

## CIVIL AERONAUTICS BOARD

**ACCIDENT INVESTIGATION REPORT**

Adopted: February 8, 1956

Released: February 13, 1956

CURREY AIR TRANSPORT, LTD., DC-3C, N 74663,  
BURBANK, CALIFORNIA, SEPTEMBER 8, 1955

The Accident

Currey Air Transport's Flight 24 of September 8, 1955, a DC-3C, N 74663, struck powerlines during an attempt to make an emergency landing and crashed at the Lockheed Air Terminal, Burbank, California, about 0757.1/ Both captain and copilot were killed, the stewardess and one passenger were seriously injured, and the remaining 29 passengers received minor injuries. One person on the ground was fatally injured; the aircraft was almost totally destroyed by impact.

History of the Flight

This was a nonscheduled flight originating at Burbank, California, for Oakland, California. There were 30 passengers and a crew consisting of Captain Joseph A. Bradsher, Copilot Keith C. Dutton, and Stewardess Utta Jorgensen. Company records indicated that takeoff gross weight was 26,089 pounds (authorized maximum was 26,200 pounds), and the center of gravity of the aircraft was located within prescribed limits.

A Defense Visual Flight Rules flight plan was filed; the plane was loaded, taxied to the end of the runway, and its engines were run up. At 0751 the flight was cleared for takeoff from runway 15, to climb westward on top of haze and smoke. It executed a takeoff and climbed in a normal manner into smoke haze, which was more dense toward the south, and in which it was lost to view of observers at the airport.

Approximately one minute<sup>2/</sup> after takeoff (0752) Flight 24 called the tower and requested an emergency landing clearance. This was granted; runway 7 was suggested by the tower and accepted by the pilot. The airport was cleared of traffic and emergency equipment alerted. At 0755 the tower called repeatedly as the flight had not been sighted. At 0756 the flight called the tower and stated its intent to land on runway "31." Lockheed Air Terminal has no runway 31 but has a runway 33.

About this time Flight 24 was sighted by the control tower operator an estimated one mile to the southwest, proceeding in a nose-high attitude toward

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

2/ The time interval may have been anywhere from one minute to one minute and 59 seconds as the clock used indicates only full minutes. This applies to all radio communications mentioned herein.

the airport but not aligned with any runway. Across the approach track being used was a powerline about 500 feet short of the airport boundary. As this line was approached the nose-high attitude increased and immediately after passing this powerline the aircraft executed a slight left turn, banked 10 to 12 degrees. The left wing then struck a service powerline at the airport boundary. The aircraft stalled, its left wing collided with two parked Air Force C-54's, it cart-wheeled, slid across the apron and struck Lockheed Service Hangar No. 24, coming to rest in the open doorway of that hangar. The fuselage broke open at a point behind the wing and most of the survivors escaped or were rescued through this opening.

Small fires started by the crash were quickly extinguished by personnel of Lockheed's plant protection organization, who also rescued survivors and rendered first aid most efficiently. This organization also guarded the scene and wreckage.

### Investigation

Examination of the wreckage disclosed extensive damage to all major assemblies of the airframe. All was due to impact with the two other aircraft, the ground, and the hangar. The landing gear was found to be down and locked and the flaps were retracted.

All electrically operated powerplant shutoff valves to the two engines were examined carefully. They were positioned as follows: Right powerplant - oil and hydraulic, both fully closed; left powerplant, oil one-half closed, hydraulic two-thirds closed. Fuel crossfeed valves were closed, the right engine fuel valve was in the left main tank position, and the left engine fuel valve was in the right main tank position.

Complete teardown examination of both engines disclosed that: The left engine, except for impact damage, was capable of delivering its power in a normal manner. The right engine had sustained internal damage during operation; a small amount of bearing metal was present in the main oil sump. The front master rod bearing had overheated but there was no appreciable loss of its bearing metal; it had lost about 50 percent of its lead-indium coating but none of its silverplating. The rear master rod had been discolored by heat; the lead-indium coating of its bearing had been worn away and about 40 percent of the silverplating had been worn from the shell of its upper half. The silverplating of the lower half of this bearing was badly scored. There was no other significant damage found. The right propeller governor and all the oil passages serving it were free from foreign material and were capable of normal operation.

The blades of the left propeller were at 32 degrees when impact occurred; those of the right propeller were at 18 degrees.

