

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: January 31, 1950

Released: February 1, 1950

TRANSCONTINENTAL & WESTERN AIR, INC., GANDER, NEWFOUNDLAND, MARCH 2, 1949

The Accident

Transcontinental & Western Air's Douglas DC-4, NC-34537, operated by the company's International Division, struck a power line and made contact with the ground during an approach for a night landing at Gander, Newfoundland, at approximately 0244,¹ March 2, 1949. Although severely damaged the aircraft became airborne and was landed at the Gander Airport. None of the passengers or crew was injured.

History of the Flight

Transcontinental & Western Air, Inc., Flight 924 departed LaGuardia Field, N. Y., at 2022, March 1, 1949, for Bombay, India, with the first scheduled stop at Gander, Newfoundland. The aircraft, with Captain Frank C. Saylor in command, carried 24 passengers, a crew of nine, and 2,440 gallons of fuel, together with mail and cargo. Total aircraft weight at the time of takeoff was 68,017 pounds, which was within the certificated gross weight of the aircraft, and the load was properly distributed in the aircraft as to its center of gravity. Flight 924 was cleared by New York Air Route Traffic Control to Gander, Newfoundland, on an instrument flight plan to cruise at 7,000 feet with Stephenville, Newfoundland, and Goose Bay, Labrador, as alternates.

On March 1, 1949, a deep occluded low pressure system was centered on the Atlantic near the south coast of Nova Scotia. This low pressure area was moving northeastward. The prognostic chart furnished the flight crew before departure showed the low pressure area to be just south of Newfoundland and weather enroute to have moderate icing in the clouds. A ceiling of 200-500 feet,

visibility from one to three-quarters of a mile and snow was forecast for Gander. The enroute weather was virtually the same as forecast, and the flight was routine until it arrived in the Gander area.

At 67 degrees west longitude, Flight 924 passed into the Gander control area and reported over Round Pond, 95 miles southwest of Gander Airport, at 0206, altitude 7,000 feet. The flight was cleared to the Gander Range to descend and maintain 5,000 feet, at approximately 0220. At 0230 the aircraft was cleared to the Gander tower to make a "GCA (Ground Control Approach) straight-in" approach, using Runway 9, and was advised that the surface wind was variable from the northeast to east-northeast at fifteen to twenty miles per hour. The 0230 weather was transmitted to the flight by GCA and acknowledged as 400 feet overcast, visibility two miles, light freezing drizzle, light snow and fog, altimeter 29.64.

Flight 924 was first picked up, and showed clearly, on the GCA azimuth scope fourteen miles west of the field. At this time it was advised to descend from four thousand to three thousand feet.

The aircraft was identified thirteen miles west of the field, and was further advised to start its final approach and it was given the latest altimeter setting of 29.64 inches. This approach was observed on the GCA precision scope. Considerable rime ice accumulated during the descent through the overcast obscuring the copilot's windshield and largely obscuring the windshield on the captain's side. Flight 924 established visual contact at approximately four hundred feet above the ground while two miles from the airport. The landing gear was then lowered and the flaps set to fifteen degrees preparatory to landing. Approximately 1,615 feet from the

¹All times referred to herein are Greenwich Civil Time and based on the 24-hour clock

approach end of Runway 9 the aircraft struck a power line and then contacted the ground. Full power was applied, the aircraft again became fully airborne and continued to the runway where a landing was made.

Investigation

Gander Airport has three runways and Runway 9, which was being used, is 6,250 feet long as shown by the CAA approved plate. A row of red approach lights of high intensity, having a one degree slope, extends for 1,500 feet and in line with its left side. The terrain to the west of the airport and under the approach path is irregular in contour gradually sloping upward for 700 feet; here it abruptly descends to the level of Gander Lake, three-quarters of a mile from the west end of Runway 9 and approximately 390 feet below it.

Sixteen hundred and fifteen feet west of the approach end of this runway is a power line which extends diagonally across and below the GCA glide path. This power line consisted of four wires suspended on poles spaced 105 feet apart. The topmost wire was 83 feet below the GCA glide path and 15 feet above the elevation of the west end of Runway 9. First contact was made with these wires by the nose wheel of the aircraft. The top three wires, in line with the propellers, were stretched and severed at a point six feet in from the pole on the left side of the flight path. The fourth wire, four feet below the others and not in line with the propellers, was torn from its insulators. From a point sixty-eight feet beyond the power line and toward the airport and for a distance of one hundred and fifty feet, the aircraft struck and sheared the tops of small trees. Matching marks indicated that the left wing, the fuselage, the left main landing gear and a portion of the leading edge of the right wing struck these trees. One hundred and thirty-six feet from the power line the right wing tip contacted the snow-covered ground and scraped along the surface for sixty feet where it struck a mound. Impact with this mound bent the wing upward at an angle of about 45 degrees, three feet inboard from the tip. Adjacent to the mound the right main landing gear made a wide furrow ninety-eight feet long in the

