

## No. 33

Aerovías del Pacífico "ARPA", DC-3-G, HK-385, crashed and burned on the side of a mountain known as El Rucio in the Cordillera Occidental, on 17 November 1956. Report released by Department of Civil Aviation, Ministry of War, Republic of Colombia.

Circumstances

The aircraft took off from Buenaventura at 1630 hours local time on a return flight to el Guavito aerodrome, Cali. Expected time of arrival at Cali was 1700 hours. On board the aircraft were the pilot, a steward (who held no licence to act as such), a flight engineer (who on this occasion was acting as co-pilot), and 33 passengers. When 1700 hours passed with no sign of the aircraft's arriving at Cali, a search was initiated. The aircraft was located the same evening on the side of "El Rucio". All passengers and crew members were killed.

Investigation and Evidence

From documents and testimony obtained it was ascertained that the aircraft flew without the co-pilot for the following reasons:

The co-pilot assigned for 17 November served on the flights from Cali to Buenaventura and Buenaventura to Cali. On return to the base the pilot asked his co-pilot for the latter's medical certificate. When the co-pilot explained that the certificate had been left at the office of the Civil Aviation Department for revalidation, the pilot (according to a statement signed by the co-pilot) instructed the latter to cease flying. On this occasion, the flight engineer acted as co-pilot.

When the co-pilot was interrogated and asked why he did not inform the management of ARPA regarding the captain's decision not to let him fly as co-pilot, he declared - "I was so disgusted, I went home and forgot to inform the airline management."

According to statements of several pilots who flew in the area a few minutes before and after the accident, the weather conditions were as follows:

ceiling over Buenaventura was unlimited and the wind was variable but not strong;

ceiling over Cali was also unlimited and there was practically no wind.

The Cordillera Occidental in the area of the valley or canyon between Cisneros and Dagua was covered by scattered stratocumulus which sometimes covered mountain peaks between 6 000 and 7 500 feet. The route generally flown by the aircraft was along the Dagua canyon to the town of that name. The top of the ridge called El Rucio, which was covered by some scattered stratus cloud, lies a short distance from a point where the 105° track flown by aircraft leaving Buenaventura changes direction. The flight was carried out in not very severe IFR conditions and at an altitude which appeared to be the same as that flown in visual conditions.

The following aids were available along the route:

radio beacon and radio service on 5589.5 kc/s at Cali;

radio beacon at Condoto.

These aids could have been useful if the flight had been conducted at the prescribed altitude for instrument flights.

Two inhabitants of the area made a written declaration which may be summarized as follows:

"At 4.45 p.m. we heard the noise of an aircraft. The mountain on the right of the Dagua valley (on the Buenaventura-Cali route) was covered with cloud. Shortly after hearing the noise of the aircraft, we heard the sound of a crash and we later were able to identify the place where the accident occurred by the fire which broke out."

The aircraft had crashed into the mountain side at an elevation of approximately 6 200 feet. Fire had destroyed the central part of the

aircraft but the two wings were perfectly distinguishable, as well as the tail surfaces. The fuselage was burned up to the level of the rear cargo door.

