



vertiflite Commentary

Innovation Outpaces Regulation

By Mike Hirschberg, Executive Director

The past decade or so has seen an incredible infusion of innovative technologies into the vertical flight industry, but regulatory guidance has not kept pace. Between tiltrotors, iPads, drones, innovative new approaches to vertical flight, and conventional helicopter enhancements, regulatory agencies such as the US Federal Aviation Administration (FAA) and the European Aviation Safety Agency (EASA) have not developed timely, consistent guidance that can facilitate the safe implementation of new technologies for vertical flight in today's demanding marketplace.

Technology Innovations Need Regulatory Innovations

Bell Helicopter CEO John Garrison recently discussed the subject of regulations at a luncheon hosted by the Aero Club of Washington, stating that while bringing technology to market is a challenge, "The FAA and industry, along with other global regulatory bodies, are struggling to fit new technology into a regulatory structure that in many cases was written when the technology wasn't even envisioned."

Industry has shown that they can be nimbler and more responsive to customer needs: "The reality is we simply cannot allow it to take three or more years to integrate technology into our products – we need to move at the speed of modern business – at the speed of our customers." In spite of these improvements in design and development, "it can be fairly frustrating to us and our customers to create a modern environment where a team can put an aircraft together in 18 months,



or adapt the latest technology to an existing platform, and then spend nearly the same amount of time working to achieve certification."

Unfortunately, regulatory approval of common-sense improvements are often subjected to bureaucratic delays, with significant impacts on the safety, sales, operations, business growth and economic vitality of vertical flight. Rotorcraft manufacturers and operators are increasingly impacted by what are often protracted back-and-forths with regulators. This results in unnecessary cost to both government and industry and is an impediment to safety improvements.

Two FAA reports to Congress in 2012-2013 outlined many of the issues with the agency's aircraft certification process and consistency of regulatory interpretations. Inconsistent guidance and its interpretation across time and distance has been a major issue: different FAA regions and even different personnel within regions interpret regulations in vastly different ways, often having significant cost and time impacts to rotorcraft businesses. The result is a patchwork regulatory environment, with compliance based on non-standard local

interpretation.

Sometimes, well-intentioned improvements go awry and fail to realize the intended benefits. The streamlined approach that the FAA adopted last year for approval of non-required safety-enhancing equipment (NORSEE) was intended to provide an efficient path to introduce some types of safety improving technologies (building on the approval of iPads). However, the implementation process has become neither efficient nor effective. Similarly, the FAA created the Designated Engineering Representative (DER) role and other

industry designees for the agency to delegate responsibilities, allowing FAA personnel to focus solely on safety-critical activities. Unfortunately, the delegation is not being fully utilized, sometimes with unnecessary duplication and second-guessing. The FAA could realize significant cost savings by actually delegating the authority set forth in the Code of Federal Regulations.

Multiplying the inconsistencies across the FAA regions in the US (the world's largest helicopter market) are discontinuities between the world's other major regulatory bodies. Despite harmonization efforts with EASA, Transport Canada and other agencies – in addition to the International Civil Aviation Organization (ICAO) – national differences cause divergences that cost time and money for the regulators, manufacturers and operators. An oft-cited example is the recent case of EASA approval for the Robinson R66 Turbine. EASA took four years longer than the FAA to issue its type certificate, during which time more than 50 other countries certified the R66 and 500 aircraft were delivered, accumulating an estimated fleet total of 160,000 hours.

EASA also levied more than \$1M in fees on Robinson, compared to \$80,500 in Canada and no charge in the US. Clearly more harmonization is required.

Transformative Technologies

Helicopters, of course, must be certified in the country in which they operate. ICAO standards work towards harmonization of the FAA, EASA, Transport Canada and other regulatory bodies have made great progress over the years, but there is still a long way to go. An exemption for the Bell 429 over the 7,000 lb (3,175 kg) Part 27 limit by Transport Canada, for example, has led to 16 other countries following suit – but not the FAA or EASA. This discontinuity has created some issues that should be addressed in a holistic approach.

