Technical report
A-024/2021

Accident on 14 June 2021 involving a Flight Design CTLS-LSA aircraft, registration D-EPAB, at Herrera de Pisuerga Aerodrome (Palencia, Spain)

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GOBIERNO DE ESPAÑA
MINISTERIO DE TRANSPORTES, MOVILIDAD Y AGENDA URBANA
SUBSECRETARÍA
COMISIÓN DE INVESTIGACIÓN DE ACCIDENTES E INCIDENTES DE AVIACIÓN CIVIL

Notice

This report is a technical document that reflects the point of view of the Civil Aviation Accident and Incident Investigation Commission (CIAIAC) regarding the circumstances of the accident and its causes and consequences.

In accordance with the provisions in Article 5.4.1 of Annex 13 of the International Civil Aviation Convention; and with articles 5.6 of Regulation (UE) nº 996/2010, of the European Parliament and the Council, of 20 October 2010; Article 15 of Law 21/2003 on Air Safety and articles 1 and 21.2 of Regulation 389/1998, this investigation is exclusively of a technical nature, and its objective is the prevention of future civil aviation accidents and incidents by issuing, if necessary, safety recommendations to prevent from their reoccurrence. The investigation is not pointed to establish blame or liability whatsoever, and it's not prejudging the possible decision taken by the judicial authorities. Therefore, and according to above norms and regulations, the investigation was carried out using procedures not necessarily subject to the guarantees and rights usually used for the evidences in a judicial process.

Consequently, any use of this report for purposes other than that of preventing future accidents may lead to erroneous conclusions or interpretations.

This report was originally issued in Spanish. This English translation is provided for information purposes only.

MINISTERIO DE TRANSPORTES, MOVILIDAD Y AGENDA URBANA

SUBSECRETARÍA

COMISIÓN DE INVESTIGACIÓN DE ACCIDENTES E INCIDENTES DE AVIACIÓN CIVIL

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ABBREVIATIONS

º	Degrees
AEMET	Spain's State Meteorological Agency
ARC	Airworthiness review certificate
ATPL(A)	Airline transport pilot license
CAMO	Continuing airworthiness management organisation
CAO	Combined airworthiness organisation
CAO(-CAM)	CAO with privileges
CB	Cumulonimbus
CPL(A)	Commercial pilot license
CR(A)	Class rating
FL	Flight level
ft	Feet
ETRS89	European Terrestrial Reference System 1989
IAS	Indicated airspeed
IR(A)	Instrument rating
kg	Kilos
km	Kilometres
kt	Knots
LAPL	Light aircraft pilot license
m	Metres
min	Minutes
masl	Metres above sea level
POH	Pilot's operating handbook
PPL(A)	Private pilot license (aircraft)
SEP	Single-engine piston
TCU	Towering cumulus

TR(A)	Type rating
v	Speed
VFR	Visual flight rules
UTC	Coordinated universal time

Technical report

A-024/2021

Owner and Operator:	Private.
Aircraft:	Flight Design CTLS-LSA, D-EPAB (Germany).
Date and time of accident:	14 June 2021 at 09:33 h local time[1].
Site of accident:	Herrera de Pisuerga Aerodrome (Palencia).
Persons on board:	1 (crew).
Type of operation:	General Aviation - Private.
Phase of flight:	Landing.
Flight Rules	VFR.
Date of approval:	23 February 2022.

Synopsis

Summary:

On Monday, 14 June 2021, at 08:05 h, the pilot and sole occupant of the Flight Design CTLS-LSA aircraft with registration D-EPAB took off from Robledillo Aerodrome (Robledillo de Mohernando, Guadalajara), intending to fly directly to Herrera de Pisuerga Aerodrome (Palencia).

The flight proceeded normally and on arriving in the vicinity of Herrera de Pisuerga Aerodrome, the pilot entered the downwind leg of the aerodrome circuit to land on runway 23. He had previously observed the windsock indicating a light westerly wind as he passed over the aerodrome, noting also that the runway was wet and even waterlogged in some places.

On the final leg, the pilot configured the aircraft for a standard landing with flaps at 15º.

He touched down and applied the brakes but was unable to stop the aircraft during the landing rollout. As a result, it overshot the end of the runway and continued into a field, where it flipped over.

The pilot sustained a minor injury from hitting his head on the cockpit roof.

The aircraft suffered significant damage to its nose leg and cockpit canopy.

The investigation has determined that the accident occurred because the aircraft landed on a contaminated runway (water).

The following is considered to be a contributing factor:

[1] All times in this report are expressed in local time. UTC can be calculated by subtracting 2 h from the local time.

- Not having configured the aircraft for landing on a runway with conditions that made it advisable to land at the lowest possible speed.

