No. 23

Ceskoslovenské Aerolinie, Ilyushin 18, OK-PAF, accident south of Anfa Airport, Morocco, on 12 July 1961. Report released by The Directorate of Aviation, Morocco.

Circumstances

The aircraft was on a scheduled flight from Zurich, Switzerland to Rabat, Morocco carrying 8 crew and 64 passengers. At 0101 hours GMT the pilot signalled that he was going to Casablanca - Anfa because of unfavourable weather over Rabat - Sale.

After a balked landing following his first approach at Casablanca - Anfa and climb back to the safe altitude of 1 300 ft, the pilot requested permission from Anfa Airport to land at Nouasseur. During the time Anfa control was transmitting this request to the American authorities in Nouasseur, the aircraft crashed at 0125 hours GMT, in line with runway 03 about 8 miles from its threshold. Ground elevation at the point of impact was 450 ft. All occupants of the aircraft were killed, and it was completely destroyed by the crash and the ensuing fire.

Investigation and Evidence

The Aircraft

The aircraft, built in the U.S.S.R., held a certificate of airworthiness, valid until 22 April 1962. It had flown about 268 hours since manufacture.

Airframe checks had been made within the prescribed periods.

The aircraft was equipped with a complete set of instruments, allowing day and night, bad visibility and poor weather IFR flights.

The maximum allowable take-off weight of the Ilyushin 18 is 61 000 kg (135 000 lb). At the time of take-off from Zurich OK-PAF weighed 59 723 kg (132 000 lb). Its centre of gravity was within the permissible limits. From the foregoing it was concluded that the aircraft's gross weight and centre of gravity at the time of the accident were within the allowable limits.

When leaving Zurich the aircraft was carrying 15 500 kg (34 200 lb) of fuel. Consumption during the flight was about 9 000 kg (20 000 lb) dependent on altitude, speed and weather conditions, which would leave 6 000 to 6 500 kg (13 200 to 14 300 lb) at the time of the landing at Casablanca.

Crew information

The flight carried a pilot-in-command, a co-pilot, a navigator, a radio operator, a flight engineer, two stewardesses and a steward.

The pilot-in-command held a first class licence valid up to 26 July 1961. He had a total of 10 560 flying hours, of which 826 were on the Ilyushin 18. During the last three months he had flown a total of 100 hours. He had a total of 208 hours' experience on African routes and had made four landings at Casablanca - Anfa.

The co-pilot held a second class commercial transport pilot's licence valid until 23 November 1961 and was qualified for day and night flights on the Ilyushin 18. His total number of flying hours amounted to 6 301 of which 223 were on the Ilyushin 18. He had flown 125 hours during the last three months and 57 hours on African routes but had made no landings at Casablanca.

The navigator, radio operator and flight engineer also had considerable flying experience and valid licences.

C.S.A. weather minima for instrument approaches at Casablanca - Anfa

They were as follows:

horizontal visibility	1 000 m (3 280 ft)
cloud base (amount, type and height above official aerodrome elevation)	150 m (490 ft)

These minima, used by the pilot during his first approach, had not been communicated to the Moroccan authorities for approval.

Note. - The above minima were lower than those currently applicable at Casablanca-Anfa, which were as follows:

3 200 m (10 500 ft)
200 m (650 ft)

Weather information

General weather situation and forecast at 0000 hr (midnight) GMT, 11/12 July

"The generally stable weather which has prevailed for several days over North Africa, including Morocco, will be disturbed by a mass of polar air, rather extensive for this period of the year. Isobars are changing position relatively quickly."

"The maritime air masses which have been stationary above the Atlantic Ocean will be set in motion by this cold mass, and should cross over Morocco during the latter part of the night of 11 12 July and the morning of 12 July, bringing in banks of stratocumulus."

The weather in Kenitra on 12 July at 0000 hours GMT explains the fog in Sale.

In Casablanca there was low stratus. The ceiling at Anfa was 150 m (500 ft) as measured by a nephoscope.

Weather conditions between 0100 - 0200 hours on 12 July

Casablanca - Anfa

at 0100 hr	155-70000-60031-87705	at 0130 hr	155-70000-60831-87705
QNH:	1017	QNH:	1017
QAN:	calm	QAN:	calm
QBA:	10 km (6.2 mi)	QBA:	10 km (6.2 mi)
QNY:	No	QNY:	No
QBB:	7/8 St 150 m (500 ft)	QBB:	7/8 St 150 m (500 ft)

Rabat - Sale

at 0100 hr	135-00000-00460	at 0130 hr	135-00000-0044
QNH:	1017	QNH:	1017
QAN:	calm	QAN:	calm
QBA:	zero	QBA:	No
QNY:	fog (sky visible)	QNY:	fog (sky visible)
QBB:	clear	QBB:	clear

