

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: April 20, 1949

Released: April 21, 1949

COLUMBIA AIR CARGO, INC.—YAKUTAT, ALASKA, NOVEMBER 27, 1947**The Accident**

At approximately 0317,* November 27, 1947, a DC-3 aircraft, NC 95486, owned and operated by Columbia Air Cargo, Inc., crashed one mile east-northeast of the Yakutat Range Station, Yakutat, Alaska. The eleven passengers and the crew of two were killed and the airplane was totally destroyed.

History of the Flight

The flight departed from Portland, Oregon, at 0919, November 25, 1947, for Anchorage, Alaska, with a crew consisting of Pilot J. B. Haworth and Copilot Toiro A. Keranen. No difficulty was experienced during the northbound trip until the flight arrived at Merrill Field, Anchorage, Alaska. During the attempted landing an engine was heard to overspeed. Power was applied, the airplane took off, and the left propeller was feathered. The flight circled the field for approximately 15 minutes after which the propeller was unfeathered and a normal landing was made. Mr. Haworth requested a repair agency on the field to remove the governor of the left engine. It was disassembled, examined, cleaned, and bench-checked. Nothing was found to indicate that the governor was malfunctioning, so it was again installed on the engine. At this time the left engine oil sump plug was examined, found clear of foreign matter, and the left main oil strainer cleaned. The flight continued to Fairbanks without further trouble, landing at 1738 November 25, 1947.

At 1955 November 26, 1947, the flight with the same crew departed from Fairbanks for the return trip to Portland with stops planned at Anchorage and Yakutat. En route to Anchorage severe turbulence and headwinds were encountered,

Otherwise this portion of the trip was uneventful. At Anchorage the airplane was serviced with 326 gallons of fuel. Ten gallons of oil were required for the right engine, and this amount plus the fact that considerable oil was noted on the outside of the cowling was called to the attention of Copilot Keranen. Mr. Keranen stated that the engine was due for overhaul upon reaching Portland and that it was all right for the remainder of the return trip. So far as is known a Weight and Balance Computation was not accomplished. However, no freight was aboard the airplane so it may be concluded that the airplane was well within the certificated gross weight.

The flight departed from Anchorage at 0020, November 27, 1947, carrying 11 revenue passengers and 600 gallons of fuel. At 0238 the flight reported that it was over Yakataga, Alaska, at 6,000 feet, and that it was proceeding in accordance with instrument flight rules to Yakutat, estimating arrival there at 0320. Twenty-eight minutes later at 0306 the flight called Yakutat Radio, stating that it was leaving the 6,000-foot altitude and making an approach "straight in." The CAA communicator acknowledged and transmitted the Yakutat weather "Indefinite ceiling, 500-foot overcast, visibility 3 miles, light drizzle, temperature and dew point 43 degrees, wind from the east-southeast at 10 miles per hour, altimeter setting 30.17." Yakutat Radio again called the flight at approximately 0316, requesting that it report the height of the ceiling when it descended into the clear. This was acknowledged by, "Okay Yakutat." No further communication was received from the flight. Shortly after the last transmission the airplane was heard to fly at a low altitude over a residence which was located approximately 300 feet south of the CAA Yakutat Radio station, and seconds later the occupants in the residence heard an explosion.

* All times referred to herein are Yukon Standard and based on the 24-hour clock.

They immediately notified the CAA communicator that an aircraft had crashed. Upon investigation it was found that the flight had crashed one mile east-northeast of the CAA Yakutat Radio station in a densely wooded area.

Investigation

So far as could be determined the first contact was made by the left wing when it struck a 140-foot spruce tree one mile distant and on a bearing of 70 degrees from the CAA Yakutat Radio station. The top of the tree, 10 feet long and five inches in diameter at the point where severed, was found with several wing skin rivets 25 feet from the base of the tree. The left wing and a portion of the left aileron were found 140 feet and on a bearing of 70 degrees from the tree. The main wreckage was 610 feet from the left wing and on a bearing of 63 degrees. The scars and broken timber in the immediate area of the crash indicated that the aircraft had plunged to the ground at an angle of 38 degrees.

Fire had destroyed the fuselage forward of the main cabin door, and also a large portion of the center section of the wing. The rearward part of the fuselage lay on its left side and was at right angles to the path of flight. The right wing lay inverted with the butt end adjacent to the fire area.

