

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: November 21, 1947

Released: November 24, 1947

AMERICAN AIRLINES, INC., —JONES BEACH, NEW YORK—JANUARY 5, 1947

The Accident

American Airlines' Flight 203 made an emergency landing at Jones Beach, New York, at 2208, January 5, 1947, with its landing gear retracted. Although the Douglas DC-3, NC 21746, received major damage, none of the 16 occupants was injured.

History of the Flight

Flight 203 was scheduled from New York, New York, to Nashville, Tennessee, with several en route stops, of which Baltimore, Maryland, and Washington, D. C., were the first two. The flight departed LaGuardia Field on an instrument flight plan at 1734, January 5, 1947, to cruise to Baltimore at 2,000 feet with Philadelphia, Pennsylvania, designated as the alternate airport. At the time of departure the aircraft had sufficient fuel aboard for approximately 3 hours and 30 minutes operation. The flight to Baltimore was accomplished without difficulty and the aircraft landed at Baltimore Municipal Airport at 1846.

After discharging some passengers and boarding others, the flight left the ramp without refueling. The pilot requested an instrument flight clearance to Washington, D. C., but was advised by Airway Traffic Control that, because of emergency traffic in that area, clearance to Washington could be approved only if the flight were conducted in accordance with visual flight rules (VFR). The pilot agreed to this condition and departed Baltimore at 1900 on a "contact" clearance. At approximately 1915 Flight 203 reported its position to Washington Tower as "east of the Capitol building." At this time the flight was advised that two aircraft had declared emergencies at Washington because of

shortage of fuel. The flight was instructed, therefore, to remain VFR east of Anacostia, D. C. After circling for approximately four minutes well to the east of National Airport, Flight 203 began to encounter difficulty in maintaining VFR flight. At approximately the time the last of the two emergency flights was in a position to land, Flight 203 called the American Airlines' station and advised that it was no longer "contact" and that it was necessary to climb to an altitude of 2,500 feet in the east A-quadrant of the Washington radio range. Immediately thereafter, Airway Traffic Control directed the flight to proceed to the Baltimore radio range station at an altitude of 4,000 feet. At 1942 additional instructions were transmitted to the flight to proceed to the Relay Intersection, eight miles west of Baltimore, and to maintain 4,000 feet until further advised.

At this time, the Washington Center of Airway Traffic Control inquired of the flight whether clearance to Baltimore was desired. The flight replied that it would defer clearance to Baltimore until 2010, and if clearance to Washington had not been obtained by that time, it would accept clearance to Baltimore.

At 1955, the flight was instructed to descend to 2,000 feet and to continue to hold at Relay. Upon learning that there were additional emergencies at Washington, at 2012 the American Airlines' station requested clearance for Flight 203 to Baltimore. However, the Washington Airway Traffic Control Center advised American Airlines that two flights had already received approach clearance into Baltimore, and that Flight 203 would be "No. 3." When further information was requested at 2025 concerning the status of approach clearance for Flight 203, American Airlines was advised that another aircraft was lost in the vicinity

*All times referred to herein are Eastern Standard and are based on the 24-hour clock

of Baltimore at 1,000 feet. Flight 203 was instructed to descend to 1,500 feet at 2037 and was advised that further clearance could be expected within two minutes. However, the aircraft preceding Flight 203 again became lost, and at 2038 it became apparent that considerable delay would be necessitated in the Baltimore area. Airway Traffic Control, therefore, advised the American Airlines' Washington station that Flight 203 was cleared to the Mount Vernon Fan Marker and to the Washington Approach Control frequency.

During this period, static interference was increasing and radio reception with the flight became increasingly difficult. Before the last clearance could be delivered to Flight 203, the flight reported that it was proceeding to Philadelphia. Washington Airway Traffic Control, therefore, cleared Flight 203 to cruise to Philadelphia Airport at 3,000 feet. The flight did not advise Airway Traffic Control concerning its time of departure from Relay.

When the New York Airway Traffic Control center was requested by the company to provide a clearance for the flight to Philadelphia Tower, Airway Traffic Control advised that it would be impossible to provide such a clearance unless a reasonable estimated time of arrival to Philadelphia could be obtained from the flight. Subsequent attempts to contact Flight 203 were unsuccessful due to severe radio interference.

