

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: December 10, 1946

Released: December 12, 1946

TRANS-LUXURY AIRLINES - ELKO, NEVADA - September 5, 1946The Accident

NC-57850, a Douglas DC-3 owned and operated by Trans-Luxury Airlines, crashed $2\frac{1}{2}$ miles west of Elko Airport, Elko, Nevada, at approximately 0132^h, September 5, 1946 while attempting a landing. One child survived the accident with minor injuries; the remaining 21 occupants of the aircraft were fatally injured and the aircraft was demolished by impact and fire.

History of the Flight

The aircraft, hereinafter referred to as Aircraft 850, departed Cheyenne, Wyoming, at 2047, September 4, 1946, after a complete crew change, with its destination as Reno, Nevada. It had been cleared by Air Traffic Control under a contact flight rule clearance with 12,000 feet approved as a cruising altitude and with Sacramento, California as its alternate airport. The ground speed of the aircraft between Cheyenne and Rock Springs, Wyoming, was abnormally slow according to computations based on position reports obtained by Air Traffic Control. The pilot reported over Sinclair, Wyoming, at 2140 at an altitude of 12,000 feet and estimated reaching Rock Springs at 2218. However, the aircraft was not reported over Rock Springs until 2254. The ground speed between Rock Springs, Wyoming, and Elko, Nevada, appeared to be normal, position reports having been obtained over Fort Bridger, Wyoming, at 2323 and Ogden, Utah, at 2359.

All times referred to in this report are Pacific Standard and based on the 24-hour clock.

When over Ogden at 12,000 feet, the pilot requested a change of flight plan to land at Elko, Nevada, estimating arrival at Elko in one hour and twenty minutes. Battle Mountain, Nevada, was selected as an alternate airport and the pilot reported 3 hours' fuel aboard the aircraft. The Salt Lake City Airway Traffic Control Center approved the request for change of flight plan and cleared the aircraft to the Elko Range Station to cruise at and maintain an altitude of 12,000 feet and to request further clearance from Elko radio. This clearance was delivered by Ogden radio at 0005 September 5, 1946, and was acknowledged by the pilot of ^{the} aircraft. The pilot reported over Lucin, Utah, at 0035 at an altitude of 12,000 feet. Approximately 25 minutes later Elko radio established contact with the flight and transmitted an Airway Traffic Control clearance to the aircraft as follows: "NC-57850 is cleared to Elko Airport for Contact Flight Rule approach. If not possible, maintain 12,000 feet and advise." At this time Elko radio advised the pilot that the 0100 Elko special weather report indicated: Measured ceiling at 200 feet, thin broken clouds; visibility 4 miles, light ground fog; wind ENE at 2 miles per hour.

The aircraft was reported over Elko, Nevada, at 0121 and the pilot stated to the Aircraft Communicator at Elko that he had the field in sight and that he anticipated no difficulty in landing. The latest weather information was transmitted to the pilot and acknowledged by him: Ceiling measured 200 feet, thin overcast; lower thin scattered clouds at 100 feet; visibility 7 miles; wind ENE at 6 mph; altimeter setting 30.14. No further transmission was received from the flight. Elko radio made several attempts to contact Aircraft 850 without success and, at approximately 0133, notified Airway Traffic Control that radio contact was no longer being maintained with the flight.

Salt Lake City Air Traffic Control requested Battle Mountain radio to attempt to contact the aircraft in the event the pilot had elected to continue

to his alternate. However, although several attempts were made, no contact was established with the flight. United Air Lines' Flight 16, of September 4, 1946, en route to Salt Lake City on Airway Green 3, was called by the United Air Lines station at Salt Lake City and requested to check the vicinity of Elko for any sign of fire or other indications of an aircraft accident. The time of this contact was 0200, at which time Flight 16 was approximately 5 miles east of Elko Range Station. The Captain of Flight 16 returned to Elko and scanned the area in the vicinity of the airport. On approaching the airport the flight crew of the United Air Lines' DC-3 observed an intense fire approximately 2 miles west and almost directly in line with Runway 23 of the Elko Airport. This information was transmitted to the United Air Lines' ground station at Elko, Nevada, and Salt Lake City, Utah.

