The World Rotorcraft Market 2019-2028

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With an eye toward the future, product innovation is the order of the day at the world’s rotorcraft manufacturers. At the same time, civil rotorcraft production is continuing its modest upward climb, though the improvement in demand is very uneven across the various sectors that make up the market. Military rotorcraft production, having declined in recent years, may experience a resurgence over the next year or two. But the longer-term trend in the military market will be gradual decline until at least the early 2030s, when full-scale production gets underway of rotorcraft for the Pentagon’s Future Vertical Lift (FVL) program and similar requirements.

Military Rotorcraft

Except for a relatively slight increase in 2016, annual production of military rotorcraft has declined each year since 2013. That year, manufacturers built almost 900 military rotorcraft. By 2018, though, yearly output had dropped to less than 600 units. These totals include new-build rotorcraft as well as remanufactured helicopters turned out by certain major modification programs.

Annual production of military rotorcraft can be expected to rebound somewhat during the 2019-2020 timeframe, before settling into a gradual decline starting in 2021. This projected downturn should be viewed in historical context, however. The nearly 900 military rotorcraft produced in 2013 marked the high point of a meteoric rise in annual production that had been fueled by modernization and re-equipment needs around the globe and by U.S. and allied spending on the conflicts in Afghanistan and Iraq.

"The military market is settling into a more sustainable level of output"

Thus, the military market is settling into a more sustainable level of output, with annual unit production ranging in the low to high 500s from 2022 through 2027. Around 2028, though, the market could enter a somewhat more critical period, with production then threatening to fall into an even steeper decline. At that point, the key to market recovery will be the timing of such new-start acquisition programs as the U.S. FVL effort, the British medium-lift replacement program, and the French Helicoptere Interarmees Leger (HIL) project.

It was thus with considerable relief that many in the rotorcraft industry greeted the Pentagon’s 2018 decision to accelerate the timetable for certain aspects of the FVL program. Previously, new rotorcraft were not expected to emerge from the FVL effort until sometime in the 2030s. However, program plans now call for initial operating capability of the Future Attack Reconnaissance Aircraft (FARA), the first FVL platform, in 2028.

The goal of the FVL program is to develop and produce next-generation rotorcraft in five classes, called “Capability Sets,” that range from lighter to heavier weight classes and are aimed at various future U.S. military helicopter replacement needs. Each Capability Set is to involve one basic rotorcraft with possibly one or more variants thereof.

The FARA is considered the Capability Set 1 (CS 1) platform, the smallest of the five planned FVL rotorcraft. It is slated to fill the armed scout role for the U.S. Army that was once
performed by OH-58D Kiowa Warriors and now by AH-64s and unmanned aerial vehicles. It would replace those AH-64s that are presently assigned to this mission, which represents about half of the Army's AH-64 fleet. Potential competitors for the FARA contract, which is to be awarded following a phased downselect and a competitive fly-off, include the Leonardo AW609, the MD Helicopters Swift, the Sikorsky S-97 Raider, variants of the Airbus Helicopters X3 and Bell V-280, and a joint design from AVX and L3 Technologies.

Following the FARA, plans call for the next rotorcraft emerging from the FVL program to be the CS 2 and CS 3 platforms. As yet unnamed, the CS 2 platform is envisioned as a replacement for the U.S. Navy's MH-60R and MH-60S Seahawks. Initial operating capability of the CS 2 rotorcraft is planned for FY32. Known as the Future Long-Range Assault Aircraft (FLRAA), the CS 3 rotorcraft is aimed at replacing the U.S. Army’s UH-60M Black Hawks and the U.S. Marine Corps’ UH-1Ys. Initial operating capability is planned for 2034.

Eventually, the Army will also look to replace the other half of its AH-64 fleet, which consists of those helicopters assigned to the heavy attack role. At present, it is uncertain whether this new attack helicopter will be an FLRAA variant or perhaps be developed under CS 4.

