No. 8

Indian Airlines Corporation, Douglas DC-3, VT-COZ aircraft, crashed near Gauhati Airport, India, on 21 January 1955. Report dated 23 March 1955 released by Ministry of Communications, Government of India.

Circumstances

The aircraft took off from Calcutta (Dum Dum) on a scheduled freighter service flight at 0546 hours Indian Standard Time and set course for Gauhati, carrying a crew of three. At 0722 hours, the aircraft contacted Air Traffic Control, Gauhati, on radio telephony and reported flying under visual flight rules, 25 miles away from Gauhati Airport at an altitude of 6 000 feet. The Air Traffic Control Officer on duty passed the altimeter setting to the aircraft, cleared it to descend under VFR and instructed it to call when ten miles from the airport. The aircraft asked for a bearing on frequency 119.7 (Homer) at 0725 hours and a bearing of 045° class "A" was given. This was confirmed as correct by the aircraft, which also reported being 15 miles from the airport at a height of 3 000 feet at that time. The next contact with Gauhati Tower was at 0727 hours when it reported being at a distance of 10 miles from the airport. Landing instructions were passed to the aircraft and it was asked to call again on joining circuit. There was no further communication with the aircraft. At approximately 0729 the duty officer at the tower noticed black smoke at the top of a patch of fog to the south of the airport. Repeated calls were made to the aircraft on 118.1 Mc/s and 6 440 Kc/s but no response was received. At about the same time persons in Tarapati village saw the aircraft hit some arecanut trees, crash in a field and burst into flames. The captain and co-pilot died instantly and the radio officer died en route to the hospital. The aircraft was destroyed.

Investigation and Evidence

The crash area was covered by fog at the time of the accident. The exact height of the fog could not be accurately established but was estimated to be about 250 to 300 feet above ground level.

The 0700 weather observation was as follows:

Total amount of cloud	4	Octa
Visibility	0.9 nautical miles	
Present weather	Fog, become thinner	
Past weather	Fog	
Significant cloud	First layer	Second layer
Amount of cloud	1 Octa.	3 Octa.
Type of cloud	St.	Ac.
Height of base	500'	10,000'
QFE	29.89"	
Altimeter setting QNH	30.06"	

A special weather observation was made at 0715 hours at the request of the aerodrome control. Visibility had improved to 1.5 nautical miles.

The aircraft crashed at a distance of 2.9 miles on a bearing of 210° from the 03 end of runway 03/21 at Gauhati airport at an elevation of 162 feet a.m.s.l.

The engine control pedestal was extensively damaged and no reliance could be placed on the position of the levers, which were as follows:-

	Left hand	Right hand
Mixture controls	Auto-lean	Emergency
Throttles	Retarded	Retarded
Propeller Pitch controls	Fully coarse	Fully coarse

The position of the fuel selector and the cross-feed could not be determined, but the positions of the trimmer controls were as follows:-

Elevator trim	1° nose down
Rudder trim	Zero
Aileron	1° right up

The actual settings of the tabs on the elevator and rudder were 1/2" up and full to the left respectively. The aileron trim tab was neutral. The control cables were checked. They showed evidence of tensile failure only as a result of disintegration of the aircraft.

Pilot's altimeter was set at 29.86". The sub-scale of the second altimeter was missing.

The undercarriage of the aircraft was down and locked.

There was no evidence of any mechanical failure of the engines. Both the engines were clear of any sign of fire, external or internal. There was evidence of adequate lubrication. Fuel was recovered from the nacelle filters and injectors. Both the propellers were in the constant speed range and in the same fine pitch.

