

No. 3

Aeronaves de Mexico S.A., Douglas DC-8-51, XA-PEI accident at "El Salado" Hill, Acapulco, Mexico, on 13 August 1966. Report dated 7 October 1966, released by the Directorate General of Civil Aeronautics, Mexico

1.- Investigation1.1 History of the flight

After an uneventful scheduled flight from New York, U.S.A. to Acapulco, Mexico, with an intermediate stop at Mexico City, the aircraft arrived at Acapulco International Airport at 0012 hours local time. It was then serviced and refuelled and took off from runway 10 at approximately 0114 hours on a local crew training flight. At about 0150 hours the aircraft reported over the station at 16 000 ft and requested clearance from the tower to carry out a simulated descent. Clearance was granted and the aircraft was instructed to report at 6 000 ft overhead which it did and was seen by the tower controller who then requested it to report on procedure turn. The aircraft reported on procedure turn at 2 500 ft and this was the last message received.

At approximately 0215 hours explosions were heard and a fire was reported southeast of the airport. The aircraft had crashed between the town of Chapultepec and Acapulco Airport.

1.2 Injuries to persons

Injuries	Crew	Passengers	Others
Fatal	6		
Non-fatal			
None			

1.3 Damage to aircraft

The aircraft was destroyed.

1.4 Other damage

There was no other damage.

1.5 Crew information

Six pilots were aboard the aircraft; all held valid airline pilot licences with no restrictions.

The pilot-in-command, who was occupying the left hand seat, was adviser and instructor of the airline and held an instrument flight instructor rating. He also held a flight mechanic rating, a DC-8 pilot-in-command and co-pilot instructor's certificate and a restricted flight radiotelephone operator's certificate. As of 27 February 1966 he had flown a total of 15 712 hours including 1 256 hours on DC-8 aircraft.

Two of the pilots, who were DC-6 pilots, were receiving DC-8 co-pilot's training, which one was at the controls at the time of the accident was not ascertained. One had a flight mechanic's rating and restricted flight radiotelephone operator's certificate. As of 25 April 1966 he had flown a total of 13 630 hours including 7 hours on DC-8 aircraft. He had received 158 hours of theoretical instruction on DC-8, 3 hours of instrument practice on Link simulators and 10 hours flight training and practice on Eastern Airlines DC-8 aircraft. The other had a restricted flight radiotelephone operator's licence and had flown a total of 8 087 hours including 7 hours on DC-8 aircraft as of 30 March 1966. He had received 158 hours of theoretical instruction on DC-8, 3 hours instrument practice on Link simulators and 10 hours flight training and practice on Eastern Airlines DC-8 aircraft.

The fourth pilot had a flight mechanic instructor's rating and was acting as flight mechanic adviser and instructor during the flight. He also held a restricted flight radiotelephone operator's licence. As of 24 April 1966 he had flown a total of 13 859 flying hours including 1 670 hours on DC-8 aircraft.

The fifth pilot held a restricted flight radiotelephone operator's licence and instrument and flight mechanic ratings. Since his body was found near the flight mechanic instructor's body it was assumed that he was receiving flight mechanic instruction at the time of the accident. He had flown a total of 8 707 hours including 16 hours on DC-8 aircraft, of which 8.45 hours were in flight mechanic training.

The sixth pilot, a Britannia 302 pilot, held a restricted flight radiotelephone operator's licence and instrument rating. As of 31 January 1966 he had flown a total of 10 034 hours including 9.15 hours on DC-8 aircraft. He had received a total of 165 hours of theoretical flight mechanic training on DC-8 aircraft and was also scheduled to receive flight mechanic instruction during the flight.

This group of pilots arrived at Acapulco on 7 August to start several days of practical training on DC-8 aircraft and had flown approximately 4 hours on 9 August (from midnight to 0400 hours), 4 hours on 11 and 12 August (between 2400 and 0500 hours) and 46 minutes on 13 August, the day of the accident.

1.6 Aircraft information

The certificate of airworthiness of the aircraft was valid and the aircraft had been maintained in accordance with DCA regulations. The aircraft was operating normally and had flown a total of 10 030 hours up to the time of the accident.

On take-off the aircraft's weight was 89 376 kg including 29 445 kg of fuel. At the time of the accident its weight was estimated to be 79 376 kg. The aircraft's all-up weight and centre of gravity were within operating limits.

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

1.7 Meteorological information

The 0100 hours local time weather report for Acapulco was clear, visibility 12 miles, temperature 27°C, dewpoint 23°C, wind calm, altimeter 1010.5 mb, some cumulus cloud.

