Class: 343-08/19-02/09
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Zagreb, 12 April 2021

# F I N A L  R E P O R T

## ON ACCIDENT OF THE AIRCRAFT CESSNA 150, REGISTRATION 9A-DMI

## 17 AUGUST 2019, A6 MOTORWAY NEAR EXIT RAVNA GORA

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**The final report cannot be used as evidence in court proceedings whose aim is determining civil or criminal liability of individuals.**

## CONTENT

## OCCURENCE INFORMATION

| | |
|---|---|
| Type of the occurrence: | Accident |
| Date: | 17 August 2019 |
| Local time: | 10:45 |
| Place: | A6 motorway, near exit Ravna gora |
| Type of the aircraft: | Aeroplane |
| Manufacturer / model: | Cessna/150 M |
| Registration: | 9A-DMI |
| Owner: | Aeroclub Penkala 1910 |
| Operator: | ECOS pilot school - aircharter d.o.o |
| Number of persons on board: | Two |
| Injuries: | No injuries |
| Damage to the aircraft: | Significant material damage |

## INVESTIGATION

AIA received the first information about the accident on the same day from the National Protection and Rescue Directorate (DUZS), the Operational Communication Center of the Ministry of the Interior (OKC MUP), and the aircraft operator.

Considering the location of the accident, immediately upon obtaining the report, AIA investigators went to the accident site to conduct an investigation in order to normalize road traffic on the A6 motorway as soon as possible. On the same day, interviews were conducted with the persons involved in the accident and the investigation was opened. After performing the inspection at the accident site, the aircraft was transferred to Lučko Airport, where a further analysis of its airworthiness was performed.

AIA issued safety recommendations to the aircraft operator - ECOS pilot school, the owner of the aircraft - Aeroclub Penkala 1910, the pilots of the accident in question and Croatian civil aviation agency (CCAA).

## SUMMARY

## 1. FACTS AND INFORMATION

On 17 August 2019 around 10:45 UTC, on the flight of the aircraft in question from Lučko Airport (LDZL) to Vrsar Airport (LDPV), above the area of the town of Vrbovsko at an altitude of 5500 ft, the engine started to run roughly and to lose power after which it had to make emergency landing on the A6 motorway (direction Rijeka), about 900 meters before the exit Ravna gora.

There were no injuries in this accident, and there was significant material damage to the aircraft and minor material damage to the motorway guardrail.

The immediate cause of this accident was engine carburettor icing.

### 1.1. FLIGHT INFORMATION

The training flight in question was being conducted in accordance with the VFR (Visual flight rules) rules and in accordance with the submitted flight plan. The take-off airport was Lučko Airport (LDZL), and the planned destination was Vrsar Airport (LDPV). Grobnik Airport (LDRG) was listed in the flight plan as an alternative airport. The route of the flight in question was "*W1-KARLOVAC-VRBOVSKO-GROBNIK-L1-N5-LDPV*".

At the moment when the aircraft was flying above the town of Vrbovsko, at an altitude of 5500 ft, the pilots noticed rough running of the engine and loss of power. After applying the *Engine failure procedure*, there was no significant improvement in the engine operation. Considering the unfavourable configuration of the landing terrain, the pilots decided to land on the A6 motorway.

### 1.2. INJURIES

| Injuries | Crew | Passengers | Others |
|---|---|---|---|
| fatal | 0 | 0 | 0 |
| serious | 0 | 0 | 0 |
| minor / none | 2 | 0 | 0 |

### 1.3. DAMAGE TO THE AIRCRAFT

Although during the landing no separation of major structural parts of the aircraft happened, a significant material damage occurred in a form of: dents in the fuselage skin in several places, bending of the propeller blades, bending of the engine mount, rupture of the engine cowling, separation of the landing gear wheel, rupture of the wing skin etc. Some of the damage are shown in Pictures 1 and 2.

Picture 1 – Damage to the tip of the wing

Picture 2 – Damage of the wing skin

### 1.4. OTHER DAMAGE

During the accident in question, a minor damage to the motorway guardrail occurred when the fuselage made a contact with it (Picture 3), in the form of minor dents and scratches.

Picture 3 – Damage to the motorway guardrail

## 1.5. PILOT INFORMATION

At the time of the accident, there were two pilots on board, a flight instructor and a student pilot.

### 1.5.1. Flight instructor – Pilot in command

Male person, Croatian citizen born in 1965. The flight instructor was also the PIC (Pilot in command) on the flight in question. The instructor holds a valid Private Pilot License - PPL(A) issued on 26 August 2013 by the Croatian Civil Aviation Agency with the following authorizations: *"SEP(A), TMG, Aerobatic, Banner towing, Sailplane towing, FI (A)"*. Until the accident in question, he had a total of 940 flight hours on various types of general category aircrafts over a period of 39 years. He has been a flight instructor for the last 30 years. On the type of aircraft Cessna 150, he had 239 flight hours, and in the last 3 months preceding the day of the accident, 123.05 flight hours. During the flight the instructor was sitting in the front right seat.

### 1.5.2. Student pilot (Student pilot for Private Pilot License - PPL)

Female person, Croatian citizen born in 1979. In the accident in question, the person was a student pilot for a PPL license, and until the decision to make the emergency landing on the motorway, she was operating the aircraft from the left seat. Until the event in question, she had a total of 49 flight hours, and was in the stage of independent flying.

### 1.6. AIRCRAFT CESSNA 150 M COMMUTER - 9A-DMI INFORMATION

| | |
|---|---|
| Type of the aircraft: | Aeroplane |
| Manufacturer / model: | Cessna /150M |
| Aircraft serial number: | 150765022 |
| Year of manufacture: | 1975 |

Cessna 150 M is a high wing aircraft of metal construction with fixed landing gear type tricycle. The fuselage contains two doors for entry of the pilot and passenger. This model of aircraft has two built-in seats, and it is multi-purpose. It is mainly used for recreational flying and for pilot training. It was manufactured in America from 1975 to 1977, and a total of 3097 aircraft were produced. Rolls Royce O-200A engine and a McCauley 1A1020CM694E propeller were installed in this model of the aircraft. Cessna 150 M is known for its greater susceptibility to carburettor icing due to the remote position of the carburettor in relation to the engine which reduces engine heat transfer.

The aircraft in question is registered in the Croatian Register of Civil Aircraft under number 0035. The owner of the aircraft is the Aeroclub “Penkala 1910”, and the operator is the company ECOS pilot school - aircharter d.o.o. At the time of the accident, a valid Certificate of Airworthiness and a Certificate of Release to Service (CRS) were issued for the aircraft. The last 50-hour maintenance works on the aircraft were performed on 9 July 2019 by a mechanic, a natural person, on a total of 7640 flight hours. At the time of the accident, the aircraft had 7655.30 flight hours.

### 1.7. METEOROLOGICAL INFORMATION

On 17 August 2019, on the route of the aircraft in question, the meteorological conditions were favourable for flying. Considering the nature of the accident, a meteorological report with detailed atmospheric data was prepared.

It is stated in the meteorological report that at the time of the accident the area of Gorski Kotar was under the influence of a field of fairly equal air pressure, while the north western Europe was dominated by a vast and deep cyclone. Such conditions are most often accompanied by small and moderate cirrus clouds, and occasional light clouds.

For the purposes of the meteorological report, data from the synoptic stations Ogulin and Parg were used, which show that at the time of the accident the situation was stable with moderate cirrus clouds, which creates very low thermal activity.

For the purpose of further analysis of meteorological conditions by altitude, the numerical model ARW (Advanced Research WRF - Weather research and forecasting) was used, which was verified by data from synoptic stations.

