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INVESTIGATION REPORT

Accident to Piper PA28
registered **F-HEHM**
on 1 July 2015
at Treilles (Aude)

Photo credit: Dominique WEIGEL

BEA

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

Ministère de la Transition Écologique et Solidaire

Safety investigations

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SPECIAL FOREWORD TO ENGLISH EDITION

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.

Contents

Glossary

AGL	Above Ground Level
AMC	Alternative Means of Compliance
AMSL	Above Mean Sea Level
ASPOC	*Application de Signalisation et Prévision des Orages pour le Contrôle aérien* (Storm cell warning and forecasting application for air traffic control)
ATIS	Automatic Terminal Information Service
ATO	Approved Training Organisation
ATS	Air Traffic Service
AVI	*Affichage et Visualisation des Informations de la navigation aérienne* (Air traffic information display (interface used at Montpellier))
BQI	*Bulletin Quotidien d'Information* (Daily information bulletin)
BTIV	*Bureau de Transmission de l'Information en Vol* (Flight information emission office)
CAVOK	Ceiling And Visibility OK: Ceiling at least above 5,000 ft and visibility above 10 km
CTR	Control Traffic Region
DSNA	*Direction des Services de la Navigation Aérienne* (French air navigation service provider)
ENAC	*École Nationale de l'Aviation Civile* (National School of Civil Aviation)
FIS	Flight Information Service
FSE	*Fiche de Synthèse d'Exploitation* (Technical summary sheet)
GM	Guidance Material
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
INCERFA	Uncertainty phase
LOC	LOCal control position
MAA	*Message d'Avertissement d'Aérodrome* (Aerodrome warning message)
MEP	Multi Engine Piston
METAR	MEteorological Terminal Air Report
PPL	Private Pilot License
RCA	*Règlement de la Circulation Aérienne* (Air traffic regulations)
RoA	Rules of the Air
SCA	*Services de la Circulation Aérienne* (Air traffic services)

SEP	Single Engine Piston
SERA	Standardised European Rules of the Air
SIGMET	SIGnificant METeorological phenomena
SIGWX	Significant weather charts
SMGCS	Surface Movement Guidance and Control System
SNA	*Services de la Navigation Aérienne* (Regional approach and control centre)
TAF	Terminal Area Forecast
TMA	Terminal Manoeuvring Area
TWR	Control ToWeR
UTC	Coordinated Universal Time
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

Synopsis

Time	11:30[1]
Operator	Private
Type of flight	General aviation, cross-country
Persons on board	Pilot
Consequences and damage	Pilot fatally injured, aircraft destroyed

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

Collision with terrain in cruise in adverse meteorological conditions

The pilot was carrying out a ferry flight under VFR from Montpellier bound for Perpignan (in Pyréneés-Orientales) along a coastal route known to him.

A layer of cloud covered all of the coastal region at daybreak. The weather forecasts indicated that they would become favourable at the end of the morning. At Montpellier aerodrome (in Hérault), a marked improvement in the meteorological conditions was observed at around 10:30. Already, Perpignan aerodrome, closed to VFR traffic on opening at 6:30 due to the meteorological conditions was in special VFR conditions at 8:00.

However, the ceiling below 500 ft around reporting point NL (north of Perpignan CTR), not shown on the weather charts, made the continuation of a VFR flight on a coastal transit impossible at this point.

Two other aeroplanes which were flying a coastal transit from Montpellier had reported to Montpellier Approach control their decision to divert due to the adverse meteorological conditions present around NL.

The pilot of F-HEHM, approaching NL and in radio contact with Montpellier Approach, had started descending due to the cloud layers without asking for weather information or help from the control unit. The controller asked him to maintain VMC conditions.

The pilot curved landwards, advising that he was flying around a cloud layer.

Witnesses in Treilles (village in Aude) saw the aeroplane fly under the cloud layer. In this area, the reduced visibility may have prevented the pilot from identifying sufficiently early, the high terrain in front of him, possible frequency changes may have contributed to the high terrain not being detected in time.

F-HEHM flying at cruise speed and at an altitude of 690 ft, struck high terrain close to Treilles, the peak of which was at that time in fog.

The investigation brought to light that the pilot's determination to get to his destination, overconfidence due to his very good knowledge of the route and the proximity of the destination aerodrome may have led him to continue the flight despite the deterioration in conditions.

In such a situation, an outside aid can help a pilot relinquish his initial intentions and lead him to anticipate a modification in his flight path or envisage turning around.

The systematic passing on, to VFR pilots, of information related to meteorological conditions making the continuation of the VFR flight impossible, and pilot reports was not one of the practices of the control unit.

This information was not given during the controller handovers which meant that it was not possible to guarantee that the controllers starting their duty had knowledge of it.

The BEA has addressed two safety recommendations to the DGAC regarding:

- the effective provision of the Flight Information Service (FIS) by the control services, as described in European regulation No 923/2012 (SERA);
- informing and raising awareness of general aviation pilots with respect to the issuing of air reports.

The BEA has addressed two safety recommendations to the DSNA regarding:

- the setting up of an effective system for processing VFR pilot reports received by the control centres;
- the transmission during controller handovers, of pilot reports or meteorological conditions likely to affect the continuation of a VFR flight.

1 - FACTUAL INFORMATION

1.1 History of the flight

The head of training of a commercial pilot flight training school based at Perpignan planned to return a (twin-engine) Piper PA34, hired by the school for a specific need, to Montpellier in the afternoon of 1 July 2015. He intended to use this as an opportunity to pick up the school's PA28 F-HEHM which had been left on the tarmac at Montpellier airport.

In the morning of 1 July 2015, the owner of the PA34 decided that he would get his twin-engine at Perpignan by ferrying F-HEHM under VFR.

The same day, the pilot of a DR400 (hereafter called aeroplane A) was carrying out a pleasure flight under VFR from Montpellier with a view to flying along the coast to the Spanish border and then returning to Montpellier. At 10:53, while he was flying above a layer of overcast clouds, the pilot decided to turn back near Port Leucate (NL, on the coast north of Perpignan airport) due to adverse meteorological conditions. He informed the Montpellier Approach controller with whom he was in radio contact of his decision (**Point A1 of Figure 1**).

At 10:56, while the pilot of F-HEHM was at the holding point with a view to taking off, he received a call from the head of training of the Perpignan school. During this brief conversation, the pilot informed him of his intention of returning F-HEHM to him.

At 10:59, he took off from runway 12R at Montpellier and then turned to follow the coast to Perpignan. He initially maintained an altitude of 2,000 ft as required by the tower controller and then climbed to 3,500 ft, in radio and radar contact with Montpellier Approach.

At 11:07, the crew of another aeroplane, a PA28 (called aeroplane B) carrying out a training transit flight along the coast from Montpellier to Spain under a VFR flight plan decided to turn back near Port Leucate because of the low ceiling at this point which did not permit the flight to be continued under VFR. They turned back at an altitude of 340 ft (**Point B2**) and informed the Montpellier Approach controller of this situation.

At 11:11, the team of controllers on duty on the Montpellier Approach frequency was relieved.

At 11:16, the crew of aeroplane B flying along the coast in a north-easterly direction observed meteorological conditions were improving, started climbing to 2,000 ft and turned left to see if the weather was better further north. The controller on duty on the Montpellier Approach frequency asked them to specify their intentions in order to make the necessary modifications to the flight plan (**Point B5**).

The instructor onboard aeroplane B specified to the controller that the weather conditions were very bad on the coast, that they had found good conditions inland west of Béziers (Hérault) and that they were going to try and continue their flight (**Point B6**).

At 11:19, over the sea, to the south-east and abeam of Béziers, the pilot of F-HEHM asked to descend to an altitude of 2,000 ft; Montpellier Approach cleared this and asked him to call back at NL (**Point 2**).

At 11:24, abeam Narbonne, he asked to descend to 1,000 ft to pass under the cloud layer (**Point 3**).

At 11:26, he said that he had come out of the clouds at 800 ft and was heading toward the coast, the controller aksed him to maintain VMC conditions (**Point 4**).

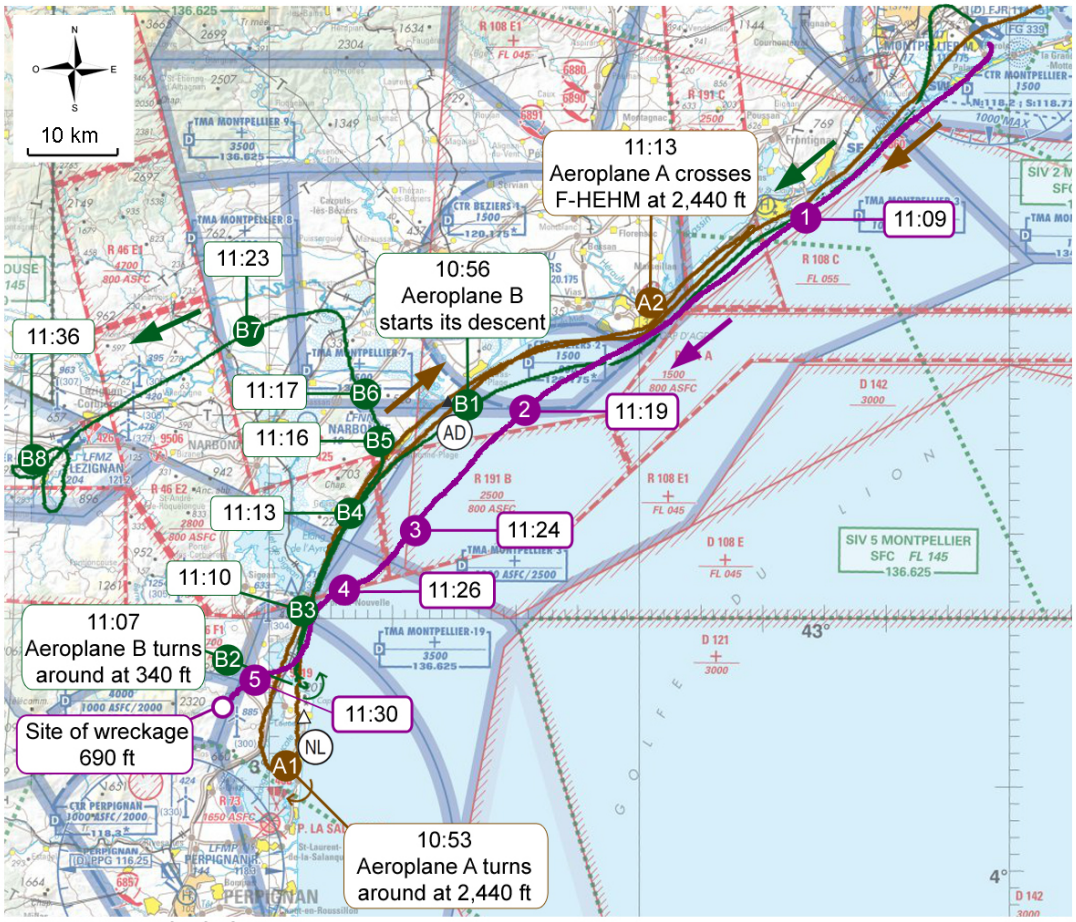
He flew along the coast between 800 and 900 ft for a few minutes and then turned right inland, heading to an area of higher ground with its highest point reaching 2,320 ft. The Montpellier Approach controller asked him if he was en route for Perpignan; he said yes and informed the controller that he was flying around a cloud mass.

At 11:30, the controller asked him to contact the Perpignan tower; the pilot of F-HEHM read this back (**Point 5**).

The radar contact was lost around 25 s later. No call was recorded by the Perpignan control tower.

A fire officer stationed in the fire watchtower on the top of a hill near the village of Treilles heard a rubbing sound followed by an explosion and contacted the emergency services.

At 11:36, the crew of aeroplane B observed that the valley was completely overcast and decided to land at Lézignan airport.



Basemap source: IGN/OACI

Excerpts of some of the radio exchanges between F-HEHM, aeroplane B and Montpellier approach:

1 The pilot of F-HM checks in with Montpellier APP

B3 The pilot of aeroplane B advises that he is turning around due to the weather in the region of NL

----------*The controllers on the frequency are relieved*----------

B4 The pilot of aeroplane B advises that there are very good conditions in the region of AD

B5 The pilot of aeroplane B asks for clearance to cross the Béziers runway axes to see whether the weather is better to the north

B6 The pilot of aeroplane B advises that there are adverse weather conditions on the coast

2 The pilot of F-HM asks for clearance to descend to 2,000 ft.
The controller clears him and asks him to call back at NL

B7 The pilot of aeroplane B says that he has very good conditions heading towards Lézignan

3 The pilot of F-HM asks for clearance to descend to 1,000 ft in order to pass under the cloud layer

4 The pilot of F-HM advises that he is at 800 ft level with the cloud layer and that he is going to descend. The controller asks him to keep VMC conditions

5 The controller asks the pilot of F-HM if he is heading to Perpignan. The pilot indicates that he is flying around the cloud layer. The controller asks him to contact the Perpignan tower on 118.3

Flight paths taken from Montpellier secondary radar data:

- Flight path of F-HEHM from first to last recorded point
- Partial flight path of aeroplane A between 10:30 and 11:27
- Flight path of aeroplane B from first to last recorded point

The times are local time.They have been rounded to the closest minute.