The fire warden at Elko was immediately notified of the location of the fire and was requested to proceed to the scene of the fire. Personnel from the C. A. Communications Station at Elko arrived at the scene of the fire at approximately 0230 and found that the aircraft had crashed near the top of a ridge, the elevation of which was approximately 114 feet above that of the field, and at a point approximately $2\frac{1}{2}$ miles west of the west end of Runway 23 at Elko Airport. At this time the wreckage was found to be burned severely and, with the exception of two passengers, one of whom died shortly afterward, all occupants had been fatally injured in the aircraft.

Investigation

The terrain west of Elko Airport rises in a gradual slope for a distance of approximately $2\frac{1}{2}$ miles westward from the airport boundary. Along a line running approximately north and south the terrain breaks abruptly into a steep downward slope which extends westward to an elevation approximately 200 feet below the highest point on the ridge. Aircraft 850 was almost directly in the

line of approach to Runway 5 at the time of the accident and had struck this ridge approximately 20 feet from the top. At the time of impact the aircraft was flying in approximately level flight and had bounced up the steep incline and come to rest approximately 100 feet beyond the upper edge of the ridge. The fuselage broke in two just aft of the trailing edge of the wings and contents of the aircraft were strewn in the direction of motion for a distance of approximately 200 feet beyond the point at which the fuselage came to rest. Both engines had been torn from their respective mounts and had rolled forward in the direction of motion approximately 150 feet.

Inspection of the wreckage disclosed the fact that the wheels were extended at the time of impact and the flaps were extended at least 30° . Damage to the propellers indicated that considerable power was being developed by both engines at the time of impact. No indication was observed in either of the two power plants of any failure in flight. Inspection of the wings and the empennage disclosed no evidence of structural failure. The remains of the control systems indicated that they were operating satisfactorily prior to impact.

An aftercast of the weather situation at the time and in the vicinity of Elko revealed that a cold front had passed that area earlier in the day accompanied by rain showers. The terrain in the vicinity of Elko was still damp and considerable moisture was present in the air during the evening of September 4. With the complete lack of cloud cover during the night of September 4, the temperature fell rapidly due to ground radiation. By early morning of September 5, radiation cooling had reduced the dew point until at the time of the accident there was one degree spread between temperature and dew point. During the late evening of September 4, light

smoke was reported within the vicinity of Elko giving indication of a condition suitable for ground fog. By midnight, ground fog was beginning to form in the vicinity, occasionally forming patches on the runway. At the time of the accident, and for thirty minutes immediately preceding, a ceiling was being reported at 200 feet, increasing from broken to overcast during the period. Throughout this period shifting patches of ground fog were observed across the airport. At 0140, shortly after the accident had occurred, the visibility had decreased to 5/8 of a mile, heavy fog covering the entire area. The dense fog condition remained until well into the morning.

The investigation disclosed that the flight had departed Cheyenne with approximately 560 gallons of gasoline aboard. At the time of departure from Cheyenne, Weather Bureau forecasts indicated that head winds would be anticipated averaging approximately 30 miles per hour throughout the trip. While it may have been possible for the flight to reach Reno, its destination, assuming a normal fuel consumption of between 85 and 90 gallons an hour, it would have been impossible to have reached Sacramento if use of that alternate became necessary. That portion of the route between Sinclair and Rock Springs was reported by Airway Traffic Control at Salt Lake City to have been covered at an average ground speed of 81 miles per hour; the remainder of the flight from Rock Springs to Elko averaged approximately 150 miles per hour. Such a discrepancy in ground speed cannot be accounted for by erratic head winds alone. The ground speeds of all other flights along Airway Green 3 between Cheyenne and Elko, from 2330 September 4, to 0230 September 5, were examined and it was observed that no other aircraft among a total of thirteen flights experienced as extensive a variation in ground speed.

