

## **Bounce on landing, nacelle tip-over, ejection of three passengers**

<b>Aircraft</b>	Lindstrand 180 A hot air balloon registered F-GSAE
<b>Date and time</b>	16 July 2013 at 21 h 45 <sup>(1)</sup>
<b>Operator</b>	Aerfun Montgolfières
<b>Place</b>	Authon-la-Plaine (91)
<b>Type of flight</b>	Public transport
<b>Persons on board</b>	Pilot and eight passengers
<b>Consequences and damage</b>	Three passengers injured, two slightly

<sup>(1)</sup>Unless otherwise indicated, the times given in this report are expressed in local time.

*This is a courtesy translation by the BEA of the Final Report on the Safety Investigation. As accurate as the translation may be, the original text in French is the work of reference.*

### **1 - HISTORY OF FLIGHT**

The pilot was performing a public transport flight with eight passengers from a field located in the town of Angervilliers (91).

Before the flight, he gave the passengers a leaflet containing safety instructions and then explained to them the use of the balloon, the operation of the flight and the landing instructions.

After boarding, he took off for a flight of about 45 minutes at a maximum height of nearly 400 metres, with an estimated speed of 20- 25 km/h. Before landing, he asked the passengers to adopt the landing position and started the approach phase at an estimated speed of 15 km/h.

He stated that he chose to land in a stubble field, just after a field of oilseed rape about two metres high. While he was flying over the latter and preparing for landing, the balloon suddenly lost altitude. The longer side of the nacelle hit the ground before the intended landing area, in the oilseed rape field. The hot air balloon took off again, swinging backwards and forwards. After 55 seconds, the nacelle touched the ground a second time, in the stubble field, and tilted forward. Three passengers situated in the front compartment were then ejected forward and then struck by the nacelle.

### **2 - ADDITIONAL INFORMATION**

The pilot is the manager of the company which operates two hot air balloons. He has had this balloon since 2009. He has held a free balloon pilot's licence since 2006 and has 350 flying hours for a total of 388 ascents.

The computed weight for the accident flight was 1,261 kg for a maximum weight of 1,306 kg.

The nacelle maximum capacity was nine people. It comprised three compartments in a "T" shape: one for the pilot and two to accommodate four passengers each. During landing phases, the nacelle is positioned width ways, the passengers in a squatting position facing backwards. The pilot has a harness. The passengers have grab handles.

Eye-witnesses stated that before take-off the pilot had emphasised the landing position and the fact that the balloon could bounce. During preparation before landing, he corrected two passengers' position which he did not consider correct.

The pilot did not remember if he had already shut down burner pilot lights when the balloon suddenly lost altitude. No eye-witness mentioned a possible "burner blast" before the first impact with the ground.

The balloon onboard equipment comprised an altimeter/climb-rate indicator whose memory could be read out. The recorded data indicated that the rate of descent at the end of the approach was moderate, in the range of 0.6 m/s. Sampling was only one measurement every five seconds, so it was not possible to determine precisely the handling of the balloon on first impact with the ground, even if the data analysis indicated that the rate of descent had noticeably increased.

The pilot stated that the meteorological conditions seemed ideal to him for the flight planned. At the time of the accident, the wind was from the north at 15 km/h. The temperature was 27 °C at the end of a sunny day. Aeronautical night time was at 22 h 17.

### 3 - LESSONS LEARNED AND CONCLUSION

The first impact with the ground was described as "violent" by all the witnesses. After the balloon took off again, the nacelle became caught in the oilseed rape crops and started to swing back and forth. On the second impact with the ground, the nacelle was most likely leaning forward, which helped it to tip over and eject the passengers situated in the rear.

Safety procedures for landing had been demonstrated to the passengers but the passengers were nevertheless surprised by the brutality of the impact with the ground. After the balloon bounced, some passengers may have relaxed their grip and not taken up the correct position for the second landing, without the pilot noticing.

The investigation was unable to determine if the balloon encountered a local loss of updraft or if incorrect management of the approach was the cause of the sudden loss of altitude.

The choice of landing point located immediately after a field of oilseed rape did not allow the pilot to take into account possible aerological variations.

A hot air balloon landing can be brutal. Passengers often underestimate the consequences and their attention should be drawn to this point.

This is why in 2007 the United Kingdom Civil Aviation Authority published a notice on improving passenger safety in hot air balloons on landing<sup>(2)</sup>. This notice highlights in particular the interest of placing "vulnerable passengers" in the front compartment of "T" nacelles. It does not refer to the risks related to bounces.

In August 2012, EASA also published a safety information bulletin<sup>(3)</sup> emphasising the information to give passengers on firm landings, especially during a possible second landing.

<sup>(2)</sup>CAA Balloon Notice 1/2007 : <http://www.caa.co.uk/docs/33/BAL200701.pdf>.

<sup>(3)</sup>SIB No 2012-13 : [http://ad.easa.europa.eu/blob/SIB\\_201213\\_Basket\\_padding.pdf/SIB\\_2012-13\\_1](http://ad.easa.europa.eu/blob/SIB_201213_Basket_padding.pdf/SIB_2012-13_1).

This event is similar to two other investigations recently conducted by the BEA:

- ❑ F-GVTN on 18 May 2013 (<http://www.bea.aero/docspa/2013/f-tn130518/pdf/f-tn130518.pdf>)
- ❑ F-HDJH on 19 August 2012 (<http://www.bea.aero/docspa/2012/f-jh120819/pdf/f-jh120819.pdf>)