

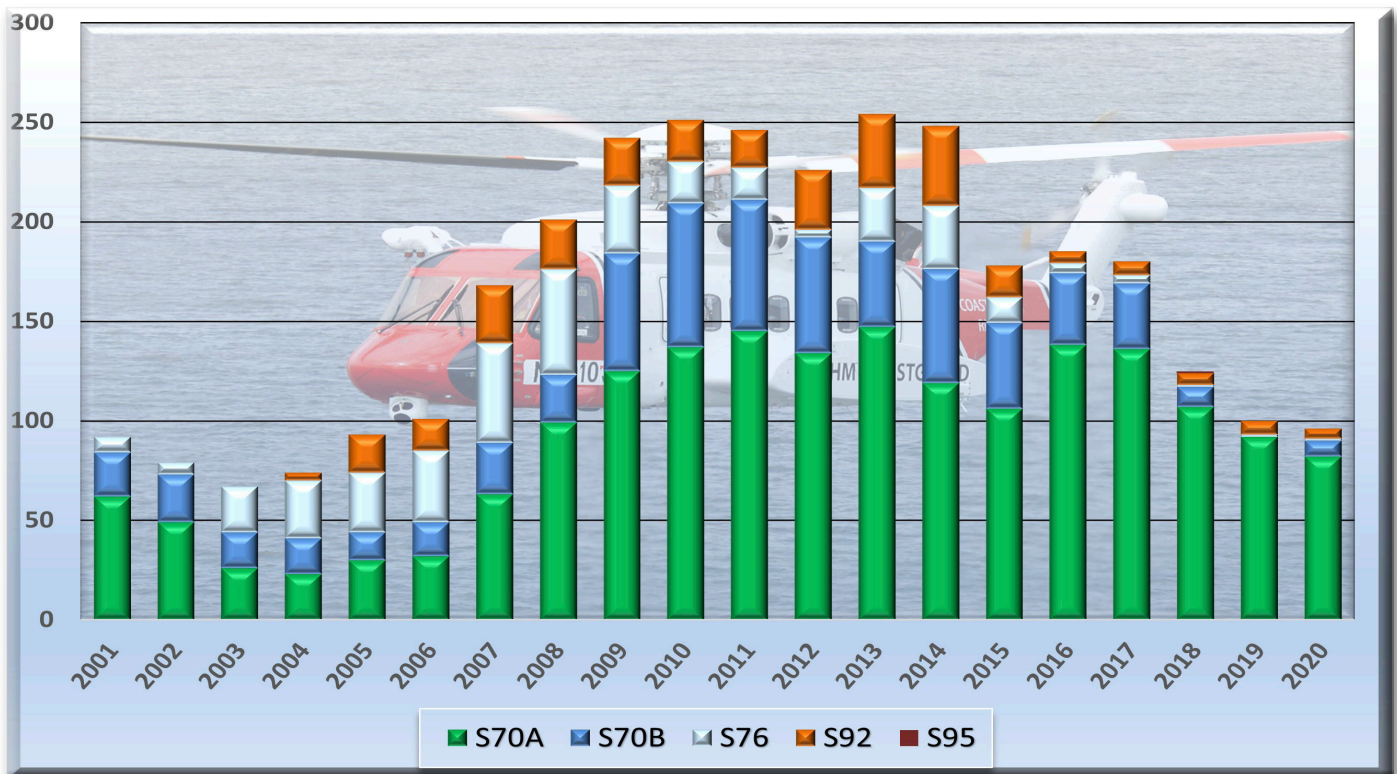


# Sikorsky Archives News

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## Four Score at Sikorsky — Part IV: 2000 to 2020



*Sikorsky Aircraft began the 21st century with a strong mix of military and commercial helicopter production programs.*

Sikorsky closed out the 20th century with the S-70 and S-76 in production, the S-92 in certification testing, and the RAH-66 Comanche in developmental flight test. The company was also outsourcing major components from international suppliers to be more cost-competitive in the global helicopter market. In 2000, Sikorsky chose Aero Vodochody in the Czech Republic to build S-76 airframes at lower cost than those made in Stratford. With the first S-92 order from Canadian offshore oil operator Cougar Helicopters, Stratford was integrating production structures and systems from risk-sharing partners in six countries on four continents.

