

## CIVIL AERONAUTICS BOARD

**ACCIDENT INVESTIGATION REPORT**

Adopted: October 16, 1951

Released: October 22, 1951

MONARCH AIR SERVICE, CHICAGO, ILLINOIS, JANUARY 4, 1951

**THE ACCIDENT**

At approximately 0228,<sup>1</sup> January 4, 1951, a C-46D, N-79982, operated as Flight 1090 by Monarch Air Service, an irregular air carrier, crashed and burned following an attempted take-off from Midway Airport, Chicago, Illinois. All of the 45 passengers and crew of three escaped, with only minor injuries to five of them. The aircraft was destroyed.

**HISTORY OF THE FLIGHT**

Monarch's Flight 1090 was cleared by Air Route Traffic Control (ARTC) to proceed on an instrument flight plan at 9,000 feet, non-stop Chicago to Newark, New Jersey. The crew consisted of Captain Marvin C. Staddon, Copilot Arthur J. Howarth, and Stewardess Thelma Dennis. Total aircraft weight at the time of take-off was approximately 46,100 pounds, 1,100 pounds in excess of the authorized gross weight.<sup>2</sup> According to the crew the disposable load was so distributed as to be within the certificated limits with respect to the center of gravity.

Prior to being cleared for take-off, pre-flight checks were accomplished in accordance with company operating procedures. All items checked satisfactorily, and the captain started his take-off at 0227 on Runway 31. He advanced the throttles to approximately 45 inches manifold pressure and 2700 RPM. The copilot then continued to advance the throttles to a manifold pressure of 47 inches, tightened the friction locks and guarded the throttles with his left hand to prevent creepage.<sup>3</sup> The aircraft became airborne approximately half-way down the runway, which is 5,730 feet in length.

According to the copilot, manifold pressure and RPM's remained constant, and engine performance was normal.

At the captain's command to raise the landing gear, the copilot moved the handle into the retract position and noticed at this time that the aircraft, now airborne, was turning slightly to the left and the air speed indicator read approximately 85 miles per hour. With the left wing down and with but a few feet of altitude, the copilot, realizing an emergency existed, immediately applied emergency take-off power—55 inches manifold pressure. However, the C-46, still turning, struck several small aircraft parked on the west side of the airport, and continued beyond the airport boundary, striking a fence and railroad embankment. Both throttles were then closed by the captain, but the electrical system switches were not turned off. The aircraft came to rest beyond the embankment and about one-half mile west of the airport's west boundary on a heading of approximately 250 degrees. A fire developed immediately, but all passengers and crew were evacuated before it assumed major proportions. The aircraft was destroyed.

The maximum indicated air speed attained in flight, approximately 100 MPH, was noticed by the captain shortly after the landing gear was retracted.<sup>4</sup> The maximum altitude attained was estimated as 25 feet.

**INVESTIGATION**

Detailed examination after the accident revealed no evidence of structural failure of any component of the aircraft prior to impact, nor was there a failure of any of the seats or seat attachments upon impact. A teardown

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

<sup>2</sup>See Appendix I.

<sup>3</sup>According to the CAA required Airplane Flight Manual, 52 inches and 2700 RPM are the approved power settings for take-off.

<sup>4</sup>The CAA required Airplane Flight Manual states that the break-ground speed is 105 MPH indicated air speed. The power-on stalling speed with flaps and gear up is 92 MPH true indicated air speed at 45,000 pounds gross weight.

and examination of both engines disclosed no evidence of mechanical malfunctioning or failure. Indications were that the propellers were in low pitch. Maintenance records for the aircraft were reviewed and reflected that it was airworthy at the time of take-off.

This aircraft had arrived at Chicago Midway Airport at 0020, January 4, as Monarch's Flight 1093 from Indianapolis, Indiana, after flying approximately 40 miles through an area of freezing rain. It was parked on the ramp outside the Monarch hangar and glaze ice which had formed was removed from the aircraft by Monarch Air Service mechanics using mops in conjunction with the application of alcohol for removal of ice on the wing panels and tail surfaces. The aircraft was inspected by the crew before boarding for Flight 1090 and no ice was found on either the wing panels or the tail surfaces. Although the copilot stated that he observed a very light coating of frost on the wings prior to taxiing, in his opinion it was not enough to have an adverse effect on the flight characteristics of the aircraft. Other aircraft on the airport were deiced in the same manner, under the same conditions, and during the same period of time as N-79982, and experienced no difficulty taking off.

