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"America Must Lead "

AND THEN THERE WERE NONE!

CW4 James T. Chandler Pennsylvania Army National Guard Annville, Pennsylvania



Igor I. Sikorsky

S omething historical happened in Army aviation recently, and many never knew what it was. The CH–54 Skycrane was retired from Army aviation service. It happened quietly with no fanfare or ceremony. The big heavy lift workhorse was taken out of service because it was too costly to maintain and another aircraft could "out lift" it now; therefore, it was retired into obscurity. To honor this magnificent helicopter, and the men and women who flew them and worked on them, I offer this brief history, hoping the CH–54 Tarhe is not forgotten.

LAST MISSION

The CH–54 flew its last mission with the Nevada Army National Guard on 10 January 1993. After that date, the National Guard Bureau told all units to stop flying the mammoth helicopters and park them. The Skycrane's illustrious military career had ended.

DESIGN BY SIKORSKY

Introduction. After the Korean War, the U.S. Army was looking for a replacement for the CH–37 Mojave helicopter. A need for a heavy lift helicopter was determined. Sikorsky proceeded to fill that need. Sikorsky was working on the S–64 helicop-

ter, designed specifically for carrying loads externally.

Turbine engine. Sikorsky wanted the S–64 to be powered by turbine engines because of the many advantages turbine engines provided. However, there were none at that time, so Sikorsky worked with Pratt and Whitney to modify the JT12 jet engine to add a power takeoff turbine. The expanding/exploding hot gases passed through a free turbine wheel, cyclic grip left and right. The collective control for the aft seat was connected mechanically to the front collective by direct linkage. You could always tell an old Skycrane flight engineer if he could fly a complete traffic pattern from the aft seat facing backwards.

Fuselage. Another innovative idea was the fuselage designed to reduce basic aircraft weight. The traditional cowlings were not used to reduce

there. In June 1963, the U.S. Army announced it had ordered six S–64As and would be designating them the CH–54A. On 30 June 1963, the U.S. Army accepted the first CH–54A Skycrane at a ceremony in Stratford, Conn.¹

THE FIRST SKYCRANES

The 478th Flying Crane Company, 44th Air Transportation Battalion, which was later changed to the 478th

which had a shaft attached to it. In effect. the front half of the turbine engine was separate from the rear half of the engine. By doing this, one stage of gearing was no longer needed, which resulted in a lighter engine and a higher lift capability.



Aviation Company (Heavy Helicopter), received the first Skycranes. After undergoing testing and training, the unit was deployed to Vietnam, providing support to the 1st Cavalry Division, Airmobile. The "Cyclones" transported bulldozers, road graders, armored vehicles. and downed air-

Automatic flight control system. The Skycrane was a helicopter way ahead of its time. It had an automatic flight control system and altitude hold that made it a dream to fly instruments. It was equipped with kneeling landing gear to facilitate easier loading and help during steep slope operations. The Skycrane had a fly-by-wire system back in 1962! The aft facing crew position had a side arm control that controlled pitch, roll, and yaw with 10-percent control authority. The cyclic grip controlled pitch and roll by normal fore, aft, and lateral movement. Yaw inputs were made by twisting the

weight and facilitated easier inspection and maintenance operations. A system was even designed to tow barges. When it was necessary to transport troops, a multipurpose "people pod" was available. The pod was designed for a mobile hospital, troops, cargo, and even paradrop operations.

FIRST PROTOTYPES

The first of three prototypes flew on 9 May 1962 and was tested by the U.S. Army at Fort Benning, Ga. The other two prototypes were delivered to the Federal Republic of Germany for testing and evaluation craft. They retrieved over 380 aircraft, which resulted in savings of several hundred million dollars worth of equipment.²

PREREQUISITES FOR TRAINING

To become qualified in the Skycrane then, an army aviator had to meet the following prerequisites:

- Be assigned to a Skycrane unit.
- Be a rotary-wing aviator.

• Be current in annual flying minimums.

• Have a minimum of 500 hours rotary–wing time.

• Have a current instrument ticket.

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• Have a current instrument ticket.

• Be turbine engine qualified.

• Have 250 hours as pilot or instructor pilot (IP) time in cargo or utility helicopters.

You must remember not every pilot going through initial entry rotary– wing training at that time received some of the training stated above. The Army was picky about who was trained to fly these new heavy helicopters.³

WORLD RECORDS

The Skycrane performed admirably in Vietnam and back home when it returned. The CH–54 held many world records for a long time. On 29 April 1965, a CH–54A of the 478th Aviation Company lifted 90 people. The Skycrane carried a crew of 3 and, with a "people pod," lifted an additional 87 combat troops. This was the largest number of people ever lifted by a helicopter at one time.⁴

Other records include four altitude records verified with the National Aeronautic Association! That's right, a helicopter held altitude records over any other aircraft for quite a while until the F4 Phantom came along.

On 30 December 1968, Chief Warrant Officer (CWO) James P. Ervin and CWO William T. Lamb climbed to over 30,000 feet in their CH–54A.⁵ The two Skycrane pilots, using a standard CH–54A with the hoist and four–point system removed, broke the previous altitude records held by the Soviet Union.