The FAA, working with industry and the General Aviation Manufacturers Association (GAMA), has begun making strides towards a “clean sheet” regulatory approach to Part 23, which regulates small aircraft, simplifying the underlying regulation and development of standards. A fresh approach to Parts 27 and 29, which regulate rotorcraft certification, is now also warranted. AHS and the rotorcraft industry applaud the FAA’s efforts to advance the dialogue on this important topic.

New concepts for manned VTOL aircraft that are radically different from conventional fixed- or rotary-wing aircraft, however, are now taking shape. Transformative vertical flight concepts using novel propulsion and energy architectures – such as distributive electric propulsion, embedded fans and other innovative approaches – are on the cusp of technical viability but cannot be certificated within any existing regulatory guidance and must also be addressed.

Meanwhile, there is an explosion in the use of unmanned vertical take-off and landing aircraft – from sophisticated toys to converted manned helicopters. The FAA is perhaps a decade behind in developing regulations that would allow hobbyists and commercial entities – for such applications as filmmaking, agriculture and powerline inspection – to fly small UAS without being a threat to manned aircraft. The FAA is slated to release its long-delayed draft rules in November for small Unmanned Aircraft Systems (UAS), but the final regulation may not be issued until 2016; standards

for larger UAS are even further away. Transport Canada, in comparison, is now issuing 1,000 Special Flight Operations Certificates (SFOCs) per year for commercial UAS flights.

The FAA has made some significant advances in understanding how UAS can operate in the National Airspace System. Six sites in the US – Alaska, North Dakota, Nevada, New York, Texas and Virginia – have been designated as national UAS test sites, and all of them have now received a certificate of authorization (COA) to begin small UAS operations.

But the reality is that drone use is going to continue to expand, with or without the proper regulations to require their safe use. Already numerous near-misses or worse have happened with airborne helicopters – and even airliners – by an oblivious public. Just as it’s ingrained in society not to play ball in traffic, so too must the public understand that they cannot fly their UAS where there may be air traffic until there are established, safety-based rules and procedures. Strict, enforceable rules that allow the sensible operations of drones are urgently needed.

Collaborating for Modernization

Technology is maturing much faster than current regulations can adapt. As John Garrison noted in his talk, “The modernization of our regulatory structure will be a key factor in the industry’s success – but more importantly, the success of our customers.” It takes great engineering and technical analysis to improve performance and safety, but it also takes a regulatory environment that rewards innovation and adapts quickly to change. This kind of change in our regulations would foster an industry environment where operators can quickly adopt the most innovative technology to enhance the safety of their missions. Government regulators must work collaboratively with industry to help the regulatory environment keep pace with innovation – allowing vertical flight to reach its full potential, while ensuring safe skies around the world.

Forecast International estimates \$100B in global civil rotorcraft production over the next decade. All of the world’s helicopter manufacturers are international in nature, with a global

supply chain, a global customer base and, often, international partners in development and production.

AHS International promotes vertical flight and its application around the world. Government agencies need to redouble their efforts towards harmonization and consistency both within their jurisdictions and with other regulatory bodies. Those governments who have more straightforward and transparent regulations that can facilitate advances in technology in a timely manner will have an economic edge in the fiercely competitive global marketplace.



2014-2015 AHS Calendar of Events

Don't miss our exciting Technical Specialists' Meetings and other great upcoming events!

40th European Rotorcraft Forum, September 2-5, 2014, Southampton, United Kingdom.
www.erf2014.com

The 4th International Technical Specialists' Meeting On Vertical Lift Aircraft Research, Development, Test & Evaluation, August 27-28, 2014, Patuxent River, Maryland, USA. www.vtol.org/pax

8th Australian Pacific Vertiflite Conference on Helicopter Technology and 3rd Asian-Australian Rotorcraft Forum (ARF), December 18-19, 2014, Melbourne, Australia. www.vtol.org/australia

Unmanned Rotorcraft Systems, January 20-22, 2015, Scottsdale, Arizona, USA.
www.vtol.org/unmanned

Airworthiness, Condition Based Maintenance (CBM), and Health and Usage Monitoring (HUMS), February 9-11, 2015, Huntsville, Alabama, USA. www.vtol.org/cbm

AHS International 71st Annual Forum & Technology Display, May 5-7, 2015, Virginia Beach, Virginia, USA.
www.vtol.org/forum

