



**Accident** to the CESSNA - T303 "Crusader"  
registered **HB-LUV**  
on 04 December 2020  
at Annecy-Meythet

Time	Around 15:50 <sup>1</sup>
Operator	Private
Type of flight	Cross-country
Persons on board	Pilot and two passengers
Consequences and damage	Pilot severely injured, aeroplane destroyed

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.

**Runway overrun during landing  
on a wet runway**

**1 HISTORY OF THE FLIGHT**

*Note: the following information is principally based on statements, radio communications and radar data.*

The pilot, accompanied by two passengers, took off at 14:36 under an IFR flight plan from Marseille-Provence airport (Bouches-du-Rhône) bound for Annecy-Meythet airport.

After around one flight hour, at approximately 15:30, while the aeroplane was in cruise flight at FL110, the pilot asked the controller at Lyon, with whom he was in contact, to provide him with the weather conditions at destination. The controller, after checking with the Chambéry and Annecy-Meythet controllers, indicated to the pilot visibility of 2 km, a cloud ceiling at 600 ft and 2,100 ft, a QNH of 989 hPa, and specified that the braking coefficient was being measured.

At 15:37, the pilot contacted the Chambéry approach controller who cleared him to descend to 6,500 ft and to head towards the GOVNA then PIRUV reporting points for a RNP Z approach to runway 04.

At the same time, the driver of the vehicle in charge of measuring friction on the Annecy-Meythet runway indicated to the Annecy-Meythet controller that there was a layer of slush of approximately two to three centimetres and warned him about average braking conditions.

This information was passed to the Chambéry controller who informed the pilot thereof at 15:38. The controller cleared him to initiate the RNP Z approach procedure for runway 04.

<sup>1</sup> Except where otherwise indicated, the times in this report are in local time.

At 15:46, the controller asked the pilot to confirm that he had initiated the descent to 5,000 ft. He reminded him that, as part of the approach procedure, he had to be at an altitude of 5,000 ft on passing over the LP 402 reporting point. The pilot confirmed that he was following the RNP Z procedure for runway 04.

At 15:49, the controller asked the pilot to contact the Annecy-Meythet controller on the 118.200 MHz frequency for landing.

At 15:50, the HB-LUV pilot contacted the Annecy-Meythet controller and announced that he was established on the RNP approach procedure for runway 04. The controller cleared him for landing and told him that there was a wind from 250° at 1 kt and that the runway was wet.

The pilot continued the approach and landed. The aeroplane touched down near the runway mid-point. The pilot did not manage to stop the aeroplane before the end of the runway. The aeroplane exited the runway, crossed the embankment located at the edge of the airport, crossed a road and came to a stop just beyond it.

## **2 ADDITIONAL INFORMATION**

### **2.1 Examination of site and aeroplane**

The accident site was located on the axis of runway 04, by the side of a road that runs along the airport's perimeter. An earth embankment located 40 m from the end of runway 04 protects road users from the blast generated by the engines of aeroplanes lined up at the threshold of runway 22.

The examination of the marks left by the aeroplane's wheels on the runway revealed that the wheels had touched down half way along the runway and that the aeroplane had remained in the centreline. The marks stopped a few metres before the embankment and then became visible again on the embankment. Both the main landing gear and nose gear, which had been torn off, were found stuck in the embankment.

The aeroplane was lying on its belly. The propeller blades of both engines were distorted and showed that the engine had been delivering power.

The examination of the damage to the main landing gear tyres confirmed a reverted rubber hydroplaning phenomenon<sup>2</sup> during landing.

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<sup>2</sup> Reverted rubber hydroplaning can occur when the wheels lock due to heavy braking on a slippery runway covered with water or snow. The heat generated by the friction produces steam which starts to revert rubber on part of the tyre. The rubber debris forms a seal around the affected area, which traps the high-pressure steam. The layer of high-pressure steam which is produced is sufficient to prevent the tyre from making contact with the runway and to result in hydroplaning.



**Figure 1: reverted rubber mark on left and right main gear tyres (Source: BEA)**

## 2.2 Pilot experience

The 70-year-old pilot held a Private Pilot Licence - Aeroplanes (PPL(A)) issued by the authorities of Luxembourg. He also held an Instrument Rating (IR(A)) and a Multi-Engine Piston rating (MEP(A)). He had logged 1,077 flight hours, including 410 h on single-engine aeroplanes, 667 h on multi-engine aeroplanes, and 797 h as pilot-in-command, with 470 flight hours logged under IFR. In the previous three months, he had logged around 15 flight hours, six hours and 21 minutes of which on a Cessna T303.

