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FINAL REPORT
ON
ACCIDENT INVESTIGATION OF
PIPER PA28R-201
OE-DYM
near Mengeš,
3rd December 2015

CONTENTS

INTRODUCTION

Final report on aircraft accident investigation contains facts, analyses, causes and safety recommendations of Committee for investigation of aircraft accident, taking into account the circumstances in which the accident took place.

This investigation has been conducted in accordance with Annex 13 to the ICAO Convention on International Civil Aviation, EU Regulation No 996/2010, Aviation Act (Official Gazette of the Republic of Slovenia No 81/10 and official consolidated text 46/16) and Regulation on investigation of aviation accidents, serious incidents and incidents (Official Gazette of the Republic of Slovenia No 72/03 and 110/05).

The sole objective of the investigation is the prevention of future accidents and incidents. It is not the purpose of the final report to apportion blame or liability. Using this report in any other intent may lead to wrong interpretation.

The final report should undoubtedly contribute to flight safety.

This document is the translation of the Slovenian version of the Final Report. Although efforts have been made to translate it as accurately as possible, discrepancies may occur.
In this case, the Slovenian is the authentic, official version.

SUMMARY

1. Date and time of accident: 3rd December 2015, 18:50 LT[2]

2. Place of accident: Mengeš, Slovenia; N 46°10'3.2"; E 014°33'10.2"

3. Type of flight: Private flight (IFR, ILS approach)

4. Aircraft: Piper PA-28R-201, four seat single engine aircraft

- Aircraft manufacturer: Piper Aircraft Corp. USA
- Aircraft type: PA-28R-201
- Aircraft registration mark: OE-DYM
- Aircraft serial number: 28R-7837072
- Airworthiness certificate validity: 4 March 2016
- MTOM: 1247 kg[1]

5. Owner / Operator: aircraft was privately owned

6. Crew and passenger data:

- Crew: pilot 1
- Number of passengers: /
- Total: 1

7. Consequences:

Injuries	*Crew*	*Passengers*	*Other*
Fatal	1	/	*
Heavy	/	/	/
Light / None	/	/	

8. Aircraft and equipment: Airframe, engine and equipment was 100 % destroyed beyond repair.

[1] Maximum takeoff mass according aircraft manufacturer.
[2] Time in this report is given in local time (UTC + 1 hour).
*The pilot was transporting a medium sized dog inside the cabin of the aircraft.

1. FACTS

1.1 Flight data

The pilot, on the day of the event, submitted a flight plan stating that he would fly from Vienna airport (LOWW) according to instrument flight rules with destination airport of Ljubljana (LJLJ). Flight plan was received by the Austrian air traffic control and forwarded to the Slovenian air traffic control.

At 6:26 p.m. local, pilot established a radio communication with the Slovenian ATC upon entering the Slovenian airspace and requested the weather data for landing airport of LJLJ.

After obtaining the weather information for the destination airport, the pilot continued the flight and gradually descended to 5,000 feet AMSL to complete instrument landing system approach to destination airport.

At 6:43 p.m., the pilot began the procedure by lowering the altitude to 4000 feet AMSL near the DOL VOR. At 6:45 p.m., the aircraft flew over the DOL VOR and followed vector 270° and intercepted instrument landing procedure and began descending towards the runway 30 to land.

The pilot reported several times in communication with the air traffic controller, about 8 nautical miles to threshold, that he had a problem. At 6:50 p.m., the aircraft disappeared from the radar screen. The search and rescue process has been immediately initiated by Slovenian air traffic control. Hours later, Police and Administration of the Republic of Slovenia for civil protection and disaster relief representatives reported that the wreckage of the plane had been found on a forested slope about 4,3 nautical miles from the runway threshold. Upon crashing, the pilot lost his life. Accident also resulted with a death of a dog, which was found on the crash site. The dog was carried in the cabin of the aircraft.