The port propeller was found near the port engine and set at approximately cruising pitch. The starboard propeller and reduction gear were hanging from the nose cowling and one of the blades was missing. Another blade was in perfect condition while the third blade had several dents. The propeller hub had been struck, causing oil to escape from the forward portion. The blow was sufficiently strong to displace the gears controlling the blade pitch and these could easily be turned by hand. It should be noted that one of the blades was found with its rear surface facing forwards, which could only be explained by the movement of the propeller after the crash. Through the hole in the hub it was possible to see the pitch control piston which was in the cruising position. As a result of the impact, the piston was displaced to the maximum cruising position but did not actually raise the feathering cam. The position in which the throttle lever was found indicated that the engines were operating at cruise power. As a result of the impact and the fire, the instruments had lost their covers and pointers and it was impossible to determine their readings prior to the accident. The fact that the pilot had not reported an emergency situation confirms the conclusion that the aircraft was operating normally at the time of the accident. The angle at which the trees were broken and the position in which the aircraft was found indicate that the latter was flying horizontally when it crashed. The flaps were in the raised position and, although the tab position indicators were not found, the position of the tabs on the tail appeared normal and there was no indication that they had been used to counteract an abnormal condition. To sum up, therefore, there is every indication that the aircraft crashed at cruising speed and that the pilot was not aware that an accident was imminent. When efforts were made to obtain copies of the passenger manifest and load and trim sheet, the investigators were informed that the company's agent at Buenaventura had given the pilot all the copies. He later certified under oath, before a competent judge, the accuracy of a copy of the original load and trim sheet and included the names of five passengers who arrived at the last minute and were accepted by the pilot.

Apart from the cause of the accident, there are two points which require initial consideration. First, the aircraft was flown without a co-pilot. According to the investigation, it was known that the individual who was scheduled to fly on 17 November as co-pilot actually did so on the first flight Cali-Buenaventura-Cali. The captain of the aircraft, contrary to the provisions of the Colombian Civil Aviation Regulations, decided to fly the aircraft alone. If there was no co-pilot available, for any reason, the pilot should have postponed the flight and informed the company. Second, the aircraft was carrying a number of passengers in excess of the number permitted under the Civil Aviation Regulations. This point must be considered solely in the light of Sections 40.9.6 and 41.5.12 of these Regulations which specify that: "In accordance with the provisions of Article 31 of Law 89 of 1938, the commander of an aircraft is in charge of that aircraft and is responsible for maintaining order and discipline on board. He must comply and secure compliance with all laws, regulations and other official orders and is entrusted with the same powers as are given to captains of maritime vessels", and in the light of the section entitled "Authority of Pilot-in-command", which reads: "The pilot-in-command of an aircraft shall be directly responsible for its operation and shall have absolute authority in all matters connected therewith while he is in command". Consequently, the individual responsible for all matters connected with the operation of an aircraft is the captain thereof. In other words, the captain, in the present instance, assumed responsibility for flying without a co-pilot and with an excessive passenger load, knowing that he was thereby rendering himself liable to sanctions under the Civil Aviation Regulations.

From the investigation and the statements obtained, there is nothing to indicate that the Company had authorized operation of the aircraft in the manner mentioned. From the copy of the load and trim sheet which was submitted it is assumed that the aircraft was loaded within the specified limits. The runway at Buenaventura which measures 1 000 metres between threshold markings but which actually has a shorter usable length, does not permit operation of DC-3 aircraft when they are overloaded. Obviously, therefore, weight was not a factor in the accident.

The testimony of the inhabitants of the area and the statements signed by the owners of the farm near the spot where the accident occurred indicate that the ridge into which the aircraft crashed was covered with dense mist. The low altitude at which the aircraft was flying, in conditions reported to have been intermittent IFR conditions, was the most probable cause of the accident.

The route normally followed by aircraft flying from Buenaventura to Cali runs along the Rio Dagua canyon. The flight time between Buenaventura and Cali is normally 30 minutes. The aircraft crashed approximately halfway along this route and the passengers' watches indicated that the impact occurred after 15 to 20 minutes of flight. On a time basis, the pilot must have known that he was at the highest point on his route. As regards flight

altitudes, the Colombian Civil Aviation Regulations provide in Sections 41.6.2 and 41.7.3 that for visual flight an altitude 1 000 feet above mountainous terrain must be maintained and that for instrument flight this margin must not be less than 2 000 feet. It is further specified that these altitudes must take into account obstacles within 5 miles on either side of the route of the aircraft.

#### Probable Cause

The most probable cause of the accident was - flight on instruments at an excessively low altitude for the route.

#### Contributory Cause

Lack of discipline on the part of the pilot.

-----