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INVESTIGATION REPORT

Accident to the Cessna - 172 – R registered F-ONDU

on 1 May 2018

at Terre-De-Haut, Îles des Saintes (Guadeloupe)

Time	Around 10:25[1]
Operator	Aéroclub de l'aviation civile de Guadeloupe
Type of flight	Cross-country
Persons on board	Pilot and two passengers
Consequences and damage	Pilot and one passenger slightly injured, one passenger seriously injured, aircraft destroyed

This is a courtesy translation by the BEA of the Final Report on the Safety Investigation published in March 2020. As accurate as the translation may be, the original text in French is the work of reference.

[1] Unless otherwise stated, all times given in this report are in local time.

Off-centre final approach below the approach slope, collision with a tree

1 - HISTORY OF THE FLIGHT

The pilot was on a cross-country VFR flight from Pointe-à-Pitre Le Raizet airport to Saintes Terre-de-Haut aerodrome. It was a pleasure flight lasting just under

20 minutes, with two passengers onboard.

The pilot flew overhead the aerodrome. During the approach to runway 09, the radar data showed that the aircraft was following a trajectory parallel to the approach path shown on the VAC and offset to the south by about 250 m (see Figure 1). Five hundred and twenty metres upstream from the runway threshold, the aircraft's left wing hit the top of a tree. The pilot lost control of the aircraft, which came to rest 60 m further on after being stopped by a tree trunk.

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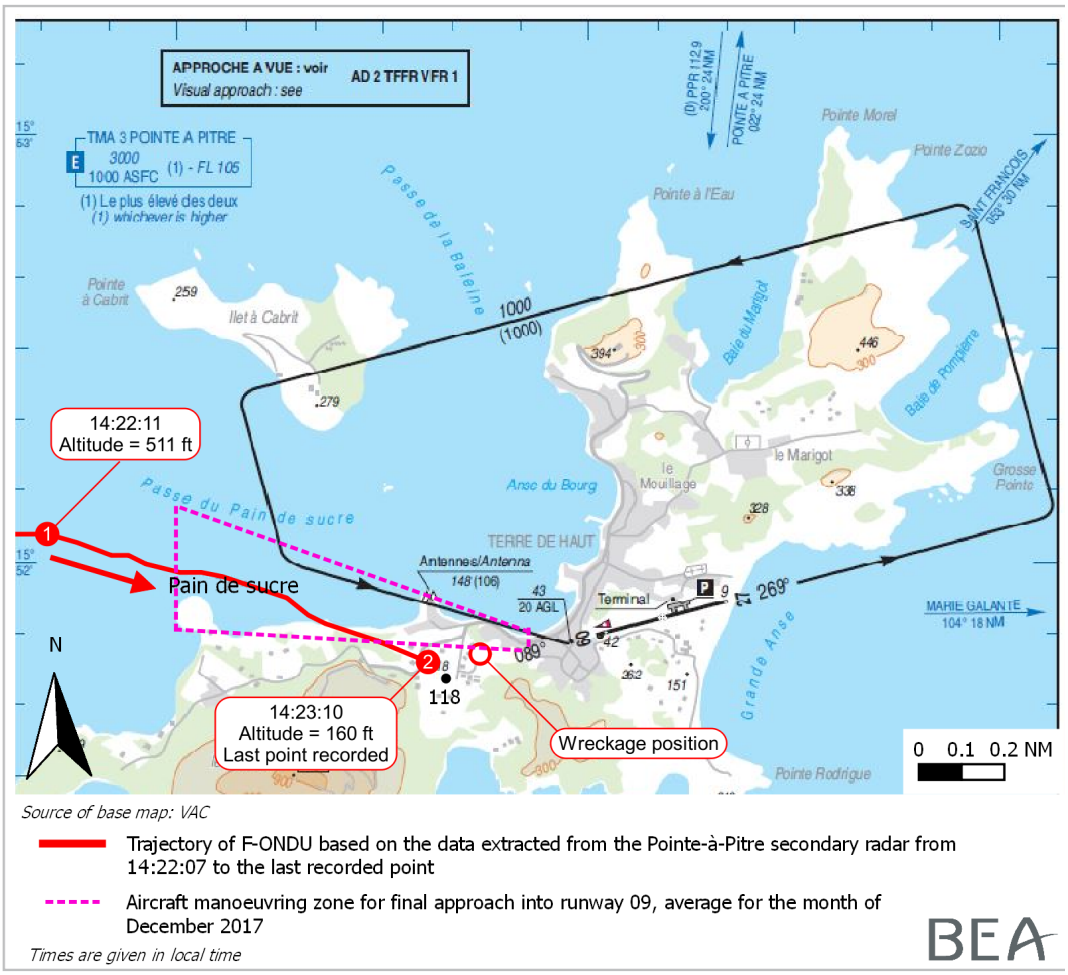

Figure 1: final trajectory of F-ONDU

2 - ADDITIONAL INFORMATION

2.1 Examination of the site and wreckage

An examination of the wreckage did not reveal any damage prior to the accident. The position of the flap extension cylinder was consistent with a 30° flap extension angle.

