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File No. 6966-46

CIVIL AERONAUTICS BOARD
ACCIDENT INVESTIGATION REPORT

Perwood

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NATS AIR TRANSPORTATION SERVICE, LARAMIE, WYOMING, OCTOBER 17, 1946

The Accident

NC-38942, a Douglas DC-3, owned and operated by NATS Air Transportation Service, crashed near Laramie Airport, Laramie, Wyoming, at 0057* October 17, 1946, while attempting an approach under extremely adverse weather conditions. The aircraft was demolished by impact and all 13 occupants were fatally injured.

History of the Flight

NATS Air Transportation Service had arranged a non-scheduled flight between Oakland, California and Newark, New Jersey, originating at Oakland October 16, 1946 and with the first stop scheduled for Cheyenne, Wyoming. NC-38942, hereinafter referred to as Aircraft 942, departed Oakland Municipal Airport at 1842 October 16, 1946 under an instrument flight rules clearance with its destination Cheyenne and its alternate airport Denver, Colorado. The Airway Traffic Control Center at Oakland had authorized instrument flight via Airway Green 3 at an altitude of 11,000 feet to Salt Lake City and 13,000 feet to Cheyenne. At 2154 Salt Lake Airway Traffic Control instructed Aircraft 942 to cruise to Cheyenne Airport at 15,000 feet. At the time this clearance was given, the weather at Cheyenne was being reported as: Ceiling 100 feet, visibility 1/4 mile. By 2230 the weather

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

at Cheyenne had worsened to a reported zero ceiling and zero visibility. At this time, Denver was reporting high scattered clouds and visibility of 30 miles. When the aircraft entered the Denver region, therefore, Denver Airway Traffic Control instructed Rock Springs Radio to contact the flight and inform the pilot of the latest Cheyenne and Denver weather. The aircraft communicator at Rock Springs acknowledged these instructions and established contact with the flight providing the pilot with the latest weather reports on the route.

Shortly thereafter, Denver Airway Traffic Control instructed Sinclair Radio to contact the flight when it reached Sinclair, to advise the pilot of the latest reported weather conditions at Cheyenne and to "find out what the pilot wanted to do." Although contact was made with the flight, Sinclair Radio was unable to obtain this information because of static interference. However, the aircraft communicator at Sinclair received a message from the flight indicating that it was experiencing difficulty with its airspeed indicators and, furthermore, that a change in flight plan would be requested of Laramie Radio. No further mention was made of the difficulty with the airspeed indicators in subsequent radio contacts.

Prior to reaching Laramie the aircraft was cleared from 15,000 feet to 14,000 feet and at 0005 October 17 the flight reported over Laramie. Laramie Radio informed the pilot of the latest Laramie weather observation: Ceiling indefinite, 400 feet overcast; visibility 20 miles; light rain. In reply to a request from the flight for a change in flight plan to land at Laramie, Denver Airway Traffic Control issued a clearance requiring Aircraft 942 to descend from 14,000 feet to 11,000 feet, "if the visibility

remains 3 miles at all times." However, when this clearance was relayed to the flight by Laramie Radio the pilot replied that he was in the clouds at 14,000 feet and that descent in accordance with contact flight rules would not be possible. An amended clearance was prepared by Airway Traffic Control and the flight was instructed to descend to 11,000 feet on the southeast leg of Laramie Radio Range in order that adequate separation be provided between Aircraft 942 and other flights at lower altitudes on Airway Green 3. Shortly thereafter, Laramie Radio instructed the flight that an instrument approach could be made to Laramie in any manner the pilot desired. At 0025 the flight reported that it was making its descent to 11,000 feet on the right side of the southeast leg. Another report was received from the flight at 0040 when it was outbound on the northwest approach leg preparing for the final instrument approach. At this time Laramie Radio transmitted the 0040 weather observation. Precipitation ceiling 400 feet, sky obscured; visibility 2 miles, light snow.

Denver Airway Traffic Control became apprehensive concerning the rapidly lowering weather conditions at Laramie and a check was made of the weather conditions at other airports in that area. It was learned that the weather at Sheridan, Wyoming, 245 miles north of Laramie, was satisfactory for contact operations. Since the fuel supply of Aircraft 942 was not known, Denver Airway Traffic Control instructed Laramie Radio to obtain a report of the total fuel on board during the next contact with the aircraft. Denver Airway Traffic Control further advised Laramie Radio to suggest to the pilot that he proceed to Sheridan if he had enough fuel. This interphone conversation was made between Laramie Radio and Denver Airway Traffic Control at 0050 at which time the

weather at Laramie was: Precipitation ceiling 400 feet, sky obscured; visibility 1/2 mile, snow. However, no further radio contact was had with the aircraft and the information concerning fuel supply was not obtained.

