



# Sikorsky Archives News

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## Sikorsky Pumps Oil



*Norsk Helikopter received its first Sikorsky S-92 in 2005. In 2006, it became the first S-92 North Sea operator to attain 10,000 fleet flight hours. (All images property of Igor I. Sikorsky Historical Archives)*

Early in their evolution, helicopters became important tools in the global oil and natural gas industry. Petroleum Bell Helicopters first used light helicopters in 1949 to fly survey teams around southern Louisiana, and by the end of that year

11 oil and gas fields were identified in the Gulf of Mexico. In March 1952, the 7,200 lb Sikorsky S-55 became the first large commercial helicopter certified by the U.S. Civil Aeronautics Authority. The January 1954 Sikorsky News reported an S-55

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demonstrator had toured Louisiana and Texas to acquaint oil company executives with the new helicopter for offshore operations.

Sikorsky Archives President Dan Libertino joined the renamed Petroleum Helicopters International (PHI) in 1954 as an S-55 mechanic at Grand Isle, Louisiana. He recalled, "The S-55 was the aircraft of choice for offshore oil operations because you could get five or six people on board." Humble Oil hired PHI to shuttle workers from Grand Isle to three offshore drilling rigs. "At Grand Isle, we had a hangar to get the aircraft out of the elements. We did all their inspections at night after the day's operation was over with." The oil company capped S-55 gross weight at 6,900 lb to operate from platforms built on war-surplus landing craft anchored beside drilling rigs and from the first helipad built on an oil rig.

A January 1955 article in the United Aircraft Corp. Bee-Hive magazine noted that, before helicopters, workers in the Gulf of Mexico spent up to six uncomfortable hours riding crew boats to and from their platforms. Two PHI S-55s flew 25 trips a day covering legs 7 to 42 miles long in just 6 to 40 minutes. Another helicopter stood by to keep operations on schedule. In addition to oil

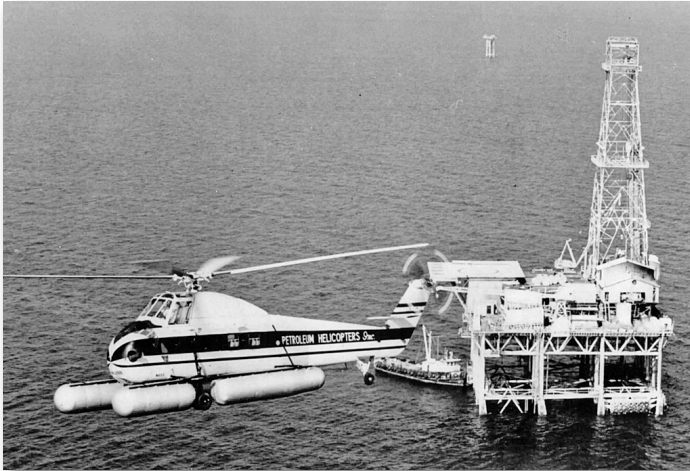


*The piston-engined S-55 was the first transport category helicopter in offshore oil service, flying workers to rigs in the Gulf of Mexico in 1954.*

rig crews, the helicopters could deliver cargo or evacuate injured workers to shore. PHI acquired another S-55 from National Airlines, but a landing mishap in marginal weather halted the Humble Oil contract. "We were stuck with four or five S-55s," recalled Libertino. "Without having any work, we were at the point of taking cuts in pay or layoffs. All of sudden, PHI got a contract from Cities Service. Then we started to work for Gulf Oil." The S-55s reacquired pontoons for emergency water landings and set the stage for more capable helicopters.

The 14,000 lb S-58 was certified by the Federal Aviation Administration on August 2, 1956. Dan Libertino joined Sikorsky that November as a technical representative and soon travelled to New Guinea in the southwest Pacific with Worldwide Helicopters. Three S-58s helped develop drilling sites for Australasian Petroleum. "It wasn't practical to build roads," Libertino explained. "We were located at stations in the interior of New Guinea. All the material to make a clearing was broken down into 4,000 lb loads." With landing zones cut in jungle by local workers, the helicopters hauled a bulldozer and supplies to successive worksites piece-by-piece. Sikorsky News reported two S-58s airlifted a million pounds in 45 days and noted that drilling equipment which would have taken two years to deliver by truck if a road had to be built was placed in three weeks by helicopter.