Examination of the feathering circuits of the right propeller disclosed an intermittent open circuit in the wire connecting the feathering button holding coil and the feathering pump relay. The cause of the open circuit was a loose soldered connection on the holding coil terminal. This condition could have been produced by impact forces that severely damaged the overhead panel upon which the feathering switch was mounted.

Examination of the wreckage disclosed no marks of fire that could have occurred prior to impact. Questioning of all witnesses, including available passengers, disclosed that none of them had seen any smoke, sparks, or other indication of real or impending fire during flight.

The right engine had been overhauled by Pacific Aeromotive Corporation on February 9, 1955, 140:54 hours before the accident. At that time both master rods were fitted with bearings reprocessed by the engine manufacturer. Records of this overhaul and of the tests which followed showed that all parts were within manufacturer's limits and that engine performance was normal.

Examination of all maintenance records of the aircraft shows that the last No. 1 check was made three days before the accident when the logged time was 9,849:23 hours, 2:16 hours short of the time when this inspection was due.

Work sheets of the last No. 2 inspection, dated August 23, 1955, and No. 3 inspection, dated July 20, 1955, disclosed that all items written up were repaired, inspected, and signed off.

Review of the flight logs back through August 20, 1955, disclosed no record of any operating difficulty with either powerplant.

Testimony of eyewitnesses made it possible to plot the path of N 74663 back about 3-1/2 miles from the point of impact. Attachment A shows this portion of the flight path in relation to the runways and to the takeoff path. The position of the aircraft at the time the crew became aware of the emergency and immediately thereafter is not definitely known and that portion of the flight path is not shown.

As a reconstruction of the radio communications with Currey Flight 24 of September 8, 1955, the following is quoted from the senior tower operator's report:

"At 0751 N 663 was cleared for takeoff runway 15 with a clearance to climb westbound to on top of the haze and smoke. Top of the haze and smoke had been reported to be 2000 feet.

"At approximately 0752 the pilot of N 663 called the tower and requested an emergency landing on runway 7.<sup>3/</sup> He did not state the nature of the emergency. Clearance was given to land runway 7, the airport was cleared of other traffic and the emergency equipment was alerted to standby for the emergency at the intersection of the runway.

"At approximately 0755, when the aircraft had not landed and was not in sight of the tower, several calls were initiated to the aircraft but no replies were received.

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<sup>3/</sup> Control Tower Operator Carl A. Swanson testified later that his recollection of this exchange included the senior tower operator's inquiry, "Is this an emergency?" and the pilot's reply, "It certainly is."

"At approximately 0756 the pilot of N 663 called the tower and stated that he was going to land on runway 31. (There is no runway 31 at this airport.) At this time the aircraft was sighted approximately one mile southwest of the airport mushing along in a nose-high attitude. At 0757 the aircraft apparently stalled and crashed into the Lockheed Aircraft Service area, located on the southwest side of the airport, causing major damage to two US Air Force C-54 aircraft parked in this area and coming to rest against the corner of a hangar.

"Three fatalities were reported to the tower, Captain Bradsher, Copilot Dutson, and one employee of Lockheed Aircraft Service who was struck by the aircraft. No recording of the tower transmissions is available due to an improperly placed record on the recorder.

"Weather at the time of the incident: 0758. Special observation - Partial obscurement, Ten thousand, broken clouds, visibility one and seven eights miles, haze and smoke, smoke layer ten thousand." (This concludes the tower controller's report.)

A pilot who had just landed reported that the visibility to the south was worse because of smoke than it was at the airport or to the north. This witness stated that if Flight 24 had as much as 3,500 feet or 4,000 feet forward visibility from the 300-foot level it would be very fortunate.

Several of the ground witnesses described the engine sound and visible rotation of the propellers as normal for the left but slower and irregular for the right. One competent witness stated that the right prop seemed to be "going in and out of feather."

The preponderance of witness testimony indicates that the gear was down and it still was down and locked when the wreckage was examined.

All qualified observers of the emergency approach gave descriptions of the attitude of the aircraft as nose-high and its speed as slow.

Chief Pilot Thompson of Currey was questioned regarding the training of Currey pilots. With particular regard to the single-engine procedures training of Captain Bradsher he testified: "These same procedures were given to Captain Bradsher in his training program. In fact, I might admit to the record that he had to perform, to the best of my knowledge, three or four of these maneuvers."

