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REPORT OF THE CIVIL AERONAUTICS BOARD

On the investigation of an accident which occurred near Palm Springs, California, on October 23, 1942, involving a mid-air collision between an aircraft of U. S. registry, NC 16017, owned by American Airlines, Inc., and a U. S. Army B-34 bomber.

CONDUCT OF INVESTIGATION

An accident occurred approximately 3 miles north of Palm Springs, California, at about 5:15 p.m. (PWT)^{1/} on October 23, 1942. It involved a collision between an aircraft of U. S. registry NC 16017 and a U. S. Army Bomber B-34, at an altitude of about 9000 feet, on Civil Green Airway Number 5. At the time of the accident Douglas Aircraft NC 16017 was operating in scheduled air carrier service from Burbank, California, to Phoenix, Arizona, as part of Trip 28 of American Airlines, Inc.^{2/} The B-34 was being operated by the Ferrying Command of the U. S. Army Air Forces^{3/} on a ferrying flight from Long Beach, California, to Palm Springs, California. The Douglas crashed to the ground and was completely destroyed by impact and subsequent fire. The nine passengers and the three crew members were fatally injured. The B-34 received only minor damage as a result of the collision and was landed safely at the Army Airport of the Sixth Ferrying Command, Palm Springs, California, without injury to either occupant.

Inspection and Preservation of the Wreckage

The Santa Monica Office of the Civil Aeronautics Board (hereinafter referred to as the Board) received notification of the accident at about 7:30 p.m. on October 23 and the Board immediately initiated an investigation in accordance with the provisions of Section 702 (a)(2) of the Civil Aeronautics Act of 1938, as amended.^{4/} Air safety investigators of the Board proceeded to the scene of the accident immediately and arrived there shortly before midnight the same day. The wreckage of the airliner had been placed under United States

^{1/} All times referred to herein are Pacific War Time.

^{2/} Hereinafter referred to as "American."

^{3/} Hereinafter referred to as "Army."

^{4/} Section 702 (a)(2) provides that it shall be the duty of the Board to "Investigate such accidents and report to the Authority the facts, conditions, and circumstances relating to each accident and the probable cause thereof."

military guard and was so kept until completion of the investigation.

Hearing

In connection with the investigation a public hearing was held in Los Angeles, California, on October 28 and 29, 1942. The hearing met in closed session on October 30, 1942 in order that testimony might be taken from military personnel.

Allen P. Bourdon, Acting Chief, Investigation Division, Safety Bureau, Civil Aeronautics Board, was Presiding Officer, and the following personnel of the Safety Bureau participated in the hearing: Jesse W. Larkford, Acting Director; Ralph A. Reed, Senior Air Safety Investigator; and Frank K. McKlveen, Air Safety Investigator.

Subsequent to the hearing an additional witness was found and his sworn statement was taken by Ralph A. Reed at Camp Young, U. S. Army Post, Indio, California, on December 1, 1942, pursuant to authorization of the Civil Aeronautics Board.

Upon the basis of all the evidence accumulated during the investigation, the Board now makes its report in accordance with the provisions of the Civil Aeronautics Act of 1938, as amended.

SUMMARY AND ANALYSIS OF EVIDENCE

Air Carrier

At the time of the accident American Airlines, Inc., a Delaware corporation 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 it to engage in air transportation with respect to persons, property, and mail between various points including Burbank, California; Phoenix and Tucson, Arizona; El Paso, Fort Worth, and Dallas, Texas; Nashville, Tennessee; Washington, D. C.; and New York, New York.

Flight Personnel

On American Trip 28, the crew consisted of Charles Fred Pedley, captain, Louis Frederick Reppert, Jr., first officer, and Estelle Frances Regan, stewardess.

Captain Pedley, aged 42, had logged approximately 17,155 hours of flying time, of which about 5000 were on Douglas DC-3 equipment. He held an airline transport pilot certificate and was rated for multi-engined landplanes of 900-2700 h.p. His last physical examination, required by the Civil Air Regulations, was taken on June 11, 1942, at Fort Worth, Texas. He had been employed by American since January 1928.

First Officer Reppert, aged 26, had been employed by American since April 14, 1942. He held a commercial pilot certificate with single-engine 0-80 h.p. landplane and instrument ratings, and had logged approximately 863 hours of flying time, of which about 353 hours were on Douglas DC-3 equipment. His last physical examination was taken in New York on May 27, 1942.

It appears from the evidence that the flight crew of the Airliner held the proper certificates, were physically qualified, and by reason of their training and experience were qualified for the flight and equipment involved.

Miss Regan, stewardess, had been employed by American since May 13, 1940.

