

## CIVIL AERONAUTICS BOARD

**ACCIDENT INVESTIGATION REPORT**

Adopted: June 17, 1953

Released: June 19, 1953

THE FLYING TIGER LINE, INC., - DOUGLAS DC-4, ISSAQUAH, WASHINGTON,  
JANUARY 7, 1953

The Accident

At approximately 2055<sup>2/</sup>, January 7, 1953, a Douglas DC-4, N 86574, owned and operated by The Flying Tiger Line, Inc., crashed two miles south of Issaquah, Washington, during an instrument approach to Boeing Field, Seattle, Washington. All seven occupants were killed. The aircraft was demolished by impact and fire.

History of the Flight

Flying Tiger's Flight 841 of January 7, 1953, a ferry flight from Burbank, California, to Seattle, to pick up military personnel, was made in accordance with the company's contract with the Department of National Defense. Departure from Burbank was at 1437, with Captain C. Greber, pilot in command, Captain B. Merrill, and Copilot W. Lowe comprising the crew. Captain H. Wall, chief pilot of the company's Burbank Division, was on board as an observer. The weight of the aircraft at takeoff was 57,520 pounds which was within the maximum allowable gross weight; there was no revenue load. Throughout the segment of the flight to San Francisco, California, Captain Merrill and Captain Lowe flew the aircraft; with the exception of a false fire warning signal from the No. 3 engine nacelle observed in the cockpit shortly after takeoff, the flight to San Francisco was routine. Upon arrival there mechanics checked the fire warning system and found no evidence of a fire having occurred. Captain Merrill told the mechanics that he was satisfied from their inspection there was no danger of fire and that he would not delay the flight further. The malfunctioning fire warning system was not repaired at this time. Captain Wall terminated his flight at San Francisco and a company stewardess, together with a woman passenger and her two children (the wife and children of a company pilot), boarded the aircraft at this point to fly as non-revenue passengers. No fuel or cargo was added at San Francisco.

Flight 841 departed San Francisco at 1737 with Captain Greber in command occupying the left pilot's seat and Captain Merrill occupying the copilot's seat. The flight was cleared by ARTC (Air Route Traffic Control) to fly VFR via Amber Airway No. 1 to Williams, California, and IFR from Williams to Boeing Field, Seattle, at an altitude of 11,000 feet MSL. The estimated time en route was three hours and 39 minutes with 1,500 gallons of fuel on board and the Seattle-Tacoma Airport was designated as the alternate.

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

Normal en route position reports were made by the flight and at 1947 it reported being over Eugene, Oregon, at 11,000 feet. Seattle ARTC then cleared the flight to descend to and maintain 9,000 feet until passing Portland, Oregon, and from this point, to descend to and maintain 7,000 feet. At 2036 Flight 841 reported over the McChord radio range station and requested further clearance. Accordingly, ARTC cleared the flight to maintain 7,000 feet, to contact Seattle Approach Control immediately and advised that no delay was expected. Contact was immediately made with approach control; the flight was then cleared to make a standard range approach to Boeing Field and requested to report leaving each 1,000-foot level during the descent. The following weather information was given the flight at this time: "Boeing Field - 1800 scattered, 2200 overcast, 8 miles, wind south-southeast 22, gusts to 30, altimeter 2925; Seattle-Tacoma - measured 1900 broken with 3100 overcast." Flight 841 acknowledged this clearance and reported leaving 7,000 feet at 2040. Two minutes later, at 2042, it reported being over the outer marker and leaving the 6,000-foot level. No report of leaving the 5,000-foot level was made and at 2045 the flight advised it was leaving 4,000 feet. When the latter was acknowledged by approach control the flight was further advised as follows: "If you're not VFR by the time you reach the range you can shuttle on the northwest course at 2,000 feet, it's possible you'll break out in the vicinity of Boeing Field for a south landing." The flight acknowledged at 2050 and said it was leaving 3,000 feet.

