

NEW ROTORCRAFT 2013

OEMs tap lucrative oil and gas segment

by Thierry Dubois and Mark Huber

While the U.S. Congress has averted mandatory budget sequestration until March, including anticipated defense spending cuts, Pentagon watchers have been predicting a new austerity one way or the other for months. The impact all this will have on new helicopter development programs remains to be seen. OEMs contacted for this report by AIN declined to comment on the impact of the so-called “fiscal cliff” and its aftermath on current or future military helicopter programs. But some analysts are already forecasting that the military will opt to go with updates of existing helicopters for a variety of roles, including aerial scout and search-and-rescue. If this comes to pass it could dampen expectations that new technology, including that for compound helicopters, would eventually find its way into the civil sector. The same pressures apply to military spending throughout Europe and parts of Asia.

New civil programs such as the AW609, Bell 525 and EC175 rely heavily on technology originally developed for the military, and shifting all related R&D expense onto the private sector could inhibit development of future new helicopters. In the U.S., senior DoD officials are concerned that the current dynamics will erode industry’s ability to design future military helicopters. Late last year Defense Undersecretary Frank Kendall told a Credit Suisse investor conference that it was likely the Pentagon would launch an initiative to fund research into the next generation of military helicopters to preserve, albeit on a small scale, contractor design capabilities.

The OEMs clearly are not waiting for the proverbial other shoe to drop. AgustaWestland is developing two new twins and purchased the remaining share of the AW609 civil tiltrotor

program from Bell in 2011. Bell is developing the super-medium 525 twin, Eurocopter is looking at refreshing virtually its entire product line, and Sikorsky is giving hints of new civil products in the offing. The common denominator to most of these new programs is the burgeoning deepwater oil exploration industry and its need for larger, more efficient helicopters with more range.

Aside from Robinson, which is currently producing its R66 turbine single at a rate of five per week, established OEMs have all but ceded the introductory single turbine market, with AgustaWestland, Bell, Eurocopter and MD all offering updated and more expensive variants of their legacy singles with prices now well above \$2 million and in some cases exceeding \$4 million. The market for those helicopters is likely to see an uptick as helicopter EMS providers move into more singles with more modern equipment to preserve margins. In December, Air Methods, the largest provider in the U.S., ordered 42 new helicopters, all but six of them singles.

One more factor could drive demand for singles for local and state law enforcement in the U.S. Traditionally, 25 percent of those helicopters have been obtained under military surplus programs. Currently, that amounts to 552 helicopters; however, that pipeline is drying up, according to a spokesman for the Defense Department’s Law Enforcement Support Office, and the number has been steadily declining in recent years from 47 in 2010 to just eight last year.

Updates and improvements to legacy products are significant as OEMs continue to find ways to cut weight, maintenance costs and noise while improving performance and operating efficiency.



provisioned troops or seat 18 passengers, cruise at 150 knots and have a maximum range of 635 nm. It has a full glass-panel avionics system that is NVG compatible, a four-axis autopilot and can be ordered with optional rotor ice protection.

In 2011 AgustaWestland announced its intention to offer a civilian variant of the AW149, the AW189, aimed mostly at the lucrative offshore oil and gas industry. Five prototypes of that aircraft are currently flying, including one in the United States, currently in Alaska for cold-weather testing. The AW189 is being marketed as a lower-cost alternative to the Sikorsky S-92A and Eurocopter EC225. With 12 passengers, the AW189 has the range to reach and return from platforms as far as 200 nm offshore. AgustaWestland is offering the AW189 in offshore, VIP, maritime search-and-rescue and para-public variants. The helicopter made its first flight on Dec. 21, 2011. The AW189 is expected to be certified in this year’s second half with a variety of options and kits, with the eventual goal of approval for single-pilot IFR. AgustaWestland continues to promote the AW149, but has yet to find a launch customer.

AW149/189

AgustaWestland announced the AW149 program in 2006 and the 8.6-ton helicopter made its first flight in 2009. Based on the successful AW139 medium twin, the 149 is a military variant that is 12 feet longer, four feet taller, 5,000 pounds heavier (mtow), has a slightly larger main rotor disk and a pair of more powerful, Faded-controlled GE CT7-2E1 turboshafts (2,000 shp each) that give the helicopter good high/hot performance and satisfy the 6,000-foot, 95-degree F OGE standard. The air-conditioned 409-cu-ft cabin is 25 percent larger than that of the AW139 and the baggage hold offers 71 cu ft. The AW149 will hold 12 fully



explored 90 percent of the flight envelope. More than 10 percent of the total flight-test hours have been logged in the last 11 months. Plans currently call for certification in 2016. Earlier this year the Italian company announced that it had selected Rockwell Collins Pro Line Fusion avionics for the production aircraft. Announced aircraft performance includes a maximum forward speed of 275 knots, a ceiling of 25,000 feet, a hover out of ground effect of 5,000 feet, hover in ground effect of 10,000 feet, and a useful load of 2,500 pounds. Short-takeoff capability will be added to the certification basis to increase the helicopter’s maximum gross weight on departure from 16,800 pounds to 18,000 pounds. That extra weight could be used to carry more fuel and increase the range of the 609 beyond the current 700 nm.

