

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: September 17, 1945

Released: September 24, 1945

AMERICAN AIRLINES - BURBANK - JANUARY 10, 1945

Summary

Following a night instrument approach to the Burbank Airport American Airlines' Flight 6001 crashed against the nearby Verdugo Hills. All of the 21 passengers and the three crew members were killed and the Douglas DC3 was destroyed by impact and fire.

After making the standard instrument let-down approach to the Burbank Airport the airplane was observed to cross the airport at the ragged base of the clouds and was seen to start a left turn as if circling for a landing. Soon after making the turn the captain radioed the control tower that he could not maintain visual contact with the ground and was proceeding to his alternate, Palmdale. The United States Weather Bureau observations disclosed that below minimum weather conditions existed at Burbank at the time. The pilot had not been properly advised of the latest weather reports. The plane was not heard from or seen again until after daylight at which time the wreckage was sighted in the nearby foothills approximately 2-3/4 miles northeast of the airport.

It is evident that after making this left turn the pilot decided to execute the standard "missed-approach"* procedure but in so doing failed to modify the procedure in keeping with his position and heading. As a result he made a climbing turn toward the nearby foothills instead of away from them as would have been the case had the standard "missed-approach" procedure been executed from the normal position.

The possibility of an accident became a potentiality when the company ground personnel failed to obtain and transmit important weather information to the pilot. Failure to obtain and transmit this information to the pilot constitutes negligence on the part of the company. This, however, did not relieve the pilot of his responsibility to conduct a safe flight although it did place him in a disadvantageous position. Had he properly executed the "missed-approach" procedure it is unlikely that the accident would have occurred. The Board, therefore, determines that the probable cause of this accident was "the pilot's attempt to use the standard 'missed-approach' procedure after having followed another course up to a point where it was impossible to apply this procedure safely."

This report is based upon evidence acquired in the Board's investigation and the hearing which was held at Los Angeles, California, January 17 and 18, 1945.

*"Missed-approach" procedure described in detail on Page 3.

NARRATIVE DESCRIPTION OF THE FLIGHT AND ACCIDENT

American Airlines' Flight 6001 took off from New York at 0723* EWT, January 9, 1945, on a transcontinental flight to Burbank. The last crew change was made at El Paso at about 0146 CWT. From this point the flight was cleared to Newhall, California, because of unfavorable weather conditions at Burbank. The flight proceeded normally and at 0314 the company transmitted the 0300 special weather report for Burbank. This report showed a measured ceiling of 700 feet, overcast, visibility two miles, and light fog. About six minutes later the company advised the flight that it had been recleared by the Los Angeles Air Traffic Control Center to the Burbank Range Station to cross Burbank at 3500 feet with no delay expected.

At 0335 the company confirmed its previous clearances and advised the flight that if unable to establish contact to request further instructions. At 0342 the pilot was given the 0330 weather report for Burbank which was the same as the 0300 report, except that the ceiling was shown as variable, 600 to 700 feet. At this time the company canceled the Long Beach landing as the airplane was needed at the Burbank Terminal. Following this weather report the Los Angeles Air Traffic Control approval for a standard instrument approach to Burbank was relayed to the captain and acknowledgment received. At 0355 the flight reported to the company that it was over Burbank on its initial approach at 3500 feet and was beginning a standard instrument approach. At this time the pilot was given the Burbank altimeter setting of 30.14 and advised to change to control tower frequency. This was the last communication with the flight until after the pilot had established visual contact with the ground.

At approximately 0406 the aircraft was seen to fly across the airport at the ragged base of the clouds, start what appeared to be a left turn and then disappear from view. The landing gear was retracted, position lights were on and the landing lights were off. According to the control tower operator he heard the plane go over and waited longer than usual to receive the captain's call. About 0407 the captain made his only radio contact after flying over the range station on his initial approach and stated that he was unable to maintain contact and was proceeding to Palmdale. The tower acknowledged this message and requested the flight to stand by for the Air Traffic Control Center's clearance. Later attempts by the tower, American and other radio stations to contact the flight were unsuccessful and nothing further was heard from the plane.