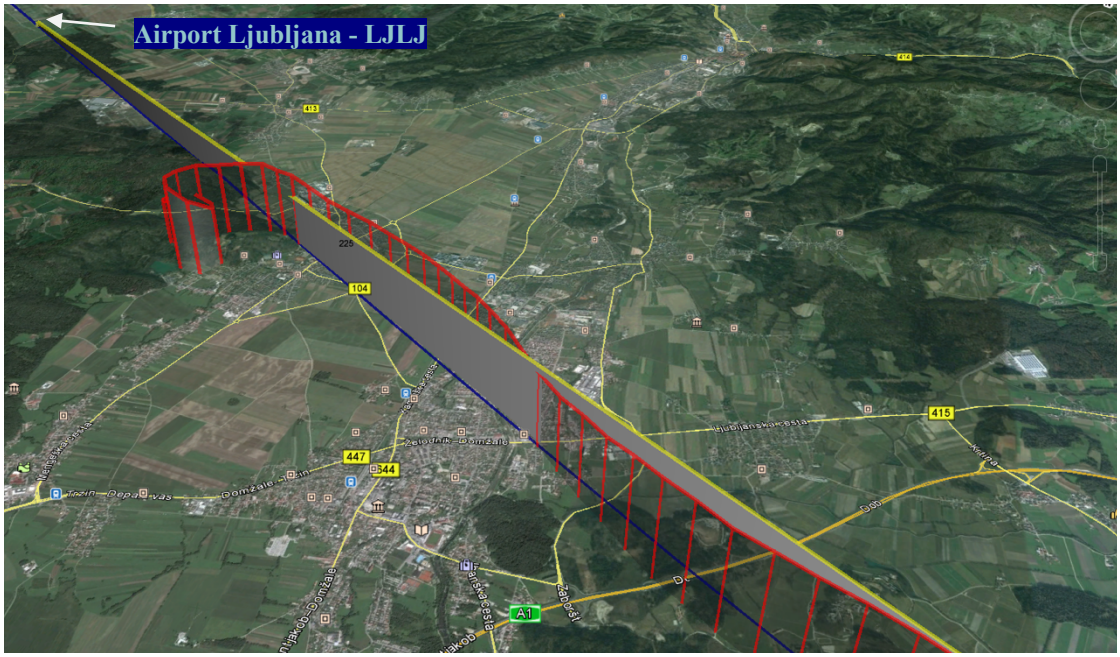

Image 1: The yellow line represents the ILS approach, while the red line represents the actual flight path

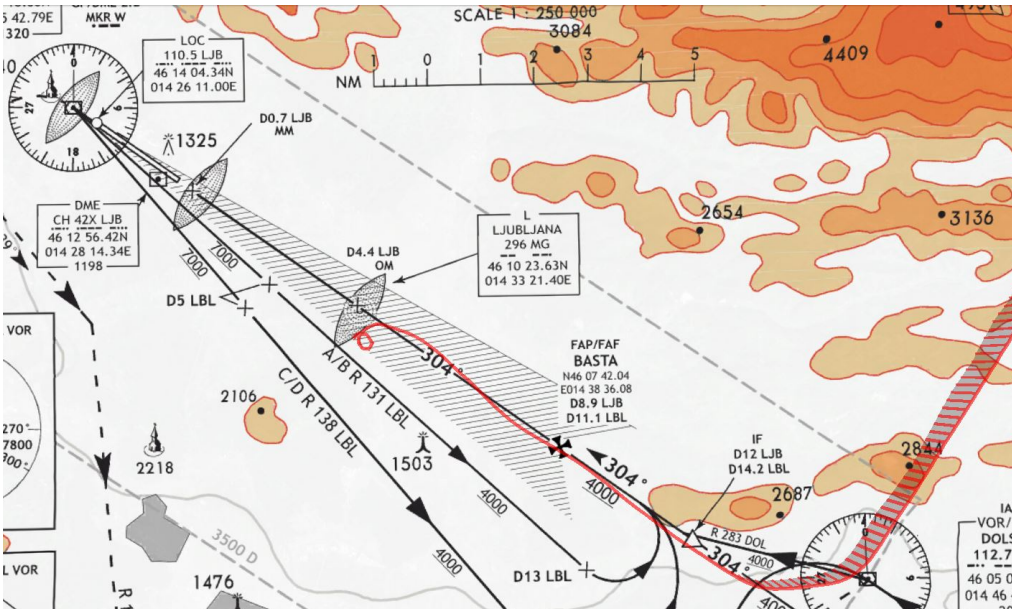

Image 2: Red line represents the actual flight path of the aircraft

1.2 Data on aircraft damage

The plane separated into smaller pieces in the direction of movement, from the top of the hill towards the valley. In the crash, the plane first impacted with left wing, which collided with a

tree. Due to force of the collision, the left wing was torn off from the fuselage and came to rest on the ground together with the landing gear wheel, which was in an extended and locked position. Some parts of the airplane remained on tree canopies. The aircraft cabin, fuselage and tail surfaces were crushed to unrecognizable shape. A wider range of wreckage contained instrument panel not containing any instruments. Identification of instruments of the instrument panel and their readouts (flight data and engine performance) was not possible. At the far lower point of the crash trajectory was the engine along with the propeller.

