

CIVIL AERONAUTICS BOARD
ACCIDENT INVESTIGATION REPORT

Adopted: March 10, 1954

Released: March 12, 1954

TRANSOCEAN AIR LINES - 300 MILES EAST OF WAKE ISLAND,
JULY 12, 1953The Accident

A Transocean Air Lines aircraft, a Douglas DC-6A, N 90806, crashed in the Pacific Ocean approximately 300 nautical miles east of Wake Island at about 0841^{1/2} on July 12, 1953. All 58 occupants including eight crew members were killed and the aircraft was not recovered.

History of the Flight

Transocean Air Lines' Flight 512 departed Guam, M. I., at 0004 on July 12, 1953, for Oakland, California, with planned intermediate stops at Wake Island and Honolulu, T. H. The crew consisted of Captain W. L. Word, First Officer H. A. Hudson, Second Officer L. H. Nowell, Navigator J. R. Hay, Flight Engineer G. C. Haaskamp, Student Flight Engineer P. Yedwabnick, flight Purser H. H. Sargent and Stewardess N. L. Downing. Forty-nine passengers were on board including one infant. The flight to Wake Island was accomplished without incident in five hours and 35 minutes.

One passenger boarded the aircraft at Wake Island and since none were discharged at this point, there was a total of 50 passengers on board for the Wake Island-Honolulu segment of the flight. Following a briefing by the U. S. Weather Bureau personnel on the expected en route weather conditions, the crew filed an IFR flight plan. This plan indicated that a rhumb-line course to Honolulu was to be flown at a cruising altitude of 15,000 feet at a true air speed of 236 miles per hour. Also that the estimated elapsed time was nine hours and three minutes with 11 hours and 15 minutes of fuel on board. Prior to departure the aircraft was serviced with 2,503 gallons of 100/130 octane gasoline (to a total of 4,069 gallons) and 32 gallons of oil.

Takeoff from Wake Island was at 0658, July 12, 1953, with the same crew on board. According to the company's records, the total gross weight of the aircraft at takeoff was 94,397 pounds which was within the allowable gross takeoff weight of 100,000 pounds; the load was properly distributed relative to the approved CG limits.

Seven minutes after departure, Flight 512 was cleared from the Wake Island CAA Control Tower frequency. At 0729 the flight made the required 100-mile-east position report and stated that it had reached cruising altitude two minutes earlier. At 0829, one hour and 31 minutes after departing Wake Island, the flight made a scheduled position report as 19°48' north latitude, 171°48' east longitude, and cruising at 15,000 feet between cloud layers. This was the last known radio contact with the flight.

^{1/2} All times referred to herein are Greenwich Civil Time and are based on the 24-hour clock.

Since the flight did not report over its next scheduled reporting point, an alert was declared by Wake Island ARTC (Air Route Traffic Control) at 1001. An aircraft flying from Honolulu to Wake Island reported at 1212 that a green flare had been seen. This aircraft's position was 19°23'N and 172°05'E at the time the flare was sighted. The U. S. Coast Guard immediately dispatched several aircraft and a surface vessel to search the area. A Preliminary Accident Notice was filed by Wake Island ARTC at 1643, July 12, 1953.

Investigation

Investigation of the circumstances pertinent to the flight was immediately initiated by the Civil Aeronautics Board. The search activities coordinated under the direction of the Commander of Hawaiian Sea Frontier, U. S. Coast Guard, Pearl Harbor, Honolulu, were extensive in scope. These activities involved the U. S. Coast Guard, the U. S. Navy, the U. S. Air Force, the CAA Communication Centers at Honolulu and Wake Island, civil aircraft and merchant vessels. An area fifty miles square, using the geographical coordinates of the aircraft's last reported position as a focal point, was searched many times by both aircraft and surface vessels. Although this area was concentrated upon, the search was far broader in scope than this and included many courses flown parallel to the intended course of Flight 512. Several false starts were made because unidentifiable radio transmissions were heard over the 500 kilocycle frequency, the frequency allotted to international distress calls, which were thought to be associated with the missing aircraft. These transmissions when checked proved to be false. During the search other aircraft and surface vessels reported seeing green flares. However, it was concluded that what was thought to be flares were actually meteors or distant aircraft lights.

At approximately 0608, July 13, 1953, the USNS BARRETT reported sighting an empty inflated life raft, identified as belonging to N 90806, and a considerable amount of floating debris. These objects were sighted at 19°49' north latitude and 172°25' east longitude. Additional surface vessels and aircraft were immediately ordered to this location and a concentrated search of this area was begun. At 2044 the same day, the USNS BARRETT reported that at 19°55'N and 172°18'E it sighted bodies floating in the water and more wreckage. As a result of the search fourteen bodies were recovered together with miscellaneous floating articles. The latter consisted of five life rafts (the total number of rafts carried by the aircraft), life vests, broken seats, pieces of plywood, foam rubber matting, clothing and luggage, etc. Only a small portion of the floating debris was salvaged.