The aircraft was first seen passing over the airport at a low altitude at 0045. At approximately 0053 one of the aircraft communicators at Laramie, while standing outside the communications building at Laramie Airport, heard the aircraft pass over the field at a low altitude and in an easterly direction. Shortly after the aircraft passed over the airport the engines stopped suddenly and the communicator heard a sound resembling impact of an aircraft with the ground. Subsequent search efforts by the Wyoming State Police and airport personnel disclosed that the aircraft had crashed approximately one mile northeast of Laramie Airport.

Investigation

At the time of the accident the aircraft was heading in a northerly direction. The left wing tip struck the ground while the aircraft was in a left bank of at least 70 degrees, and while dragging along the ground for a distance of approximately 75 feet, the left wing failed at the outer panel attachment. The left engine and landing gear struck the ground almost simultaneously, followed immediately by impact of the nose and the right engine in that sequence. At this point the aircraft disintegrated and parts and contents of the aircraft were strewn in the direction of motion an additional 950 feet.

Examination of the wreckage disclosed that the landing gear was extended at the time of the accident. The damage sustained by the propellers indicated that both engines were developing considerable power at impact. A measurement of the gasoline in the fuel tanks disclosed approximately 150 gallons remaining. However, inasmuch as the fuel lines were broken as

a result of impact, it was estimated that approximately 20 gallons had escaped prior to the time this measurement was taken. No indication was disclosed of malfunctioning of any part of the aircraft while in flight.

At the time of the flight a low pressure area was centered over eastern Utah. A stationary front was located near Laramie and was oriented in a north-south direction. Strato-cumulus clouds covered the area of western Nebraska, southeastern Wyoming and northeastern Colorado with ceilings from zero to 800 feet. The entire area east of the Continental Divide and south of Sheridan was affected by this weak frontal system resulting in low ceilings and poor visibilities.

Prior to departure of the flight from Oakland the pilots were briefed by meteorologists of the Flight Advisory Weather Service concerning the weather conditions to be expected. The pilots were informed that difficult flying conditions could be expected from Salt Lake City to the Cheyenne and Denver area at the estimated time of arrival. The pilots were further informed that they could expect icing conditions at all levels up to 16,000 feet. The Flight Advisory Weather Service personnel further indicated that the ceilings throughout the area would be below instrument minimums and would be accompanied by precipitation. Prior to leaving the weather office the captain indicated that he expected the flight to be difficult but that he intended nevertheless to conduct the flight as originally planned.

Shortly before the aircraft had arrived in the Salt Lake region the Denver office of the Weather Bureau had prepared forecasts which indicated trends lower than those previously predicted. These forecasts indicated that the weather at Cheyenne would lower to 400 foot ceiling, 3 miles

visibility, light fog, during the 6 hours following 2130 and the weather at Laramie to lower to 400 foot ceiling, overcast, 4 miles visibility, light snow, light fog, by 0030. Since no request was made either by Airway Traffic Control or by the pilot for the transmission of special weather information, in accordance with Civil Aeronautics Administration practice none of the above forecasts were transmitted to the pilot during the flight. Examination of the weather observations for Cheyenne disclosed that at 2130, when Aircraft 942 was in the vicinity of Salt Lake City, the weather at Cheyenne was reported as: Ceiling 100 feet, overcast; visibility 1/4 mile.

Shortly after reporting over Rock Springs at 2255 the flight was advised of the latest Cheyenne weather observation which reported: Ceiling zero, visibility zero, dense fog, light drizzle. Radio contact with Sinclair was attempted by the flight; however, due to heavy precipitation static, the flight crew and the aircraft communicator had difficulty understanding each other. The comment made by the pilot at this time concerning the difficulty experienced with the airspeed indicator was not clarified and it is not known of what that difficulty consisted. Before reaching Laramie the flight was advised by that station that the latest Denver weather was reported as: Ceiling measured 500 feet, overcast; visibility 10 miles; visibility northwest 4 miles. The aircraft communicator at Laramie advised the flight that the weather at Laramie at that time was: Ceiling indefinite 400 feet, visibility 20 miles, light rain.

Since some difficulty was encountered as to clearance of Aircraft 942 below 14,000 feet because of other traffic in the vicinity of Laramie at the 12,000 and 13,000-foot levels, the flight was delayed approximately

30 minutes before beginning the instrument approach procedure. During this period the aircraft communicators at Laramie attempted to keep the flight advised as to weather conditions at that station but no information was provided concerning possible alternate airports. At least one of the Laramie communicators remained outside making weather observations throughout this period. While the flight was descending on the Laramie range, snow began to fall at Laramie reducing the visibility considerably. By 0050 the visibility at that station was reported as 1/2 mile. During the twelve minutes it was maneuvering beneath the overcast in the vicinity of the airport, the aircraft passed over the field at least three times indicating that the pilot was experiencing considerable difficulty in aligning the aircraft with a suitable runway.