Image 3: Crash trajectory line was downslope and 120 m long

1.3 Other damage

There were some branches and stems cut off the trees at the scene. There was also a spillage of a small amount of oil and fuel on the expanded forest area. There was no other damage.

1.4 Licence data and total flight times

The pilot was 62-year-old Austrian citizen, who was the holder of:

- CPL(A)
  - Issued: 21 July 2004;
  - Valid until: 3 February 2016;
- Ratings SEP/IR and MEP/IR last revalidated on 22 February 2015 – Examiner A-988;
- Medical Certificate Class 1 expired on 11 August 2015 (issued by AME ID: AT.AME.0046);
- Medical Certificate Class 2 valid until 11 February 2016 (issued by AME ID: AT.AME.0046);
- Medical Certificate LAPL valid until 11 February 2017 (issued by AME ID: AT.AME.0046).

Exact data on the pilot's total flight time could not be obtained during the investigation. The Journey Log Book and ownership records show that the pilot had at least 350 hours of total time before the accident. He had his last instrument rating evaluation check on 22 February 2015 with examiner no. A-988. Skill test documentation according Appendix 7 to Part FCL has not been obtained in process of investigation.

In the last year, the pilot has flown 26 times on OE-DYM from 18 February to 3 August, with a total of 42 hours 5 min being flown.

All flights were performed in visual meteorological conditions. The pilot, before the accident, last flew on 3 August 2015. There was no information that the pilot had completed any instrument flights (from 3 August 2015 to the date of the accident) to maintain practice in the IFR flight procedures.

1.5 Aircraft data

- Type of aircraft: four seat, single engine aircraft with retractable gear
- Manufacturer: Piper Aircraft Corp. USA
- Type: PA-28R-201
- Serial number: 28R-7837072
- Year of manufacturing: 1978
- State of registration: Austria
- Operator/Owner: private owner
- Registration mark: OE-DYM
- Airworthiness Review Certificate number: 460/15, issued by authorised maintenance organisation number DE.MG.0170
- Last renewal: 19 August 2015, valid until 2 September 2016
- MTOW: 1247 kg / 2750 Lbs
- Basic Empty Mass: 742 kg / 1637 Lbs
- Useful Payload: 435 kg / 960 Lbs
- Total time (Total airframe hours): 7203 h 35 min (until 19 August 2015)

1.5.1 Engine data

- Manufacturer: Lycoming
- Type: IO-360-C1C6
- Serial number: RL-20710-51A
- Date of installation: 4. November 1994 (last check on 19 August 2015)
- Time remaining to next engine overhaul: 457 h 25 min

1.5.2 Propeller data

- Manufacturer: McCauley Propeller
- Type: B2D34C-213-B
- Serial number: 778956
- Date of installation: 25 August 2006 (last check on 19 August 2015)
- Time remaining to next propeller overhaul: 1606 h 25 min

1.5.3 Mass and balance

According to the information obtained from the operating manual and the mass and balance reports, the basic empty mass is 742 kg. Underload to MTOM was 505 kg. Before departing from the Vienna airport, the pilot added 72 litres to the fuel tanks (general calculation of mass for 72 litres (0.72 kg / l) = 51.84 kg).

Taking into consideration the weight of the pilot, baggage, dog and fuel weight in the aircraft before departure, it is found that the total mass of the aircraft before the event was less than the maximum take-off mass of 1247 kg. According to calculations, the aircraft did not exceed the maximum take-off mass and the aircraft's centre of gravity was within the permitted range.

1.5.4 Other aircraft data

Aircraft OE-DYM conformed to the type certificate and the manufacturer's VFR and IFR certified instructions. Flying in icing conditions is prohibited. A review of the aircraft documentation revealed that in 2015, the aircraft had 26 take-offs, on all of which the pilot was present on board and was operating 25 times as Pilot in command. He has flown alone eight times, in most other cases he has flown in the role of pilot in command, but was accompanied by more experienced pilot - examiner. Also, in last 24 months prior to the event, in most cases the aircraft was flown by the pilot involved in the accident.

