

Report

Accident on **25 August 2007**
at **Vannes-Meucon (56) Aerodrome**
to the **Piper PA 39**
registered **N13PF**

BEA

Ministère de l'Écologie, du Développement durable, des Transports et du Logement

Bureau d'Enquêtes et d'Analyses
pour la sécurité de l'aviation civile

Foreword

This report expresses the conclusions of the BEA on the circumstances and causes of this accident.

In accordance with Annex 13 to the Convention on International Civil Aviation and with European Regulation n° 996/2010, the investigation has not been conducted so as to apportion blame, or to assess individual or collective responsibility. The sole objective is to draw lessons from this occurrence which may help to prevent future accidents.

Consequently, the use of this report for any purpose other than for the prevention of future accidents could lead to erroneous interpretations.

SPECIAL FOREWORD TO ENGLISH EDITION

This report has been translated and published by the BEA to make its reading easier for English-speaking people. As accurate as the translation may be, the original text in French is the work of reference.

Glossaire

CAA	Civil Aviation Authority
CAG	Circulation Aérienne Générale
CAVOK	Ceiling And Visibility OK
CTR	Control Traffic Region Région de contrôle aérien
DGAC	Direction Générale de l'Aviation Civile (France)
FAA	Federal Aviation Administration (Etats Unis)
FL	Flight Level
hPa	Hectopascal
kt	Knots
m	Mètres
MEP	Multi Engine Piston
MPH	Miles Per Hour
NOTAM	Notice for Airmen
PIC	Pilot In Command
PPL	Private Pilot Licence
TR	Training
UTC	Universal Time Coordinated
VFR	Visual Flight Rules
Vmcg	Vitesse minimale de contrôle de l'avion au son avec uniquement les gouvernes aérodynamiques

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Synopsis

Date

25 August 2007 at 16 h 35⁽¹⁾

Place

Vannes–Meucon Aerodrome (56)

Type of flight

Local flight

Aircraft

Piper PA 39
registered N13PF

Owner

Southern aircraft consultancy
inc trustee

Operator

Private

Persons on board

Pilot + 1

⁽¹⁾All times in this report are UTC, except where otherwise specified. Two hours should be added to express official time in metropolitan France on the day of the accident.

1 - FACTUAL INFORMATION

1.1 History of Flight

The owner of the aircraft, the holder of a PPL, and another pilot, his companion, decided to perform a flight on the PA 39 registered N13PF. The owner of the aircraft was in the front right seat and the other pilot in the front left. The aircraft was on the parking area of the Montair Park aeronautical village, adjacent to Vannes aerodrome.

The pilot in the right seat contacted the tower controller around 16 h 18. He was cleared to taxi to the paved Runway 04 to holding point Bravo. Since the traffic was very busy, he waited about 10 minutes before taxiing back up runway 04 to the threshold. He was cleared for takeoff at 16 h 33. The wind was 060° at 10 knots. The pilot in the right seat announced that he intended to make a runway circuit. A witness stated that the takeoff run was long and that the aircraft seemed to have difficulty gaining height. The pilot in the right seat called out "Emergency for PF" to the controller at 16 h 34. A few seconds after that information, the aircraft struck the ground near the runway.

1.2 Injuries to Persons

Injuries	Flight Crew	Passengers	Others
Fatal	1	1	-
Serious	-	-	-
Light/None	-	-	-

1.3 Damage to Aircraft

The aircraft was destroyed.

1.4 Personnel Information

1.4.1 Pilot in the front left seat

Female, aged 56.

- Aeronautical qualifications:
 - PPL issued by the UK CAA in 1978;
 - SEP rating valid until 26 April 2008;
 - The pilot had been the holder of an MEP rating valid until January 2002.
- Experience:
 - total: 1,497 flying hours, including 71 as captain;
 - on type: 110 flying hours;
 - in the previous 3 months and the previous 30 days: 7 hours on the aircraft, including 4.2 as captain.

1.4.2 Pilot in the front right seat

Male, 67, owner of the aircraft.

- Aeronautical qualifications:
 - PPL issued by DGAC in 1961;
 - PPL issued by the FAA as a "Temporary airman certificate" valid until 4 September 2007 with SE and ME endorsements;
 - MEP IR rating valid until 30 November 2007;
 - Limitations: wearing of corrective lenses and safety glasses in the cabin;
 - The pilot had no instructor rating.
- Experience:
 - total: 3,569 flying hours;
 - on type: 1,306 flying hours;
 - in the previous three months: 28 hours, all on the aircraft;
 - in the previous thirty days: 7 hours, all on the aircraft, including 2.8 as captain.