The CS 4 and CS 5 platforms will be the last FVL models to appear and, as yet, do not seem to be as well-defined as the other Capability Sets. Early indications are that the CS 4 requirement involves a medium-class rotorcraft, while the CS 5 platform will be a heavy lift rotorcraft intended to complement, and possibly replace, the Army’s CH-47Fs and the Marines’ CH-53Ks.

Overall, it would be difficult to overestimate the importance of FVL to the rotorcraft industry. The manufacturers selected to develop and produce the various FVL platforms will be in position to produce hundreds of rotorcraft for the U.S. military, with export sales possibly adding to this total. In particular, the FLRAA contract could prove especially lucrative for the company that wins it.

The emergence of the FVL program has also helped kickstart a new level of innovation in the U.S. military rotorcraft industry. U.S. manufacturers have long been accustomed to turning out improved versions of legacy rotorcraft designs for the U.S. armed services. The FVL effort changes that trajectory, as it is aimed at the development and production of all-new rotorcraft.

The Joint Multi-Role (JMR) project is the technology demonstration precursor to the FVL program. Bell and a team of Sikorsky and Boeing have each been tasked to build a demonstration prototype under the JMR effort. Bell’s V-280 Valor prototype made its first flight in late 2017. Sikorsky and Boeing’s SB>1 Defiant prototype took to the air in March 2019. The V-280 is a tiltrotor aircraft, while the SB>1 is a compound helicopter featuring coaxial counter-rotating main rotors and a pusher propeller.

Plans for the JMR program call for the prototypes to undergo flight test campaigns aimed at evaluating the feasibility of various rotorcraft technologies. Despite the work being conducted under the JMR effort, it should be noted that the Pentagon plans to hold open competitions for each of the FVL contracts.

In the meantime, a gradually declining military market will still yield opportunities for rotorcraft manufacturers. Bell completed the 160th and final UH-1Y for the U.S. Marine Corps in late 2018, but this latest version of the venerable Huey remains available for sale on the export market. Bell’s similarly upgraded AH-1Z attack helicopter remains in production for the USMC. The Royal Bahraini Air Force has ordered 12 AH-1Zs, with deliveries planned to begin in 2022.

Bell is teamed with Boeing on the V-22 tiltrotor aircraft. The two manufacturers were awarded a $4.2 billion contract in mid-2018 for the V-22 program’s third multiyear buy. The acquisition includes the U.S. Navy’s first 39 CMV-22B models, one CV-22 for the Air Force, 14 MV-22s for the Marine Corps, and four MV-22s for Japan. So far, Japan remains the only export customer for the V-22, but a number of countries have shown interest in possibly acquiring the tiltrotor aircraft.

Boeing’s AH-64E Apache attack helicopter and CH-47F Chinook heavylift transport currently dominate their respective market subsegments. Both models are procured in quantity by the U.S. Army and are also popular on the export market. And both are available as new-build helicopters and as upgrade packages for earlier versions. In 2018, the U.S. Army increased the Army Procurement Objective (APO) for the AH-64E to 791 helicopters: the exact breakdown of this total is subject to change, but presently includes 717 remanufactured helicopters and 74 new-build units.

The current-production version of the CH-47F is known as the Block I model. Boeing and the U.S. Army recently began development of an improved configuration known as Block II. The Block II configuration includes composite rotor blades, a
lightweight fuel system, an improved drivetrain, and structural strengthening in critical areas. Originally, the Army had intended to convert 473 Block I Chinooks (essentially its entire CH-47F fleet) to the Block II standard, with redeliveries of converted helicopters to begin in 2023. However, in early 2019, the service removed CH-47F Block II procurement from its FY20-FY24 spending plans, thus proposing cancellation, or at least a significant postponement, of the program. Upgrades of MH-47G special operations helicopters would nevertheless still proceed.

