

## SUMMARY

The intention of the flight was a hot air balloon flight experience with two passengers. The weather forecasts showed that the wind strength would increase during the evening because a sharp cold front was moving south over Svealand<sup>1</sup> during the afternoon and evening.

The hot air balloon lifted off just after eight o'clock in the evening in favourable weather conditions. The flight time was calculated to be one hour. After about 40 minutes flight, a significant weather change in the form of fog was observed. The pilot decided to immediately abort the flight and commence des-cent. Before the landing could be commenced, the wind changed direction and strength, which made a landing at the first designated site impossible, upon which the pilot selected a new landing site.

The first touchdown was very hard. Both the rate of descent and the speed were high. All those on board lost their balance and fell over. In connection with this, the pilot happened to inadvertently put the burners on full power. This contributed to the balloon climbing to an altitude of 30-50 metres. Shortly thereafter, the pilot succeeded in shutting down the burners.

A second hard touchdown was made after about 1 000 metres. The balloon basket was then pulled along the ground and was at times in the air a little above the ground. The system for a rapid deflation of the balloon's hot air was not activated in connection with this touchdown.

About 400 metres after the second touchdown, the pilot fell out of the balloon basket. The balloon then climbed with only the two passengers on board. The passengers, however, operated the top vent so that the balloon again descended towards the ground. They subsequently decided to leave the balloon. In conjunction with this, the first passenger became caught for a short while between the basket and the ground. The second passenger's foot became tangled in an operating line. Held fast by the line, the passenger was dragged behind the balloon for several hundred metres before the balloon drifted into a power line and stopped.

The pilot and one of the passengers were seriously injured, while the other passenger received minor injuries.

In light of the weather information that was available, it is SHK's view that the margin appears too small between the time of planned completion of the flight and the time at which there was reason to assume that the weather could deteriorate drastically. However, there are no rules regarding time margins between planned flight and forecasted significant aviation weather. In SHK's view, the introduction of such rules could reduce the risk of accidents of this type.

When the hard landing occurred, the pilot was not wearing the safety harness that was in the basket. However, there are no explicit rules regarding the conditions in which the pilot is to put on the safety harness. National rules will soon be replaced by common European rules. According to the proposals for new rules, the actual type of balloon will no longer be subject to any safety harness requirements. As the event shows that there is a risk that the pilot will fall out of the basket even in the actual type of balloon, SHK believes that EASA should consider introducing safety harness requirements for all types of balloons in commercial air transport and to clarify when it will be used.

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<sup>1</sup> Region located in south central Sweden.

The accident was caused by the following factors:

- The flight was planned with a too small, albeit permitted, time margin to forecasted significant weather conditions that could impair a safe flight.
- A high speed and rate of descent during the landing caused the touchdowns to be very hard. In addition, after a hard ground contact, the pilot fell out of the basket and thereby lost the ability to control the balloon.
- The system for a rapid deflation of the balloon's hot air was not active-ted in connection with the second touchdown.

### **Safety recommendations**

The Swedish Civil Aviation Authority's regulations (LFS 2007:48) on commercial air transport with manned hot air balloon are currently applicable. New regulations for balloon flight, which will replace the national rules, are being drafted at EASA and are planned to be introduced in 2018. With reference to this, SHK does not deem it appropriate to recommend amendments to the current regulations but instead chooses to direct its recommendations to EASA.

### **EASA is recommended to:**

- Consider introducing time margins between planned landing time and significant weather conditions. (*RL 2017:06 R1*)
- Consider introducing requirements for safety harness or other restraint systems for all types of balloons in commercial passenger operations and clarifying the conditions in which the system is to be used. (*RL 2017:06 R2*)