No. 18

Pakistan International Airlines, Boeing 720B, AP-AMH, accident near Cairo Airport, United Arab Republic, on 20 May 1965. Report undated, released by the Director General of Civil Aviation, United Arab Republic

1. - Investigation

1.1 History of the flight

Flight 705 was a scheduled international public transport flight from Karachi to Dhahran, Cairo, Geneva and London. No defects were reported by the crew at Dhahran. The flight departed Dhahran at 2122 hours GMT. It reported abeam Aqaba, 196 NM from the Cairo omni at 2313 hours, leaving FL 360 at 2322 hours, RD fix at 2330 hours and approaching FL 130 and one minute away from the field at 2338 hours. The flight was then cleared down to FL 65 and was given a QNH of 1 014 mb. It reported coming overhead at 2339 hours, passing FL 100 and was instructed to maintain FL 65. It then made a holding turn in the Cairo range pattern, descending to FL 65. On reporting overhead Cairo range station, after completing one holding at 2340 hours the flight was cleared to join left-hand circuit for runway 34 and to report downwind. The crew then informed the tower that they would carry out an instrument let-down and would call when commencing the procedure turn. The flight was then cleared to descend to FL 45 and was told to report procedure turn inbound descending to 2 500 ft. At 2345 hours the crew informed the tower that they were in a position for reporting downwind for runway 34 and, on being asked by the control tower about their intention, they requested a clearance to proceed downwind. During this period the aircraft continued on a southerly heading towards a downwind position for a left-hand circuit for runway 34. Cairo approach control then cleared the flight to descend to circuit height for final approach to runway 34 and to change over to tower frequency 118.1 Mc/s for landing. At 2345 hours the crew reported that they would be turning on final and changing to tower frequency. The flight was then cleared to continue approach and to report on short final. It was given weather information for landing and was asked whether it was turning on to final. At 2348:30 hours the crew acknowledged: "affirmative" and finally, at 2348:55 hours, a scratching noise was heard on the control tower receiver and nothing further was heard from the aircraft.

1.2 Injuries to persons

Injuries	Crew	Passengers	Others
Fatal	13	108	
Non-fatal		6	
None			

1.3 Damage to aircraft

The aircraft was destroyed.

1.4 Other damage

There was no other damage.

1.5 Crew information

The pilot-in-command, aged 37, held an airline transport pilot's licence valid until 27 June 1965. He had flown a total of 13 142 hours including 10 395 hours as pilot-in-command, of which 2 214 hours were on Boeing aircraft. His total flying hours during the last 90 days before the accident was 162 hours, all of which were flown on the Boeing 720B aircraft. He had not carried out any trips to Cairo Airport during the last 30 days before the accident.

The co-pilot, aged 35, held an airline transport pilot's licence valid until 24 July 1965. He had flown a total of 6 754 hours including 3 948 hours as pilot-in-command on various aircraft and 2 806 hours as co-pilot, of which 148 hours were on Boeing 720B aircraft. During the last 90 days before the accident, he had flown 107 hours as co-pilot on the Boeing 720B and 143 hours as pilot-in-command on Viscount. During the last 30 days before the accident, he had carried out a single trip to Cairo, a route check six days before the accident.

The flight engineer, aged 29, held a flight engineer's licence valid until 8 August 1965. He had flown a total of 6 272 hours including 1 802 hours on the Boeing 720B, of which 112 hours were flown during the last 90 days before the accident.

The navigator, aged 30, held a flight navigator's licence valid until 16 August 1965. He had flown a total of 4 528 hours including 1 746 hours on the Boeing 720B, of which 149 hours were flown during the last 90 days before the accident.

1.6 Aircraft information

The aircraft had a certificate of airworthiness valid until 4 November 1965, and a certificate of maintenance dated 14 May 1965 valid for 140 hours.

The estimated weight of the aircraft at the time of landing at Cairo Airport was within the permissible limits.

The type of fuel being used was not stated in the report.

1.7 Meteorological information

The weather at Cairo Airport as reported in the sequence report at 2330 hours GMT was as follows:

Surface wind	:	020°/4 kt
Visibility	:	10 km
Clouds	:	none
Temperature	:	18°C
QNH	:	1 014 mb
QFE	:	1 000 mb
Humidity	:	76%

The pilot-in-command of another flight which landed at Cairo Airport at 2336 hours, 12 minutes before the accident, stated that the weather conditions at the time were generally good. It was a clear night.