The two pilots had flown together on all flights over the previous thirty days. Examination of the aircraft owner's logbook shows eight flights listed after 7 August 2007. The following information was indicated in the "Observation" column: the initials of the left-seat pilot followed by "TR" or "PIC"⁽²⁾. Examination of the logbook of the pilot in the left-hand seat shows he had performed 4 of these flights as "captain" and 4 as "co-pilot".

⁽²⁾The commonly accepted meanings of these abbreviations in English in a flight log are TR for "Training" and PIC for "Pilot in command".

1.5 Aircraft Information

1.5.1 Airframe

Manufacturer	Piper Aircraft Corporation
Type	PA 39
Serial number	60
Registration	N13 PF
Entry into service	1970
Certificate of Airworthiness	FAA DART 810262EA
Use on the date of the accident	2,132 h
Since general inspection	137 h

1.5.2 Engines

	Engine No.1 left	Engine No.2 right
Manufacturer	LYCOMING	LYCOMING
Type	IO-320-BIA	IO-320-BIA
Serial number	L-4615-55A	L-177-66A
Installation date	30 November 2005	30 November 2005
Total running time	136.73 h	136.73 h
Operating time since installation	136.73 h	136.73 h

The aircraft was equipped with a stall warning device.

The weight and centre of gravity were within the limits recommended in the airplane flight manual.

1.5.3 Takeoff Performance

According to the flight manual, the takeoff performance for the weight of the aircraft (approximately 1,470 kg), under the pressure, temperature and wind conditions on the day were:

- takeoff roll distance: 220 m;
- take-off distance (to pass a height of 15 m): 365 m;
- Accelerate-stop distance: 550 m.

These performance characteristics are valid for a takeoff with the flaps positioned at 15° and 2 engines operating.

1.5.4 Takeoff speeds

- Rotation: 70 mph;
- Minimum control speed on one engine: 80 mph;
- Speed for best rate of climb: 112 mph on 2 engines, 105 mph on one engine.

The minimum control speed on one engine being greater than the rotation speed, the manufacturer's operations manual recommends accelerating to 80 mph on the ground or at a low height before increasing the climb slope.

In case of flight on only one engine, the manufacturer recommends maintaining a speed above 90 mph. It adds that in no circumstances should the aircraft be flown at a speed below 80 mph, with one engine at full power and the other engine with feathered propeller.

1.5.5 Failure of one engine on takeoff

The procedure recommended in the manufacturer's flight manual is as follows:

- If the remaining distance is sufficient, reduce power and stop on the runway;
- If the distance is insufficient and the speed below 95 mph, reduce power, set the MASTER SWITCH and the tank selector to OFF and continue straight ahead, avoiding obstacles;
- If the distance is insufficient and the speed above 95 mph, the decision to take off on one engine or abort rests with the pilot, based on his/her assessment of the situation.

1.5.6 Failure of one engine during climbout

The recommended procedure in the flight manual is as follows:

- Feather the propeller of the inoperative engine;
- Maintain the speed of the best rate of climb on one engine (105 mph);
- Monitor the temperature of the cylinder.

1.5.7 Stall speeds

- Flaps extended: 76 mph
- Flaps retracted: 70 mph

1.6 Meteorological Conditions

The weather information available at the tower when the accident occurred was as follows:

- Wind 060° at 10 kt;
- QFE 1013 hPa, QNH 1029 hPa;
- CAVOK;
- Temperature 21°C, dew point temperature 14°C.

1.7 Telecommunications

The transcript of the communications between the pilot in the right front seat and the controller at Vannes aerodrome is in appendix 1.

1.8 Aerodrome Information

The plan of the aerodrome is in appendix 2.

1.8.1 Runway

The runway used was the paved main runway 04, which is 1530 m long and 45 m wide. It is usable over its entire length for the take-off run. From runway 04, the aerodrome circuit is performed to the right

1.8.2 Airspace

The aerodrome is controlled according to a schedule defined by NOTAM.

There is no CTR around the Vannes aerodrome. However, given the extensive scale of parachuting there, the airport is included in the R 90 zone which extends from the ground to FL 115, entry into which is only authorised after contacting the Vannes Tower for the AGC VFR.

1.9 Flight Recorders

FAA regulations do not require flight recorders on this type of aircraft. The aircraft was not equipped with any.