Eleven other bodies were seen but due to the high seas, waves eight feet or higher, and the shark infested water, they could not be recovered. No live persons were sighted. As the search had covered a wide area without finding any survivors and believing it impossible for anyone to have survived, the search was ended at approximately 0000, July 15, 1953.

Several Japanese fishing boats were known to have been in the general vicinity of the recovered wreckage. An effort was made to determine if anyone on board these boats had any knowledge whatever of the missing aircraft. Low flying aircraft dropped notes on board these boats but no response was received. When these boats returned to their base in Japan, statements were received from their captains indicating that no crew member had seen N 90806.

It is believed that N 90806 crashed approximately 12 minutes after its last position report (19°48'N and 171°48'E) and about 45 miles east of this position. The daily drift is estimated to be approximately 25 miles westerly. The ocean at this point is about two miles deep. No primary structure of the aircraft was recovered; therefore, it was not possible to determine if a structural or mechanical failure of the aircraft occurred in flight. An examination of the recovered bodies and wreckage definitely indicates that the aircraft crashed with a high impact force. On the recovered material there was no evidence of fire in flight.

Inspection of the five life rafts recovered revealed that the one found inflated had become inflated because of impact forces. The other four rafts were damaged and not inflated when found. None of the six life jackets recovered had been used; all were in working order.

The aircraft had received routine servicing on both the west and eastbound flights. There was no record of any mechanical troubles having been reported by the crew on either of these flights. Interviews with ground personnel at Guam and Wake and an examination of company records revealed nothing which would indicate that the aircraft was unairworthy when it departed Wake Island. All CAA communication facilities were operating normally.

The possibility of sabotage was considered. An investigation which included a security check of every passenger was made by the Board's investigator with the cooperation of the local and Federal authorities at Guam. No evidence of sabotage was found.

In aircraft of this general type where the fuel carried aboard is distributed over almost the entire wing span, it is customary for the aircraft designer to utilize the relieving effect of this dead weight in the basic design of the structure. All sequences of fuel loadings and usage are considered and optimum sequence is determined. Accordingly, it is extremely important that the manufacturer's recommended procedures be followed in order that the design limitations will not be exceeded in any particular flight condition. During the investigation this phase of the subject was thoroughly explored. It was determined that the fuel had been properly loaded aboard at Guam in accordance with CAA approved fuel weight distribution charts and instructions, and that the crew had been thoroughly trained in the recommended in-flight fuel management procedures.

The synoptic weather was as follows on July 12, 1953: An elongated high pressure area lay from Wake Island to Honolulu. The crest of the pressure ridge was to the north of the intended route of Flight 512. As a result easterly winds existed along the route from the surface to high altitudes with the winds at the flight's cruising altitude of 15,000 feet averaging 15 knots. The freezing level was also at approximately this altitude. In this latitude with pressure conditions as described, waves which consist of pressure troughs form in the pressure field aloft and these troughs move in a westerly direction. Where a decided trough exists from the surface to 30,000 feet or higher, the cumulus clouds near the trough build up and form cumulo nimbus clouds and thunderstorms, the tops of which reach 20,000 to 30,000 feet or higher. These are usually accompanied by moderate to heavy turbulence. Although two such waves were present in the pressure field between Wake Island and Honolulu the day of the accident, only one could have affected the subject flight since the other was east of 180 degrees of

longitude. The wave which lay along the route was developing into a high level cyclonic circulation. Cumulus clouds were gradually developing in the vicinity of the flight's path with tops mostly under 15,000 feet but with scattered peaks reaching approximately 20,000 feet. Some lightning was present in these clouds.

Subsequent to the accident and public hearing, the Board received a statement from the captain of a westbound Pan American World Airways flight which was flying at an altitude of about 8,500 feet and approximately 30 miles north of the course of the eastbound Transocean flight. This statement indicated that an extensive thunderstorm area accompanied by heavy turbulence was encountered.

When Captain Word and his flight crew were briefed by the Weather Bureau personnel at Wake prior to departure, a flight folder was furnished to them. This folder consisted of an aerodrome forecast sheet, cross section profile chart, surface chart, 700 mb. prognostic chart and a 500 mb. chart. According to the meteorologist, the crew was thoroughly briefed on each of these documents as well as terminal forecasts and pilots' reports. This information indicated that cumulus clouds with tops generally below 10,000 feet might be expected in Zones I and II (170°E to 180°E) with the tops of some clouds reaching 14,000 feet between 175°E and 180°E. In-flight reports indicated an occasional build-up to 20,000 feet. No turbulence of importance was indicated.

The historical, maintenance and inspection records of the aircraft were examined and it was indicated that the aircraft had been maintained in accordance with CAA and company approved procedures. The aircraft was originally a prototype model for cargo operation. Upon completion of required flight tests, the aircraft was certificated by the CAA. Transocean Air Lines purchased N 90806 in 1952 at which time it was modified and converted to a passenger type aircraft. During April and May of 1953, the aircraft was at the manufacturer's plant and at that time all applicable CAA Airworthiness Directives, in effect at that time, were complied with. (No additional Airworthiness Directives were issued by the CAA in the interval between May 1953, and July 12, 1953.) In addition the complete aircraft was thoroughly inspected and all necessary work was accomplished.

