

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: October 1, 1952

Released: October 7, 1952

CALIFORNIA EASTERN AIRWAYS, INC. AND OVERSEAS NATIONAL AIRWAYS,
AIR COLLISION - NEAR OAKLAND MUNICIPAL AIRPORT,
OAKLAND, CALIFORNIA, NOVEMBER 17, 1951

The Accident

California Eastern Airways' training flight, a DC-4, N 4002B, and Overseas National Airways' training flight, a DC-4, N 79992, collided at an altitude of about 3000 feet MSL at approximately 1013,^{1/} November 17, 1951. Both aircraft were making simulated instrument approaches to the Oakland low frequency radio range. The three captains in the Overseas National DC-4 were killed, and the aircraft was destroyed by impact and fire. The two captains and one mechanic in the California Eastern DC-4 were not injured, but the aircraft received substantial damage.

History of the Flights

Overseas National's DC-4^{2/} took off from the Oakland Airport at 0820. Captain Marion Harvey Click, company check pilot, was in command and aboard were Captains Hammond Garrard and Warren Cecil Gessner who were to receive their six months DC-4 instrument competency checks. There were no other persons aboard. The aircraft had been refueled with 1,229 gallons of gasoline and 11 gallons of oil; the total load was within the certificated gross weight and was properly distributed. At 0923, this flight received a clearance from the Oakland tower to make a practice range approach and to remain above 1,500 feet on the final approach to the airport.

At 0935, the California Eastern DC-4^{3/} took off from the Oakland Airport for the purpose of a six-month instrument competency check. Captain Ralph A. Shope, company chief pilot, was in command and occupied the right seat. Captain Winfield B. Kinner, receiving the check, was in the left seat. Louis Goldberg, an upholsterer and company mechanic, occupied a cabin seat and was on board only to sew some arm rests. The aircraft had been refueled with 1600 gallons of gasoline, and the total load was within the certificated gross weight and was properly distributed.

According to accepted practice, both flights conducted their training checks in the "Bay area," with all maneuvers above 3,000 feet. Both aircraft were equipped with hoods, installed on the left side of each cockpit to

^{1/} All times referred to herein are Pacific Standard and based on the 24-hour clock.

^{2/} Henceforth referred to as "Overseas".

^{3/} Henceforth referred to as "California".

prevent the pilots being checked from seeing outside. The check pilots in the right seats, also perform the duties of safety pilots, maintaining watch for other aircraft. There was also a third pilot on board Overseas who acted as an observer.

Shortly before 1013, the approximate time of the accident, both aircraft approached the Oakland low frequency radio range station, which is 0.2 mile northeast from the approach end of Runway 15 of the Oakland Airport. Overseas was on a magnetic heading of approximately 124 degrees inbound on the NW leg of the range; and California was homing on the range on a heading of 75 degrees M.^{4/} Both aircraft were at an altitude of 3,000 feet.

Weather conditions were good in the San Francisco Bay area at the time. The U. S. Weather Bureau reported at 1016 (three minutes after the accident); ceiling 25,000 feet, thin broken clouds, visibility seven miles, wind south four mph at Oakland. The sun's bearing at 1015 was 153 degrees true, and its altitude above the horizon was 28 degrees and 27 minutes.

During a short period prior to 1013, both aircraft were observed to converge without any apparent change in direction or altitude. Neither attempted to avoid collision but remained in straight and level flight, and collided approximately over the range station at an altitude of about 3,000 feet.

California was at a slightly lower altitude than Overseas, and contact was made between the leading edge of the vertical stabilizer of California and the right side of the fuselage of Overseas just forward of the horizontal stabilizer. Shortly after the collision, Overseas crashed out of control on Doolittle Drive, the highway paralleling the north side of Oakland Airport. Its three pilots were killed at the time of impact with the ground. A number of persons driving on the highway close to the impact site received burns of varying degrees, and several automobiles were destroyed by fire.