snow. The nose wheel did not touch the ground or the snow at any time. The absence of ground marks beyond this point indicated that the aircraft became fully airborne thirteen hundred and twenty-two feet from the end of the runway. Though impact with the wires, trees, and the ground substantially damaged the aircraft, it was flown to the airport and a safe landing was made. A reconstruction of the flight path over the ground from the point of initial contact with the wires showed that the aircraft was flying in line with the approach lights extending from the left edge of the runway and was making a shallow right turn when the accident occurred.

At an altitude of 2,300 feet MSL (above sea level), the aircraft entered the lower overcast. During the descent through this overcast, the captain turned on the propeller deicers. Later noticing the windshield gathering ice, the windshield deicer was turned on. However, it had to be turned off shortly as alcohol fumes filled the cockpit, creating a fire hazard. As a result the windshield became covered with ice impairing forward vision except through an opening approximately one-fifth of the area of the left windshield in its upper left corner. Examination of the windshield and windshield deicer system disclosed that the rubber seal and sealing compound had deteriorated allowing alcohol to enter the cockpit through the windshield.

The "clear view" window, which is normally opened when cockpit visibility is obscured, was not opened because of a company restriction. The company restriction against its use was based on the belief that carbon monoxide might enter the cabin and the cockpit, since the company had not complied with the directive below. This CAA Airworthiness Directive concerning the above was issued December 1, 1947, to be effective by January 1, 1948, and states:

"If the clear view panel in the windshield is opened in flight when the landing gear and flaps are extended, exhaust fumes enter the cabin. This causes considerable discomfort to passengers and may create a hazard which would affect the safe operation of the

airplane. In order to prevent the exhaust fumes from entering the cabin under these conditions, all openings around the control cables and flap buss system at the side of the fuselage must be sealed and additional means for exhausting main cabin and cockpit ventilating air provided, unless tests made by the operator of the individual airplane show no unsatisfactory condition of carbon monoxide entering cabin with open windows when landing gear is down and flaps extended."

Once contact and beneath the overcast the captain did not look at the altimeter but relied entirely upon visual reference to the ground and upon GCA instructions for changes of altitude.²

The aircraft first became properly aligned with the GCA flight path at a point about 6 miles west of the runway. All deviations from the flight path were properly and quickly corrected. About two miles from the end of the runway, apparently when the flaps and gear were lowered on becoming contact, the aircraft dipped below the glide path. When approximately one mile out the aircraft was observed to be 88 feet low and from this point it remained consistently low. About one-half mile from the end of the runway the captain was advised to make a slight correction to the right and was told that he was 40 feet low. A moment later he was advised that he was 20 feet low and correcting nicely. Shortly thereafter, the aircraft shuddered as if approaching a stall. A quick glance at the air speed indicator showed that it then registered 110 miles per hour. Investigation disclosed that at this point the aircraft struck the power line and, an instant later, the right wing and right landing gear scraped the snow-covered ground. From this point until a landing was accomplished on the airport, the captain flew solely by visual reference to the ground.

There was no evidence of malfunctioning of the engines, instruments or the

aircraft prior to the accident, other than the windshield deicing system.

During the investigation, it was found that shortly prior to the arrival of Flight 924, the GCA mobile unit was moved from Runway 36 to Runway 9 because of change of wind direction. Inspection of this equipment subsequent to the accident disclosed that the glide path and runway azimuth was in proper alignment.

The captain had a total of 8,793 hours of piloting. His total instrument time was 542 hours and total DC-4 time was 393 hours. He had made a number of GCA practice approaches to Gander Airport, the subject approach, however, was the first actual approach made necessary by weather conditions.

