

**Accident** to a Schroeder G42/24  
registered **F-GXTD**  
on 25 August 2013  
at La Meilleraie-Tillay (Vendée)

<sup>(1)</sup>Unless otherwise stated, all times given in this report are in local time.

<b>Time</b>	20:57 <sup>(1)</sup>
<b>Operator</b>	Company
<b>Type of flight</b>	Commercial Air Transport
<b>Persons on board</b>	Pilot and seven passengers
<b>Consequences and damage</b>	One passenger seriously injured
<i>This is a courtesy translation by the BEA of the Final Report on the Safety Investigation published in July 2019. As accurate as the translation may be, the original text in French is the work of reference.</i>	

## Hard landing, collision between two passengers

### 1 - HISTORY OF THE FLIGHT

After a flight time of around 1 h 10 min, the balloon started its descent with a low vertical speed to land in a field, facing the upward slope. At a height of around five metres, the balloon suddenly descended. The pilot activated the double burner to dampen the descent but his input had no effect. He informed the passengers that it was going to be a hard landing and that the basket would be dragged along the ground. On impact with the ground, one passenger was unable to hold his position, collided with another passenger and broke her left collarbone. The basket slid around ten metres and then turned onto its side before coming to a halt.

### 2 - ADDITIONAL INFORMATION

#### 2.1 Pilot's experience and witness statement

The pilot, holder of a free balloon pilot licence and pilot for the company since 2006, had logged 838 flight hours and 732 ascents of which 40 on type in the previous three months.

He explained that, during the pre-flight briefing, he had shown the passengers the position of the handles to be held for the landing or in the event of turbulence. He had also described to them, the position to be adopted (knees bent) for the landing. He had specified that once on the ground, according to the wind, the basket could either remain upright and immobile or be dragged and then probably tip over. He said that he had positioned the younger passengers so that they would be under the older passengers in the case of the basket tipping over on landing, and would cushion the older passengers if they should fall.

The pilot considered that his double input on the burner before landing did not reduce the rate of descent which had suddenly increased at a low height.

## 2.2 Balloon information

The VII/7 type basket has two compartments, one for the pilot and another for six passengers. The Schroeder flight manual specifies that the maximum capacity of a VII/7 type basket is seven, including the pilot. The operations manual and the company's insurance contract indicate that the maximum number of passengers authorized onboard this basket is seven.

*Note: When there are more than six people onboard, including the crew, the regulations require that the basket is divided into compartments, with a specific compartment for the pilot, fuel tanks and balloon controls.*

The maximum allowable weight including the envelope, basket, equipment and payload is 1,260 kg. On take-off on the day of the event, the take-off weight was 1,002 kg for a maximum weight in the forecast flight conditions (temperature of 20 °C, maximum altitude desired 1,000 m) of 1,071 kg.

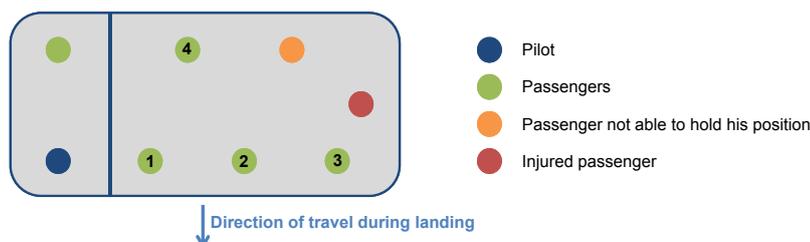
## 2.3 Meteorological information

During the approach and landing, there were no significant clouds and the wind was north-north-west for a speed of around 15 km/h<sup>(2)</sup>. The weather forecasts and, in particular, those in the operator's flight file, indicated for the flight period, a north-north-west wind of less than 15 km/h and no gusts. It is possible that thermal phenomena associated with a steady wind led to the wind being reinforced or to downdrafts appearing on approaching the slope of the hill.

The pilot had a GNSS receiver. The analysis of the data found that over the last five kilometres of flight, the average strength of the wind had increased from 12 to around 20 km/h.