The funds freed up by the proposed changes to Block II and other programs would apparently be used for certain modernization initiatives, such as FVL, that the Army regards as higher-priority items. Congress will, of course, have the final say on any such revisions to program plans.

Boeing garnered a big win in September 2018 when it was awarded a contract valued at approximately $2.4 billion (including options) to provide up to 84 MH-139 helicopters and associated equipment to replace the U.S. Air Force fleet of UH-1N Hueys. On this effort, Boeing is teamed with Leonardo. The MH-139 is a militarized variant of Leonardo’s AW139 civil intermediate twin.

The H-60 series of Black Hawk and Seahawk helicopters provides Lockheed Martin subsidiary Sikorsky with a solid business foundation in the military rotorcraft market. U.S. Army procurement of the Black Hawk is at the core of this foundation. The Army intends to acquire 1,375 M model Black Hawks, including 956 UH-60M utility helicopters and 419 HH-60M medevac models, and is about two-thirds of the way toward fulfilling that objective.

The U.S. Air Force also intends to acquire new Black Hawks. Under the Combat Rescue Helicopter (CRH) program, the service plans to procure 112 Black Hawks to replace its HH-60G Pave Hawks in the personnel recovery role. Sikorsky is developing a UH-60M derivative, called the HH-60W, for the CRH effort.

Development is also underway of the CH-53K, the latest version of Sikorsky's CH-53 heavy-lift helicopter. The U.S. Marine Corps intends to replace CH-53Es in its fleet with the CH-53K. Current plans call for Sikorsky to build 200 CH-53Ks for the Marines. The CH-53K is also competing with the CH-47F for a German Air Force acquisition of 44-60 heavy-lift helicopters; deliveries are scheduled for the 2023-2031 timeframe.

Airbus Helicopters’ military rotorcraft product line is wide-ranging, and includes dedicated military types such as the Tiger combat helicopter as well as militarized variants of the company’s numerous civil models. One example of the latter is the H225M, a derivative of the H225 civil helicopter. H225Ms roll off two final assembly lines, including the original line in France and a second line located in Brazil at Airbus Helicopters’ Helibras subsidiary.

Airbus Helicopters has proposed the H145M for an upcoming Australian Army acquisition of at least 16 special operations helicopters. Other possible candidates for this procurement include the Bell UH-1Y, the Boeing AH-6i, the Leonardo AW109, the MD Helicopters MD 530, and the Northstar Aviation 407MRH. The H145M is a member of Airbus Helicopters’ H145 family of light twins, as is the UH-72A model that is currently in production for the U.S. Army.

A military version of Airbus Helicopters’ new H160 civil intermediate twin, the H160M has been selected to serve as the basis for France’s joint-service HIL program. The HIL effort involves the replacement of various light helicopters in French military fleets. Program plans call for the acquisition of 169 rotorcraft, with deliveries scheduled to begin in 2028.

Airbus Helicopters is partnered with Leonardo and Fokker Aerostructures in NH Industries, the consortium that produces the NH90 multirole helicopter. By the end of 2018, NH Industries had delivered more than 350 NH90s, against an order book then totaling 543 helicopters. That order book is set to grow in the near future, as the Spanish government recently authorized the acquisition of an additional 23 NH90s.

Leonardo Helicopters offers a number of military rotorcraft. Some, such as the AW149 and AW159, were developed specifically for military use. Others, such as the AW139M and AW169M, are derivatives of civil models. The aforementioned MH-139 is an example of the latter. Leonardo is hoping to replicate the U.S. success of the MH-139 with the TH-119, a version of its AW119 light single. The company has proposed the TH-119 for a U.S. Navy program to acquire a replacement for the service’s aging Bell TH-57 training helicopters. The TH-119 is facing competition from the Airbus Helicopters H135 and the Bell 407GXi for this contract. The Navy plans to procure up to 130 helicopters to replace the TH-57s, the first 32 of which are included in the service’s FY20 budget request. Contract award is planned for November 2019.