The report contains a safety recommendation addressed to the manager of Herrera de Pisuerga Aerodrome.

1. FACTUAL INFORMATION

1.1. History of the flight

On Monday, 14 June 2021, at 08:05 h, the pilot and sole occupant of the Flight Design CTLS-LSA aircraft with registration D-EPAB took off from Robledillo Aerodrome (Robledillo de Mohernando, Guadalajara), intending to fly directly to Herrera de Pisuerga Aerodrome (Palencia). He had flown the same aircraft at the aerodrome without incident the week before.

The weather report requested by the pilot for the overfly areas on the day of the accident forecast stable conditions in the morning and storms in the afternoon.

The flight proceeded normally. On arriving in the vicinity of Herrera de Pisuerga Aerodrome, the pilot observed that there was no other traffic and it was not raining. However, he could see a storm over the town of Herrera de Pisuerga to the west, which, as he later observed, had already passed over the aerodrome, leaving the runway wet and even waterlogged in places.

The pilot proceeded to approach the aerodrome, joining the downwind leg of the circuit to land on runway 23. He had previously observed the windsock indicating a light westerly wind as he flew over the airfield.

On the downwind leg, he ensured sufficient distance to fly over a power line in the vicinity of the airfield and then proceeded to fly the base leg before turning to final, again passing over the power line.

On the final leg, the pilot configured the aircraft for a standard landing with flaps at 15º.

He touched down at approximately 60 knots at the point where the aerodrome's two runways intersect. The pilot then applied the brakes, noticing that the aircraft was skidding rather than braking effectively. Consequently, he was unable to stop it during the landing rollout, resulting in a runway excursion. After overshooting the end of the runway, the aircraft went down an embankment and into a field, where it flipped over.

The pilot secured the overturned aircraft and evacuated without assistance, having suffered a slight blow to the head from hitting the cockpit roof.

The aircraft suffered significant damage to its nose leg and cockpit canopy. The cockpit remained structurally intact with no deformations.

1.2. Injuries to persons

Injuries	*Crew*	*Passengers*	*Total in the aircraft*	*Others*
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	1	-	1	-
Unharmed	-	-	-	-
TOTAL	1	-	1	-

1.3. Damage to the aircraft

The accident damaged the landing gear nose leg and some of the cockpit windows were smashed. The vertical stabiliser and rudder also sustained minor damage.

1.4. Other damage

There was no other damage.

1.5. Personnel information

On the day of the accident, the pilot was 47 years old.

He held ATPL(A), CPL(A) and PPL(A) licences, with the following ratings:

- TR(A) A320 (valid until 30-09-2021).
- IR(A) (Valid until 30-09-2021).
- CR(A) SEP (land) (valid until 30-04-2023).

He also held the following medical certificates:

- Class 1 (valid until 31-01-2022)
- Class 2 (valid until 31-01-2022)
- Class LAPL (valid until 31-01-2023)

In terms of flying experience, the pilot had 22 years of experience flying as a commercial air transport pilot. He currently serves as a commander on Airbus A320 aircraft and as a co-pilot on Airbus A340 aircraft.

He had returned to general aviation 3 months before the accident, having not flown in the discipline since he left the pilot school where he obtained his licence flying a CESSNA aircraft in 1994.

He renewed his SEP rating with a 2008 Tecnam aircraft at the end of April 2021.

With the SEP rating in force, he started flying the Flight Design CTLS-LSA aircraft with registration D-EPAB.

At the time of the accident, he had accumulated 30 hours of flight time since the beginning of May 2021, all of which were in the aircraft involved.

1.6. Aircraft information

1.6.1.- Aircraft specifications.

- Make: Flight Design
- Model: CTLS-LSA
- Year of manufacture: 2010
- Serial number: F-10-03-11
- Maximum take-off weight: 600 kg
- Type of engine: ROTAX 912 ULS2
- Information about the owner Private

The Flight Design CTLS-LSA is a high-wing, two side-by-side seat aircraft with a composite structure.

It has tricycle-type landing gear. The main landing gear wheels are equipped with hydraulic disc brakes that act simultaneously when actuated by a lever located next to the throttle.

The aircraft has a 98 hp ROTAX 912 ULS2 engine and a Neuform three-bladed composite propeller with a variable pitch in flight.

The aircraft has a wingspan of 8.59 metres, a length of 6.60 metres, a height of 2.34 metres and a maximum take-off and landing weight of 600 kg.

At the time of the accident, both the aircraft and engine had accumulated 602 flight hours.

1.6.2.- Aircraft documentation.

