

## CIVIL AERONAUTICS BOARD

**ACCIDENT INVESTIGATION REPORT**

Adopted December 14, 1948

Released December 15, 1948

**AMERICAN INTERNATIONAL AIRWAYS, INC—BERMUDA SKY QUEEN, NORTH ATLANTIC OCEAN—OCTOBER 14, 1947****The Accident**

A Boeing flying boat, Model 314, aircraft NC-18612, operated by American International Airways, a non-scheduled carrier, landed at sea at 1004,<sup>1</sup> October 14, 1947, near the United States Coast Guard weather ship, "Bibb." All 62 passengers and the crew of seven were rescued by the Bibb. The aircraft was then sunk by gunfire since it constituted a hazard to surface vessels.

**History of the Flight**

NC-18612 departed New York, New York, October 8, 1947, for Poole, England, and arrived there three days later without incident. The crew consisted of Captain Charles Martin, First Officer Addison Thompson, Second Officer John H. Shafer, Flight Engineer Walter Yaramishyn, Robert Hamilton, assistant flight engineer, and Willard Keith Woodmansee, radioman. During the afternoon of October 12th, 62 passengers and 3,651 pounds of baggage were taken aboard at Poole, and the flight then took off for the return trip to the United States. Later that day the aircraft arrived at Foynes, Ireland, the first scheduled stop. Since weather was unfavorable over the North Atlantic, the flight remained there over night. The following morning Captain Martin, First Officer Thompson, and Second Officer Shafer visited the official meteorological station at Shannon, Ireland, to obtain the necessary weather information for the 1,730-mile over-water trip to Gander, Newfoundland.

A high pressure area existed south of the great circle course from Foynes to Gander, and a series of low pressure cells were located to the north. Winds at the intended cruising altitude of

8,000 feet were expected to have an average headwind component of 26 knots. With this information a flight plan was computed. Based on a true airspeed between 128 and 132 knots, the time en route was estimated to be 16 hours and 58 minutes. The fuel supply was 4,000 gallons. The point-of-no-return (that point in time beyond which the aircraft could not be flown and still return to its point of departure) was computed to be 11 hours and 36 minutes after take-off. At the rate of 180 gallons per hour fuel consumption, the crew estimated they had a fuel supply sufficient for 22 hours of flight which allowed for a 5-hour fuel reserve after reaching destination.

Take-off from Foynes was accomplished at 1540, the afternoon of October 13th. The flight climbed to its cruising altitude of 8,000 feet, proceeded on course for five hours and 50 minutes over the tops of clouds, and then, at 2130, instrument weather conditions were encountered. Since celestial navigation was no longer possible, Mr. Thompson, the only qualified celestial navigator aboard, retired. Before he had retired, however, he informed Captain Martin that the estimated time of arrival over the United States Coast Guard weather ship, Bibb, located on course and approximately 961 miles west of Foynes, was 0200. This was 45 minutes later than was originally estimated.

Icing conditions were encountered shortly after midnight. At 0134, October 14th, the flight requested and was granted permission from the Moncton Ocean Air Traffic Control to descend to 6,000 feet. About this time the flight received from the Gander radio station a weather forecast which included wind information at the original cruising altitude of 8,000 feet. According to the data received, the average headwind component had a velocity of 12 knots greater than that which was used in the computation of the flight plan.

<sup>1</sup>Times noted in this report are Greenwich and based on the 24-hour clock, and all distances expressed in miles are nautical miles.

No further icing conditions were encountered at 6,000 feet, but instrument weather continued. The flight proceeded without the benefit of any navigational fix until 0205 when a radar fix from the Bibb placed the aircraft 68 miles from the vessel on a bearing of 80 degrees. At this time the flight had flown approximately 892 miles from Foynes, was slightly over half way to Gander, and had used 10 hours and 25 minutes of the estimated 22 fuel hours carried at the time of take-off. They informed the Bibb that their estimated arrival time at Gander was 0930, which was 52 minutes later than was originally estimated. The crew anticipated no possibility of fuel exhaustion, and one hour and 11 minutes remained before they were to reach the point-of-no-return as computed in their flight plan. The Bibb reported the wind at its location at 6,000 feet to be 40 to 45 knots from the west, a headwind component of about 17 knots greater than that used in the flight plan. The captain estimated at 0232 that they were on course and 15 to 20 miles south of the Bibb. This was one hour and 17 minutes later than the original estimate and 32 minutes later than the amended estimate.

Altitude was reduced to 4,000 feet after approval had been given by Moncton Ocean Air Traffic Control, and shortly thereafter, at 0327, eleven minutes after the flight passed its point-of-no-return, another weather forecast was received from Gander which showed the average headwind for the remainder of the route to be from 250 to 260 degrees at 38 knots, a headwind component 12 knots greater than that received in Shannon. Still no difficulty was anticipated, nor was the navigator consulted at this time.

