

No. 30

Pakistan International Airlines Corporation, Convair 240-7, AP-AEH, accident near the western boundary of Delhi Airport (Palam), India, on 15 May 1958. Report released by the Civil Aviation Department, Government of India, on 8 August 1958.

Circumstances

The aircraft, which was operating PIA Flight No. PK 205 (scheduled) from Delhi to Karachi, with 6 crew and 32 passengers, crashed soon after getting airborne from Palam aerodrome. Fatal injuries were sustained by 4 members of the crew, 17 passengers and 2 others who were in the vicinity of the crash. Nine passengers and one other were seriously injured. The aircraft was destroyed by impact and fire.

Investigation and EvidenceThe Flight

The aircraft had landed at Palam at 1902 hours following an uneventful flight from Karachi. A thorough service check was carried out, and it was refuelled and loaded for the return flight to Karachi.

The total take-off weight indicated on the load sheet was 41 589 lbs. The investigation revealed an error in the empty weight of the aircraft and the actual gross take-off weight was determined to be 41 319 lbs, which is 1 181 lbs less than the maximum permissible all-up weight.

At 2018 hours the aircraft commenced its take-off run and was airborne at the latter half of the runway. Soon afterwards flames were observed at the western boundary of the airfield. The crash crew chief had watched the aircraft take-off. He saw the aircraft becoming airborne and then climbing to a height estimated by him to be 50 ft. He then noticed the landing lights pointing downwards and the aircraft losing height. He feared that a crash was imminent and immediately instructed the

crew to proceed in that direction. At about this time the crash siren was sounded. The crash tender reached the site of the accident in about 7 to 8 minutes by which time the fire had reached large proportions.

Evidence of witnesses at the aerodrome

The following statement was made by a senior station officer of an international airline who witnessed the take-off:

"The aircraft take-off on runway 27 appeared perfectly normal taking into consideration the knowledge that it was well loaded. At roughly 2/3 to 3/4 of the length of the runway the aircraft became airborne and by means of its tail light I was able to follow its flight path and again taking into consideration the fact that the aircraft was well loaded, the initial climb seemed perfectly normal. At what appeared to be a height of roughly 200 ft the aircraft appeared to level out. For a few moments I thought it was an optical illusion but a couple of seconds later it was quite obvious the aircraft was descending. There was a momentary blackout caused by some trees obstructing my view as the aircraft disappeared behind them. But within two seconds a huge ball of fire appeared followed by a muffled "Woof". I had the impression that the flight path of the aircraft from the point of take-off to the point of impact described was rather a flat parabolic arc. From the time I picked up the tail light of the aircraft as it moved down the runway on its take-off run until the moment or two when I lost sight of that before impact I saw nothing whatsoever to suggest that the aircraft was on fire neither did I hear any other sound which would suggest that the aircraft was not executing a normal take-off."

Statements of Survivors

"...Almost at the last moment, however, we became airborne, I remember seeing the black and white stripes marking the end of the runway below a second or two after we had lifted. Then the headlamps were switched off."

"The aircraft climbed sharply for a few seconds then abruptly levelled out (far sooner than I expected) and began to point, as it seemed to me, slightly downwards. I remember, in my astonishment commenting on this to my neighbour. I concluded at once that the pilot had decided to make a forced landing and looked out of the window expecting to see the headlamps switched on again immediately. The aircraft, however, continued to fly through the darkness in apparently normal fashion, except for a slight slant to the port side and I had just begun to tell myself that my fears must be groundless, when the impact occurred."

"I wish to state categorically that at no time did any sparks emerge from the port engine, nor was there any explosion or fire while in the air."

The statements of most of the passengers who appeared to have a clear recollection of the events preceding the crash were substantially the same excepting that they had not experienced any change in attitude of the aircraft after getting airborne.

Technical examination of the wreckage

The wreckage trail commenced 720 ft from the end of the runway and 325 ft to the left of the extended centreline of the runway. The trail when extended backwards intersected the centreline of the runway at an angle of 11°.

The aircraft struck the ground at a shallow nose-down angle with the port wing slightly low.

Both the propellers were in fine pitch and were rotating at an equally high speed considered to be equivalent to the take-off rpm at the time of the first impact with the ground.

The engines were developing substantial power at the time of the crash, and the flaps were 5° down. The nose and port landing gears having completed retraction were locked in the "up" positions. The starboard landing gear was not locked - being still in the process of retraction.

All gyro-driven instruments were uncaged.

Landing lights were in the retracted position.

There was no evidence of any pre-crash explosion or fire, or malfunctioning of the aircraft prior to the crash.

The aircraft had flown a total of 12 668 hours since manufacture and 452 hours since the last major overhaul.

The Pilot

At the time of the accident the captain had flown 4 775 hours. His total flying experience on Convair aircraft was 324 hours as first officer and 65 hours as captain of which 53 hours were by day and 13 hours by night. Since obtaining his command, he had operated six night flights prior to the flight resulting in the accident. This was his first night flight involving a take-off from Palam in command of Convair aircraft.

The captain was properly qualified and licensed to undertake the duties expected of him as a commander on Convair aircraft. He, however, had not acquired much experience as a captain on this type of aircraft. He had obtained his command on 2 April 1958. He had, however, adequate instrument and night flying experience as a commander on DC-3 aircraft.