Weather at the time of the accident was reported as ceiling 1,800 feet, overcast, visibility 8 miles, light snow, temperature 28 degrees, dew point 25 degrees, wind west-northwest 10 miles per hour. Freezing drizzle and intermittent snow had been falling at Chicago Midway Airport between 2028, January 3, and 0125, January 4, and rough glaze ice about 1/16 inch thick had accumulated on exposed surfaces. However, the accumulation after 0020, January 4, when N-79982 arrived there, was negligible. The freezing drizzle discontinued at 0150 and precipitation after that time consisted of light snow only.

Monarch Air Service was unable to produce the original or a duplicate of the weight and balance manifest for Flight 1090, but did furnish a copy compiled from memory by the captain and copilot. They estimated 700 gallons of fuel on board, however, this estimate was erroneous as it was established conclusively that the fuel load totaled 880 gallons.

## ANALYSIS

As previously mentioned, the wing and tail surfaces were de-iced by Monarch Air Service mechanics with the aircraft parked outside the hangar, at approximately 0130. Investigation revealed that any further accumulation of ice on aircraft surfaces after that time would have been negligible. It is probable that at 0227, the time of take-off, there would have been, at most, only a slight trace of ice on the wing panels and tail surfaces. The very light coating of frost which was noticed by the copilot would evidently not have affected the flight characteristics, since aircraft of other carriers, also de-iced during the same period, experienced no further ice or frost accretion and departed Chicago Midway Airport uneventfully. Similarly, there was no evidence that the take-off characteristics of N-79982 would have been appreciably affected by the accumulation of ice on the other portions of its surfaces.

Investigation revealed no structural failure of the aircraft. Likewise, no mechanical malfunctioning or failure of the engines and propellers was indicated.

In the light of these factors and the power setting of 47 inches manifold pressure used for take-off, it appears that the accident was induced by faulty judgment and flying technique on the part of the captain. The copilot stated that the aircraft was airborne and the landing gear was in the process of being retracted when the indicated air speed was approximately 85 miles per hour. It must, therefore, be concluded that the aircraft became airborne at a speed of 85 miles per hour, or less. It has been previously noted that the recommended break-ground speed for this type aircraft is 105 miles per hour, and the power-on stalling speed is 92 miles per hour, when the aircraft is loaded to its maximum authorized gross weight. In this instance, the take-off was obviously made with the aircraft in a near-stalled attitude and lateral control was not obtained. Contributory factors were the 1,100-pound overload, which increased the stalling speed, and the application of less than the recommended take-off power setting of 52 inches manifold pressure prior to becoming airborne.

## FINDINGS

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

- 1 The company, the aircraft, and the captain were properly certificated, and the aircraft was airworthy.
- 2 The copilot was not properly certificated in that he had not accomplished the required six-month's equipment check in this type equipment.<sup>5</sup>
- 3 The aircraft was loaded approximately 1,100 pounds in excess of its authorized take-off weight.
- 4 Take-off was made using less than the recommended power.
- 5 The aircraft became airborne at an indicated air speed of 85 miles per hour, or less, and before a safe flying speed had been attained.

<sup>5</sup>See Supplemental Data--Flight Personnel

## PROBABLE CAUSE

The Board determines that the probable cause of this accident was loss of control of the aircraft due to faulty piloting technique and overloading of the aircraft.<sup>6</sup>

## BY THE CIVIL AERONAUTICS BOARD

*/s/ Donald W Nyrop*

*/s/ Oswald Ryan*

*/s/ Jos<sup>r</sup> Lee*

*/s/ Joseph P Adams*

*/s/ Chan Gurney*

<sup>6</sup>Subsequent to this accident the Civil Aeronautics Administration filed six alleged violations of the Civil Air Regulations against this carrier. On September 19, 1951, the Administrator accepted an offer of compromise in the amount of \$2,500.