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Figure 1: paths of F-HEHM, aeroplane A, aeroplane B and excerpts from radio exchanges

1.2 Injuries to persons

The occupant of the aeroplane was fatally injured.

1.3 Damage to aircraft

The aeroplane was destroyed.

1.4 Other damage

Not applicable.

1.5 Pilot information

1.5.1 F-HEHM pilot

The pilot, aged 54, held a Private Pilot Licence - Aeroplanes (PPL(A)) issued in 2012 associated with valid SEP and MEP ratings. He did not have an instrument rating.

The last entry in his logbook was dated 28 May 2015, i.e. a little over one month before the accident.

He had logged 470 flight hours at this date of which:

- 360 h as pilot-in-command;
- 409 h on SEP aeroplanes;
- 61 h on MEP aeroplanes;
- 14 h in dual control in instrument flight conditions.

The pilot had a twin-engine Piper PA34 acquired in 2014 with which he had carried out his MEP class rating training in May 2014 and which he regularly used for VFR flights.

From time to time, he hired out this aeroplane to flight training schools.

In addition, he was a member of an aero-club based at Montpellier. In the club, he had performed 11 flight hours in the last 12 months up to 12 April 2015 on various single-engine aeroplanes, a Cirrus SR20 equipped with EFIS (two hours), a Diamond DA40 (three hours) and a Piper PA28 (three hours) along with aerobatic training on a Cap10 (three hours).

The logbook showed that the pilot had performed seven flights between Montpellier and Perpignan between 21 January and 28 May 2015, all under VFR.

According to the information gathered, he had never flown F-HEHM before this ferry flight.

1.5.2 Pilot of aeroplane A

The pilot said that he was 59 years old, held a PPL(A) obtained in 2010 and had logged around 190 flight hours under VFR on SEP aeroplanes.

He was accompanied by three passengers.

1.5.3 Pilots of aeroplane B

A student pilot and his instructor were onboard the aeroplane:

- The student pilot in the left seat held a PPL(A) obtained in 2016 and had an experience of around 130 flight hours; he was performing a cross-country flight under VFR between Geneva (Switzerland) and Ampuriabrava airport (Spain).
  This cross-country foreign flight was a prerequisite to obtaining the authorization from his aero-club based at Geneva (Switzerland) to perform foreign flights.
- The instructor in the right seat held an Airline Transport Pilot Licence (ATPL(A)) and said he had logged a total of around 23,000 flight hours.

As the instructor managed the diversion when they encountered adverse meteorological conditions along with all the radio conversations with the control services during the event, he will be referred to as the "pilot" of aeroplane B. The pilot in the left seat will be referred to as the "student pilot".

1.6 Aircraft information

The PA28-181 is an aeroplane equipped with a 180 hp Lycoming O-360 engine.

F-HEHM was equipped with Avidyne avionics including an electronic navigation system and a moving map. It had been exclusively operated since March 2015 by a flight training school based at Perpignan for its commercial pilot training needs and was not under a hire agreement with a third party.

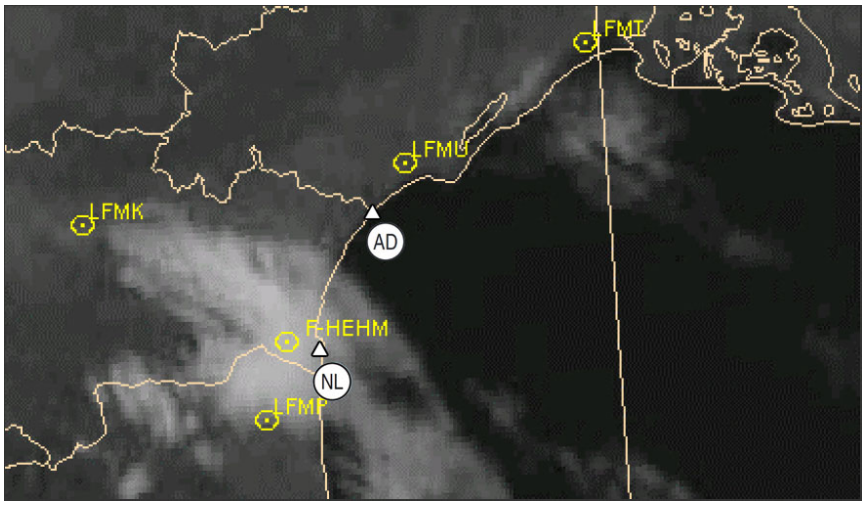
1.7 Meteorological information

1.7.1 Meteorological situation

On 1 July 2015, despite a high pressure field and general good weather over the south of France, the air flow over the Pyrénées produced low clouds over the Golfe du Lion.

A layer of cloud covered all of the Golfe du Lion at daybreak. It broke up over the Montpellier region around 10:30 and only concerned the section between Narbonne and Perpignan at 11:00. The situation remained stable up to around 12:30.

The accident site is situated in the geographical portion where the terrain is at its highest and where the layer of cloud was the most dense.



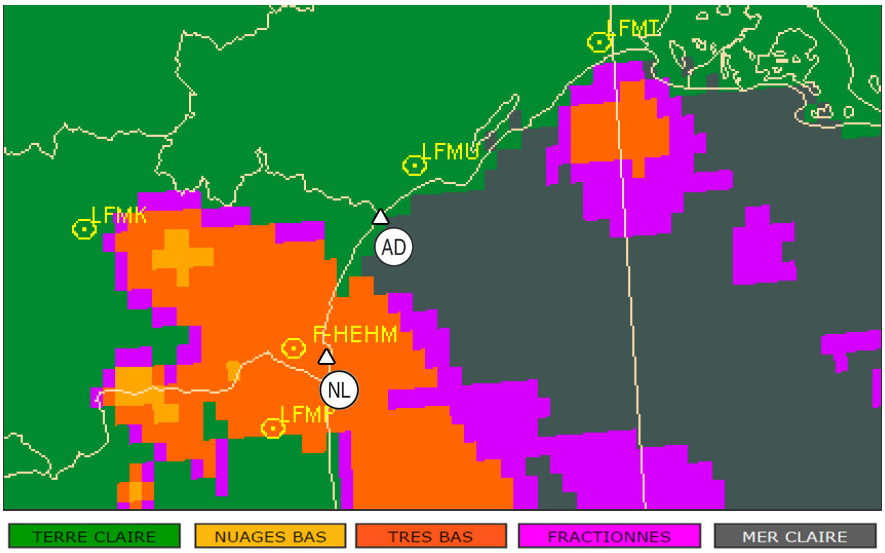
Source: Météo-France

Figure 2: satellite image of 1 July 2015 at 12:00[(2)]

[(2)]Satellite images available in real time on https://aviation.meteo.fr

Key

LFMT: Montpellier airport
LFMU: Béziers airport
LFMP : Perpignan airport
LFMK: Carcassonne airport
F-HEHM: site of F-HEHM accident
(AD) **and** (NL) : reporting points shown on the Perpignan visual approach chart



Source: Météo-France (document created for the needs of the investigation)

Figure 3: cloud classification on 1 July 2015 at 12:00

Key

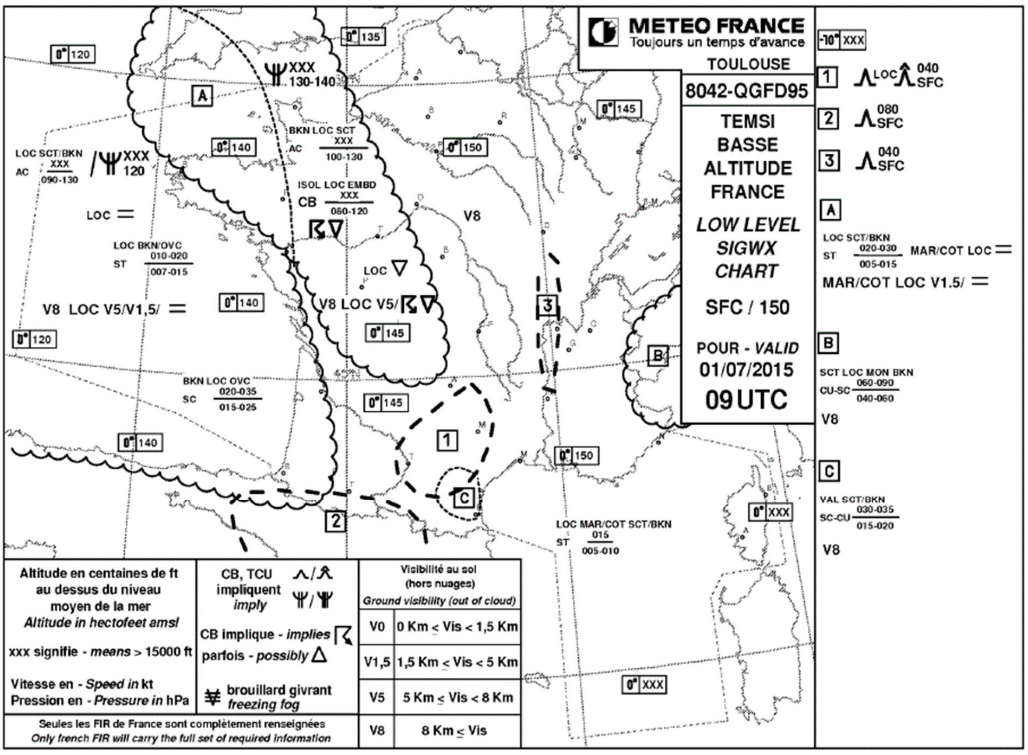
LFMT: Montpellier airport
LFMU: Béziers airport
LFMP : Perpignan airport
LFMK: Carcassonne airport
F-HEHM: site of F-HEHM accident
(AD) and (NL): reporting points shown on the Perpignan visual approach chart

1.7.2 Weather forecasts

The SIGWX chart France for 1 July 2015 at 11:00 (Figure 4) forecast clear weather in an area covering two-thirds of southern France.

The area in which the accident occurred was situated in this area; only the following information was given:

- Visibility of 8 km or more.
- A zone marked out with dashes showing local clouds in the valleys, with a cloud base at 1,500 ft. The coastal route from Montpellier to Perpignan was tangential to this cloud zone.
- Local stratus clouds on the coast or at sea with a cloud base at an altitude of between 500 and 1,000 ft; this information was positioned on the Mediterranean sea.



Source: Météo-France

Figure 4: SIGWX chart France - forecast situation at 11:00

The TAFs forecast for the morning of 1 July 2015:

- **At Montpellier**
  Visibility of 7 km and scattered clouds at 1,000 ft, with temporarily from 08:00 to 10:00, fog with a visibility of 500 m, improving between 10:00 and 12:00 to obtain visibility greater than 10 km and CAVOK.

- **At Béziers**
  Visibility greater than 10 km and a clear sky with temporarily between 8:00 and 11:00, broken clouds at 1,000 ft, with a 30% probability of temporarily having fog between 08:00 and 09:00 and broken clouds at 500 ft, improving between 12:00 and 14:00 to obtain visibility greater than 10 km and a completely clear sky up to at least 5,000 ft.

- **At Perpignan**
  Visibility greater than 10 km and overcast at 600 ft with a 30% probability of having haze between 08:00 and 11:00 and overcast at 300 ft, improving between 11:00 and 13:00 to obtain a visibility greater than 10 km and a completely clear sky up to at least 5,000 ft.

The TAFs in full can be found in appendix 2.

1.7.3 Meteorological Terminal Air Reports

The METARS indicated that:

- **At Montpellier airport**
  at 10:30, visibility was greater than 10 km and clouds scattered at 1,600 ft;
  (*at 11:30: visibility was greater than 10 km with few clouds at 1,600 ft*)[3].
- **At Béziers airport**
  at 10:30, visibility was greater than 10 km and clouds broken at 1,800 ft;
  (*at 11:00, visibility was greater than 10 km and clouds scattered at 1,900 ft*)[3].
- **At Perpignan airport**
  at 10:30, visibility was greater than 10 km and clouds broken at 900 ft;
  (*at 11:00: visibility was greater than 10 km and overcast at 800 ft*)[3].

The METARs in full can be found in appendix 2.

[3]The weather reports published after the pilot's departure from Montpellier are shown in italics in brackets.

1.7.4 ATIS Messages

The ATIS messages issued by the Perpignan tower indicate:

- at 10:00: ILS Z runway 33 – Runways 33 and 31 in use – special VFR – wind 080° 11 to 14 kt – visibility greater than 10 km – Broken clouds at 900 ft and 1,600 ft;
- at 11:00: ILS Z runway 33 – Runways 33 and 31 in use – special VFR – wind 070° 11 to 13 kt – visibility greater than 10 km – overcast at 900 ft;
- at 12:15: ILS Z runway 33 – Runways 33 and 31 in use – special VFR – wind 070° 8 to 13 kt – visibility greater than 10 km – Broken clouds at 1,000 ft.