Westland in the UK licensed S-55 production in 1950, and in 1955 Bristow Helicopters began flying Westland Whirlwinds under contract to Shell Oil Company in the Persian Gulf. In 1957, Bristow expanded operations to Iran and Bolivia. Sikorsky ad copy meanwhile credited S-55s and S-58s in the Gulf of Mexico with more than 27,000 passengers a month. It continued, "Now in regular service in the Gulf of Mexico and other areas, the S-58 equipped with floats can fly

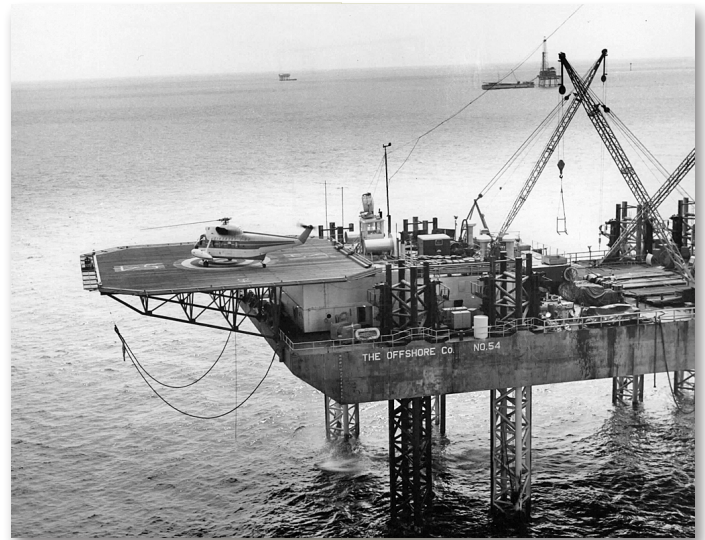


*The S-58 was equipped with 'hot-dog floats' for PHI to serve Humble Oil and Refining in the Gulf of Mexico.*

125 miles offshore and return without refueling. It cruises at more than 90 miles per hour, making trips in only minutes which would take hours by surface craft. The S-58 is the industry's most advanced offshore transport." Sikorsky gave the piston-engined S-58 four floats and retractable wheels for amphibious operations, but a turbine-powered amphibian was on the way.

## Turbine Times

The 8,300 lb S-62 with its General Electric CT58 turboshaft engine flew for the first time on May 14, 1958 and earned its FAA type certificate in June 1960 as the first aircraft to satisfy then-new regulations governing commercial passenger-carrying helicopters. The first production S-62 was delivered to PHI on July 23, 1960. Sikorsky News in November 1963 reported, "The turbine-powered Sikorsky S-62 has appeared in the Gulf and, with its boat hull (requiring no floats), has proved a natural for the offshore mission." Rotor Aids flew two S-62s and three S-55s from Grand Isle for Humble Oil. One rig 200 miles away could be reached in 105 minutes by S-62. Sikorsky News quoted Humble district superintendent James Walvoord, "The helicopter means added safety in cases of sickness and accident . . . We can operate from one base; without helicopters we'd need three or four bases."



*The turbine-engined S-62 began offshore oil operations in the Gulf of Mexico in 1963.*

The single-engine, 10-passenger S-62 captured few oil industry orders. Sikorsky first proposed airliner versions of the twin-turbine S-61 in 1959 and flew the 20,500 lb S-61N in August 1962 with a sealed hull and float sponsons for overwater operations. In May 1965, an Okanagan Helicopters S-61N made the first transatlantic crossing by a commercial helicopter flying 37 hours and 11 minutes in stages from Stratford to London to support Shell in then-new North Sea oil fields. British European Airways introduced the 26-seat



*Okanagan began offshore operations with the twin-turbine S-61N for Shell Canada in 1968.*

helicopter into the North Sea in 1965 followed by Dutch KLM and Norwegian Helikopter Service in 1966. Brunei Shell Petroleum started flying two S-61Ns in Borneo in 1967.