1.5.5 Aircraft maintenance

No deviations or malfunctions were found in the obtained aircraft documentation. A review of the aircraft technical log book revealed that the aircraft owner maintained the aircraft at an authorized aircraft maintenance organization. It was maintained according to the manufacturer's instructions and in accordance with the maintenance manual. The examination of the aircraft documentation shows that the following periodic inspections of the aircraft have been carried out:

No..	***Date:***	***Type of check***	***Aircraft total hours***	***Provider PART 145***	***Remarks***
1	*19. 8. 2015*	*100-hour check*	7203:35	*DE.145.0170*	*Location EDMS*
2	*3. 9. 2014*	*100-hour check*	7153:55	*DE.145.0170*	*-//-*
3	*16. 10. 2013*	*500-hour check*	7106:07	*DE.145.0170*	*-//-*
4	*23. 8. 2013*	*Non-scheduled check*	7106:07	*DE.145.0170*	*-//-*
5	*24. 8. 2012*	*100-hour check*	7072:21	*DE.145.0170*	*-//-*
6	*5. 10. 2011*	*Periodical check*	7036:22	*CH.145.0220*	*Location LSZH*
7	*19. 8. 2011*	*100-hour check*	7031:00	*HU.145.0089*	*Location LHFM*

A review of the data in the Journey Log Book indicates that the aircraft was regularly maintained and was issued an Airworthiness Review Certificate (ARC) from 2010 onwards. In September 2009, a 1000-hour inspection of the aircraft was carried out by the maintenance organization HU.145.0089. The aircraft had a total of 7007: 55 flight hours at the time. The latest ARC was issued on 19 August 2015 (which was valid until 2 September 2016) by authorized maintenance organization DE.145.0170 (see Appendix 2).

1.6 Meteorological data

Description of the weather situation on3 December 2015.

Temperature and possibility of in-flight icing

Over Slovenia the temperature was above 0˚C in the lower part of the atmosphere. The temperature dropped below 0˚C at altitudes above 10000 feet, below this altitude the temperatures were positive (Image 4). There were no conditions for the formation of icing on the structural parts of the airplane as temperatures were positive below 10000 feet and there was no visible moisture above 10000 feet.

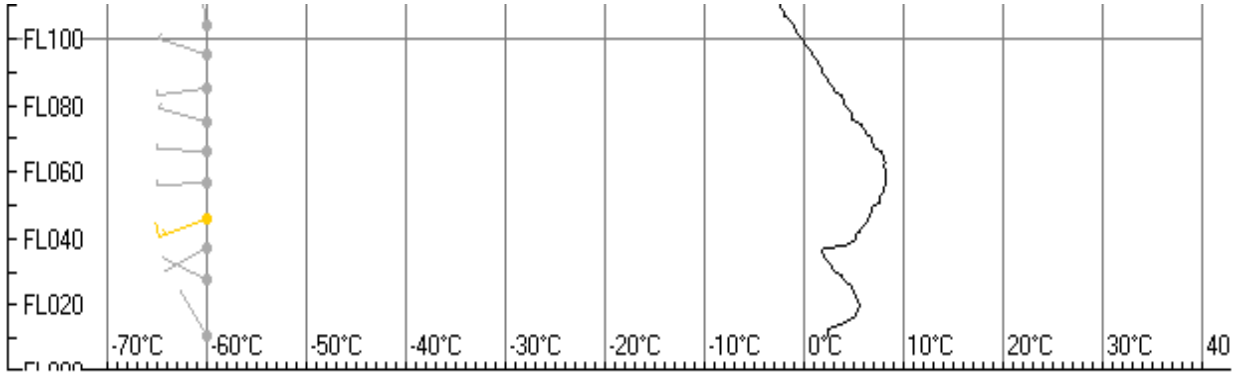

Image 4: Temperature profile above LJLJ at 18:46 LT

Fog and clouds

Fog was present at LJLJ airport and visibility was reduced in the horizontal as well as in the vertical direction. There were two layers of clouds in the wider area of Ljubljana Airport. The first layer of ground fog (stratus nebulosus) was about 500 feet thick, up to a height of approximately 1700 feet AMSL. Above the first layer of fog was another layer of clouds (genus stratocumulus), extending from a height of approximately 3000 feet AMSL up to approximately 4000 feet AMSL. There were no clouds above 4300 feet AMSL.