An aftercast of the weather conditions in the vicinity of Laramie indicated that low ceilings extended northward from Laramie to the vicinity of Casper, Wyoming, but that Sheridan, Wyoming, the first major terminal north of Casper, was reporting weather conditions satisfactory for contact flight operation. At no time did any ground station provide the flight with the weather at Sheridan, nor was any request made by the flight for assistance in the selection of a suitable alternate airport. Because no information was available to Airway Traffic Control concerning the fuel supply aboard the aircraft while it was in the vicinity of Laramie, suggestions concerning alternate airports were not transmitted to the flight. Laramie Radio was instructed to obtain this information from the flight, however, the number of hours of fuel remaining was not obtained prior to the accident.

In each Airway Traffic Control Center throughout the United States is located personnel of the Weather Bureau who are assigned to a Flight Advisory Weather Service, commonly referred to as FATS, whose function it is to assist Airway Traffic Control in providing all pilots in flight with continuous information regarding factors that might affect the safety of their flying operations. Statements of FATS personnel at both the Salt Lake and Denver centers indicate that during the period of this flight these personnel were completely engaged in such routine meteorological duties as plotting synoptic charts and pseudo adiabatic diagrams, that they were unaware of the presence of Aircraft 942 in their respective regions and, furthermore, that no specific request was made for their assistance by Airway Traffic Control.

Discussion

It is apparent that the pilot was forewarned concerning the general weather conditions east of the Continental Divide. At all times after entering the Denver region the flight was provided complete information concerning the actual conditions at its destination and alternate airport. The activities of the aircraft communicators at Laramie indicate that they were cooperating with the flight to the best of their ability. Several reports were furnished to the flight concerning the weather conditions at Laramie and the pilot was well aware of the existing conditions while approaching Laramie. It must be concluded, therefore, that, although the pilot was not informed while en route of the later forecasts for the Denver - Laramie - Cheyenne area, this fact did not materially affect the conduct of the flight in this instance. Having been advised prior to departure from Oakland that he could not expect weather conditions at

his destination or alternate to remain above minimums throughout the period, it is apparent that the pilot exercised poor judgment in his failure to select an alternate airport outside the area affected by the frontal system in the vicinity of Cheyenne and in his failure to request later information while en route concerning weather conditions forecast for his destination and alternate.

Having learned that both his destination and alternate had lowered to below minimum safe weather conditions and having been advised that the weather at Laramie was being reported as below safe minimums, the pilot would have been expected to request assistance from Laramie Radio in selecting another alternate at which more favorable weather conditions were anticipated. However, the pilot elected to attempt an approach at Laramie. The judgment of the pilot can be questioned, furthermore, because of his repeated attempts at aligning the aircraft with a runway at Laramie after having observed that the weather conditions at that station were extremely adverse. Inasmuch as the pilot at this time had almost two hours' fuel aboard it would still have been possible for him to proceed to a suitable alternate for a safe landing. In attempting to keep the field in sight while circling the area at a very low altitude the pilot evidently momentarily lost control of the aircraft by permitting it to bank excessively and before recovery could be completed the wing tip struck the ground and the crash resulted.

The Flight Advisory Weather Service was instituted jointly by the Civil Aeronautics Administration and the Weather Bureau in order to utilize personnel and facilities most effectively in implementing a weather information service to itinerant pilots. The Board's study of FAW'S opera-

tion indicated a lack of clear definition of the responsibility of the various personnel of both agencies who participated in this service, particularly with respect to its initiation to itinerant flights. Although the flight was apparently not affected by the lack of assistance by Airway Traffic Control in providing amended forecasts for the Denver - Laramie - Cheyenne area, it must be concluded that the functions of the Flight Advisory Weather Service were not accomplished in this instance in that the services of the FATS units in Denver and Salt Lake City were at no time requested by their respective Airway Traffic Control centers. Had there been proper coordination between Airway Traffic Control and the Flight Advisory Weather Service personnel, Airway Traffic Control might have been able to recommend a suitable alternate airport in sufficient time to have avoided the accident. The lack of definition of responsibility indicated above was further reflected in the variance with which this service was administered in the other Civil Aeronautics Administration regions. Since the date of this accident, however, the Civil Aeronautics Administration and the Weather Bureau have revised the manual of standard procedures for flight assistance service and clarified this question adequately.* In operations of the nature of this flight, the primary responsibility for issuance of flight information now rests with the airway traffic controller and it is believed that this definition of responsibility will assure improved service in the future.

