



# IHSF Publishes Safety Technology White Paper

By Paul Schaaf, VFS Advisor for Technology in Regulations

This past December and January, several high-profile, fatal helicopter accidents — including one that killed Los Angeles sports superstar Kobe Bryant — drove home the fact that while helicopter operations continue to get safer, they are still not safe enough.



As elaborated in his March/April 2020 *Vertiflite* commentary, “Looking Back from 2020: A Vertical Retrospective of Rotorcraft Safety,” VFS Executive Director Mike Hirschberg — a board member of the International Helicopter Safety Foundation (IHSF) — called for the helicopter safety community to conduct a “Heading Check.” Over the 15 years since its establishment, the IHSF had seen significant reductions in accidents, but progress has largely plateaued over the past five years.

With the endorsement of the IHSF Board, the Heading Check effort was divided into three working groups: Safety Promotion, led by Bob Sheffield, one of the founding members of IHSF; Technology, led by Mike Hirschberg; and Regulations, led by Chris Martino, Helicopter Association International (HAI).

### Safety Technology White Paper

Regular web meetings have been held over the spring and summer with volunteers from manufacturers, the US Helicopter Safety Team (USHST), the European Safety Promotion Network Rotorcraft (ESPN-R), US Federal Aviation Administration (FAA), European Union Aviation Safety Agency (EASA), and other safety experts. Work continues and significant strides have been made to date, most notably in defining realistically actionable items to be moved higher in the set of the helicopter community’s priorities.

The IHSF Technology Working Group published a short paper in August 2020, entitled, “White Paper on Helicopter Safety Technology: Combined USHST and ESPN-R Helicopter Safety Technology Emphasis Items.” This document groups and identifies those technology items deemed most likely in the present and near term to be effective towards eliminating helicopter accidents. By abstracting to higher-level functionality, this paper synthesized the technology priorities of these two regional volunteer organizations for the first time.

With the help of a variety of manufacturer’s engineers assigned to the Working Group, it used the exhaustive work of the IHSF, USHST and ESPN-R, combined with more recent findings and advances to create a list of 15 items, all potent applications of safety technology

promising improvements not only in the direct safety of helicopter operations from a cockpit perspective, but from an operational control, risk management and aircrew preparedness perspective as well. It is important to note with accident prevention as its focus, crashworthiness and survivability were intentionally omitted.

The four-page white paper, posted at [www.vtol.org/safety](http://www.vtol.org/safety), covers the following technologies:

#### Group I: Available and mature flight deck technologies

1. Automatic flight control systems (AFCS)
2. Data-derived terrain and obstacle detection systems
3. Synthetic vision systems (SVS)

#### Group II: Emerging or advancing technologies

1. Cost-effective IFR certification
2. ADS-B “Out” and “In”
3. Support of the “e-Conspicuity” Initiative
4. Air data sensing systems
5. Active terrain, obstacle and traffic detection
6. Lightweight health and usage monitoring system (HUMS) warning systems

#### Group III: Technologies for improved operational control, risk management and aircrew preparedness

1. App-based “smart” flight risk assessment tool (FRAT)
2. Flight Simulation Training Devices - Helicopter (FSTD-H)
3. Flight briefing/preparation/debriefing app/software applications
4. Helicopter flight data monitoring system (HFDM)
5. Flight operations quality assurance (FOQA)
6. Optionally piloted aircraft (OPA) and unmanned aircraft systems (UAS)

Emerging from the work and emphasized in the paper is increasing evidence that technology can help bridge the insidious and deadly gap between Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) that has been plaguing the helicopter industry for decades. As such, the paper underscores the recent FAA IFR certification of single-engine helicopters and EASA’s 2018 “Rotorcraft Safety Roadmap,” which called for advancing cost-effective IFR certificated helicopters, both newly manufactured and retrofittable through supplemental type certificates (STCs).

### Surveying Pilot Attitudes Towards Safety

Additionally, the Technology Working Group authored and distributed a survey entitled “Cockpit Safety Technology.” With nearly 1,400 responses from pilots, plus hundreds of additional responses from translated surveys in different countries, the working group intends to further refine and emphasize specific

items in the white paper. Analysis of the data continues; however, first glimpses reveal helicopter pilot attitudes becoming increasingly “IFR friendly and comfortable.”

All this ties nicely with the intent of 2012 white paper, “14 CFR 27 Single-Engine IFR Certification Proposal,” which was developed by HAI, the Aircraft Electronics Association (AEA), the General Aviation Manufacturers Association (GAMA) and VFS (see [www.vtol.org/se-ifr](http://www.vtol.org/se-ifr)). While the paper was focused on the technical IFR certification process, its underlying intent was to give pilots the tools they need to fly IFR when appropriate and begin a cultural change such that the apparent cause of the Kobe Bryant crash would not continue to repeat itself.

The 2012 white paper laid out suggested alternative means of compliance with IFR certification requirements established nearly three decades ago. While the paper and follow-on certification of the single-engine Leonardo AW119 and Bell 407GX set new precedents for IFR certification (see “Single Engine IFR At Last!” *Vertiflite*, Nov/Dec 2019), a few vexing issues remain for the cost-effective certification of training and smaller helicopters due to physical constraints. The requirement for dual electrical generation capability and dual pilot static systems are two examples. However, given the FAA and EASA’s recent allowances for technological solutions to provide alternative means of compliance to regulations, it is possible that advances in battery technology and optical/laser air data sensing systems could bridge these final gaps.

Without doubt, helicopter pilots who become comfortable flying in instrument meteorological conditions (IMC) in training — without the benefit of seeing outside the cockpit — will be better prepared to shift gears into the “IFR mode” as a more appropriate,


professional and safer alternative to flying in marginal, uncertain or deteriorating weather conditions. This is the ultimate goal and it’s foundational to the cultural shift sought by members of all three IHSF working groups.

### More Work Ahead

Meanwhile, the Promotion Working Group has re-evaluated the key audiences it targets and the key messages it is trying to get to those audiences. The Working Group has identified opportunities to better connect to the key target audiences and to make the messaging to them more effective.

On the regulatory side, effort by the members to date has been focused on working to clarify the nuances of Congress’s reactionary approach of forcing “quick fix” mandates upon the industry that may not address the root cause of the fatal accidents. The Regulation Working Group will ultimately leverage the work from the Technology Working Group and other sources for recommendations related to international regulations.

From the top down in the helicopter industry, we have seen enough tragic loss of life. The global tension brought about by COVID-19 and unparalleled political and economic uncertainty may have given the helicopter industry the pause it needed to recollect itself and make the IHSF’s 2020 “Heading Check” meaningful.

Indeed, thinking on how to solve the troubling problems of the past have been surprisingly unanimous within the three working groups. Could the year 2020 and the work coming from it provide us with 20/20 vision into the future of helicopter operations and a set of actionable steps to move us into a surprisingly improved and safer future? 

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