Certification and delivery deadlines slip to the right for new helicopters

by Thierry Dubois and Mark Huber

Both product support and research and development have taken hits in the helicopter industry as cash flow and current sales shrink, while future orders are clouded by important changes and growing uncertainty in key customer sectors.

In helicopter EMS (HEMS), stricter patient transport protocols in some markets have significantly reduced flight operations, and new FAA Part 135 rules governing HEMS will include equipment mandates that are expected to drive up costs, perhaps resulting in additional operator and program consolidations.

Offshore operators have seen oil prices nearly halved from record highs of $145.29 per barrel on July 3, 2008, while natural gas prices have plunged even more precipitously. Collapsing property and other tax revenues have strained governmental budgets, particularly at the state and municipal levels, and the overall economy has cramped air-tour and charter operators.

Certification programs for new helicopters continue to move to the right as tighter revenues stretch development timetables. The degrees of delay vary considerably and some, such as those for the Bell/Agusta 609 tiltrotor, are not completely related to the macro economy. Bell achieved certification for its 429 last year and has begun amping up deliveries. Certification in this year’s first half. The company plans to finalize dealer agreements, deposit policies and a price for the R44. However, due to the RR300’s 23-gph fuel burn, the R66 carries 75 gallons of fuel, while the R44, which burns 15 gph, carries 47 gallons.

Initially, all major R66 components, including the engine, will have a TBO of 2,000 hours, although that is likely to be extended over time to perhaps 2,000 hours. The RR300 weighs about one-third of the Lycoming IO-540 that powers the R44 and produces 225 shp (continuous). Forward speed on the R66 increases slightly to 117 knots and the service ceiling increases to 14,000 feet.

The R66 will have hydro-pneumatic engine controls as opposed to Fadec, and the traditional “six-pack” steam gauges replaced by an integrated glass cockpit display. The R66’s main rotor chord is slightly wider than the R44’s, but the diameter is the same. Its fuel system meets new and more stringent crashworthiness standards. The R66 features the same T-bar cyclic as that in R44 and is designed for easy pilot transition from the R44.

R66, believed to be near $1 million, early this year and achieve full-rate production next year. Company founder Frank Robinson thinks that R66 production could eventually reach 150 to 200 annually.

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RotorWay Eagle 300T

Kit helicopter company RotorWay launched a new to-be-certified design aimed primarily at the training market in July 2009, but the company’s plan to have a non-conforming prototype ready to fly by early this year appears to have been delayed. RotorWay now hopes to have a helicopter airborne by the middle of this year and certification by the end of next year so customer deliveries can begin in 2012. It should be noted, however, that RotorWay has never before produced an FAA-certified aircraft, suggesting that this timetable might be optimistic. CEO Grant Norwitz said the new helicopter will be priced “less than an R66.” The company is currently taking $5,000 deposits on the helicopter.

The Eagle will be powered by a Rolls-Royce RR300B1 turbine that is similar—but not identical—to the engine used on the
Sikorsky S-434
The first S-434 flew in December 2008. Sikorsky received an initial order for nine 434s from the Saudi Arabian Ministry of Interior and had delivered two of those helicopters by the end of last year. FAA certification for the 434 is expected later this year.

The 434 is a derivative of the Sikorsky-Schweizer 333 and incorporates several system components developed with Northrop Grumman for the Navy’s MQ-8B Fire Scout vertical takeoff and landing tactical unmanned aerial vehicle. The chief difference between the 333 and the 434 is the latter’s four-blade main rotor, which reduces noise, improves lift and increases mtow and useful load when combined with a more powerful Rolls-Royce 250-C20W engine (320 shp for takeoff). The useful load of the 434 increases by 655 pounds, to 1,855, compared with that of the 333. The 434 also has a larger, 84-gallon fuel tank. This makes the 434 a stronger-performing hot-and-high and utility helicopter suitable for a variety of missions, including training, patrol and sling-load operations. Price is expected to approach $1 million. Sikorsky will continue to produce the 333.

