

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: May 12, 1950

Released: May 15, 1950

**TRANSCONTINENTAL & WESTERN AIR, INC., CHICAGO, ILLINOIS,
DECEMBER 18, 1949****The Accident**

Transcontinental & Western Air's Flight 154, NC-86501, a Lockheed Model 49-46 Constellation, failed to stop within the length of Runway 13R during a landing on the Chicago Municipal Airport at 0817¹, December 18, 1949. The aircraft continued on beyond the end of the runway, went through the airport boundary fence, and came to rest in the adjacent street. The aircraft was extensively damaged. One passenger was slightly injured; the other 25 passengers and the five crew members were not injured.

History of the Flight

Flight 154 departed San Francisco, California, at 0045 on an Instrument Flight Plan for New York, New York, with one stop scheduled at Chicago, Illinois, and with Amarillo, Texas, designated as the alternate airport. The crew consisted of Captain S. M. Kasper, First Officer H. C. Shively, Flight Engineer D. G. Grimes, and Hostesses L. Mond and J. Tutt. Total aircraft weight was 90,323 pounds which was within the allowable gross limit of 93,000 pounds and all disposable load was so distributed that it was within the certificated limits with respect to the center of gravity.

The weather forecasts available to the crew at the time of take off indicated that at the planned cruising altitude of 17,000 feet, the flight would be generally above the clouds until the descent was made at Chicago.

After passing Cheyenne, Wyoming, the captain changed his flight plan and selected Omaha, Nebraska, as the new alternate. Over Moline, Illinois, Chicago Air Route Traffic Control cleared the flight to Aurora Illinois, and instructed it to hold west of the Aurora

Intersection because of an estimated two-hour traffic delay. Flight 154 reported over the Aurora Intersection at 0703, and a few minutes later the captain requested a clearance to return to Omaha. This clearance was granted. Seven minutes later, at 0710, while en route to Omaha the company issued the flight revised instructions to proceed to Kansas City, Missouri, instead of Omaha.

While en route to Kansas City, the company's Kansas City dispatcher informed the flight that if they returned to Chicago immediately, an approach clearance could be obtained without delay. Accordingly, the flight returned to Chicago and upon arrival there approach control cleared it to make an ILS (Instrument Landing System) approach and to land on Runway 13R.² At this time the Chicago weather was reported: ceiling 300 feet, visibility 1-1/2 miles with moderate fog and smoke, and wind west-southwest at 8 miles per hour. The ILS approach was abandoned at the captain's discretion and he started another. On this second approach the aircraft was observed to touchdown approximately 3,200 feet from the approach end of the runway. From this point, it traveled the remaining 2,530 feet of the runway, went through the airport fence and came to rest in Cicero Avenue.

Investigation

Investigation revealed that the aircraft traveled 875 feet beyond the far end of Runway 13R and went through a heavy wire fence, crossed a parking lot and struck a billboard and a large ornamental stone pillar before coming to rest. Contact with these structures extensively damaged the aircraft.

¹All times referred to herein are Central Standard and based on the 24-hour clock

²13R is the right hand of two parallel runways, both 13

That portion of the left wing between Number 1 engine nacelle and the fuselage was torn in a rearward direction from its leading edge to the rear spar. Damage sustained in this area permitted the wing to slope downward away from the fuselage. Approximately six feet from the end the wing was bent slightly upward. Number 1 and 2 engine nacelles, attached to this wing, were badly damaged. A large segment of the leading edge of the right wing was compressed inward toward the front spar. Engine nacelles 3 and 4 were not damaged. Considerable damage was done to the left side of the fuselage in the vicinity of the main cabin door. Immediately below and to the right of this door the fuselage was torn and crushed. A long tear was found on the right side of the fuselage near the galley.

Both the main landing gear and the nose wheel gear were extended and locked. The left side of the main landing gear together with that part of the aircraft's structure to which it was attached was forced rearward allowing the fuselage to settle to the left. The aircraft remained supported by the right main and nose landing gear.