The aircraft CTLS-LSA registration D-EPAB and serial number F-10-03-11 does not have an airworthiness certificate and, consequently, an airworthiness review certificate (ARC), since this aircraft flies under a permit to fly and flight conditions issued by EASA on October 9th 2020 indefinitely on the document: FLIGHT CONDITIONS FOR A PERMIT TO FLY – APPROVAL FORM (EASA form 18).

The document specifies the following in relation to continued airworthiness:

“An Airworthiness Review must be carried out following the principles of Part ML, by a Part-ML organization (CAMO, CAO or CAO(-CAM)), by an airworthiness review staff or by the Competent Authority but cannot result in the issue of an ARC.

If during the review the aircraft is found to be:

- *In compliance with the aircraft configuration defined in the EASA approved flight conditions, and*
- *In compliance with the conditions and restrictions of the EASA approved flight conditions, and*

- *In a technical condition to perform a safe flight in accordance with the stated conditions and restrictions,*

Then, the staff performing the review shall enter a statement into the aircraft technical logbook to confirm that it has been subjected to an airworthiness review based on the EASA-approved flight conditions and that it is considered airworthy at the time of the review".

The most recent airworthiness review was carried out on 13 September 2020 by the CAMO organisation with reference ES.MG.208. (Mister Propeller, S.L.).

The aircraft does not have a registration certificate. Furthermore, for this aircraft, the registration certificate is not required since the European regulations classify the aircraft as a light aircraft and it flies under a permit to fly issued by EASA, (the permit to fly serves as its registration certificate).

1.6.3.- The aircraft's ergonomics and safety harnesses

The aircraft is equipped with two seats that can be adjusted to change their angle and distance with respect to the controls.

The distance from the control panel can be altered by moving the seat backwards or forwards on rails attached to the fuselage.

The seat's angle is adjusted using a strap behind the seats.

Lastly, a central beam crosses the cabin from one side to the other.

Figure 1 – Cabin (1)

Figure 2 – Cabin (2)

According to the information provided by the pilot, the accident aircraft was equipped with the original safety harnesses at the time of the accident. The harnesses, which are anchored to the aircraft in three places, restrain the occupant with shoulder and waist straps, as shown in the following photograph:

Figure 3 - Safety harness on the accident aircraft

In his interview, the pilot explained that once he has adjusted the seat to suit him, his head almost touches the beam.

1.6.4.- The aircraft's POH

The aircraft's POH provides the following information relevant to the approach and landing phases:

1.6.4.1- Checklists:

The aircraft's POH contains, among others, the following landing procedures:

- Before landing:

Safety harness:	Tight.
Wing flaps:	0º.
Airspeed:	62 kt (114 km/h) IAS.
Wing flaps:	15º.
Airspeed:	55 kt (102 km/h) IAS.
Landing light:	On.
Carburettor heat:	Off.

- Landing in normal conditions (normal landing):

Approach airspeed:	55 kt (102 km/h).
Flaps in final:	15º at long fields, gusty conditions, or crosswind. 30º only on final for short runways and when conditions permit.
Airspeed on final:	52 kt (96 km/h) with flaps at 30º.
Flare:	Smoothly, nose not too high, avoid ballooning.
After touchdown:	Stick smoothly back to relieve front wheel.

The checklists also contain the following warning:

The aircraft can be landed at all flap settings. The maximum flap position (30º) should be used to land on very short runways under favourable wind conditions (no crosswind component, very light wind and low gusts).

- Short field landings:

Flaps:	30º already after base turn.
Speed:	Approach 48 kt (88 km/h) IAS.
Throttle:	Idle before touchdown at 5 ft (1.5 m) above ground.
Touchdown:	Positive landing and immediate braking.

- Soft field landings:

Approach:	Same as normal landing.
Flaps:	30º in final.
Speed:	Approach 48 kt (88 km/h) IAS.
Descent:	Smooth descent rate, no steep descent.
Throttle:	Reduce smoothly just above the ground.
Flare:	Hold aircraft just above the ground and reduce speed to minimum speed.
Touchdown:	Smooth touchdown at minimum speed.
After landing:	Hold nose wheel high as long as possible. When nose can no longer be held, apply very little power to finally lower nose wheel smooth.
Brakes:	Typically, not required on soft field. Avoid braking to avoid pressure on nose wheel.

1.6.4.2- Minimum equipment list

The minimum equipment list includes, among other items, the use of a four-point safety harness:

Flight Instruments:	Airspeed Indicator
	Altimeter with barometric adjustment
	Magnetic Compass with calibration card
Engine Instruments:	Tachometer,
	Cylinder Head Temperature Indicator
	Oil Temperature Indicator
	Oil Pressure Indicator
Safety Harness	Four-point; one per seat

1.7. Meteorological information

There was no significant meteorological information for the vicinity of the aerodrome.