## 2.4 Passenger Protection

The positions of the pilot and the passengers in the basket during the landing were the following:



There were handholds in front of the passengers. Passengers 1, 2 and 3 were facing the balloon's direction of travel, unlike passenger 4 and the passenger who was not able to hold his position. The passenger who was injured, 57 kg, was facing the lateral wall of the basket, for space reasons according to the pilot. The passenger who collided with this passenger, aged 80, weighing approximately 90 kg and with a knee prosthesis, was unable to hold his position during the landing due to, according to him, the loads experienced and despite holding the internal handles.

<sup>(2)</sup>Less than the maximum strength indicated in the flight manual.

<sup>(3)</sup>Acceptable means of compliance BOP. BAS.115 and 120 for Commission regulation No 395 of 2018.

<sup>(4)</sup><https://www.bea.aero/fileadmin/documents/docspa/2012/fjh120819.en/pdf/fjh120819.en.pdf>

<sup>(5)</sup>Article 2 paragraph 23 of the French decree of 6 February 2015 modifying the decree of 6 March 2013 concerning the conditions of use of free hot air balloons operated by a commercial air transport operator: Balloons operators check, under the responsibility of the pilot-in-command, the capacity of passengers to simultaneously adopt the landing position before each flight.

The compartment reserved for the pilot is not intended for passengers. Since this event, and after clarification with the DSAC, the company no longer places a passenger in the compartment reserved for the pilot.

The European regulations<sup>(3)</sup> for the operation of balloons take into account since 2018, the protection of occupants in balloon baskets:

- ❑ The passengers must be given a safety briefing by the operators. A presentation of the positions which must be assumed on landing shall be given before take-off and the crew shall ask passengers before the landing phase, to practise the correct landing position.
- ❑ Persons with reduced mobility may be excluded from transportation in a balloon in order to guarantee the safety of the flight and balloon occupants. The balloon operator thus has the possibility of refusing a passenger for a flight in the following conditions:
  - their presence may impede the crew in their duties, access to emergency equipment or the emergency evacuation of the balloon;
 and/or
  - the person is unable to take a proper brace position or is smaller than the inner height of the basket wall.

The protection of passengers on landing after a free balloon flight has been addressed in numerous safety investigations, including the investigation into the accident on 19 August 2012 to a Cameron Balloons Z-750 registered F-HDJH. It determined that hard balloon landings did not always allow passengers to comply with or continue to comply with the operator's instructions to limit the risks of injury, this being particularly the case for passengers who are vulnerable, fragile or with limited physical capacities.

In the report published in 2014 with respect to this event<sup>(4)</sup>, in order to improve the conditions of passenger transport and protection, the BEA recommended that EASA and the DGAC ensure that before each flight, balloon operators check the capacity of passengers to simultaneously adopt the landing position.

In response to the safety recommendation FRAN-2014-009, the DGAC amended the decree concerning the conditions of use of free hot air balloons operated by a commercial air transport operator by introducing this provision<sup>(5)</sup>.

EASA's response in 2014 to recommendation FRAN-2014-008 and then the publication of the new regulations concerning balloon operation in 2018 did not explicitly introduce this practical pre-flight check at European level.

### 3 - LESSONS LEARNED AND CONCLUSION

The possible presence of downdrafts at low height associated with the inertia of the balloon close to its maximum weight meant that the pilot was not able to prevent a hard landing. One of the passengers was unable to hold the recommended landing position, probably due to physical limitations, and fell on a passenger who was injured during the impact.

The following factors contributed to the accident:

- insufficient consideration given to the physical limits of the passengers before the balloon flight;
- lateral loads during the impact with the ground (perpendicular to the direction of travel of the balloon);
- a probable element of surprise due to the position of the passenger who was not able to hold his position on landing, with his back to the direction of travel of the balloon, which limited his preparation and reaction despite the pilot's warning.

This event shows that despite compliance with the flight preparation and landing rules, rough contact with the ground can catch some passengers unawares or exceed their physical capacities. A simple reminder to occasional or regular ballooners can prove insufficient to cover this risk.

The regulations for balloon operation introduced in France since February 2015 (cf. paragraph 2.4) are designed to limit these risks by requiring that the passengers show, before the flight, their capacity to simultaneously adopt the landing position.