In the analysis of the results of the numerical model, air temperatures and dew points on the last thirty kilometres of the route of the aircraft in question were taken into consideration. The probability of icing is shown in Table no. 1.

| **Altitude*** | **1200 m** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Time**** | **8** | | | **9** | | | **10** | | | **11** | | |
| **Location** | **T** | **D** | **PCI** | **T** | **D** | **PCI** | **T** | **D** | **PCI** | **T** | **D** | **PCI** |
| Loc 1 | 14 | 3 | low | 15 | 3 | low | 15 | 4 | low | 15 | 7 | moder |
| Loc 2 | 14 | 4 | low | 15 | 5 | moder | 15 | 8 | moder | 15 | 10 | moder |
| Loc 3 | 14 | 7 | moder | 15 | 8 | moder | 15 | 9 | moder | 16 | 10 | moder |
| | **1500 m** | | | | | | | | | | | |
| Loc 1 | 13 | 3 | low | 13 | 3 | low | 13 | 4 | moder | 13 | 4 | moder |
| Loc 2 | 13 | 4 | moder | 13 | 4 | moder | 13 | 5 | moder | 13 | 8 | moder |
| Loc 3 | 13 | 4 | moder | 13 | 6 | moder | 13 | 7 | moder | 14 | 9 | moder |
| | **1700 m** | | | | | | | | | | | |
| Loc 1 | 10 | 2 | low | 11 | 3 | low | 12 | 3 | low | 12 | 4 | moder |
| Loc 2 | 10 | 2 | low | 11 | 3 | low | 12 | 3 | low | 12 | 7 | moder |
| Loc 3 | 10 | 3 | moder | 11 | 3 | low | 11 | 4 | moder | 11 | 7 | moder |
| | **2000 m** | | | | | | | | | | | |
| Loc 1 | 9 | 1 | low | 9 | 1 | low | 9 | 1 | low | 9 | 2 | moder |
| Loc 2 | 9 | 1 | low | 9 | 1 | low | 9 | 1 | low | 9 | 3 | moder |
| Loc 3 | 9 | 1 | low | 9 | 1 | low | 10 | 2 | moder | 10 | 4 | moder |

*Table 1 - Legend: *refers to the heigh above sea, **refers to UTC time, T – temperature, D – dew point, PCI – probability of carburettor icing, Loc 1: N 45.37 E 15.3, Loc 2: N 45.37 E 15.1 (Vrbovsko), Loc 3: N 45.37 E 14.95 (Ravna Gora) .*

### 1.8. COMMUNICATION

Communication between the pilot of the flight in question and the controller of CC (Croatia Control) of APP Pula was listened for the purposes of the safety investigation.

From the mentioned record it was identified that at 08:30:00 UTC communication was established between the aircraft in question and the controller of the APP Pula sector, whereby the flight instructor reported to the controller to have heard him for "1". The controller informed the instructor that the aircraft had been identified and to continue the flight.

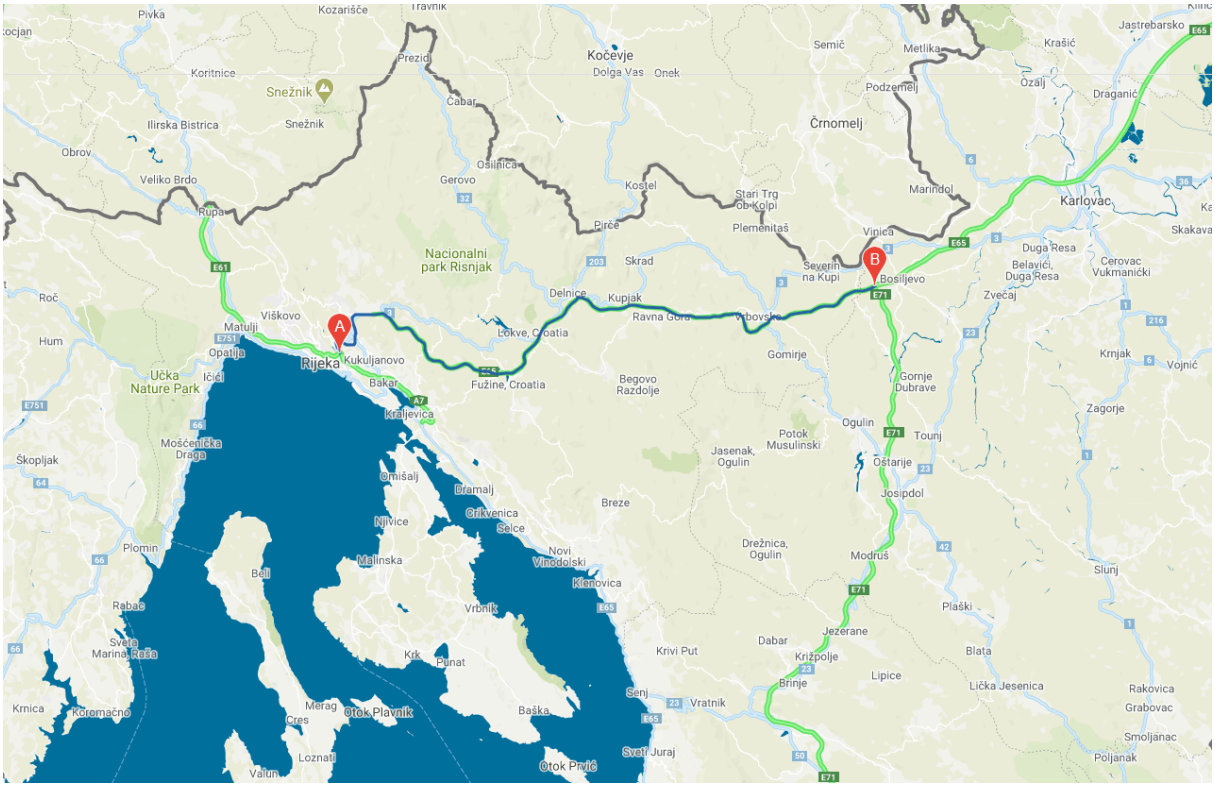
At 08:40:00 UTC, the aircraft instructor broadcasted an emergency call by the words: "Mayday, mayday, mayday 9A-DMI". When asked by the controller about the nature of the problem, the instructor replied: *"We have a partial engine failure."*. When asked by the controller what were their intentions, after a short pause, and after being asked again by the controller if they heard him, the instructor answered: "*We have engine interruptions"*. The controller repeated the question about their intentions, to which the instructor replied: *"I don't know, we will see, if the engine fails, we will have to make an off-field landing."* The controller instructed the instructor to inform him of a possible off-field

landing in order to initiate the rescue procedure, to which the instructor replied that he would report in time. The mentioned communication ended at 08:41:50 UTC.

At 08:44:10 UTC, the instructor broadcasted an incomprehensible message with strong interruptions, after which the controller told him to repeat what was said. At 08:45:10 the instructor informed the controller that they will land on the motorway near Vrbovsko.

## 1.9. INFORMATION ON THE A6 MOTORWAY

The A6 motorway (Picture 4) connects the Bosiljevo junction with the city of Rijeka, and its total length is 81 kilometres. Due to the hilly terrain configuration, the motorway often passes through tunnels and viaducts. During the summer season, and especially at the end of the week and at weekends, the traffic on the motorway is often heavy, with frequent traffic jams due to the increased influx of tourists. The average daily summer traffic in 2018 was 23 772 vehicles.