The low-level maps shown below for 14 June at 6 UTC (valid 3 hours before and after 12 UTC) indicate isolated showers and TCU and/or CB with bases at 80-100 and ceilings above FL150 in the area of the accident (Herrera de Pisuerga, Palencia).

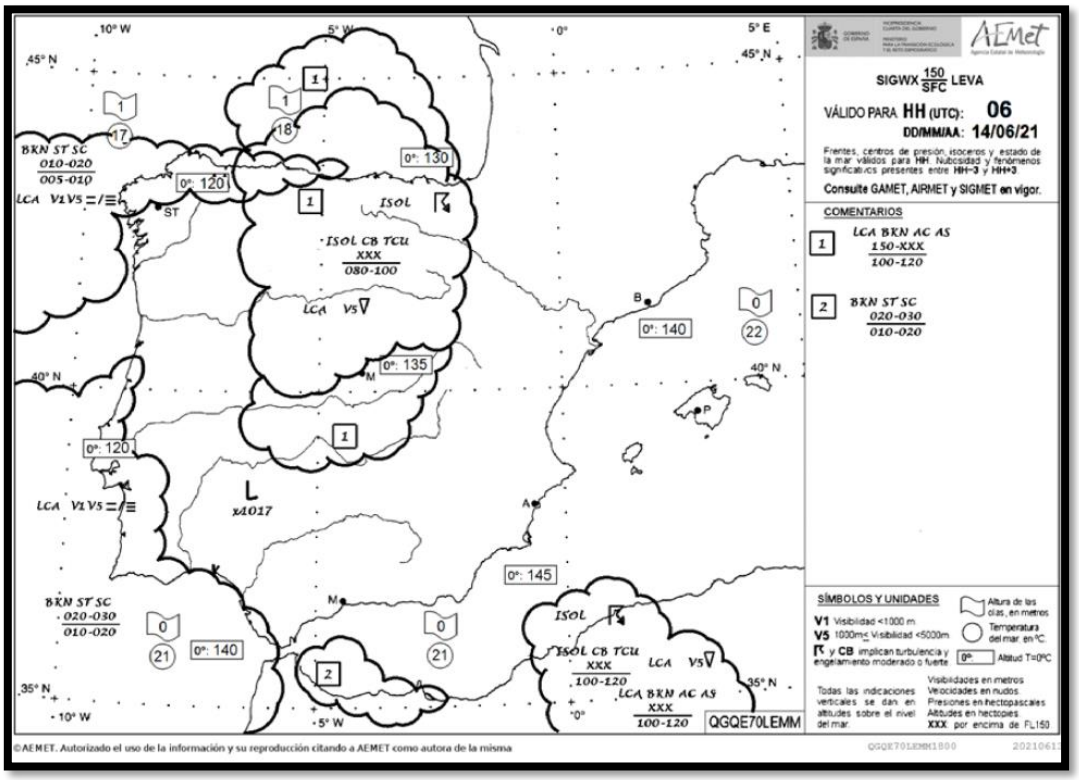

Figure 4 - Weather map provided by AEMET.

In preparation for the flight, the pilot consulted the weather forecast on the AEMET website (in the self-service aeronautical weather report section), paying particular attention to the significant weather charts. He also consulted another well-known weather forecast website to obtain information for the municipalities he planned to fly over. The information he gathered indicated the presence of storms after 14:00.

During the cruise phase of the flight, he saw storms in the area around Valladolid, and as he neared the destination aerodrome, he noted that it wasn't raining but that there was a storm over the town of Herrera de Pisuerga to the west, which, as he later observed during the approach phase, had already passed over the aerodrome, leaving the runway wet and even waterlogged in places.

1.8. Aids to navigation

N/A.

1.9. Communications

N/A.

1.10. Aerodrome information

Herrera de Pisuerga Aerodrome is located in the municipality of Herrera de Pisuerga (Palencia), at an elevation of 2,952 ft. The aerodrome is privately owned and managed.

It has two compacted earth and grass runways with the following specifications:

	Designation	***Length***
Main runway	05 / 23	450 metres
Secondary runway	09 / 27	300 metres

Table 1 - Specifications of the runways at Herrera de Pisuerga Aerodrome.

Next to the extremity of runway 05, a slight embankment slopes down to farmland.

The existence of a high-voltage power line located approximately 650 metres from the head of runway 23 should also be noted.

Herrera de Pisuerga Aerodrome is not included in the ENAIRE guide for visual flight, which contains information on public and restricted aerodromes open to VFR flights.