2.2 Pilot experience and ratings

[2] Single Engine Piston.

The pilot, who held a European private pilot licence (FCL PPL(A)) and a SEP class rating[2], had logged 352 flight hours, five of which were in the previous three months.

Prior to his arrival in Guadeloupe in the summer of 2017, the pilot's flying experience was in metropolitan France. During his first flight with an instructor on 27 September 2017, he flew circuit patterns at Les Saintes. On 4 October 2017, he was cleared to fly into Saint François and La Désirade. On 16 January 2018, he was cleared to use Les Saintes aerodrome after completing three circuit patterns with an instructor. The next day, he landed again in Les Saintes. He was accompanied by the president of his aero club, who had held the clearance since 2015. He then made three flights to and two flights from Les Saintes as pilot-in-command on the same type of aircraft.

2.3 Meteorological information

The meteorological conditions estimated for the morning of 1 May 2018 were dry and fairly sunny during the day, with some cloud over the terrain and a moderate east south-easterly wind.

The visibility reading at Le Raizet airport was over 10 km during the whole morning of 1 May. Météo-France had forecast a homogeneous easterly wind, blowing at an average of 18 kt. The readings taken at Le Raizet showed a well-established wind with an average direction of 110° and an average strength of 15 kt. The wind was turbulent with gusts of up to 25 kt observed at Le Raizet. Météo-France does not have wind reading instruments at Les Saintes.

The pilot indicated that the ceiling and visibility were good: he could see the Îles des Saintes just after take-off from Pointe-à-Pitre. He recalled that the windsock at the threshold of runway 09 indicated a wind in the centreline of around 10 kt.

2.4 Les Saintes aerodrome

2.4.1 General

Les Saintes aerodrome has a paved 544-m long runway. The dimensions of the runway leave little margin for landing and require precision in respect of the aiming point. The landing performance of the Cessna 172R is compatible with this runway length.

The VAC for Les Saintes aerodrome indicates that *"AD reserved for ACFT with suitable performances and characteristics, as well as pilots having a good knowledge of its conditions of use and a verified experience of using the aerodrome as co-pilot under the control of a pilot instructor who certified them*."

2.4.2 Approach method taught by the instructor that issued the pilot's clearance

The normal approach to runway 09 at Les Saintes begins across the Pain de Sucre (see Figure 1), which must be passed at an altitude of about 600 ft. It continues through the Antenna at an altitude of 300 ft. Since the runway threshold is obscured by the terrain during the approach, the pilot must use a visual reference point in the form of a delineation between a forest and a rock to maintain his course until the runway centreline is intercepted. The corresponding approach slope is around 10% (6°), which is twice as steep as the standard approach slope, which is usually 3°. On short final, the pilot regains his view of the runway and uses the beginning of the threshold of runway 09 as the aiming point on a standard 3° approach slope.

The approach speeds taught by the instructor are:

- 65 kt and flaps 30° if the wind is less than 15kt;
- 65 kt and flaps 20° if the wind is between 15 and 20 kt;
- 70 kt and flaps 20° if the wind is more than 20kt.

During the approach, the instructor recommends avoiding flying over the top of the Pain de Sucre, where there are often downdrafts. When there are south-easterly winds, there are also downdrafts in two areas of the approach: before passing through the Antenna and just before intercepting the runway centreline.

2.4.3 Execution of the approach on the day of the accident

The radar recordings, the tree impact marks and the geographical position of the wreckage indicated that the pilot's trajectory was 250 m south of the recommended trajectory. The last recorded point (point ❷ in Figure 1) was located in an area likely to be subject to downdrafts or significant turbulence due to the surrounding terrain.

The tree with which the aircraft collided was on the standard approach slope, i.e., 5% or 3° in respect of the runway threshold.

2.4.4 Assessment of the approach performance by other authorised pilots

An analysis of the radar trajectories followed by aircraft in December 2017 served to determine the manoeuvring area of aircraft on final into runway 09 at Les Saintes (see Figure 1). A more general analysis for the year 2017 confirms that a significant number of approaches were performed with a trajectory offset to the south of the published approach path in areas subject to potential severe turbulence and characterized by the presence of obstacles that interfere with a conventional 3° approach path.