Analysis

Since no primary structure of the aircraft was recovered, it was not possible to determine if a mechanical or structural failure occurred. However, if such a failure did occur, it must have happened suddenly without prior warning to the crew. The fact that the aircraft struck the water with a high impact force indicates that the crew lost control of the aircraft prior to impact. The flight last reported flying at the planned cruising altitude of 15,000 feet and nothing was said in this report to indicate that any difficulty was being experienced. Statements of ground personnel and an examination of company records indicated that the aircraft was in an air-worthy condition when it departed Wake Island. From the position of the wreckage and time it was first sighted and allowing for a daily westerly drift of about 25 miles, it seems probable that the aircraft flew about 12 minutes after it last reported and crashed about 45 miles east of its reported position.

Assuming no radio failure, it is difficult to understand why in that

period of time and distance and from that altitude the crew were unable to advise of any difficulty unless it happened as stated above.

From an analysis of the weather conditions it appears that the flight probably encountered light to moderate turbulence during the climb to cruising altitude. For the first hour the flight should have been in the clear after which it was reported to have been between cloud layers. Relatively smooth air should have existed unless the flight encountered one of the local thunderstorms which appear to have been located along the flight course. However, there is insufficient information to determine definitely whether the more extensive thunderstorms reported north of the course extended far enough southward to have been intercepted by the subject aircraft. If the flight did penetrate an extensive thunderstorm area or one of the isolated thunderstorms, moderate to heavy turbulence would have been encountered.

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 segment of the flight from Guam, M. I., to Wake Island was without incident.
3. No mechanical discrepancies affecting the airworthiness of the aircraft were reported by the crew to ground personnel at Wake Island.
4. Prior to departing Wake Island, the crew was briefed by U. S. Weather Bureau personnel on expected weather conditions along the intended route.
5. The aircraft's last position report indicated that it was flying at 15,000 feet between cloud layers.
6. Investigation indicated that as the flight progressed isolated cumulus tops extended to 20,000 feet.
7. The aircraft struck the water with a high impact force.

Probable Cause

The Board is unable to determine the probable cause of this accident from the available evidence.

BY THE CIVIL AERONAUTICS BOARD:

/s/ CHAN GURNEY

/s/ HAEMAR D. DENNY

/s/ OSWALD RYAN

/s/ JOSH LEE

/s/ JOSEPH P. ADAMS

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 0930 PDT on July 12, 1953. 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 in Alameda, California, on August 12 and 13, 1953.

Air Carrier

Transocean Air Lines is a California corporation with its principal office at the Oakland Municipal Airport, Oakland, California. The company is engaged in the air transportation of persons and property both internationally and domestically under a letter of registration issued by the Civil Aeronautics Board and an air carrier operating certificate issued by the Civil Aeronautics Administration.

Flight Personnel

Captain William L. Word, age 36, was employed by the company on March 18, 1946. He was the holder of a valid airman certificate with an airline transport pilot rating and a type rating for the aircraft involved. Captain Word had a total of 10,312 flying hours of which 729 were in DC-6A type aircraft. His last instrument check was accomplished January 9, 1953. Captain Word received a CAA physical examination on July 7, 1953.

First Officer H. A. Hudson, age 34, was employed by the company July 24, 1950. He held a valid airman certificate with an airline transport rating and a type rating for the aircraft involved. He had a total of 5,699 flying hours of which 434 were in DC-6A type aircraft. His last instrument check was accomplished June 16, 1953. His last CAA medical examination was accomplished May 20, 1953.

Second Officer Leonard H. Nowell, age 33, was employed by the company September 18, 1947. He held a valid navigator's certificate and an airman certificate with an airline transport rating for single and multi-engine land aircraft. He had a total of 4,810 flying hours of which 716 were in DC-6A type aircraft. His last CAA medical examination was accomplished July 2, 1953. His last instrument check was accomplished March 30, 1953.

Navigator J. R. Hay, age 42, was employed by the company September 25, 1947. He held a valid navigator's certificate. He had a total of approximately 9,100 flying hours.

Flight Engineer G. C. Haaskamp, age 29, was employed by the company April 4, 1946. He held valid flight engineer, and airplane and engine mechanic certificates. He had a total of 2,424 flying hours of which 634 were on DC-6A type equipment.

Student Flight Engineer P. Yedwabnick was employed by the company October 15, 1947.

The Aircraft

N 90806, a Douglas DC-6A aircraft, was owned by Transocean Air Lines. It had a total of approximately 6,235 hours, and was currently certificated by the Civil Aeronautics Administration. The aircraft was equipped with four Pratt & Whitney R-2800-CB-16 engines and Hamilton Standard 23E60 propellers.