The day before the accident (see para. 2.7.2), the pilot had carried out the RNP Z procedure for runway 04 at Annecy-Meythet. The weather conditions were then very favourable.

## 2.3 Meteorological conditions

### 2.3.1 General situation in the region

The department of Haute-Savoie was under a “yellow”-level snow alert for the day of 04 December 2020. The weather was unsettled over the Alpine departments with a rain/snow line in the morning at an altitude of approximately 1,000 m, which was forecast to drop to approximately 400 m due to intense snow precipitation.

### 2.3.2 Weather forecasts

The TAF forecast for Annecy-Meythet airport at 11:35 UTC indicated, for the period from 04 December 2020 at 11:00 UTC to 05 December 2020 at 09:00 UTC, wind from 220° at 8 kt, visibility of 10 km, rain and cloud cover at 3,000 ft. The conditions could temporarily deteriorate between 12:00 UTC and midnight, with visibility reduced to 1,000m, snow and cloud cover at 200 ft.

A SNOWTAM for Annecy-Meythet airport forecast between one and three centimetres of snow from 12:00 to 15:00 UTC, and between three and five centimetres of snow from 15:00 UTC to midnight.

The SIGWX chart at 15:00 UTC for the Annecy region indicated visibility locally reduced to 1,500 m and snow precipitation in the mountains.

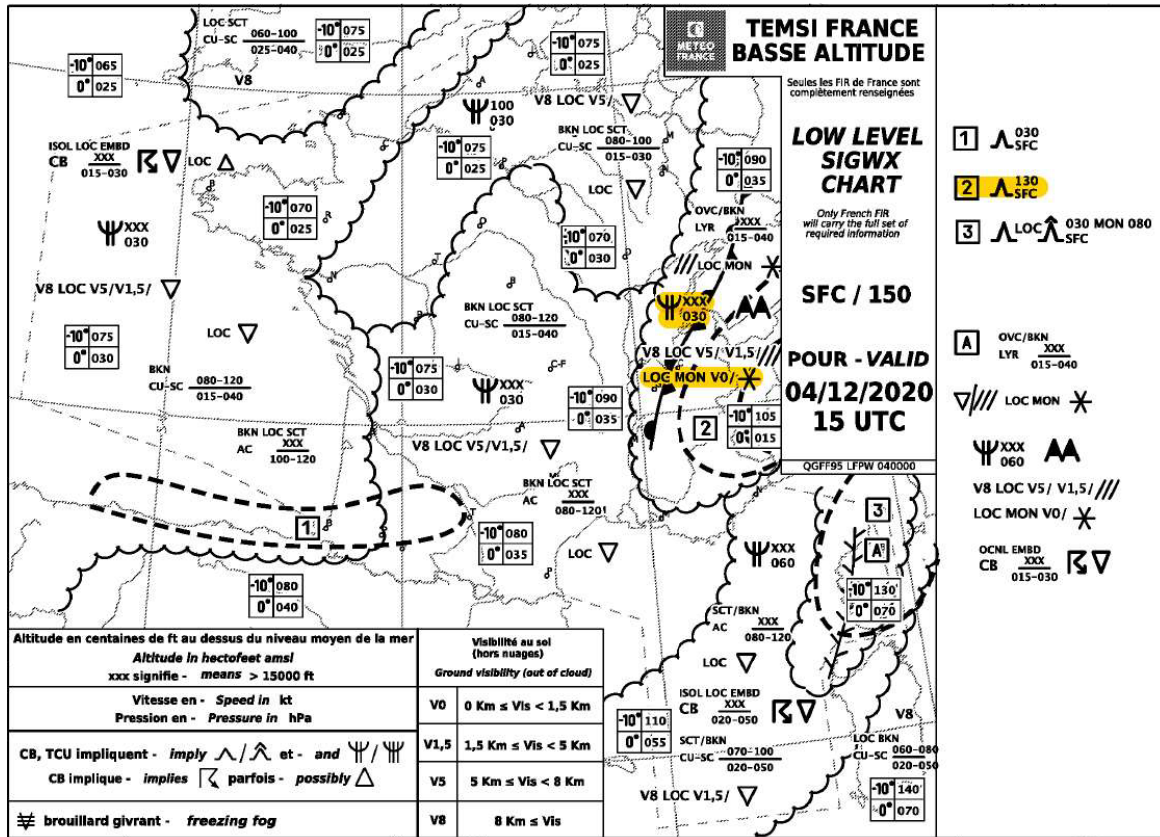


Figure 2: SIGWX chart (Source: Météo-France)

### 2.3.3 Situation observed at Annecy Meythet airport at the time of the accident

According to the airport controller, the conditions were as follows: wind from 060° at 1 kt, visibility 2,000 m, broken clouds (BKN) at 600 ft, overcast sky (OVC) at 2,200 ft, presence of towering cumulus (TCU), temperature +1 °C, QNH 989 hPa, two to three centimetres of slush and valid SNOWTAM.