The top portions of the vertical stabilizer and rudder of California were torn off in the collision. The aircraft was still controllable at an air speed of 160 miles an hour. Immediately following the collision, Captain Shope had Captain Kinner remove the hood. As California was then south of the Oakland Airport at 2,500 feet, Captain Shope requested permission to land on Runway 9R, the longest runway, and to have emergency equipment stand by. However, since all fire equipment was then at the crash scene of Overseas, the flight was directed to the San Francisco Airport, 12 miles away, where an emergency landing was made at 1021.

Investigation

Overseas struck the ground at an angle slightly beyond vertical. It did not move appreciably after impact and burst into flames immediately. Local fire fighting equipment extinguished the fire after considerable fire damage had occurred. The bodies of the three pilots were extricated, and the wreckage was removed from the highway to restore traffic. It was determined that Captain Garrard was in the left seat, and Captain Click in the right seat. Captain Gessner's position could not be determined.

^{4/} See Attachment A.

As a result of ground impact, all four engines broke from the structure, and all four propellers and nose sections broke free of their respective engines. Both wings and the fore part of the fuselage had been exposed to considerable heat, and the rear of the fuselage was flattened. The main part of the aircraft was 1,425 feet southeast of the center of the Oakland Range Station. The entire empennage had been severed at the time of collision and fell free of the aircraft, landing 1,350 feet southeast of the range station.

Inspection of Overseas' empennage, which had separated from the fuselage at a point just forward of the horizontal stabilizer's leading edge, disclosed aluminum paint marks running in the horizontal direction on the rubber de-icer boot of the right horizontal stabilizer, starting about eleven feet in from the tip and continuing inboard to where the de-icer boot was torn free near the inboard end. The inboard portion of the leading edge of the right horizontal stabilizer was flattened. The fuselage had been struck on the right side about on a line with the leading edge of the horizontal stabilizer. Blue paint marks were found on the fuselage in this area.

Further examination of Overseas' rear fuselage disclosed a twenty foot length of antenna wire lodged in a tear in the side-skin at station No. 920. This wire was of a stranded type and was positively identified as having come from the top antenna of California. All control cables which passed through the damaged rear fuselage area were severed by impact forces or by subsequent tearing forces damaged as the tail unit left the aircraft.^{5/}

Two pieces of the top portion of the vertical fin from California were found 1,300 feet east from the center of the Oakland Range Station. An inspection of California at the San Francisco Airport revealed that the vertical tail surface was sheared off irregularly approximately 20 inches above the center rudder hinge. The dorsal fin portion was painted blue, accounting for the blue marks on Overseas.

An inspection of the maintenance records of both aircraft indicated that they were in an airworthy condition at the time of take-off, and there was no indication from either flight of any malfunction prior to the collision.

As stated, both carriers were conducting six-month pilot DC-4 checks. The first phase of the work consisted of practice turns, stalls and other maneuvers. It was customary for such training flights to use the area in the south and southeast quadrants of the Oakland range. Also a portion of the six-month check consisted of orientation, beam bracketing, cone identification, and approach procedures. During these checks the hood is up to require the pilot in the left seat to fly solely by instruments.

The hoods installed in both aircraft were of fabric. The one in Overseas obscured the left windshield, except for its top two inches (approximately), and the left side glass except for its top six or eight inches. California's installation covered the left windshield, except for about four inches from the center, and all of the left side glass. The safety pilot of California could see to his right, ahead, and to the left of ahead by about 45 degrees.

^{5/} See Attachment B, a photograph of two model DC-4's placed in the approximate relative positions as the two aircraft at time of collision.

However, reference to Attachment A shows that Overseas, during the final stages of flight, was at a relative bearing of 53 degrees to the left of California, preventing its safety pilot from seeing Overseas.

Overseas was making a standard range approach to the Oakland station inbound on the northwest leg (124 degrees) at an air speed of approximately 140 mph, and maintaining 3,000 feet, the initial approach altitude, all in accord with company procedure. The company also required an "in range check list," which was in effect for training flights. This check list is read by the check pilot and the response is made by the pilot being checked. This list is:

1. Altimeter "SET."
2. Seat belt - no smoking sign "ON."
3. Wing and prop de-icers "OFF."
4. Cabin and cockpit heaters and galley switches "OFF." (Not applicable.)
5. Driftmeter "CAGED" and "OFF." (Not applicable.)
6. Trailing antennae "IN." (None on this aircraft.)
7. Main Tanks "ON."
8. Carburetor air "COLD."
9. Cross feed "OFF."
10. Blowers "LOW." (None installed on N 4002B.)^{6/}
11. Hydraulic by-pass "DOWN." Pressure "UP."
12. Hydraulic hand pump valve "CLOSED" (forward).
13. Automatic pilot servo "OFF."
14. Parking brake "OFF."
15. Mixtures "RICH."
16. Check magnetos.
17. Gear handle "UP," flaps as required.