Horizontal and vertical visibility at LJLJ

METAR LJLJ 031600Z 00000KT 0300 **R30/0500N FG VV001** 04/04 Q1032 NOSIG=
METAR LJLJ 031630Z VRB01KT 0400 **R30/0500N FG VV001** 04/04 Q1032 NOSIG=
METAR LJLJ 031700Z 27001KT 0400 **R30/0700D FG VV001** 04/04 Q1032 NOSIG=
METAR LJLJ 031730Z 26001KT 0400 **R30/0600N FG VV001** 04/04 Q1033 NOSIG=
METAR LJLJ 031800Z 00000KT 0800 **R30/1100U FG BKN002** 04/03 Q1033 NOSIG=

TAF forecast

TAF issued 14 UTC (3:00 p.m. local); valid for 3 December from 15 UTC until 4 December until 15 UTC.

TAF LJLJ 031400Z 0315/0415 VRB01KT **0800 FG VV002** TEMPO 0321/0408 0300 FZFG VV001 BECMG 0409/0412 CAVOK=

At 16:29 UTC (5:29 p.m. local) a modified forecast was issued:

TAF AMD LJLJ **031629Z 0316/0415** VRB01KT **0300 FG VV001** TEMPO 0321/0408 0800 FZFG VV002 BECMG 0409/0412 CAVOK=

Conclusion

On the 3 December 2015, at the time of accident, the following weather conditions prevailed at LJLJ and in close vicinity:

- Light wind up to a few knots,
- There were no conditions for in-flight airframe icing,
- RVR varied between 500 meters and 1100 meters,
- Meteorological varied visibility between 300 meters and 800 meters,
- Vertical visibility varied between 100 feet and 200 feet,
- Fog layer persisted up to 1700 feet AMSL and above the fog was the second layer of obscured visibility in shape of clouds from 3000 feet AMSL up to 4000 feet AMSL.

- **RVR was variating from 500 meters to 1100 meters** until 7:00 p.m. local (minimum RVR for CAT I approach is 550 meters)
- Meteorological visibility was variating from **300 meters to 800 meters**.
- Vertical visibility was variating between **100 feet and 200 feet**.

TAF forecasts for LJLJ on 3 December 2015:

TAF AMD LJLJ 030924Z **0309/0409** VRB01KT **0500 FG BKN002** BECMG 0309/0312 CAVOK PROB40 0403/0408 0300 FZFG VV001

TAF LJLJ **031400Z 0315/0415** VRB01KT **0800 FG VV002** TEMPO 0321/0408 0300 FZFG VV001 BECMG 0409/0412 CAVOK

TAF **AMD*** LJLJ **031629Z 0316/0415** VRB01KT **0300 FG VV001** TEMPO 0321/0408 0800 FZFG VV002 BECMG 0409/0412 CAVOK

Last forecast was amended at 5:29 p.m. local time, approximately one hour before OE–DYM entered the Slovenian airspace and predicted drastic reduction of meteorological visibility down to 300 m.

Actual weather (METAR) at 5:30 p.m. local, reported RVR 500 m and meteorological visibility 400 m. At that time the pilot could not legally complete an ILS CAT I approach). At 6:00 p.m. local RVR increased to 700 m. Vertical visibility persisted at 100 feet. These conditions (mainly due to low vertical visibility) gave a very small chance, of providing the pilot with enough visual references for landing.

1.6.1 Weather situation at other airports

METAR/SPECI for LOWW, Wien / Schwechat-Flughafen (Austria).

SA 03/12/2015 19:50-> METAR LOWW 031950Z 15004KT 9999 FEW035 05/02 Q1032 NOSIG=
SA 03/12/2015 19:20-> METAR LOWW 031920Z 16005KT 9999 FEW035 03/01 Q1032 NOSIG=
SA 03/12/2015 18:50-> METAR LOWW 031850Z 17006KT 9999 FEW036 04/01 Q1032 NOSIG=
SA 03/12/2015 18:20-> METAR LOWW 031820Z 17005KT 9999 BKN037 04/02 Q1032 NOSIG=
SA 03/12/2015 17:50-> **METAR LOWW 031750Z 17007KT 9999 SCT038 03/01 Q1032 NOSIG=**
SA 03/12/2015 17:20-> **METAR LOWW 031720Z 17005KT 9999 FEW010 SCT038 05/01 Q1031 NOSIG=**

METAR/SPECI for LOWG, Graz-Thalerhof-Flughafen (Austria).