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The first production CH-60S marinized utility helicopter flew in January 2000 and began U.S. Navy testing that May at Patuxent River, Maryland. Though the Navy helicopter master plan aimed to modernize the fleet with new-build Knight Hawks and remanufactured SH-60R Seahawks (today, the MH-60S and MH-60R), low rate initial production was more than a year off. The U.S. Army likewise had big plans for Black Hawk remanufacture, but Stratford was building just one new S-70A (UH-60L) a month for the U.S. government under the fifth H-60 multi-year production contract. Announcing reorganization plans, company President Dean Borgman told Sikorsky employees, **"The future is tremendous and it's ours to take."**



*The MH-60S marinized utility helicopter completed its first operational U.S. Navy deployment in May 2003.*

The Boeing-Sikorsky LHX team received the RAH-66 Engineering and Manufacturing Development contract in June 2000. Sikorsky's historic Bridgeport factory would be modernized for Comanche "lean" manufacturing with assembly control points networked to show workers graphic instructions on tablet computers. However, the Bridgeport airfield that launched R-4s in 1944 was not due to see low rate initial production Comanches until 2007.

To offset the U.S. Government lull, Sikorsky had healthy international and commercial business. Colombian Black Hawks were coming off the Stratford line, and marinized Thunderhawks, Seahawks and Naval Hawks were in work for Taiwan, Spain, and Turkey. New suppliers were simultaneously feeding commercial production in the U.S. The first Czech S-76 fuselage was delivered to Stratford in January 2001 for engines, dynamics, and flight certification. The 'green' S-76C+ then flew from Stratford to Keystone Helicopters in Coatesville, Pennsylvania for its corporate interior, paint, and options. Sikorsky turned Stratford warehouse space into the S-92 assembly area, and the digital design environment that linked international partners through S-92 development now orchestrated production.



*Two Comanche System Design and Development helicopters were built for developmental testing.*

A U.S. Army operational requirements document to recapitalize the UH-60A/L fleet was approved in March 2001, and Sikorsky received its UH-60M system design and development contract that May. The first MH-60R for the U.S. Navy – a remanufactured SH-60B -- made its maiden flight July 19, 2001 at Stratford. Terror attacks shook the world on September 11, 2001, and America's response made new demands on helicopters and Sikorsky Aircraft.

## Steps at a Time

Numerous government restructurings of the Comanche program delayed fielding of the stealthy scout-attack helicopter from 2006 until 2009 but increased full-rate production plans from 72 to 96 aircraft annually. More changes in the fall of 2002 cut the total buy from 1,213 to 650 Comanches at 40-odd aircraft per year and made each RAH-66 far more expensive.

Sikorsky commercial business received a major boost in December 2002 when the S-92 became the first helicopter certified under the FAA's latest and most stringent Part 29 safety amendments. The 19-passenger transport won the 2002 Collier Trophy for its safety innovations. S-76 sales meanwhile hit a 20-year high in 2003 as offshore oil operators renewed their helicopter fleets.



*S-92 production used the same digital engineering environment that coordinated S-92 risk-sharing partners.*

The MH-60S vertical replenishment helicopter with its marinized utility airframe and a Lockheed Martin cockpit shared by the multi-sensor MH-60R completed its first operational deployment in May 2003. That August, Sikorsky delivered the first production MH-60S configured for airborne mine countermeasures. Knight Hawks in later batches would be armed for combat rescue and anti-surface warfare. The Stratford line had also delivered prototype, test, and low rate initial production

MH-60Rs to Lockheed Martin Helo Systems in Owego, New York for anti-submarine and anti-surface warfare systems.



*The MH-60R Seahawk integrated dipping sonar, radar, electro-optics, and electronic support measures.*

Operation Iraqi Freedom began in March 2003, concluded "major combat operations" a month later, and settled into a long insurgency that taxed U.S. military helicopter resources, notably Army UH-60A/Ls and Marine Corps CH-53Es. The first UH-60M flew at the Development Test Center outside West Palm Beach, Florida on September 17, 2003. The next-generation M-model with its high-lift main rotor, new structures, and integrated cockpit promised to restore Black Hawk performance at high density altitudes, cut fleet costs, and make the helicopter interoperable on a digital battlefield.