The geographical data for the main runway is as follows:

	Coordinates (Geographical ETRS89)		Elevation (masl)
Threshold 05	42°35' 28,68" N	4°17' 29,52" W	900.92
Threshold 23	42°35' 38,10" N	4°17' 16,62" W	902.35

Table 2 - Threshold specifications of the main runway at Herrera de Pisuerga Aerodrome.

The previous table shows that runway 23 has a slight negative slope:

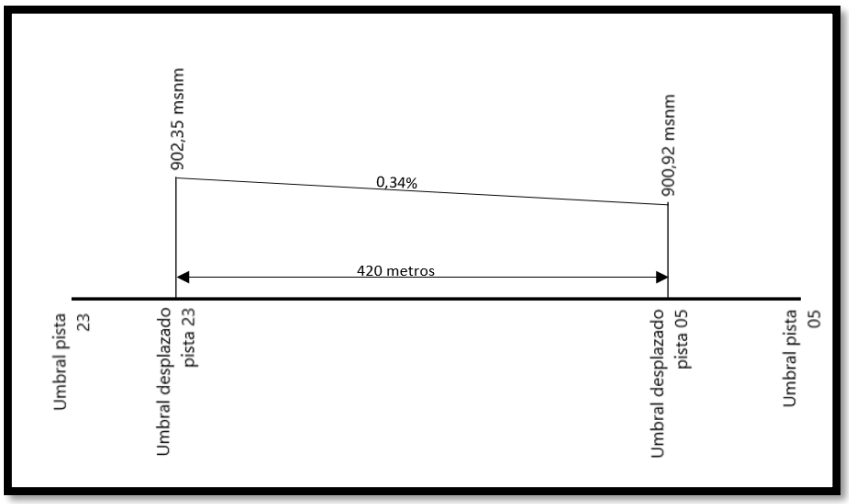

Figure 5 - Longitudinal sketch of runway 05/23 at Herrera de Pisuerga Aerodrome.

The following image shows some of the previously mentioned elements:

Figure 6 - Satellite image of Herrera de Pisuerga Aerodrome.

1.11. Flight recorders

The aircraft was not equipped with a flight data or cockpit voice recorder because they are not a regulatory requirement for this type of aircraft.

However, the investigation was given access to data from the aircraft's GPS, which recorded the flight made by the pilot. The data was processed in the CIAIAC Technical Laboratory, obtaining the results shown below.

According to the GPS data, the aircraft took off at 08:08 h from Robledillo Aerodrome (Robledillo de Mohernando, Guadalajara) and headed towards Herrera de Pisuerga Aerodrome, where it landed at 09:33 h.

A detailed explanation of the GPS trace during the approach and landing is provided below.