Picture 4 – A6 motorway

## 1.10. INFORMATION ON THE IMPACT AND THE REMAINS OF THE AIRCRAFT

At the moment when the engine started to tun roughly, the aircraft was located above the narrow area of the town of Vrbovsko, which is located in the eastern part of Gorski Kotar. This area is hilly, and there are not many flat surfaces on which it would be possible to land in case of emergency. The pilots chose the most favourable area for landing at the time, the A6 motorway, on which at the time the

road traffic was increased. On the picture 5 the direction of the landing of the aircraft is marked with a yellow arrow, while the red circle indicates the place where it stopped.


Picture 5 – Direction of the landing (yellow arrow) and stopping place (red circle)

During landing on the northern lane of the A6 motorway, the aircraft hit the left guardrail, and then the right one where it stopped (Picture 6). Although there was no separation of major structural units of the aircraft, a significant material damage occurred to the aircraft.

Picture 6 – Place where the aircraft stopped on the A6 motorway

## 1.11. ADDITIONAL INFORMATION

### 1.11.1. Statement of the instructor – Pilot in command

Regarding the event in question, the instructor stated that before the flight, he and the student pilot had prepared for the flight at Lučko Airport. During the preparation of the flight, together they reviewed the necessary documentation and the aircraft in question. They established that the aircraft was technically correct. They then re-fuelled the aircraft (they were second in line at the gas station) after which they drained the fuel and established that there was no water or impurities in it.

At 09:50 (LT) they started the engine and took off at 10:00 after the engine run was performed. The flight took place along the planned route at an altitude of 5500 ft. At the cruising altitude they leaned the fuel mixture. At 10:45 (LT) the engine started to run rough. After noticing that the outside air temperature was 12.7 $^{0}$C the instructor enriched the mixture and turned on the carburettor heating. Then the operation of the engine stabilized, and after 2 minutes and 30 seconds it started to lose power again and again work unevenly. He once more checked the fuel valve, fuel mixture and carburettor heating and concluded that he had acted correctly. Considering there were no changes in the operation of the engine, they decided to look for a suitable place to land. The instructor took full control of the aircraft until the landing.

In a subsequent explanation, the instructor explained that when the engine started to operate roughly, he applied the procedure for *"Engine failure during flight"*.

### 1.11.2. Information on the engine O-200-A, SN: 25R196

By an insight to the aircraft logbook it was established that a four-stroke petrol engine type Rolls Royce O-200-A, serial number: 25R196, was installed in the aircraft in question.

The engine consists of four horizontally-opposed direct power transmission cylinders. The engine is air-cooled, and has a built-in so-called "Wet crankcase" and carburettor. It develops a power of 100 hp at 2700 rpm. The ignition system consists of two magnetos, distribution cables and 8 spark plugs, two per each cylinder. Fuel distribution is performed by a free fall from the fuel tanks located in the wing of the aircraft to the engine. This model of the engine is known in the aviation community for its tendency to carburettor icing.

In the C-150M Owner's manual (1975) the possible causes of rough engine operation are stated, as follows:

- Carburettor icing.
- Spark plugs fouling.
- Magneto malfunction.
- Low oil pressure.

The built-in carburettor is model MA-3SPA (PN: 10-4894-1). It is located under the crankcase. If necessary, alternate heated air can be obtained from the muffler shroud through a duct to a valve, in the airbox.

### 1.11.3. Preliminary inspection of the aircraft at the accident site

The aircraft was preliminarily inspected at the accident site by AIA investigator. The flaps were found in a fully extended position.

The engine power and mixture levers were fully extended, and the fuel valve was found in the "ON" position. The carburettor heating lever was found in the retracted position (OFF position).

It was established that the fuel tanks and the associated system contained blue gasoline with odour corresponding to the approved AVGAS 100LL aviation fuel. The indication on the fuel gauges corresponded to the actual fuel quantity in the fuel tanks. The fuel drainage and visual inspection did not determine the presence of water or impurities in the fuel. The fuel tank vent on the left wing was not clogged, and the fuel tank plugs were found in good condition with the corresponding seals.

By the inspection of the engine lubricating and cooling oil dipstick, a volume of 6 litres was established. There were no signs of fluid leaks or mechanical damage on the engine caused by overheating on the engine. The engine mount was found bent in several places as a result of the impact.

After the preliminary inspection, the aircraft was dismantled and transferred to Lučko Airport, where a detailed inspection continued.

### 1.11.4. Aircraft checklist

The Aircraft Check list was found attached to the pilot commands, in which certain listed procedures differ from those described in the Owner's manual, and in the heading of this document a pilot school was listed, which was never the owner or the operator of the aircraft in question.

### 1.11.5. Inspection of the crash worthiness of the aircraft

The analysis of the airworthiness of the aircraft was performed at the Lučko Airport by AIA investigators and authorized mechanics of the contracted Maintenance Organization. During the initial inspection of the aircraft, certain damages were established on all parts of the aircraft which occurred during the impact to the guardrail of the motorway. After the inspection of the entire aircraft, and considering the nature of the accident in question, a more detailed inspection of the engine and pertaining components was initiated.

The inspection did not identify any fuel leaks or the presence of impurities or foreign objects in the main fuel filter or in the carburettor fuel filter. The presence of gasoline was detected in the fuel pipes. Visual inspection of the power, mixture and heating controls of the carburettor it was established that they were properly fixed, not blocked, and that they could be moved completely up to the corresponding mechanicals stops. The carburettor heating system was found in good condition. The carburettor was subsequently sent to an authorized Component Maintenance Organization for further check of technical serviceability.

After checking the fuel system, the engine ignition system was checked. The spark plugs, distribution cables and magnetos were found tightened in the correct position with no signs of damage or visible malfunction. The spark plugs were tested by a testing device, and were all in order. The ignition lock was also found in good condition. The ignition angle was $28^0$ in accordance with the prescribed instructions of the engine manufacturer.

After inspection of the engine ignition system, the oil system was inspected. The oil filter was found clean with no impurities and no traces of metal chips that would indicate mechanical damage inside the engine. The inspection of the oil system did not identify any malfunctions.

During turning of the propeller, all moving parts such as, valves, valve springs, rocking arms and valve lifters were inspected. It was established that the moving parts were not blocked. The compression of individual cylinders was checked, the values of which, despite the fact that the engine was cold, were within the permitted limits.

A detailed inspection did not identify any defects or malfunctions that would indicate a loss of power or complete engine failure.

### 1.11.6. Inspection of the technical accuracy of the carburettor

The analysis of the technical serviceability of the carburettor was performed in the Engine and Component Maintenance Organization. During the analysis of the technical accuracy of the carburettor, the following was established:

- Visual inspection did not identify any malfunctions or defects that would indicate a malfunction of the carburettor.
- Testing of the operation of the carburettor on the test bench also did not identify a defect or malfunction that would indicate a malfunction of the carburettor.
- During the testing of the operation on the test bench, the fuel flow of 22 litres per hour was established. This flow value corresponds to the age of the carburettor.
- It was established that the carburettor float was set correctly.

The inspection of the technical accuracy of the carburettor did not identify any defects or malfunctions.

### 1.11.7. Carburettor icing

Carburettor icing is a hazard which is possible during flight, and has been recognized as a cause or a contributing factor in many safety-related events, including aviation accidents or serious incidents.

**Atmospheric conditions**

The three main atmospheric factors that affect carburettor icing are air temperature, dew point, and air humidity percentage.