AgustaWestland is currently promoting four interior configurations for the aircraft, including a standard two-pilot, nine-passenger layout; a six- to seven-passenger executive cabin; a two-litter medevac interior; a search-and-rescue design that includes hoist, basket, litter and four single seats; and a patrol/surveillance variant.

AVICOPTER

AC311

The CAAC certified the Avicopter AC311 Air Sprite light single last June. Among the performance numbers released by Avicopter are a cruise speed of 131 knots, endurance of four hours and maximum range of 335 nm. The aircraft has an mtow of 4,850 pounds. Capable of carrying six people or 2,000 pounds, it can be powered by either a Honeywell LTS101-700D-2 (the engine used thus far) or a WZ8D, a license-produced Turbomeca Arriel. The new helicopter is also said to feature “highly integrated” avionics.

AC313

It emerged last year that the CAAC certified the Avicopter AC313 heavy twin in December 2011. Avicopter said certification includes category A takeoff and landing capability at altitudes up to 14,700 feet. The AC313 can carry up to 27 people and is based on the 1970s Aérospatiale SA321 Super Frelon. The AC313 tips the scales at 27,600 pounds and has a maximum ferry range of 486 nm.



AC352

Avicopter has released little information on the Chinese variant of the EC175. It is to be powered by Turbomeca/Avic Engine Dongan Ardiden 3C/WZ16 turboshafts. Certification has been delayed



BELL

525 Relentless

Bell announced its most ambitious civil helicopter program at Heli-Expo 2012 and has begun assembly of the first prototype for first flight in 2014. With an mtow of more than 18,000 pounds, the 525 Relentless will have an expected range of more than 400 nm, cruise speed near 150 knots and a ceiling of 20,000 feet, aiming it squarely at the oil-and-gas market. Certification is expected in late 2014 or 2015. It will be powered by a pair of GE CT7-2F1 turboshafts (1,800 shp each) driving an all-composite five-blade main rotor system and a four-blade tail rotor. The aircraft will incorporate a triple-redundant fly-by-wire flight control system with a BAE flight computer incorporating lessons learned on the Bell/Boeing V-22 and AW609 (formerly Bell/Agusta BA609) tiltrotors. The 525 will feature the Garmin G5000H touchscreen-controlled glass panel integrated avionics suite with four main displays and Telligence voice-command capabilities, two key components of Bell’s new ARC (awareness, react and control) cockpit.

The ergonomic cockpit features pilot seats that J-track, pushing back and swiveling outward, for ease of egress. Right-hand, fly-by-wire side sticks replace the conventional cyclics. The 525’s tail boom has been designed to provide less resistance and more lift for a higher-altitude out-of-ground effect hover ceiling than conventional designs. Bell claims the boom’s aerodynamic shape will allow 88 more horsepower to be directed to the main rotors, compared with conventional designs, by capitalizing on main-rotor downwash to assist with anti-torque duties. The five-blade main rotor is a commercial first for Bell, but its design is conventional. Entry to the 525’s 4.5-foot-tall cabin is through a pair of hinged doors located between the cockpit and the first row of four seating areas or through a pair of large aft sliding doors. Each seating area offers four-abreast seating for a total of 16 passengers.

EUROCOPTER

EC145T2

The Eurocopter EC145T2 light twin represents a major upgrade from the EC145. It is slated for FAA certification and first delivery this year. Two Arriel 2E turboshafts, at 894 shp each, will



deliver 21 percent more takeoff power. Turbomeca will also offer a “special 30-minute power rating for occasional use.” The Arriel 2E is equipped with Faded and offers a higher TBO.

In addition, the EC145T2 features a fenestron shrouded tail rotor. In the cockpit, pilots will find Eurocopter’s new house-developed Helionix avionics suite. A four-axis autopilot will be standard.

EC175

Eurocopter has postponed certification of the EC175 medium twin to this summer, citing longer-than-expected development of the Helionix avionics system. Deliveries will start in September instead of “late in 2012,” as initially planned. The first production EC175 flew last December in Marignane, France.

Performance numbers have improved and Eurocopter now expects a cruise speed of 150 knots—10 knots faster than the previous published number—“without affecting payload-range.”