Analysis

On departure from LaGuardia Airport weather reports indicated that at Gander the weather would be marginal with low ceiling, light freezing rain, and restricted visibility. On arrival of the flight over the Gander area the weather was substantially as forecast. Due to the weather being below required limits for other methods of approach, the captain chose to make a GCA approach rather than to go to either of his alternate airports. At the time the weather at both alternates was well above minimums. Even though the windshields accumulated considerable ice during the descent through the overcast, which greatly impaired cockpit visibility, the captain did not discontinue the approach. Rather, upon becoming contact he chose to continue the flight using two piloting methods, i. e., by visual reference to the ground and by following GCA instructions. This is not considered standard piloting technique since the use of either method alone requires the undivided attention and alertness of the pilot. Furthermore, the approved GCA procedure states that "Upon reaching authorized minimums proceed in accordance with visual reference, or if unable to maintain visual reference, execute a prescribed missed approach procedure." Once the captain established contact he did not again refer to the altimeter but relied entirely on GCA instructions for changes of altitude. This was not in accordance with approved procedure as GCA is an approach aid to specified

²GCA is an aid to landing during marginal weather. Its function is supervisory only and its responsibility ceases once the flight has established visual contact with the ground. However, as in this case, the aircraft's position sometimes continues to be given to the pilot

minimums and from this point on the pilot is solely responsible for the safe operation of the aircraft. Since the captain did not lower the gear and flaps of the aircraft until he was close in on his approach, approximately 2 miles out, this fact may have caused the remainder of his approach on the glide path to be erratic. The final mile of the approach was flown consistently low, and was so reported to the flight by the GCA operators. Nevertheless, the aircraft's elevation was not fully corrected as it continued its approach, and as a result, it struck the power line.

Findings

1. The carrier, the aircraft and the crew were properly certificated.
2. The weather, as reported at the time of the accident, was above the prescribed CAA night minimum for a standard GCA approach.
3. Weather at the predetermined alternate airports was within safe limits.
4. The windshield rubber seal and sealing compound deteriorated permitting alcohol fumes to enter the cockpit causing a fire hazard and preventing the use of the windshield deicer system.
5. Ice, which accumulated on both windshields, restricted the cockpit visibility of the crew.
6. A company restriction prohibited the use of the clear view windows.
7. The captain's attention was divided when he employed two flight

methods, i. e., by visual reference to the ground and by instructions from GCA during the approach.

8. The radar precision scope showed that the aircraft was consistently low throughout the latter stage of the approach.

9. There was no malfunctioning of the aircraft or engines prior to the accident, other than the windshield deicing system.

10. There was no malfunctioning of the GCA equipment prior to or during the approach.

Probable Cause

The Board determines that the probable cause of this accident was the attempt to continue an approach for a landing using both GCA and visual reference to the ground under conditions of restricted cockpit visibility which resulted in the aircraft striking the ground.

BY THE CIVIL AERONAUTICS BOARD:

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

Harold A. Jones, Member of the Board, did not participate in the adoption of this report.

Supplemental Data

Investigation and Hearing

The Civil Aeronautics Board was notified of the accident involving Transcontinental & Western Air, Inc., at Gander, Newfoundland, by telephone at 0025, March 2, 1949. An investigator from the Board's New York office proceeded to the scene of the accident and an investigation was immediately initiated in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. A public hearing was ordered by the Board and was held in New York, April 7 and 8, 1949.

Air Carrier

Transcontinental & Western Air, Inc., is incorporated in the State of Delaware and maintains headquarters for its international division at New Castle, Del. Transcontinental & Western Air, Inc., possessed a certificate of public convenience and necessity and an air carrier operating certificate which authorized the air carriage of persons, property, and mail over the route described in this report.

Flight Personnel

Captain Frank C. Saylor, age 36, held a valid airline transport pilot rating. He had a total of 8,793 flying hours of

which 393 were in DC-4 type equipment. His last instrument check was accomplished on October 13, 1948, and his last physical examination was October 12, 1948. First Officer J. E. Carey, age 30, held a valid airman certificate with commercial pilot and instrument ratings. He had a total of 4,628 flying hours of which 415 were in DC-4 type equipment. His last physical examination was accomplished January 21, 1949. The other crew members consisted of George Gay, relief pilot; C. J. Query, flight engineer, O. C. Hodge, radio officer; W. J. Freeman, radio officer; L. W. Nocito, navigator, M. A. McFarland, purser, and Mary Boyle, hostess.

The Aircraft

NC-34537, a Douglas DC-4, Model C-54B-DC, had a total of 7883:23 flying hours and was currently certificated by the Civil Aeronautics Administration. It was equipped with four Pratt and Whitney R-2000-9 engines. No. 1 engine had a total of 4248:24 hours, No. 2 a total of 4355:34 hours, No. 3 a total of 3248:59 hours and No. 4 a total of 4082:38 hours. Nos. 1, 2 and 3 engines all had 1020.47 hours since overhaul. No. 4 had a total of 637:52 hours since overhaul.