Several videos of approaches performed to the south of the approach path, during which the aircraft flew over the accident site on final, can be viewed over the Internet.

2.5 Statements

2.5.1 Pilot of F-ONDU

The pilot stated that the approach to Les Saintes had been completed without any problems. He did not recall encountering any turbulence and he had not been required to modify engine power. The indicated airspeed during the approach was around 70 to 75 knots. He moved the flap control from 20 to 30° and began the left turn to align with the final runway centreline. He reported that, shortly after the start of the turn, he felt that the left landing gear had hit an obstacle and then he lost control of the aircraft, which rolled left with a nose-down attitude. The passenger in the left rear seat told him that the left wing had hit a tree branch.

2.5.2 Witness on the ground facing the final approach

The witness held a private pilot licence (PPL(A)) and was cleared to land at Les Saintes. He was on the waterfront, about 200 m north of the threshold of runway 09.

He indicated that he observed the aircraft fly overhead Les Saintes aerodrome. He then observed the aircraft throughout its final approach. The wings were flat on final and the aircraft was stable. The engine appeared to him to be at idle and the rpm constant. He added that he did not hear any variation in engine rpm. A few seconds before the accident, he reported that he had a feeling that something was not right. The aircraft seemed too slow and too low. He saw the left wing hit a tree and a branch being ejected.

3 - CONCLUSIONS

The approach to runway 09 at Les Saintes is tricky because of a final trajectory that is offset in respect of the runway centreline, the late acquisition of a view of the runway on final and local aerological phenomena. A clearance issued by an instructor is necessary to be able to fly into the aerodrome. The pilot had obtained his clearance in January 2018 and the characteristics of his aircraft allowed him to land at Les Saintes aerodrome.

At the time of the accident, the pilot probably benefited from favourable aerological conditions during the approach. He followed an approach path that was not in line with the recommended procedure: he lined up too early on the runway centreline on a standard approach slope without being aware of the presence of obstacles. The investigation revealed that a significant number of pilots deviated from the procedure by aligning prematurely on the runway centreline. This deviation, which makes it possible to acquire a view of the runway threshold more quickly, entails flying over terrain and obstacles, including dwellings, at a very low height. This increases the risk of an accident.

Safety measures

On 6 June 2019, the aero club's safety committee met and issued the following recommendations to its members:

- Perform the pre-landing checklist before passing the Antenna (see figure 2) so that the pilot can keep his full attention on his final trajectory into Les Saintes.
- Pass the Antenna at a minimum altitude of 300 ft.

The committee also drew the pilots' attention to the presence of a hill (see area circled in red in Figure 2) and the need to adapt their trajectory accordingly.

