

ACCIDENT INVESTIGATION REPORT

Adopted: November 3, 1955

Released: November 8, 1955

PORT OF NEW YORK AUTHORITY - NEW YORK, NEW YORK, JULY 13, 1955

The Accident

A Bell Helicopter, model 47G, N 942B, owned and operated by the Port of New York Authority, crashed during takeoff from the heliport atop the Authority's building, 111 Eighth Avenue, New York, New York, about 1515 e. d. t., July 13, 1955. The aircraft was destroyed by impact and ensuing fire and both occupants, Pilot Marcel Chevalier and Passenger Arthur Truss, were seriously injured.

History of the Flight

Pilot Chevalier landed the subject aircraft at the heliport about 1450 e. d. t. The engine was stopped to permit his two passengers to examine the helicopter. They did so, and left for an elevator to the building below. Passenger Arthur Truss then boarded with an aerial camera. The pilot plugged in to the helicopter an external power line and started the engine.

The purpose of this flight was to take photographs at Staten Island in the Port of New York Authority area, of projects in connection with the work of the Authority. Both the pilot and the passenger-photographer were employees of the Authority.

Takeoff was toward the southwest into a wind of about 16 miles an hour. Both occupants had their safety belts fastened. Seconds later, when the helicopter was about 10 feet high, it nosed down and its rotor blades struck the side of the building at the edge of, and immediately beyond, the heliport. It then turned over and fell, crashing in an inverted position against the west wall, and at the edge of the heliport. The tail rotor and associated components continued beyond the wall and fell to Ninth Avenue, 16 floors below, causing slight damage to one automobile and superficial injury to one pedestrian. The main wreckage balanced precariously at the edge of the heliport as fuel burned violently. The fire burned through the webbing of both safety belts, allowing both occupants to fall a few feet to the tiled roof, both landing on their heads. Building employees rushed in, dragged both from the fire, and extinguished flames on their clothing.

Meanwhile police, hospital, and fire-fighting agencies had been alerted. Personnel from all three were at the scene almost immediately as the site was in a congested area of Manhattan. The fire was extinguished with negligible damage to the building and pilot and passenger were taken to nearby St. Vincent's Hospital, Seventh Avenue and Eleventh Street, New York City.

Investigation

External power supply was used for starting. It is commonly used in helicopter operation as individual flights are often too short to allow re-charging of the helicopter's battery.

It was ascertained that the auxiliary battery boost cable, used for starting, had not been disconnected from the helicopter prior to takeoff. This cable is 32 feet, 9 inches long and consists of two conductors of No. 6 wire using a standard AN-2552-2A cannon plug. It is rather large in cross sectional area, strong in tension, and durable.

The external power supply receptacle was installed on the helicopter at the Bell factory, with CAA approval. It was located at station minus 12 on the left side (just rear of firewall and pilot seat) and faced outward horizontally.

Almost immediately after takeoff a right turn was made to the west toward the nearby Hudson River as a safety measure (the helicopter was fitted with pontoons). When the slack in the external power cable was used up, the cannon plug did not pull free because the direction of pull was at a large angle to the axis of the plug. Consequently, the helicopter was abruptly snubbed resulting in the nose dropping and the aircraft crashing. The pilot had sensed this drag only an instant earlier and there was no time to remedy the situation. A witness on the street below saw the helicopter "quiver" before it crashed.

The heliport is 376.50 feet above mean sea level and is privately operated by the Authority for its own use. The landing area is 40' x 45' and is surrounded by a heavy mesh wiring approximately 5' wide and at an upward angle of 15 to 20 degrees. Marking is conspicuous with a yellow center circle 20 feet in diameter with a white border one foot wide and white diagonal lines one foot wide.