Captain Byron F. Sherrill, Overseas Chief Pilot, testified that this check is completed one or two minutes prior to arrival over the range station on the initial approach. He further stated it required about one minute to complete this check.

According to approved company procedure, at least three pilots are scheduled for training flights so that one can act as an observer. Normally, this observer stands on the navigator's stool looking from the astrodome, particularly during turns and other maneuvers. He also is required at times to look from cabin windows on the left side for other aircraft. Company practice requires the flight to contact the tower, even under VFR conditions, one to two minutes prior to reaching the range station, for permission to make a simulated low approach to the airport. The Oakland Tower records revealed that Overseas was cleared to make an approach at 0923, fifty minutes prior to the accident, but no request from Overseas was received by the tower immediately prior to 1013. The captain of California testified that he was just about to contact the tower in accord with his company's practice when collision occurred. However, under existing Civil Air Regulations neither flight was required to contact the tower under VFR conditions.

^{6/} By this is meant that the "high blower" was deactivated leaving the engine continually in "low blower."

California required an ADF approach during the check flight, and at 0950 Captain Shope requested Captain Kinner to do a "time and distance" problem from the Oakland Radio Range Station. After orienting himself in relation to the range station and estimating the time therefrom as four minutes, Captain Kinner took up a heading of 75 degrees holding an altitude of 3,000 feet, air speed 170 mph. As the flight crossed the range station at 1013, a rather abrupt jar was felt and California was swung about 30 degrees to its right. From his right, Captain Shope observed the other DC-4 descending at a sharp angle; he had not seen it previously.

Captain Shope testified that a flight plan had been made out on the morning of November 17, 1951, which listed the names of three other captains who required flight checks; however, since these pilots were not present at the designated time, the flight departed without them. Investigation disclosed that California had previously required a check list prior to reaching the range station, somewhat similar to Overseas, but had discontinued its use since such a procedure at that point would divert the attention of the check pilot and impair his watching for other aircraft. Also, the company did not normally require an observer to be stationed in the astrodome, but since the accident this has been required on all training flights.

Statements were obtained from a number of eye witnesses to the accident. Some saw both aircraft converging, one headed in an easterly or northeasterly direction and the other in a southeasterly direction. Most witnesses were in agreement as to direction and that neither aircraft deviated from its respective heading. Time of observation of both aircraft varied from the time of impact to several seconds before the accident. One witness, a pilot flying inbound on the southeast leg of the range, stated that he saw a C-54 (later identified as Overseas) immediately after the collision, and that it appeared to be on a heading of 120 degrees, which corresponds approximately with the inbound magnetic heading of the northwest leg of the range.

Examination of the medical records of all crew members involved in this accident revealed no waivers for physical defects.

Analysis

Overseas was approaching the Oakland range station inbound on the northwest leg which has a magnetic course of 124 degrees. California was homing on the range station on a heading of 75 degrees magnetic. Thus, the angle of convergence was about 49 degrees; this was borne out by a detailed matching of wreckage, paint marks, cuts, and the probable speeds of both aircraft. The resulting computation confirms the above-mentioned angle of convergence.

The cockpits of both aircraft were hooded on their left sides. Each carried a safety check pilot on the right. Further, the third crew member in Overseas was supposedly acting as an observer and would be normally stationed in the cabin during straight and level flight and at the astrodome during maneuvers. Since the airplane for some few minutes prior to the collision was observed to be in straight and level flight, it must be assumed that this observer was in the cabin, where his primary duty was to

maintain a watch on the left, or the hooded side of the aircraft, for other traffic. Although the observer's field of vision supplements that of the safety pilot, it is also reasonable to assume that he would check the right side for traffic.