All main gear tires showed evidence of wear due to skidding in addition to service wear. The left inboard tire had a hole in its center caused by a skid burn. Tire marks were visible on the runway for a distance of 1,000 feet from its southeast end with evidence that tires were skidded the last 500 feet of this distance.

Due to impact forces Number 1 engine was partially separated from its mount. Propeller blades of each of the four propellers were damaged with the greatest damage done to the propellers of engines one and two.

Wing flaps were in the full down position which corresponded to the position of the cockpit control. The flap control mechanism was examined and tested and functioned in a normal manner.

Investigation showed that the landing gear control handle in the pilot's cockpit was in the "up" position, as a result of the copilot's attempt to retract the gear when it became apparent that the aircraft could not be stopped within the length of runway.

The brakes of the right wheels were tested at the scene of the accident and found to be normal. Later tests substantiated this finding. The left landing gear assembly was damaged in such a manner that similar braking tests were impossible. However, the left wheels and brakes were removed from the aircraft and shipped to the company's maintenance headquarters for further examination. These brakes also functioned properly under test. All flight instruments and the aircraft's ILS radio apparatus were tested and found to operate within normal tolerances. The aircraft was not equipped with reversible pitch propellers or a steerable nose wheel.

Runway 13R of the Chicago Municipal Airport is a macadam runway 5,730 feet long and is approved by the CAA for ILS straight-in approaches. On the morning of December 18, 1949, the runway was wet from rain during the night; however, there was no water standing on the runway.

Forecasts available to the crew before departing San Francisco indicated generally good weather along the route at the proposed cruising altitude of 17,000 feet until arrival in the Chicago area. The weather at Chicago between the hours of 0130 and 1100 was forecast to be ceiling 400 feet, light rain or drizzle, and visibility variable from two to one-quarter miles. Weather encountered was virtually as forecast except that when over the states of Nevada, Utah, and most of Wyoming, icing conditions caused an increase of flight altitude to 19,000 feet.

Flight 154 had an estimated 2,100 gallons of gasoline aboard when it first arrived in the Chicago Area. As stated, the flight was routine until the first ILS landing approach was attempted at Chicago. On this approach the aircraft was aligned with the ILS glide path but was too far to the right of the course and the approach was therefore abandoned before visual contact with the ground was established. The second approach, however, was properly aligned with both the glide path and course. These approaches were observed and monitored by the CAA Ground Control Operator on the GCA radar precision scope. Flight 154 was first observed about 3/4 mile from

the approach end of Runway 13R at an approximate altitude of 300 feet. Competent observers on the ground testified that the approach speed was faster than normal. As the aircraft came closer to the airport it seemed as though it would land on the runway approximately 1/3 the distance from the approach end; but as it neared the surface and flared out, it remained airborne for a considerable distance before the touchdown was made. Approximately 2,530 feet of usable runway remained. Contact with the runway was made in a normal manner with the aircraft landing on the main landing gear wheels in a nose-high attitude. Almost immediately after initial contact with the runway, the nose of the aircraft was pushed down and brakes were applied. The piloting technique of bringing the nose wheel of the aircraft to the ground immediately after contact with the runway is a company procedure recommended for use on slippery runways. The crew stated that there was normal brake pressure when the brakes were applied but that there was little or no braking action. When approximately 450 feet from the end of the runway the captain applied power to Number three and four engines and simultaneously applied the left brakes in an attempt to ground loop the aircraft to the left. This was done to avoid the ILS transmitter building located a short distance beyond the end of the runway. The aircraft did not ground loop but did swerve to the left enough to miss the building; however, the speed of the aircraft was increased because of the application of power and it continued on and through the fence.

Although there was some difference of opinion among those watching the landing as to the exact location of the aircraft's initial touchdown, all witnesses agreed that the aircraft actually landed well down the runway.