By 0500 clear weather was encountered. The navigator was then awakened in order that he might fix the aircraft's position by celestial observation, and according to the fixes that were plotted, headwinds in excess of 60 knots had existed en route, the average ground speed being only 59 knots. The crew immediately became concerned as to whether or not the fuel remaining was sufficient. Approximately 550 miles remained to destination. Captain Martin and First Officer Thompson believed that it was impossible to accomplish the remaining portion of the flight with the fuel remaining, so decided to return to the Bibb where rescue

facilities would be immediately available. However, the flight continued westward and a position report was made to Gander at 0600. The turn around was actually made at 0758, at which time the aircraft was still 60 miles east of the previously reported 0600 position and approximately 460 miles east of Gander and 300 miles west of the Bibb. Gander was advised of the decision, and at 0840 was informed that the flight had two hours and 45 minutes of fuel remaining. The aircraft's position was reported at 0914 to be 100 miles west of the Bibb.

The flight arrived over the Bibb at 0940, made four low passes, and then landed. All passengers had been fitted with life jackets and had been provided with seats and safety belts. Though the aircraft encountered waves six to eight feet high, no injury to any person or damage to the aircraft occurred. However, in taxiing toward the Bibb the aircraft and Bibb drifted together with substantial damage to the aircraft. Rescue operations were slow and hazardous because of high seas, but by the next day all of the passengers and crew had been successfully transferred to the Bibb.

### Investigation

Since the aircraft could not be flown from its position because of the heavy seas and the damage which had resulted from the collision with the Bibb, it was considered a hazard to surface navigation and was sunk by gunfire. Therefore, no part of the airplane remained for examination, and many of the records essential to the investigation, such as the weight and balance form, the engine and aircraft log books, the navigation, the radio, and the engineering logs were lost. So far as could be determined from the records secured from the operator, the airplane was in an airworthy condition prior to the flight, and according to the testimony of the crew, no mechanical difficulty was experienced en route.

It was determined that all passengers had been provided with life jackets and safety belts. The aircraft carried nine 10-man life rafts and other emergency equipment such as an emergency radio transmitter, a Very pistol, smoke bombs, and flares. According to the flight engineer, the aircraft weight at the time of take-off from Foynes was approximately 89,710 pounds. If this was correct, the

aircraft weighed 5,710 pounds in excess of its maximum allowable weight of 84,000 pounds. The flight engineer testified that this load was distributed with respect to the center of gravity within approved limits. However, the testimony of the passengers as to the attitude of the aircraft in level flight, and also the testimony of the captain regarding the difficulty in trimming the aircraft for level flight indicated that the load was distributed so that the center of gravity was at the maximum rearward position.

An aftercast of the weather, together with reports from other flights that flew the route at about the same time as NC-18612, established that weather conditions, including winds, were substantially as forecasted and reported by Shannon radio, the Bibb, and Gander radio. Winds over that portion of the route flown by the flight were generally westerly with an average velocity of 39 knots

Since charts, maps, and records pertaining to navigation and engine operation were not recovered from the aircraft, the following data concerning airspeed and fuel consumption can be, at best, only approximated. Crew statements were in part conflicting. The planned indicated airspeed of 115 knots when corrected for an altitude of 8,000 feet and a temperature of minus two degrees centigrade results in a true airspeed of 130 knots, approximately the same, according to the captain's testimony, as that used by the crew in computing their flight plan. However, the navigator stated that an average indicated airspeed of only 105 knots was maintained from take-off until 2130. An indicated airspeed of 105 knots corrected for the same altitude and temperature results in a true airspeed of only 118 knots. This discrepancy alone accounts for the speed of the aircraft being 12 knots slower than planned.

The effective headwind component used in computing the flight plan was 26 knots. Actually it was 39 knots. This resulted in a ground speed 13 knots slower than originally estimated. The difference in effective headwind should have been apparent to the crew from the weather reports received from Foynes, the Bibb, and Gander. The increase in effective wind and the failure to obtain the planned indicated airspeed resulted in a ground speed of 25 knots slower than planned. In other words, the flight made good a ground

speed not of 104 knots as estimated but of only 79 knots.

True ground speed could have been computed by the crew at the time of their 0205 position report, at which time they received a radar fix from the Bibb. The flight had then been in the air 10 hours and 25 minutes and had traveled 892 nautical miles, resulting in a ground speed of 86 knots. Had the ground speed of 86 knots remained constant, it would have required 20 hours and 12 minutes to complete the 1,730 mile trip from Foynes to Gander. Thus a reserve of only one hour and 48 minutes of fuel was available to the flight instead of the five hours which they believed they carried.