The responsibility of the Overseas safety pilot under these conditions was to maintain a lookout ahead and to the right to avoid collision with other aircraft, since his vision to the left was greatly obscured. Since both aircraft were converging at an angle approximately 49 degrees for some period of time prior to collision, the evidence is clear that had the safety pilot been maintaining such a lookout, he would have definitely seen California on his right. As to why he did not do so, we may only conjecture that he, during a portion of the time, was in the process of going through the required cockpit check prior to reaching the range station or that he may have possibly been engaged in grading the pilot in the left seat or in other duties. Had Overseas observed California converging on its right, it would have been required to give way to that aircraft.^{7/}

As previously stated, California was on a heading of 75 degrees magnetic, which placed the aircraft to the right of Overseas. Thus, the safety pilot of California on the right side of the cockpit could not see more than 45 degrees to his left. As there was no observer stationed in the cabin, it is apparent that this flight could not see Overseas as both aircraft converged on the range station.^{8/} The fact that a mechanic working in the cabin of California did observe the other aircraft, but too late to alert the crew, is significant. Had an observer been on duty, the accident could have been averted. In fact, during the final stages of convergence both aircraft could have been plainly visible one from the other had safety requirements of adequate lookout from both aircraft been adhered to. Furthermore, had both flights followed their company practices of reporting to the tower immediately prior to arrival over the range station, the tower operator might well have prevented the collision.

At the Oakland Airport the altitude of the traffic pattern is 1,500 feet, as established by the local authorities and approved by the CAA. Below this altitude all aircraft in the traffic pattern are under the control of the tower operator, whose duty is to assist in maintaining an orderly flow and separation of traffic. Above the traffic pattern altitude, the tower operator does not normally exercise control under VFR conditions. As both flights were on VFR flight plans they were not under control of Air Traffic Control. Thus, neither flight was under any ground control whatever at the time of collision; therefore, responsibility for preventing collision in this case was vested solely in the flight crews.

^{7/} Civil Air Regulations Section 60.14 (b) Converging. Aircraft converging shall give way to other aircraft of a different category in the following order When two or more aircraft of the same category are converging with approximately the same altitude, each aircraft shall give way to the other which is on its right.

^{8/} Civil Air Regulations Section 43.67 (c) Simulated Instrument Flight. Aircraft shall not be flown under simulated instrument flight conditions unless (c) Such safety pilot at all times has adequate vision forward and to either side of the aircraft, or a competent observer occupies a position in the aircraft so that his field of vision adequately supplements that of the safety pilot.

The Board has stated in reports of previous air collisions that pilots are charged with the highest degree of responsibility in maintaining a lookout for other aircraft. In fact, the Board's regulations require the utmost pilot vigilance at all times, and CAA standards, as published in its Flight Information Manual, set forth in part that: "When flying in Visual Flight Rule weather conditions, (regardless of the type flight plan or air traffic clearance), it is the direct responsibility of the pilot to avoid collision with other aircraft."

It appears that the hoods installed in both aircraft met the general requirements of the CAA's Manual of Procedure, No. 4-2-1. This reads in part:

"The applicant for an instrument rating will furnish a certificated aircraft suitably equipped with a proper hood, baffles, or colored glass,

"The term 'proper hood' is construed to mean a hood which will completely exclude all outside visual reference to the pilot on instruments yet not unduly restrict vision of the safety pilot, agent, or examiner. Sufficient visibility to permit clearance for turns in either direction, as well as adequate forward visibility is required. In aircraft having a side-by-side seating arrangement affording inadequate visibility to the left, a safety observer will maintain a watch on the left. Such observer must be in uninterrupted aural or interphone contact with the safety pilot at all times."