At approximately 0930 the control tower sighted the wreckage on a hillside about 2-3/4 miles northeast and about 1034 feet above the level of the airport. The position of the wreckage indicated that the airplane was headed at about 110° magnetic in a right climbing turn at the time it crashed. The accident resulted in fatal injuries to the 21 passengers and three crew members and almost total destruction of the aircraft by impact and fire.

The following are descriptions of the radio facilities, instrument approach procedure and the "missed approach" procedure for the Burbank Airport. Familiarity with these facilities and procedures is essential to the understanding of the reconstructed flight path believed to have been taken by the pilot after the plane was seen to fly over the Burbank Airport.

* 24 hour clock used throughout this report.

The Burbank Airport lies approximately five miles east of the southwest leg of the Newhall Range and 20 miles north of the east leg of the Los Angeles Range. The airport therefore is not served by a leg of the usual high-powered radio range. However, a localizer (a low-powered range station) is located on the Burbank Airport. This facility permits the pilot to approach on the regular radio range station beam and work his let-down on the localizer.

Instrument Approach Procedure

The instrument approach procedure used by American at Burbank when the top of the cloud deck does not exceed 3500 feet above sea level specifies that the pilot, upon reaching the Burbank localizer on the initial approach, fly out the northwest leg $3\frac{1}{2}$ minutes at 120 m.p.h., make a procedure turn at 3500 feet on the south side of this leg and descend back toward the station on a course of 95° magnetic. American representatives testified that the landing gear should be lowered over the range station on the initial approach and that during the final approach an airspeed of 120 m.p.h. should be maintained. The night landing minimums for the Burbank Airport specified a ceiling of 700 feet and two miles visibility.

Missed Approach Procedure

If ground contact is not made upon passing over the localizer the pilot should immediately make a climbing right turn to a magnetic course of 270° , climb back to 3500 feet altitude and ask the company ground station for further instructions.

Burbank Field Rules

The Burbank Airport is a right-hand field when used under instrument weather conditions. Frequently pilots desire to circle to the left in order that they may more easily keep the airport clearly in view from their position in the left seat and usually request permission for the left turn from the tower. However, inasmuch as clearance to land has been given, occasionally the pilot may fail to request such permission as the captain apparently did in this case.

The airplane was first seen to cross Burbank Airport and then to make a left turn during which it disappeared from view. Soon after making the turn, possibly for the purpose of lining up with the North-South runway, the pilot radioed the control tower that he could not maintain contact and that he was proceeding to his alternate, Palmdale. It is believed that he attempted the standard "missed approach" procedure from this point. In referring to the attached sketch it can readily be seen that if the standard "missed approach" procedure were applied after making a left turn a correction would have to be made both for position and heading. It is evident that the pilot's failure to make these corrections resulted in his being carried into the foothills rather than away from them as intended by the standard "missed approach" procedure.

In the course of investigation a simulated flight was made by company personnel and representatives of the Civil Aeronautics Board. This flight was started from a position and heading believed to have been that of

Flight 6001 and from which point a normal right climbing turn was made. If the simulated flight been continued to a climax the plane would have struck the hill at the position of the wreckage at an approximate heading of 110° magnetic.

THE BOARD'S INVESTIGATION

The Santa Monica Office of the Civil Aeronautics Board received notification about 0450 PWT that the aircraft had missed its approach to the Burbank Airport on its scheduled arrival at about 0406 and had not been heard from since. Upon being notified at 1000 that the wreckage had been sighted an investigation was immediately initiated in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. Frank K. McKlveen, Air Safety Investigator of the Santa Monica Office of the Board, arrived at the scene of the accident at about 1130. The wreckage was first placed under a temporary Army guard. This guard was later relieved by a police guard which remained at the scene until an examination of the wreckage had been completed by the Board's investigators.

Hearing

The Board ordered a public hearing in connection with the investigation and John M. Chamberlain, Assistant Director, Safety Bureau of the Board, was designated as the presiding officer. The hearing was held in Los Angeles, California, on January 17 and 18, 1945, and the following personnel of the Safety Bureau staff participated: Jesse K. Fenno, Chief, Investigation Division; Ralph A. Reed, Senior Air Safety Investigator in charge of the Santa Monica Office; Frank K. McKlveen, Air Safety Investigator; and Kenneth C. Somner, Air Safety Specialist (Powerplants).