The ATIS messages indicated that:

- Perpignan airport was closed to VFR traffic on opening at 06:30 due to the meteorological conditions;
- at 08:00, as the conditions had improved, the airport was operating in special VFR conditions;
- at 13:00, the special VFR conditions were lifted due to the good weather conditions.

1.8 Aids to navigation

The aeroplane was equipped with an onboard avionic system with display screens which included a moving map and a GPS system.

The investigation was not able to determine if the pilot had used this function during the flight.

An iPad tablet was present in the aeroplane. The damage to the tablet following the accident and subsequent fire meant that it was not possible to determine if it was being used by the pilot for navigation.

1.9 Communications

1.9.1 Airspaces crossed during flight

The pilot initially requested an altitude of 2,500 ft and then 3,500 ft when he was in contact with Montpellier Approach.

The aeroplane was then flying in controlled airspace (class D).

When he descended through 2,500 ft (point 3), he left the class D airspace and flew in class G (uncontrolled airspace) up until the accident.

The route (bearing 230°) followed by F-HEHM would have led the pilot into the Perpignan controlled airspace (class D) less than two minutes after his last radio exchange with the Montpellier Approach.

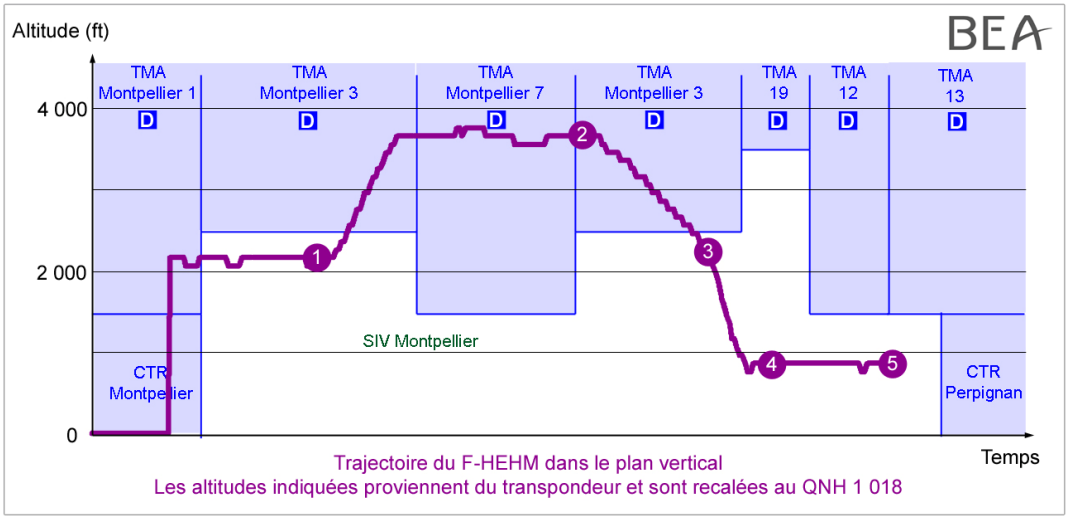


Figure 5: vertical profile of F-HEHM flight path

1.9.2 Radio exchanges

For all of his flight, the pilot was in radio contact with the Montpellier control unit, on different frequencies according to his flight phase.

All the radio exchanges between aeroplane A, aeroplane B, F-HEHM and the Montpellier Approach controllers took place in French on the 130.85 MHz frequency.

Following the Montpellier Approach controller's request at 11:30 to switch to the Perpignan control tower frequency (**point 5** of Figure 1), no radio call was recorded by the Perpignan control tower.

Time (local)	Flight phase	Unit
10:51 to 10:58	Taxiing	Montpellier Ground
10:58 to 11:08	Take-off and start of cruise at 2,000 ft	Montpellier Tower
11:08 to 11:30	Cruise at 3,500 ft and descent	Montpellier Approach

Figure 6: table summarizing different air traffic control units contacted by the pilot of F-HEHM

At 11:30, the Approach coordinator on duty called the Montpellier tower manager in order to inform him of the loss of radio and radar contact with F-HEHM and to start the alert phases. The controller advised the tower manager of his concern, particularly as the aeroplane was descending in an area of high terrain.

The tower manager said that he was going to start the alert phases and then called the unit concerned.

At 11:40, the tower manager called the BTIV in order to initiate the INCERFA[4]. The BTIV suggested passing directly to the ALERFA[5] in view of the elements transmitted.

At 12:02, the tower manager called back the coordinator in order to have more detailed information about the last known position of F-HEHM and to guide the SAMU[6] rescue helicopter which was in the area for the search. The search was hampered by the adverse weather conditions (low clouds). The coordinator told the tower manager that aeroplane B had been in difficulty in the same area, that he had tried to pass by the north and that he had finally diverted to Lézignan airport.

[4] Uncertainty phase.

[5] Alert phase.

[6] French emergency medical services.

1.10 Aerodrome information

Not applicable.

1.11 Flight recorders

The F-HEHM was not equipped with a flight recorder. It is not a regulatory requirement.

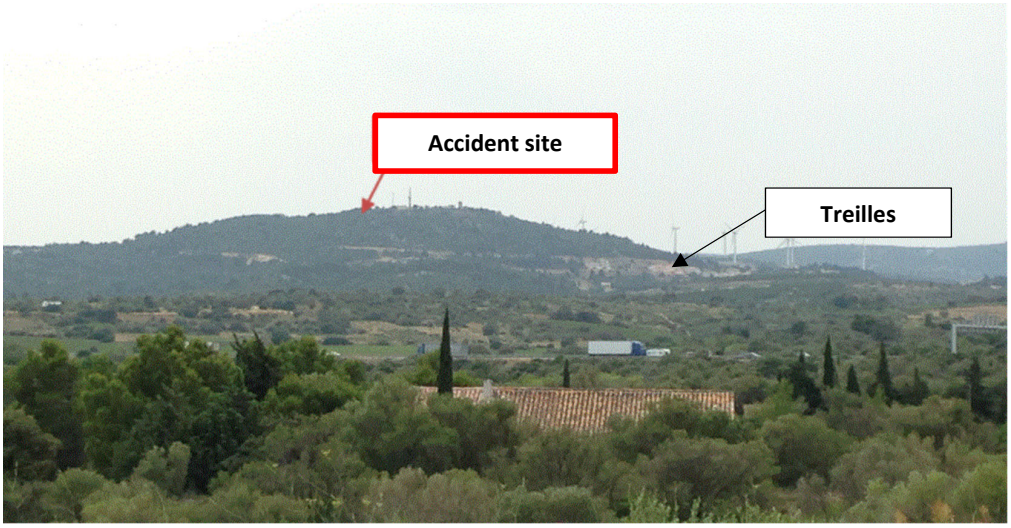
1.12 Wreckage and impact information

The division of the debris into two clear zones and the scars on the vegetation indicate two points of impact with the ground.

The parts found starting from the first point of impact in the vegetation showed that the aeroplane had struck the ground with its wings relatively level, bounced over around 50 m and then made a high-energy impact with the ground a second time. The aeroplane then slid over several metres towards the top of the slope before catching fire.

The parts found at the second point of impact were the propeller, engine and landing gear. The examination of the engine found that it had been producing high power at the impact.

It was not possible to determine the radio frequency displayed at the time of the accident.



Source: BEA

Figure 7: hill and Treilles village

Source: GTA

Figure 8: aerial view of the accident site

The examination of the wreckage found that at the time of the impact with the terrain, the aeroplane was complete and the movable surfaces in place. No anomaly which could have contributed to the accident was identified.

All the damage observed on the wreckage was the consequence of the aeroplane's collision with the terrain and the fire which followed.

1.13 Medical and pathological information

An autopsy was carried out on the pilot's body. It did not bring to light any element that might have contributed to the accident.

1.14 Fire

The fire which followed the impact spread to the surrounding vegetation.

The fire fighting services arrived around twenty minutes after the accident and contained the fire.

There were no third-party injuries or damage.

1.15 Survival aspects

The violence of the impact and the fire which followed left no possibility for the occupant to survive the accident.

The fire officer in the fire watch tower situated around 100 m from the accident immediately contacted the emergency services. The wreckage was accessible from the road leading to the watch tower on the ridge of the hill.

1.16 Tests and research

Not applicable.

1.17 Organizational and management information

1.17.1 Rules of the air – SERA[7]

1.17.1.1 Regulations in force

The regulations concerning the rules of the air are currently in transition from the French regulations (RCA, SCA and RDA) to the European regulations (SERA and Part ATS).

At the date of the event, the following regulations were in force:

- SERA A and B implemented 4 December 2014;
- RCA3 partially modified in December 2014.

1.17.1.2 Responsibilities of pilot-in-command and minimum flight height

SERA.2010 states that the pilot-in-command of an aircraft shall, whether manipulating the controls or not, be responsible for the operation of the aircraft. However, he may depart from these rules in circumstances that render such departure absolutely necessary in the interests of safety.

In addition, before beginning a flight, the pilot-in-command of an aircraft shall become familiar with all available information appropriate to the intended operation.

[7] Commission implementing regulation (EU) No 923/2012 of 26 September 2012 (SERA) laying down the common rules of the air and operational provisions regarding services and procedures in air navigation.

Minimum flight height

The regulations require a minimum flight height of 500 ft above the ground or water and obstacles within a radius of 150 m, outside of congested areas of cities, towns or settlements or over an open-air assembly of persons (SERA 5005 f).

1.17.1.3 VMC conditions

The VMC conditions are determined so that an aeroplane flying under VFR has external visual references to safely fly and comply with the "*see and avoid*" principle with respect to terrain and other traffic.

Part 5 of the SERA defines the different meteorological conditions required according to the type of aircraft, type of flight and class of airspace in which the aircraft is flying.

Apart from special VFR flights (cf. below), the VMC conditions applicable to the F-HEHM flight according to the SERA are the following:

- In class D airspace:
  minimum flight visibility of 5 km and a distance from cloud of 1,500 m horizontally and 1,000 ft vertically.
- In class G airspace and below an altitude of 3,000 ft:
  minimum flight visibility of 5 km (*), clear of cloud and with the surface in sight.

(*): Case where flight altitude is below 3,000 ft or 1,000 ft from terrain, in class F or G airspace:

The European text specifies that when so prescribed by the competent authority, flight visibilities reduced to not less than 1,500 m may be permitted for flights operating at speeds of 140 kts IAS or less to give adequate opportunity to observe other traffic or any obstacles in time to avoid collision.

The French supplement FRA.5001(***)a) states that for this case, the required flight visibility for aeroplanes is 1,500 m, if the indicated airspeed is 140 kt or less (case of F-HEHM).

1.17.1.4 Special VFR

Special VFR are rules which allow an aircraft to get to an aerodrome when the prevailing conditions at this aerodrome are below the VMC conditions applicable to the class of airspace of the associated control area, i.e. usually a minimum visibility of 5 km and a ceiling of 1,500 ft in order to comply with the vertical distance to cloud of 1,000 ft.

A special VFR clearance is required before entering or flying in a controlled zone when the pilot considers that the visual meteorological conditions are not present or will not be present.

1.17.1.5 Flight information service (FIS)

The purpose of the FIS is to provide advice and information useful for the safe and efficient conduct of flights.

In class D airspace, all aircraft automatically benefit from the flight information service.

In class G airspace, the VFR flights benefit from a flight information service as soon as radio contact is established.

SERA 9001 states that the "*Flight information service shall be provided by the appropriate air traffic services units to all aircraft which are likely to be affected by the information and which are:*

(1) provided with air traffic control service; or

(2) otherwise known to the relevant air traffic services units."

❒ Information contained in the FIS

Part 9 of the SERA gives details about the scope of the FIS.

Article SERA.9005 indicates in particular that the "*Flight information service provided to VFR flights shall include, in addition to that outlined in (a), the provision of available information concerning traffic and weather conditions along the route of flight that are likely to make operation under the visual flight rules impracticable.*"

It should be noted that the wording "on the pilot's request" which was mentioned in the previous French regulations (SCA) has been deleted from the SERA concerning the FIS.

The national supplement drawn up by the French authorities (FRA.9005c) specifies that the available information concerning traffic and weather conditions along the route is that which is known to the controller.

The DSNA specifies that the word "controller" in the French supplement corresponds to the physical person in radio contact with the aircraft concerned and not the overall control unit.

- Weather conditions reported or forecast at departure and destination aerodromes (SERA.9005 b) 1)).

Article SERA.9005 b) 1) adds that the FIS will include weather conditions reported or forecast at departure, destination and alternate aerodromes. The associated GM explains that pilots must normally obtain information about the meteorological conditions before their flight. Information which is pending or relevant to safety will normally be provided by radio communication when it is available.

- Transmission of an ATIS message (SERA.9010)

In article SERA.9010, it is indicated that the ATIS messages include meteorological information about the aerodrome concerned and information essential for operation. When requested by the pilot, the applicable ATIS message(s) shall be transmitted by the appropriate air traffic services unit.

