

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: February 15, 1957

Released: February 21, 1957

PIEDMONT AIRLINES, DC-3C N 45V,
NEAR SHELBY, NORTH CAROLINA, JUNE 13, 1956The Accident

A passenger on Piedmont Airlines Flight 5, DC-3C N 45V, fell to his death through the main cabin door from an altitude of 6,500 feet, near Shelby, North Carolina, at approximately 1807^{1/} June 13, 1956. The crew and other passengers were not involved in the accident. The air stair door received minor damage during the inflight opening and subsequent flight to a normal landing at Asheville, North Carolina.

History of the Flight

Piedmont Airlines Flight 5 originated at Fayetteville, North Carolina, destination Louisville, Kentucky, with intermediate stops at Charlotte and Asheville, North Carolina, and Tri-Cities, Tennessee. It departed Charlotte at 1744, six minutes late, with Captain Baxter B. Slaughter, Jr., First Officer Henry A. Schulze, Jr., and Purser Bert R. Barnes as crew members, and 24 passengers. Seated in next to the rearmost pair of seats on the left side were Mr. and Mrs. Oren A. Pruitt, who had been transferred to Piedmont Flight 5 after arriving at the airport too late to claim their reservations on another carrier's flight that departed Charlotte at approximately 1715.

The aircraft reached 6,500 feet m. s. l. cruising altitude at approximately 1806. The seat belt sign had been left on since takeoff because of anticipated turbulence, which had not developed. About one minute later, at 1807, while the purser was on the flight deck obtaining information for a passenger, the aircraft suddenly yawed to the left as the cockpit door-warning light came on. The first officer and purser immediately went to the rear of the cabin where they found the main cabin door fully open. A woman passenger, who was in the lavatory when the door opened, left the lavatory and was assisted past the open door by the two crew members. A passenger check revealed that Oren A. Pruitt was missing.

The captain circled to establish the location and then proceeded to Asheville, where a routine landing was made. The flight was canceled at Asheville and the aircraft remained there awaiting inspection.

The U. S. Weather Bureau 1728 observation at Charlotte was: Scattered clouds at 25,000 feet, visibility 12 miles.

^{1/} All times referred to in this report are eastern standard based on the 24-hour clock.

Investigation

The main cabin of N 45V is equipped with 24 passenger seats and they were all occupied at the time of takeoff. Statements of the other passengers indicate that none of them observed Mr. Pruitt's actions at the rear of the cabin. One passenger, seated immediately in front of the Pruitts, overheard Mr. Pruitt remark to his wife that he was going to the lavatory, or words to that effect. At this time the lavatory was occupied. Other passengers stated that they heard a noise and a rush of air which called their attention to the open door. One passenger, who had been looking out of the window at his right across from the main cabin door, stated that after hearing the rush of air he turned and saw a man trying to hang to the doorframe from outside the aircraft. No other person was near the door.

Investigation disclosed the main cabin door of N 45V to be a Metropolitan Air Stair, model A, serial number 2363, located on the left side of the aircraft. Attached to its inner side are five steps, which are an integral part of the door and provide a means of entering and leaving the aircraft when the door is down. The air stair door is hinged at the bottom and opens out and down when the door latch is released.

The door latch mechanism is actuated by a five-inch lever handle pivoted at its lower end and recessed in the center of the step riser between the second and third step from the top of the door when viewed from the closed position. The handle is approximately waist-high when the door is closed. Latching of the door is accomplished by rotating the lever handle approximately 90 degrees counterclockwise through an arc of approximately 6-1/2 inches. This extends three tapered latch pins 1-3/4 inches into the doorframe in the fuselage. Inspection windows are installed in the fuselage so that engagement of the latch pins can be checked. The lever handle is held in the locked or unlocked position by a detent-type friction plate, which is also a part of the latching mechanism. There are three warning lights installed - one near the outside of the door, another at the purser's station in the cabin, and a third on the pilot's instrument panel. When the door is closed and latched all warning lights go off. When the lever handle is moved clockwise or toward the open position approximately one-half inch, the three warning lights come on. The handle movement continues more than two inches before the latch pins start to move slowly from their closed position. When the pins are retracted sufficiently for the door to open the lever handle has traveled 70 or 75 degrees of the full 90-degree movement. This 90-degree movement is 45 degrees on either side of vertical. (See attachment A.)

A test of the subject door, after the accident, revealed normal functioning of the latch pins, all warning lights, and the latching mechanism. According to the crew, a check of the door-warning lights was made for correct door closure prior to take off from Charlotte.

Airport personnel, and others, were interviewed regarding their observations of Mr. and Mrs. Pruitt before the departure of Flight 5. Their statements give definite indication that the Pruitts had been drinking before their arrival at the airport. Their taxi driver stated: "I could detect the odor of alcohol though the couple was not staggering and there was no disorder."