# Supplemental Data

## INVESTIGATION AND HEARING

The Civil Aeronautics Board received notification of the accident at 0330, January 4, 1951, from the CAA Communications Station at Chicago, Illinois. An investigation was immediately initiated in accordance with Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. As part of the investigation a public hearing was held on January 23 and 24, 1951, at Chicago, Illinois.

## AIR CARRIER

Monarch Air Service, a large irregular air carrier, was incorporated in the state of Illinois in 1933, with its principal place of business at Chicago, Illinois. It held the necessary authorization from the Civil Aeronautics Board and the Administrator of Civil Aeronautics to conduct flight operations.

## FLIGHT PERSONNEL

Captain Marvin C. Staddon, age 40, had been continuously employed by Monarch Air Service since October 4, 1950. He held current airline transport rating #16223. His last instrument and equipment check on C-46 aircraft was accomplished on October 20, 1950. While no personal log books were available, he stated that he had accumulated a total of 18,000 flying hours since 1926, of which 2,170 hours had been obtained in C-46 type aircraft. He had flown a total of 91 hours in this type aircraft in the 30 days preceding the accident. Mr. Staddon's last CAA physical examination was accomplished on October 31, 1950.

Copilot Arthur J. Howarth, age 36, had been employed by Monarch since December 10, 1950. He held current airline transport rating #53777. Mr. Howarth had accumulated a total of 3,700 flying hours, of which 300 had been obtained in C-46 type aircraft.

His last instrument and equipment check was accomplished on September 11, 1950, in a Douglas DC-3, and his last route check was given on December 21, 1950. Mr. Howarth had flown 55 hours in C-46 type aircraft in the 30 days preceding the accident. His last CAA physical examination was accomplished on August 18, 1950.

The copilot had not had the required six-months equipment check in C-46 type aircraft prior to the accident.<sup>7</sup> A violation was filed against him by the Administrator of Civil Aeronautics and noted as a matter of record. The copilot had been given a check flight by a Monarch captain, who, however, had not been designated as a company check pilot by the Civil Aeronautics Administration.

Stewardess Thelma Dennis, age 21, was employed by Monarch Air Service on December 31, 1950. Miss Dennis had completed the stewardess training course of a major scheduled airline.

## THE AIRCRAFT

The aircraft, a C-46D, N-79982, was manufactured on April 7, 1945. It had been operated by Monarch Air Service since November 3, 1950, the date it was purchased by that company. At the time of the accident the aircraft had been flown a total of 1,257 hours. It was equipped with two Pratt & Whitney R-4800-51 engines, with a total of 542 and 71 flight hours for the left and right engines, respectively. The aircraft was equipped with two Curtiss-Hub C-543SC28 propellers.

<sup>7</sup>Section 42.44 (a)(2) of the Civil Air Regulations, provides as follows:

"Within the preceding 6 months a pilot on large aircraft shall have successfully accomplished an equipment check on aircraft of the type on which he is to serve. Such equipment check shall be given by an authorized representative of the Administrator or a check pilot designated by the Administrator."

# Appendix I

## COMPUTATION OF TOTAL AIRCRAFT WEIGHT AT THE TIME OF TAKE-OFF

	Pounds
Basic weight of aircraft.....	31,475
Crew weight.....	470
Crew baggage.....	10
Deicer fluid.....	120
Extra equipment.....	30
Passenger weight.....	6,988
Baggage weight.....	1,352
Oil.....	375
Fuel 880 gallons.....	15,280
Gross at take-off.....	46,100
Certificated take-off weight.....	45,000
Overload at take-off.....	1,100

<sup>1</sup>Fuel weight computed as follows:

Center tanks filled to bottom of filler neck:

240 gallons each—480 gallons @ 6 lb..... 2,880

Front tanks filled to bottom of filler neck (see Exhibit 15a):

200 gallons each—400 gallons @ 6 lb..... 2,400

Total fuel weight..... 5,280

THE ABOVE COMPUTATIONS ARE BASED ON DATA IN THE TRANSCRIPT OF THIS HEARING