At 2107, the American Airlines' radio station at New York received a message from the flight on very high frequency, indicating that it had no range reception or operative direction finding facilities. Because it had become apparent that precipitation static was so severe that it would not be possible to use the Philadelphia radio range for an approach to the Municipal Airport, the flight advised that it was continuing northeastward until visual contact with the ground was established. During this transmission, Flight 203 reported its position as in the vicinity of Lakehurst, New Jersey.

When asked by the New York station of American Airlines at 2115 if he were "contact" in the South Jersey area, the pilot of Flight 203 replied that he had not been "contact" since leaving Washington. At 2128, Flight 203 declared an emergency, reporting that it had 70

gallons of gas aboard, with little or no D/F or radio range reception, and requested a report on the "nearest weather that is 1,000 feet or better." While maintaining a northeasterly heading, the flight descended to an altitude of 200 feet. However, inasmuch as instrument conditions were still being encountered at that altitude, the pilot climbed again to an altitude of 1,500 feet. By the time the American Airlines' New York station was able to provide the flight with weather reports in the area northeast of LaGuardia Airport, the pilot had decided to effect an emergency landing without further delay. At this time there was but 30 minutes gas supply remaining on board.

The pilot turned to a heading of 110 degrees toward the Atlantic Ocean in order to permit a descent to be made over open water. At 2156, after having maintained an east-southeasterly heading for 15 minutes, the flight advised the American Airlines' station at New York that it intended to drop a flare. Upon dropping the flare and following it to the surface, the pilot found that the flight was over water. The pilot turned, therefore, to a heading of 300 degrees and, with the aircraft landing lights shining on the surface, continued westbound until sighting a shore line. He immediately maneuvered the aircraft to align it with the beach, which was oriented approximately 60 degrees to the left of his flight path, and completed an emergency landing at 2208 with his wheels retracted. Being unaware of his location, the pilot requested that bearings be taken in order to identify the position of the aircraft. At 2245, American Airlines was advised by telephone that Flight 203 had been located on the beach approximately one mile east of the Coast Guard Station at Jones Beach, New York.

Investigation

The investigation disclosed that the right wing tip of the aircraft had struck a slight rise in the beach during the landing approach. The aircraft had spun to the right as it skidded along the beach on an approximate bearing of 240 degrees. After turning approximately 270 degrees to the right the aircraft had come to rest with its nose extended partially over the water. The entire right wing tip was torn off, the

right engine was torn completely loose and the left engine was partially dis-mounted. Extensive damage was sustained to the wing center section, the left elevator and both horizontal stabilizers. The fuselage was broken at the main cabin entrance door. The landing gear was badly mutilated and crushed into the center section structure.

Examination of the wreckage disclosed no evidence of malfunctioning of the aircraft prior to the crash. Although much of the radio antenna systems was destroyed in the crash, ail radio components undamaged by impact operated satisfactorily when subsequently examined. The company maintenance records indicated that the aircraft had been in an airworthy condition prior to the time of take-off at LaGuardia Field. According to the testimony of the crew no mechanical difficulty was encountered in the aircraft after the departure from New York.

Communications records of the Civil Aeronautics Administration indicate that all radio facilities between New York and Washington were functioning normally during the evening of January 5, 1947, although unusually severe static on all frequencies other than VHF was experienced. The flight crew testified that the voice communications equipment appeared to be functioning during that portion of the flight between Relay and New York, although voice communication was possible only on the very high frequencies. Both automatic and manual direction finding equipment were inoperative, however, it is not known whether the difficulty encountered with this equipment was due to some failure of the loop actuating system or was the result of intense atmospheric interference. The pilot stated that, although he attempted to use the ILS facility at LaGuardia Field, the localizer indicator fluctuated in such an erratic manner that he presumed this instrument to be inoperative.