In the Gulf of Mexico, PHI tested an S-61N from April to August 1967, but only three platforms in the Gulf then had helipads big enough for the stretched S-61. Bristow flew S-61Ns in Malaysia in 1968 and started North Sea operations at Aberdeen, Scotland in 1971. A year later, the operator under contract to Shell Oil placed a single S-61N at Sumburgh to the south and ultimately launched 30 flights a day. By the mid-1970s Bristow was flying 18 S-61Ns, a turbine-powered S-58 Westland Wessex, and ten piston-engined S-58s from Aberdeen and Sumburgh averaging 100 hours per month per helicopter. The last S-61N built was delivered to Okanagan Helicopters in early 1980 and flew from Stratford to Nova Scotia, Canada for offshore work.

The S-64 Skycrane earned its FAA Type Certificate on July 30, 1965, and the big cargo lifter began a commercial sales drive including oil industry applications. Sikorsky News in January 1968 reported on a Skycrane demonstration conducted by Shell Oil. The 38,000 lb crane helicopter carried a complete sand-wash oil rig 11 miles from a marshalling yard at Leesville, Louisiana to an offshore structure in the Gulf of Mexico. In April 1969, ERA Helicopters purchased the first two commercial S-64Es for use in Alaska to transport heavy drilling equipment, but the powerful crane never became a regular feature of offshore operations. Erickson Air-Crane acquired the S-64 type certificate in 1992 and continues to offer heavy-lift services to the oil and gas industry.

## Made for the Market

Sikorsky Light Twin Helicopter market studies in the early 1970s defined the company's first true



*VOTEC Taxi Aéreo in Brazil began oil operations with the Sikorsky S-61N in 1979.*

commercial helicopter, one tailored to the oil industry. The notional S-74 Twin Centurion became the S-76 Spirit, the name chosen from contest entries by Sikorsky president Gerald Tobias to tie in with the U.S Bicentennial celebration. The Spirit of '76 was unveiled in February 1975 by Tobias at the Helicopter Association of America convention in Anaheim, California. Tobias cham-



*Sikorsky performed an offshore heavy lift demonstration with an S-64 over the Gulf of Mexico in 1968.*

pioned the program before United Technologies management. "Without him it would never have happened," acknowledged Bill Paul, then S-76 chief engineer and later Sikorsky vice president of engineering. Paul explained, "For the first

time in our history, we developed a commercial helicopter from scratch. The others were using a military base because it would be very difficult to amortize that [development] cost . . . All of the suppliers had to invest in it as well.”

Informal talks with fleet operators had sketched a 10,000 lb helicopter with 400 nm range carrying 12 passengers and two crew at 145 kt cruising speed. Significantly, Category A performance requirements called for return to base at any point in the mission with one engine inoperative at maximum gross weight. “What Tobias added to that was the comfort of a corporate aircraft,” noted Paul. “We recognized we wanted a market that would be broad enough, and Tobias was looking to the corporate market. In the end, it was the corporate market that saved our skin.”

The elegant S-76 had a bifilar rotor head to suppress vibration and a main rotor shaft tilted forward to fly level at high speeds. Early designs put engines up-front like those of the S-61, but Tobias wanted a sleeker profile. Category A posed a bigger engine dilemma. According to Bill Paul, “Allison had the only engine that had the fuel consumption and the power that barely made it.” Customers and engineers needed convincing, and Sikorsky flew tests with a three-bladed CH-53D to substantiate the smaller S-76. “We had actual data that had the rotor loading equivalent to what the S-76 would have on a percentage basis and proved we could meet that Cat. A with the S-76.”