OPERATIONAL DATA

Air Carrier

At the time of the accident American Airlines was operating as an air carrier 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 authorized the corporation to engage in air transportation with respect to persons, property and mail between various points in the United States including New York, El Paso, Phoenix and Burbank.

Flight Personnel

The crew of Flight 6001 consisted of Joseph Russell McCauley, captain; Robert Gaylord Eitner, first officer; and Lila Agnes Doeken, stewardess.

Captain McCauley, age 38, held an airline transport pilot certificate. Although his copies of the certificate and ratings were destroyed by fire and no duplicates showing that he had the required horsepower rating could be found in Civil Aeronautics Administration files, various records such as medical certificates and airline and CAA air carrier forms indicated that he

had 160 to 2700 horsepower, single and multi-engine land ratings. He had flown approximately 6315 hours which included 4660 hours for American Airlines on DC3 equipment. He was employed by American as a pilot in training on March 4, 1940, and was assigned as a reserve captain on October 5, 1942. His last physical examination required by the Civil Air Regulations was passed on September 12, 1944. He satisfactorily passed his last instrument check on September 30, 1944, and was last route checked on November 6, 1944.

First Officer Eitner, age 25, held a commercial pilot certificate with single-engine land, 0-330 horsepower and instrument ratings. He was employed by American as a first officer trainee on September 15, 1942, and was assigned as first officer on January 11, 1943. He had flown approximately 2143 hours including 1792 hours for American on DC3 equipment. His last physical examination required by the Civil Air Regulations was passed December 14, 1944.

Stewardess Docken, age 22, had been in the employ of American since April 3, 1944, and was assigned as stewardess on May 29, 1944.

The Aircraft

The Douglas DC3, NC 25684, was manufactured in May, 1940 and was purchased by American the same month. It had been in continuous service up to the time of the accident and had flown approximately 14,888 hours, including 3379 hours since the last major overhaul. It was powered by two Wright G-102 engines and equipped with Hamilton Standard hydromatic propellers. The engines and propellers had had 531 hours since major overhaul. The aircraft, its engines and other equipment had received a major inspection on January 6, 1945.

At the time of the departure from Phoenix en route to Burbank the aircraft was equipped with de-icers and was loaded to 25,332 lbs., which was within the allowable limits. The weight was properly distributed with respect to the center of gravity. It was estimated by American that at the time of the plane's arrival at Burbank 215 gallons of fuel remained in the tanks. American's maintenance record of the aircraft revealed no previous malfunctioning that could in any way have contributed to the accident.

EVIDENCE DISCLOSED BY INVESTIGATION

Examination of the Wreckage

Examination of the wreckage disclosed no indication of failure of any part of the aircraft prior to impact. Marks on the ground clearly indicated that the aircraft struck the hillside in a sharp right turn, banked at about 20°, with the elevator tabs trimmed for what appeared to be a slight climb. The outer wing panels were resting in a normal position relative to each other. The tail section from about the rear cargo compartment bulkhead aft slid back a short distance and came to rest with the tail wheel on the ground and with the horizontal surfaces resting on bushes in an upright position. With the exception of the tail group and the outer wing panels the plane was almost completely consumed by fire. Therefore, little could

be learned of its condition prior to the crash. Examination of the propellers indicated that the blades were set at approximately 30° at the time of impact. This blade setting is one which might be expected were the plane in a normal climb. Inspection of the engines revealed that the propellers had stopped suddenly, probably making less than one revolution after impact. There was no evidence disclosed which might indicate any malfunctioning of the engines or their accessories.

Most of the instruments were so damaged that little information could be obtained from them. One altimeter indicated an approximate setting of 30.14 which was in close agreement with the station setting. Evidence indicated that all seat belts were fastened at the time of impact.

Air Navigation Radio Aids

As described earlier in this report Burbank Airport is not served by a leg of the regular airways radio range but operates with a low-powered localizer. Both the control tower and the localizer at the Burbank Airport are operated by the Civil Aeronautics Administration. A check of the localizer as well as the regular range stations at Newhall, Los Angeles and Palmdale indicated that all were operating normally at the time of the accident.

