



Tragic Loss of Lincoln During Mercy Flight

Human factors, in combination with weather and equipment deficiencies led to loss of Lincoln A73-64 near Emu Vale, Queensland on 9th April, 1955

At 0030 hrs on the 9th April 1955 a Lincoln with a crew of four, a civilian nursing sister, and a two day old baby, departed on a mercy flight from RAAF Garbutt (Townsville) for Eagle Farm, Brisbane.

Position reports received from the aircraft's crew indicated that the aircraft was on track for the first half of the flight and to left of track for the second half. Height was altered from 5 500 ft to 6 000 ft in the vicinity of Rockhampton.

At 0405 hrs the crew advised Brisbane Control that they were estimating Brisbane in about ten minutes and, as they were in cloud at the time, requested clearance to descend to 5 000 ft.

Brisbane Control replied "Cleared to 5 000 ft or 4 000 ft if you wish", which was acknowledged by the aircraft. This altitude option was later to prove significant.

Later, Brisbane Control called the Lincoln again and advised: "QNH now 1019, nil low cloud, weather fine. Report if sighting Caboolture". The Lincoln captain replied "Roger, Roger will do".

When a further message was transmitted to the aircraft enquiring whether the crew had a visual fix or sight on Brisbane, there was no reply. Further attempts to communicate with the aircraft and crew were also unsuccessful.

The aircraft was subsequently located on the northern slope of an arm of Mt. Superbus where it had crashed at 0414 hrs, killing all occupants on board instantly. The mountain is 4 200 ft high and the aircraft crashed approximately 200 ft from the summit.

Flight objective

The purpose of the flight was to convey a two day old infant to Brisbane. The child, after being born on the 7th April, rapidly became jaundiced and it was not possible to obtain compatible blood for transfusion at Townsville.

At 2230 hrs on the 8th April, the superintendent of the Townsville hospital requested that the child be conveyed to Brisbane for blood transfusions. These transfusions had to be given within the next twelve hours for the child to survive. The Air Officer Commanding North Eastern Area approved the flight and instructed that a civilian medical attendant was to accompany and accept responsibility for the baby during the flight.

The flight was correctly authorised by the Commanding Officer of No 10 Maritime Reconnaissance Squadron.

Weather

Forecast and actual weather conditions along the route Garbutt to Eagle Farm for the period of the flight were:

- General weather. A frontal zone existed along coastal waters to Rockhampton and thence seawards. A secondary front existed in the vicinity of Rockhampton. Light rain areas and scattered cloud en route.
- Cloud. Varying between 1/8 and 8/8 Alto Cu or Stratus. Cloud bases 3 000 - 12 000 ft and tops to 30 000 ft.
- Wind. Actual wind at cruising heights was easterly 12-25 kts.
- Turbulence. Light to moderate.
- Freezing level. 13 000 ft.

Aircraft details

The serviceability state of the No 10 Squadron had been adversely affected by intensive operations, causing a backlog of inspections and an unavailability of spares. Lincoln A73-64 was the only aircraft available to carry out this flight when the medevac request was made. It had flown only a total of 593 hrs since new and its engines had accumulated an average of approximately 700 hrs since new (and only six hours since fitment to the accident aircraft).

Aircrew and passenger details

The aircraft was not manned by a full maritime Lincoln crew but comprised:

- Aircraft captain (WGCDR), with 3 500 total hrs including 287 on Lincolns.
- Copilot (SQNLDR), an engineer officer who had been authorised to receive flying training. Total flying hrs 274 (21 in Lincolns).
- Navigator (SQNLDR), a highly experienced navigator with over 3 000 hrs, (133 in Lincolns).
- Signaller (FLTLT), another highly experienced aircrew member with 4 550 hrs (435 in Lincolns).

All aircrew other than the copilot had experienced operational service during WWII.

The squadron Commanding Officer considered that a mercy flight of this nature could be carried out efficiently by a reduced complement.

The crew were all currently fit for full flying duties. Neither the captain or navigator were known to be experiencing any anxiety or domestic worries and were reported to have been in good spirits.

The aircrew were stationed in their correct positions. The nursing sister was located in the right observation seat and the baby in a crib in the aisle between the two observation seats.

Search and Rescue equipment was removed during the pre-flight inspection with the exception of two “storepedoes” - which were located in the rear of the bomb bay.

Wreckage examination

The aircraft was extensively broken up and the forward fuselage and left wing had been gutted by fire.

The manner in which the trees had been damaged indicated that the aircraft was flying straight and level at impact on a course of approximately 135° T. The aircraft struck the slope in a manner suggesting a change of attitude to that of climbing after impact with the trees.

The crumpled fuselage had burnt, destroying the section forward of the pilots' positions beyond recognition. However, the control pedestal revealed:

- all throttles fully open;
- all pitch controls in the approximate cruise position; and
- all petrol cocks open.

Remains of the rudder trim control indicated that it had been in the neutral position.