*The UH-60M started as a remanufacturing plan for early S-70 Black Hawks but soon gave Sikorsky an all-new production program.*

Bridgeport received its first Comanche forward fuselage for the first engineering and

manufacturing development aircraft in August 2003. The RAH-66 production facility opened formally in September 2003, but the “Quarterback of the Digital Battlefield” and “Cornerstone of the New Army Vision” was by then consuming 38% of the U.S. Army aviation budget. The Army canceled the RAH-66 program altogether on February 23, 2004 with a promise to “strengthen Army Aviation” by re-directing Comanche money to broader modernization, including Black Hawk upgrades.

Also in 2004, a Joint Operational Requirements Document defined a new Marine Heavy Lift Replacement helicopter that would become the Sikorsky CH-53K. Late that year, a militarized, marinized, multi-sensor S-92 with fly-by-wire flight controls – the CH-148 Cyclone -- won the Canadian Maritime Helicopter Program.

Sikorsky acquired Schweizer Aircraft in Horseheads, New York in 2004 to provide added production capacity and a rapid prototyping “Hawk Works.” Work on the company-funded X2 high-speed compound helicopter started in 2005. Sikorsky suffered a stinging loss in February 2005 when the U.S. Navy chose the imported EH101 over the S-92 as the U.S. Presidential Replacement Helicopter -- VXX. The Navy’s ambitious and ultimately canceled two-step program aimed for

a growth version of the off-the-shelf aircraft developed abroad to meet objective requirements.

Cougar Helicopters nevertheless took delivery of the first production S-92 in 2005, and Sikorsky acquired Keystone Helicopters later that year to continue S-92 completions. Black Hawk and Seahawk remanufacturing plans gave way to all-new UH-60M and MH-60R production, and with Stratford full of military helicopters, Coatesville took on commercial S-92 and S-76 final assembly in stages. The S-76C++ with Arriel 2S2 engines was certified and the first aircraft delivered in December 2005.



*The S-92 found notable success in offshore oil operations and introduced hands-off rig approaches.*

## Better and Bigger

From September 11, 2001 to the end of 2006, some 1,600 U.S. Army Black Hawks logged more than one million flight hours, nearly a third of that time in combat. Sikorsky delivered the first production UH-60M on August 3, 2006 against Army plans for 1,200 new-build Black Hawks to fly utility, Medevac, and Special Operations missions. The Marine Corps CH-53E fleet was also wearing out with extraordinary utilization. On January 2, 2006, the Navy awarded Sikorsky an initial system development and demonstration contract for what would become the CH-53K, an all-new



*The S-92 became the marinized, militarized CH-148 for the Canadian Maritime Helicopter Program.*

heavy lift replacement helicopter with new-technology engines, hybrid composite structures, and fly-by-wire flight controls.

Sikorsky delivered 174 S-70, S-76, and S-92 helicopters in 2007, double the output of just three years earlier. The company acquired PZL Mielec in 2007 and set about modernizing the 71-year-old Polish fixed-wing aircraft manufacturer to produce the S-70i, a new Black Hawk for the international market. “Sikorsky has taken a major step toward becoming a leading member of the European aerospace community,” said Sikorsky President Jeffrey Pino. In 2008, Shanghai Sikorsky and Aviation Industries of China began building S-76 airframes in the People’s Republic of China.

The single-seat X2 demonstrator flew first in August 2008 with a suite of technologies promising cruise speeds around 250 kt with helicopter low-speed handling and hover efficiency. In 2009, Sikorsky demonstrated automated oil rig approach technology for the big S-92. The company by that year had nearly 17,000 employees and annual revenues of \$5.4 billion.

In 2010, Sikorsky Stratford delivered the 200th UH-60M Black Hawk to the U.S. Army. The X2 surpassed 250 kt in September, and Sikorsky began company-funded work on the S-97 light tactical helicopter demonstrator using X2 technologies. Tata Advanced Systems Ltd. started building S-92 cabins for Sikorsky in Hyderabad, India. The digitally-designed CH-53K also integrated major structures made by outside suppliers. Spirit AeroSystems in Wichita, Kansas rolled out the fuselage of the first CH-53K ground test vehicle. Aurora Flight Sciences delivered the first CH-53K main rotor pylon in April 2011.