Aircraft shall acknowledge receipt of the information upon establishing communication with the ATS unit providing the approach control service or with the aerodrome control tower. Information contained in a current ATIS, the receipt of which has been acknowledged by the aircraft concerned, need not be included in a directed transmission to the aircraft. However, if an aircraft acknowledges receipt of an ATIS that is no longer current, any element of information that needs updating shall be transmitted to the aircraft without delay.

1.17.1.6 Aircraft observations

Regulations

Part 12 of the SERA deals with aircraft observations (air-reports) and their transmission by voice communication. It states, in particular, that a pilot-in-command shall report any observation when he considers that it may affect the safety or markedly affect the efficiency of other aircraft operations (other non-routine aircraft observations).

The ATS units shall transmit, as soon as practicable, the air-reports to the other aircraft concerned.

The transmissions to aircraft shall be repeated at a frequency and continued for a period of time which shall be determined by the ATS unit concerned.

1.17.2 Montpellier control unit

1.17.2.1 Organisation of centre

General organization

The traffic managed by Montpellier is composed of VFR and IFR flights broken down into around 100,000 VFR and 50,000 IFR movements per year. The commercial traffic represents 30 to 40% of the IFR flights. The Montpellier unit explained that the three schools based in the sector generated 60 to 70% of the IFR traffic which leads to a work load which is variable and difficult to anticipate. The VFR traffic is of a strong seasonal character.

The approach room is managed by the tower manager.

The nominal configuration is the following:

Sector FE east (east):	Coordinator[8] + radar controller[9]
Sector FA west (west):	Coordinator + radar controller
FIS:	1 controller

Consolidation

Sectors are opened on the day itself by the tower manager according to the forecast workload. The planned configuration can be modified according to the forecast workload or weather. In particular, a peak in the workload can occur on the transition between a good weather situation and the arrival of low clouds. Sectors FA and FE can be combined taking into account the density and complexity of the traffic.

[8] This controller is not on the frequency. He works in a team with the radar controller to, in particular, coordinate the various traffics for which they are responsible.

[9] Controller on the frequency who communicates with the crews.

FIS sector

The Montpellier FIS sector corresponds to a sector extending from the ground to FL145 managed by Montpellier and shown on the pilot navigation charts with the associated frequency (136.625 MHz).

In the Montpellier approach room, the FIS position is generally combined with the FE and FA sectors. The decision to open the FIS is taken according to the VFR traffic flows, in particular, in the case of specific events such as air rallies, and staff availability.

The Montpellier unit said that the FIS position is opened when required by the amount of VFR traffic, and the staff numbers permit it. The majority of the time, the FIS position is combined with the approach positions. It added that splitting is not the ideal solution in terms of workload as the coordination action is time consuming.

In addition, the complexity of the airspaces in the zone south of Montpellier requires numerous frequency changes when the FIS is split, when leaving and entering class D airspace, even if the pilot remains at the same altitude (cf. Figure 5). Combining the FIS frequency with sectors FE or FA overcomes this problem.

When the FIS is combined with the Approach control and when the controller's workload permits it, the aircraft flying in class G airspace are kept on the frequency and thus benefit from the traffic information.

Relieving

It takes between one and five minutes for a controller to be relieved. The information handed over concerns the traffic and zone activity. The Montpellier controllers said that information on the weather situation is not one of the elements generally communicated during the handover.

The Montpellier control unit specified that formalization actions are in progress in order to define good practices in the context of the handover.

Situation at time of event

The day of the event, the approach sectors FA and FE were split. The FIS sector was combined with the approach frequencies. An unidentified call arrived on the incorrect sector (FE) for an unknown aeroplane. The attention of the two FE and FA control position coordinators was occupied to a large extent by this.

There was a partial handover at 11:11: the radar controller was replaced.

Around ten minutes later, the coordinator was replaced and the handover finalized.

Meteorological information available to Montpellier controllers

The Montpellier unit operation manual details the tools available (weather observed, SMGCS interface, ASPOC interface) and the aviation weather reports available (TAF, METAR and MAA). At the date of the event, it did not contain specific information about the procedures for transmitting the meteorological elements relating to the flight information service to crews of VFR flights (excluding IFR conditions, special VFR, wind in landing phase).

The Montpellier controllers have meteorological information from various sources:

- **SMGCS**: This system procures the METAR, aerodrome TAF and SIGMET information. These elements can be communicated to pilots as part of the flight information service, the time delta can be one hour. The interface requires the user to browse the menu pages, the information not being directly displayed and continuously visible.
- **AD warning**: Aerodrome warning messages
  These messages advise of forecast exceptional phenomena which could damage aircraft on the ground such as: strong wind, violent rain, snow, etc. No AD warning is issued for low clouds. The messages, primarily intended for aerodrome operators, also arrive in the tower manager's mailbox with a discrete warning on the screen. At Montpellier, the tower only receives messages concerning Montpellier.
- **ASPOC WEB** system: This is a web application designed by Météo-France which shows the storm cells (past and extrapolated positions). It does not display cloud layers.

1.17.2.2 Coordination with Perpignan regarding special VFR and ATIS

Special VFR

Perpignan airport is situated in class D airspace (Perpignan control unit) and the visual approach chart specifies the meteorological minimas applicable for aeroplanes arriving under special VFR:

- When there is IFR traffic in progress:
  - visibility of 3,000 m;
  - ceiling of 1,000 ft.
- When there is no IFR traffic in progress:
  - visibility of 1,500 m;
  - no ceiling or vertical distance to clouds is specified.

In practice, the Perpignan control service applies traffic segregation and systematically holds a special VFR flight when there is IFR traffic proceeding to Perpignan.

When Perpignan airport is under special VFR, the controller calls the Montpellier tower manager to inform him of this. The tower manager then fills in an AVI interface and the information is displayed on each AVI unit located above each workstation.

A new call is made when the special VFR conditions are lifted at Perpignan and the information is updated on the AVI displays in the Montpellier Approach room.

In the absence of IFR traffic proceeding to Perpignan, information about the special VFR conditions is not given to the VFR traffic by the Montpellier control unit and there is no coordination between the two control units.

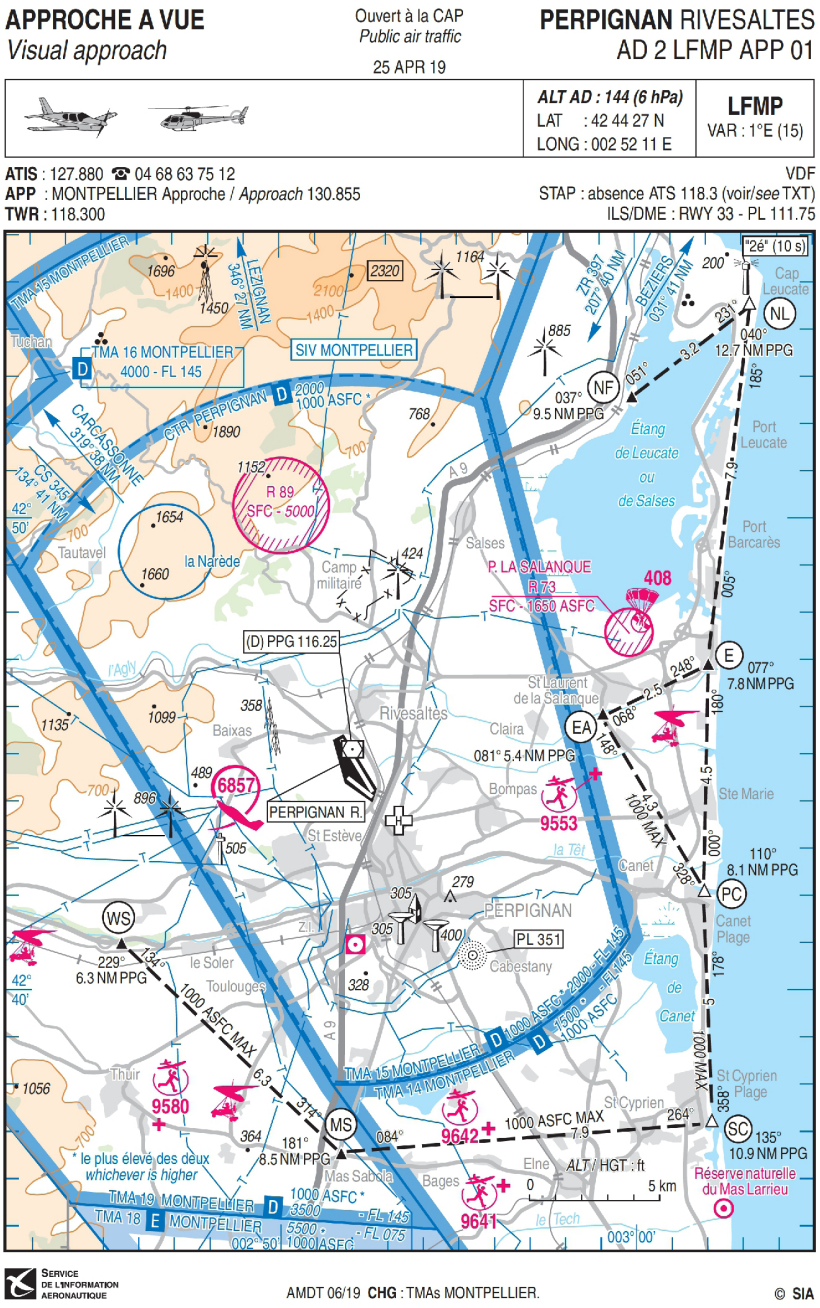


Figure 8: excerpt from Perpignan visual approach chart

Perpignan ATIS

The Montpellier control services said that VFR pilots bound for Perpignan are not in the habit of acknowledging receipt of the ATIS message when they are in contact with Montpellier Approach. The VFR flights are transferred sufficiently early for the pilots to have time to obtain the ATIS information and clearance before entering the Perpignan CTR.

1.17.2.3 Montpellier unit practices concerning flight information about adverse meteorological conditions

Transmission of meteorological information to pilots at Montpellier

The Montpellier control unit said that the VFR pilot reports regarding meteorological conditions are often inaccurate and sometimes unreliable and necessitated caution being exercised before passing them on.

In the scope of the investigation, the DSNA and the controllers were questioned about the transmission of meteorological information to pilots. Some controllers transmit this information as often as possible, others consider it as supplementary information to be transmitted if the workload permits or as information which is too volatile and too subject to interpretation to be transmitted to pilots.

Control unit procedures

The procedures are defined in the operation manuals of each control unit.

They are based on both the regulations and national standardization directives described in the FSE sheets.

The DSNA specified that the SNAs are to comply with the FSE sheets even if their content is not integrated in the operation manuals.

A FSE sheet dated 2 January 2012 (sheet 4.2 "*Mise en œuvre du service d'information de vol et du service d'alerte*") states that the flight information and warning services are provided by a FIS, an AFIS unit or an air traffic control unit designated for the purpose.

Furthermore, the Montpellier operation manual dated 11 June 2015 takes into account the provisions of SERA 9 for the FIS. However, no mention is made about supplying to VFR flights "*available information concerning traffic and weather conditions along the route of flight that are likely to make operation under the visual flight rules impracticable*." (cf § 1.17.1.3). Neither is it stated that the supply of this information is no longer subject to the pilot requesting it.

Training provided to controllers following introduction of SERA

The operations directive No CE 26/CA of 3 October 2014 details the training means made available to the Montpellier controllers concerning the upcoming introduction of the SERA in December 2014:

- a 46-page SERA Briefing presentation, developed by the Montpellier unit;
- a 13-page booklet written by the Montpellier unit air traffic division which was distributed to the controllers;
- on request, a presentation composed of 155 slides and an e-learning training course developed by ENAC, in collaboration with the DSNA (head office).

The presentation and training carried out by ENAC contained a section on the new aspects of the SERA for the flight information service and, in particular, the fact that in the case of adverse meteorological conditions for the VFR flight, it is now no longer only provided on pilot request (example of slide in Figure 9).

These elements are not quoted in the supplementary training documents issued by the Montpellier control unit and distributed to controllers locally (SERA Briefing and SERA booklet).

Figure 9: Excerpt from ENAC/DSNA training presentation

Phraseology

The voice communication manual edited by the FIS is the phraseology reference document for pilots and controllers. The version in force on the day of the event is the 7th edition dated 27 June 2013.

- Flight information service phraseology (SERA 9):
  Chapter 6 of the manual describes the FIS and the associated phraseology (in accordance with SERA 9).

