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Introduction

Manufacturer:	Piper Aircraft, USA
Aircraft type:	Piper, PA-22
Owner and operator:	natural person, pilot
Identification mark:	D-EIRY
Location of incident:	approx. 9 km NE LKKT, Klatovy Airport
Event date and time:	26 September 2019, 18:15 UTC 20:15 CEST (all times are UTC)

A) Synopsis

On 26 September 2019, the AAI CZ was notified by RCC of interception of signal from ELT of the said aircraft. Based on such signal interception, aerial and ground search for the aircraft commenced at 19:44. It was already established during this search that the aircraft had taken off from LKLT (Letňany Airport) with two persons on board, with planned landing at LKKT. The Czech Police helicopter's aerial search was interrupted during its second flight due to unfavourable meteorological conditions. The ground search continued even during the night. On the following day, having resumed the aerial search, the Czech Police helicopter found the aircraft wreckage. The rescue crew took the rope down from the SAR ACR helicopter. Having entered the high-grown forest, the aircraft was destroyed by hitting the trees, crashing on the ground and by subsequent fire. Both persons on board of the aircraft died.

1.1. Critical Day

At 17:19, the pilot with a close person took off from LKLT for a flight without a flight plan to LKKT. He carried out the taxiing and take-off with a radio-telephone connection with the LKLT AFIS station. After taking off, he switched to the connection with LKKB MTWR. After logging off from the LKKB MTWR frequency, he established no other radio-telephone connection. According to the radar recording, he continued in his flight towards LKKT.

1.2. Personnel Information

The pilot:

Male – age: 63 years,

Passenger:

Female – age: 38 years, no flying experience

1.3. Meteorological Information

Under the influence of an advancing warm front from the west.

Ground wind:	240–330°/4–12 KT
Upper wind:	2000 FT MSL 240°/10–15 KT, 5000 FT MSL
Visibility:	over 10 km, deteriorated in rainfall
Weather:	broken, sporadic rain

Cloudiness:	SCT/BKN Sc, Cu, in rainfall St, the lowest layer SCT/BKN Cu, BASE 040-055, in rainfall St SCT/BKN 015–025, Sc 025–040, TOP Sc 070, Cu 080-100, another layer sequentially up to BKN/OVC As, BASE 070-080 FL 090–100
Zero isotherm level:	
Turbulence:	sporadic light ground/050
Icing:	light, sporadically moderate FL 100–150

1.4. Wreckage and Impact Information

The crash site was located at an altitude of 566 m, in a hilly terrain, on the edge of a forest opening of approximately 30 x 40 m, covered with high-grown spruce trees. The trees were about 25 m high. On the forest opening, there was dense vegetation consisting of wild and self-seeded bushes sprung up to 2 m. The aircraft wreckage was located about 200 m north-east of the 576m high hilltop. The wreckage was consumed by fire in the centre of the impact and charred in the vicinity thereof. The wreckage was not affected by fire at a greater distance from the centre. Some parts of the wreckage and pieces of aircraft equipment were dispersed on the branches of forest trees and on the ground in the direction of the aircraft motion.

After the impact on the ground, fire broke out, affecting the aircraft wreckage at the place of impact. Those parts of the aircraft and pieces of its equipment that had been dispersed on the trees and on the ground after the impact or had remained stuck on trees were not affected by fire.

2. Analyses

2.1. Pilot

- He had a valid Private Pilot Licence.
- He also held a valid Medical Certificate and a valid General certificate for radio operator of an aeronautical mobile service.
- According to the data recorded in the Pilot Logbook, his total hours flown amounted to 433 hours, 837 flights. Hours flown on the type equalled 53.6 hours, 91 flights. Over the last month, he has flown 16.1 hours, 19 flights on the type.
- He had experience with the way of arriving at and departing from LKKT.
- He performed all the flights recorded in the Pilot Logbook in the daytime.
- He has not conducted any training to acquire IR qualification. He did not have IR qualification in his Pilot License, he was not qualified to conduct IFR flights.
- He did not have training and night flight clearance recorded in his Pilot Logbook.
- He took off for a VFR flight from LKLT 5 minutes before the end of the civil dark.
- He did not arrange for the use of runway lighting installed at LKKT with the airport operator.
- He entered deteriorated weather conditions on the warm front with decreasing visibility and a lower cloud base, with reasonably assumed occurrence of rain showers and frontal and orographic turbulence over the hilly forested terrain.

- He descended below the safe altitude below the decreasing lower cloud base in an effort to maintain visual reference to terrain for determining aircraft's geographical location in an insufficiently lighted area.
- He switched on the landing headlight probably at this phase of the flight.
- By using the landing lights, he was likely to enhance the negative effect on his spatial orientation after entering the clouds or rain shower in night light conditions. It must have further reduced his capability of visual reference to ground light sources already rather limited given the space and such a low altitude. In view of his level of theoretical knowledge and no practical experience with flying in such meteorological and lighting conditions, this would highly likely have had a strong impact on his ability to maintain a real sense of spatial orientation and not to succumb to negative sensory illusions in flight, which could lead to the loss of his spatial orientation and thus of his ability to pilot properly.

2.2. Passenger

- The Commission has not been able to confirm or disconfirm her intentional or unintentional intervention to the control of aircraft in the final phase of the flight.

2.3. Aircraft

- With regards to the mechanical and thermal degradation of aircraft wreckage, the Commission was unable to confirm or disconfirm with certainty the possible impact of the technical condition of the aircraft on the occurrence of the air accident.
- The flight segment described by the witnesses was steady and the engine run was regular.

2.4. Weather

- The weather conditions that must have clearly deteriorated in the second half of the flight, the decreasing lower cloud base, poor visibility, and the effect of rain showers negatively affected the pilot's decision-making process and thus his piloting conducted under increasing stress.
- The frontal and orographic turbulence on the down-wind side of the slope during the advancing warm front most likely had an impact on the performance capabilities of the aircraft.

3. Conclusions

3.1. Pilot

- He was not qualified to fly at night and under IFR conditions.
- Before the flight, he did not assess the possible weather development and conditions along the flight route and at LKKT at the time of landing.
- He was not prepared to deal with the situation after entering deteriorated meteorological conditions at night.

- After entering the deteriorated frontal meteorological conditions, he did not decide to fly from them to the area with known favourable weather, but continued in his flight to LKKT under these conditions.
- By possibly switching on the landing headlight, he negatively influenced his perception of his spatial orientation and thus his piloting under the said lighting and meteorological conditions.

3.2. Aircraft

- The Commission has not been able to confirm or disconfirm the impact of the technical condition on the occurrence and course of the air accident.

3.3. Weather

- It was not suitable for a VFR flight in the given area.

3.4. Aircraft Accident Cause

- The air accident was caused by a series of events starting with:
 - The pilot's decision to perform a night flight for which he was not qualified.
- The series of events further continued by:
 - Incorrect assessment of the weather situation and weather forecast by the pilot.
 - Pilot's entering the area in conditions unsuitable for a VFR flight.
 - His failure to leave the area and return to the area with suitable conditions for a VFR flight.
 - Continuing in the flight in unfavourable conditions for a VFR flight to LKKT.
 - Decreasing the flight altitude in the hilly wooded terrain below the safe altitude.
- The said series of events resulted in the aircraft's entering the forest, crashing into trees, falling on the ground and then catching fire.
- The Commission has not been able to confirm or disconfirm the passenger's intentional or unintentional intervention in the aircraft control or her further activity on board which could have caused the occurrence of the air accident or could have been a contributing factor in the course of the air accident.