The left engine with its mount considerably distorted was centrally located in the fire area, and considerable damage from fire had resulted. The left propeller blades were bent straight back, following the contour of the engine cowling. The rose section was cracked. Upon removal it was found that the propeller reduction gear assembly was in a satisfactory condition. An examination was made of the interior of the front and rear power sections but revealed no damage to articulating or master rods, cylinder barrels, or piston skirts, nor was any sign of foreign matter found which may have grooved, scratched, cracked, or broken any part of the power plant. All cowling, magnesium alloys, and the major portion of the accessory section were destroyed by fire. Upon disassembly of the propeller it was found that two blades were in the full low pitch position and the third in a 70 to 80 degree high pitch position. Two of the propeller segment gears were broken.

The right engine remained partially attached to its mount in the nacelle. Most of the accessory section had been destroyed by fire. The propeller reduction gear housing was found broken from the engine and lay with the propeller and the reduction gear assembly behind the trailing edge of the wing approximately 12 feet from the rest of the right engine. All of the right propeller blades were found in a low pitch position, with their tips considerably twisted and distorted.

The position of the flaps could not be positively determined, but matching of broken turnbuckle bolts indicated that the flaps may have been in the 3/4ths "down" position. Landing gear retracting struts were found extended.

Spar caps, stringers, and portions of the skin from the left wing in the area of the point of separation were subsequently subjected to examination and tests. All of these parts proved to be of required strength, and no indications were found of fatigue. An examination of the left wing at the point of separation disclosed that the leading edge skin had been forced rearward almost to the face of the front spar, and the front spar itself had been displaced to the rear.

Maintenance of Columbia Air Cargo aircraft was accomplished at the company's base in Portland, Oregon. Only emergency and turn-around service was done en route. So far as could be determined, no continuing flight log was kept in the aircraft, nor was any record kept by the company to show that the pilots' requests for repairs were actually accomplished. Although these discrepancies were found in the maintenance records of the company, investigation revealed no instance of unsatisfactory workmanship or material, and the Portland base was adequately equipped to perform service on the company's airplanes.

When the flight departed from Fairbanks a deep low pressure area was centered over the southeastern portion of the Bering Sea. The low pressure area extended northeastward over Alaska, resulting in a strong flow of moist air from the south. Overcast conditions prevailed over the route flown with ceiling unlimited at Fairbanks, but reduced to about 3,200 feet at Anchorage and 500 feet at Yakutat. High winds and turbulence existed over the Alaska range.

Over the route south of Anchorage the most severe weather existed in the vicinity of Portage Pass, Alaska, where turbulence and icing existed at the 10,000-foot level. South of Portage Pass turbulence and icing were light to moderate, and in the Yakutat area no icing should have been experienced below 5,000 feet. Immediately before the accident the ceiling at Yakutat was observed to be 500 feet with a visibility of three miles.

Pilot J. B. Haworth, Jr., age 26, held an effective airman certificate with a commercial pilot and instrument rating. He had a total of 4,300 hours, 1,000 of which were in DC-3 type aircraft. His last instrument check was accomplished October 22, 1947, and he received his last CAA physical examination December 4, 1946. At the time of the accident he had made 25 round trip flights from Portland to Fairbanks. Copilot T. A. Keranen also held an effective airman certificate with a commercial pilot and instrument rating. He had a total of 4,000 hours, 2,000 of which were in DC-3 type aircraft. He received his last instrument check October 22, 1947, and his last CAA physical examination November 24, 1947. He had made six round trips from Portland to Fairbanks at the time of the accident.

At the time of this flight no radio facility was located on the northwest course of the Yakutat Range from which a suitable fix could be made for an instrument approach to the airport at Yakutat. For this reason, a straight-in approach to Yakutat from the northwest had not been approved by the Administrator of Civil Aeronautics. The standard radio range procedure for Yakutat as approved by the Administrator at the time of this accident, required a flight to continue on course, when approaching from the northwest, until passing over the radio range station at Yakutat. A descent below the initial approach altitude of 1,500 feet was to be made only after turning and proceeding outbound from the radio range station on the northwest course of the range. Then, after a procedure turn and returning inbound, the descent could be continued to 700 feet when again over the range station, and then to 500 feet, the minimum approach altitude.

At the time of the accident the runway and airport lights were on and clearly visible at the CAA Yakutat Radio Station

which was located 3-1/10 miles northwest of the airport.

Analysis

Though complete and detailed maintenance records were not kept by the company, no item of unsatisfactory workmanship or material was found in the aircraft. There is a possibility that the flight experienced failure of the left engine prior to the time of the crash. Bending of the left propeller blades straight back following the contour of the engine nacelle showed that only very small rotational forces, if any, were present at the time that the airplane struck the ground. Breakage of the propeller segment gears, on the other hand, indicated that the propeller was stopped when it struck some object, most probably a tree. Accordingly, the left engine may have failed as a result of striking trees, or as a result of some other reason, since there was not sufficient evidence found during the investigation to make any positive determination. Apart from this possibility of left engine failure, there was no indication of mechanical or structural failure prior to the time that the airplane struck the spruce tree.