  It gives examples of phraseology to be used when giving available information concerning weather conditions along the route of flight that are likely to make operation under the visual flight rules impracticable and which has, in particular, been reported by a pilot, for example:
  Controller: "*Citron Air 3 2 4 5, for information, pilot report, adverse weather conditions in the vicinity of xxx.*"

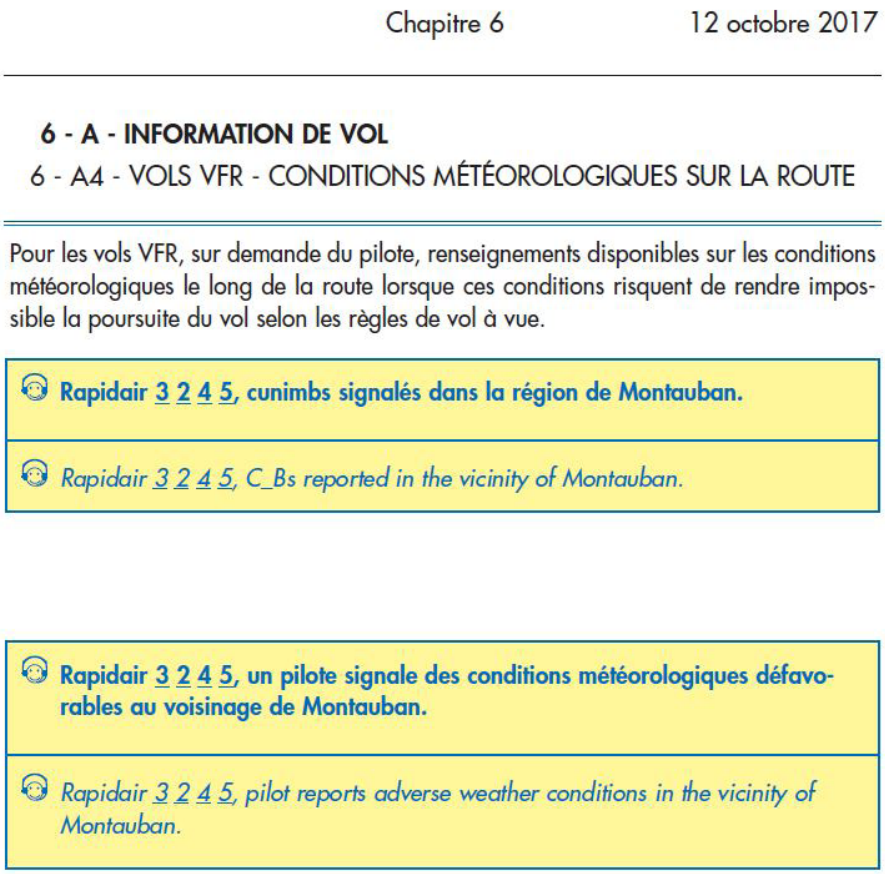
  This chapter indicates that the meteorological information along the route is given on pilot request.

This guide was updated in October 2017. This update did not integrate the regulatory changes of December 2014 and the wording "on pilot request" still figures (cf. Figure 10 below).

Part 11 of the operation manual (flight information service) quotes examples of phraseology associated with this service without one corresponding to reports of adverse weathers conditions for a VFR flight.

The Montpellier control unit specified that the message "Maintain VMC conditions" is sometimes used by its services to warn pilots flying under VFR of the possible risk of encountering adverse meteorological conditions.

This phraseology is used by other control centres under the DSNA. The DSNA said that this phrase is a common practice, an oral tradition and does not figure in the training and operation documents.



Chapitre 6 12 octobre 2017

6 - A - INFORMATION DE VOL

6 - A4 - VOLS VFR - CONDITIONS MÉTÉOROLOGIQUES SUR LA ROUTE

Pour les vols VFR, sur demande du pilote, renseignements disponibles sur les conditions météorologiques le long de la route lorsque ces conditions risquent de rendre impossible la poursuite du vol selon les règles de vol à vue.

Rapidair 3 2 4 5, cunimbs signalés dans la région de Montauban.

Rapidair 3 2 4 5, C_Bs reported in the vicinity of Montauban.

Rapidair 3 2 4 5, un pilote signale des conditions météorologiques défavorables au voisinage de Montauban.

Rapidair 3 2 4 5, pilot reports adverse weather conditions in the vicinity of Montauban.

Figure 10: Excerpt from chapter 6 of voice communication guide (edition of Oct 2017)

1.17.2.4 Procedures for transmitting air-reports

Control unit procedures

Pilot reports of weather conditions which could present a danger for flights under VFR are generally made by radio and are not standardized.

The processing of these reports by the control unit and their transmission to other crews who may be concerned do not figure in the control unit operation manual and are carried out by the controllers when necessary, according to needs.

It is the position controller who determines the necessity of reporting or not the information transmitted by pilots in flight to other crews.

Phraseology

The phraseology manual does not include a chapter specifying the phraseology used to collect and pass on pilot reports or observations.

1.18 Additional information

1.18.1 Witness statements

1.181 Aeroplane operator statement

The head of training of the Perpignan school said that he had used the twin-engine belonging to the pilot for several days. He had hired the aeroplane to carry out tests and it was initially planned that it would be him who would return the twin-engine to Montpellier to pick up F-HEHM which was parked on Montpellier airport.

The aeroplane had been left unlocked in the general aviation parking area at Montpellier by the head of training of the ATO on the day that he had taken the twin-engine. Starting up the engine of F-HEHM did not require a key.

It was planned to swap the aeroplanes in the afternoon of 1 July. The weather conditions did not pose a problem for him as he had the IFR rating and he intended performing both flights under IFR

He explained that he called the pilot on his mobile phone at 10:56. The latter was at this time at the holding point before taking off.

During this brief call, the pilot of F-HEHM told him that it was finally him who was going to come and get his twin-engine aeroplane at Perpignan.

The head of training said that as this call had been brief, he was not able to warn the pilot about the average weather conditions for VFR flights still present at Perpignan airport.

He added that there was no F-HEHM hire agreement between the school and the pilot and that he had not formerly released or authorized him to fly F-HEHM

He explained that at the time of the phone call, the pilot had already started up the engine and was taxiing with a view to his flight to Perpignan. Surprised by this, he did not feel able to forbid him from flying and ask him to return to the parking area.

1.18.1.2 Statement from close friend of pilot

A person close to the pilot who had flown several times alongside him as a passenger said that generally he wanted to fly high and in controlled airspace in order to be monitored by an air traffic unit.

He added that the pilot had already found himself in adverse weather conditions while under VFR in his presence and that he had decided, without hesitation, to divert.

He specified that the pilot had recently bought shares in an aircraft maintenance facility situated at Perpignan airport and that he probably had the intention of making the most of the trip to visit the facility.

He said that the day of the accident, the pilot of F-HEHM had asked him to bring him his headset which he had left at his house.

The pilot waited at Montpellier airport for the time needed to make the trip (around 20 minutes). He added that he did not seem in a particular hurry to leave.

He usually used his tablet for the navigation charts and his mobile phone to collect weather data.

1.18.1.3 Statements from pilots of other aircraft present in sector

Aeroplane A

The pilot of aeroplane A was carrying out a round trip under VFR on a Robin DR400 from Montpellier-Candillargues airport to the Banyuls area, via the coast. He had consulted the weather information before his departure and had not detected any element preventing him from carrying out his flight. He had noticed that the Perpignan weather messages indicated a lower and more overcast cloud layer than at Montpellier. This had not alerted him as his objective was not to land at Perpignan.

He explained that on leaving Montpellier, the sky was clear and that he flew at an altitude of 1,500 ft.

In the vicinity of Béziers, seeing further ahead that there was a broken cloud layer which started in the vicinity of Valras Plage, he decided to climb to a higher altitude in order to pass over the clouds.

He explained that he saw that the lower limit of the clouds was quite low and that he had not wanted to try and pass below it.

After passing abeam Valras, the layer became denser under the aeroplane as the flight progressed until it was completely overcast.

The pilot said that the sky was clear above the cloud layer and that he estimated that the cloud tops were situated at an altitude of 2,200 or 2,300 ft.

The aeroplane was well equipped (autopilot, GPS navigation systems, etc.) and finding very good conditions above the cloud layer, it would have been possible, in terms of regulations, to continue the flight on top under VFR.

However, it was only a pleasure flight and having no imperative to get to a destination, the pilot preferred to turn back. He returned to his departure airport without any particular difficulty.

Being in continuous radio contact with Montpellier Approach, he explained that he informed the controller of his decision to turn around for weather reasons. The main purpose of this message was to inform the control unit of his new flight path which could have been in conflict with aeroplanes arriving behind him.

He added that according to the weather forecasts that he had consulted before his departure, he did not think he was going to meet such a dense, high cloud layer as that which he had flown over around NL

He specified that he did not know of the possibilities of making a pilot report to the control services for this type of case and that he had therefore not used specific phraseology or formulated his radio message as a "report" for the Montpellier Approach controller.

Aeroplane B

The pilot of aeroplane B explained that he had carried out a cross-country training flight over several days with a licensed pilot from the aero-club based at Geneva (Switzerland) in order to "release" him for cross-country foreign flights.

On 1 July 2015, he planned to carry out a VFR cross-country flight on a flight plan from Montpellier airport to Ampuriabrava airport (Spain) on a Piper PA28.

He said that the student pilot had an important appointment at Ampuriabrava in the afternoon of 1 July.

The pilot explained that before leaving Montpellier, he had consulted all the weather reports and forecasts for the planned cross-country flight and had decided to leave given the marked improvement at Montpellier. He had planned diversion strategies in the event that adverse conditions were encountered on the route, in particular to Lézignan airport where the weather was good.

He added that the only critical point with respect to the weather was along the coast before the Spanish border, as the weather was completely clear in Spain.

The student pilot was in the left seat, he let him fly and manage all of the flight which proceeded normally along a coastal route at an altitude of around 1,000 ft.

The pilot said that after passing abeam Béziers, the clouds started to get denser above the aeroplane and the ceiling got progressively lower until reaching an altitude of around 800 ft abeam Valras Plage. The crew descended as the cloud base got lower.

He said that he had suggested to the student pilot that they went a little further on to see if they could "*pass*" and that if it was not the case, that they would turn back and try and pass inland.

The pilot explained that on approaching NL, visibility got a lot worse ahead of the aeroplane although was still greater than 1,500 m, with stratus type clouds which were lower and lower on the sea. The horizon was no longer visible. Continuing a coastal VFR flight beyond NL was not possible.

He added that the brighter weather inland to the right of the aeroplane gave the impression that it was possible to fly around the cloud mass west of NL but that on consulting the altitude of the terrain in this area, the crew realised that this was not a good solution.

The pilot said that he then asked the student pilot to turn around and return towards good conditions in order to determine subsequently if it was possible to pass by a route more inland.

He then informed Montpellier Approach of the diversion for weather reasons.

On finding good weather conditions abeam Béziers, he said that he again advised by radio that the weather conditions were very bad on the coast.

He specified that he knew of the principle of pilot reports and that he did not use a specific format to formalize his radio messages.

He added that the controller seemed concerned by the actions to be carried out to the VFR flight plan as the Spanish boarder crossing time had to be changed.

He explained that after passing abeam Lézignan airport, he saw that the valleys were submerged in the cloud layer further ahead and that it was therefore not possible to continue the flight under VFR.

The pilot and student pilot jointly decided to divert to Lézignan airport where the aeroplane landed without any incident.

The pilot of aeroplane B said that he had not been informed that another VFR traffic had diverted in the NL region earlier on and had not heard the messages from the pilot of aeroplane A on the frequency.

1.18.1.4 Statements from Montpellier Approach controllers who managed F-HEHM

At the time of the event, the sector FA control position was manned by two controllers: a controller in front of the radar screen with a coordinator next to him.

The radar controller had been relieved at around 11:10.

The controllers on duty in the IFR room said that an unidentified military traffic had made a very quick descent in the Montpellier zones and had mobilized the team coordinators before and after the handover.

This is why at 11:03 they asked the controllers on duty in the Montpellier tower to limit the altitude of F-HEHM at 2,000 ft and to keep the pilot on the frequency for a few more minutes.

The radar controller on duty at this point (before being relieved) said that he had heard that aeroplanes A and B were turning around due to the weather.

The controllers said that during the relief briefing, the problem of the military aeroplane had been mentioned and that no information was given to the new team about the diversions of aeroplanes A and B due to adverse weather conditions.

They added that there was a low amount of IFR and VFR traffic in the Montpellier zone at this time and that the work load for the radar controller was not particularly high at this point.

The radar controller on duty after the handover explained that he had indeed noticed that the pilot of F-HEHM had started to encounter adverse meteorological conditions and that he had asked F-HEHM to maintain VMC conditions. He added that this was a message which made known to the pilot that it was necessary to pay attention to the meteorological conditions.

During all the exchanges, the pilot of F-HEHM spoke with assurance and did not seem to need specific assistance in terms of monitoring meteorological conditions or in terms of help with navigation for his route to Perpignan.

When F-HEHM started a turn inland, the aeroplane was at a low altitude in a region where the radio coverage can be bad. The controller said that, worried about losing contact with him, he asked the pilot to contact the Perpignan tower. He added that at this point the aeroplane was in uncontrolled airspace (class G) and that he could have suggested that the pilot left the frequency earlier.

However, it is customary at Montpellier to keep aeroplanes on the frequency even in uncontrolled airspace so as to be able to give them information about other traffic if necessary, as the coastal zone is very busy.

1.18.1.4 Statement from former Perpignan controller

A former controller at Perpignan said that pilots frequently mistook the lake situated north of NL with that situated further south.

The latter could be used to get to Perpignan airport by turning inland without the risk of encountering high terrain.

1.18.1.5 Witnesses on ground

Witnesses on the ground near Treilles said that they had seen and heard the plane passing just under the cloud layer, coming in from the coast.