In the terminal building, they were observed by an airport employee stationed 15 feet from the Capital Airlines counter. Her statement reads (in part): "..... at the counter both the man and his wife started using dirty English and raising Cain because the agent was not around. In this commotion, the man, Mr. Pruitt, knocked the bell (for service) off the counter three times. I saw them next at the Piedmont counter being ticketed. Both were obviously under the influence of alcohol. Both had flushed, or red, faces."

The Piedmont agent said of the time they were being ticketed: "The passengers conducted themselves very mannerly, and I was not close enough to smell any liquor on their breath, but there was a doubt in my mind because Mr. Pruitt walked a little unsteadily away from the counter. But as he had given me no trouble I let them go."

The purser's statement covers attending Mr. and Mrs. Pruitt after takeoff, and reads, in part: ". . . I detected a strong odor of alcohol on the breath of Mr. Pruitt . . ." Passenger statements reflect nothing unusual in Mr. Pruitt's actions or conduct prior to the accident.

The Board has made repeated but unsuccessful efforts to obtain a statement from Mrs. Pruitt.

In the main cabin door installation of N 45V there was no means of preventing the door from fully opening if the latches were inadvertently actuated. Investigation revealed that the door can be opened accidentally. Many operators of DC-3 aircraft equipped with air stair doors have a safety device installed, such as a quickly removable chain preventing full door opening, or a means of retarding movement of the unsafeguarded door latch handle.

There have been several accidental openings of the air stair door on aircraft operated by other air carriers. These incidents were without fatality or injury because of the installation of safeguards on the door. Since this accident Piedmont Airlines has installed on its entire fleet a means of safeguarding against accidental opening of the door. As a result of its investigation of this accident, the Civil Aeronautics Board recommended to the Administrator of Civil Aeronautics that an Airworthiness Directive be issued requiring correction of this unsafe condition.

Analysis

The air stair door is a feature of the past few years and it is physically located in the same position as the side-hinged original door of DC-3 aircraft. The appearance of the door with the five integral steps facing the interior suggests only an exit, and it must be remembered that Mr. Pruitt had boarded the aircraft through this door.

As stated, the seat belt sign had been on for the entire 22 minutes of the flight because of anticipated turbulence. However, the turbulence did not develop. In fact, both passengers and crew stated that the flight

was smooth. Therefore, it is highly improbable that Mr. Pruitt was thrown against the door by turbulence.

In view of the investigation which found the door latching mechanism normal in its operation, it must be concluded that the passenger opened the door by operating the unlatching handle.

It is probable that Mr. Pruitt, after finding the lavatory occupied, stood in the area by the main door and while there accidentally grasped the door handle and moved it to the open position. This accidental act is substantiated by the statement of a passenger who observed Mr. Pruitt's efforts to retain his grasp of the doorframe from outside the aircraft. A lack of normal acuteness on the part of Mr. Pruitt is suggested by the evidence of his drinking before arrival at the airport.

Findings

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

1. The aircraft, the carrier, and the crew were currently certificated.
2. Turbulence was not a factor in the accident.
3. The cabin door was closed, latched, and inspected by the crew prior to departure.
4. There was no failure or malfunction of the main cabin door.
5. Passenger Pruitt left his seat to go to the lavatory, accidentally opened the cabin door, and fell to his death through the opening.
6. The purser was temporarily absent from the cabin in the performance of his duty.
7. The interior of the door was not placarded or otherwise safeguarded against inadvertent opening, nor is it required.

Probable Cause

The Board determines that the probable cause of this accident was a passenger's accidental opening of the main cabin door in flight.

BY THE CIVIL AERONAUTICS BOARD:

/s/ JAMES R. DURFEE

/s/ CHAN GURNEY

/s/ HARMAR D. DENNY

/s/ G. JOSEPH MINETTI

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

Investigation

The Civil Aeronautics Board was notified of the accident on the night of June 13, 1956. An investigation was immediately initiated in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended.

Air Carrier

Piedmont Aviation, Inc., the parent company, conducts a general aircraft sales and service type of operation. The company is incorporated in the State of North Carolina with its principal offices in Winston-Salem, North Carolina. In December 1947, the company established the Piedmont Airlines Division. The company operates under a currently effective certificate of public convenience and necessity issued by the Civil Aeronautics Board, and an air carrier operating certificate issued by the Civil Aeronautics Administration. These certificates authorize the company to transport by air persons, property, and mail between various points in the continental United States, including the route involved.

Flight Personnel

Captain Baxter B. Slaughter, Jr., age 34, held a currently effective airman certificate with an airline transport rating and equipment rating for the type of aircraft involved. He had a total of 5,568 hours in DC-3 aircraft. His last en route check was on August 18, 1955, and his last proficiency check was on December 7, 1955. His last CAA physical examination was passed successfully on January 5, 1956.