At the time N 86574 was making the approach to Boeing Field, a Pan American DC-4 aircraft was also approaching this airport from the northwest. The latter aircraft had been advised by approach control that it was No. 2 to land behind the Flying Tiger aircraft in the traffic pattern. The Pan American aircraft was making a routine let-down on the northwest leg on the Seattle range and at 2054 reported being at the 3,000-foot level and VFR. Immediately after receiving this altitude report approach control called N 86574 and advised: "You're clear to contact Boeing Tower on 118.3 for landing instructions." This was acknowledged by "Roger" and was the last known contact with the Flying Tiger aircraft. At approximately 2055, N 86574 crashed about 11 miles east of the Seattle range station at the base of Squak Mountain. All seven occupants were killed and the aircraft was demolished by impact and the ensuing fire.

### Investigation

The aircraft first struck a high tree on a mountain ridge at an elevation of 1,620 feet. The location of the impact was approximately one-half mile east of the summit of Squak Mountain (elevation 1,980 feet MSL) on which radio towers are located. Following impact with the tree the aircraft continued flying and finally struck the ground in a canyon 1500 feet below.

The aircraft was in a nearly vertical attitude on impact with the ground and the velocity was such that the engines and cockpit were bedded deep in the soft muddy loam. Pieces of wreckage were scattered in all directions, and fire destroyed a considerable portion of the aircraft.

Examination of the wreckage revealed that the landing gear was fully retracted and that the wing flaps were in the 25° down position when the accident

occurred. Because of the damaged condition of the cockpit it was impossible to obtain control settings or instrument readings. The upper portion of the aircraft's vertical fin, a section of the engine cowling, the No. 2 propeller with reduction gearing attached, and the major portion of the rudder were found on the mountain ridge within a 1500-foot radius and in a northeasterly direction from the base of the damaged tree. A subsequent tear-down and inspection of the propeller hubs and engines indicated that all propellers were in the cruise range at impact and that all engines were rotating. Unused cabin fire extinguishers were found in their respective brackets; however, the brackets had been torn from their mounts. All CO<sub>2</sub> bottles had broken necks and two of these bottle necks were recovered with their seals unpunctured. Due to the disintegration of the cockpit and cabin areas, the bodies of the three-man crew could not be associated with specific seating positions. No evidence was found which indicated the existence of fire, structural failure, or malfunctioning of the aircraft or its components prior to impact with the tree.

There are three airports in the immediate Seattle area<sup>2/</sup>. When approaching from the south, Seattle-Tacoma is the first airport encountered. Seattle-Tacoma is a large airport with four surfaced runways and lies to the west of the southwest leg of the Seattle range, approximately four miles southwest of the range station. Boeing Field is located on the northwest leg of the Seattle radio range 2.1 miles from the range station. Renton Airport is located approximately two miles east of the range station on the southeast leg of the range. Both Boeing Field and Renton have single runways oriented northwest to southeast. Boeing Field is equipped with high intensity runway lights and Renton has a low intensity runway lighting system.

Two witnesses who were working at the Renton Airport at the time the subject aircraft was making its approach stated that a large four-engined aircraft crossed that airport at a low altitude and that it disappeared from their view in a northeasterly direction. Other ground witnesses at various locations north and northeast of this airport reported seeing a large aircraft flying toward the north or northeast<sup>3/</sup>. In each instance, the aircraft sighted was flying at a low altitude with engines operating in a normal manner, and there was no indication of fire aboard the aircraft. Several witnesses stated that after seeing the aircraft, they saw in the direction it had flown a large orange glow, which appeared to them as if a ball of fire was falling toward the earth. Some of these witnesses also heard an explosion. Those witnesses in the vicinity of the scene of the accident said that the lighted radio towers located on Squak Mountain were not visible to them because of clouds, and that at the time of the accident a heavy rain was falling which was accompanied by strong gusty surface winds.