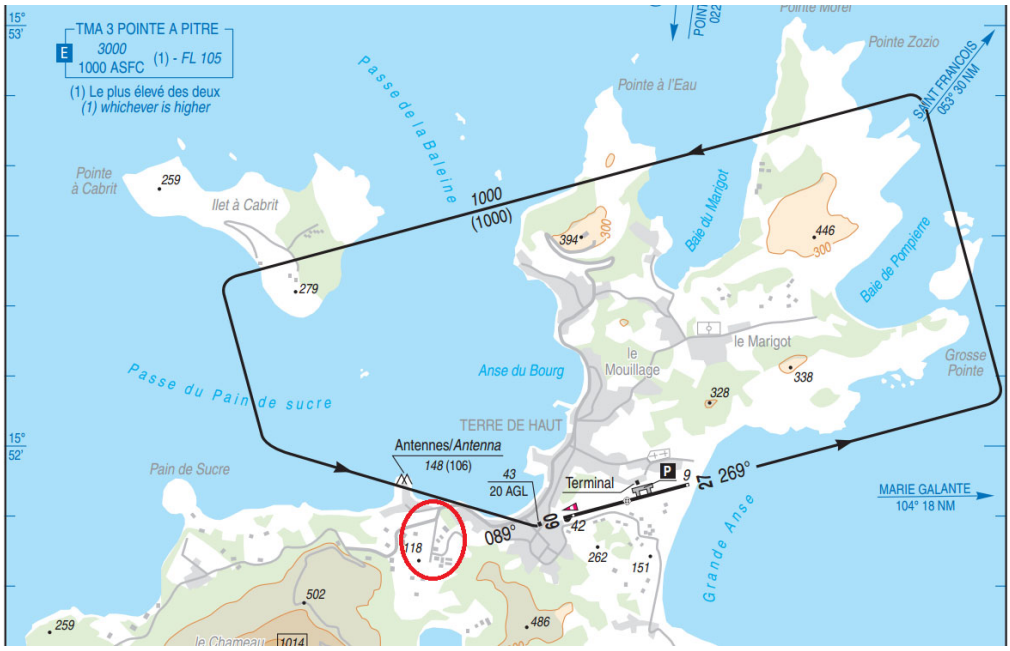

Figure 2: document used to inform the members of the aero club

[3] https://www.sia.aviation-civile.gouv.fr/dvd/eAIP_13_AUG_2020/CAR-SAM-NAM/AIRAC-2020-08-13/html/eAIP/FR-AD-2.TFFS-fr-FR.html#AD-2.21.TFFS

[4] https://www.sia.aviation-civile.gouv.fr/dvd/eAIP_13_AUG_2020/CAR-SAM-NAM/AIRAC-2020-08-13/html/eAIP/Cartes/TFFS/AD%202%20TFFS%20ATT%2001.pdf

On 15 August 2019, an amendment to pages AD-2.TFFS-4[3] and AD 2 TFFS ATT 01[4] of AIP CAR SAM NAN for Les Saintes aerodrome was published (see Figure 3).

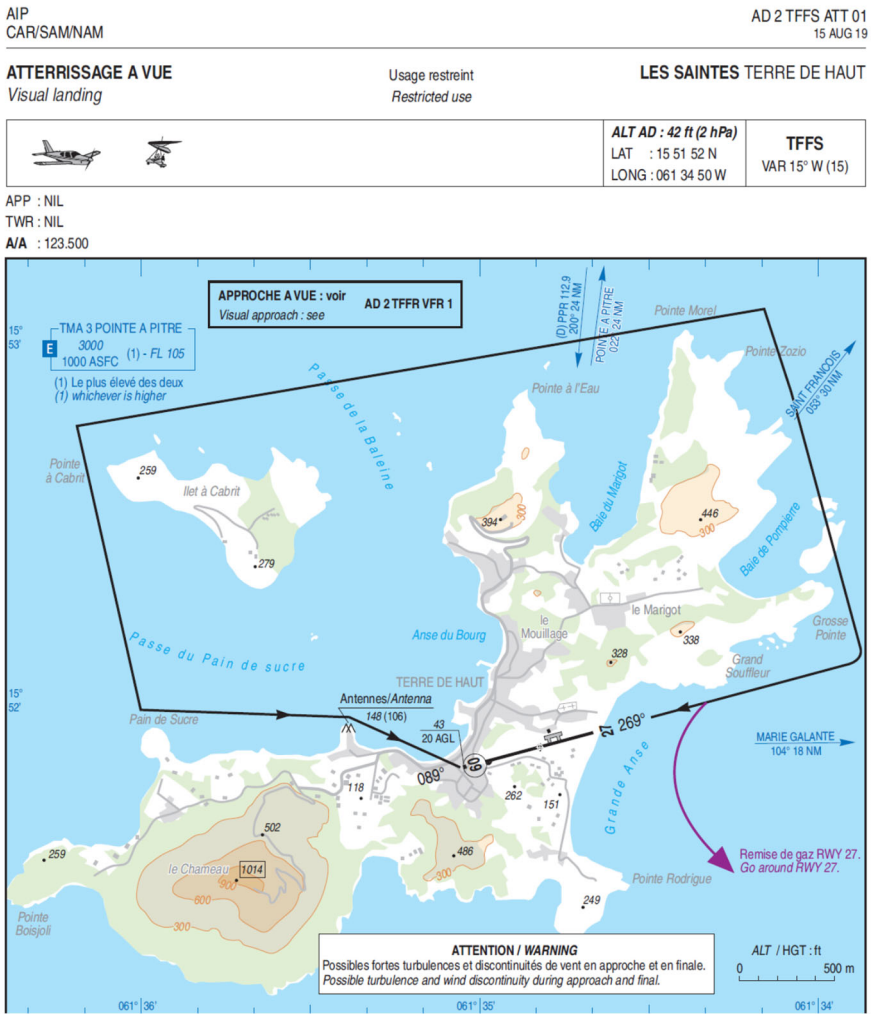

Figure 3: excerpt from the amendment to AIP CAR SAM NAN - AD 2 TFFS ATT 01

A new VFR arrival trajectory for runway 09 was defined, which reiterates the need for absolute compliance with the routes and clearance heights. The operational and environmental specificities linked with the approach are also specified.

Since implementation of this new trajectory, DSAC AG has been conducting periodic checks of the radar trajectories to ensure compliance with the approach procedures published for Les Saintes.