1.10 Wreckage and Impact Information

The wreck was lying flat in a field near vegetable crops. The short distance between the impact marks and the wreckage indicates that the airplane had a near vertical trajectory.

The nose of the aircraft and the cabin were broken off. The rear tail section had separated from the fuselage and turned over to the right of the aircraft. A large number of ridges were visible on the wings and fuselage, showing that the aircraft had banked to the right and had a nose-down angle on impact. The landing gear and flaps were retracted. The right propeller blades were slightly bent backwards with no twisting. The left propeller blades were slightly distorted with combined bending and twisting. This suggests that the right engine was delivering less power than the left engine.

The two main tanks contained a large quantity of 100L fuel. Both engines' selectors were positioned on the main fuel tank on the corresponding side.

The six engine control levers were found pulled back.

The landing gear control lever was found in the "extend" position.

Both control columns were blocked slightly tilted to the left and pulled back about 20 cm.

The rudder pedals were in the "neutral" position.

The 2 fuel pump selectors were in the "ON" position.

The 4 magneto selectors were in the "ON" position.

The “cowl/flap” cooling flap lever for the left engine was pulled back; the lever for the right engine was pushed forward.

The checklist for the aircraft was found in front of the right seat pedal system, open on the “Engine Failure” page.

Additional examinations

The wreckage was examined at the Engine Test Centre at Saclay. The results of the examinations were as follows:

Left and right engines:

- no pre-existing defects before the accident was detected on the engine or propeller system,
- at the time of impact, the propeller was in a regulation and timing range close to fine pitch,
- the air and oil supplies were functioning,
- the complete ignition system was operating satisfactorily.

The left engine was delivering power at the time of impact, while the right engine was delivering low power.

There were no anomalies at the level of the fuel system.

The flight controls were functional at the time of impact. All the failures detected were subsequent to impact

1.11 Medical and Pathological Information

An autopsy of the two pilots was performed. No medical or pathological factor liable to be related to the accident was identified.

1.12 Survival Aspects

The violence of the impact left no chance of survival for the occupants.

1.13 Witnesses

A witness of the accident was a private pilot (1,200 flying hours) and the owner of a single-engine aircraft. He had additional aeronautical experience as a former head of the research department at a manufacturer of commercial aircraft. He frequently flies at the aerodrome and lives near Vannes.

He reported that after landing on runway 04, he returned to his hangar, got out of his aircraft, and watched the air traffic. He was about 200 m from runway 04/22 (point T1 on the plan in appendix 2). He heard the power-up of the N13PF engines but could not see the beginning of the acceleration phase due to the runway profile. When he did see it, the aircraft had run about 500 metres. It left the ground after about 800 m from the threshold of runway 04. The witness added that in his opinion the take-off run seemed long. He thought that the speed during takeoff and the climb slope were low. He estimated that the aircraft climbed to a height of about 10 metres. The

aircraft suddenly veered to the right as it was climbing. It tilted about 30° to the right and then stalled. The aircraft struck the ground with a steep nose down attitude. The tail broke off.

The witness then took part in first aid operations.

Three other witnesses located about 400 metres from the runway described the takeoff more succinctly (position T2 on plan)

A witness who was also a private pilot noticed that the engine noise was low in intensity and frequency. Another witness, a private pilot and a builder of light aircraft, observed that the aircraft had a high nose-up attitude after takeoff. Its speed and height seemed low. A third witness noticed that the landing gear was retracted very early after takeoff.

Several people also mentioned the fact that the crew trained regularly and that exercises simulating an engine failure on takeoff were carried out.

2 - ANALYSIS

All the witnesses saw the plane take off at a low speed, climb to a low height and stall to the right. One witness said that the take-off run seemed particularly long. These accounts are consistent with the observations made during the examination of the wreckage, which showed that the right engine was delivering low power. No technical faults with this engine or the corresponding fuel supply system were found. It is therefore likely that the reduced power of the right engine was the result of a deliberate action by one of the two pilots, conducted as part of an engine failure during takeoff exercise.

The rotation speed being less than the minimum air control speed (V_{mcg}) on one engine, managing a failure of this kind is difficult. At low speed, the pilot must quickly reduce the power of the engine running to keep control of the aircraft. Because of the risk associated with flying on one engine at a speed close to the minimum air control speed (V_{mcg}), the manufacturer recommends the take-off be aborted, even if the length of the remaining runway is insufficient.