Customers can choose between various seating/radius of action combinations, such as 12 passengers/190 nm or 18 passengers/100 nm. Mtow stands at 16,535 pounds. The EC175 is powered by a pair of 1,775-shp Pratt & Whitney Canada PT6C-67E turboshafts. The program is a 50-50 joint effort with China’s Avicopter.

X6

Under the codename X6, Eurocopter is about to officially launch a replacement for the AS332/EC225 Super Puma medium twin, according to French finance newsletter *Sud Infos*. The Marignane, France-based manufacturer is reportedly targeting 2020 for entry into service.

One version of the X6 could be the first application of the X³ (“x cube”)

helicopter compound concept. While helicopters usually fly at 140 to 150 knots in cruise, the X³ concept is aimed at proving that 220 knots is a sweet spot where speed is profitable. A demonstrator has completed two flight-test phases, reaching a maximum speed of 232 knots.

X4

The X4 medium twin, to replace the AS365/EC155 Dauphin series, will be released in two versions. The first, less advanced one, will enter service in 2017. In 2020, the second iteration of the X4 will feature fly-by-wire controls.

The X4 will compete in the 9,000- to 12,000-pound category. On the main rotor, double-swept blades will cut noise. The X4’s system architecture will be “more electric,” meaning a number of hydraulic or bleed-air systems will be replaced with electric ones.

Turbomeca and Eurocopter signed a contract in July for the former company to supply 1,100-shp TM800 engines. The other engine option for customers is the Pratt & Whitney Canada PW210.

EC130T2

Last year Eurocopter delivered the first EC130T2, an upgraded version of the EC130B4 large-cabin single. Introduced at Heli-Expo 2012, the EC130T2 features a more powerful Arriel 2D, enabling a 3,300-pound sling load. Other improvements include more robust doors and air conditioning. The price increase over the B4 is said to be 4 percent.



MARENCO

Skye SH-09

In Switzerland, would-be helicopter manufacturer Marenco Swisshelicopter has postponed the maiden flight of the first prototype of its Skye SH09 light single. Initially planned by the end of 2012, the inaugural sortie is anticipated in this year’s first half as the company plans to build a conforming prototype rather than an experimental aircraft. The first prototype will be powered by a Honeywell HTS900 turboshaft. EASA certification is targeted late in 2014.

The 5,500-pound-class SH09 will seat five to eight passengers. It will feature a shrouded tail rotor, a flat-floor cabin and clamshell doors. It targets a max cruise speed of 145 knots. Maximum range will be 430 nm.

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MD

540F

MD Helicopters announced plans last year to offer a six-blade variant of its MD530F single with a more powerful F408 Rolls-Royce 250-C30HU turboshaft and more robust landing gear. The new helicopter would be available for both the commercial and military markets—the latter as a scout/gunship—and will include a full suite of Elbit glass panel avionics. Preliminary specifications call for the MD540F to have a maximum external gross weight of 4,100 pounds, a useful load of 2,000 pounds, hover in ground effect at 16,000 feet and out of ground effect at 14,300 feet, a VNE of 152 knots, a range of 232 nm and a service ceiling of 20,000 feet. Certification is expected in this year's first quarter.

QUEST

AVQ

Dubai-based Quest Helicopters has postponed first flight of its AVQ light twin by half a year, to "August or September" of this year. A prototype four-seater is said to be almost ready to fly, although the company would not provide any photo.

Unveiled in November 2011, the AVQ has two counter-rotating rotors in tandem configuration and an ejection capsule for the occupants. Another feature is fly-by-wire controls. Quest Helicopters wants to have the AVQ certified in Ukraine, where it is being designed, before involving the EASA. The four-seater could be produced in "limited" quantities (if any) in a factory to be built in the United Arab Emirates.

Quest designers have now turned their attention to a 10-15 seater, which they believe will appeal to a broader market. It would have tandem rotors but neither fly-by-wire controls nor the escape pod.



Quest AVQ

DAVID MENTOSH

ROBINSON

R66 Police

The police variant of Robinson's R66 turbine single was certified in September last year, and the company plans to release an electronic news gathering variant later this year. The \$1.104 million police model comes standard with Flir camera, fold-down color monitor, searchlight and dual audio controller. Many additional options are available. The R66 police has a maximum cruise speed of 120 knots, a full-fuel payload of 800 pounds and a hover ceiling OGE at max weight of 10,000 feet.

RUSSIAN HELICOPTERS

Redeveloped Ansat

Russian Helicopters announced last spring that it is redeveloping the Kazan Ansat light twin with conventional flight controls in place of the fly-by-wire (FBW) system it has been flying with thus far. Kazan Helicopters has started a test program with two prototypes fitted with a hydro-mechanical flight control system. The manufacturer has filed an application with the Interstate Aviation Committee's Air Registry for additional type certification.

