

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: September 7, 1956

Released: September 12, 19

WEST COAST AIRLINES, INC., DOUGLAS DC-3, N 62374, PULLMAN-MOSCOW
AIRPORT, PULLMAN, WASHINGTON, FEBRUARY 26, 1956

The Accident

A West Coast Airlines DC-3, N 62374, flew into the side of a hill 1-1/4 miles northeast of the runway threshold during an approach to Pullman-Moscow Airport, Pullman, Washington, about 1940, ^{1/} February 26, 1956. The aircraft was substantially damaged and the copilot and two of the twelve passengers received minor injuries.

History of the Flight

West Coast Airlines' Flight 97 of February 26 was a scheduled passenger flight between Idaho Falls, Idaho, and Spokane, Washington, with intermediate stops at Pocatello, Burley, Twin Falls, Boise, and Lewiston, Idaho; and Pullman, Pasco, and Walla Walla, Washington. It departed Idaho Falls at 1430 and flew routinely to Boise, where a scheduled crew change was made. The new crew consisted of Captain Houghton H. Whithed, First Officer Alfred R. Klein, and Flight Attendant Clifford E. Hammond.

An IFR flight plan was filed at Boise and the flight departed there at 1706. Following a normal landing at Lewiston, Captain Whithed checked the weather with the company's station agent at Pullman, and the flight departed Lewiston at 1916 with 12 passengers. Gross weight of the aircraft was 23,518 pounds, 2,228 pounds below that allowable, and the load was properly distributed.

When in the vicinity of Pullman, at 1929, an ADF (Automatic Direction Finder) instrument approach was made, using the company's "H" facility, and visual contact was established at 3,500 feet m. s. l. The aircraft flew over the airport and then made a right turn, followed by a left turn, planned to align with the runway. During this maneuver a small snow squall was encountered and momentarily the captain lost visual contact. Shortly thereafter the aircraft struck the side of a hill and crashed in a snow-covered field.

Investigation

Inspection at the scene, which was open, rolling farmland, disclosed that the aircraft had made its first contact at a point 1-1/4 miles northeast of the airport while moving on a course of 230 degrees. (The runway is aligned on a 229-degree heading.) The altitude of the point of contact is 2,660 feet

^{1/} All times herein are Pacific standard and are based on the 24-hour clock

m. s. l., 109 feet higher than the runway. Flight 97 had failed by 50 feet to clear a round-topped hill, which lies between the point of contact and the airport. Three to 10 inches of snow covered the ground at the scene and plainly registered the initial imprint of the wheels and the sequence of contacts that followed. First impact, which occurred while the aircraft was in a nose-high attitude, caused both main wheels to fail rearward driving each drag strut upward through the wing; the second ground contact was made 100 feet beyond the first, and the aircraft then skidded 650 feet.

Both propellers were broken from the engines and both engines were broken from their mounts. The aircraft came to rest in an upright attitude on the bottom of its fuselage.

Examination of both engines and both propellers indicated that they were capable of normal operation prior to impact. Examination of the airframe disclosed repairable impact damage to the center section, the fuselage bottom, and the nacelles but disclosed no defect that could have existed prior to impact. Both outer wing panels also suffered major damage.

The airport at Pullman has a single landing strip, 100 feet wide and 4,931 feet long, aligned 229 degrees and 49 degrees magnetic. Hills, reaching 100 to 250 feet above the landing strip, lie in all directions within one mile.

The company-owned "H" facility is located near the center of the landing strip. West Coast Airlines uses two ADF approach procedures: No. 1, which requires reference to a commercial broadcasting station that operates on week days only, was not available on Sunday, February 26; No. 2 specifies, "Initial approach from the south at 5,100 feet. Outbound track is 225 degrees from the 'H.' Procedure turn is to the south, minimum altitude 4,000 feet. Maximum distance 25 miles. Minimum altitude over the 'H' on final approach is 3,500 feet. If visual contact is not established over the 'H' on final, or landing is not accomplished the following 'Missed Approach' procedure is established. Turn left and climb to 5,500 feet on a 225-degree track from the 'H' within 10 miles of the station."

A stationary front existed from Vancouver Island across southern British Columbia, thence southeastward through eastern Montana during the afternoon of February 26, 1956. At the same time an occluded front was moving eastward across western Washington. To the south and east of these two fronts, namely, eastern Washington and western Idaho, a westerly flow of relatively cold unstable air existed. At the time the flight departed from Boise, en route weather was being reported as generally overcast, with light rain at Walla Walla, light snow at Spokane and Pullman, and precipitation generally over the mountains. Ceilings were being reported ranging from 1,200 to 5,000 feet and a visibility 10 miles or better, except three-quarters of a mile at Pullman. The area forecast available to the flight at Boise indicated the following expected conditions en route: Broken to overcast, with ceilings mostly 4,500 or better but occasionally lowering in snow showers to ceiling 800, sky obscured, visibility one to three miles. Snow showers were expected to be frequent over all mountains. The terminal forecast for the Spokane area after 2000 was gusty southwest wind and occasional ceiling 600, sky obscured, visibility one mile, light snow and fog. The Lewiston terminal forecast was ceiling 3,000 overcast, occasional light rain showers, wind south-southwest 12. No terminal forecasts are issued for Pullman.