Leonardo has embarked on development of a new attack helicopter, called the AW249, that is intended to replace A129 Mangustas in the Italian Army fleet. The manufacturer is also promoting the AW249 for sale on the export market.

Currently in production for the Turkish Army, the T129 combat helicopter is an A129 variant developed jointly by Leonardo and Turkish Aerospace Industries (TAI). The helicopter is produced in Turkey by TAI.

TAI is making a concerted effort to expand its share of the global rotorcraft market. In February 2019, the company was awarded a contract from Turkey’s Presidency of Defense Industries to develop a larger and heavier attack helicopter, which may eventually be called the T130. First flight is planned to occur by 2024.

Another new product in the works at TAI is the T625 Gokbey multirole helicopter, which made its initial flight in September 2018. TAI is also slated to build a Black Hawk variant, dubbed the T70, for the Turkish armed forces and various civil agencies.

Russian Helicopters is a leader in the military rotorcraft market with a varied product line that includes such rotorcraft as the Ka-52, Mi-28, and Mi-35M attack helicopters, the giant Mi-26 heavy-lift helicopter, and the Mi-17 utility/transport model. Designed for personnel and cargo transport, and with more payload capability than the Mi-17, the new Mi-38T made its first flight in November 2018. Additional Mi-38 military variants could eventually appear, such as a medevac version, an electronic warfare variant, and/or a patrol model capable of operating in Arctic conditions.
Korea Aerospace Industries (KAI) has leveraged its Surion helicopter into a family of different models. In addition to turning out Surion utility/transport and medevac helicopters for the South Korean Army, KAI has been producing Surion variants for South Korea’s Coast Guard, Marine Corps, National Police Agency, and Forest Service. KAI is also developing a pair of new helicopters, derived from the Airbus Helicopters H155. These are the Light Armed Helicopter (LAH), an attack helicopter slated for use by the South Korean Army, and the Light Civil Helicopter (LCH), a related variant intended for civil operators. The LAH and LCH will be marketed for export as well as for domestic use.

Hindustan Aeronautics Ltd (HAL) continues to produce its Dhruv Advanced Light Helicopter, primarily for the Indian military. Development is underway at HAL of a dedicated attack helicopter called the Light Combat Helicopter (LCH) and a multirole light single dubbed the Light Utility Helicopter (LUH). Combined requirements of the Indian Air Force and Army total 179 LCHs and 187 LUHs.

Aviation Industry Corp of China (AVIC) competes in the military rotorcraft market with a product line that includes such models as the Z-8 and Z-9 multirole rotorcraft and the Z-10 attack helicopter. AVIC’s new Z-18 is derived from the Z-8, and is available in a number of maritime versions. The company has developed a light attack helicopter, called the Z-19, from the Z-9.

Forecast International projections indicate that 5,693 military rotorcraft, worth approximately $148 billion in 2019 U.S. dollars, will be produced from 2019 through 2028. Besides new-production rotorcraft, these projections also include remanufactured helicopters turned out by such programs as the AH-64E and CH-47F conversions.

Civil Rotorcraft
The civil rotorcraft market continues its gradual climb out of a deep downturn that had seen annual production fall by nearly 40 percent between 2013 and 2016. Counting both turbine-powered and piston-powered machines, manufacturers produced 905 civil rotorcraft in 2016. Subsequently, production increased to 986 rotorcraft in 2017 and approximately 1,114 in 2018.

In the past two years, the civil market has been buoyed by general economic improvement, particularly in the U.S. Growing segments worldwide include law enforcement, utility, search-and-rescue, and corporate transport. In the years ahead, increased demand for new helicopters will also be found in such niche markets as aerial firefighting and offshore wind farm services.