On January 5, 1947, a cell of polar continental air was moving in a southeasterly direction into the United States from central Canada. The influx of the dry cold air into the northeastern United States, due to its unstable lapse rate and low moisture content, was believed by company and U. S. Weather Bureau forecast personnel to provide an indication of satisfactory

weather conditions throughout the period of this flight. However, during the afternoon the barometric pressures began to fall very rapidly in the Ohio Valley area and at approximately 1630 indications of a cold front aloft were noted. Meanwhile a low pressure trough began to appear in the West Virginia area with which there was associated considerable precipitation. This area of precipitation gradually spread northeastward. The surface flow during this period was toward the northeast and east-northeast and the moisture content of the lower levels of air appeared to be higher than had been anticipated. The cold dry air aloft, meanwhile, was flowing toward the east and southeast. The convergence of these two air flows was difficult to detect because of the absence of radio reporting stations for winds aloft in the northeastern states. The advection of cold air aloft resulted in the formation of snow showers. These snow showers became more severe than was anticipated and, due to the miscalculation of the strength of the flow aloft, they moved eastward much more rapidly than was expected. Thus, not only were visibility and ceiling conditions more adverse than expected, but the movement of these conditions into the New York area took place during the time that ample ceilings and visibilities were expected to maintain. By the time the meteorologists became fully aware of what was taking place, it was too late to provide adequate warnings for the flight involved. The intense precipitation static experienced by the flight was aggravated by crash static resulting from electrical discharges which were exceptionally uncommon for this time of the year.

The forecasts for the New York and Washington area, during the period 1130 to 1930, issued by the Weather Bureau were available to the flight prior to departure from LaGuardia Field. These forecasts indicated that contact conditions were expected to prevail throughout the period. While this forecast indicated lowering conditions, no indication was contained which would have led the flight to believe that satisfactory weather conditions would not be encountered. The company trip forecast likewise indicated a slight worsening of the weather, but in no instance anticipated conditions below visual flight rule

minimums north of Washington. At 2040, which was approximately the time the pilot decided to proceed from the Relay intersection to Philadelphia, a local forecast for LaGuardia Field was issued which predicted a precipitation ceiling of 400 feet; visibility 1/2 mile and moderate snow by 2230.

At the time of departure from Baltimore, the Washington weather was reported as: measured ceiling 1,800 feet, 2 1/2 miles visibility. At this time the weather at Baltimore was reported as: estimated ceiling 3,000 feet, scattered clouds at 1,500 feet, 1 1/4 miles visibility. While the flight was holding at Relay, the weather at Washington became: precipitation ceiling 1,200 feet, 2 miles visibility, and at Baltimore: measured ceiling 1,000 feet, 3/4 mile visibility. It was at this time that the flight requested Philadelphia weather, which was being reported as: precipitation ceiling 1,300 feet, 1 1/2 miles visibility.

As the flight was proceeding north-eastward in the South Jersey area, it was given the 2030 LaGuardia Field weather report: unlimited ceiling, 8 miles visibility. However, at approximately the time that Flight 203 declared an emergency, the LaGuardia Field weather was observed as: precipitation ceiling 600 feet, 3/4 mile visibility. During this period, the snow which had been affecting Western Pennsylvania was moving into the New York area, causing a rapid and unanticipated deterioration of the weather in that area. Ceiling and visibility continued to decrease at New York until, at 2230, LaGuardia Field was reporting: precipitation ceiling 400 feet, 1/2 mile visibility.

In response to a request from the flight for ground D/F bearings, American Airlines requested the assistance of Army, Navy, and Coast Guard air-sea search and rescue services at 2139. Since coordination of such requests is made by the Airway Traffic Control center at New York, this center attempted to obtain the assistance of emergency facilities operated by the military services, however, with the exception of the Navy Ground Control Approach (GCA) at Floyd Bennett Field, these facilities were not equipped with the crystals required for reception of the frequencies on which Flight 203 was transmitting. Since the military services are assigned

separate VHF frequencies and, since no facilities are available which serve civil aircraft expressly, it was impossible to utilize the radar and D/F equipment located in the New York area as emergency navigational facilities. The GCA unit at Floyd Bennett Field was not ready for operation before 2202 and, by this time, the flight was already committed to an emergency landing.