Testimony of flight crew and dispatch personnel disclosed that at 1855, prior to departure from Lewiston, Flight 97 called the company station at Pullman and requested the local weather. The reply was, "Special No. 15 1850 Pacific time precipitation ceiling 1,000 feet^{2/} obscuration; visibility 2 miles; ^{3/} light snow; temperature 30; depoant 30; wind southwest 8." The flight then requested the runway condition and was told there was a thin layer of ice, the braking was "fair," and it looked all right to come in. This was the last weather requested or received by Flight 97.

At 1929 the flight reported over the "H" facility at Pullman, Captain Whithed started his ADF approach, and extended and checked the landing gear. This approach was completed in a routine manner and visual contact was established over the southwest end of the runway (which is 2,551 feet m. s. l.) with the obstruction lights in sight.

After visual contact had been established Captain Whithed flew over the runway for its entire length and noted his heading as 50 degrees while descending to 3,100 feet, and advanced power to 25"-26" to maintain that altitude.

Reaching the eastern end of the runway and moving out over the unlighted area east of the airport, the captain started a restricted-visibility procedure turn. This maneuver is used to assist the pilot in reversing his course and provide a means of staying fairly close to the runway on which he plans to land and be certain that on completion of the procedure he will be aligned with the runway and at the right position to complete his final approach and landing by visual means. Accordingly, he made a standard rate right turn to a heading of 95 degrees and held it for 40 seconds. Thereafter he executed a standard rate left turn to the runway heading of 230 degrees. This series of maneuvers performed at 3,100 feet and 110 knots throughout was calculated to end with the aircraft aligned with the runway on the proper heading. During much of the final turn few, if any, lights on the ground were within the angles of vision from the cockpit. At the approximate instant of completing the procedure turn the flight encountered a snow squall, which reduced visibility to zero for an estimated 10 seconds.

Captain Whithed testified that during this interval on instruments he reached for his throttles to abandon the approach but changed his mind when the airport lighting again became visible and completion of the landing appeared to be a routine matter. (Copilot Klein was calling out the airspeed which still was about 110 knots at that time.) Captain Whithed saw that he had reached a point from which the airport lights were on a bearing about 10 degrees farther south than he had planned.

^{2/} WCA's night approach limits at Pullman-Moscow were 900 feet ceiling and 2 miles visibility. After this accident they were changed to 1,000 feet and 3 miles with descent prohibited unless all runway lights could be seen.

^{3/} The weather observer on duty testified that the actual observation of visibility at night is limited to the farthest lighted target, to the east this is three-fourths mile.

Captain Whithed testified that he then altered his heading an estimated 10 degrees to the south to bear upon the lights at the threshold and he continued his approach, starting his descent along a path a little to the north and at a small angle from the projected centerline of the runway. At that time he reduced his manifold pressure to about 19 inches, and his speed to 90 or 95 knots. A moment later his only landmark, the lights on the airport, disappeared. Believing the loss of visual reference to be only another snow squall he attempted to initiate a missed approach by climbing through the squall. He told his copilot to raise the gear (flaps had not been extended) and to shut off carburetor heat; he, Whithed, opened the throttles, pulled back on the elevator controls, and started reducing propeller pitch. The airplane had been put into a climbing attitude at about 90 knots but had not started to climb when, at 2,660 feet m. s. l., it struck the snow-covered hillside which was in its path to the runway threshold. At the time of impact the copilot had not had time to retract the gear and it was still locked down.

During the preliminary maneuvers of the approach, Flight Attendant Hammond checked the passengers' safety belts and found them all properly buckled. At impact one girl passenger was thrown from her seat into the aisle although the belt had not broken. Passenger evacuation through the main passenger door was started. The captain and first officer came through into the cabin and assisted in the handling of the evacuation, which was discontinued as soon as it became apparent there was no danger of fire.

Three to 10 inches of snow on the ground and falling snow, with wind, estimated by Captain Whithed to be 30 to 35 m. p. h., made it less comfortable outside. The cabin door was left open, and passengers went out and in while waiting for removal.

One passenger, Dr. Loehr, a practicing physician from Moscow, Washington, was well acquainted with the terrain. He examined all in need of attention, one girl with nose bleed, the copilot with facial lacerations, and a woman who thought the snock may have caused injury to her back. Then he and the captain sought and found a farmhouse with a telephone. After Captain Whithed reported the location of the aircraft, the farmer used his tractor and a trailer to assist passengers to the highway and ambulances removed all occupants to the local hospital for examination.

Analysis

The weather records, communications, logs, and the crew testimony disclose that the flight was entirely routine until it reached the Pullman-Moscow Airport, completed the instrument approach, and the circling approach had advanced to the very end of the planned 225-degree turn into final. While this turn was being made darkness and the lack of visible lights in the sky or on the ground prevented continuous reference to visual landmarks and compelled flight by reference to instruments. The weather as recorded, reported to the flight crew, and observed by them was above authorized minimums except for about 10 seconds while the aircraft was passing through a snow squall. During that 10-second interval Captain Whithed decided to abandon the approach, but when he emerged from the snow squall and reestablished visual contact, he reversed his decision.

