

REPORT OF THE ACCIDENT BOARD OF THE
BUREAU OF AIR COMMERCE, DEPARTMENT OF COMMERCE

Statement of probable cause concerning an Aircraft Accident
which occurred to plane of Transcontinental and Western Air,
Incorporated, on May 6, 1935, near Atlanta, Macon County, Mo.

To the Director of Air Commerce:

A fatal aircraft accident having occurred in civil air navigation
in the United States, the Secretary of Commerce, pursuant to Sec. 2 (e)
of the Air Commerce Act of 1926, as amended, designated two officials
of the Department of Commerce to investigate said accident. They pro-
ceeded to the scene; inspected the site, and during the six days there-
after held public hearings at Macon, Mo. and Kansas City, Mo. At Macon
25 witnesses were examined; at Kansas City 34 witnesses were examined.

In the course of the proceedings in addition to numerous exhibits,
hereto attached, nine hundred and seven pages of testimony were obtained
and are herewith submitted.

The following is a summary of the facts, conditions and circum-
stances relating to the accident, at the end of which appears a state-
ment of the probable causes found by the board which analyzed said
accident.

On May 6, 1935, at about 3:30 a.m. at a point six miles west and two
miles north of the town of Atlanta, Macon County, Mo., an airplane of
United States registry, a Douglas Model DC-3, owned and operated by Trans-
continental & Western Air, Inc., while being flown in scheduled Interstate
operation carrying passengers and mail, met with an accident resulting in
serious and fatal injuries to persons on board and the complete destruction

of the aircraft.

The fatally injured were: Senator Bronson L. Cutting, Santa Fe, New Mexico; Jean Anne Hillias, Kansas City, Missouri; Mrs. William Kaplan, West Los Angeles, California; Harvey F. Bolton, pilot, Kansas City, Missouri, and Kenneth H. Greeson, co-pilot, North Kansas City, Missouri.

The seriously injured were: C. B. Drew, Santa Monica, California; William Kaplan, West Los Angeles, California; Mrs. D. L. Mesker, Kansas City, Missouri; Mrs. Nora Metzger, Los Angeles, California; Dorothea Metzger, Los Angeles, California; Henry Sharpe, Los Angeles, California; Richard Wallace, Hollywood, California, and Paul King, Beverly Hills, California.

The aircraft had been inspected by the Department of Commerce on February 8, 1935 and bore Department of Commerce license number NC-18785, dated February 15, 1935. It was being operated by that corporation on scheduled flight No. 6 from Los Angeles, California, to Newark, New Jersey, with a crew change at Kansas City, Missouri. The schedule from Los Angeles to Kansas City covers 1,473 miles and the flying time scheduled for this flight was 8 hours and 15 minutes.

The pilot, Harvey Bolton, held a Department of Commerce transport pilot's license and a scheduled air transport rating. The records of the Department of Commerce contain a report of the physical examination taken by the pilot on November 10, 1934, but no record was found of his having taken the quarterly examination in February 1935. His physical condition at the time of his examination on November 10, 1934, qualified him for the renewal of his transport pilot's license. He was assigned to the Eastern region on the Kansas City-Columbus-Newark run. The co-pilot, Kenneth Greeson, held a Department of Commerce transport pilot's license, but did not hold an S.A.T. rating.

The plane departed from Los Angeles at 4:00 p.m. PST and arrived at Albuquerque, New Mexico, at 8:50 p.m. MST. After refueling at Albuquerque, the plane departed for Kansas City at 9:15 p.m. It was cleared by the company for instrument flying on the strength of official weather reports and forecast favorable for this kind of flying. This clearance was issued notwithstanding the fact that the western night frequency of the plane's two-way radio was not functioning. Later events show that the crew of the plane were unable to effectively communicate with ground stations which prevented them from transmitting requests for information or instructions or reporting the progress of the flight.

At 2:00 a.m. CST, about 26 minutes after the airplane had passed over Wichita, Kansas, official weather reports which had been broadcast by the Department of Commerce, available to both the ground personnel and the crew, disclosed that the ceiling at Kansas City had dropped to 600 feet, which was lower than the authorized minimum ceiling of 700 feet for landing at that point. The plane, due at Kansas City at 2:30 a.m., was allowed to proceed toward Kansas City and at 2:50 a.m. the company's ground station at Kansas City directed a radio message over the company's frequency to the pilot instructing him to attempt a landing, although the ceiling was then much lower than the authorized minimum.