Lieutenant William Norman Wilson, 25 years of age, attached to the Air Transport Command and stationed at Long Beach, California, was the pilot of the Army B-34. He had logged approximately 1500 flying hours. On B-34s he had had about 9 hours as first pilot and approximately the same amount of time as copilot. He held a commercial certificate with a flight instructor

rating issued by the Civil Aeronautics Administration.

Robert Reed Leicht, aged 25, staff sergeant, Sixth Ferrying Command, Army Air Forces, stationed at Long Beach, California, was acting as copilot in the B-34. He had accumulated approximately 100 solo flight hours in Army primary trainers, but had never soloed a B-34.

The Airplanes

The American NC 16017 was a Douglas Model DC-3 powered with two Wright cyclone G102 engines, each rated at 1100 h.p. for take-off and equipped with Hamilton Standard, constant speed, full-feathering propellers. The aircraft and its equipment had been approved by the Civil Aeronautics Administration for air carrier operation, with 21 passengers and a crew of 4. It had been certified for operation with a maximum take-off weight of 25,346 pounds. The gross load at which the airplane departed on the subject flight was 23,622 pounds.

The other aircraft was a U. S. Army B-34^{5/} manufactured by the Lockheed Aircraft Corporation.

Facts Preceding the Flight

Lt. Wilson testified to the following facts: That he was a friend of First Officer Rappert, of American's Trip 28^{5/}; that they had met the previous evening and during their conversation it was revealed that there was a possibility of both of them "going out" the following afternoon at about the same time; that they had trained together several months previously in small type aircraft and thought it would be pleasant to "see each other in the air"; that they discussed the possibility of clicking their radio microphones as a signal of "hello", but decided to abandon that idea on account of the difference in transmitting frequency of their equipment, and that no definite signals of

^{5/} Hereinafter referred to as "Bomber".

^{5/} Hereinafter referred to as the "Airliner".

recognition were decided upon. Sergeant Leicht testified that just before their flight on October 23 Lieutenant Wilson told him that he knew the copilot on the Airliner and that he "would like to thumb his nose at him." There is no evidence to indicate that Captain Pedley, in command of the Airliner, had any knowledge of the tentative arrangements between Wilson and Reppert.

History of the Flights

The Airliner was properly cleared and took off from the Lockheed Air Terminal, Burbank, California, on regular schedule at about 4:36 p.m., October 23, 1942 on an approved flight plan calling for a cruising altitude of 9000 feet to Indio. All of the proper reports, such as weather forecast, amount and distribution of fuel, airplane load computation, passenger manifest, and dispatch message were in order and delivered to Captain Pedley prior to the take-off.

The radio log at Burbank records a radio ramp check at 4:31 p.m., five minutes previous to the take-off. At 5:02 p.m. the pilot of the Airliner gave his position by radio to Burbank as over Riverside, California, at 9000 feet, and estimated his arrival over the Indio, California, intersection at 5:22 p.m. at 9000 feet.

Meanwhile the Bomber was cleared under Contact Flight Rules^{7/} from Long Beach to Palm Springs. Lieutenant Wilson, the pilot, took off at about 4:26 p.m. and proceeded to a point north and west of March Field near Riverside, California, at an altitude of about 4000 feet. Here he made two wide circles and instructed his copilot to be on the lookout for the Airliner.

^{7/} See Page 10 of this report for discussion of Contact Flight Rules.

Upon sighting the Airliner, he proceeded in a climb toward the San Geronio Pass. Upon reaching an altitude of about 9000 feet in the vicinity of March Field, he passed about one and one half to two miles to the left of the Airliner. As they passed Lieutenant Wilson rocked the wings of the Bomber to identify himself to First Officer Reppert in the Airliner. Both Pilot Wilson and Copilot Leicht testified that they observed no maneuver of recognition from the Airliner. Lieutenant Wilson, then well ahead, crossed the line of flight of the Airliner and throttled back, waiting for it to overtake him on his left. The Airliner was next observed overtaking the Bomber on a parallel course to the left. Pilot Wilson, feeling that he was still too far from the Airliner to recognize his friend, turned his plane to the left to approach closer. Following this change of course he realized he was coming closer to the Airliner than he had anticipated and he immediately made a right turn to avoid it. Wilson testified that "It was while in this right bank that the impact occurred after I had been in it for a long enough time that I felt perfectly clear and far away and on my way back to the airport. As a matter of fact, I had throttled my left engine up a couple of inches and was getting my nose down a little bit, and I was ready to trim it up and prepare for my letdown when the impact occurred."