The noise of the engine seemed normal to them.

1.18.2 Previous occurrences associated with adverse meteorological conditions

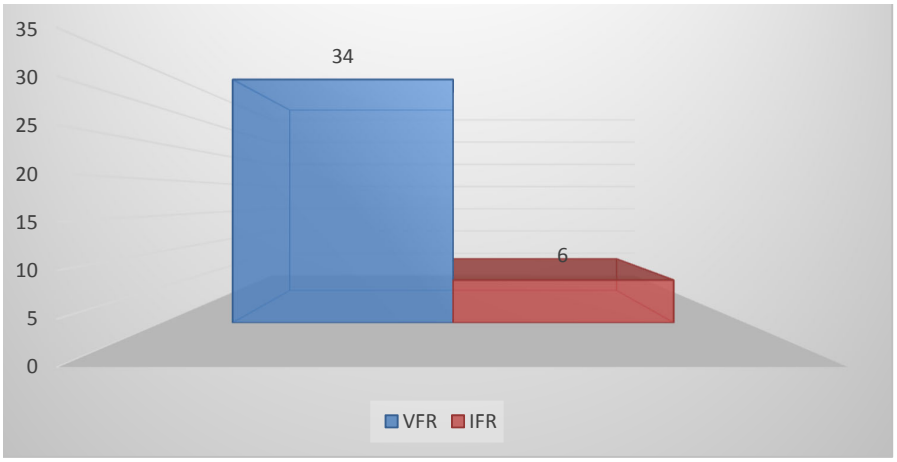
The BEA analysed previous occurrences associated with adverse meteorological conditions.

Of all the investigations opened by the BEA, around 200 light aeroplane and helicopter[(10)] accidents between 2010 and 2016 showed that the pilot had inadequately managed an adverse weather situation.

Forty of these two hundred accidents were fatal (including the F-HEHM accident) leading to the death of 83 people.

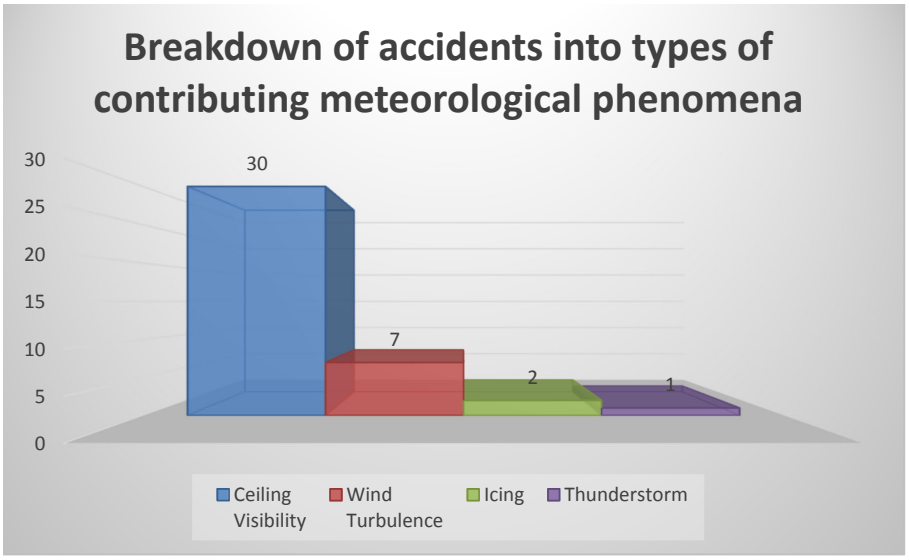
[(10)] Aeroplanes and helicopters of less than 5.7 t.

These 40 recorded fatal accidents can be broken down as follows:



Source: BEA

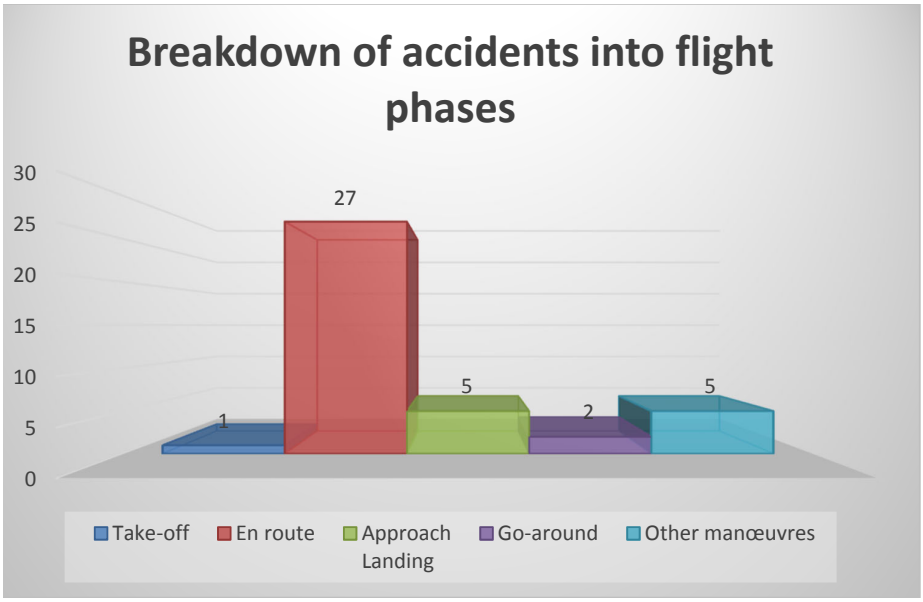
Figure 12: breakdown of accidents into flight rules



Source: BEA

Figure 13: breakdown of accidents into types of contributing meteorological phenomena

Note: Of the 30 accidents linked to reduced visibility or adverse cloud cover, 25 involved aircraft flying under VFR. They caused the death of 53 people.



Source: BEA

Figure 14: breakdown of accidents into flight phases

Note: In 24 of the 40 recorded fatal accidents, the pilot was in radio contact with an air traffic unit at the time of the event.
The possible presence of weather reports transmitted by other pilots was not systematically studied in past investigations. For this reason, the information contained in the accident database cannot be used to draw conclusions about past events in terms of pilot reports and their use.

2 - ANALYSIS

2.1 Scenario

Purpose of flight

On 1 July 2015, the pilot was ferrying F-HEHM from Montpellier to Perpignan. He was flying this aeroplane for the first time and without the operator's explicit authorization. This flight was probably motivated by a professional visit to Perpignan airport. He held the necessary licences and ratings to carry out the planned flight.

Decision to take-off given forecast weather conditions

To assess the feasibility of carrying out a safe VFR flight, two parameters - visibility and cloud cover - are to be taken into account. Visibility corresponds to the ability of seeing and avoiding aircraft and obstacles as applicable, while the height of the lowest cloud layer base determines the maximum flight altitude under VFR and the safety margins for flying over terrain.

On reading the SIGWX charts and METAR and TAF weather information, a pilot could deduce from these when preparing the flight, that there might be low clouds in the region with visibility which would not descend below 8 km and that there would be no cloud layer below 500 ft on the coastal route.

As the regulations impose a minimum flight height of 500 ft above the ground or water, the coastal route might appear possible from a regulatory point of view for aeroplanes leaving Montpellier and heading south while being very marginal if clouds were encountered with a base which was actually at a height of 500 ft.

In addition, the Perpignan TAF message indicated good visibility and ceilings above 500 ft which permitted, from a regulatory point of view, arrival at Perpignan under special VFR. The possible temporary adverse conditions between 8:00 and 11:00 forecast by the TAF message was only a probability of 30% and ended at 11:00, i.e. at least 30 minutes before F-HEHM was to enter the Perpignan CTR.

A pilot could thus decide to take-off based on the weather reports and forecasts available in flight preparation, which permitted the planned flights to be carried out from a regulatory point of view. In addition, the marked improvement observed at Montpellier might support the current forecasts of improvement for all of the coastal area at the end of this summer morning.

A diversion strategy in the event of encountering more adverse conditions en route might however be prepared before leaving which is what the pilot of aeroplane B did.

Actual weather situation

The very low clouds and adverse visibility around NL reported by the pilots of aeroplanes A and B meant that it was not possible to continue the flight under VFR along a coastal route. These conditions did not figure in any of the available weather reports.

Aeroplanes A and B had previously diverted their VFR flight on the same coastal route around NL and had reported their diversion on the Montpellier Approach frequency.

The pilot of F-HEHM was on the same frequency when the pilot of aeroplane B announced he was turning around at NL because of the weather. It was therefore theoretically possible for him to hear this message. However, a pilot, concerned by the management of his flight might pay less attention to a message which was not addressed to him, all the more so as at this point, flying in good conditions, he was not aware of the impacts for his flight.

When the pilot of aeroplane B again mentioned the poor conditions present on the coast, even if the pilot of F-HEHM had paid attention to this message, it might have been difficult for him to know which coastal zone was being referred to.

Performance of flight

In cruise at 3,500 ft, F-HEHM was flying at a higher altitude than the top of the cloud layer situated in front of him. The pilot had two options: to remain above the clouds and continue the flight in "on top" conditions (as aeroplane A) or to descend and continue his route under the clouds (as aeroplane B). The pilot of F-HEHM opted for the second solution and, anticipating the lower cloud layer ahead, he asked for successive descent clearances.

The controller cleared F-HEHM for his descents and asked him to report at NL.

The fact that the radar controller asked him to report at NL suggests that at this time, he was not aware of the adverse meteorological conditions at this reporting point. At this stage, his coordinator, who had not yet been relieved, was employed in managing an unidentified military traffic and had been unable to contribute to the radar controller's briefing.

During the handover, the controllers do not necessarily transmit information about weather conditions or VFR aircraft manoeuvres. There was no record at the control position of the information transmitted by aeroplanes A and B when they turned around. The subsequent exchanges concerned the conditions progressively encountered and above all, the management of the flight plan of aeroplane B.

At no time did the pilot of F-HEHM ask for or receive from the control unit, information regarding meteorological conditions on his coastal route or the diversion of aeroplanes A and B. He expressed no difficulty or need for assistance in finding his bearings and flying. When the pilot of F-HEHM said that he was at 800 ft, the controller asked him to maintain VMC conditions. This phrase was intended to warn the pilot about continuing the flight in adverse conditions. However, this message did not give rise to any discussion or request and/or proposal of assistance.

On approaching NL, the pilot started turning inland and reported that he was flying around a cloud layer. Consequently, he headed towards an area of terrain incompatible with his flight altitude.

This suggests a possible navigational error. The pilot knew this route very well. He probably carried out the flight without navigation aids due to his lack of experience in the use of the aeroplane's equipment and to his familiarity with the coastal route. A possible explanation is the common confusion between the lake situated to the north of NL and the one situated to the south, the latter being a landmark for turning towards Perpignan without the risk of encountering high terrain. In addition, his previous flights along this route had been made with a twin-engine which meant that the navigation landmarks were passed more quickly. This might have led the pilot to think that he was further south than he was.

The controller's question as to whether he was now heading towards Perpignan might have reinforced his erroneous mental representation of his position.

The Montpellier Approach controller asked him about his intentions then, worried that he might lose him on the frequency, which is common in this area and at this flight altitude, asked him to contact the Perpignan control tower.

It is probable that the F-HEHM pilot had not yet obtained the Perpignan ATIS. At no time did he in fact ask Montpellier Approach for the Perpignan weather report nor did he leave the frequency a few moments in order to connect to the ATIS frequency.

Witnesses saw the aeroplane fly under the cloud layer. In this area, the reduced visibility may have prevented him from identifying sufficiently early, the high terrain in front of him. Possible frequency changes in these marginal weather conditions may have contributed to the high terrain not being detected in time.

F-HEHM flying at cruise speed and at an altitude of 690 ft, struck high terrain close to Treilles, the peak of which was at that time in fog.

2.2 Continuation of flight and no diversion

Aeroplane A was flying a local flight along the coast with a planned return to Montpellier. In the face of adverse weather conditions on approaching NL which meant that the flight no longer corresponded to its purpose, the pilot decided to turn around which was of very little negative consequence for him.

Aeroplane B was flying on a flight plan to Spain. Despite the potential get-home-itis phenomenon (stay and meeting in Spain), the pilots adapted their path by first turning around to try and pass inland and then by landing at an aerodrome which was not their planned destination. This turn around had been jointly planned by the crew. The presence of an instructor onboard the plane meant the workload was divided. The pilots were able to share their assessment of the situation and their decisions with each other and with the control unit as this aeroplane was on a flight plan.

Although the pilots of aeroplanes A and B diverted, the pilot of F-HEHM continued his route to Perpignan and had to fly around the cloud layer by choosing a route which proved to be unsuitable because of high ground. This shows that turning around was not envisaged and suggests that the pilot had probably not anticipated this change of path.

Several factors might explain why flying around the clouds occurred in such a late and unprepared manner. Firstly, the determination to arrive at destination might have interfered with the rationality of a decision to turn around. Turning around would have certainly meant failure with respect to the manager of the training school who had offered to get the aeroplane himself under IFR. To reduce the complexity of a choice between two alternatives (continue or turn around), there may be a tendency to minimize the risks associated with the chosen solution and to give too much value to the negative aspects of the alternative solution. In the event, this might have led the pilot to underestimate the risks of continuing the flight, in particular those associated with a flight with reduced visibility in a region where the presence of high ground was possible.