N 86574 was equipped with two low frequency radio receivers, two ADF (Automatic Direction Finder) receivers, a VHF transceiver and Loran radio equipment. Of this equipment, one low frequency receiver, one ADF and the VHF were recovered. The low frequency receiver was found tuned to 260 kc., the frequency of the Seattle radio range station; the ADF receiver was tuned to

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2/ See Attachment.

3/ The accident occurred approximately nine miles east and north of Renton Airport.

201 kc., the frequency of the ILS (Instrument Landing System) middle marker for the Seattle-Tacoma Airport, and the VHF communications transceiver was tuned to 119.5 kc., the frequency of Seattle Approach Control.

The pilot of the Pan American aircraft which was approaching Boeing Field from the northwest when the accident occurred, said that the weather conditions in that area were substantially as reported and that he was visually contact at 3,000 feet. He also said that the ground navigational facilities were operating in a normal manner, that all radio communications between these facilities and his flight appeared to be clear and reasonably free of static. The pilot said that he could not state what the weather conditions were northeast of the Seattle range station as he did not fly any farther east than this station.

All three crew members of the Flying Tiger aircraft had current air transport rating certificates with appropriate aircraft and horsepower ratings. Captain Merrill and First Officer Lowe<sup>u/</sup> were acquainted with the route involved and had flown to Seattle and landed at Boeing Field within the previous six months. Captain Greber had not flown to Seattle since being employed by the company in 1951. He had recently transferred from the east coast where he had been working for the company, and in recent weeks had been appointed by the CAA as a designee check pilot.

A check with the proper CAA authorities disclosed that no other aircraft were known to be flying in the area other than those previously mentioned at about the time this accident occurred. All CAA navigational facilities were both ground and flight checked immediately following this accident and found to be within proper tolerances.

### Analysis

A study of the known facts, conditions and circumstances surrounding this accident points to but one conclusion - that it was operational in character. To summarize briefly: First, the ceiling of the clouds, the wind, the mild turbulence and the visibility was such that a safe approach and landing should have been consummated; second, the radio facilities available for navigational purposes were functioning in a normal manner and static interference at the time was negligible; third, there is no evidence which indicates a fire or any malfunctioning of the aircraft or its components prior to first impact; fourth, the company's approved low frequency range approach procedure for an approach from the south to Boeing Field is both safe and correct. If executed properly, a turn to the right or east should not be made after once aligning the aircraft with the southwest leg of the range inbound except for possible slight corrections.

There is no reasonable explanation to account for the presence of the aircraft in the sector where the crash occurred, which is approximately 11 miles to the right and east of the range station. It is possible that the pilot became confused and for a few moments thought Renton Airport, which lies

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<sup>u/</sup> It is not known which crew members were occupying the pilot's seats at the time the accident occurred.

slightly to the right of course, was Boeing Field; however, following such a mistake corrective action would not permit a course to be taken in a north-easterly direction which would lead the aircraft toward the mountains, instead an immediate turn to the left should have been made to contact the northwest leg of the range. In fact, such instructions had already been issued the flight in the event it was not visually contact upon reaching the range. Pilots unfamiliar with the area have in the past, under similar conditions, mistaken Renton Airport for Boeing Field; however, if the approach procedure to Boeing Field had been correctly followed this could not have occurred.

### Findings

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

1. The carrier, the aircraft, and the crew were properly certificated.
2. The aircraft did not carry any cargo and there was sufficient fuel aboard for the flight with a considerable reserve.
3. The flight was properly cleared to make a standard instrument approach to Boeing Field.
4. Although instrument weather conditions prevailed at the time of the approach to Seattle, no unusual weather existed which should have prevented the approach being made according to approved procedures.
5. The pilot of the aircraft deviated from the established approach procedure by flying 11 miles to the east of course.
6. All ground navigational aids were functioning normally.
7. There was no indication of fire or malfunctioning of the aircraft or any of its components prior to first impact.