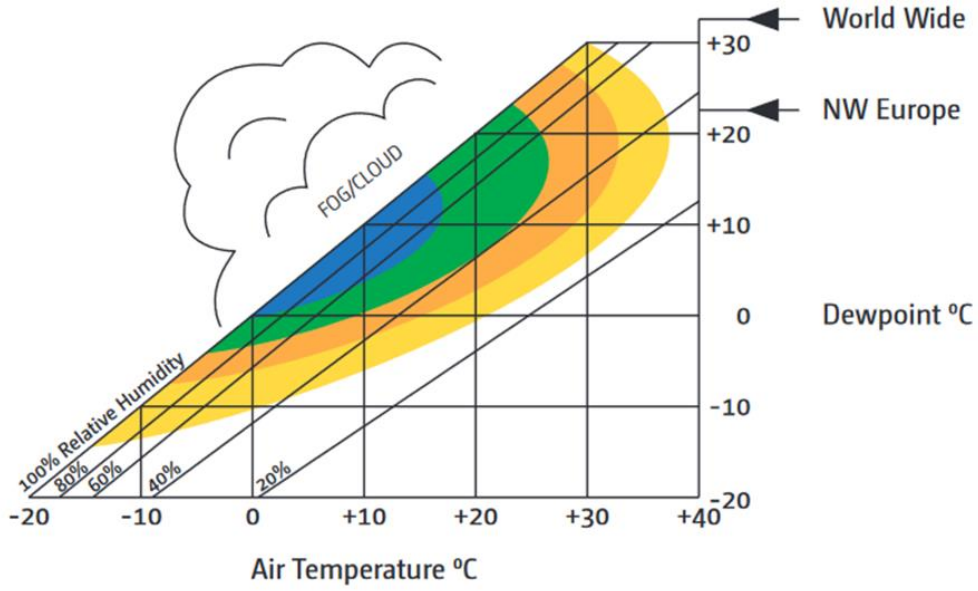
Possible atmospheric conditions in which carburettor icing can occur are:

- In an atmosphere with clean air without visual signs of possible icing.
- In a cloud (mass of condensed watery vapour), and below or above clouds.
- In the atmosphere just after the clouds break.
- If the surface of the ground over which it is flown is wet or just moist.

Atmospheric conditions of possible carburettor icing are shown in Picture 7. Aeronautical meteorological reports usually do not contain specific meteorological warnings of possible icing; therefore, pilots' knowledge and transfer of experience is very important. The reason for the lack of possible warnings about the conditions of possible icing is that in many cases it is impossible to measure

individual values, such as humidity at certain flight altitudes, and it is very likely that these values significantly differ from those measured at the airport or at other measuring station on the ground.

In the past, testings have shown that sometimes carburettor icing can occur during cruising if the air temperature is 20 $^0$C and humidity 60%, or during descent if the air temperature is 25 $^0$C and humidity 30%.



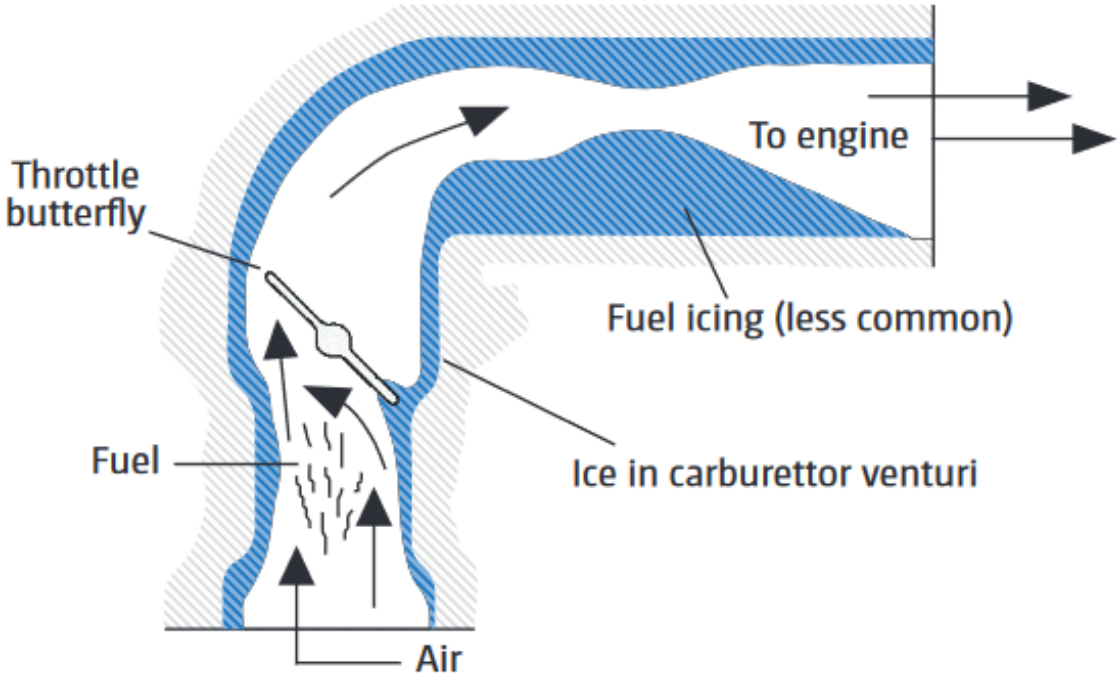

Picture 7 – Chart of atmospheric conditions for carburettor icing

**Engine factors**

When certain atmospheric conditions are met, carburettor icing can occur when, during engine operation, the air temperature in the carburettor drops in one of two cycles, as follows:

- When fuel evaporates in the air which is used for combustion.
- After the mixture has passed through the venturi, when the air pressure drops.

If the air temperature inside the carburettor drops below the dew point, moisture condenses and ice accumulates on the inner walls of the carburettor or on the throttle butterfly, which directly regulates the engine power (Picture 8). Accumulations of ice inside the carburettor blocks the air flow, thus changing the ratio of air and fuel in the mixture, which can result in constant, equal loss of engine power, rough engine operation, and ultimately engine failure.




Picture 8 – Carburettor cross-section with possible icing points

Engine factors that can increase the possibility of icing are:

- Use of MOGAS fuel.
- Use of reduced engine power during flight, especially at cruising altitude or in descent.
- Rough surface of the venturi on which ice accumulates more easily.
- Carburettor position in relation to the engine.

**Procedures in case of suspicion of carburettor icing during flight**

The procedures which the pilot needs to follow in case of suspicion of carburettor icing during the flight depend on the aircraft model and the engine model, i.e. the procedures prescribed by the aircraft manufacturer and described in the Pilot operating handbook (POH) or its equivalent; Aircraft flight manual (AFM) or Owner's manual (OM).

Regardless of the specifics of each aircraft, the standard procedures described in a number of issued documents of aviation organizations, such as the FAA (Federal Aviation Administration) or EASA (European Aviation Safety Agency), can generally be applied.

Accordingly, on 17 July 1996 the FAA issued an advisory document AC 91-51A, which describes the hazards of carburettor icing, how to detect such hazards timely, and how to act in such case. As a background to the issuance of this document, it was stated that the analysis of accidents and serious incidents established that the pilots were not fully aware of the effects of icing on aircraft control.

On 13 October 2010, EASA issued a Safety Information Bulletin, SIB 2010-03, in which it also describes the hazards of carburettor icing in aircrafts, referring to the previously issued document AC 91-51A by the FAA.

In a leaflet for promotion of safety, "Piston engine icing" issued by EGAST (European General Aviation Safety Team), the hazard of carburettor icing, its causes, recognition, general practices as well as pilot procedures are described in detail.

### 1.11.8. Owner's manual – Rough Engine Operation or Loss Of Power

The Cessna 150 Owner's manual (1975) contains manufacturer's instructions for its safe use. In Section 1, page 1-1, Operational checklist, the manufacturer among other states that that section contains all points for typical flight which should be familiar to the user. Furthermore, the manufacturer states that the said procedures should be memorised. The Check list should be used for brief check, to make sure that the user has not missed anything.