Overseas, following this accident, continued to use the same type of hood. The company believes that this type hood offers a satisfactory degree of safety because it permits a reasonable amount of vision to the left by the safety pilot. The company further feels that when a competent observer is carried, as was the case when this collision occurred, there is ample vision ahead and to both sides. The fact that Overseas was hooded did not in any way contribute to the accident. Overseas is continuing to use a check list prior to arrival over the range station on the initial approach. Company policy is to complete this check-off at an appreciable period of time before arrival over the range. Following the accident the CAA recommended that both carriers adopt a different crew arrangement during training flights. This called for the safety pilot in the right seat to have no other duty than keeping continuous watch ahead and to both sides. The engineers' (jump) seat would be occupied by the check pilot who would accomplish grading the trainee and handling the check-off. However, Overseas continued using its former crew arrangement except that the observer is now stationed continuously at the astrodome; this arrangement was acceptable to the CAA.

California, immediately after the accident, revised its policy to require that the third crew member or observer on all instrument training flights be stationed at the astrodome. It also changed its type of hood installation, using a vertical slat or baffle type hood, which permits a largely unobstructed field of vision to the left by the safety pilot. Later, following the afore-mentioned recommendation by the CAA, California again revised its crew arrangement, complying with that recommendation in full.

On January 3, 1952, the CAA filed a report of violations of the Civil Air Regulations against the safety pilots of both aircraft.

Captain Click, (deceased), safety pilot of Overseas, was charged with three violations of the CAR.^{9/} These are summarized in the violation report, to wit: "While on a six months hood check the safety pilot and third crew member acting, it is assumed, as another observer for aircraft, failed to see the California Eastern C-54 and collided with it."

Captain Shope, safety pilot of California, was likewise charged with three violations of the CAR.^{10/} These are also summarized in the violation report, to wit: "While under an instrument hood during a six months hood check, the safety pilot sitting in the right hand pilot seat failed to provide a third crew member to supplement adequately the restricted vision of the safety pilot." The CAA filed these violation reports for record purposes only.

Both the Board and the Administrator, in conjunction with the industry and the military, have had the over-all problem of airspace collision hazard under intensive study for some time, including the function of airport traffic control under VFR conditions. Concerning the latter, the Board is considering a requirement that all simulated instrument (hooded) flights operating in accordance with visual flight rules be under tower supervision at all times when within the airport control zone.

Irrespective of the lack of tower supervision, however, it is clear to the Board that had the responsible crew members of both aircraft complied with existing Civil Air Regulations and maintained the lookout required, this accident would not have occurred.

Findings

On the basis of all available evidence the Board finds that:

1. Both carriers, both aircraft and all five pilots were properly certificated.
2. Both flights were operating under visual flight rules from the Oakland Airport.
3. Both flights were for the purpose of giving six-month instrument competency checks, with hoods installed on the left side of both cockpits.
4. Overseas carried an observer, as required; California did not.
5. Both aircraft were making simulated (hooded) instrument approaches to the Oakland range station at the same altitude.

^{9/} These are CAR Sections 60.12 (c), 60.14 (b) and 60.15.

^{10/} These are CAR Sections 43.67 (c), 60.12 (c) and 60.13.

6. The aircraft converged at an angle of approximately 49 degrees.
7. Overseas was a few feet higher than California.
8. No evasive action was taken by either aircraft before collision.
9. Collision occurred at an altitude of 3,000 feet approximately over the Oakland range station.

Probable Cause

The Board determines that the probable cause of this accident was the failure of the Overseas safety pilot and/or his observer to observe and so avoid the other aircraft and the failure of California's safety pilot to carry a qualified observer aboard the aircraft to insure an adequate field of vision.

BY THE CIVIL AERONAUTICS BOARD:

/s/ DONALD W. NYROP

/s/ OSWALD RYAN

/s/ JOSH LEE

/s/ JOSEPH P. ADAMS

/s/ CHAN GURNEY

S U P P L E M E N T A L D A T A

Investigation and Hearing

The Civil Aeronautics Board received notification of the accident on November 17, 1951, at approximately 1100, by telephone from CAA Communications, Los Angeles, California, and immediately initiated an investigation in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. A public hearing was ordered by the Board and held at Oakland, California, on December 13, 1951.