The tailplane assembly was inverted and the tail gun turret had broken off. Trim tabs on both elevators and rudders were approximately in the neutral position.

The engines and propellers were severely damaged and scattered on either side of the fuselage. It was not possible to determine if they had been functioning normally at impact; however, the propellers were not feathered.

Search and recovery

At 0414 hrs, members of the Brisbane Bush Walking Club heard the aircraft pass overhead and crash into the mountain. A runner was despatched to the nearby township of Emu Vale to raise the alarm. The wreckage was eventually sighted from the air at 0920 hrs.

Eyewitness evidence

From eyewitness reports, the aircraft's track was plotted; from Baralba to the accident scene. One witness at Bell (near Mt Superbus), reported that the aircraft circled the town three times between 0330 and 0340 hrs.

Other witnesses a few miles from the accident site reported that the aircraft passed close to their position which confirmed the time of impact as 0414 hrs. At 0427 hrs two explosions in quick succession were heard.

The majority of eyewitnesses stated that the aircraft sounded normal but low. All witnesses confirmed that the weather from Bell southward was completely low overcast with light drizzle.

Probable causes examined

All available evidence from ground witnesses, crew reports from the aircraft and the examination of the wreckage indicated that no malfunctioning of the engines or airframe contributed to the accident.

The basic cause of the accident was assessed to have been faulty navigation which in turn was the result of several probable factors:

1. Ability. The ability of the crew to undertake the flight was of the highest order and it is difficult to reconcile the known movements of the aircraft with the professional capabilities of the captain and navigator. The captain was known to be “hill conscious” and the navigator was well aware of the limitations of his equipment.

The flight, however, was not an ordinary one but a mercy flight to save the life of a baby requiring an urgent blood transfusion. The desire to save others has been the underlying cause of many accidents in the past and this crew would have had the greatest incentive to carry on with the mission when normally they would have exercised more caution.

The responsibilities of the captain for the serviceability of the aircraft were laid down in AFO 10/B/7. As unserviceabilities did exist in the aircraft's equipment, it was considered that the captain's decision to accept the aircraft was influenced by the urgency of the mission.

2. Fatigue. The crew had had little if any sleep prior to the flight. However, they had not engaged in any tiring occupations during the day nor had they participated in social activities. The captain was reported to have been a little tired when in the Operations Room. The navigator was reported to have been fresh and alert. At the time of the accident, the crew would have been without adequate sleep for approximately 21 hours but as the effects of fatigue vary greatly with individuals, it was not possible to determine to what extent this influenced the crew's actions.

3. Compasses. There was an error of approximately seven degrees between the aircraft's position reports and the positions over which witnesses heard the aircraft. This suggests the possibility of variation not being set on the G3 master unit. This unit was situated above the navigator's table and, as comparisons were always made between the pilot and navigator of the P8 and G3 compasses, this error should have been apparent. Alteration to the variation setting would have been necessary during the flight and it is unlikely that this drill was not carried out but it cannot be entirely dismissed. (Reference to diagram removed).

The compasses had not been swung since August 1954. The aircraft had had a turret change at the Government Aircraft Factory, Fishermen's Bend, Victoria, and had recently completed a 600 hourly inspection at No 3 AD Amberley where the four engines were changed. The G3 compass had a 2.75° easterly error removed on the 28th May 1954. During the inspection at Amberley, the master indicator was changed and was *not* adjusted to compensate for this error. The compass system would have had a constant error of 2.75° east on all headings.

The P type compass was replaced during the 600 hourly inspection and would therefore have had indeterminate amounts of coefficients A, B and C. The aircraft compasses were not swung for the ferry flights from Laverton to Amberley or Amberley to Garbutt. Air Force instructions clearly detailed when aircraft compasses were to be swung and, as the compasses of this aircraft were overdue for adjustment, it is possible that the deviations applied to the compasses on this flight were incorrect.

There had been several reports of malfunctioning G3 compasses in the squadron. Precession, causing the pilot to veer to the right, had been experienced as well as complete toppling of the unit. This would have become apparent to the pilot in a short time, but would have made it necessary to use the P8 compass as the main reference.

A test was carried out to see if an oxygen bottle and trolley, similar to the items carried on the flight, would cause any deviation on the P8 compass. No deviation was apparent on the ground or in the air; however, the magnetic qualities of the bottle and trolley carried on the fatal flight were not known and the possibility did exist that the P8 compass was affected by these items.

Because of the known irregularities and the other probable causes of error, faulty compasses were considered to have been a contributory factor to faulty navigation.

4. Map reading. The route over which the aircraft flew did not have many towns which could be reliably pinpointed. A later flight conducted over the same route between midnight and dawn, reported that no lights were seen until the last third of the route. On the night of the accident, this last third was cloud-covered and reliable pinpoints would have been difficult to obtain. It was apparent that if any pinpoints were obtained, they were misidentified because the aircraft was to right of track. It is possible that, when circling Bell, a feature was misidentified, incorrectly related to the planned track, and used as a basis for the descent.

