

CIVIL AERONAUTICS BOARD  
ACCIDENT INVESTIGATION REPORTAdopted: June 27, 1950Released: June 28, 1950

CALIFORNIA ARROW AIRLINES, INC., NEAR VALLEJO, CALIFORNIA, DECEMBER 7, 1949

The Accident

At approximately 1715<sup>1/</sup>, December 7, 1949, a Douglas DC-3, NC-60256, operated by California Arrow Airlines, an intrastate air carrier, crashed six miles east of Vallejo, California. Six passengers and three crew members were killed. The aircraft was destroyed by impact and fire.

History of the Flight

The flight departed Burbank, California, at 1420, December 7, 1949, for Oakland and Sacramento, California, with a crew consisting of James S. Garnett, pilot; Joseph Head Dillon, copilot; and Susan DeVore, stewardess. Take off was accomplished from Oakland at 1656 at which time the aircraft carried six passengers, but no cargo. Total aircraft weight was within the certificated limits and the load was properly distributed. The aircraft carried fuel sufficient for a flight of two hours and thirty minutes and the estimated flight time to Sacramento was thirty minutes.

Following take off, the flight cruised five miles northwest of the Oakland Airport for seven minutes while waiting for receipt of an instrument flight clearance which provided for a cruising altitude of 4,000 feet to Sacramento. The flight then proceeded on course, and at 1708 reported over the Richmond Radio Range Intersection, 16 miles northwest of Oakland, stating that it would be over the Fairfield Radio Range Station, 41 miles

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<sup>1/</sup> All times referred to are Pacific Standard and based on the 24-hour clock.

northeast of Richmond, at 1723. Since there was no routine mention of altitude, Air Route Traffic Control immediately requested the information, and the flight replied that it was at 4,000 feet. This was the last communication received from the flight. Approximately one hour after the position report over Richmond, CAA Communications received a report that the flight had crashed six miles east of Vallojo. All occupants were killed; and the aircraft was destroyed.

### Investigation

The initial point of impact was at an elevation of 782 feet, which was 200 feet below the crest of a hill and approximately on the center line of Amber Airway 3 between Oakland and Sacramento. Markings on the ground indicated that the aircraft struck on a heading of approximately five degrees magnetic in a laterally level 20-degree climbing attitude, the nose section not being crushed from the impact. Ground markings further showed that both engines had been torn from the nacelles at the time of first impact, after which the aircraft had bounced into the air coming to rest 150 feet uphill and turned to the left 180 degrees to the initial heading. The fuel tanks had ruptured; and fire had followed, destroying the entire fuselage from the horizontal stabilizer forward. The wings and the empennage did not burn.

An examination of the torsional bends and breaks of the propeller blades and propeller ground markings indicated that both engines were developing considerable power at the time of impact. The engines though damaged by impact, showed no evidence of mechanical malfunctioning prior to the accident. There were no indications of any structural failure or malfunctioning of any of the components of the aircraft. The control cables

for the ailerons, rudder, and elevators were found intact and unbroken. The elevator trim tab control was found in the neutral position, and the rudder trim tab control was found set seven degrees to the right. The landing gear and flaps were both in the retracted position.

Only one altimeter was found but it was so severely damaged by fire that its setting could not be determined. Because of the complete destruction of the nose section by fire, none of the instruments could be read, nor could the settings of the various flight and engine controls be determined. An examination of the radio equipment disclosed that it was set to the "on" position and that the automatic direction finder was tuned to the Sacramento Radio Range frequency. None of the radio equipment was capable of being bench tested because of the extensive fire damage. However, all radio communications from the flight, including the last one, indicated that the radio equipment was operating normally.

Approximately 20 minutes prior to take off from Oakland, the pilot checked the weather sequences to Sacramento. He was advised by Flight Advisory Service that instrument conditions would prevail along the route, and that it would not be possible to make the flight in accordance with Visual Flight Rules. At Oakland at the time of take off, the ceiling was 6,500 feet and there were scattered clouds at 2,500 feet. From Oakland to the Richmond Intersection the ceiling was variable from 1,000 to 2,000 feet. From the Richmond Intersection to Sacramento, the ceiling was 2,000 feet with patches of lower scud between 300 feet and 1,000 feet and visibility two miles. Many of the hilltops in the area of the accident were obscured by clouds. The wind from the Richmond Intersection to Fairfield at 4,000 feet was from the northeast at 30 to 40 knots. Turbulence was light at the proposed cruising altitude, and the freezing level was

at 6,500 feet. Other flights in the area at the time of the accident reported that there were neither icing conditions nor more than slight turbulence at altitudes between 4,000 and 6,000 feet.