Air Carriers

California Eastern Airways, Inc., was incorporated under the laws of the State of Delaware in 1946 and operated as an exempted air freight carrier until 1948. On August 1, 1950, the company was granted a prime contract by MATS (Military Air Transport Service) to fly passengers and, or, freight on the Pacific Airlift over routes designated as "Mid Pac" and was engaged in this operation on November 17, 1951. The company holds Letter of Registration No. C-14 of the Civil Aeronautics Board, dated October 3, 1947, and was issued an air carrier operations certificate No. 6-10 (c) on February 19, 1951.

Overseas National Airways, Inc., was incorporated under the laws of the State of Delaware in 1950. The company was issued Letter of Registration No. 806 by the Civil Aeronautics Board on August 12, 1947, but since the carrier's aircraft were being operated by Transocean Air Lines, under agreement, the Letter of Registration was cancelled. However, after Overseas National obtained control of its aircraft, it applied for, and the Board re-issued, the Letter of Registration on April 25, 1950. The company was also issued air carrier operating certificate No. IR-5 by the Civil Aeronautics Administration on September 12, 1947. This carrier also has a contract with MATS (Military Air Transport Service) to fly passengers and/or freight in air lift operations.

Flight Personnel

Captain Ralph A. Shope, age 40, was employed as chief pilot by California Eastern Airlines, Inc., on March 3, 1951. He started flying in 1934 and subsequently instructed Army cadets; later he flew for TACA, TWA-ATC during World War II and for KLM and SAS until March 1951, acting as pilot and pilot navigator. His total flight time on November 17, 1951, was approximately 11,225:20 hours, of which 4,732:59 hours were in DC-4 aircraft. His total instrument time was 1,005:55 hours. Captain Shope held a valid airline transport pilot and flight instructor certificates, and had passed his last physical examination on September 6, 1951. Captain Winfield B. Kinner, age 40, was employed by California Eastern Airlines on August 1, 1951. His flight training started in 1928. He was a pilot instructor for the U. S. Air Force in 1943 and subsequently flew for ATC and other military services. During 1950-51, Captain Kinner was a pilot for several irregular air carriers. His total flight time on November 17, 1951, was 5,000 hours, 3,500 of which were in DC-4's. His total instrument time was approximately 350 hours. He

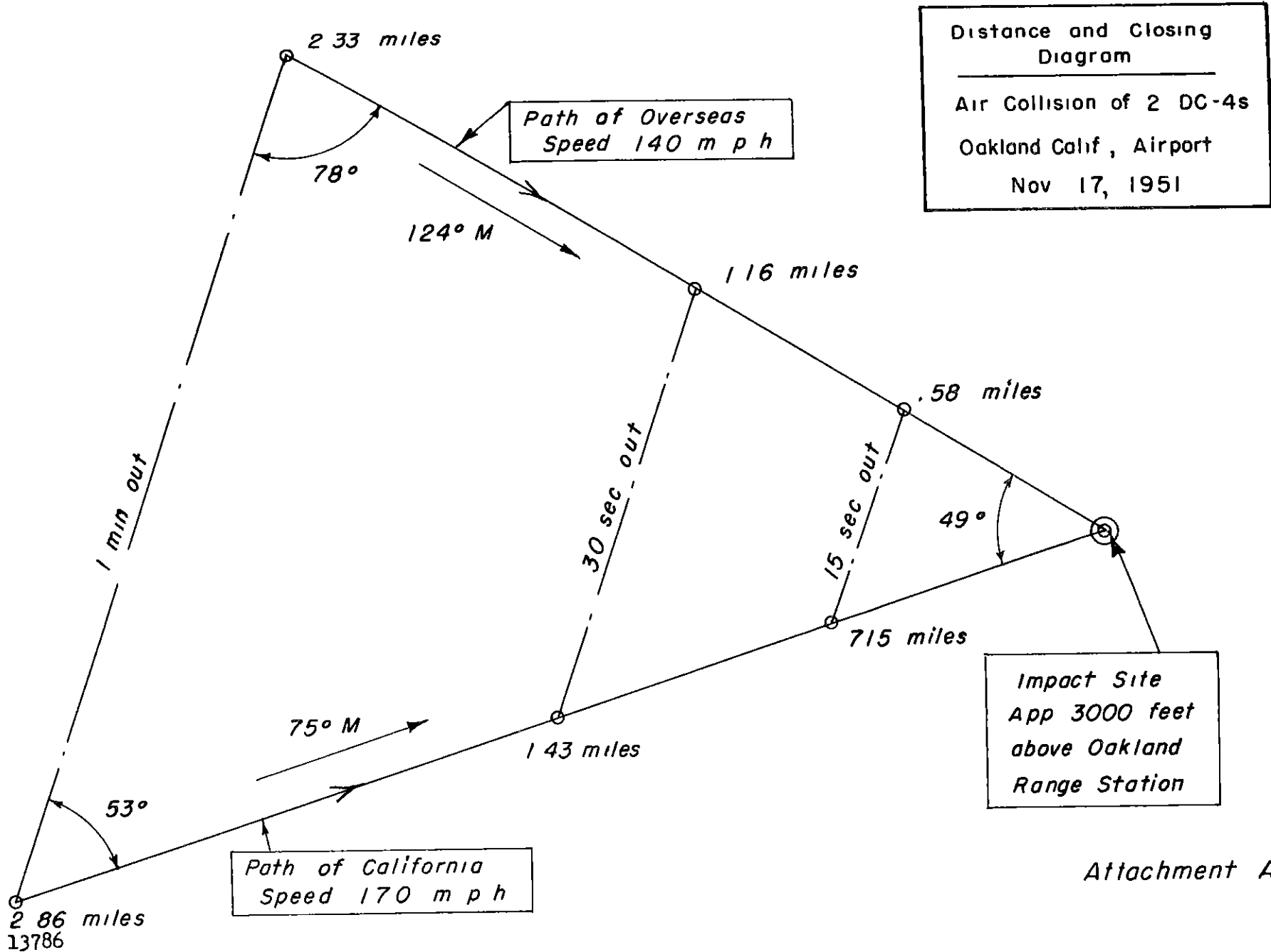
held a valid airline transport pilot and flight instructor certificate, and had passed his last physical examination May 1, 1951.

