**My Helicopters Encounters and Experience**

Throughout my aviation career I have been fascinated by helicopters, although my background is mainly with fixed-wing aircraft. I am always amazed at the skill demonstrated by helicopter pilots, who operate in many challenging and difficult environments, backed by skilled aircraft maintenance engineers (AMEs) and technicians who must cope with demanding maintenance requirements. In both military and civilian use, helicopters fly in some of the most demanding situations imaginable: in mountainous regions and deserts, in high winds over land and water, from ships and oil rigs, or from remote and sometimes dangerous bases.

My first close encounter with helicopters was at 1 Wing Marville, France in 1965 when a Sikorsky S-58 caught fire and burned during start-up. The crew escaped safely but all that was left after the fire was the engine, an old radial and the main blade tips. I never forgot that incident because the destruction happened so quickly.

My next experience with helicopters was in my air force days with 434 Squadron as part of Mobile Command, when I rode out to the Cold Lake Weapons Range on a Labrador. It was memorable because we had to set down to drain gasoline from some snowmobiles we were hauling out to the army. The snowmobiles had been filled with gasoline and were venting inside the helicopter fuselage.

At Transport Canada I helped facilitate the move of Bell Helicopters Textron from Texas to Québec in the early 1980's. To help accomplish this I was given a helicopter familiarization course with a lot of information on helicopter theory of flight and some limited flying training.

During my Transport Canada career, I also had the privilege of working with many fine helicopter flight test pilots, AMEs and technicians, as well as with helicopter manufacturers and approved maintenance organizations (AMOs). It was the fixed-wing aircraft issues, however, that seemed to dominate the day, mainly because it was the large and highly visible fixed-wing air carriers that created the daily regulatory and political issues that needed urgent attention. In my opinion, this fact works against the recognition of the vital role played by the helicopter industry in its day to day operations across North America.

**Birth of an Industry**

Believe it or not the idea of vertical flight seems to go back thousands of years. Just Google 'helicopter history' and you will be amazed. Leonardo Da Vince had produced design sketches of such a machine, a model of which I saw at a Da Vince model exhibition in Edmonton, Canada, as I recall. So here is a little more history before we get on to the modern day situation.

I quote from Wikipedia the following; "Heinrich Focke at Focke-Wulf was licensed to produce the Cierva C.30 autogyro in 1933. Focke designed the world's first practical transverse twin-rotor helicopter, the Focke-Wulf FW 61, which first flew on 26 June 1936. The FW 61 broke all of the helicopter world records in 1937, demonstrating a flight envelope that had only previously been achieved by the autogyro. During World War II, Nazi Germany used helicopters in small numbers for observation, transport, and medical evacuation. The Flettner Fl 282 Kolibri synchropter—using the same basic configuration as Anton Flettner's own pioneering Fl 265—was used in the Mediterranean, while the Focke Achgelis Fa 223 Drache twin-rotor helicopter was used in Europe. Extensive bombing by the Allied forces prevented Germany from producing any helicopters in large quantities during the war."

**American Helicopter History**

Again form Wikipedia , “In the United States, Russian-born engineer Igor Sikorsky and W. Lawrence LePage competed to produce the U.S. military's first helicopter. LePage received the patent rights to develop helicopters patterned after the FW 61, and built the XR-1. Meanwhile, Sikorsky settled on a simpler, single rotor design, the VS-300, which turned out to be the first practical single lifting-rotor helicopter design. After experimenting with configurations to counteract the torque produced by the single main rotor, Sikorsky settled on a single, smaller rotor mounted on the tail boom. Igor Sikorsky designed and manufactured the world's first mass-produced helicopter, the Sikorsky R-4, 1944. Developed from the VS-300, Sikorsky's R-4 was the first large-scale mass-produced helicopter, with a production order for 100 aircraft. The R-4 was the only Allied helicopter to serve in World War II, when it was used primarily for search and rescue (by the USAAF 1st Air Commando Group) in Burma; in Alaska; and in other areas with harsh terrain. Total production reached 131 helicopters before the R-4 was replaced by other Sikorsky helicopters such as the R-5 and the R-6. In all, Sikorsky produced over 400 helicopters before the end of World War II. The first airmail service by helicopter took place in Los Angeles, in 1947.