Company training procedure at Lockheed Air Terminal for single-engine return on instruments starts with pilot already under a hood and on instruments. The procedure starts with a climb to 2,000 feet on a course of 255 degrees (parallel to the ILS leg at Lockheed Air Terminal which is 255 degrees outbound). At 2,000 feet and beyond the marker he executes a turn toward the leg and the marker, intercepts the glide path and localizer, and completes his approach. Company method of practicing single-engine return after takeoff is to use a lightly loaded aircraft; it prescribes throttling the engine to little or no thrust in lieu of feathering. Captain Bradsher and Copilot Dutson had both been checked out on this procedure.

The chief pilot also testified that he had used the subject aircraft for a 40-minute pilot qualification flight (of another pilot) ending about 30 minutes prior to the takeoff of Flight 24. This training flight utilized a pre-flight check which included the functional testing of the feathering of both propellers. (This check is required by the carrier prior to every flight.) No malfunction was noted in engine or propeller performance.

All airborne radio, navigation, and communications equipment was used without malfunction during this flight which included a single-engine instrument approach. During the investigation all airborne radio units were examined and no evidence was found to indicate that it had not been in operating condition prior to impact. Immediately after the accident all ground radio facilities including the ILS for runway 7 were tested; all functioned normally.

### Analysis

Since the crew neither survived nor described the emergency by radio it is possible to reconstruct what transpired on the flight deck only by consideration of the factual material already presented. This material includes the following items considered pertinent.

Takeoff was under visual flight rules and was made toward the south-southeast into haze which restricted horizontal visibility and bordered on conditions requiring instrument flight. There is nothing to indicate that flight by visual references had been discontinued when the emergency was caused by the difficulty with the right engine one to two minutes later.

The malfunction which occurred in the right powerplant would have been evidenced by rising oil temperature, dropping oil pressure, and roughness, all discernible to the pilot. This malfunction did not of itself cause very great loss of power and there is no reason to believe that it included a fire warning. Continued use of power on the right engine for a brief period would have been hazardous but possible. Power reduction at that instant was precautionary.<sup>4/</sup> The propeller of this engine continued to rotate until impact; its pitch was then 18 degrees indicating that little or no power was being developed.

This was Captain Bradsher's first takeoff with Copilot Dutson. Upon noting the malfunction of his right engine Captain Bradsher asked the tower for and received emergency clearance to return and use runway 7. Runway 7 is the ILS runway and its glide path and localizer were available to guide Flight 24 in establishing alignment and completing its landing.

The aircraft was loaded close to but within legal limits and the performance of this model so loaded is known to be such that a safe margin exists which would have permitted it to climb on one engine at takeoff power. Under the worst possible combination of propeller and landing gear positions it would have been just able to maintain level flight at  $M_{TO}$  power if the airspeed was maintained at  $V_2$  (97 m. p. h.) or more. Climb would have been possible if the

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<sup>4/</sup> Cockpit checklist specified "Feather" for single-engine operation; power setting 2,550 r. p. m. and 42 inches; for  $M_{TO}$  power 2,550 r. p. m. and 41 inches.

gear had been retracted, the propeller had been feathered, or any thrust at all had been developed by the malfunctioning engine.

These known performance data indicate that N 74663 was not incapable of making a safe return after use of its right engine had been discontinued.

As a crew for this operation Captain Bradsher and Copilot Dutson had qualifications which met the requirements of CAR and they were properly certificated by CAA.

The observed portion of the flight path, charted in Attachment A, does not include the base leg of the approach.

When the malfunction occurred the captain may have considered his altitude insufficient for safe transition from visual to instrument flight, or for reliance on his copilot for much, if any, help on this their first flight together. He may have tried to continue flight by visual references only, or he may have been guided by the IIS inner marker at the approach end of runway 7. The flight path after the emergency was announced indicated single-engine operation and since the malfunction did not cut out the engine the captain may have reduced power on that engine as done in Currey's practice of single-engine flight; or he may have tried unsuccessfully to feather the right propeller. The fully closed position of the right engine shutoff valves indicates that feathering was attempted. The shutoff valves of the left engine were in a midposition indicating that the crash may have interrupted their closing.