It was impossible to determine the reasons for the apparent delay between Sinclair and Rock Springs. However, having consumed approximately 30 minutes longer than had been anticipated in arriving at Ogden and having realized that the fuel supply carried aboard would not have provided a sufficient safety margin in a flight to Reno with Sacramento as an alternate, the captain evidently chose to amend his flight plan to permit refueling at Elko rather than attempt to extend his flight to Reno. None of the passengers aboard was scheduled to deplane at Elko.

The Weather Bureau Flight Advisory Service at Salt Lake City noticed the report of fog at Elko at about midnight and drew the attention of the air traffic controller to this condition. Salt Lake Air Traffic Control, therefore, advised the aircraft communicator at Elko at 0050 to provide the flight with the latest weather information when transmitting the approach clearance. In accordance with these instructions the Elko communicator advised the pilot of Aircraft 850 at least 15 minutes before the flight reached Elko that the weather conditions had changed from: "Sky clear, visibility 30 miles" to: "Ceiling 200 feet, thin broken clouds; visibility 4 miles."

Elko Airport lies at an elevation of 5,066 feet above sea level and is located at a point 8/10 of a mile and at a bearing of 200° from the Elko range station. No tower facility is available at Elko Airport. The CMA Communications Station provides aircraft desiring to land at Elko with the latest weather information submitted by a local Weather Bureau observer and the direction of landing is left entirely to the discretion of the pilot. The radio communicator is located indoors in such a position that the approach paths toward all runways are not visible to him, nor is any but a small area of the airport within his range of vision. No means are

available to communicate to transient pilots sudden changes in the condition of the airport, such as traffic in the vicinity of and on Elko Airport. With the exception of the information contained in the special weather reports the aircraft communicator was not able to advise the pilot of Aircraft 850 as to the conditions which existed at the time of approach. The testimony of several witnesses indicated that at the time of ^{the} accident the Airways Beacon, which was located approximately 200 feet from the point at which the aircraft came to rest, was not visible from the airport due to ground fog. However, this information was not available to the pilot.

Although several local and special reports were made at intervals of no more than 15 minutes in accordance with the most recent directives from the Weather Bureau, the weather observer on duty at the time was not aware of the approach of Aircraft 850 until after the accident had occurred. The weather reports available to the aircraft communicator indicated that the weather conditions in the vicinity of the airport were fluctuating very rapidly. However, no arrangements were made for an "on-the-spot" weather observation concerning conditions along the approach path nor were any requests made for such assistance. The Civil Aeronautics Administration, at stations at which no control tower is located, does not provide personnel for such special services to the itinerant pilot as are normally provided by scheduled air carriers for their own exclusive use.

Discussion

It is apparent that the flight plan of the crew prior to departure for Cheyenne was faulty. If complete attention had been given the forecasts of winds aloft it would have been apparent to the crew that a flight to Sacramento at 12,000 feet would not have been possible under the conditions

that existed. However, recognition of this fact became apparent in flight when the captain requested a change of flight plan at Ogden, Utah. It is not known why the captain elected to continue to Elko rather than to land at Ogden inasmuch as the terrain in the immediate vicinity of Ogden is more suitable for a night approach. However, at the time he reported over Ogden and obtained his change of clearance to Elko, the weather reports indicated conditions satisfactory for CFR operations into Elko. Pilots for scheduled airlines experienced with night approaches into Elko Airport state that approach procedures for that station require considerable caution in view of the difficulty imposed by high terrain in the proximity of the airport. It was determined that the pilot had landed at Elko on three occasions prior to the accident. It must be assumed, therefore, that he was aware of the general nature of the terrain in the vicinity of Elko but that he was not sufficiently familiar with the contours in the immediate vicinity of the airport to have avoided the ridge on which the accident occurred unless it were clearly visible to him.

