

Ministry of Civil Aviation
Civil Aircraft Accident

Report on the accident to Lancastrian III G-AGWH
which occurred on 2nd August 1947
in the Andes Mountains South America

London: His Majesty's Stationery Office
1948

22nd December 1947

Ministry Of Civil Aviation
Ariel House, Strand
London, W.C.2

The Minister of Civil Aviation

My Lord,

I have the honour to submit herewith my Report on the circumstances of the accident to Lancastrian Mk. III. G-AGWH, which occurred in the Andes Mountains, South America, on 2nd August 1947.

I have the honour to be,

My Lord,

Your Obedient Servant

Vernon Brown
Air Commodore
Chief Inspector of Accidents

Accidents Investigation Branch
Report No. C.A. 106

AIRCRAFT:

Lancastrian Mk. III
British. G-AGWH

ENGINES:

Four Rolls-Royce Merlins.
One T 24/2 type
One 502 type
Two 500-2 type

OWNERS:

British South American Airways Corporation

CREW:

Commander Mr. R. J. Cook (Missing since 2nd August 1947)
First Officer Mr. N. H. Cook (Missing since 2nd August 1947)
Second Officer Mr. D. Checklin (Missing since 2nd August 1947)

Number Of Passengers: Six (Missing since 2nd August 1947)

PLACE OF ACCIDENT:

Aircraft wreckage not located to date, but considered to be in the Andes Mountains probably within 40 miles eastward of Santiago-de-Chile.

DATE AND TIME:

On 2nd August 1947. Presumed to be at between 1741 hrs. and 1745 hrs.
All times given in this report are G.M.T.

1. NOTIFICATION

By telephone from B.S.A.A.C., London, at 1100 hrs. on August 3rd 1947. The vicinity of the accident was visited August 31st 1947. In the meantime information was received from the British Air Attaches in Argentina and Chile causing the Minister of Civil Aviation to call for an investigation.

2. CIRCUMSTANCES OF THE ACCIDENT

The aircraft was completing the last leg from Buenos Aires to Santiago of a scheduled flight (C.S. 59) from London to Santiago. The flight from London to Buenos Aires was carried out in a York aircraft and at Buenos Aires the customary transfer was made to a Lancastrian to facilitate the crossing of the Andes Mountains.

There are three recognized trans-Andean routes, viz. Direct, North or South diversionary routes. For all general purposes they may be described as follows:

- (a) Central and most direct, Buenos Aires-Santiago, 30 nautical miles South of Mendoza or via Mendoza.
- (b) Southern, Buenos Aires-Santiago via Planchon.
- (c) Northern, Buenos Aires-Santiago via San Juan.

Both in London and Buenos Aires the pilot had been briefed against taking the central route if bad weather prevailed.

The flight plan was made out for the route Buenos Aires-Santiago via Mendoza. The amount of fuel carried was 1,380 gallons, giving an estimated duration of 6 hours 30 minutes. The estimated time of the flight was 3 hours 45 minutes. By keeping to the flight plan and arriving over Mendoza at 18,000 feet the distance of 526 nautical miles from Buenos Aires to Mendoza should have taken 3 hours 12 minutes. The remaining distance of 106 miles from Mendoza to Santiago should have taken 33 minutes at proposed height of 26,000 feet. The aircraft departed Buenos Aires at 1346 hrs. on August 2nd 1947, and was reported as follows:

1507 hrs. 33 55' S. 62 33' W. Height 10,000 feet, course 286 , speed 196 knots, E.T.A. Santiago 1730 hrs.

1600 hrs. 33 25' S. 65 30' W. Height 10,000 feet, course 282 , speed 196 knots, E.T.A. Santiago 1730 hrs.

1700 hrs. 32 50' S. 68 30' W. Height 20,000 feet, ascending to 24,000 feet, speed 194 knots, E.T.A. Santiago 1743 hrs.

1733 hrs. E.T.A. Santiago 1745 hrs.