It is not known that this or any other message was received on the company's frequency by the pilot because no radio contacts had been established with the plane after its departure from Albuquerque. Possibly he made an attempt to land at Kansas City but he was not heard or seen over the airport.

Not having heard from the plane at Kansas City at 3:00 a.m., the company directed the following radio message to the pilot; "Proceed toward Burlington as Burlington or Kirksville are the best available fields." At 5:15 a.m.,

at the request of the company, a similar message was broadcast over the Department of Commerce radio range. Subsequent developments indicate that the pilot had directed his course toward Kirksville, Mo., before these messages were sent. The air line distance from Kansas City to Kirksville is 128 miles.

Flying blind through clouds, headed toward the directional radio marker at Kirksville and confronted with a limited fuel supply and an inoperative Kirksville in an apparent attempt to complete the remaining distance with the ground in view.

On breaking through the clouds, the pilot found a very low ceiling with occasional mist and light to moderate fog. From the evidence of witnesses on the ground, it is known that just before the accident, the aircraft flew a distance of at least two miles at a very low altitude over slightly rolling terrain. During this time, the passengers were given the signal, by means of a lighted sign in the cabin, to fasten their seat belts. Almost immediately thereafter, the pilot, following the contour of the ground, directed the path of the plane down into a depression. In a turn to avoid fog collected in this depression, the left wing of the plane dragged into the ground, throwing the plane out of control and into a road bank about 100 feet beyond. This point is 16 miles south of the Department of Commerce intermediate landing field at Kirksville.

The position and condition of the various parts of the wreckage, including propellers, wing flaps, landing gear, fuel and oil supply, as well as marks on the ground, all indicate that the airplane was in normal flight until the moment the wing tip dragged into the ground.

The exact time of the accident could not be fixed. The approximate time, 3:30 a.m., is calculated from known fuel consumption between Los Angeles and Albuquerque, where the plane was refueled, and from the amount of fuel remain-

ing in the tanks after the accident. This time agrees with the testimony of witnesses.

The amount of fuel found in the tanks of the wrecked airplane was calculated to be sufficient to have kept the engines running under normal conditions for an additional 27 minutes. By actual test, under the supervision of the Department of Commerce, this amount of fuel ran engines of the same type and service in an identical airplane for a period of 22 minutes with the carburetor set for maximum fuel consumption. These facts and computations indicate that the pilot was faced with the necessity of locating the Kirksville field and effecting a landing there within a matter of minutes. His realization of this emergency, as indicated by the precautions taken just before the accident, probably accounts for his dying declaration that he was "out of gas".

The airmanship of Pilots Bolton and Greeson, which overcame all save the last obstacle, and Pilot Bolton's efforts for the welfare of his passengers after the accident are to be commended.

It is the opinion of the Accident Board that the probable direct cause of this accident was an unintentional collision with the ground while the airplane was being maneuvered at a very low altitude in fog and darkness.

The probable contributory causes of this accident were:

- a. A forecast by the United States Weather Bureau which did not predict the hazardous weather that developed during the latter part of the forecast period.
- b. Improper clearance of the airplane from Albuquerque by the company's ground personnel because of their knowledge that the plane's two-way radio was not functioning on the Western night frequency.
- c. Improper control by the company's ground personnel at Albuquerque for not calling the airplane back or ordering it to stop at an intermediate point when it was found that two-way radio communication could not be established.

- d. Error on the part of the pilot for proceeding in the flight after discovering that he was unable to effectively communicate with the ground.
- e. Failure of the company's ground personnel at Kansas City to expeditiously redispach the airplane to a field where better weather existed when it became apparent that the ceiling at Kansas City was dropping to and below the authorized minimum for landing and while the airplane still had sufficient fuel to meet the Department of Commerce requirement of 45-minute fuel reserve after effecting a landing.

THE ACCIDENT BOARD

/s/ Denis Mulligan

/s/ R. W. Schroeder

/s/ Dr. R. E. Whitehead

/s/ Richard C. Gazley

/s/ Jesse L. Lankford

June 5, 1935
/s/ J. Carroll Cone