1.8 Aids to navigation

Not mentioned in the report.

1.9 Communications

No difficulties were reported.

1.10 Aerodrome and ground facilities

Not mentioned in the report.

1.11 Flight recorder

The Fairchild flight data recorder was recovered from the wreckage. Except for speed all parameters, vertical acceleration, flight altitude and headings were recorded perfectly. The readout of these parameters for the 46 minutes that elapsed between take-off and the accident revealed that:

- in the middle of the procedure turn, the aircraft started a descent which was continued until the aircraft struck the ground at an elevation of 250 ft.
- during the last part of its descent the aircraft maintained the proper approach heading to the runway and was aligned with it.
- at no time was the aircraft subjected to severe stress since the highest vertical acceleration value recorded was within safety limits.

1.12 Wreckage

No evidence of failure of the aircraft prior to impact was found. From ground marks it was determined that the aircraft first struck the ground at an elevation of 250 ft in an almost level attitude, but slightly banked to the right by approximately 5°. The main wreckage was found 220 m from the point of initial impact on a heading of approximately 270°.

Evidence revealed that the engines were operating normally, the undercarriage was extended, the landing lights retracted, the flaps at a setting of 50° and the horizontal stabilizer at a setting of 2°45' nose down, at impact.

1.13 Fire

Fire broke out following the accident.

1.14 Survival aspects

None mentioned in the report.

1.15 Tests and research

None mentioned in the report.

2.- Analysis and Conclusions

2.1 Analysis

The aircraft had requested and was cleared to carry out a simulated descent. The flight data recorder readout indicated that the final descent was initiated in the middle of the procedure turn and was continued until the aircraft struck the ground.

According to the instrument approach procedure established for Acapulco, an altitude of 2 500 ft should have been maintained until completion of the procedure turn, when the aircraft was aligned with the runway. Furthermore, the aircraft should not have been allowed to descend below the minimum altitude limit established for the descent procedure.

Weather conditions at the time of the accident were good and the flight data recorder readout did not reveal any abnormal turbulence or any loss of control during the turn on the descent.

The aircraft had just completed a scheduled flight from New York to Acapulco and no discrepancies had been reported. No evidence of malfunction or failure of the aircraft, its engines or systems was found during the investigation. The aircraft's reports at 16 000 ft, 6 000 ft and 2 500 ft were normal and there was no indication that an emergency situation could have developed aboard the aircraft.

The possibility of a wrong setting of the altimeters was examined. It was considered highly improbable in view of the fact that the aircraft had landed at Acapulco two hours before the accident and that the altimeters were therefore most probably at the correct setting. Furthermore, the altitudes reported by the aircraft coincided with those recorded on the flight data recorder. However, a misinterpretation of the altimeter's indications by the pilot under training, accustomed to a different type of equipment, was considered possible.

The fact that the landing lights had not been extended and lighted, that the flaps were set at 50° instead of 35° as required in the approach checklist, implied a marked degree of complacency on the part of the instructor.

2.2 Conclusions

(a) Findings

The flight crew were properly certificated.

The certificate of airworthiness of the aircraft was valid and the aircraft had been properly maintained. Its weight and centre of gravity were within allowable limits.

Weather was not a factor in this accident.

The aircraft was carrying out a simulated descent approach procedure and the descent from 2 500 ft was initiated in the middle of the procedure turn, whereas according to the standard procedure it should have been initiated on completion of the procedure turn when the aircraft was aligned with the runway. The aircraft's descent was continued below the minimum altitude limit until the aircraft struck the ground in a nearly level attitude, slightly banked to the right, with the undercarriage extended and 50° of flaps (instead of the normal 35°).

No evidence of a malfunction or failure of the aircraft, its engines or equipment, or of a loss of control of the aircraft was found.

Evidence of complacency in the supervision of the flight was found.

(b) Cause or
Probable cause(s)

Careless and untimely descent in the course of a procedure turn which was continued below established minimum altitude.

3.- Recommendations

It was recommended that:

- (1) night-time training be given only when the airport being used has facilities appropriate to the aircraft type involved;
- (2) in cases of night-time training, adequate resting facilities should be provided for pilots;
- (3) persons receiving training should form a crew and not a group;
- (4) the search and rescue equipment should be appropriate for the class of airport and its operations and manned by a sufficient number of trained personnel.

Training
Landing
Collision - ground
Pilot - Improper training or supervision, flight