Two market segments present a more mixed picture, however. The emergency medical services (EMS) market has contracted somewhat in the U.S., as consolidation among EMS providers has resulted in fewer opportunities for sales of new rotorcraft. At the same time, though, the EMS segment has been growing in China and the rest of the Asia/Pacific region. This region has tremendous growth potential, and should help offset slowing in the U.S. EMS market.

The oil and gas segment, for years the engine of growth in the civil rotorcraft market, remains subdued. Oil prices continue on the roller coaster ride that they have been on for the past couple of years, but even a consistent rise in crude prices would not soon lead to many sales of new helicopters from oil and gas customers. An initial increase in demand from the energy sector would likely be met instead by a return to service of helicopters now in storage or by increased use of currently underutilized assets in industry fleets. It may be three years or so before the oil and gas sector once again generates significant demand for new rotorcraft.

Our forecast calls for civil rotorcraft production to increase slightly in 2019 and a bit more robustly in 2020. However, a big wild card in the market outlook is the timing of the next economic recession. Recent surveys of economists show that many believe a recession will get underway by late 2020 or 2021. Our forecast calls for production to decline in the 2021-2022 timeframe, due to the effects of an economic downturn, before growth in annual production resumes in 2023.

Currently, much innovative work is being done in the area of electric vertical takeoff and landing (eVTOL) aircraft, which have considerable long-term potential to transform the marketplace. Approximately 155 eVTOL aircraft are in various stages of design and development. Major rotorcraft manufacturers and small start-ups alike are working on such designs.

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The concept of on-demand transportation using eVTOL aircraft, with or without a pilot on board, is generating interest around the globe. And the passenger market is only one example of an area where eVTOL aircraft could have a major impact. Delivery within urban areas of packages and other priority cargo is another. Various parapublic uses can also be envisioned.

Nevertheless, enthusiasm over eVTOL should be tempered with a recognition that a number of issues need to be addressed before the full potential of these aircraft can be realized. These include airspace congestion, certification standards, infrastructure limitations, regulatory requirements, safety, and public acceptability, among others. Solutions will take time and money. However, none of these issues are insurmountable, and progress is already being made on several of these fronts.

Bell is one of the manufacturers working on an eVTOL concept, and has already been studying how it might shift company operations from low-volume production to a high-volume model. At the same time, though, the company has hardly been neglecting its current product line. More than 140 Bell 505 light singles have been delivered since the model’s entry into service in 2017, marking a successful return for Bell to the entry-level segment that it once dominated with the JetRanger. The huge JetRanger replacement market, in fact, can be expected to generate numerous sales opportunities for the 505 in the years ahead. Meanwhile, the new Bell 525 super medium twin is currently in flight testing. Program plans call for certification of the 525 by the end of 2019.

Airbus Helicopters is also involved in work on eVTOL concepts, including the self-piloted, single-seat Vahana platform and the CityAirbus multi-passenger aerial vehicle. Meanwhile, the company has launched the H145D3, a new version of the H145 light twin, that features a five-blade main rotor, a 150-kilogram increase in useful load, and improved onboard connectivity. Deliveries are to begin in 2020. The new H160 is a key product for Airbus Helicopters in both the civil and military markets. Program plans call for type certification of the new model by the European Aviation Safety Agency in late 2019, followed by service entry in 2020. Simultaneous with the introduction of such new models, Airbus Helicopters has been rationalizing its product line by withdrawing certain older types, such as the H120 and AS350B2, from the market.

The popularity of the AW139, and the ability to leverage AW139 technology into new models, has helped increase Leonardo Helicopters’ share of the civil market in recent years. However, competition is intensifying in the intermediate twin category, especially with the advent of the H160, which Airbus has aimed squarely at the AW139. Leonardo can be expected to
eventually upgrade the AW139 in order to shore up its position in the segment. Meanwhile, the company remains committed to the civil tiltrotor market. Certification of Leonardo’s AW609 tiltrotor aircraft by the U.S. Federal Aviation Administration is planned for late 2019. The Italian company is also leading a project, conducted largely under the European Union’s Clean Sky 2 initiative, to develop a Next Generation Civil Tiltrotor.