The lack of reliable pinpoints was considered to have been a contributory factor in faulty navigation.

5. Drift. Navigators in the squadron adopted a standard procedure of finding winds by the drift method as often as possible. The lack of suitably lighted towns would make drift observations from the navigator's position difficult. Access to the drift meter in the bomb aimer's compartment was blocked by the infant's crib and it is unlikely that the navigator would have used this instrument due to interrupting the sister attending to the child. The drift meter also required light to sight on. Flame floats were available in the aircraft but were not used over land.

The difficulties in obtaining drift was considered to be a contributory factor in the faulty navigation.

6. Wind effect. The effects of the winds experienced by the crew did not differ greatly from those forecast, but would have "blown" the aircraft to right of the positions reported by the aircraft to Aeradio.

7. Astro navigation. The aircraft carried an astro compass but not a sextant. Astro was not normally used on flights of short duration but it was considered that, knowing the compasses had not been swung and that the "loop" had its limitations, some effort would have been made by the crew to check the aircraft's heading by this method. The accepted degree of accuracy for an astro compass heading was $\pm 2^\circ$ and this discrepancy could have contributed to the total error.

The crew selected an altitude of 5 500 ft for the flight, consistent with safety and the necessity for warmth and oxygen for the baby. At this height the cloud experienced over the route would have greatly hampered the navigator's efforts to reliably make astro compass checks. Turbulence also at that height was forecast as "light to moderate" and this would have further handicapped the navigator.

It was considered that difficulty in obtaining astro compass checks was a contributory factor in the total navigation error.

8. Loop. There was no record of when the loop was last swung. It was customary for this to be carried out at the same time as the compasses. The navigator was well aware of the limitations of the loop as a navigational aid and had recently told one of the squadron pilots that "the loop is at best only good enough for rough positions at night". It was reasonable to assume, therefore, that if positions were obtained by means of the loop, the navigator would have treated them with reserve.

The position reports sent from the aircraft did not indicate the method used to obtain them eg, DR, loop, etc, but the Aeradio log indicated that the aircraft was trying to tune in to Bowen NDB and that atmospheric conditions were unfavourable.

An ex-RAAF wireless operator reported that he had observed many times that broadcasting station 4BC Brisbane faded out in the early morning and that 2UW Sydney came in strongly on the same frequency. (These two stations varied in frequency by only 10 Khz.) It was possible to tune in to 4BC and take a bearing, on 2UW, although the operator no doubt would not rely on the bearing. However, if a homing was being carried out and the indicator showed the station to be well to the right, a navigator, who had not accurately established a position, would have tended to believe that they were heading to the left of their destination. As this would have been the safest course in this particular situation, it was a possible explanation why the crew chose to let down when the aircraft's position was uncertain.

The unreliability of the loop was considered a probable factor contributing to faulty navigation.

9. The let down. When the captain requested permission to let down from 6000 ft to 5 000 ft, he stated that he was estimating Brisbane in about 10 minutes and that they were in cloud at that time. This suggested that:

- they were uncertain of their position as it was considered the request would have been to let down into the airfield, or
- they thought 5 000 ft was the safety height for aircraft approaching from the north.

The Approach controller gave permission for the aircraft to descend to 5 000 ft "*or 4 000 ft if you wish*". (4000 ft was the safety height for aircraft approaching Eagle Farm from the north).

The fifty per cent error allowed in DR navigation was 8 nm per hour. Within a radius of 50 nm around the last position given by the aircraft, 4 000 ft was clear of terrain.

It was considered that the captain and navigator were influenced to let down by the following factors:

- It was suggested they descend to 4 000 ft.
- A feature had been identified which lead the crew to believe they were on track.
- 4 000 ft was a safe height within a radius of 50 nm of their last calculated position.
- Brisbane was reporting fine weather.

Conclusions

After an exhaustive investigation process, it was concluded that the accident resulted from faulty navigation and that the factors which contributed to the faulty navigation were:

- weather;
- lack of lights en route to pinpoint or assess drift;
- loop unreliability; and
- compass errors.

The investigation found that other factors which contributed to the accident were:

- the incentive to carry out the task quickly;
- the unavailability of any other aircraft to carry out the mission.
- the lack of radar aids;
- the suggestion to let down to 4 000 ft; and
- non-observance of orders.

Recommendations

The accident investigation report listed the following recommendations:

- That all future position reports included the means used to establish position (DR etc), indicated airspeed, and to specify whether heading was true or magnetic.
- That aircrew be instructed to report errors in the flight plan (especially unserviceability of aids) to the tower before clearing to area guard or Aeradio.
- That only fully operational aircraft be used for flights outside the local flying area.
- That the attention of aircrew be drawn to AFOs regarding the responsibilities of captains for the serviceability of aircraft and compass adjustment.
- That a revised navigational procedure for calculating safety height be instituted.

Quidquid agas, prudenter agas, et respice finem (Latin proverb):

Whatever you do, do cautiously, and look to the end.