As the flight progressed, the pilot's attention probably focused on adapting the path, in real time, to the weather conditions with a high workload made all the more so by the fact that he was not very familiar with the aeroplane that he was flying, and in particular, the use of the navigation equipment. The pilot perhaps did not have sufficient resources to ask himself whether it was pertinent to continue the flight.

The pilot was also very close to his objective which might have accentuated the difficulty of renouncing. The further the distance covered by a pilot, the less conceivable it is to turn around.

Provision of an outside aid

The continuation of a VFR flight when the weather conditions have deteriorated is in general the result of failing to question the initial assessment of the situation and possibly under-estimating the risks of continuing. These assessment problems might be linked to motivations which distort the reasoning and to a cognitive load which is too high and impairs attentional control.

In these conditions, an outside aid might extract the pilot from his initial planned action and lead him to envisage other alternatives.

This outside aid might come from the cockpit in the form of sufficiently salient information such as a warning, a colour indication on an instrument or from an exchange between crew members.

This outside aid might also come from the controller. A radio information message from the control unit might allow the pilot to reassess the situation, provide him with new data about the risks linked with continuing the flight or lead him to formulate his decisions or lack of decisions.

Lastly, information about the diversions made by other pilots might force the pilot to consider turning around as a possible alternative solution, chosen by peers.

2.3 Flight information service provided by control service

Whether in class D (controlled) airspace or in class G (uncontrolled) airspace, F-HEHM was provided with the flight information service as soon as he was known to the control unit. It is provided by the Montpellier SNA, either by radio contact on a specific radio frequency if the FIS is open or on the combined Montpellier Approach control frequencies, which is the most frequent case since 1 July 2015.

The flight information service includes "*available information concerning traffic and weather conditions along the route of flight that are likely to make operation under the visual flight rules impracticable*." It should be noted that the SERA have deleted the wording "*on pilot request*", which figured in the previous regulations (SCA).

At the time of the event, there was no FSE or DO directive showing these changes. The Montpellier control service operation manual did not describe how these new regulatory points should be complied with and the controllers did not have uniform practices. These points had not been included in the local training either.

Consequently, the information about these changes had probably only partially filtered down to the position controllers. The controllers had probably kept to a model of supplying information on pilot request, which did not encourage them to spontaneously transmit this information in the relief briefing.

In addition, the French supplement which specifies that this concerns information known to the controller may add an ambiguity to the term "controller": either this refers to the control service or it refers to the physical position controller with headset. When DSNA personnel were asked about this, they specified that in their opinion there was no ambiguity and that the term refers to the physical person. This then poses the problem of knowing how the control service is organized so that the position controller has knowledge of the relevant weather information that he must transmit to VFR flights.

2.4 Pilot reporting

Two aeroplanes had reported adverse weather conditions prevailing in the coastal zone around NL and their decision to divert, without this being the subject of a specific and detailed message from the pilots.

In addition, one of the two pilots had clearly mentioned to the controller that it was impossible to continue a coastal route under visual flight rules. The controller acknowledged this message.

This information was lost and not transmitted to the pilot of F-HEHM.

As indicated in section 2.1, the presence of clouds at an altitude below 500 ft and of deteriorated visibility around NL did not figure in the weather information available for flight preparation. Only the reports from pilots who had passed beforehand made it possible to have the information about it being impossible to continue the VFR flight on a coast route at this point.

More globally, for dangerous, localized and unpredictable phenomena, the information transmitted by VFR pilots in real time constitutes a precious aid which generally cannot be replaced by another information source.

To allow the control services to provide a flight information service, notably when the conditions are likely to make it impossible to continue a flight under visual flight rules, the controllers must have sufficient information.

SERA section 12 requires control units to transmit non-routine air-reports to the other aeroplanes with which they are in contact and the control centres concerned.

However, the control services do not systematically take into account the weather reports from VFR pilots firstly due to there being no formalization in their procedures, and notably no reference to a specific phraseology for pilot reports and secondly due to the lack of confidence in the accuracy and relevance of the weather information with respect to VFR flights.

The regulatory text specifying that the control services must relay the information does not require the information to be interpreted, but for it to be passed on to other aircraft concerned. The fact that VFR traffic is obliged to divert for weather reasons can be considered de facto as "*likely to make operation under the visual flight rules impracticable*" and therefore as information to be transmitted. What's more, transmitting information that another aircraft under VFR has diverted due to the weather conditions encountered does not seem to raise any difficulty with respect to the formalization of the radio message.

3 - CONCLUSION

3.1 Findings

The investigation showed that:

- The pilot held the necessary licences and ratings to carry out the planned flight and had experience on PA28 type aeroplanes.
- The pilot had undertaken the ferry flight on F-HEHM without the explicit authorization of the aeroplane operator.
- The pilot knew the Montpellier-Perpignan route having flown it seven times in the last six months under VFR, principally on a twin-engine aeroplane.
- No technical anomaly was identified and the engine was providing power.
- The pilot kept control of the aircraft and struck the terrain when on a roughly straight path.
- The weather reports and forecasts for the route and at Perpignan airport permitted departure and arrival under VFR or special VFR in compliance with the regulations.
- There were adverse weather conditions for visual flight around NL with visibility between 1.5 and 5 km and low stratus type clouds based at below 500 ft. These conditions made it necessary for flights to divert or bypass the zone.
- The SIGWX chart forecast visibility of 8 km or more in the zone concerned and locally, on the coast, stratus type clouds based at an altitude of between 500 and 1,000 ft.
- The pilot of F-HEHM did not ask for additional weather information or assistance from the Montpellier control services.
- The controller used the phraseology, "Maintain VMC conditions" in reply to the pilot of F-HEHM who indicated that he was level with the cloud layer at 800 ft on getting closer to the coast. This message, an oral tradition, does not figure in the regulatory documents available to the controllers.
- The pilot of F-HEHM was probably not aware of the special VFR conditions at Perpignan or of the ATIS message.
- The procedures at the Montpellier control unit do not specify that pilots should be informed of special VFR conditions at Perpignan in the absence of IFR traffic proceeding to Perpignan.
- The pilot adopted a strategy of flying around the cloud layer present around NL, bringing him over terrain that was incompatible with his flight altitude.
- Two other traffics under VFR on a similar route had turned around due to the adverse weather conditions around NL and reported this on the Montpellier Approach frequency.
- The pilot of the second aeroplane which had diverted informed Montpellier Approach that he was turning around in the region of NL one minute after radio contact with the pilot of F-HEHM on the same frequency.
- During the radar controller handover, the information about two preceding aeroplanes turning around was not in the relief briefing.
- The information about the turnarounds due to weather conditions present in the area around NL, reported to the controllers by two other pilots shortly before the accident, was not transmitted by the control service, to the pilot of F-HEHM.

- No procedure exists in the operation manual of the Montpellier control services concerning the processing and transmission of pilot reports of adverse weather conditions concerning VFR flights.
- Since the introduction of European regulation No 923/2012 (SERA), the supply to VFR flights of available information concerning traffic and weather conditions along the route of flight that are likely to make operation under the visual flight rules impracticable is not subject to the pilot requesting it.
- The Montpellier operation manual does not quote "*available information concerning traffic and weather conditions along the route of flight that are likely to make operation under the visual flight rules impracticable*" as being part of the information to be transmitted to pilots in the scope of the flight information service nor the phraseology to be used in this case.
- In practice, supplying pilots of VFR flights with this information is left to the controllers' judgement.

3.2 Causes of the accident

The pilot was carrying out a ferry flight under VFR bound for Perpignan, along a coastal route that he knew.

While he was flying around a cloud layer and heading inland, the aeroplane collided with the terrain. It is possible that an erroneous representation of his position may have meant that he was not aware of the high ground present. In addition, the reduced horizontal visibility and the pilot's attention taken up by the selection of a new frequency may have contributed to preventing him from identifying the high ground ahead of him sufficiently early.

The following elements may have contributed to the pilot's decision to undertake the flight:

- The conditions observed at the destination aerodrome were still marginal but a marked improvement was forecast in his arrival slot.
- A notable improvement was observed at the departure aerodrome which could give the impression that there was clear weather along all of the route.
- The absence of available information concerning the presence of low clouds and deteriorated visibility along the route.

The pilot's determination to get to his destination, overconfidence due to his very good knowledge of the route and the proximity of the destination aerodrome may have led him to continue the flight despite the deterioration in conditions.

In this situation, an outside aid can help a pilot relinquish his initial intentions and lead him to anticipate a modification in his flight path or envisage turning around.

The information about the turnarounds due to weather conditions present in the area around NL, reported to the controller by two other pilots shortly before the accident, was not transmitted to the pilot of F-HEHM. This information, which might have been useful to him, was not transmitted during the controller handover. The systematic passing on of this type of information is not part of the control unit's practices.

The controller had probably kept to a model of supplying information on pilot request. This might be explained by the control service not having assimilated the regulatory change specifying that the supplying of information necessary for VFR safety is no longer subject to pilot request.

The event brings to light that including the regulatory text at different levels without providing standard operational solutions and without taking into account local specificities probably does not lead to its effective application.

4 - SAFETY RECOMMENDATIONS

Note: in accordance with the provisions of Article 17.3 of Regulation No. 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation, a safety recommendation in no case creates a presumption of fault or liability in an accident, serious incident or incident. The recipients of safety recommendations report to the authority in charge of safety investigations that have issued them, on the measures taken or being studied for their implementation, as provided for in Article 18 of the aforementioned regulation.

4.1 Document changes subsequent to event

Following the introduction of European regulation No 923/2012 (SERA), in December 2014, the DSNA issued a technical summary sheet (FSE) on 10 November 2015 (sheet 9.1 "Flight information service") which gave information about the implementation and scope of the Flight Information Service (FIS) and included the elements from SERA 9005 a), b) and c).

In compliance with this FSE, the updated Montpellier operation manual published in 2016 (version 4.1) indicates in paragraph 6.5.1 Weather information provided: The flight information service for flights under VFR includes available information about weather conditions along the route of flight when these may make operation under the visual flight rules impracticable (information known by the control along with that provided by pilots).

4.2 Provision of flight information service

The pilot's determination to get to destination, overconfidence due to his very good knowledge of the route and the proximity of the destination aerodrome may have led him to continue the flight to destination (Perpignan) despite the deterioration in weather conditions.

The analysis of accidents which occurred in France shows that between 2010 and 2016, the BEA investigated 40 fatal light aeroplane or helicopter accidents associated with adverse meteorological conditions. Twenty-five of these were VFR flights flown in adverse cloud cover or visibility conditions for a visual flight.

In these situations, an outside aid can help a pilot relinquish his initial intentions and lead him to anticipate a modification in his flight path or envisage turning around.

The SERA regulations specify that in class D or in class G airspace, an aircraft shall benefit, as soon as it is known to the control, from the flight information service. This includes "*available information concerning traffic and weather conditions along the route of flight that are likely to make operation under the visual flight rules impracticable*." The wording "on pilot request" for this information which figured in the previous regulations (SCA) has been deleted. This change means modifying practices concerning the flight information service for VFR flights. This change was not included in the training at local level, thus showing that the implications for the control practices were underestimated.

The phraseology guide published by the FIS at national level which is a reference for the controller training did not delete the wording "on pilot request" in the chapter corresponding to the flight information service concerning adverse weather conditions.

The regulatory changes concerning the flight information service for VFR flights require the controllers to effectively apply and assimilate the new practices. For this, the support must go beyond simply including the text in the operation manual and provide operational responses which take into account local specificities.

Consequently, the BEA recommends that:

- **The DGAC ensure the effective provision of the flight information service by the control units as described in SERA.9005 c), when the weather conditions make operation under the visual flight rules impracticable and this even when not explicitly requested by the pilot. [Recommendation FRAN-2019-027]**

4.3 Transmission of non-routine observations from aircraft under VFR

Two aeroplanes had previously reported to the control unit that they were turning around due to the adverse weather conditions present in the coastal area around NL. This information was not transmitted to the pilot of F-HEHM who was in contact with the same control unit and who benefited from the FIS.

Certain phenomena are local and do not appear in the Meteorological Terminal Air Reports or are liable to occur suddenly. For dangerous, localized and unpredictable phenomena, the information transmitted by pilots in real time constitutes a precious, irreplaceable aid.

SERA.12010 states that the pilot-in-command shall advise the appropriate air traffic services unit of non-routine observations when he considers that the meteorological conditions may affect the safety or markedly affect the efficiency of other aircraft operations. The article quotes windshear conditions as an example.

SERA.12020 specifies that the ATS units shall transmit, as soon as practicable, the special and non-routine air reports to other aircraft concerned and to other ATS units concerned.