Captain Whithed had landed at Pullman-Moscow many times and felt quite familiar with the approach pattern he was following. Although he was slightly north of his alignment upon starting the final leg, he considered the correction for this to be no additional hazard as he then had the runway lights in sight. He continued his approach following a pattern that was normal except for the small deviation toward the north. When the lights ahead disappeared again the captain, according to his testimony, thought a second snow squall was in his path straight ahead, and as the condition seemed to be worse than reported and to be below minimums, he tried to abandon the approach. But the restriction to visibility ahead was not merely airborne snow; it was in fact a snow-covered hill, or more likely a snow-covered hill shrouded in falling or wind-driven snow. In fact, at this point the aircraft had actually descended too low to clear the terrain. Whithed also testified that when he pulled the plane up it did not stall but he did feel it descend as if in a downdraft.

In his attempt to pull out for a go-around Captain Whithed had changed the attitude of the aircraft to tail-down, thus getting much of the effect of a flare-out and probably reducing the force of impact a great deal.

Findings

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

1. The aircraft and both pilots were properly certificated for the flight involved.
2. The company records show that the aircraft was loaded within allowable limits as to the amount and distribution of weight.
3. The weather was forecast to be within limits for the entire operation.
4. The weather encountered by the flight was generally as forecast.
5. Snow squalls encountered along the final approach path could not be observed from the weather station at Pullman-Moscow, and could not be seen by Flight 97 until it had actually entered them.
6. At the last moment of Captain Whithed's turn into final, loss of visual reference caused slight misalignment with the runway.
7. Captain Whithed accepted this misalignment as something he could correct without significant reduction of safety, and continued his approach.
8. The aircraft descended too low to clear the terrain ahead.
9. Visual reference to the airport was lost a second time and the airplane struck a snow-covered hill 50 feet below its top while a missed approach was being initiated.

Probable Cause

The Board determines that the probable cause of this accident was the continuation of a landing approach following loss of visual reference to the airport, and the delayed attempt to execute a missed approach.

BY THE CIVIL AERONAUTICS BOARD:

/s/ JAMES R. DURFEE
/s/ CHAN GURNEY
/s/ HAROLD D. DENNY
/s/ G. JOSEPH VINETTI

Adams, Vice Chairman, did not participate in the adoption of this report.

S U P P L E M E N T A L D A T A

Investigation

The Civil Aeronautics Board was notified of this accident at 2015, February 26, 1956. An investigation was started immediately in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. The investigation included examination of the physical evidence at the scene and of the company records. Also depositions were taken at Seattle, Washington, on March 15 and 16, 1956.

Air Carrier

West Coast Airlines, Inc., is a scheduled air carrier incorporated in the State of Washington. It maintains its headquarters at Seattle, Washington, and operates DC-3 aircraft on scheduled routes in Washington, Oregon, and Idaho. It possesses a currently effective certificate of public convenience and necessity for route No. 77 issued by the Civil Aeronautics Board and air carrier operating certificate No. 702 issued by the Civil Aeronautics Administration which authorize carrying of persons, property, and mail between various places in the area and over the route prescribed.

Flight Personnel

Captain Houghton H. Whithed, age 40, held a valid airman certificate No. 54764 with rating as airline transport pilot on DC-3 equipment. Company records show he had logged 13,984:24 hours, of which 10,030:24 were in DC-3's, and 682 hours were instrument flying. His last physical was dated February 20, 1956, and his last six-month proficiency check was in September 1955. He had been in the employ of the company since June 19, 1946.

First Officer Alfred R. Klein, age 33, held airman certificate No. 467204 with airline transport rating in DC-3 aircraft. He had a total of 6,598:40 hours, of which 467 hours were instrument time. His last physical was dated May 1955.

Flight Attendant Clifford E. Hammond, age 26, had been in the employ of West Coast Airlines since October 2, 1955. In September 1955, he satisfactorily completed a test in emergency procedures.

The Aircraft

Douglas DC-3, N 62374, manufactured February 2, 1944, serial No. 12559, was owned and operated by West Coast Airlines.

It had logged time as follows:

Total	17,797:51 hours
Time since last major overhaul	120:45 hours
Time since line maintenance	46:55 hours

The powerplant engines were Pratt and Whitney, model 1830-90D:

	<u>Right</u>	<u>Left</u>
Serial No.	450358	316451
Total time (hours)	893:21	270:42
Time since overhaul	893:21	270:42
Date manufactureu	5/25/41	6/13/44

The propellers were Hamilton Standard, model 23E50-473 hubs and model 6353A-18 blades:

	<u>Right</u>	<u>Left</u>
Serial No.	4257	54846
Time - Total	9,124:13	1,149:03
Time since overhaul	2,660:44	1,149:03
Blade Nos.	67688	P-198186
	67689	P-198187
	67690	P-198188