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CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: August 31, 1949 Released: September 2, 1949

TRANSCONTINENTAL & WESTERN AIR, INC.—LOS ANGELES, CALIFORNIA—NOVEMBER 25, 1948

The Accident

Transcontinental & Western Air's Flight 211, a Lockheed Constellation NC-90824, crashed while landing at the Los Angeles Municipal Airport, Los Angeles, California, at approximately 0552,[1] November 25, 1948. Minor injuries were sustained by two passengers The other 16 passengers and crew of five on board the aircraft were not injured The airplane was substantially damaged by the landing and the fire which followed

History of the Flight

Flight 211 of November 24, 1948, originated in Washington, D C , and was scheduled for stops, en route to Los Angeles, at Kansas City, Missouri, Albuquerque, New Mexico, and Phoenix, Arizona After a routine trip to Kansas City, the airplane was serviced and at 2200 the night of November 24, 1948, the flight took off with a flight crew consisting of Captain Evan Lewis, First Officer Leon R Pierson, Flight Engineer Virgil C James and Hostesses Sally Sanes and Virginia Munson Except for a little difficulty the hostesses had in closing the main cabin door, no trouble was experienced during the trip, until the time of landing at the Los Angeles Municipal Airport

Weather information available to Flight 211 prior to departure from Phoenix at 0358 indicated that at the time of arrival in Los Angeles, ground fog conditions would prevail over the airports located at Los Angeles, Burbank, and Long Beach. Palmdale, California located 45 miles northeast of Los Angeles, forecasted to remain clear, was designated as the alternate airport

Additional weather information was received en route Approximately one hour after takeoff from Phoenix, a company weather report was received by the flight to the effect that the visibility at Los Angeles was reduced to one-half mile, when 23 miles from Los Angeles, at 0530, the Los Angeles tower advised that visibility on the field was restricted to one-quarter of a mile

As Flight 211 approached Los Angeles, clearance was given to pass over the Los Angeles Municipal Airport, and the tower there relayed to the crew information received from a previous flight to the effect that ground fog conditions in the area were general Shortly after 0540 the tower transmitted a special weather observation as, "Roger 211, special, at 0540 clear, visibility one mile ground fog " Accompanying remarks contained in the Weather Bureau report, "Ground visibility one-half mile, variable from one-quarter to three-quarters mile, estimated 10 to 50 feet deep," were omitted

A shallow left turn was made over the airport, after which the prelanding check list was accomplished. A procedure turn was then executed east of the field and a landing approach was made to Runway 25L. According to the pilot the runway approach lights remained clearly visible, though small puffs of clouds were encountered during the approach. Flaps were fully extended when the airplane passed over the boundary of the field

Before touching down on the runway, a thick formation of ground fog was encountered. Visibility was reduced to practically zero. Contact with the runway, 2,300 feet from the approach end, was made with sufficient impact force to deform the wing structure and deflect the No 4 engine nacelle downward to the extent that the No. 4 propeller struck the runway Following the landing fire was observed in the area of the No. 4 engine nacelle. Brakes were vigorously applied The aircraft rolled forward in

[1] All times noted herein are Pacific Standard and based on the 24-hour clock.

a slight left turn, coming to rest 1,500 feet from the point of landing, and 197 feet from the left edge of Runway 25L. Flames rapidly engulfed the right wing and fuselage but all passengers were deplaned without serious injury.

The airplane had been observed by the tower on the landing approach, though fog obstructed it from view just before it passed over the airport boundary. The tower also observed it over the runway, at which time it appeared to be flaring out for a normal landing. After that the airplane could not be observed because of fog. Several calls were made by the tower to Flight 211 but no acknowledgements were received. Noticing a reddish glow on top of the fog approximately where the flight had disappeared, the tower called Pan American Operations, located near Runway 25L, and was informed that something was burning on the runway. At 0558, six minutes after the aircraft landed, the tower called the Los Angeles Fire Department and asked them to investigate Equipment on the airport was promptly dispatched and it arrived at the scene of the accident about two minutes later. By the time fire equipment arrived, however, the aircraft was practically destroyed.

Investigation

Wheel marks on the runway showed that the left main landing wheels made contact with the runway first and were immediately followed by the right main wheels and the nose wheel. Rim cuts from the nose wheel showed that the tire had blown out at the time of landing. Wheel marks also showed that the airplane had a heading of eight degrees to the left of the runway when it landed, and that it swerved slightly to the right for 10 feet of roll, then followed a curve to the left. At the point where the aircraft was stopped, marks showed that a very abrupt turn of approximately 90 degrees had been made to the right. Rivets from the wing were found scattered along the entire path of the landing roll.

On the date of this accident there was a trench three feet wide and two and one-half feet deep located 250 feet to the left of Runway 25L. It had been dug for the installation of FIDO[2] equipment. When the aircraft was turned sharply 90 degrees to the right just before stopping, the left outboard tire had passed over the lip of this trench.

To the right of the wheel marks, starting 275 feet from the point of touchdown, several cuts one inch deep were left on the runway and in the ground by the No. 4 propeller. There was also found along the path of the landing roll scorched areas which showed that fire occurred almost immediately after the landing.