The copilot of the Bomber stated that at the moment of the impact he saw the Airliner, which was then immediately below and ahead of them. He said he observed that the rudder of the Airliner had been hit by the propeller of the Bomber and that about three-fourths of the rudder was gone. He stated further that the Airliner then appeared to rise about ten feet above them, hover momentarily, fall off to the left and disappear. He said he noticed no markings on the aircraft but knew it was an airliner because he "just saw the silver . . . shining in the sun."

Lieutenant Wilson testified that at no time during which he had observed

the Airliner could he identify it as the one his friend Reppert was aboard. He stated that his first knowledge of the collision was a "noise and a wrenching of my ship up and to my left." Shortly thereafter he noticed that a portion of his right de-icer boot had been ripped loose from the leading edge of the wing; that the right engine felt rough and that the aircraft handled a little sluggishly. He asked Copilot Leicht what had happened and was informed that "we hit the airliner." Lieutenant Wilson instructed Leicht to call the Palm Springs tower and notify them of the accident. He then circled the Palm Springs Army Airport, landed, and with his copilot proceeded to the office of the Commanding Officer to report the accident.

The radio log of the company station at Burbank and the testimony of the Burbank operator disclose that Burbank picked up a message from Trip 28 at exactly 5:15 p.m., as follows: "Flight 28 from Burbank ... correction Burbank from Flight 28." The company radio operator at Burbank thought this unusual and directed a message to American's Flight Superintendent at Burbank, stating that he had heard Trip 28 call Burbank and that its carrier wave was heard about three times - just enough for him to distinguish the flight calling Burbank. The Burbank operator called back several times but received no answer from Trip 28. He stated that Phoenix and Tucson both called Trip 28 several times thereafter but received no answer. As the time of the actual impact is estimated to have been about 5:15 p.m. it is possible that Trip 28 was attempting to report the collision.

Witnesses

Mrs. Margaret Caldwell, housewife, Raymond W. Martin, telephone company guard, who also served as a volunteer airplane spotter at his guard station near Pala Springs, and Private Roy West, cook, United States Army, were the only persons known to have witnessed the accident from the ground.

Private West was unknown to the Civil Aeronautics Board at the time of the hearing on the present accident and, therefore, was not called as a witness in that hearing. The Board first learned of this witness at the time he appeared before the Army Court Martial of Lieutenant Wilson, which was subsequent to the Board's hearing, and his deposition was thereupon obtained. Private West, in this deposition, testified that while batting a tennis ball against a backstop at the U.S.C. tennis courts in the northern section of Palm Springs he observed two airplanes flying in such close proximity to each other that they attracted and held his attention. He stated that the airliner was about 50 feet to the north and about seven "Bomber lengths" to the rear of the Army plane. He identified the two planes by the silver color of the Airliner and the Army green of the Bomber. He stated that "they were coming through this Pass and the Bomber in a right bank and the airliner moved in under it. The airliner nosed down and the tail came up and hit the right motor of the Bomber and the tail was cut off."

Private West was under the impression that when an airplane is nosed down the tail rises by a considerable amount. This is incorrect. The precise course followed by the tail during such a maneuver would

depend upon the rapidity with which the controls were moved, and the speed and exact characteristics of the airplane, but it would appear impossible under any conditions for the tail to rise more than 10 or 15 feet above the line of the original flight path as the result of nosing down. The probable amount of rise of the tail surface would be considerably less than that. For the Bomber to have been in such close proximity to the Airliner that a deviation of the tail of the Airliner of 10 or 15 feet from its path would have caused a collision, would in itself have been inexcusable.

The testimony of Private West cannot be considered reliable. He was observing airplanes that were flying at an altitude of 6,000 feet above an area on the ground approximately three miles distant from the tennis court on which he was standing. It is doubtful whether one experienced in the observation of aircraft in flight would have been able, under the circumstances, to determine in such detail the relative position and course of the two planes in question; and Private West was not an experienced observer of aircraft in flight. He was a stranger to aviation, except for two flights which he had taken as a passenger. Moreover, his testimony is inconsistent with that of the other witnesses, Mrs. Margaret Caldwell, who witnessed the accident from approximately the same point, and Raymond W. Martin, who, as previously stated, had served as an airplane spotter, saw the collision from a closer point of observation. Both testified that just before the impact the Bomber was maneuvering above and behind the Airliner and that the latter, after the impact, fell off to the left, then turned or spun slowly several times until it disappeared beyond obstructions to their view. Private West's testimony is also inconsistent with that of the Bomber

pilot himself, who freely admitted under oath that "I * * * was getting my nose down a little bit, and I was ready to trim it up and prepare for my let down when the impact occurred." The testimony of Witness West, therefore, is not only unsupported in the record but must fall before the weight and character of the other evidence.