By 2011, UH-60Ms were in production or under contract for Bahrain, Jordan, the UAE, the Mexican Federal Police, Sweden, the

Saudi Land Forces, Taiwan, Thailand, and Brazil. Australia chose the MH-60R as its next-generation, multi-role naval combat helicopter. Sikorsky Mielec in Poland delivered its first S-70i to the Kingdom of Saudi Arabia Ministry of Interior, and Black Hawks made in Poland were on order for Mexico and Brunei. Thailand received two MH-60S Knight Hawks in 2011.

The X2 team earned the Collier Trophy in March 2011. By then, 15 S-92s were flying head-of-State missions around the world. The first CH-148 Cyclone in interim configuration arrived at Shearwater, Nova Scotia in May 2011 to train Canadian Forces aircrew and technicians.

The U.S. Army received its 500th H-60M in 2012, but declining defense budgets led Sikorsky to close the military completions center in Horseheads and transition the work to West Palm Beach. International orders for Sikorsky helicopters grew. In December 2012, the U.S. Navy announced Denmark as the second international customer for the MH-60R. Australia took delivery of the first of 24 MH-60Rs in 2013 to replace its S-70B-2 Seahawks.



*The Sikorsky-funded S-94 or X2 technology demonstrator integrated the advancing blade concept with structural, propulsion, and flight control advances.*

In the commercial helicopter business, the S-76D with high-lift composite rotor blades, Pratt & Whitney Canada engines, and a Thales integrated cockpit went on the market and won

orders from operators in China, Japan and Mexico. Sikorsky finished 2012 with a backlog of nearly \$3 billion—its largest ever—driven by growing demand in the oil and gas industry. The CH-53K GTV at West Palm Beach began turning its rotor head without blades attached in December 2013 and started shakedown testing with blades installed in April 2014. Combined production of UH-60M utility and HH-60M Medevac Black Hawks at Stratford for the US Army was running eight to 10 aircraft per month. UH-60Ms for the Republic of China were being built at West Palm Beach. Sikorsky signed agreements with the Turkish government and local suppliers to license-produce 109 T-70 Black Hawks in Turkey. The company also teamed with Boeing to design and build the SB>1 Defiant joint multi-role technology demonstrator for the U.S. DoD Future Vertical Lift (FVL) initiative. FVL envisioned a family of fast, long-range rotorcraft, ultimately to replace the Black Hawk and other DoD helicopters.



*The S-95 or Marine Corps CH-53K King Stallion designed to replace the CH-53E entered development flight test in October 2015.*

The first fully-configured S-76D was delivered to the Bristow Group in January 2014. In that year, Sikorsky Coatesville delivered its peak output of 42 S-92s. Cancellation of the Presidential VXX program also positioned the S-92

as the new Marine One to replace VH-3Ds and VH-60Ns. The U.S. Navy announced on May 7, 2014 that Sikorsky would build the VH-92 fleet totaling 21 operational aircraft. Sikorsky President Mick Maurer stated, **“For 57 years, our company has been trusted with the critical responsibility of building and supporting a safe and reliable helicopter fleet for the President of the United States. . . We stand ready to deliver the next Marine One, the world’s most advanced executive transport helicopter.”** By the end of 2014, Sikorsky had over 15,000 employees and net sales of \$7.5 billion.

## Fast and Smart

Sikorsky Aircraft worked with the Army Aviation and Missile Research Development and Engineering Center in 2014 to demonstrate autonomous flight with fly-by-wire flight controls, first on the JUH-60A Rotorcraft Aircrew Systems Concepts Airborne Laboratory (RASCAL) and later on a fly-by-wire UH-60M Upgrade (UH-60MU) Black Hawk. In March 2014, the Manned/Unmanned Resupply Aerial Lifter (MURAL) demonstration put the UH-60MU under the control of Sikorsky Matrix autonomy software and a ground control station to deliver sling loads accurately commanded by an engineer on the ground. Sikorsky meanwhile continued Matrix autonomy development on the fly-by-wire S-76 SARA -- Sikorsky Autonomy Research Aircraft and announced plans to fly an autonomous Black Hawk to mature the technology.