Fire destroyed the right wing inboard of the No. 4 engine nacelle, the fuselage forward of the tail section, and the right main landing gear. The nose wheel gear collapsed as a result of fire damage to the attaching structure. Relatively little fire damage occurred to the left side of the airplane and the left wing did not burn. The left main landing gear remained extended with the tires still inflated.

Examination of the left wing disclosed damage resulting from a severe download. The wing structure was badly deformed. Skin on the top surface was wrinkled, many skin rivets were missing, and several buckles appeared in the front and rear spars. Since the right wing had been consumed by fire inboard of the No. 4 engine nacelle, an examination similar to that accomplished on the left could not be made, but such fragments as remained contained similar evidence of a severe download.

Engines, propellers, and the fuel, oil, hydraulic, and electrical systems were all examined in detail. This part of the investigation disclosed no evidence of any type of mechanical or structural failure in any component of the airplane, nor was any indication found of fire prior to the time that the aircraft was landed.

A weak cold front passed over the Los Angeles area the night of November 24, but it did not penetrate to the surface. Consequently, moist stable air which had been carried in from the sea remained below the 2000-foot level over the coastal basin. As the ground cooled during the night of the 24th and the morning of the 25th, patches of stratus clouds and heavy ground fog formed. By 0300 the stratus clouds dissipated, leaving thick banks of ground fog varying from 10 to 50 feet in depth. Light variable winds, from three to four miles per hour, shifted these thick formations of fog

[2] Fog, intensive dispersal of

back and forth over the Los Angeles Air Terminal. These conditions were accurately forecasted. As previously stated, the information was available at Phoenix prior to departure, and it was confirmed in the company's radio weather report and in the tower's transmissions, prior to the time the flight arrived over the Los Angeles area.

After the layer of stratus clouds dissipated, the sky remained entirely clear, but visibility, with the low dense formations of ground fog, became highly variable From a position permitting observations above the fog, there was visibility from one to three miles while visibility was limited from three-fourths to one-sixteenth of a mile on the ground in the fog. The variability of this condition is indicated by the fact that between the period of midnight and 0835 the morning of November 25, the weather observer on duty found it necessary to make 32 special observations.

A temporary improvement of conditions on the field was reflected in the 0540 special observation when the visibility was reported to be one mile It was this particular observation that was transmitted to the flight as it flew over the Los Angeles Municipal Airport. But the transmission omitted the observation remarks, "Ground visibility one-half mile, variable one-quarter to three-quarters mile, ground fog estimated 10 to 50 feet deep." At 0551 another special observation reported the visibility to be one-half mile, however, the flight was landing at that time and the information was not available to the pilot.

Instructions of the Administrator to tower operators at the time of the accident required reporting of ceiling and visibility when weather conditions were at or below minimums, but they did not make mandatory an inclusion of the information contained in the remarks portion of a weather observation. Such information, however, was contained in a teletype message which was received by the company dispatcher on duty at the Los Angeles Municipal Airport.

The tower and weather observation platform at the Los Angeles Municipal Airport are three-eighths of a mile from the nearest part of Runway 25L, and approximately one-half mile from the east end, and three miles from the west end. Accordingly, neither the tower nor the weather observer can see the entire runway when visibility at the tower or the weather observing platform is reduced to one-half mile.

At the time of this accident the company did not have in operation the necessary radio equipment to monitor communications between tower and aircraft, and no member of the crew was required to stand by on a company frequency immediately before or during landing approach.

A pilot of another flight, parked near the approach end of Runway 25L, observed Flight 211 before landing, watched it disappear into the fog, and shortly after observed the glow of fire. When taxiing west on the runway to locate the aircraft, he encountered fog one-quarter of a mile from the approach end of the runway.

Ground personnel located on the airport and to the south of Runway 25L observed dense fog conditions prior to and at the time of the landing. From their position the burning aircraft was visible only as a faint glow because of the fog. One passenger on board Flight 211, seated next to the right hand window, third seat from the front, was unable to observe any lights on the runway or the airport either before or during the landing approach.

Runway 25L at the date of this accident was equipped with high intensity Bartow lights for the first 1,160 feet of runway from the east or approach end. Only low intensity contact lights were installed on the remainder of the runway.

The pilot of the flight, Captain Evan Lewis, age 44, had flown for the company as pilot since April 7, 1930 At the time of the accident he had a total of 15,425 flying hours, of which 1,410 were in Constellation type aircraft. The co-pilot, First Officer Leon Pierson, age 28, was employed by the company June 19, 1947. He had a total of 3,700 hours, of which 490 were in Constellation type aircraft. Both pilots had received their first training in the United States Air Forces, and both held the necessary airman certificates and ratings to make the flight.

Analysis

It is apparent that the pilot, losing visual reference to the runway and the ground when he encountered fog just before completing his landing maneuver, was neither able to control the last portion of the descent nor to maintain

directional control of the aircraft after making contact with the ground. As a result, the aircraft struck the ground hard enough to cause structural failure and then rolled off the runway. The fact that the fire smudges on the runway were closely followed by the propeller marks indicated that the fire occurred immediately following the structural failure.

