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FRASCA SIMULATION TRENDS

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Trends in Helicopter Simulation

by Ryan Mason

By all indications, the helicopter simulation industry is booming. With the steady introduction of new helicopter models from several manufacturers, the simulation equivalents of current and previous airframes will ensure the simulation market continues to trend upwards with increasing sales.

Helicopter simulators are an essential training tool for all sectors of the helicopter industry. Many companies require simulators for pilots to obtain initial and recurrent training. Simulation-based training is an effective way to manage the cost of transitioning pilots to new airframes, and it is also a much safer way to train pilots in emergency procedures without damaging a multi-million dollar aircraft.

The simulation industry, now more than ever, has evolved to align with the needs and requirements of major helicopter manufacturers, operators, and flight schools. Simulation has become a large factor when both operators and flight schools purchase a particular model of helicopter. For flight schools, it is essential that students are able to fly in the same airframe in the simulator as they fly out on the ramp.

Ask old pilots about their experiences in simulators dating back 15 years and they usually say that they were never airsick until the first time they stepped into a fixed-flight simulator with only moving graphics. That old technology often made even the most seasoned aviator ill.

However, the simulation industry today immerses the pilot in an increasingly realistic and functional environment. From the graphics of waves lapping at the base of an oil platform, to subjects running from a traffic stop in a law enforcement-based scenario, the addition of Full Flight Simulator (FFS) technology not only solves the airsickness of seasoned pilots, but also allows them to feel the "helicopter" move. The whole cockpit, mounted on a motion platform, now moves in unison with pilots' control inputs, like real helicopters.

The simulation industry has transformed a once clunky and unrealistic experience into a total environment. Anyone who remembers the early days of simulation can remember the air traffic controller also being their instructor in the seat behind them. Air traffic control in simulators can now feature a live controller. Companies, such as Pilot Edge, provide live ATC with controllers that have real-world experience, as they are either a current or retired air traffic controller. Simulation is taken to an entirely different level when you are flying in a virtual environment, and the traffic that you see approaching is another live pilot. That pilot may be in a simulator on the other side of the world, but you are both within the same virtual airspace and being given instructions by the same controller.

Frasca International has been at the forefront of simulation for many years and continues to develop new technology to further enhance what flight simulators can do. At a recent demonstration at the ALEA conference, Bell Helicopter was displaying the latest in Frasca's FTD law enforcement line: the Bell 407 law enforcement trainer. This trainer was equipped with a simulated FLIR system, GPS mapping, and the latest cockpit technology advancements on display.

"The helicopter simulator industry has seen steady growth this year in both the Full Flight Simulator (FFS) and Flight

Flight deck of the Sikorsky S76 simulator made by Frasca

Training Device (FTD) market," said Mike Phillips from Frasca's helicopter programs division. Single-engine turbine helicopters, and other model types and locations, are being added worldwide. There is significant increased emphasis on safety and training, as well as technological advances that make the simulation product more useful and cost effective.

Frasca is not one to settle for simulation status quo. They continue to push technology to its limits, and beyond, by developing new technology and partnering with suppliers to offer a wide range of simulation products. Their current focus is on advanced avionics and helicopter mission training.

The purchase and use of helicopter simulators is a "no brainer," according to Dennis Pierce of Colorado Heli-Ops in Broomfield, Colorado. There are things that a pilot in training can do in the simulator that simply can't be done in a helicopter, such as running out of fuel scenarios, flying in IMC, dealing with high winds, or creating other adverse weather conditions. Flight training devices can also save customers money in many ways. Of course you can log some time for different certificates, but you can also even pre-train in simulators for complicated maneuvers. Furthermore, if a student is struggling with autorotations or any other portion of their flight training, he or she can go back to the sim and take a lot of stress out of the equation. When training then returns to the aircraft, the student consistently does much better. In instrument training you can start and stop at any point during the instruction to discuss what's going on, good or bad, and even return to the beginning of the approach, which saves time and money.

Pierce said that when it comes to the purchase of a helicopter simulator, customer service from the manufacturer is key. To offer a better product to your customers, and to your pilots in training, you have to spend money.

As an operator of two FTD simulators (Frasca Tru Flite R44 instrument & 300C, Merlin Schweitzer 333 Turbine/Instrument)

Cockpit of the AS350 simulator made by Frasca

Colorado Heli-Ops has been utilizing simulators since they opened their doors. Although simulators are a necessity for them, when asked, Pierce stated that if he had a chance to influence the way that the simulation industry provided simulators out of the box, he would like to see more component failures modeled and built-in scenarios. Just like the treadmills in gyms today, it would be nice to see multiple programs you could select, that would put pilots in training through complete scenarios.

As the increase in technology improves the overall "feel" of getting into a simulator and flying around a virtual environment, the retention of learned skills increases due to the realism the simulator offers. Mike Franz, owner of Helicopter SBT (Scenario-Based Training) explains, "Scenario-based training can be anything from portions of simple flight maneuvers or environments, to involved thinking processes regarding NTSB accident replication. Pilots can learn from the mistakes of others and think through multiple safe solutions that can be filed away as situational awareness examples to either avoid, or rely on, in the future."

As the demand for advanced flight simulators increases, and the push for more advancement within the training environment is achieved, competition among flight simulator manufacturers for that elusive piece of market share increases. The pilots who train in today's simulators reap the benefits of advanced training that better prepares them than the simulators of the past. This healthy competition benefits the companies who operate aircraft and use simulation technology to enhance their safety programs, and thus the industry as a whole benefits. The 2013 world uptrend in simulator sales indicates that safety is a priority. As manufacturers, companies, and pilots, we are all committed to mitigating potential accident causes to create a safer helicopter industry. Simulators are not going anywhere but up; if you haven't educated yourself on how a simulator can benefit you or your company, now is the time. The life you save may be your own.

Helipad approach simulation from the cockpit of the EC135 simulator made by Frasca