The S-97 Raider compound helicopter flew for the first time at West Palm Beach on May 22, 2015. The company-funded demonstrator integrated the rigid rotor advancing blade concept with fly-by-wire flight controls, integrated tail thruster, and active vibration control to achieve unprecedented speed and agile maneuvering for FVL. The last of 275 MH-60S Knight Hawks for the U.S. Navy



*The S-76 Sikorsky Autonomy Research Aircraft was the first company-funded testbed for autonomous flight controls.*

rolled out in 2015. However, the first of four CH-53K Engineering Demonstration Models, EDM-1, hovered on October 27, 2015 at West Palm Beach. Marine Corps plans called for 200 King Stallions. With healthy long-term prospects, Sikorsky was sold by United Technologies to Lockheed Martin Corp. for more than \$9 billion.

In March 2016, Sikorsky formally opened its commercial helicopter Customer Care Center in Trumbull, Connecticut to use data from the advanced S-92 health and usage monitoring system (HUMS). Sikorsky Stratford rolled out the 1,000th UH-60M Black Hawk in October 2016, and production continued for the U.S. government, Foreign Military Sales, and direct commercial customers. MH-60Rs were being built in Stratford and integrated in Owego for the U.S. Navy and Denmark. Chile ordered six S-70i Black Hawks from



*The S-92 Raider applied X2 technologies to a light tactical compound helicopter that exceeded 200 kt in October 2018.*

the Polish production line.

Four CH-53K King Stallion engineering development model aircraft and three system development test articles were built in Florida. When Sikorsky came to terms with the State of Connecticut in 2016 to locate CH-53K production at Stratford, the company began rearranging H-60 production space to accommodate the new "Kilo." Each King Stallion build station filled the space of two Black Hawk stations.

Sikorsky and the U.S. Army finalized the ninth Black Hawk multiyear contract in June 2017 buying helicopters for the U.S. Government and Foreign Military Sales to Taiwan, the Saudi Arabia, Latvia and Thailand. The United Arab Emirates received the first armed S-70i, and commercial S-70i helicopters outfitted with fire-fighting water tanks became Fire Hawks.

In January 2018, Sikorsky Coatesville delivered the 300th production S-92. The Sikorsky S-97 Raider light tactical coaxial compound helicopter exceeded 200 knots in October 2018 at West Palm Beach. The bigger Sikorsky-Boeing SB>1 Defiant joint multirole technology demonstrator flew for the first time on March 21, 2019 to help the U.S. DoD make informed decisions for FVL. The U.S. Air Force HH-60W Combat Rescue Helicopter also flew for the first time on May 17, 2019 in Florida. By the end of 2020, Stratford had delivered 831 UH-60M utility and 281 HH-60M medevac helicopters to the U.S. Army. Foreign military sales in process included UH-60Ms for Saudi Arabia, Thailand, Latvia, Croatia and Jordan. The Philippines took delivery of its first Polish-built S-70i. The Republic of Korea joined the United States, Australia, Denmark, Saudi Arabia, India and Greece in the family of MH-60R Naval Hawk operators.

Sikorsky concluded the first 20 years of the 21st century with a new corporate owner, strong international partnerships, and a vibrant technology portfolio for the global helicopter market.

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*The American Helicopter Museum & Education Center in West Chester, Pennsylvania unveiled its restored Sikorsky HOS-1, the Gander Express, on October 15, 2021. The historic S-49/R6 was airlifted from Coast Guard Air Station Brooklyn to rescue survivors of a Sabena airliner crash 20 miles south of Gander, Newfoundland on Sept. 22-23, 1946. The HOS-1 and a Sikorsky HNS-1 shuttled from makeshift helipads to the remote crash site to move 18 injured passengers to a lake for evacuation by fixed-wing flying boats. The episode was the first large civil aviation rescue to involve helicopters and helped establish rotary-winged aviation in the Coast Guard. (Courtesy National Naval Aviation Museum)*

Prepared by Frank Colucci and John Bulakowski with graphic art and layout by Jodi Buckley.



“When the time comes the helicopter could be offered for sale, the number of uses would be almost unlimited. Also inaccessible terrain would become available. We can visualize the helicopter being used for carrying mail, passengers and freight. We can further expect it in extensive use for all types of emergencies such as forest control, health, medical assistance, and development for private use.

*Igor Sikorsky's remarks from the movie "The Sikorsky Helicopter" - 1948*