Ervin flew the aircraft straight up with vertical speeds exceeding 6,500 feet per minute with zero forward speed until 20,000 feet. When the Skycrane passed through 30,000 feet, it was still climbing at 995 feet per minute. The flight had to be terminated because of darkness and the absolute record for the Skycrane will never be known.⁶

During the record flight, air traffic control (ATC) tapes were notably affected. One ATC controller notified a commercial airliner flying at 17,000 feet about traffic stating, "be advised there's a helicopter at your 9 o'clock position descending out of 27,000 feet at a rate of 4,000 feet per minute." The pilot of the commercial airliner responded with, "Good Lord, you mean they're up here now?" Another pilot according to ATC tapes asked, "What kind of helicopter is that?"⁷

ANOTHER RECORD

A record for Skycranes I personally flew in was with Company H, 104th Aviation, Pennsylvania Army National Guard. Thirteen CH-54A helicopters were assigned to Fort Indiantown Gap, Pa. All 13 were fully mission capable at one time and an attempt was made to fly all 13 in one formation. Thirteen fully trained Skycrane crews were not available, so only 12 were manned. One aircraft had a caution segment light when the flight was lining up and had to be left behind. However, 11 CH-54A Skycrane helicopters took off in formation on 6 August 1988 and flew for about one hour. The flight was led by the commander Major Paul Almer, who regrettably died in a civilian helicopter accident one year later, which resulted in a nineship, missing-man formation over his funeral service.

ONE-OF-A-KIND HELICOPTER

A total of 88 CH–54 Skycranes were built. The CH–54 was originally produced with a short cabin. Then after serial number 66–18413, Sikorsky went with an extended cab model. The CH–54B was later developed with an increased maximum gross weight and higher payload capability. What made the CH–54 a one–of–a–kind helicopter was the hoist on it equipped with 100 feet of cable. With the hook being further away from the load, less rotor wash was noticeable when picking up the load. Also the hook could be lowered down through trees to retrieve downed aircraft.

VIETNAM—COMBAT TRAP

The CH–54A had an additional interesting history in Vietnam. It was tested and used to drop 10,000 pound bombs to clear landing zones (LZs). This program was called Combat Trap. The CH–54A would drop an M–121 bomb from 6,000 feet to clear helicopter LZs. The bomb was rigged to drop from under the helicopter and detonate at about 3 feet and clear a useful area of 100 feet in diameter. ⁸

WORKING FOR THE NATIONAL GUARD

After serving faithfully on active duty, the CH-54 Skycrane went to work for the Army National Guard, and work it did! The Skycrane had a multitude of missions both military and civilian. The "Flying Crane" carried aircraft to and from museums and air conditioners to the top of the Pentagon. Whole antenna towers were lifted at one time and set in place. One mission the Pennsylvania Army National Guard completed annually was to drop telephone poles with baskets at the top from 100 feet into marshes. This was done to provide nesting sites for eagles.

Humanitarian missions were always being conducted with this beautiful beast. An attempt to save a whale in Alaska was tried in the late 1980s. An aircraft fuselage was placed in Long Island Bay just off John F. Kennedy Airport to conduct a simulated airline disaster. A historic log cabin was moved in one piece onto the Appalachian Trail and the list goes on and on.

SAFETY RECORD

The Skycrane's safety record was very good. The U.S. Army



Safety Center (USASC), Fort Rucker, Ala., records go back only to January 1972. They show the CH–54 experienced only six Class A accidents during this time.⁹ This is a testament to the dedication of the people who flew and worked on the famous "Flying Crane."

CONTINUING TO SERVE

All Skycranes are out of the Army inventory now, but they are far from dead. Some Skycranes have found a new life with civilian companies and are hard at work again in the external loading and logging industry. Many are in museums now. One is proudly on display at the U.S. Army Aviation Museum at Fort Rucker, Ala. The museum now owns many of them and uses them to trade for other aircraft for their displays. Many were purchased for rebuild and have been sold overseas.

With a gallant history behind it, the Skycrane continues to serve this nation. Everyone watched on national/world TV this year when a Skycrane was used to lift the statue off the capitol building in Washington, D.C. for repairs. The Skycrane also was used to replace the statue. The massive helicopter was always a favorite at airshows. It probably burned more fuel than any helicopter ever will (500 gallons per hour)! Though the helicopter was over 88 feet long and weighed well over 40,000 pounds, it was the easiest helicopter to fly I have ever flown. The CH-54 Skycrane has earned a place in, not only Army aviation history, but all aviation history as a workhorse, a phenomenal aircraft, and a tribute to Igor Sikorsky and his abilities to develop an amazing machine!

Endnotes:

¹*Vertiflite*, November 1964, p. 5.

²Jane's All the World's Aircraft, 1969—1970, pp. 424— 436.

³U.S. Army Aviation Digest, February 1968.

⁴*Aviation Daily*, 3 May 1969, p. 9.

⁵U.S. Army Aviation Digest, June 1969, p. 10.

6Ibid.

⁷Ibid.

⁸*Air Force Review*, 1969, pp. 69–71.

⁹USASC data base. Aviation Mishaps involving CH–54—1 January 1972 through 4 May 1993.