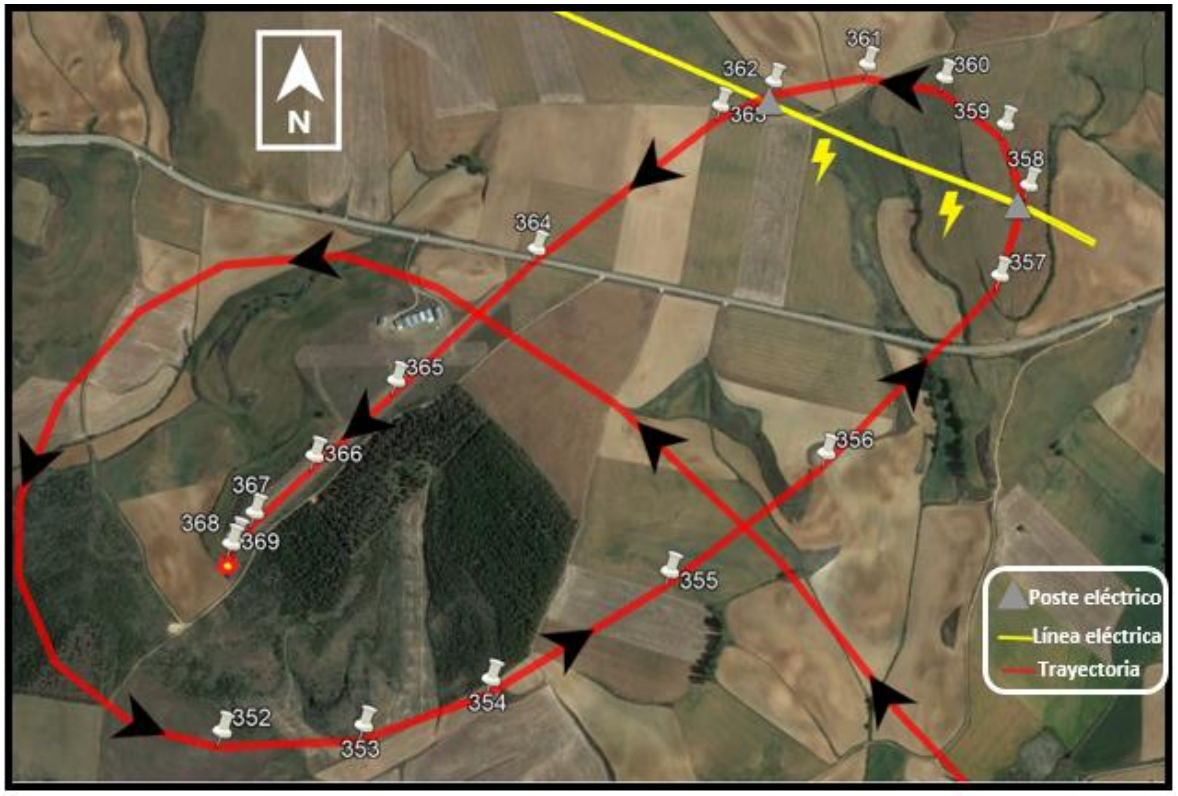

Figure 7 – Path followed by the aircraft (1).

As can be seen from the GPS trace, the pilot approached the aerodrome area from the southeast. He passed over the airfield, turned to join the aerodrome circuit for runway 23 on the crosswind leg, and then proceeded to the downwind leg.

During the downwind leg, he flew over the power line in the vicinity of the aerodrome. He turned to base and then turned again to line up for the final leg, flying over the power line for a second time.

The aircraft touched down at the intersection of the two runways, travelled approximately 360 metres to the threshold of runway 05, continued another 80 metres to the embankment and then rolled down the slope into the field.

The following table shows the GPS data for the relevant parameters during the approach and landing:

Point	Time	Circuit leg	Elevation* (masl)	Height* (m)
352	09:32:16	Crosswind	1014	129
353	09:32:23	Downwind	1009	140
354	09:32:30	Downwind	1003	118
355	09:32:41	Downwind	995	104
356	09:32:52	Downwind	994	106
357	09:33:06	Downwind	1004	105
358	09:33:11	Base	1008	101
359	09:33:15	Base	1008	103
360	09:33:19	Base	1006	103
361	09:33:23	Final	1000	107
362	09:33:28	Final	985	91
363	09:33:31	Final	970	70
364	09:33:42	Final	914	13
365	09:33:52	Landing rollout	900	0
366	09:33:59	Landing rollout	900	0
367	09:34:06	Landing rollout	900	0
368	09:34:10	Roll down embankment	898	0
369	09:34:16	Aircraft overturns	898	0

**Obtained by subtracting the Google Earth elevation from the GPS reading*

Table 3 - Aircraft parameters during the approach and landing (1)

A more detailed analysis of the parameters obtained from the GPS can be found in section 1.16.

1.12. Aircraft wreckage and impact information

The accident occurred during the landing on runway 23 at Herrera de Pisuerga Aerodrome.

The aircraft touched down about 90 metres from the threshold on runway 23 and taxied approximately 360 metres along the runway until it crossed the threshold of runway 05. It then continued for a further 80 metres to the end of the runway.

After overshooting the end of the runway, the aircraft rolled into a field and flipped over.

Figure 8 - Aircraft after the accident (1).

Subsequently, with the help of an excavator, the aircraft was towed to a hangar at Herrera de Pisuerga Aerodrome.

1.13. Medical and pathological information

No relevant information.

1.14. Fire

There were no signs of fire during the flight or after the impact.

1.15. Survival aspects

The cockpit maintained its structural integrity, and the harnesses and restraint systems performed their function, preventing serious injury to the pilot.

Although the pilot was wearing his safety harness when the aircraft flipped over, he hit his head against the beam in the upper part of the cockpit (see figures 1 and 2). The pilot unbuckled his safety harness, secured the aircraft and exited through one of the side windows (which had smashed when the aircraft overturned, as had the windscreen). He sustained minor injuries from the blow to his head.

Figure 9 - Aircraft after the accident (2).

The photographs received from the pilot show that all three harnesses anchorages were intact.

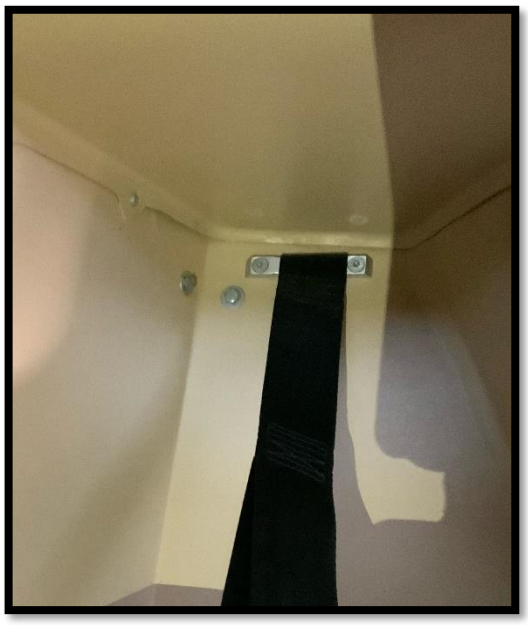

Figure 10 - Aircraft after the accident (3)

Figure 11 - Aircraft after the accident (4)

The harnesses in the aircraft are the original factory fitted safety harnesses. The pilot indicated that they come loose easily in flight.