### Probable Cause

The Board determines that the probable cause of this accident was the flight's deviation from the established approach procedure to Boeing Field.

BY THE CIVIL AERONAUTICS BOARD:

/s/ HARMAR D. DENNY

/s/ JOSH LEE

/s/ JOSEPH P. ADAMS

/s/ CHAN GURNEY

Oswald Ryan, Chairman, did not participate in the adoption of this report.

## S U P P L E M E N T A L   D A T A

### Investigation and Hearing

The Civil Aeronautics Board was notified of this accident at 2220, January 7, 1953, by CAA Communications at Seattle. An investigation was immediately initiated in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. A public hearing ordered by the Board was held at the Washington Athletic Club, Seattle, Washington, January 29 and 30, 1953.

### Air Carrier

The Flying Tiger Line, Inc., is a scheduled air carrier incorporated in the state of Delaware with its principal business office at Burbank, California. It operates under a currently effective certificate of public convenience and necessity issued by the Civil Aeronautics Board and an air carrier operating certificate issued by the Civil Aeronautics Administration. These certificates authorize the company to transport cargo by air over numerous routes within the continental limits of the United States including the route involved. The subject flight was conducted under an exemption granted by the Civil Aeronautics Board which authorizes the carrier to engage in interstate, overseas, and foreign air transportation of persons, pursuant to contracts with any department of the military establishment.

### Flight Personnel

Captain C. E. Greber, age 32, held a currently effective airline transport pilot rating with an appropriate rating for the subject aircraft. He had a total of 8,590 flying hours, of which 2,050 had been in DC-4 type aircraft. He had passed his last CAA physical examination on December 18, 1952, and had been employed by the company since 1950.

Captain B. M. Merrill, age 48, held a currently effective airline transport pilot rating with an appropriate rating for the subject aircraft. He had been employed by the company since 1950. He successfully passed his last CAA physical examination on December 10, 1952. He had accumulated a total of 14,961 flying hours, of which 8,060 hours had been in DC-4 type aircraft.

First Officer W. C. Lowe had been employed in that capacity by the company since 1952. He held a currently effective airline transport pilot rating and had successfully passed his last CAA physical examination on September 11, 1952. He had accumulated a total of 3,980 flying hours, of which 837 hours were in DC-4 type aircraft.

