchester of Harris Corp. talked about expanding controlled airspace for safer low-altitude IFR helicopter operations. ADS-B and NextGen technology can support both flight surveillance and voice



The Regional Partners Panel discussed “How to Best Implement Intervention Recommendations in Regions Throughout the World” with panel facilitator Dr. Harold Demuren, Director General of the Nigerian Civil Aviation Authority.

communications all the way to the ground. The same ground stations could also load “electronic flight bags” hosted on an iPad computer or feed heliport data directly into aircraft Flight Management Systems. Jason Patrick of Satellite Technology International described the benefits of a low altitude GPS-based IFR route system independent of radar tracking. However, despite local successes, the US has no common rules for such systems. Mr. Manchester concluded, “What we need to go forward is a centralized set of regulations guiding development of a low-altitude infrastructure.”

Nigel Talbot of AgustaWestland said future helicopters need better control and stability and improved cockpit displays to exploit an improved infrastructure with low-altitude IFR, point-in-space approach, and traffic self-separation capabilities. In addition, he concluded, “There is no point in having a high-integrity delivery to a point-in-space where you can see nothing when you get there.”

Training remains pivotal to improved helicopter safety, and IHSS presentations addressed the growing importance of flight simulators in training commercial pilots. Terry Palmer of Flight Safety International and the JHSIT noted the number of helicopter simulators has tripled since the start of the IHST. FSI developed its VITAL X PC-IG visual system specifically

for helicopter training and integrated its MATRIX classroom and task trainers with the same software and graphics used in the company’s highest-fidelity FAA Level D flight simulators. Most of the 100-plus helicopter simulators made by CAE so far have been for military customers, but the American Eurocopter AS350 Level B simulator in Phoenix now provides over water, urban law enforcement, and other advanced civil training environments. CAE also partnered with HAL on the HATSOFF training center in Bangalore, India to provide Level D training in interchangeable Bell 412, Eurocopter Dauphin, and HAL Dhruv cockpits. In a different scenario, Frasca International often trains younger pilots who work for private and smaller operators. Helicopter business development manager Mike Phillips told the IHSS audience, “If you want the training to fly an R22 or R44, or even a Bell 206, maybe a Level D simulator is not the way to go.”

Trey Wade of the Bell Helicopter Training Academy commented, “Doing a checkout in a Level D full-flight simulator is still not the same as doing it in a real aircraft.” He observed that 90% of the Bell training business was focused on small fleet operators with one-to-five aircraft. The helicopter manufacturer now also offers more balanced services with training split evenly between pilots and maintainers. Nick Mayhew of the Bristow Academy noted there are more than 30 FAA Part

141 helicopter flight schools and around 500 Part 61 unregulated training operations currently in the US. The training landscape is complicated by differences between the US FAA and the European Aviation Safety Agency. He said, “We need to find a way to provide some sort of training standardization across the globe.”

Medium and large fleet operators are still the greatest users of flight simulators. However, HAI president Matt Zuccaro notes that small fleet operators make up about 85% of the helicopter industry. The association chief should know. Mr. Zuccaro, HAI president and IHST co-chair since the formation of this safety effort, reported in 2011 that his organization has 561 operator members flying 4,961 helicopters. Half of his operator members fly just two helicopters and more than 72 percent fly a maximum of five rotary wing aircraft. Only two of his member operators have more than 36 helicopters in their fleet. Having Mr. Zuccaro in the key position of IHST co-chair was always seen as an important bridge to the small operator who makes up the majority of the civil helicopter operator community. In its next five years, the IHST intends to both scale its processes and target its messages to reach the greatest number of helicopter operators. “We can’t identify this as a finite program,” said Mr. Zuccaro. “It’s a work in progress.”