According to the testimony of the crew an average fuel consumption of 180 gallons per hour was used in computing their flight plan. Thus, they estimated that 4,000 gallons of fuel would provide for 22 hours of flight. However, at 0840 when the aircraft had been airborne for 17 hours, it reported having two hours and 45 minutes of fuel remaining, which would mean that the total fuel capacity was 19 hours and 45 minutes, rather than 22 hours which had been estimated. This being true, the average hourly consumption would have been 202 gallons per hour instead of 180 gallons per hour. Therefore, there was insufficient fuel to complete the flight as planned.

No attempt was made to use long range cruise control technique which would have resulted in lower fuel consumption. The low indicated airspeed from Foynes to the Bibb can be accounted for in part by the fact that the aircraft carried an overload in excess of 5,000 pounds. There was no "howgoezit" or cruise control chart made prior to the time of take-off, nor was any attempt made during flight by any member of the crew to systematically plot fuel consumption in relation to time of flight and distance made good. Had a cruise control chart been prepared before the flight departed and maintained systematically during the course of the flight, it would have been evident to the crew after the first hour or two of cruise that their fuel consumption was greater than planned. At the time that they reached the position of the Bibb, they should have known from their cruise control charts and from their average ground speed made good that the fuel on board was insufficient to reach destination.

The flight engineer testified that at the cruising altitude of 8,000 feet power settings were 1750 rpm and 28.8 inches of manifold pressure, resulting in 810 hp and a fuel flow of 290 pounds per hour. A fuel flow of 290 pounds per hour would give a fuel consumption of 192 gallons per hour. With the fuel capacity of 4,000 gallons and fuel consumption of 192 gallons per hour, the total endurance of the aircraft would be 20 hours and 18 minutes rather than the 22 hours which had been estimated. However, an engineer from the Wright Aeronautical Corporation testified that at the above power settings, the fuel flow would be 340 pounds per hour, and at this fuel flow the consumption would be 228 gallons, resulting in endurance of 17 hours and 30 minutes, or 4 hours and 30 minutes less than the estimated endurance. This engineer also testified that if the fuel flow reading had been 290 pounds per hour the horsepower would be less than 650.

This flight was Captain Martin's second round trip crossing of the North Atlantic. His total flying time was 2,000 hours. He had a total of 162 hours in Model 314 flying boats, and of this 60 hours were as a co-pilot. Captain Martin's seaplane experience had been obtained in the Naval service where he accumulated 200 hours in PBYS and 30 hours in PBMs. He held commercial pilot, single and multi-engine land and sea, and instrument ratings. His last instrument check was January 11, 1946.

First Officer Addison Thompson, the navigator, was also a pilot. He had a total of 4,040 flying hours, which included 102 hours in Model 314 flying boats. He was a graduate of a trans-ocean, scheduled air carrier navigation school, and had approximately 10 years of navigational experience on racing yachts. This was his second round trip crossing of the North Atlantic. He held commercial pilot, single and multi-engine land and sea, and instrument ratings. His last instrument check was September 20, 1947.

Second Officer Jack Shafer had accumulated a total of 1,238 flying hours, including 67 hours in Model 314 flying boats. This was his fourth crossing of the North Atlantic. He held commercial pilot, single and multi-engine land, and instrument ratings. His last instrument check was June 12, 1946

Walter Yaramishyn and Robert Hamilton, the first and second engineers, respectively, held airman certificates with aircraft and engine ratings. Willard Keith Woodmansee, the only radio operator aboard, held a first class radio telegraph operator's certificate.

#### DISCUSSION

There are three basic reasons for the aircraft landing at sea due to a shortage of fuel. These reasons are (1) exceeding the maximum permissible gross weight, (2) no cruise control, and (3) failure to utilize available weather data, with reference to speed and navigational fixes.

When the aircraft departed Foynes, it was loaded above its maximum gross weight by approximately 5,000 pounds. The aircraft was certificated and placarded for a gross weight of 84,000 pounds, and as far as can be determined, the actual gross load was over 89,000 pounds. The captain and flight engineer, who are responsible for the loading of aircraft, testified that they were aware of the maximum authorized gross weight, but believed that the flight could be accomplished with the overload.<sup>2</sup>

The quantity of fuel at take-off, 4,000 gallons was insufficient for the flight. The flight engineer had available the operating manuals for this type aircraft and also the operating instructions for the engines from the manufacturers. Both of these instructions showed clearly that at the power settings which the flight engineer had recommended for the flight it would be impossible to reach their destination.

