AIR SAFETY BOARD

REPORT

TO THE CIVIL AERONAUTICS AUTHORITY

AS A RESULT OF AN INVESTIGATION OF AN ACCIDENT INVOLVING AIRCRAFT

Accident involving aircraft NC 13735 of Eastern Air Lines, in the vicinity of Montgomery, Alabama, on October 18, 1938.

Accident involving aircraft of United States Registry, NC 13735, while operating as Flight 2 of October 18, 1938, of Eastern Air Lines, having occurred in the vicinity of Montgomery, Alabama, on the eighteenth day of October, 1938, at approximately 10:44 o'clock P. M. of said date; such accident having been investigated, and the Air Safety Board having considered the evidence adduced therefrom, reports the following facts, conditions, and circumstances relating to the said accident, its findings, and its conclusions as to the probable cause thereof:

FACTS, CONDITIONS, AND CIRCUMSTANCES:

AIR CARRIER:

Eastern Air Lines, a corporation, as authorized by currently effective Air carrier Operating Certificate issued by the Civil Aeronautics Authority, operates as an air carrier via certain named intermediate points between the terminal points of Newark, New Jersey and San Antonio, Texas. Application has been filed consistent with the provisions of the Civil Aeronautics Act of 1938 with the Civil Aeronautics Authority for Certificates of Convenience and Necessity over certain routes, including the route above named.

Eastern Air Lines Flight 2 of October 18, 1938, scheduled to operate between San Antonio, Texas and Newark, New Jersey, with scheduled intermediate stops at Houston, Texas; New Orleans, Louisiana; Mobile, Alabama; Montgomery, Alabama; Atlanta, Georgia; Spartanburg, South Carolina; Charlotte, North Carolina; Greensboro, North Carolina; Richmond, Virginia; Washington, D. C.; Baltimore, Maryland, and Camden, New Jersey; arrived in Montgomery, Alabama at approximately the scheduled time. The aircraft had functioned normally during the entire trip prior to this time.

AIRCRAFT:

Aircraft NC 13735, operated on the flight, was a Douglas Model DC-2, manufactured by the Douglas Aircraft Corporation of Santa Monica, California. This model is approved by the Civil Aeronautics Authority, for air carrier operation over the route flown by Eastern Air Lines with an approved gross weight of 18,560 pounds. It was powered with two Wright Cyclone engines, model GR 1820 F 2 B., and Hamilton Constant Speed propellers, hub models 3E-50, and blade models 6111-6. The left engine had a total time of 6929 hours and 45 minutes, and had operated 98 hours and 50 minutes since last overhaul, while the right engine had a total time of 6863 hours and 18 minutes, and had operated 499 hours and 13 minutes since last overhaul. Overhaul period on this type engine, approved in the currently effective Air Carrier Operating Certificate issued to Eastern Air Lines by the Civil Aeronautics Authority, is 600 hours.

AIRMEN:

The crew consisted of Captain J. D. Hissong, First Officer C. R. Russell, and Flight Steward Frank Gibbs. Captain Hissong had accumulated a total of approximately 8,000 hours flying time, of which 2,546 were in Douglas aircraft, while First Officer Russell had accumulated a total of 1400 hours flying time, of which 1092 hours were in Douglas aircraft. Both airmen were possessed of required ratings and Certificates of Competency for the flight and equipment involved.

The trip was cleared from Mobile, Alabama to Atlanta, Georgia via Montgomery and was subsequently dispatched from Montgomery to Atlanta in a manner consistent with company procedure, departing Montgomery at 10:40 P. M.

WEATHER:

Weather conditions at the time of departure from Montgomery were: Clear, ceiling unlimited, visibility 12 miles, temperature 65°, dew point 57°, wind west 2 MPH, barometer 30.09.

At the time of departure from Montgomery the gross weight of the aircraft was approximately 17,156 pounds, including mail, cargo, approximately 230 gallons of gasoline and 30 quarts of oil, and the following passengers:

John H. Sotham, address given as 315-4th Ave. New York City
Joseph V. Connally, address given as 235 East 45th St. New York City
Z. Livenson, address given as 261-5th Ave. New York City
J. H. Bonck, address given as 356 Fairway Drive, New Orleans, La.
D. Drucker, address given as 10 East 40th Street, New York City
Dr. J. T. Nix, address given as 2140 S. Carrolton, New Orleans, La.
R. B. Kahle, address given as 630-5th Ave. New York City
E. D. Rivers, Jr., address given as Atlanta, Georgia
George Stuart, address given as Atlanta, Georgia
W. O. Fotte, Jr. address given as Montgomery, Alabama
F. F. Vonnegut, address given as New Orleans, La.