In the C-150M Owner's manual (1975) the manufacturer states four possible causes of rough engine operation during flight, as follows:

- Carburettor icing.
- Spark plugs fouling.
- Magneto malfunction.
- Low oil pressure.

The manufacturer describes the characteristics of the above causes of rough engine operation and lists procedures for pilots in the mentioned four situations.

In the Owner's manual in Section 2, pages 2-15, Normal procedure – Cruising, the manufacturer describes necessary actions in case of suspicion of carburettor icing. The manufacturer states that since the heated air causes a richer mixture, it is necessary to manually readjust the mixture setting when carburettor heat is to be used continuously in cruise flight.

In the Owner's manual in Section 3, pages 3-17, Emergency Procedures – Rough Engine Operation Or Loss Of Engine Power, the manufacturer additionally describes necessary actions in case of suspicion of carburettor icing. The manufacturer states that a gradual loss of RPM and eventual engine roughness may result from the formation of carburettor ice. To clear the ice, it is necessary to apply full throttle and pull the carburettor heat knob full out (turn on the carburettor heat fully) until the engine runs smoothly.

After the engine runs smoothly it is necessary to remove carburettor heat and readjust the throttle. If conditions require the continued use of carburettor heat in cruise flight, it is necessary to use the minimum amount of heat necessary to prevent ice from forming and lean the mixture slightly for smoothest engine operation.

During the investigation in question, it was established that the owner of the aircraft in question has the Cessna 150 M Pilot operating handbook, 1977, and not the Cessna 150 Owner's manual, 1975 as provided by the aircraft manufacturer.

Furthermore, the Checklist for the aircraft in question provided by the owner does not correspond to the Checklist found on the aircraft at the accident site. Both Checklists were not fully prepared in accordance with the procedures described in the Cessna 150 Owner's manual, 1975.

### 1.11.9. Definition of Engine failure during flight

For the purposes of the safety investigation, clarifications of the definition of "Engine failure during flight" were requested in order to better understand the application of certain emergency procedures. Clarifications were requested from the American National Transportation Safety Board (NTSB) and the aircraft manufacturer Textron Aviation (Cessna).

**National Transportation Safety Board**

NTSB defined "Engine failure during flight" as a complete loss of engine power, where no internal combustion is achieved in any cylinder. In such case, the pilot should take into consideration the Checklist relating to "Engine failure during flight".

Furthermore, the NTSB explains that in case the pilot notices rough engine operation, by applying the extended procedures specified in the POH or OM of the aircraft, he should try to detect the reason for the engine rough operation, and apply the prescribed procedures. The pilot should be acquainted with the extended procedures related to the rough operation of the engine, specified in the POH or OM of the aircraft, prior to the flight. The pilot should be aware at all times of possible reasons for rough engine operation.

**Aircraft manufacturer, Textron Aviation (Cessna)**

The aircraft manufacturer, the company Textron Aviation, in its explanation of the definition of "Engine failure during flight" states that this term refers to the complete loss of engine power without internal combustion in the cylinders. Furthermore, as an explanation of the definition, it states that in the Checklist regarding "Engine failure during flight" the terms such as gliding and restarting the engine are used, specifically in order to better understand the condition of the engine in the case of "Engine failure during flight".

The manufacturer also states that the definition of "Engine failure during flight" is clearer by the fact that the Pilot Operating Handbook or Owner's Manual also contain a procedure related to "Rough engine operation or loss of power".

### 1.11.10. Course of the event in question

For the purposes of the safety investigation, a radar image matched with an audio recording was examined with the purpose of determining the course of events in detail. From the mentioned reviewed records, the following was established.

At 08:30:00 UTC, communication was established between the aircraft in question and the controller of the APP Pula sector. At that moment, the aircraft was at an altitude of 5500 ft MSL above the Bosiljevo municipality. In the period from 08:30:00 UTC to 08:40:00 UTC, the aircraft was gradually descending to the altitude of 5200 ft MSL, and was flying west without communication with the flight control via radio.

At 08:40:10 UTC, the instructor via radio broadcasted the emergency call (Mayday, Mayday, Mayday – Partial engine failure), and the aircraft began the descent from 5200 ft MSL to an altitude of 4400 ft MSL without significant change of course for 4 minutes. At the time of broadcasting the emergency, the aircraft was located about 3 NM west of the town of Vrbovsko.

At 08:44:10 UTC, the instructor reported with an incomprehensible message resulting from the interruption of the radio connection, and the aircraft started a right turn with a short stay in the east direction. At that moment, the aircraft was located about 7.5 NM west of the town of Vrbovsko. At 08:45:10 UTC, the instructor reported that they would land on the motorway near Vrbovsko. At 08:46:10 UTC, at an altitude of 3400 ft MSL, the aircraft started the second right turn.

At 08:47:10 UTC the aircraft was moving in the east direction, and the radar recorded the last altitude of the aircraft, 2900 ft MSL, after which the information on the altitude was lost.

At 08:47:40 UTC the information on the flight direction of the aircraft was lost.

7 minutes and 10 seconds passed from the moment of broadcasting the emergency call until the moment when the information on the altitude was lost, while 7 minutes and 40 seconds passed until the moment when the information on the flight direction of the aircraft was lost.

The area over which the aircraft in question was flying after declaring emergency was surrounded by a hilly area of 3300 ft to 3800 ft. The landing site on the A6 motorway is at an altitude of 2400 ft.

### 1.11.11. Comments on the draft of the Final report

EASA, NTSB and Aeroclub Penkala representatives and pilot student in question did not have any comments on the draft of the Final report.

CCAA accepted Safety recommendation **AIN04-SR-04/2020** without additional comments on the draft of the Final report.

Operator representative comments were appended on his request to the Final report and amended until a point AIA considered acceptable.

Pilot in command comments were not amended.

## 2. ANALYSIS

**Analysis of airworthiness**

By the analysis of airworthiness of the aircraft and its components it was established that at the time of the accident the aircraft was airworthy. The technical inspection of the aircraft also included the components described in the C-150 M Owner's manual - 1975; spark plugs, ignition magnetos, oil system, the malfunction of which can cause rough engine operation or complete engine failure.

**Analysis of meteorological report**

Considering that no technical malfunction of the engine or its pertaining components, which would indicate rough engine operation was established, and that one of the causes of rough engine operation,

or its complete malfunction can be carburettor icing, the analysis of meteorological conditions was performed.

The analysis was performed for the route of the aircraft, especially for the area where the problem with the regular operation of the engine occurred.

The meteorological report confirmed that in the mentioned area the aircraft was passing through atmospheric conditions in which there was low to moderate probability of carburettor icing.

**Analysis of pilot's actions after the occurrence of rough engine operation**

After the occurrence of rough engine operation, the instructor took over the commands of the aircraft while the student pilot helped to find an adequate location for landing. Actions of the instructor after the occurrence of rough engine operation were compared with the procedures listed in the Cessna 150 Owner's manual -1975.

By the analysis it was established that actions of the instructor after the occurrence of rough engine operation did not correspond to the procedures specified in the Owner's manual, Section 3. The instructor applied the procedure for "Engine failure during flight" while he did not try to determine the reason for rough engine operation as envisaged by the Owner's manual.

Furthermore, the mentioned procedures differ, and their inadequate application can worsen the condition of the engine. Namely, when the carburettor icing occurs, the mixture becomes richer due to the lack of air required for combustion, because at that moment the air flow in the carburettor is reduced due to the accumulation of ice inside it. Then it is necessary to apply full throttle in order to increase the flow of the mixture, in order to try to warm up the engine and it is necessary to turn on the carburettor heat in order to clear the ice. Putting the mixture lever in the "rich" position (by enriching the mixture), as the instructor did, further enriches the already too rich mixture at that moment, which can result in even rougher engine operation.