California Arrow Airlines, a California corporation, began its scheduled intrastate operation between Burbank, Sacramento, and Oakland on or about August 12, 1949. The company held no certificate for this operation from the Administrator of Civil Aeronautics.<sup>2/</sup>

### Analysis

The fact that the aircraft struck approximately 3,000 feet below the assigned altitude of 4,000 feet, and at a point on the center line of Amber Airway 8 between Oakland and Sacramento, indicates that the flight was proceeding along its intended course, but not at the altitude assigned in the flight plan. Approximately seven minutes prior to the accident, the flight reported that it was at 4,000 feet over the Richmond Intersection. However, if it had been at 4,000 feet it would have cleared all of the hilly terrain. Radio communications received from the flight were routine, and since the flight was on course there was no indication of radio difficulty. Altimeter error can not be considered as a contributing factor because an error in the instrument would not give an erroneous reading as great as 3,000 feet.

It appears, therefore, that the only reasonable explanation for the accident is that the pilot either did not attain or failed to maintain the assigned altitude, and attempted to fly by visual reference to the

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<sup>2/</sup> Section 45.2 of the Civil Air Regulations

ground at a much lower altitude than that specified by his flight clearance. As a result, the aircraft struck a hill obscured by low clouds. The fact that the aircraft struck in a steep climbing attitude indicates a last minute attempt to gain altitude so as to avoid the hill.

### Findings

1. The crew and aircraft were properly certificated.
2. The carrier held no certificate from the Administrator of Civil Aeronautics.
3. No evidence of mechanical or structural failure of the aircraft or any of its components was found.
4. The freezing level was at 6,500 feet and there was no severe turbulence at the assigned cruising altitude of 4,000 feet.
5. Low hanging clouds obscured the terrain in the vicinity of the accident.
6. The aircraft struck a hill at an elevation of 782 feet or approximately 3,200 feet below the flight's assigned cruising altitude, at which time it was in the laterally level and climbing attitude.

### Probable Cause

The Board determines that the probable cause of this accident was failure of the flight to fly at the assigned altitude on an instrument

flight plan, which resulted in the aircraft striking a mall obscured by clouds.

BY THE CIVIL AERONAUTICS BOARD:

/s/ JOSEPH J. O'CONNELL, JR.

/s/ OSWALD RYAN

/s/ JOSH LEE

/s/ HAROLD A. JONES

/s/ RUSSELL B. ADAMS

## 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 that NC-60256 was overdue at Sacramento, California, at 0900 PST, December 7, 1949; at 0810 PST December 8, 1949, the Civil Aeronautics Board was notified that the wreckage had been located and an investigation was immediately initiated in accordance with 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 Oakland, California, December 20, 1949.

### Air Carrier

California Arrow Airlines, a California corporation, began its scheduled intrastate operation between Burbank, Sacramento and Oakland on or about August 12, 1949. The company held no certificate for this operation from the Administrator of Civil Aeronautics.

### The Aircraft

The aircraft NC-60256, a Douglas DC-3, was owned by Arrow Airways and leased to California Arrow Airlines. The total flight time on the aircraft was 7,722 hours. It was equipped with two Pratt and Whitney Model 1830-65 engines. The left engine had 770 hours and the right engine 808 hours. The two Hamilton Standard propellers had a total time of 1,716 hours.

### Flight Personnel

The pilot, James Stanley Garnett, age 33, held an airman certificate with a valid airline transport pilot rating. He had been employed by the company April 30, 1949, and had a total of 5,567 flight hours of which 1,176

were in DC-3 type aircraft. Copilot Joseph Lead Dillon, age 38, held an airman certificate with a valid commercial pilot rating. He was employed by the company May 31, 1949, and had a total of 7,367 hours, of which 798 were in DC-3 type aircraft.