The METAR report at 14:30 UTC indicated the following: wind from 330° at 1 kt, visibility 2,900 m, mist and snow, broken clouds at 600 ft, overcast sky at 2,100 ft, towering cumulus, temperature 1°C, dew point 0°C with, temporarily, visibility reduced to 1,000 m, snow and overcast sky at 200 ft.



Figure 3: panoramic view from the surveillance camera

When the aeroplane was lined up for landing (red circle in Figure 3), the black asphalt of the runway surface was visible, the aeroplane parking areas were wet, and snow was visible on the grassy parts of the airport and on the sides of the runway. Snow was falling and can be seen in the picture.

## 2.4 Aeroplane characteristics and performance

The Cessna T303 is a piston-powered, twin-engine aeroplane with a seating capacity of six. The aeroplane is approved for flight in icing conditions.

The certificate of airworthiness indicates that the aeroplane was, among other things, approved for single-pilot IFR flight, GNSS navigation (RNAV), GNSS approaches (RNAV APCH) and RNP LNAV approaches<sup>3</sup> (RNP APCH LNAV).

The recommended approach speed for this aeroplane is between 80 and 90 kt with flaps in the landing position, which makes it a Category A aeroplane for approach manoeuvres.

Section 5 of the Flight Manual, which describes the landing performance values (table 5-21), contains a table with landing distance and run distance values on a dry runway. The Flight Manual indicates that the reference landing speed on passing 50 ft is 81 kt with flaps set to 30° for landing. The Flight Manual also specifies adding 10% to the distances for every 2.5 kt of tailwind, up to 10 kt. The Flight Manual contains no data<sup>4</sup> or indication for wet or contaminated runways.

For a dry, paved, level runway at an altitude of 1,500 ft, with no wind and an outside temperature of 0°C<sup>5</sup>, the landing run distance is 250 m and the landing distance is 442 m.

In contrast to commercial air transport, regulations do not impose increased distances in non-commercial aviation. In the absence of manufacturer's data, the value added to landing distances on wet or contaminated runways is left to the discretion of the operator.

## 2.5 Aerodrome and approach procedure

Annecy-Meythet airport is a controlled airport open to public air traffic, which is located at an altitude of 1,521 ft. The landing distance available on runway 04 at Annecy-Meythet is 1,328 m. The airport has instrument approach procedures allowing IFR activity.

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<sup>3</sup> Non-precision RNP approach.

<sup>4</sup> The aeroplane manufacturer confirmed that no data table is available for this type of aeroplane in the event of a landing on a contaminated runway.

<sup>5</sup> Conditions on the day of the accident.

The information indicated regarding the RNP Z procedure for runway 04 is as follows:

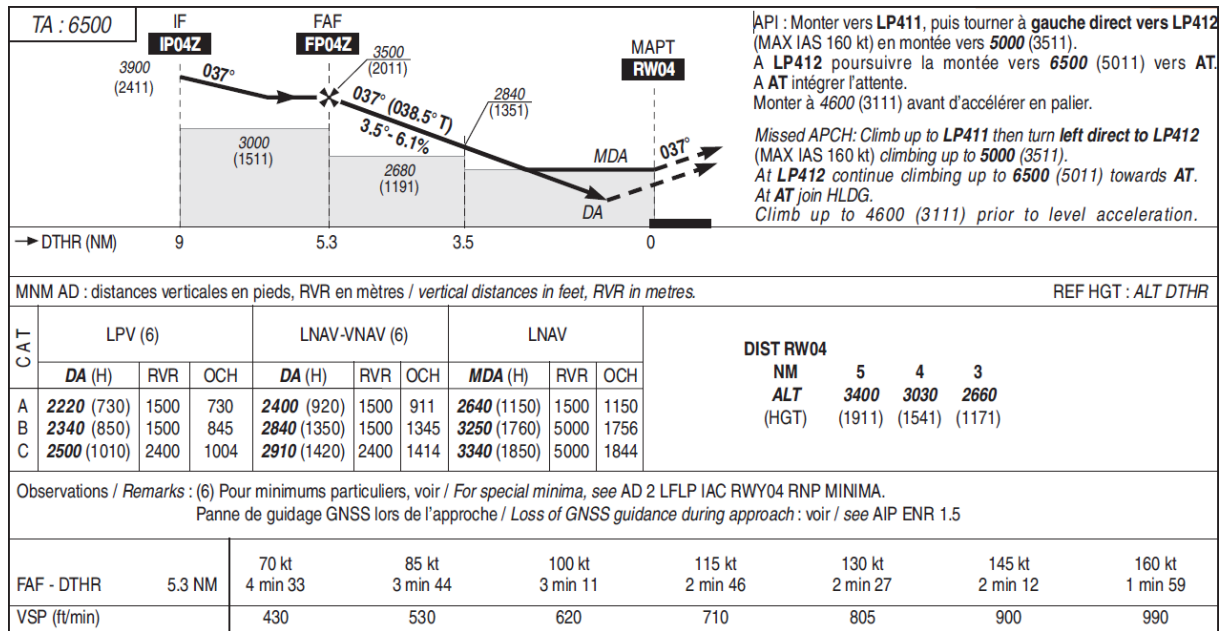


Figure 4: excerpt from RNP Z 04 procedure

For a Category A aeroplane<sup>6</sup>, the runway visual range required for landing is 1,500 m. For the LNAV procedure, the minimum descent altitude (MDA) is 2,640 ft (i.e. a height (MDH) of 1,150 ft). The approach slope is 3.5°.

## 2.6 Approach path taken by the pilot

The radar detected the aeroplane until approximately 2,600 ft while the pilot was on final for runway 04 at Annecy-Meythet. In the absence of other information sources, the final approach path taken by the pilot could not be reconstructed below this altitude.

<sup>6</sup> Aeroplane with an indicated airspeed of less than 91 kt at threshold.