The aircraft started the take-off to the southeast, from the northwest corner of the field, at approximately 10:40 P. M., after the motors had been run up and instruments checked, in accordance with normal procedures; and, in a slow normal climb, crossed the boundary lights on the south edge of the field. Immediately after the gear had been pumped to a completely retracted position a slight vibration was felt, which increased noticeably when the motors were throttled from take-off power at an approximate altitude of 1,000 feet to 28 inches manifold and 1950 RPM. After discovery that the right motor was the source of the vibration, this engine was throttled to about 20 inches manifold pressure, and additional power applied to the left motor. On continuation of vibration from the right engine, it was completely throttled, and the aircraft banked in a right gliding turn toward the Montgomery airport, with landing gear lowered.

The cockpit immediately filled with smoke, and flames appeared around the right engine. Immediate closing of the fuel supply to the right engine, and use of the fire extinguisher in the engine nacelle, served to only momentarily check the flames, and fire continued to burn around this engine and along the right wing. The supporting structure of this engine mount was burned away by the flames and the engine dropped free from the aircraft.

The aircraft thereupon lurched violently, the right wing went up in a vertical position and was brought back to a normal position through the combined efforts of both pilots. When an altitude of approximately 400 feet was reached the landing gear retracting valve was placed in the "up" position and the aircraft nosed down in a glide, with the left engine throttled. Just before reaching the ground the right wing struck a tree, and was shreared from the aircraft. This impact resulted in the rotation of the aircraft to the left, and it struck the ground after an approximately 180° rotation in a tail-first attitude. The ship skidded over uneven ground and came to rest in an upright position.

All passengers and the flight steward left the aircraft through the door, while Captain Hissong and First Officer Russell escaped through the cockpit hatch. No injuries were suffered by either the passengers or crew, with the exception of of minor burns sustained by Captain Hissong. The aircraft was destroyed by the fire.

Examination and inspection of the aircraft and engines subsequent to the accident, indicated that three front holddown nuts on the No. 6 cylinder flange of the right engine had been loose prior to failure of studs, and that the holddown studs on this cylinder failed progressively, resulting in the cylinder being forced outward because of pressure exerted by power impulse, thus permitting the bottom oil ring to leave the cylinder when the piston was near bottom center of the stroke. Failure of the oil sump, exhaust manifold and No. 6 connecting rod, occurred in rapid succession. Oil flowing from the cracked oil sumps is believed to have become ignited by the flame emitting from a broken exhaust manifold, and, because of the forward speed of the aircraft, the resultant fire progressed through the engine cowling and the diaphragm separating the power section from the accessory compartment, where, intensified by the burning away of fuel, oil and hydraulic lines, it continued around or through the fire wall, into the wheel well and center section, igniting the fuel tanks, and eventually progressing into the cabin.

FINDINGS

1. Aircraft NC 13735 was certificated as airworthy by the Civil Aeronautics Authority, and had been inspected and maintained in accordance with approved maintenance procedure of Eastern Air Lines.

2. Both airmen held required ratings and Certificates of Competency for the flight and equipment involved.

3. Eastern Air Lines Flight 2 of October 18, 1938, was properly dispatched and subsequently cleared to Mobile, Alabama, Montgomery, Alabama, and Atlanta, Georgia, in accordance with approved company procedure and Air Carrier Operating Certificate issued to Eastern Air Lines by the Civil Aeronautics Authority.

4. Weather conditions at Montgomery, Alabama at the time of take-off were: clear, ceiling unlimited, visibility 12 miles, temperature 65°, dew point 57°, wind 2 MPH, barometer 30.09.

5. The take-off and climb were normal until shortly after the gear was raised when vibration set in from the right engine, of such intensity as to result in the engine being throttled.

6. [illegible] down studs on No. 6 cylinder of the right engine failed, r[illegible] in prog[illegible] failure of other component parts of the engine.

[illegible] report takes [illegible]gniz[illegible]ion that an [illegible] was heard over Creso[illegible] on the Pacific

7. Fire resulted from ignition of escaping oil or gasoline, or both, coming in contact with heated parts of the engine.

8. The fire burned either through or around the engine fire wall, and progressed into the center section and the cockpit, destroying the aircraft after an emergency landing had been effected.

9. The Captain and crew displayed exceptional skill and courage, in meeting the emergency and in bringing the aircraft to a landing in a manner as to prevent loss of life.

PROBABLE CAUSE:

Fire in the right engine nacelle, resulting from progressive failure of engine parts, which increased in area and intensity to such an extent as to make it impossible to continue the aircraft in flight.

RECOMMENDATIONS:

Such recommedations as, in the opinion of the Air Safety Board, will tend to prevent similar accidents in the future, will be transmitted in due course.