The pilot failed to maintain the symmetry of the flight and the aircraft rolled. It was not possible to determine if the flaps were retracted at the beginning of acceleration or if they were retracted during the initial climb. In this configuration, given the low speed and the bank angle above zero, the aircraft stalled. The low height prevented either of the pilots from regaining control.

The entries in the flight logs by both pilots show that, although neither had an instructor rating, the owner of the aircraft in the right seat often left the controls to the other pilot. The latter was no longer qualified to fly twin-engine aircraft since 2002. Given her position on the plane, it is likely that she was flying during the accident flight. The purpose of the flights they made together was probably to let the pilot in the left-hand seat continue to fly and train on this type of aircraft, perhaps with a view to obtaining a new MEP rating.

Without the requisite training, the pilot in the left seat probably did not have the necessary skills to improvise and supervise an engine failure during takeoff exercise.

3 - CONCLUSIONS

3.1 Findings

- ❑ The pilot in the right seat and owner of the aircraft held the necessary qualifications to fly the aircraft but not those allowing him to be an instructor.
- ❑ The pilot in the left seat did not possess the qualifications allowing her to fly this aircraft.
- ❑ Examination of the wreckage showed that the right engine was delivering low power. No technical anomalies were found that could explain the accident.
- ❑ The aircraft took off at low speed, stalled, and struck the ground.

3.2 Causes of the accident

The aircraft stalled at a low height during initial climb because of inadequate management of aircraft power and configuration, probably during an engine failure on takeoff exercise.

The decision to perform training flights outside the formal framework of instruction and the lack of the requisite qualifications were major contributing factors in this accident.