Twins
AgustaWestland AW109S Da Vinci
AgustaWestland has begun delivering a tailored version of the AW109S Grand to Swiss air rescue organization Rega. The Da Vinci, the result of a set of specifications issued by Rega to replace its A109 K2s, is thus not offered to other customers.

The cockpit is new and includes a dual duplex four-axis digital automatic flight control system, a 3-D synthetic vision and terrain awareness and warning system (Taws), a Euronav V digital map and a Max-Viz EVS-1000 enhanced vision system (EVS). The cockpit is equipped for single-pilot VFR operations and is compatible with night-vision goggles.

The Da Vinci helicopter delivers more power through the main transmission with one engine out and has an aerodynamically cleaner rotor system. This contributes to an increased rate of climb and more speed, both of which are important for Rega’s operations in the Alps. Rega and Aerolite developed a special EMS interior.

Thanks to its fixed landing gear, the aircraft is thought to be more than 200 pounds lighter than the standard Grand, but AgustaWestland would not confirm this.

HAL Dhruv
The Dhruv advanced light helicopter (ALH) by India’s state-owned aeronautical and defence company Hindustan Aeronautics (HAL) is a multi-role, multi-mission new-generation helicopter in the 5.5-ton weight class. It is powered by two 990-shp Turbomeca TM333-2B2 turboshafts that have sufficient margins to provide single-engine performance and Category A takeoff and landing capability.

The Dhruv is two-thirds composite by weight for resistance to corrosion, longer life, ease of repair and crashworthiness. The helicopter is designed to meet the requirements of both civil and military operators. Company sources told AIN that HAL is able to offer any variant of Dhruv for civil use, and it builds these commercial helicopters to order. HAL has so far delivered 90 utility versions of the ALH to defense forces and civilian agencies. Prices vary according to modifications.

The current production rate of the Dhruv is between 20 and 24 per year. The company intends to obtain EASA certification for the Dhruv. It is also working on a new version that will have a glass cockpit and more powerful engines.

Eurocopter EC175
Eurocopter’s EC175 medium twin made its first flight on Dec. 4, 2009. It is targeted at the offshore oil and gas market, which accounts for most of the 114 helicopters currently on order. EASA certification is pegged for the second half of 2012. The lag between certification and delivery stems from the high number of options (40 to 45)–each of which needs to be certified–on this first aircraft, according to Eurocopter.

The cruise speed is understood to be approximately 140 knots. The radius of action offshore at ISA+20, with 16 passengers, will be 270 nm. Maximum range, with “very few” passengers, will be 700 nm. The EC175 is a seven-metric-ton-class (15,000-pound-class) helicopter. Two Pratt & Whitney Canada PT6C-67E turboshfts will supply 1,775 shp each.

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Sikorsky S-76D
Russian Helicopters is flight testing a Kamov Ka-226T light twin powered by Turbomeca Arrius 2Gs. Known as the Ka-226T, it is the first coaxial-rotor helicopter to be fitted with Turbomeca turboshfts, which raise its operating ceiling to 24,600 feet. Production is expected to start next year. The manufacturer is touting the performance of the Ka-226T “in mountainous terrain and hot climates, over water, in windy conditions and in urban high-rise operations.” The Ka-226T has an mtow of 8,800 pounds and a payload of 3,200 pounds. It can carry nine people, including two pilots. Maximum speed is 124 knots. With 10-minute emergency reserves, endurance is 3.3 hours and range is 283 nm.

Instead of a conventional cabin, the Ka-226 can be outfitted with different cabin modules depending on the mission—passenger transport, patrol, construction, EMS, firefighting or search-and-rescue.

Sikorsky S-60
The latest variant of this now 34-year-old airframe was announced in 2005 and might receive FAA certification approval later this year. The S-76D first flew on February 7 last year. Currently three aircraft are in the flight-test program and the first production airframe was assembled in December at Aero Vodochody in the Czech Republic. The airframe will be shipped to Sikorsky-Coatesville in April for final assembly. Customer deliveries are slated to begin next year, and Sikorsky claims 100 “delivery position agreements” for the $12 million helicopter. Falcon Air Services of Abu Dhabi will be the launch customer for the S-76D.