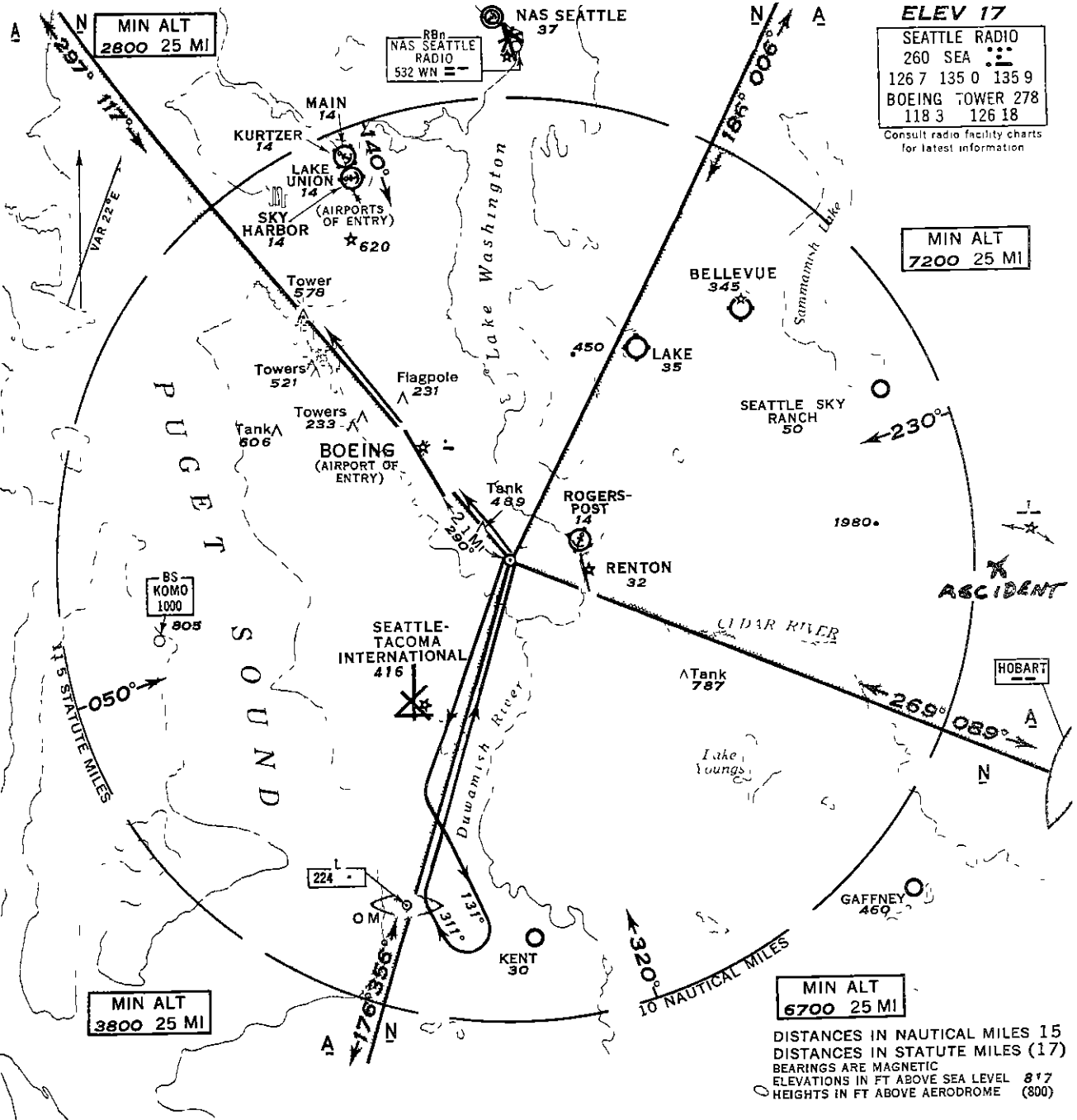
### The Aircraft

N 86574, a Douglas Model C-54B, was owned and operated by The Flying Tiger Line, Inc. The aircraft was manufactured August 8, 1944, and had a total of 20,078 hours of operation. It was equipped with Pratt and Whitney R-2000-7 engines and the propellers were Hamilton Standard. The aircraft was properly certificated and there was no evidence to indicate that it was not airworthy.

**MINIMUM SAFE ALTITUDES**  
**100 Nautical Miles 16500**  
**25 Nautical Miles 7200**

**ELEV 17**

**SEATTLE RADIO**  
 260 SEA  
 126 7 135 0 135 9  
**BOEING TOWER 278**  
 118 3 126 18  
 Consult radio facility charts  
 for latest information



**INITIAL APPROACH**  
 All courses MEA  
 E course 5000 from Hobart FM  
 S course 1500 from Lakeview FM\*

\*Descent to cross Range at 1200 may be started after passing Seattle LOM, if LOM not received final approach altitude over range is 1500

DISTANCES IN NAUTICAL MILES 15  
 DISTANCES IN STATUTE MILES (17)  
 BEARINGS ARE MAGNETIC  
 ELEVATIONS IN FT ABOVE SEA LEVEL 8'7  
 HEIGHTS IN FT ABOVE AERODROME (800)

**PROCEDURE TURN**  
 East Side S course  
 2000 within 13 (15) miles  
 NA beyond 13 (15) miles  
 LOM

If visual contact not established at authorized landing minimums within 2 1 miles after passing Seattle Range, or if landing not accomplished, CLIMB TO 7500 ON NW COURSE WITHIN 13 (15) MILES