The information concerning weather conditions at Elko Airport furnished the flight when it was over the Elko range station at 12,000 feet was part of the 0125 weather report. This report was being prepared by the weather observer during the radio contact with the flight at 0121 and was not completed until four minutes later. However, inasmuch as the ceiling and visibility had already been obtained for the report, this information was transmitted to the flight at 0121. Having been informed that the ceiling had been measured at 200 feet, that the bases of lower scattered clouds were at 100 feet, and that there were shifting patches of ground fog in the vicinity of the airport, the pilot elected to attempt an approach. It is probable that this decision was largely determined by the fact that neither

refueling facilities nor passenger accommodations were available at nearby fields, such as Battle Mountain, which otherwise were satisfactory for landing.

It is apparent from the testimony of observers and from the aftercast of the weather conditions at Elko that a fog condition existed over and in the vicinity of Elko Airport at the time of the accident. It is estimated that the ground fog may have extended to an altitude as high as 300 feet above the field. Although the pilot may not have had any difficulty in sighting the airport when over Elko at an altitude of 12,000 feet, the acute angle of reference to the airport during the final approach would have reduced his visibility considerably. It is probable that, at an altitude of at least 200 feet above the field elevation, the pilot encountered a fog condition in which he lost visual contact with the field. Under this condition he elected to continue his descent to the runway and in doing so descended to an altitude of approximately 100 feet above the elevation of the field. Inasmuch as the top of the ridge is at an elevation of 1114 feet above that of the field, the pilot descended to below the top of the ridge under conditions of extremely poor visibility while on final approach to Runway 5. It was in this descent that the aircraft struck the top of the ridge approximately $2\frac{1}{2}$ miles from the southwest end of Runway 5. However plainly visible the field may have been from a higher altitude, it must be concluded that his decision to continue the approach after having lost sight of the airport was contrary to sound pilot judgment.

Inasmuch as Trans-Luxury Airlines is a non-certificated air carrier*

* The term "non-certificated air carrier" as used in this report refers to an air carrier which does not possess a Certificate of Public Convenience and Necessity as issued by the Civil Aeronautics Board under the provisions of the Civil Aeronautics Act of 1938, as amended. These carriers are commonly referred to as non-scheduled air carriers.

and does not possess the dispatch agencies and ground-to-air communications facilities normally operated by the certificated air carriers, the pilot of Aircraft 850 was entirely dependent upon the reports of the Weather Bureau observer transmitted through the CAA aircraft communicator for data concerning weather at Elko. Because no control tower is located at Elko Airport a scheduled air carrier serving Elko has installed its own facilities to mitigate such a difficulty by providing the company aircraft communicator with a portable microphone and extension cable to permit "on-the-spot" observations to be made from a point outside the building for the use of flights approaching the field under unfavorable conditions. No such facility is available for the itinerant pilot or non-certificated air carrier at either Elko or other airports with no control tower.

Findings

As a result of the investigation of this accident, the Board finds that:

1. The aircraft and crew were properly certificated for the flight.
2. The original flight plan from Cheyenne to Reno was deficient in that the fuel carried aboard the aircraft did not provide sufficient margin of safety.
3. Between Sinclair and Rock Springs, Wyoming, the aircraft was delayed approximately 30 minutes for reasons not determined.
4. At Ogden, Utah, a change of flight plan was approved authorizing a landing at Elko, Nevada, with Battle Mountain as the alternate airport.
5. The flight was informed when over Ogden that weather conditions at Elko, Nevada, were satisfactory for a contact landing but that patches of ground fog were in the vicinity of the airport.

6. The flight was advised when over Elko that a thin overcast, with ceiling of 200 feet, lower scatter clouds at 100 feet and drifting patches of ground fog, existed at that station.

7. Inasmuch as the pilot of the aircraft was able to establish visual contact with Elko when directly over the airport, he elected to attempt a landing.

8. The pilot established an approach to Runway 5 and descended to an altitude of between 200 and 300 feet above the elevation of the airport at which time he lost visual contact and entered the low stratus overcast which obscured the ridge.

9. The pilot failed to stop his descent and continued his approach without visual reference to the field, crashing against a ridge $2\frac{1}{2}$ miles southwest of the airport at an elevation of approximately 100 feet above that of the field.