While LePage and Sikorsky built their helicopters for the military, Bell Aircraft hired Arthur Young to help build a helicopter using Young's two-blade teetering rotor design which used a weighted stabilizer bar placed at a 90° angle to the rotor blades. The subsequent Model 30 helicopter showed the design's simplicity and ease of use. The Model 30 was developed into the Bell 47, which became the first helicopter certified for civilian use in the United States. Produced in several countries, the Bell 47 was the most popular helicopter model for nearly 30 years.”

One cannot write about helicopters without mentioning their growing use in the Korean War. The massive use of them in Vietnam is a story well told. Helicopters added much mobility to the troops and added firepower on an almost everywhere basis. They were also vastly used in the Medevac system which later transferred over to medical evacuation and transport in civilian society.

**Helicopter AME and Technician Development**

Most early helicopter technicians had their start in the military. At one time all three armed services operated helicopters in Canada and overseas. Today, I believe, all helicopters in the Canadian Forces are operated by air force personnel. In the United States helicopters have been in use by all the armed services and the Coast Guard since their beginnings. Community colleges in the United States and Canada have instituted helicopter training courses for both flight and maintenance. I would suggest that today most helicopter technicians come from that source.

In Canada before the current M1 and M2 category AME licensing system, there was an independent category R (R for rotorcraft). In my opinion, the R category licence served us well during that period. However, in the 1990s the system was changed to today’s model, which includes helicopters and fixed wing in the same M1 and M2 categories. Today’s system still does require type training at Approved Maintenance Organizations (AMOs). Under the FAA system helicopters fall under the general A&P system of technician licensing. This change made the U.S.A. and Canadian systems more similar.

**Some Canadian Helicopter History**

Canadian helicopter history goes back to early experiments before the First World War. There was some experimentation in British Columbia in the 1930s and the Royal Canadian Navy flew Sikorsky R4s during World War II. Before unification as the Canadian Armed Forces, the army, air force and navy, were all independently operating helicopters. Some of the types then operated were Hilliers, Labradors, and Hueys. Canadian legacy companies that laid the framework for the industry in the east were Dominion (King City), Spartan Helicopters (Ottawa); and, Universal (Carp); and, in the west, Okanagan (Vancouver), Foothills Klondike-Kenting (Calgary). There were also many smaller operators such as Skyrotors, Niagara, Bow Valley, Atlantic, Viking, TNTA, and another dozen or so that eventually formed the basis of larger entities through merger or acquisition. One of Canada's largest helicopter operators, which began in BC in 1947 is now Canadian Helicopter Corporation (CHC) and has worldwide operations.

Although piston powered helicopters blazed the trail in this field the addition of turbine power was what really brought helicopters to where they are today in capability. The additional power enabled much more electrical generation, as well as heat and air conditioning capabilities. Larger loads can include fuel, so range capability was greatly increased. Since then, helicopters have flown many long-range operations in search-and-rescue and military missions. Additional electrical generation capability has also permitted new systems, such as powerful search lights for use in crime fighting. New structural designs and use of lighter weight composite materials in construction have also improved performance.

**Today's Workhorses**

Today, the civil and military helicopter industry is as vital as ever. In November 2008, Canada sent eight specially modified CH-146 Griffons utility helicopters equipped with large machine-guns and sensors to escort and protect the six new CH-47 Chinook heavy-lift choppers already stationed at the Kandahar airfield. Although helicopters were used in NATO in Europe during the Cold War, I do not think Canadian helicopters have ever been used as much they are today in Afghanistan. This of course pales in comparison to the great US assignment of helicopters in support of their forces. This all goes to show how a very different type of aircraft has become so vital in today's world.

In the civilian world, helicopters are being used in police work adding to their other uses in search and rescue, heli-skiing, fire fighting, wildlife surveys, land surveying and resource exploration. Community colleges are training future technicians and pilots. The Armed Forces are also recruiting and training helicopter personnel. FAA and Transport Canada also employ helicopter-experienced personnel in many areas, especially in the air-carrier and maintenance inspection fields. Colleges and industry associations continue their work in providing individual aviation trades personnel, and identifying and addressing industry technical workforce needs.

As I write this, many types of helicopters are passing over my winter home in Arizona which just goes to show how vital they have become. Aviation's workhorses that have become both specialized and indispensable. This should ensure a good future for helicopter maintenance managers and technicians.