According to expert opinion given by CAA Air Carrier personnel the radio facilities and procedures at the Burbank Airport are adequate provided pilots adhere to the standard approach procedure. If, however, deviation is made from standard procedure during marginal weather the proximity of terrain obstructions presents a critical situation. Even with the installation of other types of radio facilities it is believed that operating conditions at this field in marginal weather would not be materially changed due to the geographical location and the character of the surrounding terrain.

Weather Analysis

The regular forecast periods used by the Weather Bureau overlapped during the period near the time of the accident. The terminal forecast for Burbank for the first period 2130 January 9 to 0530 January 10 (PWT) was:

Ceiling 400, overcast, visibility 1 mile, light fog to 0030, followed by ceiling 200, overcast, 1/2 mile, moderate fog, clouds stratus top 1800.

For the second period, 0330 to 1130:

Ceiling 500, overcast $1\frac{1}{4}$ mile, light fog to 0900, followed by ceiling 700, overcast, visibility one mile, light fog intermittent light drizzle, upper clouds cirrus and altocumulus, lower clouds stratus top 3000.

The forecasts for both the Weather Bureau and the Company were somewhat on the conservative side, both indicating conditions slightly worse than those which occurred. They also indicated that minimums allowable for landing would probably not exist at the time of the arrival of American Airlines Flight 6001.

A summary of the weather reports for the Los Angeles area from 1230 to 0430 is as follows:

In the San Fernando Valley ceilings and visibility were variable with below minimums prevailing over most of the period but with occasional periods of marginal conditions slightly above minimums occurring at Burbank. On the ocean side of the Santa Monica Mountains instrument conditions were reported during the first two hours of the period but ceiling was reported as 900 to 1200 feet at the Los Angeles Municipal Airport during the remainder of the period. Throughout the area occasional light drizzle was occurring and temperature was reported in the low fifties with the dew point only a few degrees lower.

The following sequence of observations was made and recorded by the Weather Bureau at Burbank on January 10, 1945:

Record*

0222 - Instrument, measured 700, overcast, 1 mile, light drizzle, light fog, 1020.3 millibars, 51, 49, ESE 3, 30.12 inches.

Local Extra*

0245 - Instrument, measured 700, overcast, 1½ miles, light drizzle, light fog.

Special*

0300 - Instrument, measured 700, overcast, 2 miles, light fog, 1020.3, 51, 49, ESE 3, 30.12.

Local Extra

0315 - Instrument, measured 700, overcast, 2 miles, light fog.

Record

0323 - Instrument, measured 700 variable, overcast, 2 miles, light fog, 1020.3, 51, 49, SSW 4, 30.12, ceiling variable 600 to 700.

Local Extra

0345 - Instrument, measured 600 variable, overcast, 1½ miles, light fog, ceiling variable 400 to 600.

Check*

0400 - Same as previous observation.

*Types of Weather Bureau Observations

"Record" - A complete meteorological observation taken once each hour for transmission by radio or teletype.

"Special" - A "special" is required at any time an important change in weather conditions takes place, rules for which are specified in Circular No. 1.

"Local Extra" - These are required at designated terminal and intermediate airport stations each 15 minutes when the ceiling becomes less than 600 feet and/or the visibility is less than 1½ miles, also upon request by an airline, private pilots or pilots and officials of the military or other organizations.

"Check" - An observation taken once an hour, midway between record observations to confirm or amend the last recorded observation.

Special

0404 - Closed, indefinite ceiling 400 variable, overcast, 1-3/4 miles, light fog, 1020.3, 51, 49, WNW 3, 30.12, ceiling variable 400 to 600.

Special

0413 - Instrument, measured 700, overcast, 2 miles, light fog, 1020.3, 51, 49, WNW 3, 30.12.