Special meteorological report:

Deteriorating conditions at Rabat - Sale:

0050 hr QAN: calm; QBA: zero; QNY: fog, sky visible; QBB: clear

0150 hr QAN: calm; QBA: 100 m (300 ft); QNY: fog, visible sky; QBB: zero

The Flight

It departed Zurich at 2043 hours on 11 July and the trip was uneventful up to

the time of contact with Rabat - Sale control tower. At 0036 hours (12 July) it gave its position as over Fez and its estimated time of arrival in Sale as 0055 hours. At 0100 hours the aircraft contacted Sale Tower on 118.3 Mc/s and requested weather information. The tower replied: "visibility 10 m (30 ft), ground fog, clear sky." The flight then advised it was heading for Casablanca.

At 0106 the aircraft gave its position as 5 miles from Casablanca - Anfa, requested permission to descend and asked for landing instructions. The aircraft was asked to call when on the downwind leg.

Four minutes later the flight was asked to call when on final approach and was told that he was No. 1 for landing, the surface wind was 040°, 4 kt. The pilot replied that he would call when over the range station. The aircraft flew over the field at 0113, and three minutes later the pilot gave his altitude as 400 m (1 300 ft) and indicated a ceiling of 150 m (500 ft). The flight was advised that cloud was 7/8, ceiling 140 - 150 m (450 to 500 ft). Three minutes later conditions were 7/8, 100 m (330 ft). At 0122 the aircraft requested permission to land in Nouasseur if possible, and the tower asked him to wait. Two minutes later the aircraft was asked how much fuel it had remaining. It replied it had enough for 90 minutes. Subsequent calls from the tower remained unanswered as the aircraft had hit the ground.

The Scene of the Accident

OK-PAF crashed in line with runway 03, 13 km from its threshold, at an elevation of 140 m (452 ft).

When the police arrived at the scene at 0150 hours, i.e. 25 minutes after the crash, they found that one passenger had been thrown clear of the aircraft but was seriously injured. Calls for help were heard coming from the wreckage, and an attempt was made to rescue the passengers, but a fire started, and it was impossible to continue operations.

All persons aboard perished in the accident; the injured man succumbed to his injuries.

The Wreckage

The main wreckage was composed of the fuselage, almost complete, with part of the stabilizer and the elevator, the fin and rudder, the No. 3 engine, and one half of the main gear twisted towards the rear.

The fuselage was on its back, in a direction which was perpendicular to its path, and the underside had been opened to remove the victims. On the right rear side, level with the fin, were traces of scraping by high voltage wires. The cockpit had been entirely destroyed by fire.

None of the flight or engine instruments could be recovered. Fire damage on the main part of the wreckage showed that, at the outset, the fire was not fed by fuel. It looked like an electrical fire, which could have run along some short-circuited electric wires in the aircraft, becoming more intense at certain points where it was fed by other combustible material (such as hydraulic fluid). Some highly inflammable objects (e.g. films and records) did not burn. It does not, however, seem possible to eliminate the leakage of fuel onto No. 3 engine as a contributory cause of the fire.

Results of examination of the wreckage

The four engines, all propeller parts, some radio equipment and other equipment located at the rear of the aircraft were sent to Czechoslovakia for examination. Representatives from Czechoslovakia and Morocco were present.

The results of the analysis did not point to any facts which would have assisted the investigation.

Assumptions

Material failure

Neither the aircraft nor the radio communications gave any indication of failure.

Electrical failure

This was considered but rejected for the following reasons:

1) a complete DC failure could only have occurred if:

   a) the four engines had stopped when the batteries were already exhausted, or

   b) if shorts occurred in four separate points of the electrical circuits.

2) a complete AC failure could only have been caused by some major disturbance, such as the simultaneous failure of engines Nos. 2 and 4, with failure of the PO 1500 converter, or two simultaneous short circuits in separate sections of the main lead feeding the radio equipment.

Abrupt manoeuvre to avoid another aircraft

This would be difficult to check. It is, however, very unlikely that such a thing occurred, as neither the area control centre nor the approach control centre reported any aircraft in the vicinity of the aerodrome at the time of the accident.

Unfavourable weather conditions

The Commission assumed that the pilot may have been in a hurry to land because the Anfa control tower had warned him of deteriorating weather conditions. This is also unlikely, since the pilot had not received an answer to his request for a landing in Nouasseur, and the fuel remaining (90 minutes) would have allowed him to fly to an alternate aerodrome.

Probable Cause

None of the above assumptions satisfied the investigating commission as being a definite cause of the accident.

The last one, however, although unlikely at first sight, as explained above, could account for the accident if the crew, warned of deteriorating weather by the Anfa tower, had decided to take advantage of the partial visibility (of the ground) between stratus cloud and had attempted a fast let-down in unfavourable conditions.

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