Captain Bradsher did not, and possibly could not, climb to 2,000 feet and follow that portion of the company's single-engine training procedure. He did circle to the right for an approach to runway 7. If he used his radio and the localizer he needed a base leg some distance out to enable him to align the runway by that means. If he depended on visible landmarks he needed a base leg close in to identify known landmarks as aids in accomplishing alignment. It is possible that the base leg he selected was too close in for the one technique and too far out for the other. In any event, alignment was not accomplished.

Although he failed to establish alignment with runway 7 he did turn to a heading of approximately 76 degrees, parallel to runway 7, then lowered the gear and descended. Discovering this misalignment he elected to use No. 33 (misnamed No. 31 when informing the tower). He changed heading to approximately 30 degrees, toward the airport. Because of the extended gear, the unfeathered right propeller, and the low airspeed then remaining, he was unable to maintain level flight but continued to the airport area, losing altitude all the way, and failed to clear the last powerline in his path.

### Findings

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

1. The carrier, the aircraft, and both pilots were properly certificated.
2. The flight was loaded within allowable limits and the load was properly distributed.

3. All radio aids on the ground were functioning normally and those on board N 74663 were in operating condition.

4. Overheating of the right engine's rear master rod and loss of much of its bearing metal constituted a failure which foretold imminent internal destruction of that engine.

5. Feathering of the right propeller was not accomplished and that propeller continued to rotate (windmill).

6. The aircraft when observed approaching the airport had its gear extended, its attitude was excessively nose-high, and it was not aligned with any runway.

7. The left wing of the aircraft struck a powerline.

8. Forward motion continued; the aircraft stalled and collided successively with two parked Air Force aircraft, the apron, and Lockheed Service Hangar No. 24.

Probable Cause

On the basis of all available evidence the Board determines that the probable cause of this accident was the captain's irrevocable commitment to a landing without radio or visual confirmation of his runway alignment following engine failure immediately after takeoff. A contributing factor was engine malfunction immediately after takeoff in near minimum visibility.

BY THE CIVIL AERONAUTICS BOARD:

/s/ ROSS RIZLEY

/s/ JOSEPH P. ADAMS

/s/ CHAN GURNEY

/s/ HARMAR D. DENNY

## S U P P L E M E N T A L   D A T A

### Investigation and Hearing

The Civil Aeronautics Board was notified of the accident shortly after it occurred 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 ordered by the Board was held at Burbank, California, on October 26, 1955.

### Air Carrier

Currey Air Transport, Ltd., is incorporated under the laws of the State of Illinois and has its principal place of business at Burbank, California. It operates under letter of registration No. 1471, issued by the Civil Aeronautics Board, and an air carrier operating certificate No. 3-273, issued by the Civil Aeronautics Administration. These certificates authorize the company to fly persons or property internationally, overseas, and over various routes in the continental United States including the route involved.

### Flight Personnel

Captain Joseph A. Bradsher, age 31, was employed by the company on September 1, 1955. He held a currently effective airline transport certificate with an appropriate rating for the subject aircraft. Company records showed that he had a total of 4,500 hours, of which 1,200 were in DC-3's. His last DC-3 equipment and instrument check was on August 30, 1955. His grades in these checks were recorded as "3" (average) on all items except "attitude" which was recorded as "2" (above average) and "tracking" which was recorded as "4" (below average). His final grade for this check was 80 percent.

Copilot Keith C. Dutson, age 34, was employed as a copilot by the company on August 11, 1955. He held a currently effective commercial certificate issued by the Civil Aeronautics Administration. Company records showed he had a total of 2,880 hours, of which 120 hours were as copilot in DC-3's. His last CAA physical examination was accomplished July 6, 1955. His last DC-3 equipment and instrument check was on August 11, 1955. Grades in these checks were recorded as "3" (average) on all items except "Oral," "Traffic patterns," "Landing technique," and "Smoothness and Coordination," which were recorded as "4" (below average), and "appearance" and "attitude" which were recorded as "2" (above average). His final grade for this check was 78 percent.