1.8 Aids to navigation

All navigational aids at Cairo Airport (VOR, radio range, NDB, locator for runway 34 and all communications equipment) were serviceable and working properly.

1.9 Communications

The aircraft was in contact with the tower up until the time of the accident. No difficulties were reported.

1.10 Aerodrome and ground facilities

All navigational lights were working properly.

1.11 Flight recorders

Two flight data recorders were recovered from the wreckage. One recorder showed that the aircraft's speed as well as its rate of descent increased just before its impact with the ground.

1.12 Wreckage

The wreckage was spread over an area of 1 250 m on a heading of 50° M. The main part of the wreckage rested in an upside-down attitude at a distance of 3 680 m from the locator (CM), which is 6 780 m distant from the threshold of runway 34. The site of the accident was hilly undulating ground, the highest point of which was 740 ft above sea level.

1.13 Fire

Fire broke out following impact due to the rupture of the fuel tanks.

1.14 Survival aspects

No information was contained in the report.

1.15 Tests and research

(See paragraph 2.1)

2. - Analysis and Conclusions

2.1 Analysis

Evidence revealed that the aircraft struck the ground in a slight left-bank attitude, with its undercarriage up and locked and a flap setting of 20°. One of the altimeters which was recovered almost intact was at a setting of 1 014 mb corresponding to the QNH given by the tower controller, and the other was indicating approximately 1 013 mb.

From 3 000 ft the aircraft descended at a normal rate of descent between 800 and 1 000 ft/min. Upon reaching 1 800 ft AMSL, the previously maintained normal rate of descent increased to an average of 1 600 ft/min. According to the reconstruction of the flight path, the aircraft was then turning left on to base leg for runway 34 and proceeding towards CM beacon.

The official instrument approach procedure for CM beacon let-down was to maintain a minimum safety height of 1 500 ft until overhead CM and proceeding inbound towards runway 34. Normal standard operational practice required to maintain this minimum safety altitude in the circuit even when making a visual approach.

At approximately 1 500 ft AMSL, the rate of descent of the aircraft increased further to an average of 2 400 ft/min and its speed by 12 kt before it struck the ground. There were prominent oscillations in the height and speed parameters tracings from 1 500 ft downwards, which might indicate an attempt to conteract a nose down condition and to prevent a descent below the required safe altitude; however, this was not positively established. Pilots' stick forces were not clearly evident since the acceleration parameter traces showed that the characteristics of the "g" traces were of the same type which tended to indicate the presence of friction in the mechanical system.

A flight was carried out along the reconstructed flight path of the aircraft. It clearly revealed that during a left-hand circuit the bright lights surrounding Cairo Airport gave to the pilot adequate reference to the attitude of the aircraft, even at very low altitude, on a clear night. Therefore, any abnormal nose down attitude should have been detected and immediate corrective action taken.

2.2 Conclusions

Findings

The crew were properly certificated and well experienced.

The pilot-in-command did not carry out any flights to Cairo during the last 30 days before the accident.

The co-pilot did the inaugural flight five days before the day of the accident. He was a skilled pilot-in-command and should have been able to fly the aircraft safely in case of emergency.

The aircraft had a valid certificate of airworthiness and proper certificate of maintenance release.

The information and technical instructions which were interchanged between the approach control, the tower and the pilot as well as the operation of the NAVAIDS and visual aids were sound and satisfactory.

Nose down attitude could not possibly go undetected in the presence of visual reference available with the help of bright illumination surrounding Cairo Airport or with reference to flight instruments.

Up to 1 500 ft the pilot was following normal approach procedures for landing on runway 34, and nothing unusual was reported. Thereafter, the aircraft inexplicably descended at an abnormally high rate with the engines nearly idle, the landing gear retracted and the flaps at 20° until it struck the ground.

The reason for this increased rate of descent below minimum safe altitude could not be established.

Cause or
Probable cause(s)

The aircraft did not maintain the adequate height for the circuit and continued to descend until it contacted the ground. The reason for that abnormal continuation of descent is unknown.

3. - Recommendations

None were contained in the report.

ICAO Ref.: AR/019/65