1.16. Tests and research

After processing the data obtained from the GPS, some of which were detailed in point 1.11, the following values of interest to the investigation were obtained:

Leg	*Phase*	*Descent rate (ft/min)*	*v* (kt)*	*Descent angle (º)*
357-358	Turn to base	170	65	-
358-359	Base	-23.5	57	-
359-360	Base	-94.5	65	-
360-361	Turn to final	-260	66	-2
361-362	Final	-605.5	67	-5
362-363	Final	-1009	70	-8
363-364	Final	-989	74	-7.5
364-365	Final and start of landing rollout	-322	64	-3
365-366	Landing rollout	-	51	-
366-367	Landing rollout	-	37.5	-
367-368	Landing rollout	-	24	-
368-369	Landing rollout	-	4.5	-
369-370	Aircraft overturns	-	0	-

**Average ground speed during the leg.*

Table 4 - Aircraft parameters during the approach and landing (2)

The image below illustrates the final approach phase and the initiation of the landing manoeuvre, showing the points indicated in the table above:

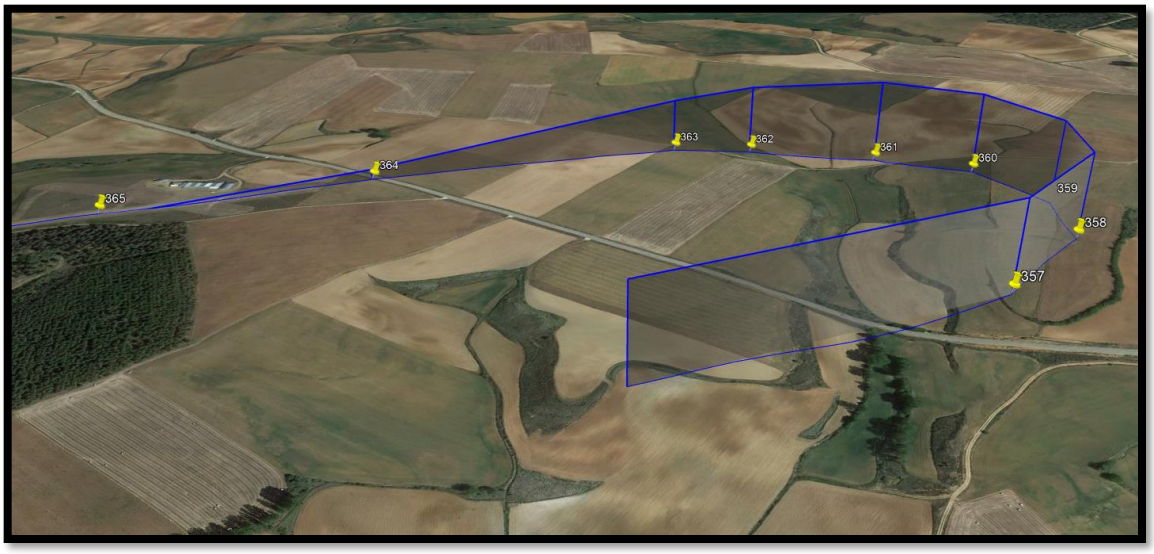

Figure 12 - Path followed by the aircraft (2).

1.17. Organisational and management information

N/A.

1.18. Additional information

- Information obtained from the manufacturer (Flight Design GmbH):

As the pilot hit his head on the central beam when the aircraft flipped over, the manufacturer was asked if the cockpit seating positions are subject to any restrictions.

The manufacturer reported that there is a weight restriction but no height restriction.

1.19. Special investigation techniques

N/A.

2. ANALYSIS

The following aspects will be analysed:

- The approach and landing phases.
- The ergonomics of the aircraft.
- The meteorological conditions.

2.1. Analysis of the aircraft's approach and landing.

The pilot was aware of the weather in the area he was flying to.