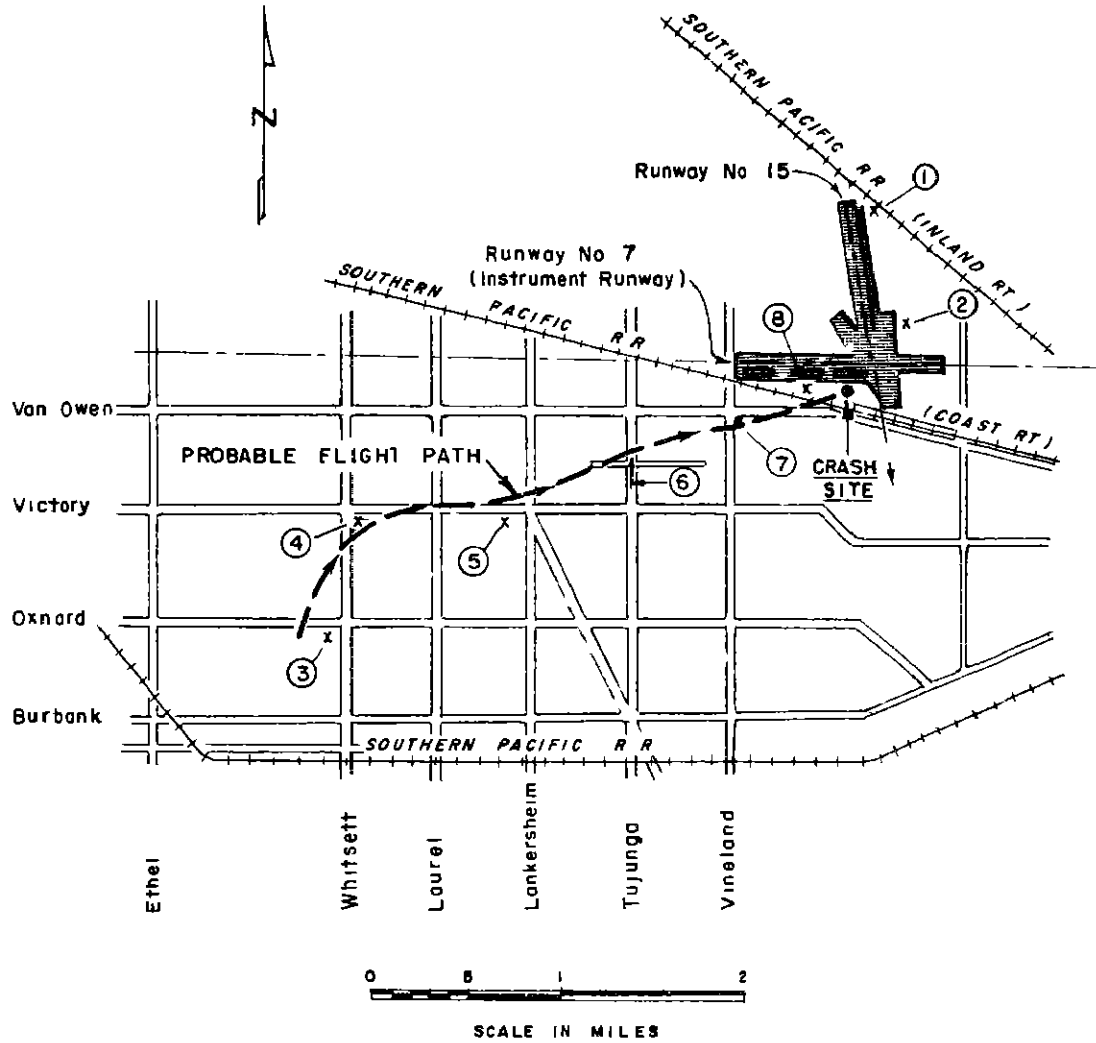
### The Aircraft

The aircraft, N 74663, a Douglas DC-3, was owned by Kearn, Inc., and leased to Currey Air Transport, Ltd. The aircraft was currently certificated by the Civil Aeronautics Administration and had a total of 9,849:23 hours. Both engines were Pratt and Whitney model R-1830-65-92. The left, serial No. BP-450259, had been flown 848:34 hours since overhaul; the right, serial No. BP-437481, had been flown 140:54 hours since overhaul.



# PROBABLE FLIGHT PATH

CURREY AIR TRANSPORT, LTD - N - 74663  
 LOCKHEED AIR TERMINAL  
 BURBANK, CALIF  
 September 8, 1955



Encircled numbers show location of ground witnesses to approach