Since the right side of the airplane was almost entirely destroyed, it was not possible to determine how the fire actually started, however, there are several possibilities Lines for gasoline, alcohol, hydraulic oil, and engine oil in the No. 4 engine nacelle were probably damaged at the time of landing. Gasoline, alcohol, or oil from a broken line or tank could have been ignited from the engine exhaust or from the short circuiting of electrical lines in the No. 4 engine nacelle. In any event, it is clear that the fire followed as a result of the hard landing since no operational or mechanical difficulty of any kind was experienced by the flight prior to that time.

It is difficult to determine whether the pilot, considering his experience, could have reasonably anticipated the fog conditions which he encountered on the runway. When the flight arrived over the Los Angeles area, the sky was clear and ground fog in the vicinity of the Municipal Airport should have been clearly discernible. Furthermore, complete and accurate weather information concerning expected conditions at Los Angeles was given to the pilot prior to his departure from Phoenix and, in addition, weather reports received en route were to the effect that fog restricted visibility below one-half mile, the authorized minimum for landing. Such evidence strongly suggests that the pilot was aware of the existing conditions on the Los Angeles Airport and that he should have been able either to see the fog on the runway or anticipate it before irrevocably committing himself to a landing.

On the other hand, consideration must be given to the fact that the tower's last weathe report was incomplete, indicating visibility on the field to be one mile. It is possible that this report, coupled with other circumstances, misled the pilot into believing that conditions were better than they actually were. The wind was variable and it is possible that the fog which was encountered just before the landing may have shifted over the runway suddenly and without warning. The investigation includes many statements concerning the density of the fog, however, the only ones who were in a position to observe the full length of the runway were the pilot and copilot in Flight 211 and their testimony indicated that the runway remained clear during the course of the landing approach.

The high intensity Bartow runway lights installed on Runway 25L extend for only 1,160 feet from the approach end. Since the landing was made beyond these high intensity runway lights, they offered no aid to landing or in controlling the aircraft after contact was made with the runway.

Findings

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

1 The carrier, crew, and airplane were properly certificated.

2. No mechanical or operational difficulty was experienced by the flight prior to the time of landing at the Los Angeles Municipal Airport.

3 Weather information received prior to the flight's departure from Phoenix, Arizona, in addition to reports obtained en route, indicated that at the time of arrival over Los Angeles, California, ground fog conditions would prevail at the Los Angeles Municipal Airport.

4. A weather report, given to the flight when it arrived over the vicinity of the airport, stated that visibility on the field was one mile, and the remarks accompanying the weather observation "ground visibility one-half mile, variable one-fourth to three-fourths mile, ground fog estimated 10 to 50 feet deep" were omitted.

5. The flight made its approach for a landing on Runway 25L at the Los Angeles Municipal Airport and encountered ground fog before making contact with the runway.

6. As a result of losing visual reference to the runway and the ground, control of the aircraft was lost before the landing was completed.

7 Contact with the runway was made 2,300 feet from the approach end and was sufficiently hard to cause structural failure and fire.

Probable Cause

The Board determines that the probable cause of this accident was the pilot's inability to see the runway after entering a ground fog during a final approach and landing.

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.

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Supplemental Data

Investigation and Hearing

The Civil Aeronautics Board was notified of the accident involving Transcontinental & Western Air, Inc , at Los Angeles by telephone at 0725, November 25, 1948. Investigators from the Board's Santa Monica 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 Santa Monica, California, December 9, 1948.

Air Carrier

Transcontinental & Western Air, Inc., is incorporated in the State of Delaware and maintains its headquarters in Kansas City, Missouri. Transcontinental & Western Air possessed certificates 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 Evan Lewis, age 44, possessed a valid airline trarsport pilot rating. He was employed as copilot by the company in 1930 and at the time of this accident had logged a total of 15,425 flying hours of which 1 410 were in Constellations. His last instrument check was accomplished October 7, 1948, and he accomplished his last CAA physical examination June 28, 1948. Leon R. Pierson, age 28, First Officer, held an effective airman certificate with commercial pilot and instrument ratings, and was employed by the company May 19, 1947. He had logged a total of 3,700 flying hours, 490 of which were in Constellations, and had accomplished his last instrument check October 11, 1948. His last CAA physical examination was accomplished April 13, 1948 Flight Engineer Virgil C. James, age 35, was employed by the company October 24, 1944 He held valid certificates as flight engineer and airplane and engine mechanic. Virginia Munson and Sally Sanes were the hostesses, no certificates were required

The Aircraft

NC-90824, a Lockheed Constellation, Model 049, had a total of 4,343 01 flying hours. It was equipped with four Wright—WAC745C18BA3 engines. No. 1 engine had a total of 3,209 24 hours, No. 2 engine a total of 4,013 59 hours, No. 3 engine a total of 4,164 58 hours, and No. 4 engine a total of 3,411 56 hours. All had 194 18 hours since overhaul. At the time of the accident, the airplane was certificated as airworthy by the Administrator of Civil Aeronautics.