

SUMMARY

The purpose of the flight was to drop eight parachutists from flight level 130 (an altitude of 13,000 feet, approximately 4,000 metres). The load sheet that the pilot received did not contain any information about the individual weights of the parachutists or the total mass of the load. The pilot could thus not, with any help from the load sheet, check or make his own calculation of mass and balance before the flight.

The aeroplane was approaching the airport and, at 14:05 hrs, the pilot requested permission to drop the parachutists slightly higher because of clouds. The airspeed was decreasing in conjunction with the aeroplane's approach to the airport. Just over a kilometre from the airport where the jump point was located, the aeroplane suddenly changed direction to the left and began descending rapidly in almost the opposite direction. The aeroplane then travelled just under one kilo-metre at the same time as it descended 1,500 metres, which is a dive angle of over 45 degrees.

The aeroplane broke up in the air as both the airspeed and the g-forces exceeded the permitted values for the aeroplane. From an altitude of 2,000 metres, the aeroplane fell almost vertically with a descent velocity of around 60 m/s.

The fact that no one was able to get out and save themselves using their parachute was probably due to the g-forces and the rotations that occurred.

All those on board remained in the aeroplane and died immediately upon impact.

The pilot had limited experience of both normal flight and parachute operations. The aeroplane was tail heavy and the centre of gravity moved in such a way that the aeroplane became unstable. The task of navigating to a precise point at high altitude at the same time as a number of actions were to be performed in accordance with a checklist resulted in a heavy workload. The large amount of clouds made safe flying more difficult or even impossible. The high altitude could also have reduced the pilot's abilities as a result of hypoxia.

It is SHK's understanding that the lack of formal training, absence of a system for determining the centre of gravity and lack of support for flight operations have been decisive factors in terms of how the flight developed into an accident.

Causes/contributing factors

The control of the aeroplane was probably lost due to low airspeed and that the aeroplane was unstable as a result of a tail-heavy aeroplane in combination with the weather conditions, and a heavy workload in relation to the knowledge and experience of the pilot.

Limited experience and knowledge of flying without visual references and changes to the centre of gravity in the aeroplane have probably led to it being impossible to regain control of the aeroplane.

The following factors are deemed to be probable causes of the accident:

- The lack of a safe system for risk analyses and operational support, including data for making decisions concerning flights, termination or replanning of commenced flights.

- The lack of a standardised practical and theoretical training programme with approval of a qualified instructor.
- The lack of a safe system for determining centre of gravity prior to and in conjunction with the parachuting jumps.

Safety recommendations

EASA is recommended to:

- Consider introducing a formal training programme for pilots in parachute operations. (See section 2.7). *(RL 2020:08 R1)*
- Review the approval procedures of mass and balance documentation when certifying aircraft approved for parachute operations. (See section 2.6.3). *(RL 2020:08 R2)*

The Swedish Transport Agency is recommended to:

- As part of its oversight activities, ensure that there are appropriate loading instructions or equivalent in place and adhered to for parachute operations. (See section 2.8). *(RL 2020:08 R3)*
- With support of SFF, take measures to ensure that licensed parachutists have sufficient knowledge of aircraft mass and balance and flight operational consequences when moving around in the aircraft and that the Pilot/Commander receives the support necessary to maintain the rules that apply to the flight. (See section 2.9). *(RL 2020:08 R4)*