Weather Conditions

Ceiling and visibility were unlimited throughout the day in the area of the accident. Winds aloft and on the surface were light except that relatively strong northerly winds prevailed at 15,000 feet and above. Turbulence is common in the area concerned either during strong winds through San Geronio Pass or in unstable air, but as the winds were light to well above the mountain and stable air existed, there appears to have been little likelihood of anything but very mild turbulence existing at the time of the collision.

In view of these conditions it appears that the weather was not a contributing factor to this accident.

Examination of the Wreckage

The wreckage of the Airliner was found approximately two miles west of the Army Airport at Palm Springs and about three miles south of the center of the airway. Parts of the aircraft were scattered over an area about two miles long and three-fourths of a mile wide. The vertical fin and upper portion of the rudder were found about two miles from the main portion of the wreckage. The impact with the ground and subsequent fire resulted in such extensive damage to the aircraft that little could be learned from an examination. During the descent, the entire tail assembly was torn loose from the fuselage.

Examination of the Bomber revealed that the right wing de-icer boot had been cut just inboard of the landing light. The oil radiator scoop was partly collapsed. Two of the blades of the right propeller were badly scratched. The third blade had severe nicks and a small diamond-shaped piece had been cut out completely. All of the blades appeared to be bent forward slightly. There were slight dents, red paint markings and other damage to the inboard side of the right nacelle, just ahead of the leading edge of the wing. With the possible exception of the right engine, which was not given a teardown inspection, there was little damage done to the Bomber.

CONCLUSIONS.

The evidence of the record leaves no doubt as to the cause of, or the responsibility for, this accident. The pilot of the Bomber testified with great frankness to the facts, which showed that he diverged from his military mission to fly the Bomber in close proximity to the Airliner for the express purpose of signalling a friend in the copilot's seat of the latter plane. Such conduct was wholly without justification. The investigation discloses no basis for any inference that the pilot in command of the Airliner was aware of the reason for Lieutenant Wilson's conduct or that he sought in any manner to cooperate with Lieutenant Wilson in any plan of reciprocal saluting. Both the pilot and copilot of the Bomber testified that they observed no maneuver of recognition from the Airliner in response to the Bomber's wing-dip salute.

We are driven to the conclusion that this collision resulted from the reckless and irresponsible act of the Bomber pilot and that the captain of the Airliner was without fault.

Recommendations

In the investigation of this accident it was learned that the Sixth Ferrying Group of the Air Transport Command at Long Beach, California, had placed an erroneous interpretation on the rules governing contact flight on a civil airway. Although this had no direct bearing on the accident, their interpretation of these rules creates a situation fraught with great danger, particularly under conditions of mountainous terrain and congested air traffic.

On June 24, 1941, the Civil Aeronautics Board passed a regulation which reads as follows:

"60.471 Contact flight above 3500 feet on civil airway. In addition to all contact flight rules, aircraft flying under contact conditions at an altitude of more than 3500 feet above the ground or water and within the limits of a civil airway shall conform to the rules prescribed for flight under instrument conditions in the following respects:

- (1) Compliance with #60.53, Flight Plan, when flights touch airways traffic control areas;
- (2) Maintenance of flight altitudes (#60.58); and
- (3) Maintenance of communication contacts (#60.571).
- (4) No change in an approved flight plan shall be made without the prior approval of the airway traffic control center concerned, unless an emergency situation arises which requires immediate decision and action or unless weather conditions make it necessary for the pilot to effect change in order to continue flight in accordance with contact flight rules; in either case the proper airway traffic control center shall be notified as soon as possible."

The Regulations are supplemented by the explanatory and interpretative material included in the Civil Aeronautics Manual, prepared and distributed by the Civil Aeronautics Administration. The particular volume of the Civil Aeronautics Manual covering Part 60 of the Civil Air

Regulations includes an illustrative diagram indicating very clearly that the 3,500-foot altitude specified in CAR 60.471 is to be measured with respect to the local ground level.

The testimony revealed that Bomber Pilot Wilson, Lieutenant Herbert, Commanding Officer of the Ferrying Command branch at Palm Springs, and Major Dunlap, Operations Officer of the Sixth Ferrying Command at Long Beach, were under the impression that the 3,500-foot limit prescribed in the above-quoted regulation was interpreted as 3,500 feet above the highest point on the airway "between two radio ranges" in one case, and "between the two radio fixes" in another.