Probable Cause

On the basis of the above findings, the Board determines that the probable cause of this accident was the pilot's action in continuing a landing approach after having lost visual contact with the airport under conditions of dense ground fog. A contributing factor was the pilot's unfamiliarity with the terrain in the immediate vicinity of the airport.

BY THE CIVIL AERONAUTICS BOARD:

/s/ J. H. Lundis

/s/ OS ALD RYAN

/s/ W. L. B. BLANCH

/s/ JOSH LEE

YOUNG, MEMBER OF THE BOARD, DID NOT PARTICIPATE IN THIS DECISION.

APPENDIX

That portion of the Civil Air Regulations known as Part 42 and which became effective August 1, 1946, was originally promulgated by the Board in order to obtain through certification a more comprehensive indication of the nature and extent of non-scheduled activity and more effectively to assure an optimum level of safety in non-scheduled operations. This original draft was intentionally constructed sufficiently broad to permit wide discretion in enforcing the Civil Air Regulations and also to avoid such restrictive regulations as may have endangered the economic existence of non-scheduled air carriers. Although it is apparent that the cause of this accident lay in poor pilot judgment, it nevertheless has become evident that revision of this Part was desirable in the interest of additional safety.

As a result of a review of non-scheduled air carrier operations accomplished in the light of the investigation of this and other accidents involving non-certificated air carriers, the Safety Bureau has completed and submitted to all interested parties a draft release containing proposed amendments to Part 42.* These changes are designed to provide additional safety requirements for non-scheduled air carriers in all instances in which the aircraft employed has a total of 600 or more rated horsepower and is engaged in air carrier passenger operation and in some instances where only cargo operations are involved. Among the several changes contemplated is the requirement for the use of the altitude and visibility minimums established by the Administrator of Civil Aeronautics for the particular airport. These limitations would provide the basis for clearance for take-off and landing of non-scheduled aircraft when weather is pertinent to the flight in question. All such minimums will be included in the next addition to the CAA Flight Information Manual to be published January 1, 1947.

* Civil Air Regulation Draft Release No. 46-6, October 25, 1946.

SUPPLEMENTAL DATA

Investigation and Hearing

The Civil Aeronautics Board was notified of the accident at 0500 Pacific Standard Time, September 5, 1946 and an investigation was immediately initiated in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. The Senior Air Safety Investigator of the Board's Oakland office arrived at the scene of the accident at 1030 the same date and was 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 Elko, Nevada, September 13, 1946.

Air Carrier

Trans-Luxury Airlines was incorporated under the laws of the State of New Jersey, August 1, 1946, and has operated since that date as a non-certificated air carrier in transportation of persons and property between various points in the United States, including New York and San Francisco. Trans-Luxury Airlines maintains its headquarters at Teterboro Airport, Teterboro, New Jersey.

Flight Personnel

Kenneth Campbell, age 26, of Bottineau, North Dakota, was employed by Trans-Luxury Airlines August 1, 1946, and was at the time of the accident acting in the capacity of captain. Until the date of the accident he had accumulated a total of 2,944 hours, of which 69 hours and 22 minutes were obtained in the service of Trans-Luxury Airlines. While his total experience in the equipment concerned was not determined, it is known that Captain Campbell had had considerable experience in DC-3 aircraft. Harry T. Leatherman, age 27, of Miami, Florida, had been an employee of the predecessor of Trans-Luxury Airlines since July 22, 1946, as a co-pilot and was acting in that capacity at the

time of the accident. Until the date of the accident he had accumulated a total of 1,339 hours, the major portion of which had been obtained in DC-3 type of equipment. Both pilots possessed commercial pilot certificates and the captain possessed an instrument rating.

Aircraft

The Douglas DC-3, NC-57850, had been operated a total of 2,137 hours, of which 275 hours were accumulated since the last major overhaul. The aircraft was equipped with two Pratt and Whitney R-1839-92 engines on which Hamilton Standard propellers were installed. Both engines had accumulated a total of 300 hours since new. At the time of take-off from Cheyenne, Wyoming, the total weight of the aircraft was within its maximum gross load limits.