Captain Marion Harvey Click, deceased, age 31, Overseas National Airways' assistant chief pilot, was employed by the company on June 16, 1950, as a captain. He received his early flight training in the U. S. Air Force and thereafter as pilot and captain for several air carriers. His total flight time was 7,871 hours, of which 5,028 hours were in DC-4's. His total instrument time was approximately 617 hours. Captain Click held a valid airline transport pilot certificate, and had passed his last physical examination on July 13, 1951. He also held a letter of authorization from the Civil Aeronautics Administration to act as company check pilot. Captain Warren Cecil Gessner, deceased, age 27, was employed by Overseas National Airways on June 16, 1950, as a first officer, and promoted to captain on December 4, 1950. He had received his flying training in the U. S. Navy and later with Alaska Airlines, Near East Transport, and Westair Transport. His total flying time was 3,590 hours, and approximately 1,900 hours were in DC-4 aircraft. Captain Gessner's total instrument time was 652 hours. He held a valid airline transport pilot certificate and had passed his last physical examination on May 7, 1951. Captain Hammond Garrard, deceased, age 32, was first employed by Overseas National Airways on July 6, 1950, as a first officer, and was promoted to captain on July 17, 1950, but was furloughed until November 15, 1950. His flight training was obtained in the U. S. Navy; later he piloted for California Eastern and with Capital Airlines. He had a total of 5,879 hours and 3,100 hours of this time was in DC-4 aircraft. His total instrument time was 330 hours. Captain Garrard held a valid airline transport pilot certificate and had passed his last physical examination on May 14, 1951.