List of Appendices

Appendix 1

Transcript of VHF communications

Appendix 2

Plan of Aerodrome

Appendix 1

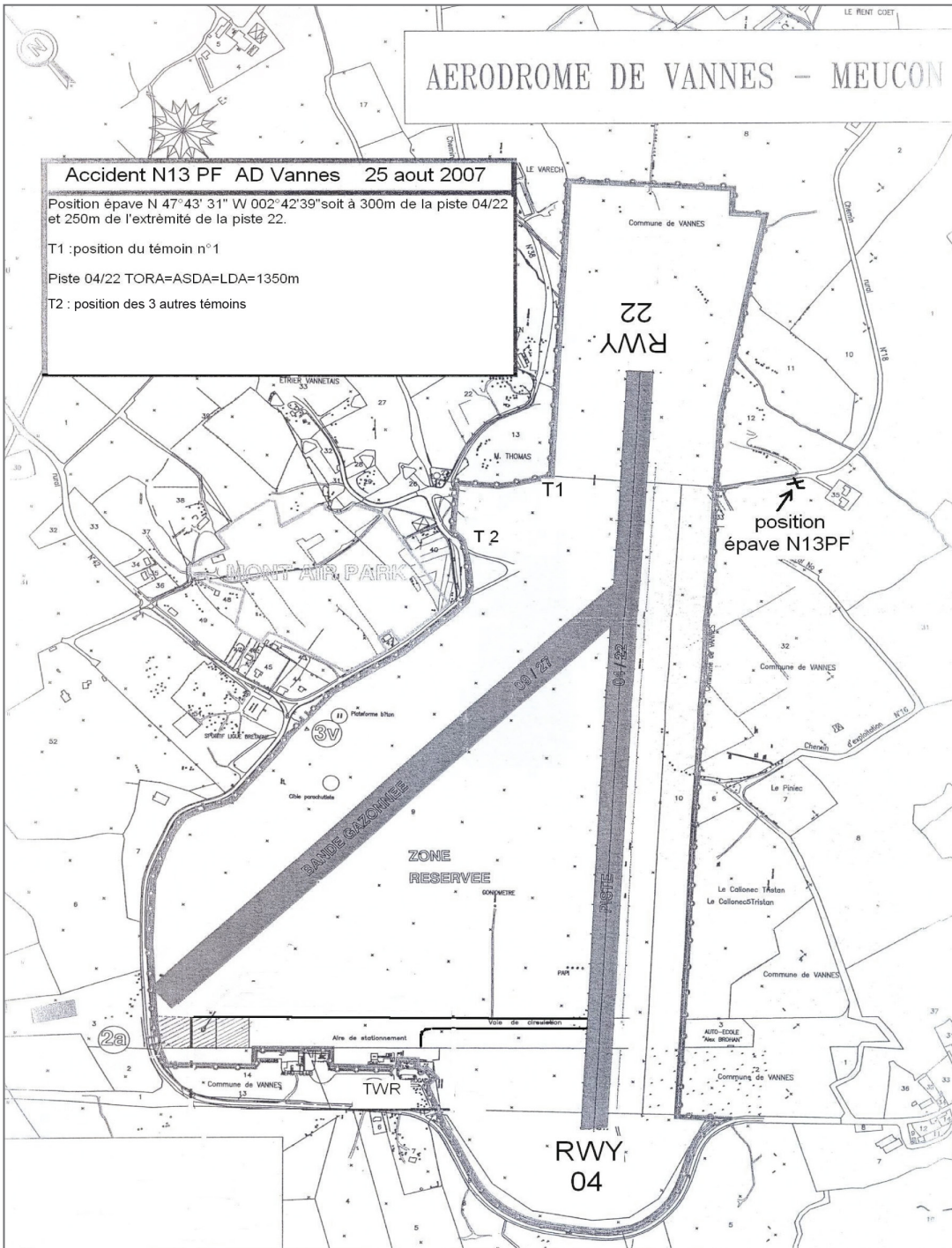
Transcript of VHF communications

Event: 25/08/ 2007
N13PF/ PA30
 Transcript of the VANNES TOWER 122.600 frequency

Broadcasting Station	Receiving Station	UTC (Hr/Min/Sec)	Communications	Observations
N13PF	TWR	161855	Vannes tower N13PF Montair Park parking good day	
TWR	N13PF	161831	good day	
N13PF	TWR		N13PF good day 9Alpha	Entry into reserved zone of aerodrome
N13PF	TWR	161843	Good day (*) good day again, we want to taxi to Bravo, we are going to make two landings and then we would like to work a bit further out.	
TWR	N13PF	161858	PF so I have the XH that's going to make way on Bravo, so according to that you can taxi to bravo for an 04	
TWR	N13PF	161912	With 050 degrees 10 knots currently 1028 1012 and there's some parachuting	
N13PF	TWR	161912	PF let the Jodel pass 04 1028 1012 parachuting N13PF	
		161936 and 162042	Exchanges with AG / XH / SY / PC	Exchanges having no connection with the accident
N13PF	FPRAG	162220	If you like I'll keep right	
F-PRAG	N13PF		No, no, it's okay, I'll go over here and you can pass	
N13PF	FPRAG	162227	Ok thanks a lot	
F- PRAG	TWR		AG so, it's clear	
TWR	FPRAG	162230	C parking	
		162245 entre 1624443	Exchanges with IP / OZ / PY / PC	Exchanges having no connection with the accident
N13PF	TWR	162445	Ready to taxi, at your convenience	Double exchange with SY
		162515 and 162522	Exchanges with SY and IP	Exchanges having no connection with the accident
TWR	N13PF	162528	PF I remind you that I have three aircraft on final	
N13PF	TWR	162536	Yes I heard thanks	
		162536 and 162727	Exchanges with IP / SY / OZ / PC and NJ	Exchanges having no connection with the accident
TWR	N13PF	162950	Right side of the runway you can go up	
N13PF	TWR		We're going up PF	
		163006	Exchanges with IP OZ and SY	Exchanges having no connection with the accident
N13PF	TWR	163120	We're going to the end and lining up	
TWR	N13PF	163120	F line up on 04	

Broadcasting Station	Receiving Station	UTC (Hr/Min/Sec)	Communications	Observations
N13PF	TWR	163128	PF we're lining up	
N13PF	TWR	163302	N13PF lined up	
TWR	N13PF	163302	PF cleared for takeoff 04 060 degrees 10 knots call back tail wind right hand	
N13PF	TWR		Tail wind right hand and if you have a lot of traffic we can do our outside training first, otherwise we'll do a runway circuit	
TWR	N13PF	163326	No there's, there's nobody, there's no problem	
		163326	Exchanges with NJ and OZ	Exchanges having no connection with the accident
N13PF	TWR	163359	Emergency for PF	
		163424	Exchanges with NJ	
NJ	TWR	163440	The twin-engine has crashed while turning right	
Security	TWR	163452	Tower security	
		163513	Exchanges with witnesses in the air to locate PF	
Security	TWR	163914	Tower security	
TWR	Security		Security	
Security	TWR		Can you call the emergency services as quickly as possible?	
TWR	Security		The emergency services were called straight away, within a minute	
Security	TWR	164623	Tower security do you have the emergency services?	
TWR	Security		The emergency services are arriving!	
		164643		The emergency services are at the site

Appendix 2 Plan of Aerodrome



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