After the engine started to malfunction, and broadcasting the emergency call via radio, the aircraft started the descent from 5200 ft MSL to the altitude of 4400 ft MSL without a significant change in direction for 4 minutes.

# 3. CONCLUSION

## 3.1. FINDINGS

- During the training flight of the aircraft in question on the route, above the town of Vrbovsko (Gorski kotar), a rough operation of the engine and its loss of power occurred.
- The pilots landed the aircraft on the A6 motorway, 900 meters before the exit Ravna Gora (direction Rijeka).
- No malfunctions or defects that would indicate the cause of engine failure were identified by the inspection of the engine and its components.
- All necessary airworthiness documents have been issued for the aircraft in question.
- The meteorological conditions for the flight in question were satisfactory.

- Meteorological report and analysis of meteorological conditions on the route, show that during the flight the aircraft passed through areas with a low to moderate probability of carburettor icing.
- The flight instructor possessed a valid pilot's license during the event in question.
- The student pilot was in the final stage of PPL training.
- After occurrence of the rough engine operation, the pilots failed to apply the procedure for "Rough engine operation or loss of power".
- After the occurrence of the rough engine operation, the pilots applied the procedure for "Engine failure during flight".
- The checklist found in the aircraft does not belong to the aircraft in question.
- The owner of the aircraft does not possess a handbook for the subject model of the aircraft manufactured in 1975, but for the model manufactured in 1977.

Considering all facts obtained during the Safety Investigation in question, it can be concluded with great certainty that the rough engine operation occurred due to carburettor icing.

### 3.2. CAUSE

**Immediate cause**

The immediate cause of the accident in question was carburettor icing, which caused rough engine operation.

**Contributing factor**

The contributing factor in the accident in question is the application of procedures which do not relate to the rough engine operation or loss of power.

## 4. SAFETY RECOMMENDATIONS

The safety recommendation in no case constitutes a legal presumption of guilt or responsibility for the accident, serious incident or incident.

During this safety investigation, AIA issued the following safety recommendations.

**Recommendation to the owner of the aircraft, Aeroclub Penkala 1910**

**AIN04-SR-01/2020**

The owner of the aircraft in question should replace the Pilot Operating Handbook 1977 with the Cessna 150 Owner's manual – 1975, in accordance with the manufacturer's instructions.

**Recommendation to the operator of the aircraft, ECOS pilot school - aircharter d.o.o**

**AIN04-SR-02/2020**

The operator of the aircraft should check the applicability of the pertaining aircraft Checklist before commencing flight operations.

**Recommendation to the pilots of the accident in question**

**AIN04-SR-03/2020**

Prior to the flight, the pilots of the accident in question should be fully acquainted with the emergency procedures, before the flight, as stated by the manufacturer in the respective Owner's manual of the aircraft in question, in order to identify potential problems related to engine operation as early as possible and in order to react adequately.

**Recommendation to the Croatian Civil Aviation Agency**

**AIN04-SR-04/2020**

CCAA should during its scheduled and unscheduled air operation audits (entities involved in air operations), increase the attention towards the correctness and compatibility of the flight manuals in accordance with the valid manufacturer instructions and revisions.

## 5. APPENDIX

**Aircraft operator - ECOS, comments on the draft of the Final report (Part 1)**

*„Poštovani,*
*Naša učenica [redacted] proslijedila mi je Vaš dopis od 20.Maja 2020. godine potpisan od gospodina [redacted]. Dopisom sam ogorčen, a što sam i u telefonskom razgovoru gospodinu [redacted] dao do znanja. Razlozi mojega ogorčenja su:*

*1. Smatram da je ovakav dopis bilo potpuno neprimjereno poslati na osobu koja je u toj nesreči bila učenica i koja sasvim sigurno nije kvalificirana za odgovor na insinuacije iz toga dopisa.*

*2. Sam dopis je, doslovce, nevjerojatno nestručan i zlo namijeran:*

*- Citat iz dopisa "konkretni zaključci upućuju na pogrešne postupke **posade".** Sigurno se može upotrijebiti izraz **posada** ali on se uobićajno koristi kada se radi o dva kvalificirana pilota, kako je u ovome slučaju jedan pilot učenik, ovaj izraz je neprimjeran.*
*Na koncu,koji su to zaključci ?? Neprimjerna analiza iz Vašeg dopisa ??*

*- Dopisom se insinuira da je nastavnik odmah po početku nepravilnog rada motora znao da se radi o zaleđivanju karburatora. Takvi genijalci koji to odmah znaju obično rade u državnim agencijama, mi ostali kada motor počne nepravilno radit to ne znamo pa koristimo check listu iz POH-a "Engine failure during flight".*
*Ovo posebno mi neuki radimo kada smo na par minuta od zemlje i nemamo vremena za duboke analize iz vašeg dopisa.*
*Razloga za nepravilan rad motora moglo je biti barem desetak,a jedan između inih i prelinovan motor. Da je ovo bio slučaj korištenje vašeg recepta,grijač karburatora plus puna snaga, vjerojatno bi odmah zaustavilo motor.*
*Ovo je vjerojatno imao u vidu i pisac proizvođačeve check liste pa je uz davanje grijaća predvidio i stavljanje komande smjese na bogatu.*
*Također bih primjetio da POH nema check liste liste za zaleđivanje karburatora. Vjerojatno jer su simptomi zaleđivanja vrlo slični sa mnogim drugim razlozima zbog kojih motor može počet nepravilno raditi. POH i u check listi "Emergency descent through clouds" pod točkom 1. traži "Apply full rich mixture", a pod točkom 2. "Use full carburetor heat". Ovo isto i u "Before landing" normal procedure check listi.*
*Kada se nakon gore navedenog,pažljivo pročita odjeljak "Carburetor icing" biva jasno da je on pisan za situaciju gdje pilot ima vremena za analizu i pokušaje a nikako za ovakvu priliku gje je nastavnik imao par minuta do zemlje.*

*- Posebno je iritantna vaša rećenica " Također koliko smo razumjeli iz izjava koje smo prikupili, u toj situaciji nije korišten POH."*
*Zar stvarno neki genijalac vjeruje da je nastavnik sa visine na kojoj je avion letio imao vremena da si "malo" čita POH. Sada se vraćam na ono što sam u prvoj alineji napisao, tu nije bilo posade u kojoj bi jedan pilot hendlao emergency situaciju, a drugi proučavao POH. Tu je bio samo jedan pilot- nastavnik koji je trebao odraditi emergency check listu i spasiti ućenicu i sebe i to u par minuta do zemlje. Iz njegove Izjave jasno je vidljivo da je on upravo to i odradio.*

*Sada na kraju, kako u buduće ne bi pisali ovakve birokratske nestručne dopise, predlažem da Vaša Agencija kolektivno pođe pogledati film "Sully". Nastavnik iz ove nesreće nije spasio toliko ljudi koliko Sally ali je u datom vremenu uspio spasiti učenicu i sebe.*
*I Sallyu i Tei se podmeće da se u datom vremenu moglo napraviti više. Ja bih volio te genijalce vidjeti*

*kako bi oni u tom vremenu čitali POH i analizirali korištenje gorivne smjese. Ja bih svakako zahvalio ako bi me obavijstili koji pilot Vam je bio savjetnik za ovakvu analizu iz Vašeg dopisa.“*

**Aircraft operator - ECOS, comments on the draft of the Final report (Part 2)**

*Očitovanje na Nacrt završnog izvješća nesreće aviona 9A-DMI od 17.08.2019.*

*„Poštovani,*

*Na Nacrt završnog izvješća nesreće aviona 9A-DMI od 17.08.2019. (u daljnjem tekstu: Izvješće) dajem slijedeće očitovanje :*