DISCUSSION

The initial difficulty experienced in the dispatch of this flight was the result of the failure of company and Weather Bureau forecasts to anticipate the extent of the weather deterioration in the New York-Washington area on the night of January 5, 1947. It appears that the facilities essential to an accurate and rapid forecast of meteorological conditions at high altitude which affected this area were lacking in this instance. Most of the winds aloft reporting stations in the northeastern states obtain their data from theodolite readings of visual balloons; however, radiosonde reports, which provide for more comprehensive data from which weather aloft studies may be made, were obtained from only one station in this region during the afternoon of January 5. Under conditions of poor visibility or low overcast, visual winds aloft readings are not possible and in this instance few reports concerning high altitude winds were available. The lack of high altitude weather information prevented the making of an accurate forecast with the resulting dispatch of a far greater number of aircraft into the affected area than would have been the case had more complete information been available.

It was readily apparent that the navigational facilities in the Washington-New York area were not adequate under the conditions of weather and traffic density which existed at that time. The saturation of these facilities was aggravated by several emergencies, seven of which were declared at Washington alone between the hours of 1922 and 2126. In this period seven emergencies were declared at New York, two at Philadelphia, and two at Baltimore. The existence of the latter emergencies made it difficult to route traffic from already saturated facilities to alternate airports. One of the two emergencies at

Baltimore was declared by a nonscheduled flight which was lost in the Baltimore area for one hour and 35 minutes, during which period it was necessary to suspend many of the approaches to Baltimore and Washington. Although most of the aircraft which accounted for the above emergencies were nonscheduled operations, it appears that this condition might have been alleviated to some extent had the Army and Navy aircraft, which were among those for which emergencies were declared at the above locations, been routed to nearby military airports possessing GCA and other equipment which could have been utilized to good advantage.

In view of the serious lack of emergency facilities in the Washington-New York area the installation of new equipment and the fuller utilization of military facilities has been accomplished. GCA units have been installed at both LaGuardia and Washington National Airport. An adaptation of the Army "micro-wave early warning" radar has been installed in the vicinity of the National Airport, the use of which is anticipated to alleviate the effect of lost aircraft upon traffic flow. Several agreements have been reached between the scheduled air carriers and the Army and Navy whereby an exchange of frequencies has been accomplished enabling air carrier aircraft to take advantage of military radar equipment during emergencies. Furthermore, arrangements have been made to permit Airway Traffic Control to route military aircraft to military airports under conditions in which the civil approach facilities are becoming saturated. Additional radar equipment is at present being installed at civil airports as a result of which sufficient operational experience is anticipated to indicate the feasibility of a more comprehensive search radar program for civil aviation.

It is significant to note that Flight 203 lost the use of all its low frequency radio equipment as a result of the severe precipitation static and that only the high frequency facilities were still usable. This experience again emphasizes the urgency of replacing present low frequency navigation and communication facilities with very high frequency equipment. The Board is advised that the Civil Aeronautics Administration's program for installation of

very high frequency radio ranges is well under way. At present approximately 70 four-course, visual-aural VHF ranges are installed throughout the country. Most of the air carriers have completed engineering and training programs which will permit complete utilization of these facilities in the near future. As rapidly as the production capacities of the radio industry permit, both airborne and ground low frequency facilities will be replaced by equipment utilizing static-free very high frequencies.

Having been confronted with a combination of circumstances which resulted in his inability to accomplish a landing on a prepared landing area, it must be noted that the pilot exercised commendable judgment and skill in completing a safe emergency landing under difficult circumstances.

Findings

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

1. The air carrier, aircraft and crew were properly certificated.
2. At the time of departure from Baltimore the aircraft was properly loaded with respect to both its maximum allowable gross weight and center of gravity.
3. At 1900, January 5, 1947, Flight 203 departed Baltimore according to visual flight rules for its destination, Washington, D. C.
4. Although in sight of the airport, the flight was advised that the existence of emergencies at Washington required that it "hold" well to the east of the National Airport.
5. Being unable to maintain visual reference to the ground in the vicinity of Washington, it became necessary for the flight to climb to a safe altitude and request appropriate air traffic control clearance.
6. The flight was instructed to proceed to the vicinity of Baltimore and, after "holding" in the vicinity of Baltimore for approximately one hour and 15 minutes because of traffic delays resulting from other declared emergencies, the flight departed from this vicinity without having obtained a traffic control clearance.
7. Since stations north of Baltimore were reporting weather conditions

suitable for visual flight, the pilot decided to land at Philadelphia.