The Spirit first flew on March 13, 1977, and the first production example went to Air Logistics Division of Offshore Logistics, Inc., in February 1979. Sikorsky News in March 1980 reported 47 deliveries against orders for 327 helicopters. Air Logistics was serving a rig 125 nm offshore with three flights a day. Bristow Helicopters became the first European operator of the S-76 in 1980, and Gerald Tobias told an Offshore Technology



*Tests with a three-bladed CH-53D proved Category A performance with the smaller, four-bladed S-76.*

Conference in Houston, “The Spirit is proving itself to be the most efficient helicopter of its class for offshore oil work around the world.” Okanagan Helicopters put four S-76As in Australia for ESSO and the Woodside consortium and two in the Gulf of Thailand for Union Oil. Bill Paul became Sikorsky president and chief operating officer in 1983.

The Spirit name was soon abandoned, and falling oil prices in the 1980s slashed S-76 sales. The S-76A had nevertheless grown popular as an executive transport. The improved fuel consumption of the powerful Pratt & Whitney PT6 engine led to the S-76B flown on June 22, 1984, and successive S-76 versions introduced progressively more powerful Turbomeca Arriel engines. The first S-76C flew on May 18, 1990 and obtained FAA certification on March 15, 1991.

The S-76C+ was delivered to Norsk Helikopter in July 1996 to fly over the North Sea. Brazilian offshore operator Lider Aviacao bought four S76-C++ in 2006. The 11,875 lb S-76D with Pratt & Whitney PW210S engines, composite rotor blades, and other improvements was delivered to Bristow in 2014. Late that year, Titan Helicopter Group accepted the first S-76D in Africa. In 2019, National Helicopter Services Ltd. deployed two S-76Ds in Guyana for offshore support.

Sikorsky moved S-76 production from Bridgeport,



*S-76s operators such as Norsk Helikopter Service quickly established the helicopter in offshore oil service.*

Connecticut to West Palm Beach, Florida, to Stratford, Connecticut and finally to Coatesville, Pennsylvania where engines, systems, and blades were integrated with airframes made by Aero Vodochody in the Czech Republic. A few S-76D airframes were made in China before Lockheed Mar-



*Malaysia Helicopter Service operated the S-76C in the South China Sea.*

tin closed the Coatesville Heliplex in 2021. Precise numbers are unavailable, but about 60 to 70% of the 850-odd S-76s served oil operators. The last S-76D from Coatesville was delivered to an offshore oil operator in India.

## Global Helicopter

Commercial sales of the rugged S-70 Black Hawk were confined to foreign military and government

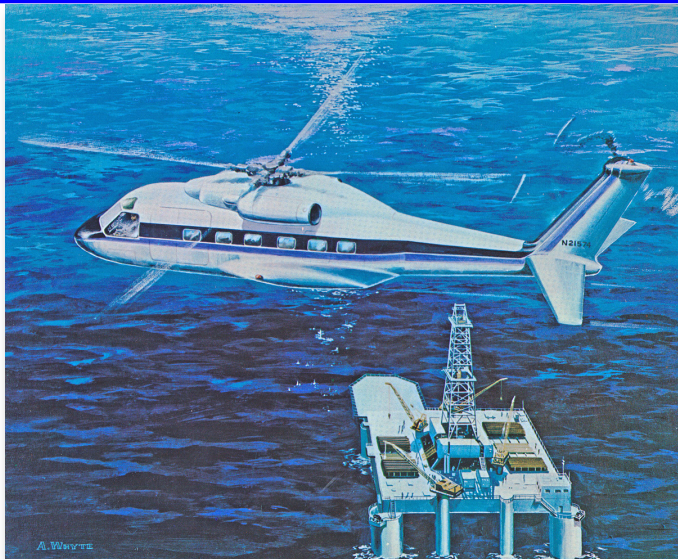
operators, but Sikorsky studied a 29-seat S-70C-29 airliner in the 1980s. Studies of a big-cabin S-92 based on Black Hawk dynamics began again in mid-1990, and a mockup of a 19 seat S-92 Helibus was unveiled in 1992 in Las



*China Southern Airlines flew the Arriel-engined S-76C to oil rigs in the South China Sea.*

Vegas at the Helicopter Association International show. International safety regulations and industry requirements ultimately made the production helicopter a totally new design with flaw-tolerant structures, a new four-stage planetary gearbox, wide-chord composite main rotor blades, GE CT7-8 engines, and four-screen integrated 'glass cockpit.'