The air traffic control and communication briefing for the flight was of a routine nature. However, some special significance attaches to the meteorological briefing. The meteorological forecast covering the route along with the terminal forecast for the period 0630 hours to 1030 hours for Gauhati Airport was handed over to the captain, the Commander of the aircraft. The terminal forecast indicated surface visibility of 660 yards in fog, intermittently 110 yards in thick fog, up to 0830 hours and thereafter improving to five nautical miles. It may be pointed out that the weather minima laid down for Gauhati Airport by the Indian Airlines Corporation and approved by the Director General of Civil Aviation require a visibility of 1.5 nautical miles for landing by day. The alternate aerodrome specified in the clearance form was Agartala. Nevertheless, the forecast did not contain the terminal forecast for the alternate. The captain did not ask for this information, nor did the meteorologist volunteer this information during the briefing.

Notice to Airmen No. 29 of 1952 which lays down Meteorological Minima for Aerodromes, requires that "a flight shall not be continued towards the aerodrome of intended landing unless the latest available meteorological information indicates that conditions at that aerodrome, or at least one alternate aerodrome, will, at the expected time of arrival, be at or above the minimum criteria specified for such aerodromes ..." In this case, although the terminal forecast for Gauhati indicated that the conditions of visibility would be lower than the minima for landing by day, and no terminal forecast was available to the pilot for any alternate for the expected time of arrival, the flight took off and continued to Gauhati, contrary to the provisions laid down in the above Notice to Airmen.

It is relevant to add that the weather observation made at 0500 hours at Gauhati indicated a visibility of 550 yards in thickening fog. As a result of this, an M.5 (Danger Met.) for visibility was issued by Gauhati. This message did not reach Air Traffic Control, Calcutta, until 0700 hours and, therefore, was not passed on to the aircraft.

It would seem, therefore, that the aircraft should not have taken off for Gauhati in view of the terminal weather forecast for that airport and that the flight should not have been continued.

The aircraft had its first impact with arecanut trees, 43 feet above the ground. The nature of the cuts on these trees indicated that the aircraft was in a laterally level attitude. The aircraft had its second impact, 100 feet ahead, with a bunch of trees, 40 feet above the ground. This goes to show that within the distance of 100 feet (the distance between the points of the two impacts) the aircraft lost three feet in height. The port wing tip was torn off at the first impact. The second impact caused pieces of landing light glass, cockpit glass, engine nacelle parts, a section of the port elevator with fabric and part of the port aileron to be thrown off from the aircraft. Yet the aircraft continued in the air until it hit the ground at a distance of 830 feet from the point of initial impact. At the time of the crash with the ground, the aircraft was substantially level laterally, though in a nose-down attitude. Heavy disruption of the aircraft took place at this point.

None of the components picked up between the points of the first and second impacts suffered any damage from fire or smoke. Similarly, all the components picked up in the vicinity of the point where the aircraft hit the ground were completely free from any evidence of fire or smoke. In fact, it was not until another 230 feet away from this point that the first burnt component (part of port aileron) was found. This component was laying within 12 yards of the burnt and burst port main fuel tank. Several components, such as the main cargo door, sections of the port elevator and floor board, which had been separated from the aircraft on its disruption, were also clear of any fire or smoke.

Larger pieces of wreckage (the starboard wing centre section and rear fuselage) had suffered damage by fire, but it had affected the top surfaces only. The fabric of the rudder and the elevators, which were still attached to the respective stabilizers, was burnt, but not the sections of the port elevator which had been torn off earlier. There was no evidence of fire on the lower surfaces of the starboard wing or

the horizontal stabilizers. There was no smoke trail on either side of the fuselage. There was no soot or fire trail running from the sides of the fuselage to the attachment of the stabilizers. The maximum intensity of the fire had been in the area of the cabin opposite the freight doors. The doors together with the frames had, however, been thrown off earlier and were perfectly clean. Pieces of floor board from this area had also been thrown out. A piece of floor board in the immediate area of the burnt fuselage was charred, and yet the two adjoining pieces of floor boards which were thrown clear of fire were untouched by fire or smoke. The aircraft step-ladder, which is normally placed in this region, but was thrown out on impact, was also clear.

From the foregoing data, it is evident that there was no fire in the aircraft either at the point of its first impact with the arecanut trees or even when the aircraft hit the ground at a distance of 830 feet from this point. The fire obviously started approximately 230 feet from the point where the aircraft hit the ground (approximately 1 060 feet from the point of first impact), as a result of the bursting of the port main fuel tank.