8. During this period static interference on all frequencies other than VHF was becoming increasingly severe.

9. When in the vicinity of Philadelphia, it became apparent to the flight that static interference prevented its use of the Philadelphia radio range.

10. The flight continued northeastward but was unable to establish visual contact with the ground or to utilize any of the low frequency navigational facilities.

11. The weather throughout this area was below visual flight rule minimums although satisfactory conditions had been forecast by both the company and the Weather Bureau meteorologists.

12. With approximately 30 minutes fuel supply remaining, the pilot decided to effect an emergency landing.

13. After having flown toward open water for approximately 15 minutes, the flight descended to the surface and flew northwestward until it intercepted the shore line.

14. A landing was made with the wheels retracted at Jones Beach, New York, at 2208.

15. The aircraft was extensively damaged; however, none of the 16 occupants was injured.

Probable Cause

On the basis of the above findings, the Board determines that the probable cause of this accident was the inability of the pilot to land at a prepared landing area due to the loss of radio navigational reference resulting from severe static interference. A contributing factor was the saturation of navigational facilities in the New York-Washington area due to the existence of a large number of emergencies which prevented an early landing. A further contributing factor was the failure of the company and the United States Weather Bureau to forecast adequately the high level conditions affecting this area due to insufficient number of radiosonde stations in the northeastern states.

BY THE CIVIL AERONAUTICS BOARD:

/s/ J. M. LANDIS
/s/ HARLLEE BRANCH
/s/ JOSH LEE

Ryan, Vice Chairman, did not take part in the decision.

Supplemental Data

Investigation and Hearing

The Civil Aeronautics Board was notified of the accident at 2330, January 5, 1947, and an investigation was immediately initiated in accordance with the provisions of Sections 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. Air Safety Investigators of the Board's New York Office arrived at the scene of the accident at 0125, January 6, and were subsequently assisted in the investigation by other investigators of the Safety Bureau staff. A public hearing was ordered by the Board and was held at New York, New York, January 24, 1947.

Air Carrier

American Airlines is incorporated under the laws of the State of Delaware maintaining its general offices in New York, New York, and operating under a certificate of public convenience and necessity and an air carrier operating certificate, both issued pursuant to the Civil Aeronautics Act of 1938, as amended. These certificates were current at the time of the accident and authorized the company to transport persons, property, and mail between various points in the United States, including New York and Washington, D. C.

Flight Personnel

Captain John E. Booth, age 32, of Nashville, Tennessee, was pilot of the

aircraft. He possessed an airline transport pilot rating and until the date of the accident had logged a total of 6,715 hours flying time of which approximately 5,580 hours were obtained in DC-3 equipment. First Officer, Thomas E. Hatcher, Jr., age 27, of Nashville, Tennessee, was co-pilot of the aircraft at the time of the accident. He possessed a commercial pilot certificate and until the date of the accident had accumulated a total of 3,850 hours flight time of which approximately 1,500 hours were obtained in DC-3 aircraft. Margaret Murphy of Old Hickory, Tenn., was flight stewardess. Both pilots were properly certificated and the captain was qualified over the route.

Aircraft

The Douglas DC-3, NC-21746, was properly certificated in accordance with the appropriate Civil Air Regulations. Until the time of the accident it had been operated a total of 25,547 hours. Its two Wright G-102 engines had accumulated a total of 6,719 hours and 5,865 hours for the left and right engines respectively; 25 hours and 304 hours respectively had been accumulated since the last major overhaul. Hamilton Standard Propellers were installed. At the time of the accident the total weight of the aircraft was approximately 2,600 pounds less than its maximum allowable gross, and the load was distributed with respect to the center of the gravity within approved limits.