1741 hrs. A signal was sent out by the aircraft, E.T.A. Santiago 1745 hrs. ending with "STENDEC."

The 1741 hrs. signal was received by Santiago only 4 minutes before the E.T.A. The Chilean Air Force operator at Santiago states that the reception of the signal was loud and clear but that it was given out very fast. Not understanding the word "STENDEC" he queried it and had the same word repeated by the aircraft twice in succession.

A solution to the word "STENDEC" has not been found.

From this time on nothing further was heard from the aircraft and no contact was made with the control tower over Santiago. All further calls were unanswered.

3. FURTHER DETAILS

(a) The Aircraft

The aircraft was manufactured by A.V. Roe & Co., Ltd., Woodford, and was completed and test flown in December 1945. It was taken over by the British South American Airways Corporation in January 1946. In February 1946 it was transferred by air to A.V. Roe & Co., at Waddington for modifications to be carried out; it was test flown in February 1946 and delivered to B.S.A.A.C. at Heathrow by air the same month. All relevant modifications and replacements had been carried out. Its service on routes commenced in March 1946. The total time flown up to the last entry in the log book on July 22nd 1947 was 1655 hours 15 minutes.

(b) The Engines

All running times are to the nearest hour.

Port Outer

Rolls-Royce Merlin No. 301045/C.2629.

Manufactured by Rolls-Royce, Ltd., Derby, as a Merlin T24/2 in January 1946. Completely overhauled by Rolls-Royce, Ltd., Derby, and converted to Merlin series 500-2 in November 1946. Time since complete overhaul 561 hours. Time since new 1194 hours. All relevant inspections and replacements carried out.

Port inner

Rolls-Royce Merlin No. 324853/C.2689.

Manufactured by Rolls-Royce, Ltd., Derby, as a Merlin T24/2 in February 1946. Completely overhauled by Rolls-Royce, Ltd., Derby, and converted to Merlin series 502 in November 1946. Time since complete overhaul 561 hours. Time since new 1020 hours. All relevant inspections and replacements carried out.

Starboard Inner

Rolls-Royce Merlin No. 300993/C.2603.

Manufactured by Rolls-Royce, Ltd., Derby, as a Merlin T24/2 in January 1946. Completely overhauled by Rolls-Royce, Ltd., Derby, and converted to Merlin series 500-2 in December 1946. Time since complete overhaul 512 hours. Time since new 1196 hours. All relevant inspections and replacements carried out.

Starboard Outer

Rolls-Royce Merlin No. 324493/C.2677.

Manufactured by Rolls-Royce, Ltd., Derby, as a Merlin T24/2 in July 1946. Time since new 535 hours. All relevant inspections and replacements carried out.

(c) Loading

Maximum total weight authorised was 65,000 lbs. Total all-up weight was 51,656 lbs. at take-off.

Centre of Gravity Position

The position of the C. of G. must be between 27.56' and 29.19' aft of the nose datum. In this case it was 28.6'.

(d) The Crew

(The flying log books have been lost with the aircraft and the flying times quoted have been supplied by B.S.A.A.C.)

(i) The Captain

Captain R. J. Cook, D.S.O., D.F.C., D.F.M., was born on March 15th 1918. He was in possession of Class "B" Pilot's Licence No. 22201 issued July 28th 1945, endorsed for Mosquito. The York and Lancastrian endorsements are dated March 19th 1947. The licence was valid until August 17th 1947. He also held First Class Navigator's Licence No. 2064, issued on July 24th 1947 and valid until February 6th 1948. His total flying time as pilot in the R.A.F. and B.S.A.A.C. was 1,971 hours. He first started flying with the R.A.F. in May 1940 as a Navigator, and commenced training as a pilot in April 1943. He joined B.S.A.A.C. in May 1946.

Time flown in Lancaster in R.A.F. as pilot.

Day:	130 hrs.
Night:	20 hrs.
Total:	150 hrs.