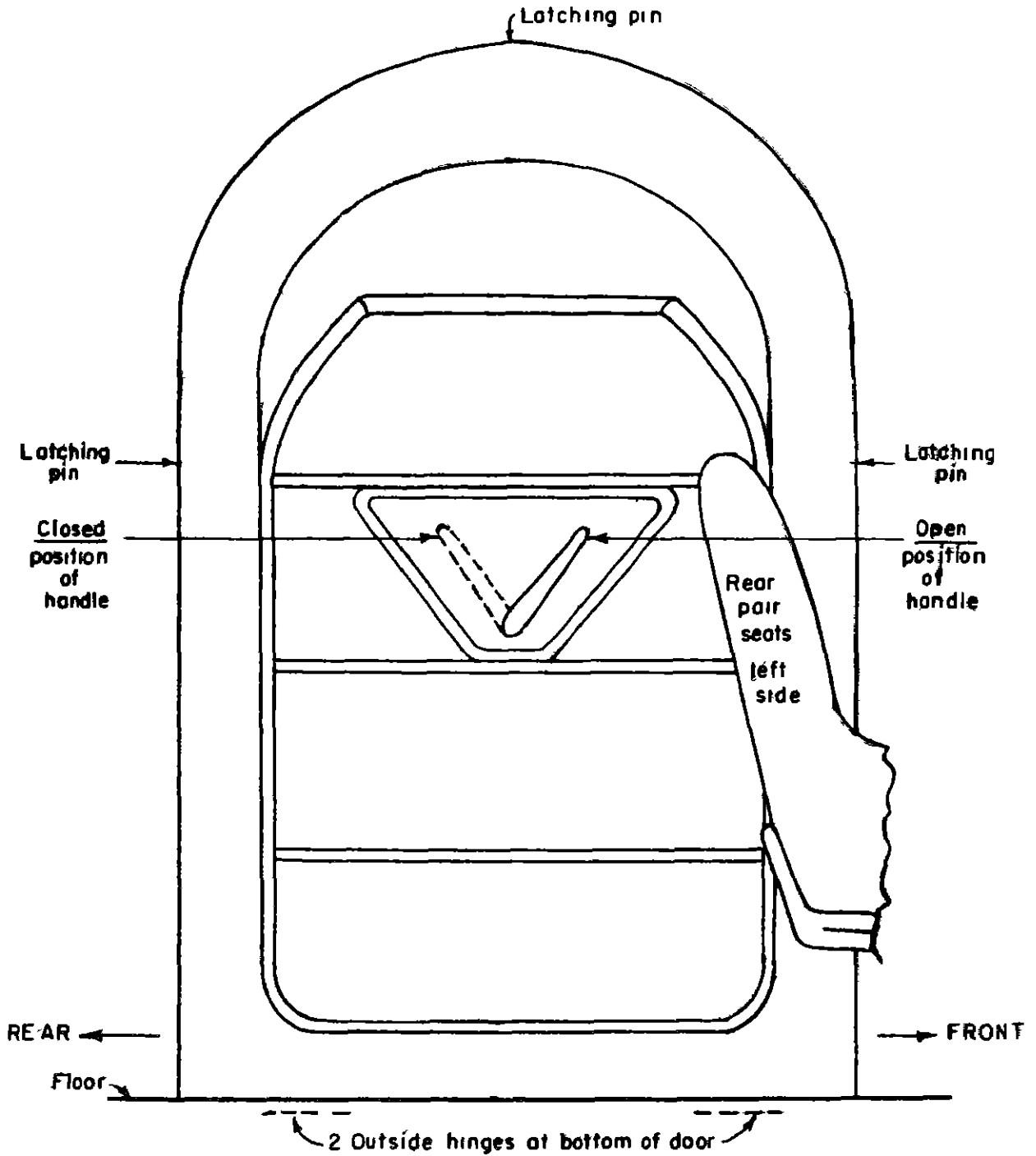
First Officer Henry A. Schulze, Jr., age 34, held a currently effective airman certificate with an airline transport rating and equipment rating for the type of aircraft involved. He had a total of 6,020 flying hours, of which 2,958 hours were in DC-3 aircraft. He passed his last instrument check on May 31, 1956, and last CAA physical examination on January 20, 1956.

Aircraft

N 45V, a Douglas DC-3C, serial number 18984, had a total of 26,536 flying hours, including 9,518 hours since last major inspection. Time since last No. 2 line maintenance was 51 hours. The aircraft was currently certificated and properly maintained. The aircraft was equipped with Pratt and Whitney R-1830-92 engines and Hamilton Standard 23E50 propellers, with model 6353-18A blades.

ATTACHMENT A

**PIEDMONT AIRLINES DC-3C, N45V
NEAR SHELBY, NORTH CAROLINA, JUNE 13, 1956**



INTERIOR VIEW FACING CLOSED DOOR

NOT DRAWN TO SCALE