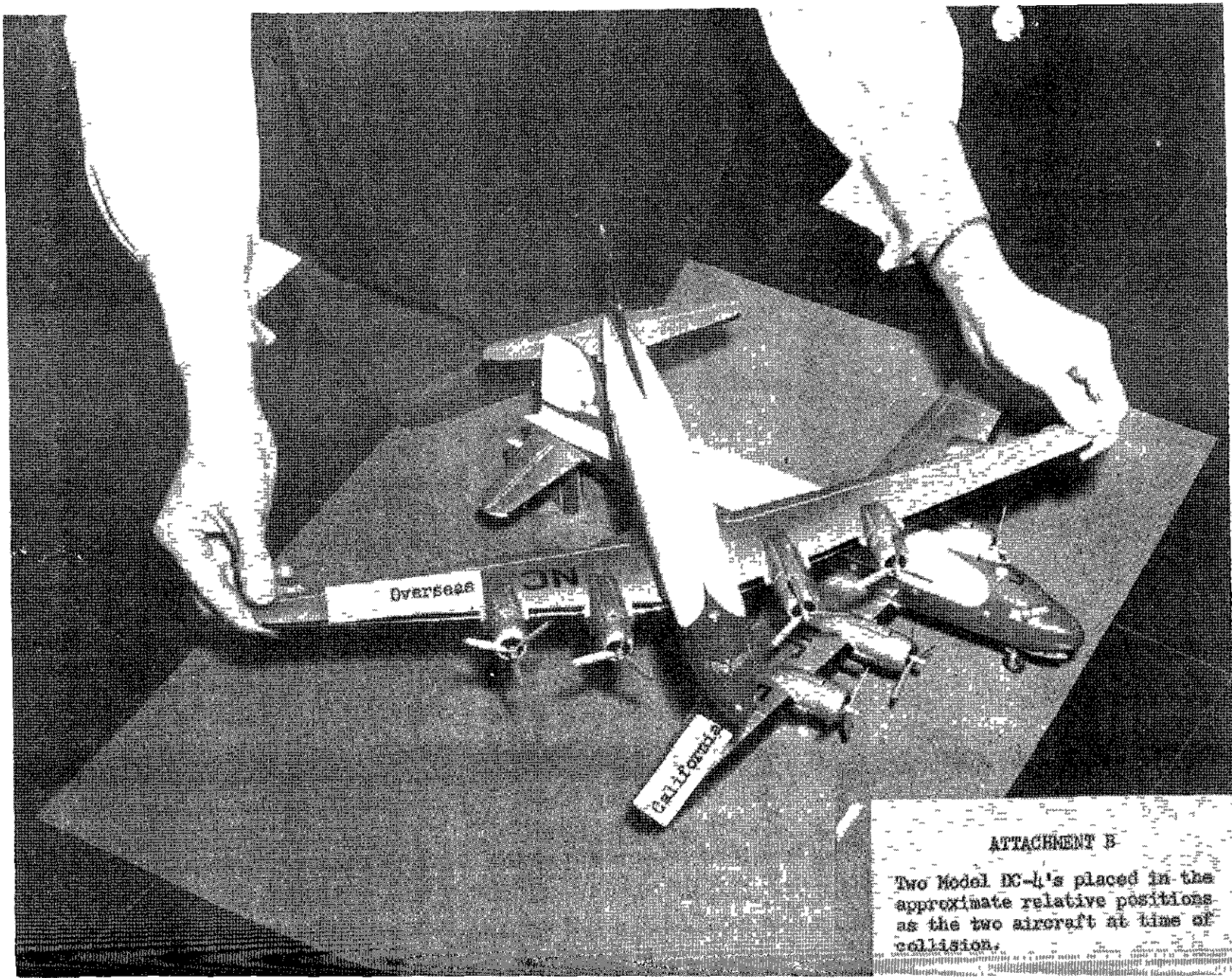
The Aircraft

N 4002B was a DC-4, and as of November 16, 1951, had a total of 16,435 hours. Flight time since its last overhaul was 6,484 hours. All historical and maintenance records pertaining to the aircraft were found in order. California Eastern Airways had leased N 4002B from TACA Airlines on April 5, 1951.

N 79992, also a DC-4, had a total time of 5,257 hours since last overhaul. The aircraft was obtained by Overseas National Airways from the U. S. Air Force on a lease agreement dated May 2, 1947. It was subsequently sub-leased to Transocean Airlines, but this lease was later terminated on January 9, 1950. The aircraft was first operated by Overseas National Airways on August 16, 1950.



Attachment A



ATTACHMENT B

Two Model DC-4's placed in the approximate relative positions as the two aircraft at time of collision.