Even though there had been a failure of the left engine, there should have been little trouble maintaining altitude since the airplane was lightly loaded at the time of the crash. Approximately 3 hours or 1,440 pounds of fuel had been consumed during the trip from Anchorage. No freight was carried, and there were only 11 passengers on board. Thus, it appears that the only explanation for the airplane striking the spruce tree is that it was flown too low during the straight-in approach to the Yakutat Airport, and the damage done to the leading edge and front spar of the left wing showed that the left wing separated from the airplane when it struck the tree.

An altimeter setting was contained in a weather report which was given to the flight eleven minutes before the accident, but it was never repeated by the pilot nor asked to be confirmed. This suggests the possibility that the altimeter may not have been adjusted to correct barometric pressure prior to or during the descent. It could not be determined what the altimeter setting was since the instrument was destroyed.

The standard radio range approach to Yakutat as approved by the Administrator required the airplane to be flown over the Yakutat Range Station at an altitude of 1,500 feet and execute a normal instrument letdown to the airport after turning on to the northwest leg. This was required since no radio facility, other than the range station itself, was available near Yakutat from which a definite position could be ascertained. The fact that the flight reported that it would approach, "straight-in," and also the fact that the flight was heard to pass 300 feet south of the range station at a low altitude indicated that the pilot in this case did not follow approved procedure, but accomplished his entire descent while en route. The last 100 miles of this flight to Yakutat was made over water and the pilot in his attempt to become contact may have descended over the water too low to clear the trees near Yakutat.

Findings

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

1. The carrier, aircraft, and crew were properly certificated.
2. Immediately before the accident the ceiling at Yakutat was 500 feet and the visibility was three miles.
3. The flight made a straight-in instrument approach to the Yakutat Airport.
4. A straight-in approach had not been approved by the Administrator for

aircraft approaching Yakutat from the northwest for the reason that a radio facility was not available on the northwest course of the Yakutat range from which a suitable fix could be obtained before descending to a minimum approach altitude of 500 feet.

5. The aircraft was heard to fly low over a residence 300 feet south of Yakutat Range station and seconds later heard to explode.

6. First contact was made by the left wing when it struck a 140-foot spruce tree one mile and on a bearing of 70 degrees from the CAA Yakutat Radio Station.

7. The left wing was separated from the aircraft at the time that it struck the spruce tree, as described above, and the aircraft then plunged to the ground.

Probable Cause

The Board determines that the probable cause of this accident was failure to follow the approved instrument approach procedures while making an initial approach to Yakutat at an altitude insufficient to clear trees along the flight path.

BY THE CIVIL AERONAUTICS BOARD

/s/ JOSEPH J. O'CONNELL, JR
 /s/ OSWALD RYAN
 /s/ JOSH LEE
 /s/ HAROLD A JONES
 /s/ RUSSELL B. ADAMS

Supplemental Data

Investigation and Hearing

The Civil Aeronautics Board, VIII Region, was notified of the accident at 0530 November 27, 1947, by a telephone call from the Civil Aeronautics Administration Communications. An investigation was begun immediately in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. The investigator from the Civil Aeronautics Board's regional office arrived at approximately 1545 November 27, 1947, at Yakutat by air. As a part of the investigation a hearing was held December 6, 1947, at Portland, Oregon, and in Anchorage, Alaska, January 15, 1948.

Air Carrier

Columbia Air Cargo, Inc., was incorporated under the laws of the State of Oregon and has its principal office at Portland. The company held a letter of registration, No. 481, issued to it pursuant to section 292.1 of the economic regulations and an operating certificate issued by the Administrator of Civil Aeronautics, VIII Region.

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Flight Personnel

Pilot J. B. Haworth, Jr., age 26, held an airman certificate with a commercial pilot and instrument rating. His last instrument check was accomplished October 22, 1947, and he received his last CAA physical examination December 4, 1946. At the time of the accident he had a total of 4,300 hours of which 1,000 were on DC-3 type aircraft.

Copilot T. A. Keranen held an effective airman certificate with a commercial pilot and an instrument rating. He received his last instrument check October 22, 1947, and his last CAA physical examination on November 24, 1947. When the accident occurred he had a total of 4,000 hours, 2,000 of which were on DC-3 type equipment.

The Aircraft

NC 95486 was a Douglas DC-3. It was manufactured in December 1942, and had a total of 3,756 hours. The left engine had never been overhauled and had a total of 700 hours. The right engine had 975 hours and had never been overhauled. The aircraft was equipped with Hamilton Standard Hydromatic Propellers.

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