B.S.A.A.C. Experience

Hours flown as Captain of Viking aircraft.

Day:	39 hrs. 51 min.
Night:	7 hrs. 22 min.
Total:	47 hrs. 13 min.

Total flying time in Lancastrian aircraft.

Day:	308 hrs. 10 min.
Night:	129 hrs. 37 min.
Total:	473 hrs. 47 min.

Total time flown as Captain of Lancastrian aircraft.

Day:	27 hrs. 5 min.
Night:	12 hrs. 17 min.
Total:	39 hrs. 22 min.

This flight as Captain was from London direct to Bermuda and return London, flight refuelling off the Azores.

Total time flown as aircraft officer of Lancastrian aircraft.

Day:	281 hrs. 5 min.
Night:	117 hrs. 20 min.
Total:	398 hrs. 25 min.

Flying times with B.S.A.A.C. in other aircraft are:

Total flying time in York aircraft.

Day:	390 hrs. 14 min.
Night:	164 hrs. 20 min.
Total:	554 hrs. 34 min.

Time flown as Captain on check flight in York aircraft.

Day:	31 hrs.
Night:	25 hrs. 50 min.
Total:	56 hrs. 50 min.

This flight was from London to Buenos Aires and return London.

Also time flown as Captain of York aircraft.

Day:	29 hrs. 32 min.
Night:	8 hrs. 37 min.
Total:	38 hrs. 9 min.

This was Captain Cook's last flight from London to Buenos Aires (as Captain) in a York aircraft. He then changed over to Lancastrian G-AGWH to complete the service (C.S. 59) from London to Santiago and it was after approximately 4 hours flying as Captain of this Lancastrian that the aircraft was lost. This was his first flight as Captain of a complete service from London to Santiago via Buenos Aires, and was also his first flight as Captain trans-Andes.

Services Flown

London to Buenos Aires to London	8 services.
London to Rio-de-Janeiro to London	1 service.
London to Santiago via Bermuda	2 services.
London to Santiago via Buenos Aires (trans-Andes)	2 services.
London to Bermuda to London	1 service.
Buenos Aires to Santiago (trans-Andes)	3 times.
Santiago to Buenos Aires (trans-Andes)	3 times.
London to Santiago (C.S. 59) incomplete.	

Thus Captain Cook had crossed the Andes eight times as second pilot and was in process of the ninth crossing, for the first time as Captain.

(ii) The First Officer

Mr. N.H. Cook was born on October 30th, 1916. He held a Pilot's "B" Licence No. 24146 issued on January 9th 1947, endorsed for Dakota and valid until November 8th, 1947. The York and Lancastrian endorsements are dated May 23rd, 1947. He also held First Class Navigator's Licence No. 1807 issued on May 25th, 1947 and valid until June 8th, 1948. His total flying time with the R.A.F., with other than the R.A.F., and with the B.S.A.A.C. was 2,129 hours 05 minutes.

R.A.F. and other than R.A.F. Experience

Time flown as pilot.

Day:	1,436 hrs.
Night:	297 hrs.
Total:	1,733 hrs.

B.S.A.A.C. Experience

Total flying time as Aircraft Officer: 396 hrs. 05 min.

This was as follows:

Flying time in Lancastrian aircraft.

Day:	93 hrs. 45 min.
Night:	33 hrs. 42 min.
Total:	127 hrs. 27 min.

Flying time in York aircraft.

Day:	175 hrs. 14 min.
Night:	93 hrs. 24 min.
Total:	268 hrs. 38 min.

This incomplete service (C.S. 59) was Mr. N.H. Cook's first crossing of the Andes.

(iii) The Second Officer

Mr. D.S. Checklin was born on May 29th, 1920. He held Pilot's "B" Licence No. 24205 issued January 20th 1947, endorsed for York aircraft and valid until November 19th 1947. The Lancastrian endorsement is dated May 8th, 1947. His total flying time as a pilot in the R.A.F. and B.S.A.A.C. was 2,074 hours 14 minutes.