In addition to the hourly observations taken by the Weather Bureau and included in the hourly teletype sequences other observations are made for keeping the weather up to date. These include "Special", "Local Extra" and "Check" observations. The "Special" observations are required to be transmitted by teletype and radio although teletype congestion may delay their transmission. These "Specials" are filed whenever changes of considerable importance occur. The "Check" and "Local Extra" observations do not necessarily contain any changes from the previous observations and if they do the changes are of small magnitude. These are not handled by teletype because of the lack of available communication time. When the ceiling or visibility approaches the operating limits of an airline even the small changes contained in the "Local Extra" or "Check" observations may be important to a particular airline. It had been agreed at Burbank between the airline operators and the Weather Bureau that whenever it was important for an airline to be kept advised of all weather changes they would notify the Weather Bureau which would then see that the airline received promptly all changes contained in any type of observation being made. In the particular case of this flight the first observation indicating the lowering of ceiling below the operating minimum was the "Record" observation at 0323 in which a remark was inserted that the ceiling was variable 600 to 700 feet. Following this, at 0345, a "Local Extra" observation showed a measured ceiling of 600 feet which was below Burbank Airport's operating minimum. American Airlines had not requested that they be kept advised of all weather changes and, therefore, had not received the report showing that the weather had dropped to below instrument approach minimums. Company personnel indicated by their testimony that they had made a visual observation of their own and assumed that no weather change had taken place.

DISCUSSION AND FINDINGS

The facts disclosed by this investigation center first around the pilot's action when he found it impossible to maintain visual reference to the ground and second around the failure of company ground personnel to obtain pertinent U. S. Weather Bureau reports and the inadequacy of the weather information which they furnished to the pilot.

Considerable significance must be attached to the manner in which this flight was handled by ground personnel. Considering the forecasts of both the U. S. Weather Bureau and the company, as well as the actual reports available to the pilot and to the dispatcher, it was evident that conditions at Burbank were varying between below minimums and a marginal condition barely within minimums. While the last report the pilot had at the time of his approach to the field indicated that weather was within company minimums there were three subsequent observations, at least two of which could have been made available to him, that indicated the ceiling would be below minimums at the Burbank Airport at or about the time the flight was expected to arrive over the field. Whereas the pilot did establish visual contact with

the airport weather conditions at the time were such that this contact must have been made at an altitude below the instrument minimum of 700 feet. Because American Airlines failed to request that they be kept advised of significant changes when weather conditions are marginal, in accordance with the procedure agreed upon, they were not aware that the weather had dropped below minimums. It, therefore, appears that weather information was available but through laxity of American Airlines ground personnel it was not utilized.

Although the pilot was placed in a disadvantageous position by the lack of accurate weather information this fact in itself did not relieve him from his responsibility to plan and execute a proper climb-out procedure. In reconstructing the sequence of events the fact that the aircraft was seen to go over the airport with landing gear up and landing lights off indicates that the pilot had decided that he would not be able to land. It appears that he then changed his mind as indicated by the left turn which followed. It was immediately after this turn that he radioed he was unable to maintain contact and was proceeding to his alternate. He apparently started the right turn of the standard "missed-approach" procedure at a point and from a heading which made this procedure inapplicable.

Based on the foregoing facts and considerations the Board finds that:

1. At the time of the accident the air carrier was operating under proper certification. The maintenance of the aircraft had been satisfactory.
2. Examination of the wreckage revealed no indication of failure of any part of the aircraft prior to impact.
3. Navigational facilities and equipment, both on the ground and in the aircraft, were operating normally.
4. Routine position reports were made between El Paso and Burbank and the operation was normal in all respects until the flight reached the Burbank Range Station on its initial approach.
5. Weather conditions at the Burbank Airport were below the established minimum for an instrument approach at the time the flight passed over the field.

PROBABLE CAUSE

The possibility of an accident became a potentiality when the company ground personnel failed to obtain and transmit important weather information to the pilot. Failure to obtain and transmit this information to the pilot constitutes negligence on the part of the company. This, however, did not relieve the pilot of his responsibility to conduct a safe flight although it did place him in a disadvantageous position. Had he properly executed the "missed-approach" procedure it is unlikely that the accident would have occurred. The Board, therefore, determines that the probable cause of this accident was "the pilot's attempt to use the standard 'missed-approach' procedure after having followed another course up to a point where it was impossible to apply this procedure safely."

BY THE CIVIL AERONAUTICS BOARD;

/s/ L. Welch Pogue

/s/ Harlee Branch

/s/ Josh Lee

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