Medical Fitness of the Pilot

The stewardess stated that when she saw the captain sitting by himself in the Palam restaurant before the commencement of the flight he did not appear to be looking too well. The steward who later on joined the captain stated that the captain had told him that he was not feeling too well. On the captain's request he felt his pulse and considered it to be normal. The senior traffic assistant of PIAC stated, however, that he "looked hale and hearty".

The captain's widow stated that on 14 May, he was scheduled to go on a flight, but returned at about 1800 hours as the flight was cancelled due to bad weather. He did not have his dinner and complained that he was not feeling well. He was running a temperature and was restless throughout the night. The following morning he also complained of not feeling well and did not have any breakfast. He left for the airport after taking only "lassi".* Before leaving he said that as he was not feeling well, he would have "khichri" ** only for his meal at night. The widow stated that her husband's relations with the first officer were strained. The captain, on reporting at the Karachi Airport, told the flight dispatcher of PIAC that "he was feeling feverish or perhaps unwell". He was advised to consult the Corporation's doctor. The doctor took his temperature and on finding it to be 98° F advised him that it was normal. The doctor also found his pulse, throat, heart and lungs to be normal. The captain is then reported to have said that as he had no fever he would fly.

The captain's airline transport pilot licence was due to expire on 20 May 1958. He had been told by PIAC to present himself for medical examination on 15 May 1958. However, he did not report for the examination as he was detailed for this flight.

The Committee did not consider themselves competent to comment on the medical fitness of the captain for the purpose of this flight. There is no doubt, however, that he was quite worried about his state of health before leaving Karachi and while he was at Palam. From the aspect of flying fatigue, however, the Committee was satisfied that he had had adequate rest not having flown on the day preceding the accident. He had flown a total of 18 hrs 35 minutes during the preceding seven days and 112 hrs 25 minutes during the preceding 30 consecutive days.

Criticism of Fire Fighting and Rescue Action

The fire fighting and rescue action was the subject of criticism of some survivors. Briefly, the comments were made in respect of the inadequacy of the equipment, the way it was handled and the absence of lighting during fire fighting and rescue operations.

There are normally two crash tenders available at Palam, a "Pyrene" and a "Sun" crash tender. Of these, the "Pyrene" crash tender was unserviceable that day and the "Sun" crash tender was manned by four individuals as against the normal complement of five. On noting that a crash was imminent, the crash crew chief immediately instructed the driver of the "Sun" crash tender to proceed to the site. Considering the difficulties of the terrain, the crash tender reached the site quite expeditiously. A runway controller also soon reached the site to assist in the firefighting. Although the fire had reached rather large proportions by that time, there is some evidence that the rear section of the passengers' cabin was still comparatively free of flames. The crash tender commenced fire fighting action immediately, but in the earlier stages a branch line burst. The foam supply to the branch lines was shut off and the foam was thereafter delivered from the monitor. This, however, caused some delay during which the fire continued to

* a sweet drink, the principal ingredient of which is buttermilk.

** fried rice with split peas.

spread. The foam stream from the monitor was not fully effective as the crash tender was located at some distance away from the wreckage. The tender was, therefore, moved forward and fire fighting action resumed. The statement of a passenger that the handling of the crash tender was defective and caused delay has not been substantiated by other evidence. The equipment was at this stage handled by the driver and the chief of the crash crew as only the monitor was in action. The remaining two crew members were in the meantime helping in the rescue work. The total quantity of water was exhausted without the fire being brought under control. The 35 gallons of foam compound that still remained in the tender could not, therefore, be utilized as replenishment of the water was not possible in the absence of a separate trailer, static tanks or hydrants.

The Committee appreciated the difficulties of aviation authorities in dealing with the complex problems of fire fighting. They, nevertheless, recommended that the fire fighting equipment and crew at Palam, an international airport, should be augmented.

The Committee also recommended that fire fighting equipment located at Palam should include adequate provision for lighting a crash area.

Comments on the Evidence

There have been a number of accidents where aircraft were airborne normally at night but soon afterwards lost height and flew into the sea or the ground. A common factor in these accidents was that the night take-offs were all under fully instrument conditions, there being no moonlight or carpet of ground lights. Such accidents have been the subject of study by the Royal Aircraft Establishment, Royal Australian Air Force and Flight Safety Foundation (USA).

In accidents under these circumstances, there is a possibility of the pilot experiencing a sensation that the aircraft is climbing when it is in fact losing height, if there is no visible horizon to provide a visual reference to the attitude of the aircraft. This is due to the fact that for a short time after take-off the aircraft continues to accelerate and the pilot experiences a backward inertia which gives him the impression that the aircraft is climbing. Once the aircraft starts to lose height it keeps on accelerating so perpetuating the illusion that it is still climbing. The Royal Air Force carried out flight tests with blindfolded pilots acting as observers. These tests established that as the aircraft continued to accelerate after take-offs, a turn and a dive could develop without any change in attitude being felt by the observer who thought that the aircraft was climbing normally.

In this particular case the take-off was on a moonless night from runway 27 at Palam. The direction of take-off was away from a built-up area, the visibility being 1-1/2 nautical miles due to dust haze. After becoming airborne there was nothing which could have given the pilot a natural horizon. In case the pilot was not fully on instruments, the sensation caused by the acceleration could have led him to lower the nose thus permitting the aircraft to enter into a shallow dive.

Probable Cause

The captain did not properly observe and interpret his flight instruments and thus inadvertently permitted the aircraft to descend to the ground immediately after a night take-off during which no visual reference was possible. A contributory factor may have been the slow reactions of the captain due to his state of health.

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