The theory that a fire took place in the aircraft during flight was advanced by some witnesses. This theory was given careful consideration but found to be untenable. The examination of the wreckage definitely revealed that fire broke out in the aircraft after it crashed against the ground. The theory of fire during flight was chiefly built up on a rumour that the aircraft had, just before it crashed, sent an S.O.S. signal. It was established that no S.O.S. signal was sent by the aircraft. The mistake arose because a signal sent by Air Traffic Control, Gauhati, to Air Traffic Control, Calcutta, was misunderstood by the Operations staff of Indian Airlines Corporation to whom it was read out on the telephone. The signal read as follows:-

> "QBM VTGT = LAST QSO VT-COZ 0157 Z (.) SMOKE SEEN THEREAFTER (.) OFFICERS GONE OUT TO ASSESS NEWS (.)"

The word "assess" was misheard for S.O.S.

The CO_2 fire extinguisher bottle as well as two fire extinguishers were recovered from the scene of the wreckage. The head of the CO_2 bottle had broken off and it was empty. The head of one of the extinguishers was also broken and it was partially empty. The second bottle had its handle loose and was empty.

Examination of the wreckage revealed that at the time of the crash the undercarriage of the aircraft was down and locked and both engines were operating. The aircraft was in a laterally level attitude and lined up with the runway. These factors go to show that the aircraft was attempting a controlled descent on the runway at Gauhati Airport and did not come down on account of any distress or emergency. The last communication between the aircraft and the Air Traffic Control, Gauhati, had been exchanged just two minutes prior to the accident. At the time of the crash, considerable fog hung over the area southwest of the airport - the direction from which the aircraft was approaching. The airport itself and an area of about two miles to the southwest were, however, clear. The fog was beginning to form into stratus cloud and the tops were estimated to be approximately 300 feet above ground level. As the sky above the cloud was clear, the pilot must have seen the airport from some distance when still at a height, and apparently he decided to make a straight-in-approach to land, a practice frequently followed by pilots arriving at Gauhati Airport from Calcutta. This is clear from the fact that the aircraft was accurately lined up with the runway with wheels down. There is no doubt that the pilot was making a controlled descent and entered the fog expecting to get out into the clear on the other side which he had earlier seen and known to be clear. Indeed he would have been able to do so, had the aircraft maintained sufficient height.

It was not possible to ascertain the reason why the aircraft was so much lower than it should have been, but it is almost certain that the pilot himself was not aware that he was so low over the ground. The two possible explanations are that either the pilot did not observe the altimeter or the altimeter itself may not have been set correctly and did not indicate correct height. It may be added that the aircraft radio log book was missing even though all other documents were recovered from the wreckage. There was no fire in the area occupied by the radio officer, although considerable disintegration had taken place. This log book would have disclosed what entries had been made therein regarding the altimeter setting.

Probable Cause

The aircraft crashed in the course of a premature descent, during the final approach, as a result of hitting arecanut trees which were obscurred from view by fog in the area.

Recommendation

There are reasons to believe that the premature descent of the aircraft was due to the pilot's being unaware of his correct altitude when entering the fog. Such a situation could easily arise from either an incorrect setting of the altimeter or the pilot's failure to observe it at the time. It is, therefore, recommended that pilots should be warned against the recurrence of such a happening, and should, in order to avoid errors, be required to repeat the altimeter setting to the Air Traffic Control.

Observations

Some other points which call for observations have come out in the course of the evidence and though they do not directly pertain to the cause of this accident are well worth mentioning.

i) Operational control was not exercised for this flight and the operator had not designated a representative for this purpose as required by Notice to Airmen No. 29 of 1952.

ii) The meteorological briefing of the pilot was not complete in as much as the terminal weather forecast for the alternate aerodrome was not obtained by him.

iii) The manuals used by the crew of this aircraft were not complete or up-to-date.

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