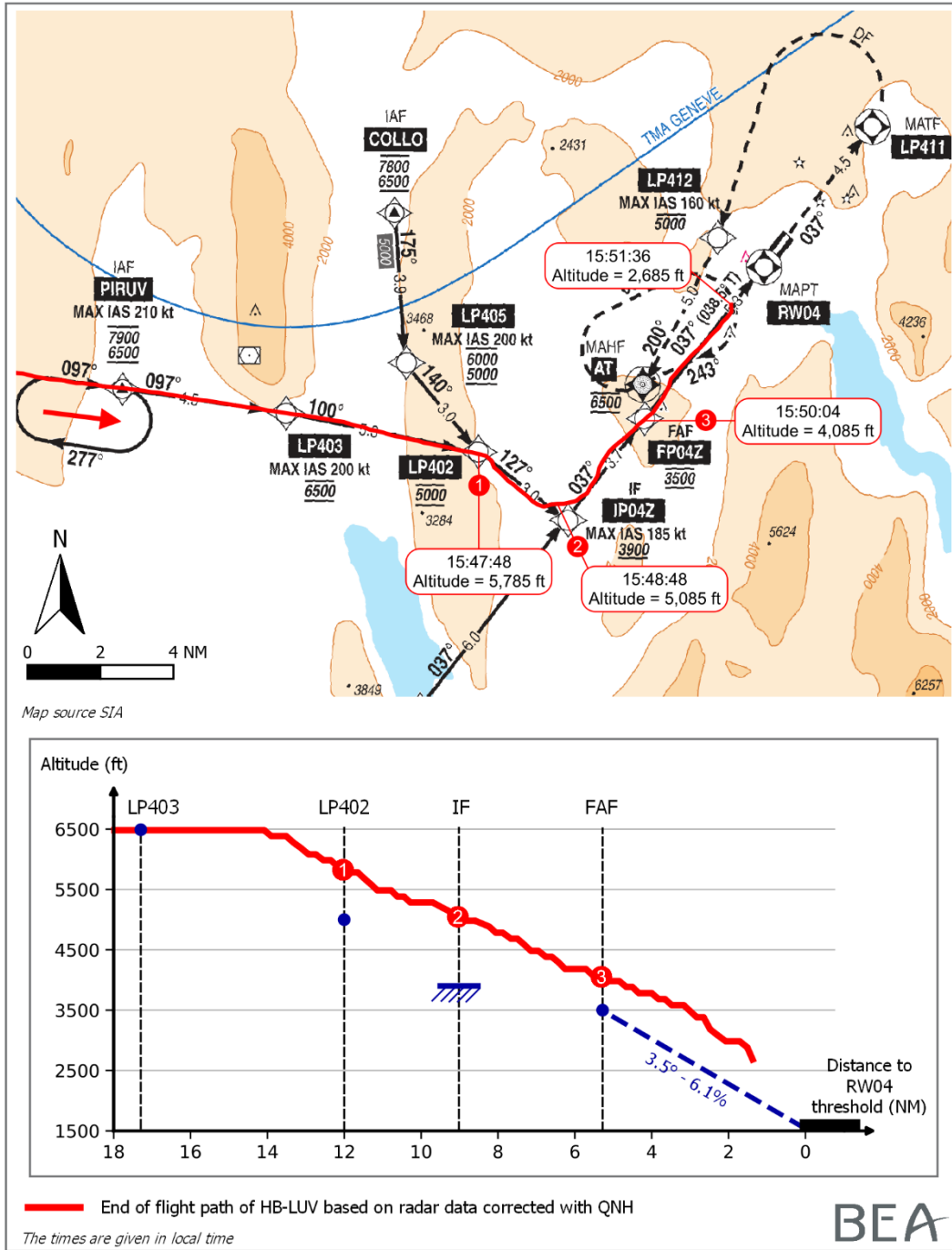
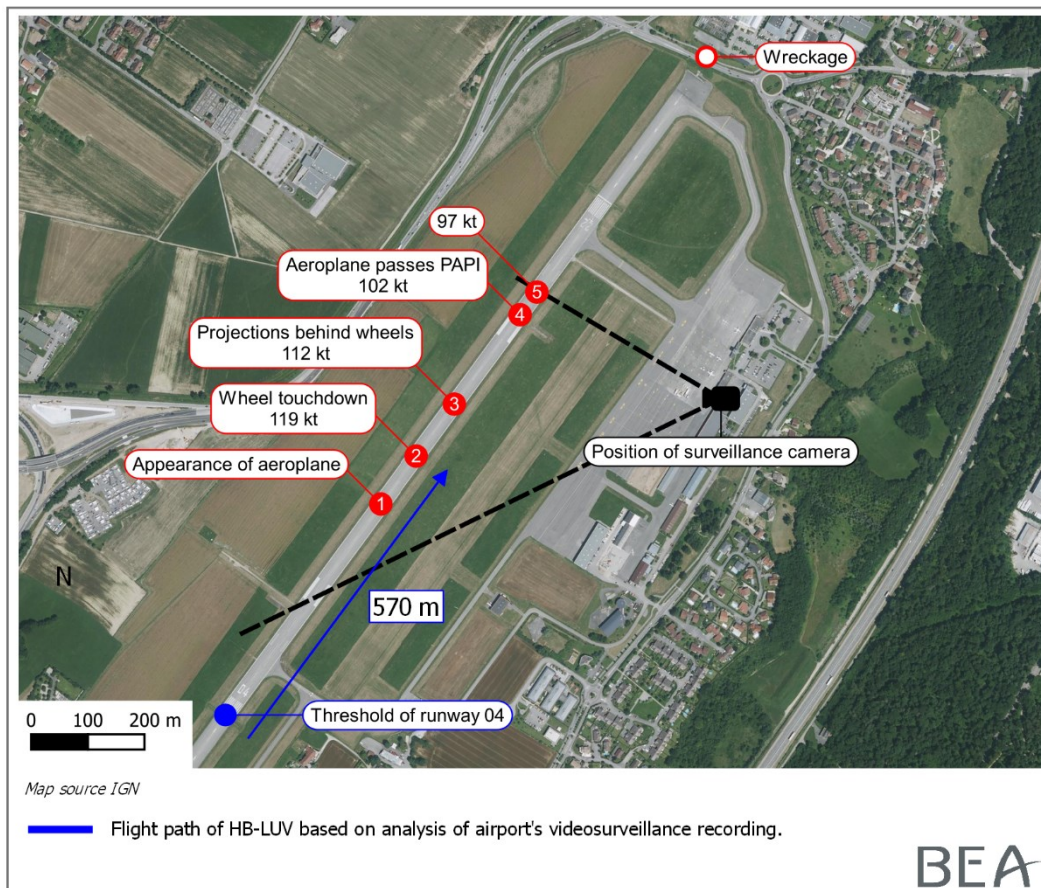


Figure 5: path taken by the aeroplane on the RNP Z 04 procedure

After passing the LP 403 reporting point, the pilot started to descend late and could not reach the required altitude of 5,000 ft on passing the LP 402 reporting point (point 1 on the path shown above). The pilot reached the FAF 3 500 ft higher than the required altitude of 3,500 ft and continued the descent. During this descent, the aeroplane was, on average, 500 ft above the approach path.