Although they testified that they were under the impression that such an interpretation had been received at some time or another by the Ferrying Command from Civil Aeronautics Administration personnel, they were unable to name any individual involved, any particular meeting at which such an interpretation had been given, or produce any specific evidence thereof. Furthermore, the Civil Aeronautics Administration personnel who testified stated that in their meetings with Army personnel on air traffic rules they had given an interpretation of the rule under discussion which was in agreement with the graphic illustration in Civil Aeronautics Manual No. 60.

The content of this regulation, and its misinterpretation by certain personnel, are not considered to have had any direct causative relation with the accident. No specification of altitude levels should have been necessary to prevent an experienced pilot from bringing his aircraft deliberately into such close proximity to an airliner; and his action was not only in violation of ordinary good flying practice and common sense, but specifically in violation of the regulation (60.343)

prohibiting the bringing of an aircraft in flight within 500 feet of another. Investigation of the accident has, however, served to bring to light the seemingly quite unjustifiable confusion regarding the interpretation of CAR 60.471; and in addition to its being obviously desirable to clear any misapprehension on that point immediately, it appears that it may be advisable to make certain modifications in this portion of the Regulations, as applied to such areas of traffic concentration as San Gorgonio Pass. Accordingly, the Civil Aeronautics Board has been giving consideration to certain such modifications based upon the sea level altitude rather than height above local terrain.

In addition a recommendation has been made to the Interdepartmental Air Traffic Control Board by the Civil Aeronautics Board that an immediate study of the traffic situation at San Gorgonio Pass be made with a view to making recommendations for the elimination of the hazard which now exists. It is further recommended that:

- (1) Immediate studies be made at all points on the civil airways where traffic is congested due to mountainous terrain, training activities, or other causes; and
- (2) Where, as a result of the above-recommended studies special rules are found necessary, bulletins covering each portion of the airway so affected be prepared explaining the reasons therefor and describing in simple language the application of such rules; and
- (3) Such of the above-recommended bulletins as are appropriate be made a part of the flight clearance for pilots unfamiliar with the affected areas.

Findings

1. The collision which occurred at approximately 5:15 p.m. on October 23, 1942, between an Army B-34 bomber and American's Trip 28 resulted in fatal injuries to the nine passengers and the three crew members of the Airliner. The Airliner was completely destroyed. The Bomber received minor damage to the right propeller, engine nacelle, and de-icer boot. Its occupants were uninjured.

2. At the time of the accident, American held a certificate of public convenience and necessity and an air carrier operating certificate authorizing it to conduct the flight. Both certificates were currently effective.

3. Captain Pedley and First Officer Reppert, of the Airliner, were physically qualified and held proper certificates of competency to perform their duties on the subject flight.

Lieutenant Wilson, the pilot, and Sergeant Leicht, the copilot, of the Bomber, were assigned by the Army to conduct this flight.

4. The Airliner, NC 16017, was currently certificated as airworthy at the time of the accident.

5. American's Trip 28 originated at Burbank, California, with New York, New York, as its final destination. It departed from Lockheed Air Terminal, Burbank, at 4:36 p.m., having been cleared in accordance with company procedure to Phoenix, Arizona.

The Army B-34 bomber had been dispatched from Long Beach, California to Palm Springs, California, on a contact flight plan.

6. The operation of American's Trip 28 was normal until it was struck by the Army B-34.

7. American's trip 28 reported by radio to Burbank at 5:02 p.m. as over Riverside, California, at 9,000 feet. This was the last radio contact with Trip 28 until 5:15 p.m. when it attempted to make contact with

Burbank, which was not completed.

8. The collision occurred when both aircraft were at an altitude of about 9,000 feet, approximately 3 miles north of Palm Springs, California.

9. The weather conditions in the area at the time were satisfactory for the flights and were not a contributing factor to the accident.

10. There was no evidence of mechanical failure of either aircraft or their engines.

11. There was no evidence that Captain Pedley had any knowledge of Pilot Wilson's intention of flying close to the Airliner to signal First Officer Reppert. Neither was there evidence that Reppert had agreed to any arrangement which would have violated either the Civil Air Regulations or good practice, nor that he had caused any deviation from the normal conduct of the flight.

PROBABLE CAUSE: Reckless and irresponsible conduct of Lieutenant William N. Wilson in deliberately maneuvering a bomber in dangerous proximity to an airliner in an unjustifiable attempt to attract the attention of the first officer (copilot) of the latter plane.

APPROVED:

/s/ L. Welch Pogue
L. Welch Pogue

/s/ Edward Warner
Edward Warner

/s/ Harllee Branch
Harllee Branch

/s/ Oswald Ryan
Oswald Ryan