*1. Dio našeg očitovanja na Izvješće je i dopis koji smo Vam dostavili 29.05.2019. godine. povodom Vašeg traženja dodatnih informacija od učenice.*

*2. Dakle,što u ovoj mojoj analizi treba stalno imati u vidu - nastavnik je sa visine cca 1500 ft iznad brda imao samo par minuta vremena do slijetanja. Kad su piloti u simulaciji leta airbusa A320 ( Hudson nesreća) znali što će biti simulacija, gotovo redovno su uspjeli sletiti na alternativni aerodrom. Kada piloti nisu znali što će biti simulacija više se niti jedan nije uspio dokopati alternativnog aerodroma već su padali po naseljenim mjestima. Ovime je pobijen pokušaj podvale zrakoplovne birokracije, da je odluka o slijetanju u Hudson, kapetana Sullenberga, bila kontributivni faktor nesreće..*

*3. Slažem se sa Vašom tvrdnjom iz Izvješća u 3.1. da se sa " velikom sigurnošću može zaključiti" kako je do grubog rada ili gubitka snage motora došlo zbog zaleđivanja karburatora ali samo kao sa jednom ne dokazanom mogućnošću. Ne slažem se da se pod 3.2. Uzrok nesreće - kao jedini mogući, bez ikakve ograde, navodi zaleđivanje karburatora. Vi ste u Izvješću pod 1.11.8. naveli četiri razloga iz AOM-a (čađave svjećice, zaleđivanje karburatora,kvar magneta, nizak tlak ulja), kao moguća za grubi rad ili gubitak snage motora. Ja tvrdim, da osim ova četiri ima još barem 5-6 drugih uzroka za ovakav rad motora. Ja ću nabrojati par koje sam doživio i koji su mogli biti razlog gubitka snage ili grubog rada motora i u ovoj nesreći:*

- *Povremeno zaglavljivanje ventila - obično se javlja kod viših radnih temperatura motora i teško utvrđuje kod hladnog motora. Mjerenje kompresije na hladnom motoru ne garantira da zaglavljivanje ne postoji. Nije dokazano da ovo nije bio uzrok.*

- *Voda u rezervoaru - kod Cessni 150 i 172 proizvedenih prije 1977 godine doživio sam u nekoliko navrata da smo našli značajnu količinu vode u rezervoarima usprkos činjenice da je avion dreniran nakon punjenja gorivom i činjenice da je nakon toga letio 1-2 sata. Zbog ove pojave u par navrata sam imao grubi rad i ozbiljne gubitke snage motora. Ovo je kod ovih aviona uzrokovano položajem cijevi goriva kojom se odvodi gorivo iz rezervoara prema motoru I činjenicom da ovi rezervoari imaju samo jedno drenažno mjesto. Da ovo nije nešto što je doživio samo [redacted] svjedoči činjenica da su sve Cessne 172 proizvedene nakon 1986 godine dobile još tri drenažna mjesta na rezervoarima. Ovime je značajno, rekao bih i gotovo u cijelosti, spriječena ova pojava. Nije dokazano da ovo nije bio uzrok.*

- *Sada ču Vam opisati jedan slučaj iz mojeg 40 godišnjeg rada u zrakoplovnim organizacijama.*

*Jedan moj prijatelj, danas capt. u prometu, redovno je sa Cessnom 150 letio Zagreb- Split-Zagreb. Dok je letio 1000 ft AGL sve je bilo OK, no kada bi se digao iznad 5000 ft nakon 20-45 minuta doživio bi gubitak snage motora. Pilot bi uključio grijač karburatora i motor bi nastavio normalno raditi. No nakon nekog kračeg vremena motor bi ponovo počeo gubiti snagu i nepravilno raditi. Pilot bi spustio nos i snizio na 1000 ft iznad terena gdje bi motor normalno radio.*

*Kod prvog slučaja moj aviomehaničar je to adresirao zaleđivanju karburatora ( temperatura na 7000 ft bila je oko 10-15 C ). Nakon drugog slučaja moj [redacted] je ponovo adresirao zaleđivanje. Nakon trećeg, moj [redacted] je pjevao istu pjesmu, a pilot me je obavijestio da on više neće letiti taj avion. Ja sam sa pilotom napravio dva leta iznad AD Lučko do 8-9 tisuća ft ali bez ikakvih simptoma. Sve kolege, kojima sam opisao pojavu, uglas su tvrdile da je zaleđivanje karburatora. Ja to nisam vjerovao jer sam taj avion često letio i nikada u par godina nisam to doživio. Na moju sreću, jedno veće prije spavanja, konačno je sinulo u mojem bolesnom mozgu. Jedva sam dočekao jutro da ispitam teoriju. Ispitivanje je potvrdilo teoriju. Nazvao sam pilota da nam kupi novine i dođe na Lučko. Kada je došao, pitao me je što je, rekoh vidjet ćeš. Kaže on, a što će nam novine? Pa rekoh za čitanje. Zapustili smo motor (na stajanci) i pilot je podesio avion kao na cruisu sa cca 1600 RPM i čitasmo novine oko 40-45 minuta. Tada je motor počeo gubiti snagu. Kada je počeo gubiti snagu, pilot je kao u letu, povukao ručicu grijač karburatora - motor se smirio i nastavio normalno raditi. Nakon par minuta motor je ponovo počeo gubiti snagu. Da ne dužim, razlog za ovakav rad motora bila je mixture komanda, a ne zaleđivanje. Na avionu je bio stari model mixture kontrole, koja je zadržavala poziciju u koju ju je pilot postavio, putem trenja. Kako je s godinama trenje oslabilo,mixture kontrola bi se od vibracija motora polako izvlačila dok ne bi toliko osiromašila smjesu da je motor počeo gubiti snagu. Pilot bi tada uključio grijač karburatora i privremeno obogatio smjesu pa je motor počeo normalno raditi. No, vražji mixture se je nastavio izvlačiti. Kada bi motor počeo ponovo gubiti snagu pilot bi u strahu snizio na visinu 1000 AGL (jer je znao da dolje motor dobro radi) i na toj visini standardno postavio mixture na rich, by the book. I gle vraga, motor bi normalno radio. Problem se nije odmah riješio,zbog krive pretpostavke da je motor iznad terena normalno radio zbog više temperature u kojoj nisu bili uvjeti zaleđivanja. Nitko nije povezo rutinsko postavljanje mixture kontrole na bogatu smjesu u snižavanju i normalan rad motora ( procedura check liste koju piloti uče od prvog školskog kruga). Zamijenili smo mixture control sa novim modelom, koji je imao mogućnost zaključivanja u postavljenoj poziciji i ovo se više nije ponovilo. Capt. je nastavio letiti Cessnu 150. Nije dokazano da nešto slično nije bilo uzrok.*

*- Mogao bih još redati razloge gubitka snage motora koje sam doživio i preživio, a koji nisu zaleđivanje, niti ona četiri iz AOM-a. No nadam se, da su i ovi koje sam iznio, dostatni da se shvati da se za Uzrok nesreće ne može apriori navesti zaleđivanje karburatora. Nakon gore navedenog skrenuo bih Vam pažnju na činjenicu da pilot u svojem izvještaju o nesreći kaže " U 10.45 sati motor je počeo ne ravnomjerno raditi, provjerio sam temperaturu zraka i ona je iznosila 12.7 celzija te sam odmah obogatio smjesu goriva i uključio grijanje rasplinjača motora. Tada se motor stabilizirao u radu što je potrajalo oko 2 min i 30 sec. ....." . S obzirom da komanda smjese momentalno djeluje na obogaćivanje ili osiromašenje smjese, da je njeno stavljanje na bogato bila pogrešna procedura, to bi odmah dovelo do još NE ravnomjernijeg rada motora. Iz mojeg iskustva i literature je poznato, da ako postoji zaleđivanje karburatora, u prvom momentu nakon davanja grijanja, motor će radi preobogačivanja smjese početi još ne pravilnije raditi. Kako je u ovome slučaju dat i mixture na bogatu smjesu, motor se je morao odmah početi gušiti još više. No u izvještaju nastavnik svjedoći da je nakon primijenjene procedure motor se stabilizirao u radu. Postavlja se pitanje da li je u opće bilo zaleđivanje karburatora.*