R.A.F. Experience

Time flown as pilot

Day: 1,443 hrs.
Night: 356 hrs.
Total: 1,799 hrs.

Time flown as pilot in Lancastrian aircraft.

Day: 14 hrs.
Night: 8 hrs.
Total: 22 hrs.

Time flown as pilot in York aircraft.

Day: 511 hrs.
Night: 86 hrs.
Total: 597 hrs.

B.S.A.A.C. Experience

Total flying time: 275 hrs. 14 min.

This was as follows:

Flying time in Lancastrian aircraft.

Day: 11 hrs. 47 min.
Night: 30 min.
Total: 12 hrs. 17 min.

Flying time in York aircraft.

Day: 180 hrs. 14 min.
Night: 82 hrs. 43 min.
Total: 262 hrs. 57 min.

Mr. Checklin had previously crossed the Andes Mountains on four occasions.

(iv) Radio Officer

Mr. D.B. Harmer was born on October 5th 1919 and served in the R.A.F. for three years as wireless operator (Ground Duties). He held a P.M.G. Aircraft Radio Operator's Licence No. 1011 issued on October 17th 1946. He joined B.S.A.A.C. in November 1946, and has since flown a total of 615 hours 26 minutes by day and night including six trans-Andean crossings.

(v) The Star Girl

Miss Iris Morcen Evans was born on September 8th 1920 and served five years as Chief Petty officer in the W.R.N.S. She joined the B.S.A.A.C. in February 1947, and as Air Hostess had flown 265 hours 34 minutes by day and night but had not previously crossed the Andes.

(e) The Weather

The route forecast from Buenos Aires to Santiago was based on the 2,000 hours synoptic chart of the previous day, and the latest available actual reports which arrived to date read:

Buenos Aires 1300 hrs. August 2nd 1947.

Forecast for route Buenos Aires to Santiago:

State of Sky Buenos Aires to Mendoza: dispersed cloud; overcast in the passes.
Santiago: dispersed irregular low cloud.

Cloud Base Buenos Aires to Mendoza clear. Zero in the passes (cloud on the surface).

Horizontal Visibility Clear up to Mendoza; passes closed.

Upper Winds W. 17/22 knots rotating to N.W. 17 knots towards Mendoza; S.W. 33 knots in the passes.

Special Phenomena Snow storms in the Andes Mountains with moderate to intense turbulence.

Conditions of flight Visual contact with the ground up to Mendoza; conditions in the passes unfit for visual contact or instrument flying.

The Actual for Mendoza at 1800 hrs.

Overcast with blue holes. Alto cumulus and alto stratus. A large layer of cloud existed between 10,000 feet and 20,000 feet.

Note: It is very doubtful whether at Mendoza the pilot could have seen the ground by visual observation at all.

(g) Oxygen system

The oxygen system was fully charged including nine emergency bottles before the aircraft's departure from Buenos Aires. In addition, each point was checked for correct functioning. A duplicate check was carried out by the First Officer immediately prior to departure.

4) CONCLUSIONS

1. All licences held by the Captain and crew were valid.
2. A daily inspection of airframe and engines was carried out and a certificate of safety issued in respect of them in Buenos Aires prior to the take-off.
3. The documents required by the regulations to be carried in the aircraft were in order.
4. Sufficient fuel was carried for the flight.
5. The all-up weight of the aircraft was within the prescribed limits.
6. The C. of G. was within the prescribed limits.
7. High altitude flying equipment was carried and was in order and the crew were trained to use it.
8. As this was the pilot's first trans-Andean flight in command, and in view of the weather conditions, he should not have crossed by the direct route.

5) OPINION

Through lack of evidence due to no wreckage having been found the actual cause of the accident remains obscure. The possibility of severe icing cannot be ignored.

Vernon Brown
Air Commodore
Chief Inspector of Accidents

Accidents Investigation Branch
Ministry of Civil Aviation
22nd December, 1947