The S-92 first flew on December 23, 1998 at West Palm Beach. In December 2002, the 26,500 lb S-92 became the first helicopter certified under harmonized FAA/JAA Part 29 regulations for transport rotorcraft. PHI took first customer delivery in 2004. In 2007, PHI initiated talks with Sikorsky about easy-to-use automatic approach technology. S-92 operators today can use rig approach software to bring the helicopter to a hover a quarter mile from the oil platform hands-off. Automation enabled oil operators to fly more paying sorties and gave crews better situational awareness in reduced visibility. S-92A project pilot Ron Doepner told Vertiflite magazine in 2009, "They will get more people to oil rigs with the system than without, but to my mind, the real payoff is



Artists concept of the S-70C-29 Advanced Commercial Helicopter, a stretch version of the S-70 BLACK HAWK

the safety.”

With airframe modules supplied by international partners working in a digital design environment, early S-92s were assembled in Stratford, Connecticut and completed at Keystone Helicopters in Coatesville, Pennsylvania.

Canadian offshore oil operator Cougar Helicopters received its first S-92 in 2005. Sikorsky acquired Keystone that year, and the Coatesville Heliplex assumed complete S-92 assembly and integration responsibilities by the winter of 2009–2010. Líder Aviation in Brazil ordered three S-92s in 2012 for offshore operations. Bond Helicopters Australia received the first of four S-92As in 2015 for offshore services in the Australasian region. In 2017, Coatesville delivered an S-92A to Bristow Norway readily convertible from offshore transport to Search And Rescue configuration for operations in the Barents Sea.

In 2017, Sikorsky, PHI and Outerlink Global Solutions introduced S-92 real-time health-and-usage monitoring with helicopter health data transmitted via satellite. The 300th production S-92 was delivered to Era Group in January 2018 for offshore operations in the Gulf of Mexico. In 2021, oil and gas operators accounted for 86%



The S-92 flew to oil rigs during a mid-east sales tour.

of all S-92 flight hours. Sikorsky President Paul Lemmo told the HAI Heli-Expo in February 2022 “Our average offshore S-92 is flown 800 hours per year. There are many aircraft out there in fleets that never reach 800 hours per year. In fact, many of ours are flying well over 1,000, but the average customer is flying 800 hours with 93% availability.”

In 2021, the U.S. Department of the Interior Bureau of Ocean Energy Management counted 75 “medium” and 110 “heavy” Sikorsky helicopters operating in the Gulf of Mexico alone. Oil industry helicopter demand has always fluctuated with crude price-per-barrel. Sikorsky relocated S-92 production to Stratford and with plans for improved S-92A+ and S-92B helicopters, the company continues to cultivate the cyclic but essential oil helicopter market.



PHI in 2022 won a new contract to fly S-92s for Australia’s largest natural gas producer.

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Memberships and Donations enable us to continue the Archives mission of acquiring, managing, protecting and disseminating historical documentation associated with Igor Sikorsky and his legacy

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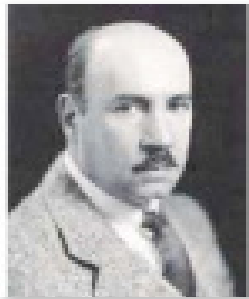
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*The Sikorsky Archives, as part of its STEM initiative, has been working a collaborative project with the Sacred Heart University Discovery Museum to add displays and hardware regarding Igor Sikorsky, his aircraft and the development of the helicopter. Pictured is a large timeline poster tracing the history of all products produced by Sikorsky Aircraft.*

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



“Most interesting results have been achieved by some non-scheduled operators. The remarkable work of the oil field operations in the Gulf of Mexico must be regarded as a significant and promising beginning of a great and very important new type of transportation. In general, there is an interesting and most promising future for the helicopter.”

Igor Sikorsky — *The Story of the Winged-S*