*4. Sve što sam izložio je u namjeri dokazati Vam da :*

*- Nalaz pod 3.1. alineja 9. "Nakon početka grubog rada motora piloti nisu primijenili proceduru za "Grub rad ili gubitak snage motora" nije točan, a niti je moguć. NE postoji u AOM 1975., a niti u jednom drugom univerzalno primjenjiva procedura za grubi rad ili gubitak snage motora za sve moguće uzroke. Kao što je AOM naveo i ja dodao, ovih razloga ima barem desetak. Kod jednih uzroka treba mixture*

*postaviti na rich ( primjer zaglavljivanja ventila - hladniji cilindar manja vjerojatnost zaglavljivanja ), kod drugog uzroka ostaviti mixture u poziciji u kojoj je bio ( recimo kod vode u karburatoru ), kod trečeg ponovo podesiti mixture ( recimo kod zaleđivanja ), kod četvrtog dodatno linovati ( kod čađavih svjećica). Sve rečeno vrijedi i za komandu gasa. Kod jednog uzroka treba dati punu snagu (zaleđivanje karburatora), kod drugog smanjiti da se smanji temperature motora ( zaglavljivanje ventila ) itd.*

*- Shodno i posljedično gore iznijetom pod 1. i 2. NE stoji niti Vaša tvrdnja da je Kontributivni čimbenik pod 3.2. "primjena procedura koje se ne odnosi za slučaj grubog rada i gubitka snage motora". Kako niste dokazali da je jedini mogući uzrok nesreće zaleđivanje karburatora ( vidi točku 2. i 3.) i kako ne postoji univerzalna procedura za sve uzroke gubitka snage i grubog rada motora, tada posljedično ne stoji niti Vaša tvrdnja da je nastavnik pridonio (kontribut) nesreći primjenom procedure koja se ne odnosi na ovu nesreću.*

*5. Vaša tvrdnja pod 3.2. Kontributivni čimbenik " je primjena procedura koje se ne odnose za slučaj grubog rada ili gubitka snage motora" - NIJE točna. Svakog pilota se uči da u slučaju gubitka snage ili grubog rada motora, posebno na maloj visini, prvo leti avion (položaj, brzina, visina),odredi mjesto slijetanja i uz to pokuša vratiti snagu motoru. Kako je ovo moment kada pilot još ne zna, što je od desetak mogućih, stvarni uzrok gubitka snage ili grubog rada motora, ovo znači da dade goriva gasom i komandom smjese i preventivno grijač karburatora. Upravo ovo je i učinio nastavnik [redacted]. Kako je motor, nakon ovoga, vračao snagu i počeo normalno raditi ( 2 min i 30sec.) nije bilo razloga da pilot sumnja u poduzete radnje. Prema Vašem Izvješću i očitovanju pilota u ovome periodu avion je u pravocrtnom letu snizio na 4400 ft MSL. Ovo znači da mu je, nakon ponovnog gubitka snage , ostalo oko 600 ft do vrhova terena i cca 1 min. 30 sec. do slijetanja. S obzirom na izuzetnu nepristupačnost terena nad kojim je bio, izvjesno je pilot ovo vrijeme trošio na izbor mjesta slijetanja i nije imao vremena za analizu desetak mogućih razloga gubitka snage ili grubog rada motora. Kako Sv. Petar nije birao proceduru za slučaj gubitka snage motora nego pilot, izvjesno se formulacijom, kako je primijenjena ne odgovarajuća procedura, indirektno implicira krivnja pilota. Shodno iznijetom smatram da bi ispravna formulacija kontributivnog čimbenika bila: Kontributivni čimbenik je mala visina leta i s time uzrokovana kratkoća vremena za utvrđivanje mogućeg uzroka grubog rada ili gubitka snage motora i izbora odgovarajuće procedure za oporavak motora.*

*6. Vama je za utvrđivanje uzroka gubitka snage i grubog rada motora u ovoj nesreći trebala godina i nešto mjeseci i na koncu još uvijek u 3.1. kažete da se sa " velikom sigurnošću može zaključiti kako je do pojave grubog rada motora došlo uslijed zaleđivanja rasplinjača". U istom Izvješću u 3.2. Kontributivni čimbenik insinuirate da je i pilot kriv jer nije u 1 min.30.sec. uspio utvrditi uzrok i primijeniti ispravnu proceduru. Jadno,nestručno i nepošteno.*

*7. Pod točkom 4. Preporuka operatoru zrakoplova, ECOS pilot school da bi trebao provjeriti primjenjivost priručnika prije početka letačkih operacija. Tražim da ovo brišete jer bi se moglo protumačiti da mi nismo imali odgovarajući priručnik. Vi ste trebali, prvo, od nas tražiti priručnik, pa ako bi Vam mi pokazali ili dostavili ne odgovarajući, onda biste mogli nama dati ovakvu preporuku. U avionu je kod nastavnika bio up to date priručnik 1975. Mi smo pretplaćeni na Cessninu dokumentaciju. Vi NISTE od ECOS-a tražili priručnik nego od vlasnika. Da ste ga od nas tražili dobili bi odgovarajući priručnik iz 1975.*

*8. Pod točkom 4. Preporuka predmetnim pilotima Cessna 150.*

*Zločesti pokušaj podmetanja da piloti ECOS-a nisu upoznati sa procedurama za slučaj nužde. Tražim da ovo brišete. Vi ničim niste dokazali da piloti ECOS-a ne znaju procedure za nuždu. Ako bi se vaše podmetanje odnosilo i samo na nastavnika letenja iz ove nesreće, isto dokazano ne stoji. Ja sam*

*nastavniku 10.07.2019. prije početka letenja na Cessni 150 9A-DMI dao check za famlijarizaciju i ocijenio pozitivno njegov Test poznavanja aviona Cessna 150 u kojem su redovni i postupci u nuždi iz AOM-a. Ovaj Test moraju proći svi nastavnici ECOS-a. Na koncu, nakon analize ovoga Izvješća, imam osjećaj da je to jedan polu stručni i zlonamjerni uradak. Skrenuo bih Vam pažnju na činjenicu da se ovakvi izvještaji redovno koriste u sudskim postupcima. Ovo znam, jer sam i sam vodio i dobio postupak za naknadu štete iz zrakoplovne nesreće. Tako da je izuzetno važno da se niti prikriveno ne okrivljuju nedužni. Kako je istraživanje zrakoplovnih nesreća izuzetno odgovoran posao, smatram da bi ga trebali obavljati najstručniji i najiskusniji ljudi za pojedina područja zrakoplovstva i da bi se njihova imena morala vidjeti u Izvješću. Ako ovo Izvješće i u svojem konačnom obliku ostane ovako nestručno i tendenciozno obratiti ću se medijima.*

*Predlažem da se za konačnu analizu ove nesreće angažiraju capt. [redacted], capt. [redacted], instruktor [redacted].“*

Investigator in charge

Dejan Ćurik