The piston helicopter market has seen more growth than the civil turbine market since 2016, but that may not be the case in the 2019-2020 timeframe. Much of the piston market lies outside of the U.S., and a combination of tariffs, a strong dollar, and economic weakness in certain key regions could slow the piston segment somewhat over the next two years, at least relative to the civil turbine market.

Robinson dominates the piston market with its R22 and R44 models. The R22 has been in production for more than 40 years. The company also competes in the turbine arena with the R66. The latter revitalized the light single turbine market in the early 2010s, resulting in Bell re-entering the segment with the 505.

In the past few years, Russian Helicopters has been expanding its sales in the civil market, particularly in the EMS sector. The Ansat light twin, produced by the company’s Kazan subsidiary, has been one of the main beneficiaries of this trend. In part, this is due to a recent Russian government initiative to establish a National Service of Medical Aviation (NSMA), which is intended to provide a unified air ambulance network across Russia. Russian Helicopters signed a contract in 2018 with the NSMA and the leasing firm Avia Capital Services for the supply of 150 helicopters in air ambulance configuration, including 104 Ansats and 46 Mi-8AMTs. Avia is procuring the helicopters and providing them to the NSMA on 15-year leases.

Russian Helicopters and AVIC subsidiary Avicopter plan to jointly develop a new, 38-tonne rotorcraft known as the Advanced Heavy Lift (AHL) helicopter. The new helicopter is aimed primarily at the Chinese market, and is to be built in China by Avicopter. Russian Helicopters is to develop various subsystems for the AHL.

Sikorsky has launched a new, lower-priced version of its S-92 medium/heavy twin, dubbed the S-92B. The new model features a new main gearbox, improved flight computing technology, a redesigned interior, and larger cabin windows. Many of the upgrades will be available in a retrofit package for existing S-92As, resulting in an S-92A+ configuration nearly identical to the S-92B standard. Sikorsky is also exploring various concepts and technologies that could be applicable to the eVTOL and urban air mobility arena.

Swiss manufacturer Kopter recently selected Lafayette, Louisiana, as the site for a U.S. final assembly line for the company’s 2.5-tonne SH09 light single. SH09s will also be assembled at Kopter’s headquarters in Mollis, Switzerland, and at a yet-to-be-selected location in Asia. Kopter plans to achieve certification of the SH09 in the first half of 2020, followed by initial delivery by the end of that year.

Forecast International projections indicate that 12,316 civil rotorcraft will be produced during the 10-year period from 2019 through 2028. This total includes 2,750 piston-powered helicopters and 9,566 turbine-powered rotorcraft. Combined, the value of this production is estimated at $72.7 billion in 2019 U.S. dollars.

**Conclusion**
Forecast International projects that a total of 18,009 rotorcraft, valued at $220.7 billion in 2019 U.S. dollars, will be produced from 2019 through 2028. During this timeframe, Airbus Helicopters is projected to be the leading manufacturer in terms of unit production, followed by Robinson, Bell, Russian Helicopters, Leonardo, Sikorsky, and Boeing. In terms of the monetary value of production, Sikorsky is forecast to lead the market, followed by Russian Helicopters, Boeing, Airbus Helicopters, Leonardo, Bell, and NH Industries.
"More than 18,000 rotorcraft will be produced in the 10-year period from 2019 through 2028...estimated at nearly $220.7B"

The rotorcraft market is witnessing an influx of innovation, thanks to the JMR and FVL programs, the new eVTOL concepts for on-demand air transport, and other efforts aimed at providing new vertical flight solutions. Many of the results and benefits of these initiatives may not be felt until sometime after our 10-year forecast period. Nevertheless, they are setting the stage for what potentially could be major transformations in the military and civil rotorcraft markets.

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