Consequently, the BEA recommends that:

- **The DGAC carry out an information and raising awareness campaign directed at general aviation pilots in order to encourage the transmission of non-routine air reports when the meteorological conditions or any other event make it impossible to continue their flight on the planned route under visual flight rules. [Recommendation FRAN-2019-028]**

- **The DSNA set up a system whereby its control centres effectively take into account and transmit to other aircraft concerned and to other ATS units concerned, the non-routine observations received from pilots and in particular, from VFR pilots who encounter weather conditions making it impossible to continue their flight on the planned route. [Recommendation FRAN-2019-029]**

4.4 Transmission of information during handovers

During the controller handover, the information concerning the previous aeroplanes which had turned around and the adverse weather conditions present around NL was not made known to the relieving controllers.

The national supplement drawn up by the French authorities specifies that the information to be transmitted as defined by SERA.9005 c) is "the information known to the controller". The DSNA specifies that this is the physical person.

However, it must be ensured that the information received from pilots remains available and in particular, that it is indeed transmitted during handovers.

Consequently, the BEA recommends that:

- **The DSNA ensure that the pilot reports and the information relating to weather conditions likely to affect the continuation of a VFR flight are also transmitted by the relieved controller to the relieving controller. [Recommendation FRAN-2019-030]**

APPENDICES

Appendix 1
Transcription of radio exchanges

Appendix 2
Meteorological Terminal Air Reports

Appendix 1
Transcription of radio exchanges

DOCUMENT RESERVED FOR THE EXCLUSIVE PURPOSE OF THE SAFETY INVESTIGATION

Transcription of ATC recording

This is a translation by the BEA of the transcription of the ATC recording. As accurate as the translation may be, the original transcription in French is the work of reference.

FOREWORD

The following is the transcript of the elements which were understood from the work on the control unit (ATC) radio communication recording.

The reader's attention is drawn to the fact that the ATC recording and its transcript are only a partial reflection of events. Consequently, the utmost care is required in the interpretation of this document.

GLOSSARY

Time: Local time	Source: ATM transcript
( )	The words or groups of words in brackets could not be determined with certainty
(*)	Indistinguishable words or groups of words
Aeroplane B	Another aircraft flying in the controlled airspace. Its call sign has been anonymized for the purposes of the transcription of the radio exchanges relative to the event.
H-XX	Anonymized call sign of "aeroplane B".

Time: (Local time)	Person speaking	Messages	Comments, noises
10:50:49		########## Start of transcription ##############	
10:51:01	F-HEHM	Montpellier ground, good day, F-HEHM	
10:51:08	LFMT_GND	F-HEHM, Montpellier, good day	
10:51:10	F-HEHM	F-HEHM, a PA28, one person aboard, with ... on apron Fox with Echo, requesting taxiing Romeo 1, 12 right	
10:51:23	LFMT_GND	HM roger, what's your destination?	
10:51:26	F-HEHM	Destination LFMP Perpignan	
10:51:30	LFMT_GND	Perpignan roger, do you have a preferred altitude?	
10:51:33	F-HEHM	euh, 2,500 ft euh if it's (possible)	
10:51:36	LFMT_GND	Roger, squawk 7030, F-HM, and taxi holding point Romeo 1, 12 right	
10:51:41	F-HEHM	Taxiing Romeo 1, 12 right, squawking 7030, ... euh F ... HM	
10:57:52	F-HEHM	Ground, F-HM, Romeo 1, ready	
10:57:56	LFMT_GND	HM hold short of holding point Romeo 1, contact tower 118.2, good day	
10:58:02	F-HEHM	118.2, good day euh HM	
10:58:18	F-HEHM	Montpellier, good day F-H ... EHM	
10:58:22	LFMT_TWR	F-HEHM, Montpellier tower, good day, line up runway 12 right, cleared for take-off wind 080°, climb 2,000 ft initially	
10:58:34	F-HEHM	Euh lining up 12 right from Romeo 1 and climbing euh ... 1,500 ft initially did you say?	
10:58:42	LFMT_TWR	1,500 ft ... 1,500 ft is good, report for higher	
10:58:46	F-HEHM	1,500 ft initially, cleared for take-off (*), HM ... and will report for higher	
11:01:51	F-HEHM	Montpellier Tower, F-HM 1,500ft, request clearance to climb to 2,500	
11:01:58	LFMT_TWR	F-HM, incorrectly received, what altitude do you want to climb to?	
11:02:01	F-HEHM	2,500 (*)	
11:02:03	LFMT_TWR	HM, climb 2,000 ft initially, I will call you back for higher	

Time: (Local time)	Person speaking	Messages	Comments, noises
11:02:07	F-HEHM	2,000 ft (*) HM	
11:03:03	LFMT_TWR	F-HEHM I'm not receiving transponder, check that ALT mode is activated	
11:03:12	F-HEHM	(*)	
11:03:24	LFMT_TWR	HM I'm receiving your transponder, for the moment hold at 2,000 ft, and I will call you back in three to four minutes to climb to 2,500	
11:03:32	F-HEHM	Holding 2,000 ft F-HEHM	
11:07:53	LFMT_TWR	F-HEHM hold 2,000 ft and to climb contact Montpellier approach 130.850 good day	
11:08:00	F-HEHM	130 850, euh HM	
11:08:53	F-HEHM	Montpellier approach, good day, F-HEHM	
11:08:59	LFMT_APP	F-HE ... HM good day, what altitude (*) do you want?	
11:09:06	F-HEHM	Euh ... 3,500 ft, would be good	
11:09:10	LFMT_APP	HM 3,500ft, euh ... cleared, QNH 1019	
11:09:15	F-HEHM	(3,500 ft cleared, QNH 1019), F-HM	
11:09:54	*Aeroplane B*	(Montpellier) *H-XX*	
11:09:57	LFMT_APP	*H-XX*	
11:09:58	*Aeroplane B*	Yes we have turned around near NL because of the weather, we are now returning towards AD, will keep you informed of our intentions	
11:10:10	LFMT_APP	Roger *XX*	
11:11:20			Controller handover on Montpellier approach frequency
11:13:22	*Aeroplane B*	*H-XX,* we are near AD in very good conditions, can we contact Beziers?	
11:13:29	LFMT_APP	*H-XX,* Beziers tower 102.175 good day	
11:13:33	*Aeroplane B*	... 175, good day, *H-XX*	
11:15:25	*Aeroplane B*	(*) approach, good day, *H-XX*	
11:15:28	LFMT_APP	*XX* still with Montpellier	
11:15:42	*Aeroplane B*	Euh, we were asked to ... not ... Beziers asked us to return to the frequency to climb to 2,000 ft	
11:15:48	LFMT_APP	And what do you want to do *H-XX*?	

Time: (Local time)	Person speaking	Messages	Comments, noises
11:15:50	*Aeroplane B*	I would like to euh cross the Beziers runway axis to go north and see if the weather is better on the north side	
11:15:57	LFMT_APP	*XX* climb to 2,000 ft then, route north	
11:16:01	*Aeroplane B*	Climbing to 2,000 ft, route north *H-XX*	
11:16:38	LFMT_APP	*H-XX,* do you want me to close your flight plan for Ampuria?	
11:16:42	*Aeroplane B*	Euh, just a minute, we will make a decision if the conditions are better on the north side, we will try to continue our flight	
11:16:50	LFMT_APP	Roger, but you ... aren't you going to Ampuria *XX* ?	
11:16:53	*Aeroplane B*	Ah it's not certain yet because it's the sea side which is very bad and the chances northward … let's say towards the hills, (aren't, don't seem to be) a lot better, we will make … will give a decision in a few minutes	
11:17:03	LFMT_APP	Roger, squawk 7040, 2,000 ft and call me back	
11:17:08	Other person	Squawk 7040.	
11:17:10	*Aeroplane B*	...40, and 2,000 ft, and will call you back *H-XX*	
11:18:30	F-HEHM	Montpellier approach, F...HM good day again	
11:18:35	LFMT_APP	F-HM I'm listening	
11:18:36	F-HEHM	Stable at level 35, request euh (start my descent) euh, ... euh, 2,000 ft	
11:18:43	LFMT_APP	HM euh descend 2,000 ft, report NL	
11:18:48	F-HEHM	2,000 ft, NL ...	
11:19:04	*Aeroplane B*	*H-XX* at 2,000 to cross runway axes, and, ... we'd like to proceed on a heading to Lezignan	
11:19:12	LFMT_APP	Approved *XX*, Lezignan	
11:19:15	*Aeroplane B*	Proceeding on a heading to Lezigan, *H-XX*	
11:22:37	LFMT_APP	*XX* do you ... have an idea of your final destination or not?	
11:22:42	*Aeroplane B*	For the moment our final destination is Ampuria, we take heading , we are in very very good conditions heading to Lezignan and we will review the situation there to see if it is do-able	
11:22:51	LFMT_APP	Roger *XX*	
11:22:54	*Aeroplane B*	What we can do though is delay the flight plan by ... 30 minutes	
11:22:58	LFMT_APP	Roger, I'm delaying your Ampuria ETA by 30 minutes	

Time: (Local time)	Person speaking	Messages	Comments, noises
11:23:02	*Aeroplane B*	Thank you *H-XX*	
11:23:29	F-HEHM	Montpellier, F-HM, euh ... I would like to descend to 1,000 ft to pass under the cloud layer	
11:23:35	LFMT_APP	HM 1,000 ft approved	
11:23:38	F-HEHM	(Roger HM)	
11:23:47	LFMT_APP	*XX* we've delayed your flight plan by 30 minutes	
11:23:49			Discussion between Montpellier approach and *Aeroplane B* about the activation of restricted area R46
11:25:52	F-HEHM	Montpellier, F-HM (level with euh ...) cloud layer which is at 800 ft, I'm going to fly towards the coast	
11:25:59	LFMT_APP	Roger HM, maintain VMC conditions	
11:26:01	F-HEHM	(*)	
11:30:07	LFMT_APP	F-HM ?	
11:30:10	F-HEHM	HM	
11:30:11	LFMT_APP	Are you proceeding to Perpignan from now on?	
11:30:14	F-HEHM	Yes I'm flying around euh the cloud layer HM (I'm going to descend a little)	
11:30:18	LFMT_APP	Contact tower 118.3 HM	
11:30:21	F-HEHM	118.3 HM	
11:30:31	*Aeroplane B*	Montpellier *H-XX*	
11:30:33	LFMT_APP	*H-XX* pass your message	
11:30:35	*Aeroplane B*	We're vertical to Lezignan, it looks completely overcast towards Ampuria, we're going to divert to Lezignan and then (*)	
11:30:44	LFMT_APP	Received *H-XX* euh ... you can contact as of now Lezignan, do you want me to close the flight plan?	
11:30:51	*Aeroplane B*	It would be kind if you could close our flight plan, affirmative	
11:30:54	LFMT_APP	We are closing your flight plan, you can leave the frequency *H-XX*, good day	
11:30:57	*Aeroplane B*	Good day and thanks very much, flight plan closed	
11:31:15			

Time: (Local time)	Person speaking	Messages	Comments, noises
		########## End of transcription ##############	

Appendix 2
Meteorological Terminal Air Reports

The Meteorological Terminal Air Reports (METAR) indicated that:

- **at Montpellier airport**
  - at 10:00: 09004KT 060V140 9999 BKN013 25/20 Q1019 NOSIG
  - at 10:30: 10007KT 070V140 9999 SCT016 26/20 Q1019 NOSIG
  - *(at 11:00: NIL)*
  - *(at 11:30: 14009KT 9999 FEW016 26/20 Q1019 NOSIG)*

- **at Béziers airport**
  - at 10:00: AUTO 09011KT 060V120 9999 BKN016 25/20 Q1019
  - at 10:30: AUTO 09012KT 9999 BKN018 26/20 Q1019
  - *(at 11:00: AUTO 09011KT 070V130 9999 SCT019 26/19 Q1019)*
  - *(at 11:30: AUTO 09010KT 060V120 9999 FEW023 26/19 Q1019)*

- **at Perpignan airport**
  - at 10:00: AUTO 08010KT 9999 BKN009 BKN016 24/21 Q1017
  - at 10:30: AUTO 08010KT 9999 BKN009 24/21 Q1017
  - *(at 11:00: AUTO 08009KT 060V120 9999 OVC008 24/21 Q1018)*
  - *(at 11:30: AUTO 07009KT 9999 OVC009 25/21 Q1018)*

Note: *The METAR reports transmitted after the pilot's departure are shown in italics in brackets.*

The Terminal Aerodrome Forecasts (TAF) forecast (for the period of the planned route):

- **at Montpellier aerodrome**
  - LFMT 010500Z 0106/0206 04005KT 7000 SCT010 TEMPO 0106/0108 0500 FG BECMG 0108/0110 16010KT CAVOK

- **at Béziers aerodrome**
  - LFMU 0100500Z 0106/0206 06010KT CAVOK TEMPO 0106/0109 BKN010 PROB30 TEMPO 0106/0107 0800 FG BKN 005 BECMG 0110/0112 16010KT

- **at Perpignan aerodrome**
  - LFMP 0100500Z 0106/0206 04005KT 9999 OVC006 PROB30 TEMPO 0106/0109 4000 BR OVC003 BECMG 0109/0111 04013KT CAVOK

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