While the S-76 airframe remains largely unchanged, the -D has significant upgrades in rotors, engines, avionics and
The company is eyeing a full-size, 11-passenger version—the X-Hawk. On the demonstrator, each of the two six-foot-diameter lift rotors has five blades. The two rotors are located fore and aft of the cabin. Two smaller shrouded rotors act as thrusters. The architecture, with its shrouded rotors, enables the aircraft to fly in a city without the dangers usually associated with open rotors. Its main drawback is fuel burn, much higher than that of a helicopter.

Bell/AgustaWestland BA609 Civil Tiltrotor

Now entering its 12th year of development, the Bell/Agusta BA609 program appears to be headed for divorce court. For nearly three years AgustaWestland CEO Giuseppe Orzi has made no secret that he is displeased with the glacial pace of the 609’s development and it now appears that negotiations are taking place that would either give AW a majority interest in, or outright ownership of, the program. Neither AW nor Bell will formally comment on the status of these negotiations, but last year Orzi told an Italian business conference that AW’s parent, Finmeccanica, had authorized him to negotiate for control of the program as a means to accelerate development and certification. Even under the most ideal outlook, airworthiness approval is unlikely until at least 2014. The 609 first flew in 2003, and only two prototypes are flying—one at Bell in Texas and the other at AW in Cameri, Italy. Two more prototypes scheduled to join the test program for several years now have yet to materialize. However, in December an AW spokesperson told AIN that both aircraft are under construction at Cameri and will join the test program in 2011 and 2012. The number-three tiltrotor will be used for iced trials and hot and cold environmental testing, while number four will be dedicated to avionics and communications validation, night flight and customer demonstrations.

Sikorsky X2 Compound Coaxial Technology Demonstrator

The X2 first flew in 2008, but 2009 came and went without its achieving Sikorsky’s stated goal of beating the world helicopter speed record of 216 knots/249 mph (held since August 1986 by the Westland Lynx).

Sikorsky announced the self-financed X2 in 2005. The compound coaxial helicopter features fly-by-wire flight controls and combines components from existing Sikorsky aircraft, including the S-76, Black Hawk and CH-53, and other manufacturers’ aircraft. All of the components were scrutinized for their ability to enhance the X2’s mission of high forward speed and low vibration.

Power for the 6,500-pound X2 comes from a single LHTec (Light Helicopter Turbine Engine Company) T800 turboshort rated at up to 1,680 shp. Sikorsky had previously flown the LHTec engine on the RH-66 Comanche scout and attack helicopter prototype developed for the Army. That program was canceled in 2004 after expenditures of $6.9 billion and 20 years of development. LHTec has developed a successful civilian variant of the T800, the CTS800. (Ironically, the same modified Westland Lynx that set the current world speed record in 1986 served as a testbed for the CTS800.) The T800 drives the twin four-blade Eagle Aviation contra-rotating main rotors and the Aero Composites six-blade pusher propeller, or auxiliary propulsion system, mounted at the end of the tailboom. Sikorsky claims its X2 technology is suitable for military missions such as assault, armed reconnaissance, close air support and combat search-and- rescue, and unmanned applications.

One way Sikorsky might cash in on the X2 was revealed in May last year, when it displayed a mock-up of a possible X2 military light tactical helicopter (LTH) design at the Army Aviation Association of America annual convention. The LTH mockup was widely seen as a precursor to a potential Sikorsky bid for the Army’s armed scout helicopter program.

However, Sikorsky would face substantial competition for the contract from both Boeing and an EADS-Lockheed Martin partnership. Both are offering solutions featuring commercial, off-the-shelf airframes that, while slower, likely present less technical risk and lower unit costs.

Andan and Madhura Katti contributed to this report.