Findings

Upon the basis of all available evidence, the Board finds that:

1. The aircraft and crew were properly certificated.

* Civil Aeronautics Administration and Weather Bureau Standard Procedures for Flight Assistance Service, April 15, 1947.

2. Prior to departure from Oakland, California, the crew were advised of the probability of below minimum weather conditions at both Cheyenne and Denver which were selected as destination and alternate airports, respectively.

3. Approximately at the time the flight entered the Salt Lake region the forecasts for both Cheyenne and Denver predicted below minimum weather conditions at both stations at approximately the time the aircraft was expected to arrive in that area, but these forecasts were not transmitted to the flight nor was any request made by the pilot for later forecasts.

4. When the flight was in the vicinity of Salt Lake City, Airway Traffic Control cleared Aircraft 942 to Cheyenne airport at which weather conditions were being reported as Ceiling zero, visibility 1/4 mile.

5. Shortly before reaching Laramie, Wyoming, the flight was advised that the weather conditions at Denver were reported as: Ceiling 500 feet, visibility 10 miles, visibility northwest 4 miles.

6. Upon reaching Laramie the flight requested and received a change of flight plan to land at Laramie and was advised that Laramie weather was being reported as: Ceiling 400 feet, visibility 20 miles.

7. At 0040, prior to establishing a final instrument approach, the flight was advised that the weather conditions at Laramie were being reported as: Ceiling 400 feet, visibility 2 miles, light snow.

8. The flight completed its instrument approach and circled for approximately 12 minutes in the vicinity of Laramie Airport attempting to align the aircraft with a runway.

9. Although Airway Traffic Control attempted to provide the pilot with information concerning a suitable alternate airport while the flight was in the vicinity of Laramie, this message was not initiated in sufficient time to be considered by the flight crew.

10. The pilot, in attempting to keep the airport in sight, momentarily lost control of the aircraft permitting it to bank excessively and, before recovery could be accomplished, the left wing tip struck the ground.

11. The aircraft was demolished upon impact and all occupants were fatally injured.

Probable Cause

On the basis of the above, the Board determines that the probable cause of this accident was the action of the pilot in maneuvering the aircraft at a dangerously low altitude under extremely adverse weather conditions in an attempt to land. A contributing factor was the negligence of the pilot in planning a flight into an area in which adverse weather conditions were forecast without making adequate provisions for a suitable alternate airport.

BY THE CIVIL AERONAUTICS BOARD.

/s/ J. M. LANDIS

/s/ HARLEE BRANCH

/s/ JOSH LEE

/s/ CLARENCE M. YOUNG

Oswald Ryan, Member of the Board, did not take part in the decision.

SUPPLEMENTAL DATA

Investigation and Hearing

The Board was notified of the accident at 0235, October 17, 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 investigator of the Board's Denver office arrived at the scene of the accident at 0730 the same day and was subsequently assisted by other investigators of the Board's Kansas City and Washington offices. A public hearing was ordered by the Board and was held at Laramie, Wyoming, October 26, 1946.

Air Carrier

NATS Air Transport Service was incorporated under the laws of the State of California January 23 1946 and at the time of the accident was operating as a non-certificated air carrier* transporting persons and property between various points in the United States, including San Francisco, California, and Newark, New Jersey.

Personnel

Clarence R. V. Abernathy, age 27, of San Lorenzo Village, California, was captain of the flight and had been employed by the company since January 1946. Captain Abernathy possessed a Commercial Pilot Certificate and an Instrument rating and until the date of the accident had accumulated a total of 3,222 hours, of which 840 hours had been obtained in DC-3 equipment. Harry K. Folle, age 28, of

* 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.

San Francisco, California, was co-pilot. Mr. Holle possessed a Commercial Pilot Certificate and until the date of the accident had accumulated a total of 1,500 hours. Dorothy Ann Hartman was stewardess.

Aircraft

NC-38942, a Douglas DC-3, was manufactured April 28, 1944 and since the date of manufacture had been operated a total of 1,861 hours. It was equipped with two Pratt and Whitney R-1830-92 engines on which Hamilton Standard hydromatic propellers were installed. The left and right engines had been operated a total of 1,310 hours and 888 hours, respectively, of which 183 and 355 hours, respectively, had been accumulated since the last overhaul. At the time of the accident the aircraft was loaded within its gross weight limits and the load was distributed with respect to the center of gravity within approved limits.