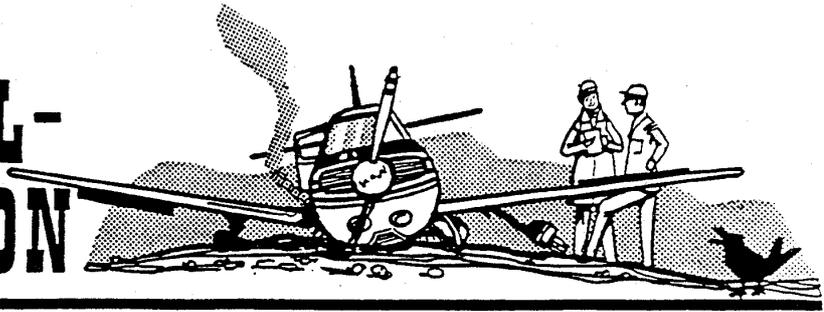


FLUGUNFALL- INFORMATION



V 98
Braunschweig, November 1991

Accident Investigation Bureau
at LBA

V 98
Braunschweig, November 1991

Metro III - Lightning can be hazardous

The most serious aircraft accident, which occurred in the Federal Republic in the last years, has to be attributed to the effects of lightning strike.

On February 8, 1988 a SA 227-AC, Metro III, was on a scheduled flight from Hanover to Dusseldorf, with 19 passengers and 2 crewmembers on board, when in initial approach approx. 7 miles (NM) from the threshold, the electrical power supply failed in a thunderstorm after the airplane had been struck into uncontrolled descent and after two minutes' flying through the thunderstorm region disintegrated in the air. In the following impact all occupants were killed and the airplane was destroyed.

In the concluding investigation report the investigation commission established that an electrical failure caused by lightning strike under instrument landing conditions, which also resulted in the failure of the cockpit and instrument lighting and made an actuation of the landing flaps and horizontal stabilizer trim impossible, has mainly contributed to the accident. An especially dramatic factor was that the damage caused to the diodes in the electrical system probably made the crew unable to restore the power supply.

Although a total electrical failure of the power supply system as a result of lightning strike had been assessed to be rather improbable by the airplane manufacturer and the certification authority, a further case has now occurred. The exemplary reaction and behaviour of the crew as well as their observance of a safety recommendation issued by the investigation commission after the first accident are likely to have prevented another accident.

What has happened? During the climb of an SA 227, Metro III, from FL 140 under instrument flight conditions, the airplane was struck by lightning.

According to the report of the crew, all of a sudden the total electrical power supply system failed. The pilot-in-command immediately took over the controls as provided for in the air carrier's Flight Operating Manual (FOM) in such cases. The switches for the operation of the electrical power supply system being located directly in front of the pilot on the left seat, he had immediately after that, to let the co-pilot take over the controls again, who managed to continue the flight by means of the built-in third artificial horizon. The pilot on the left seat was then able to concern himself with the restoration of the electrical system for which a certain order in the operation of the battery and generator switches was required to be strictly observed (see also "Total Electrical Failure" in the Airplane Flight Manual, Metro III, Chapt. Emergency Procedures).

An accident could be prevented. The pilot was familiar with the procedure "Total Electrical Failure", which after that recent accident had been incorporated in the Airplane Flight Manual on the basis of a safety recommendation. The "Crew Coordination" in the cockpit worked out well. The diodes in the electrical power supply system, which probably prevented the restoration of the electrical supply, have been removed in accordance with a safety recommendation issued by the Accident Investigation at LBA (FUS) resulting in an AD.

(please turn over)

Due to the constructional characteristics of the electrical power supply system it cannot be excluded for the types SA 226 AT and SA 226 TC and its models, including the SA 227 AC, Metro III, that the danger of a total electrical failure as a result of lightning strike continues to exist.

For this reason the FUS recommends all pilots flying these types:

1. to observe the procedure "Total Electrical Failure" in the Airplane Flight Manual and practise the required actions in the simulator or in a ground training on the airplane.
2. to be prepared for a failure of the electrical power supply system in weather situations with the danger of lightning. That means, among other things, that a torch should be at hand, ready for use.
3. to take off the headphone after a lightning strike which total electrical failure. A communication by the Intercom System is no longer possible then.
4. to observe the position of installation of the third artificial horizon. The location in the cockpit panel can differ from airplane to airplane.

Extract from the Airplane Flight Manual SA 226-AC:

TOTAL ELECTRICAL FAILURE

1. Entrance Light Switch..... ON (IF ILLUMINATION IS REQUIRED)

NOTE

The pilot's overhead and entrance door flood lights are powered by the left battery when the entrance lights switch is in its ON position

2. Both Battery and Both Generator Switches OFF
3. Battery Switches (individually) RESET/ON
4. Generator Switches (individually) RESET/ON

If total electrical failure occurred as a result of lightning strike or discharge, the aircraft should be thoroughly inspected for evidence of lightning damage. See the SA227 Maintenance Manual, Chapter 05 and the TPE 331 Maintenance Manual, Chapter 72.