After flying the base leg (passing over the power line in the vicinity of the airfield twice) and final approach, the aircraft landed about 90 metres from the runway 23 threshold at approximately 60 kt (5 kt faster than specified for a normal landing[2] in the POH), as shown in table 4. The table also shows that, after overflying the power line for the second time (point 362), there was a notable increase in speed on the last part of the approach. This increase in speed is believed to result from the increase in the descent angle applied by the pilot in order to land on runway 23 after clearing the power line. Although the pilot decreased speed as he eased the descent angle just before touchdown, the adjustment was insufficient to prevent the aircraft from landing at a higher than recommended speed with flaps at 15º.

After the aircraft touched down, the pilot applied the brakes but could not prevent it from overshooting the end of the runway and flipping over.

Based on the foregoing, it is believed that two factors prevented the pilot from being able to brake the aircraft sufficiently within the confines of the runway: firstly, the fact that it approached at a slightly higher speed than recommended in the POH (5 kt) for flaps at 15º, and secondly, the fact that the grass runway was wet (even waterlogged in some places) and had a slight negative slope.

Nonetheless, the specific conditions at the aerodrome at the time of landing:

- Calm wind.
- Wet grass runway.

Should have prompted the pilot to land at the slowest possible speed in anticipation of a loss of brake effectiveness during the landing rollout due to the runway conditions extending the required landing distances.

Although there are no instructions in the POH for landings and take-offs on wet (contaminated) runways, there are checklists that recommend landing at lower speeds than those used in a normal landing with flaps at 15º (checklist for short and soft field landings). Among other things, these checklists specify flaps at 30º.

Had the pilot realised the need to land at a lower speed than that used in normal conditions, he would have configured the aircraft with flaps at 30º, which, in turn, would have allowed him to:

[2] At this altitude and in calm conditions, it can be assumed that the aircraft's indicated speed is its ground speed.

- Fly at a lower approach speed and, consequently, touch down at a lower speed, thereby reducing the horizontal distance travelled by commencing from a lower initial speed when braking.
- Follow a steeper descent path. This would have allowed the aircraft to fly over the power line without the need to adjust the descent angle, maintaining a steady descent throughout the final approach and avoiding 'steps' (although he would have needed to start the final approach at a higher altitude to maintain the descent angle).
- Benefit from more aerodynamic drag during the landing rollout, which would have assisted the aircraft's brakes and partly compensated for the loss of effectiveness caused by the runway conditions.

The investigation has therefore concluded that a 30º flap configuration, rather than 15º, would have been more appropriate for landing in the conditions that existed at the aerodrome at the time of the accident.

2.2. Analysis of the ergonomics.

As shown in Figures 1 and 2, a structural beam runs across the roof of the aircraft's cockpit from one side to the other. Although this beam prevented the cockpit from suffering any structural deformities during the accident, the pilot hit his head on it when the aircraft overturned, even though he was wearing his safety harness.

In his interview, the pilot explained that when he configures the cockpit seat to suit his height, the resulting position causes the top of his headset to hit the beam, or, if he is not wearing a headset, his head almost touches the beam.

It is possible the pilot may have been focusing on other aspects (such as the presence of a storm and the runway conditions) and forgot the "before landing" checklist item that specifies tightening the safety harness (see 1.6.4.1). If the safety harness was not sufficiently tightened when the aircraft flipped over, the slack would have allowed the pilot's body to shift and his head to hit the beam.

Although the manufacturer states in the POH that a four-point safety harness should be used, this would not have prevented the pilot from hitting his head when the aircraft overturned because:

- The safety harness attachments to the aircraft structure maintained their integrity at all three anchor points.

- The safety harness had straps to restrain the pilot's shoulders and, had it been properly tightened, would likely have prevented him from slipping in the seat and hitting his head.

2.3. Analysis of the meteorological conditions.

After analysing the weather information provided by AEMET and that compiled by the pilot, it is concluded that the flight was not subject to any limiting conditions.

3. CONCLUSION

3.1. Findings

- The flight was not affected by any type of limiting meteorological phenomena.
- The runway was contaminated (water).
- The landing was performed at a slightly higher speed (5 kt) than that recommended in the POH for the selected aircraft configuration.

3.2. Causes/contributing factors

The investigation has determined that the accident occurred because the aircraft landed on a contaminated runway (water).

The following is considered to be a contributing factor:

- Not having configured the aircraft for landing on a runway with conditions that made it advisable to land at the lowest possible speed.

4. RECOMMENDATIONS

The following safety recommendation is addressed to the manager of Herrera de Pisuerga Aerodrome:

REC 13/22: In order to increase the visibility of the existing power line under the approach obstacle limitation surface for runway 23 and the take-off climb obstacle limitation surface for runway 05, it is recommended that the manager of Herrera de Pisuerga Aerodrome liaise with the owner of the power line to mark the cables with spherical markers, beacons or similar.