The captain and navigator, who were responsible for the flight plan, estimated the true air speed for the flight to be between 128 and 132 knots. This true air speed was not based upon an air speed that could be maintained by a heavily-loaded aircraft, but was based on the air speed that had been maintained on the previous east-bound flight without a payload. During the most critical period of the flight, from 2130 to 0500, the navigator was asleep when the aircraft received a radar fix from the Bibb. The fix showed that the flight had not been maintaining the ground speed necessary to allow them to reach their destination with the amount of fuel on board. Also

<sup>1</sup> See Appendix I

during this period, winds aloft reports were received from Gander, which would indicate that it was not possible to reach their destination. While in the vicinity of the Bibb they had sufficient fuel to return to the point of departure but not to reach Gander

The evidence developed during the course of this investigation showed that the crew disregarded fundamental principles of long range flight planning and certain Civil Air Regulations designed for safe flight. As a result a landing was necessary at sea.

### Findings

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

1 The aircraft and pilots were properly certificated, (the navigator, flight engineers, and radio operator were not certificated as such)

2 There was no malfunctioning of the aircraft during the flight involved.

3. The crew received adequate weather information prior to take-off and during the flight.

4 The aircraft was loaded approximately 5,000 pounds in excess of its certificated gross weight at the time of take-off.

5 Estimated air speeds for the flight could not be obtained without the use of uneconomical power settings because of the overloaded condition of the flight

6. There was not sufficient fuel on board for the flight in its overloaded condition to complete the intended trip safely.

7. Information concerning winds received during the course of the flight was not properly considered in estimating a point-of-no-return and total time of flight.

8. No continuing cruise control chart was prepared or maintained during the course of the flight.

### Probable Cause

The Board finds that the probable cause of this accident was due to improper flight planning under conditions of an excess gross weight, resulting in a landing at sea.

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

## Supplemental Data

### Investigation and Hearing

The Civil Aeronautics Board received notification of the accident on the morning of October 14, 1947, and immediately initiated an investigation in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. On October 20th, depositions were obtained from the crew and a public hearing was held in New York, New York, on November 7, 8, 10, and 11, 1947.

### The Air Carrier

American International Airways, Inc., a Delaware corporation with headquarters in New York, New York, had been issued a letter of registration under Section 292.1 of the Economic Regulations as an irregular air carrier, but it had not been issued an air carrier operating certificate under part 42 of the Civil Air Regulations.

### Flight Personnel

Captain Charles M Martin, age 26, of Miami, Florida, until the date of the accident had accumulated a total of 2,000 hours flying time, of which 162 had been obtained in Model 314 flying boats. He held commercial pilot, single and multi-engine land and sea, and instrument ratings. His last instrument check was January 11, 1946.

First Officer Addison Thompson, age 34, of Miami, Florida, until the date of the accident, had accumulated a total of 4,040 hours flying time, of which 102 had been obtained in Model 314 flying boats. He held commercial pilot, single and multi-engine land and sea, and instrument

ratings. His last instrument check was September 20, 1947.

Second Officer Jack Shafer, age 25, of Miami, Florida, until the date of the accident had accumulated a total of 1,238 hours flying time, of which 67 had been obtained in Model 314 flying boats. He held commercial pilot, single and multi-engine land, and instrument ratings. His last instrument check was June 12, 1946.

Walter Yaramishyn, age 28, of Philadelphia, Pennsylvania, and Robert Hamilton, age 24, of New York, New York, the first and second engineer, respectively, held airman certificates with aircraft and engine ratings. Willard Keith Woodmansee, of Santa Monica, California, held a first class radio telegraph operator's certificate. Charles Penn of New York, New York, was steward.

### The Aircraft

NC-18612 was a Boeing Model 314 flying boat and was registered in the name of American International Airways, Inc. The flying boat had accumulated a total of approximately 12,000 hours since its manufacture in 1941. It was equipped with four Wright R-2600-579-C-14 AC-1 engines on which Hamilton Standard propellers were installed. The time since overhaul was 557, 316, 258, and 499 hours for the Nos. 1, 2, 3, and 4 engines, respectively. At the time of departure from Foynes, Ireland, the gross weight of the flying boat exceeded the maximum allowable by at least 5,570 pounds, although the load was distributed with respect to the center of gravity within approved limits.

# Appendix I

## CORRECTIVE ACTION ACCOMPLISHED

As a result of the evidence developed during the course of this investigation the Administrator of Civil Aeronautics accepted the payment of a civil penalty in the amount of \$200 in compromise from Captain Martin for his alleged violations of the Civil Air Regulations in the conduct of the flight. Furthermore the letter of registration issued by the

Civil Aeronautics Board to the company, American International Airways, Inc., was indefinitely suspended by the Board. A further compromise of a civil penalty by the Administrator of Civil Aeronautics with American International Airways, Inc., in the amount of \$500 for alleged violation of Civil Air Regulations is still pending.