The FBW control system that equips the original Ansat met "an unexpected obstacle, as no FBW civil helicopter had been certified before and no standard requirements existed," Russian Helicopters said. Russia's defense ministry currently uses the FBW variant of the Pratt & Whitney Canada PW207K-powered aircraft for pilot training.

Kamov Ka-226TG

Although the Kamov Ka-226T single is still in development, Russian Helicopters is already working on the Ka-226TG, a "modernized" version to "meet the client's needs for operations in the Far North and on the Arctic shelf." It will feature a KBO-226T avionics suite for low-visibility operations, and additional fuel tanks will boost range.

The coaxial-main-rotor Ka-226T/TG uses Turbomeca's 730-shp Arrius 2G1 turboshaft, which is already certified. It has an mtow of nearly 8,000 pounds, a maximum payload of 2,860 pounds and a maximum speed of 135 knots. It can carry up to seven passengers. The service ceiling is 24,000 feet. Russian Helicopters plans to deliver the first Ka-226TG this year.

Kamov Ka-62

Russian Helicopters plans to fly the Ka-62 medium twin in August. Russian certification of the 12- to 15-passenger helicopter is planned for the fourth quarter of 2014, with deliveries beginning in 2015.

Offshore oil and gas passenger transportation is seen as a major application. Other roles include EMS, search-and-rescue, law enforcement, border patrol, training and executive transport.

Turbomeca is powering the aircraft with two Ardiden 3G turboshafts of 1,680 shp each. Also new, among other improved structures and systems, is the five-blade



Sikorsky S-76D

main rotor. Austria-based Zoerkler supplies the rotor gearboxes. The Transas KBO-62 avionics suite includes a health and usage monitoring system (Hums).

The Ka-62's mtow is 14,300 pounds, for a maximum payload of 5,290 pounds. Maximum range is said to be 405 nm. The Ka-62's maximum cruising speed is 157 knots. The Ka-62 is a redevelopment from a 1980s design.



Kamov Ka-226T

Mil Mi-38

There is little indication that development of the Mi-38 heavy twin is continuing. Russian Helicopters resumed the program in late 2010 and with the goal of certification in 2014. The aircraft is pitched at civil markets such as aerial work, executive transportation and off-shore operations.

One prototype, OP-1, is powered by a pair of Klimov TV7-117V engines (2,500 shp each). The other one, OP-2, is fitted with Pratt & Whitney Canada PW127/TS engines of equivalent power. Transas provides IBKV-38 avionics.

The 34,400-pound-mtow Mi-38 has seating capacity for 30; maximum sling load is estimated at 15,400 pounds. Operational range is published as 480 nm. Service ceiling is said to be 16,700 feet, and cruise speed is expected to be close to 150 knots.



Robinson R66 Police

Russian Helicopters/ AgustaWestland light single

AgustaWestland and Russian Helicopters signed a "preliminary agreement" last year to jointly develop a new 2.5-metric-ton class (5,500 pound) single-engine helicopter. The program will be shared 50-50. The aircraft will be smaller, and thus less expensive, than the existing AW119 Ke Koala single and compete with the Eurocopter EC130T2.

SIKORSKY

S-76D

The FAA certified the Sikorsky S-76D medium twin, launched in 2005, on October 12 last year.

The new version features major changes such as a digital four-axis autopilot and a Thales TopDeck avionics suite. The dual-speed main rotor provides a quiet mode. A still-to-be-certified rotor de-icing system for all-weather capability will be available as an option. Each PW210S engine provides 1,077 shp at takeoff and offers 8-percent better fuel efficiency than its predecessor powerplant, according to Pratt & Whitney Canada. The 11,700-pound S-76D has a range (without reserves) of 442 nm.

S-434

Sikorsky did not respond to AIN's repeated requests for fresh information on the S-434 light single. Certification has been postponed several times.

An improved Schweizer S-333, the S-434 sports a four-blade rotor, a new tail-rotor blade design, a structurally enhanced landing gear, a new trim system and an improved Kaflex driveshaft. The main rotor and its transmission come from the unmanned Fire Scout.

The S-434 and the S-333 use the same Rolls-Royce 250-C20W turboshaft, which provides 320 shp. The new main rotor allows the mtow to increase by 300 pounds, to a maximum of 2,850 pounds. This translates into a useful load of "more than 1,400 pounds." The new tail rotor can generate some 20 percent more thrust than the tail rotor on an S-333, improving handling and controllability, despite the increased weight, according to Sikorsky. □

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