The crew stated that the flaps were set at the 80 percent down position during the initial ILS approach and that throughout the entire go-around they remained in this position. They also stated that on the second approach, immediately after establishing visual contact with the ground, the flaps were lowered to the full down position. A passenger aboard the aircraft who, although not a pilot, had ridden as a passenger many times in large aircraft,

said that they were not fully extended until after the aircraft was on the ground.

According to the crew, the aircraft's indicated air speed was between 135 and 145 miles per hour throughout the ILS approach until visual contact was established and from this point on the approach speed to them seemed to be normal.

Analysis

As stated above, a passenger aboard the aircraft said that the flaps were not fully extended until after the landing was accomplished. If this was correct, the approach speed of the aircraft would have been faster than normal which could account for the fact that when the aircraft neared the surface of the runway it remained airborne for a considerable distance.

The captain lowered the nose wheel of the aircraft to the runway immediately after the landing was made in order to lessen the lift on the wing and to place more of the aircraft's weight on the landing gear; in so doing it was possible to obtain more effective braking and quicker deceleration of the aircraft.

The crew stated that throughout the landing run the braking action was not effective. When the brakes were subsequently examined, however, they were found to function in a normal manner. The worn condition of the tires and tire marks on the runway were additional supporting evidence to this fact. It is well established that the coefficient of friction of rubber tires on wet runway surfaces is very low at high speeds. Since Captain Kasper knew the runway was wet, he should have used greater precaution during his approach, so that the landing would be made with sufficient runway remaining within which to stop.

In conclusion, an examination of the facts shows that the ceiling was near the ILS minimum, the pilot had missed one approach, the direction of the surface wind was unfavorable, possibly increasing somewhat the ground speed of the aircraft, and the runway was wet. In addition, the aircraft was landed too fast and too far down the wet runway to allow stopping within the remaining distance.

Findings

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

1. The carrier, aircraft and crew were properly certificated.
2. There was no malfunctioning of the aircraft or any of its components prior to the accident.
3. Upon the arrival of the flight in the Chicago area the weather was below landing minimums and an estimated two-hour delay in landing was reported to the crew by Air Traffic Control.
4. While enroute to another airport, the flight was advised to return to Chicago where an immediate landing could be executed upon arrival.
5. An ILS approach was instituted at Chicago but was abandoned by the pilot because the aircraft was too far to the right of the localizer course.
6. A second ILS approach was properly executed and visual contact and alignment were established with runway 13R which was wet but without standing water.

7. The aircraft landed too fast and too far down the runway, went through the airport boundary fence and struck various objects before coming to rest in an adjoining avenue.

8. The brakes were found to function in a normal manner.

Probable Cause

The Board determines that the probable cause of this accident was the execution by the pilot of a final approach at an excessive air speed and a landing too far down the runway.

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 Chicago, Illinois, by CAA Communications, Chicago, at 0825, December 18, 1949. An investigator from the Board's Chicago 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 Chicago, on January 5, 1950.

Air Carrier

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

Flight Personnel

Captain Stanley M. Kasper, age 42, held a valid airline transport pilot rating. He had a total of 11,558 flying hours. His last instrument check was accomplished on July 8, 1949, and his last CAA physical examination was August 29, 1949. First Officer Hubert C. Shively age 28, held a valid airman certificate with a commercial pilot and multi-engine instrument ratings. He had a total of 4,897 flying hours. His last CAA physical examination was accomplished March 14, 1949, and his last instrument check accomplished on September 12, 1949. The other crew members consisted of D. G. Grimes, flight engineer; L. Mond and I. Tutt, hostesses.

The Aircraft

NC-86501, a Lockheed Constellation, Model 49-46, manufactured in November 1945, had a total of 9,512 flying hours and was currently certificated by the Civil Aeronautics Administration. It was equipped with 4 Wright engines 745018BA-3, and the propellers were Hamilton Standard Hydromatic, full feathering type.