Pilot Marcel Chevalier possessed a CAA airman certificate No. 98783-41 with commercial airplane, single- and multi-engine land and sea, instrument, flight instructor, aircraft, and helicopter ratings. His last CAA physical examination was passed on January 2, 1955. His total flying time to July 1, 1955, was 5,427:50 hours, of which 3,561:55 had been in helicopters. He had flown 3:50 hours during the day of the accident and had previously rested for a period of 18:40 hours. Mr. Chevalier had made approximately 4,000 takeoffs and landings without incident at the subject heliport. On one other occasion he had started takeoff (at La Guardia Airport) with the starting cable still attached but the plug pulled free before any damage occurred.

Investigation disclosed further that from May 1951, until this accident, there had been over 7,500 helicopter takeoffs from, and landings on, the subject heliport. All had been uneventful.

Gross weight at takeoff was 2,097 pounds as against a maximum allowable of 2,350 pounds. The location of the center of gravity, which is critical and

extremely important on helicopters, was within prescribed limits. A breakdown of the gross weight follows:

Empty weight	-	1,524	pounds
Photographer	-	170	"
Aerial camera	-	35	"
Pilot	-	140	"
Gas (35 gallons)	-	210	"
Oil (10 quarts)	-	18	"
		<u>2,097</u>	

Weather at the approximate time of the accident was reported by the U. S. Weather Bureau at New York as follows: Cumulus clouds .4 (approximately 5,000 feet); visibility 9 miles; relative humidity 39 percent; wind south 16 m. p. h. The Port of New York Authority has arbitrarily limited the use of their helicopters at this heliport to winds of less than 30-35 m. p. h., or 25 m. p. h. if gusty.

Maintenance on the helicopter had been thorough and in full compliance with all manufacturer's and CAA directives. Records indicated all periodic inspections had been meticulous. The total operating time was 1,089 hours of which 89 hours had been since the last 100-hour inspection on June 14, 1955. Individual components of the helicopter had been used well within their specific limits. The Port of New York Authority had set high operational standards for their helicopters as well as for the experience levels of pilots and mechanics.

Examination of the wreckage yielded nothing to suggest that there had been any malfunction of any sort and the pilot testified that there had been none.

The Port of New York Authority helicopters do not carry a takeoff checklist and are not required to. But it is the established custom for the pilot, and his exclusive responsibility, to handle the plugging in of the auxiliary power cable before starting the engine and to disconnect it before taking off. This is so because, as a safety measure, no persons are allowed on the confined area of the heliport while a helicopter is there with rotor turning. In this instance the pilot forgot to disconnect the cable and said so to Board investigators.

Analysis and Corrective Action

This accident does not present contention of any sort.

Immediately after this accident engineers of the Port of New York Authority devised a quick and automatic release fitting cable plug intended to prevent similar accidents. This new installation was soon applied to the Authority's sister helicopter and at all their landing sites.

On the new installation the receptacle on the helicopter faces vertically down. The plug is inserted vertically upward. A weight of several pounds rests on the surface of the heliport and is attached by a small chain with a few inches of slack to a quick-disconnect arm on the plug. Should the

disconnect operation be forgotten and the helicopter rise only these few inches, the weight trips the arm and the plug is forcibly ejected. This type of device is known generically as a mouse trap mechanism.

Findings

On the basis of all available evidence the Board finds that:

1. The helicopter and its pilot were currently certificated.
2. Weather was not a contributing factor.
3. There was no malfunction of the helicopter or of any of its components.
4. It was the pilot's sole responsibility to disconnect the starting cable.
5. The resulting snubbing by the cable unbalanced the helicopter causing loss of control.

Probable Cause

The Board determines that the cause of this accident was the pilot's oversight in not disconnecting the starting cable, causing the aircraft to crash.

BY THE CIVIL AERONAUTICS BOARD:

/s/ ROSS RIZLEY

/s/ JOSEPH P. ADAMS

/s/ JOSH LEE

/s/ HARMAR D. DENNY

Chan Gurney, Member, did not participate in the adoption of this report.

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AIR CARRIER
COMM. DIVISION
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