As the pilot had no memory of this part of the flight, it was not possible to know whether he had been aware that he was very high on the path.



**Figure 6: aeroplane positions and ground speeds during landing, based on the analysis of the airport surveillance camera recording**

The analysis of the airport surveillance camera recording showed that:

- the aeroplane touched down 570 m beyond the runway threshold (see Figure 6, point ②) with a ground speed of 119 kt<sup>7</sup>;
- between points ② and ⑤, the aeroplane speed slightly decreased (about 20 kt in 380 m);
- at point ⑤ (end of the camera's field of view), the aeroplane's ground speed was 97 kt and the remaining runway distance<sup>8</sup> was 400 m.

## 2.7 Statements

### 2.7.1 Pilot

The pilot stated that he had no memory of the day of the accident.

### 2.7.2 Passenger behind the trip

The passenger stated that he was interested in buying an aeroplane for his company in order to make business trips by air. He specified that he was not a pilot. He added that having found the Cessna 303 registered HB-LUV during an internet search, he contacted one of the co-owners of 303 Flyers AG (the company that owned the aeroplane). He explained to this person that he wanted to take a few trips before finalising the purchase to ensure that the aeroplane met his needs.

<sup>7</sup> The landing speed recommended by the Flight Manual is between 80 and 90 kt.

<sup>8</sup> Including the clearway.



The 303 Flyers AG co-owner told him that it was possible to rent the aeroplane with a pilot and referred him to another pilot who was also a co-owner of 303 Flyers AG. The passenger stated that he contacted this pilot and explained that he wished to make a first trip with another passenger over two days, on 03 and 04 December 2020, from Annecy-Meythet airport bound for La Môle airport on the first day, then bound for Marseille-Provence airport on the second day, before returning to Annecy-Meythet airport. The pilot agreed and told the passenger that he could perform this trip. He added that he would prepare the flights and arrive on 03 December from Zurich.

The passenger stated that before taking off from Marseille-Provence airport, the pilot told him that the weather conditions at destination were not good and that he might have to divert to Geneva. The two passengers notified relatives of the situation in order to organise being met at Geneva if necessary.

The passenger stated that during this flight, he was seated at the rear of the aeroplane with the second passenger and that the pilot was alone at the front. He specified that during the final approach, the aeroplane seemed to have a steep nose-down attitude and was being shaken about. During the landing, he heard the pilot speak loudly in German without understanding what the latter was saying. He saw the pilot braking hard and had the feeling that the aeroplane was slipping. He saw the embankment approaching rapidly. He and the second passenger adopted the safety position until the aeroplane came to a complete stop.

### 3 CONCLUSIONS

*The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation. They are not intended to apportion blame or liability.*

#### Scenario

The pilot, in cruise flight and approaching Annecy-Meythet airport, was informed by the Chambéry controller of the weather conditions, of the presence of slush on the runway and of an average braking coefficient. He was cleared to join the RNP Z procedure for runway 04. He started the descent late. The Annecy-Meythet controller cleared him for landing and informed him that the runway was wet. The pilot continued the descent, the final approach and decided to land although the aeroplane was not stabilised, either in terms of speed or on the approach path. The aeroplane touched down near the runway mid-point at 119 kt, more than 30 kt faster than the speed recommended in the Flight Manual. The presence of water on the runway, the high speed during the landing and the pilot's braking action resulted in a hydroplaning phenomenon which made braking almost ineffective, with the aeroplane's speed decreasing only slightly. The pilot did not manage to stop the aeroplane before the end of the runway. The aeroplane struck the blast deflector embankment at the end of the runway, crossed the road which runs alongside the airport and came to a stop next to it.

#### Contributing factors

The meteorological information made available to the pilot allowed him to initiate the landing procedure. Nevertheless, it was not possible to determine whether the pilot had acquired the visual references at the required height.

The runway excursion resulted from the pilot's decision to continue the approach and land on a wet runway, although the aeroplane was not stabilised (above the path and too fast).

*The BEA investigations are conducted with the sole objective of improving aviation safety and are not intended to apportion blame or liabilities.*