SA 03/12/2015 19:50-> METAR LOWG 031950Z VRB01KT 6000 OVC025 06/05 Q1032 NOSIG=
SA 03/12/2015 19:20-> METAR LOWG 031920Z VRB01KT 7000 OVC025 06/06 Q1032 NOSIG=
SA 03/12/2015 18:50-> METAR LOWG 031850Z VRB01KT 9000 OVC026 06/06 Q1032 NOSIG=
SA 03/12/2015 18:20-> METAR LOWG 031820Z VRB01KT 9000 OVC026 06/06 Q1032 NOSIG=
SA 03/12/2015 17:50-> **METAR LOWG 031750Z VRB02KT 8000 FEW010 OVC026 07/06 Q1032 NOSIG=**
SA 03/12/2015 17:20-> **METAR LOWG 031720Z VRB02KT 8000 FEW010 OVC027 06/06 Q1032 NOSIG=**

METAR/SPECI za LOWK, Klagenfurt-Flughafen (Austrija).

SA 03/12/2015 19:50->	METAR LOWK 031950Z 30003KT 0600 R10/0750N R28/1000D FG VV002 01/01 Q1033 R10L/19//95 NOSIG=
SA 03/12/2015 19:20->	METAR LOWK 031920Z 31003KT 0700 R10/0800N R28/0800N FG VV002 01/01 Q1033 R10L/19//95 NOSIG=
SA 03/12/2015 18:50->	METAR LOWK 031850Z 29003KT 0650 R10/0750N R28/0800N FG VV002 01/01 Q1033 R10L/19//95 NOSIG=
SA 03/12/2015 18:20->	METAR LOWK 031820Z 30004KT 0650 R10/0800N R28/0800N FG VV002 01/01 Q1033 R10L/19//95 NOSIG=
SA 03/12/2015 17:50->	**METAR LOWK 031750Z 29004KT 0750 R10/0800N R28/0800N FG VV002 02/02 Q1033 R10L/19//95 NOSIG=**
SA 03/12/2015 17:20->	**METAR LOWK 031720Z 29003KT 0650 R10/0750N R28/0800N FG VV002 02/02 Q1033 R10L/19//95 NOSIG=**

From the weather data for nearby airports, we can deduct that Graz airport (LOWG) represented a suitable alternate airport as it had a visibility of 8000 m and just a few clouds at 1000 feet above the airport. The temperature there was also highest in the area (6˚C).

Pilot flew over Graz airport on his route to Ljubljana and could check (he might have) the latest weather during his communication with Graz ATC.

Although the weather at Klagenfurt airport was much worse and the airport is more demanding to fly to in instrument conditions, the pilot decided that Klagenfurt airport (LOWK) is suitable as his alternate.

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1.7 Radio communication data

Slovenian Aeronautical Information Publication defines that Ljubljana Approach Control utilizes primary communication frequency 135,275 MHz. During duration of the flight all communication between ATC and accident aircraft was made on this frequency. OE-DYM was first detected by radar available to Slovenian ATC around 17:43:27 local, 11 NM north of the SNU VOR radio navigation aid. At 18:28:55, it entered Slovenian airspace, at FL 100 or (10,000 feet respectively). The transcript of the voice communication is made on the basis of the analysis of the audio recording during communication on frequency 135,275 MHz.

The "XXXXXX" call signs in the voice communication table below are the call signs of other aircraft present in the Slovenian airspace and its immediate surroundings from 4000 feet AMSL altitude to FL 400 (40000 feet). Other communication is presented in order to show chronologically the overall situation in the airspace of the Republic of Slovenia at the time of the accident.

Before the aircraft entered Slovenian airspace, the controller informed the ATC in Graz by means of telephone that they should inform the pilot on his way through their airspace of the current visibility at the Ljubljana airport.

Time (local)	Phone ATC	Communication with APP Ljubljana Assistant
18:24:45	GRZ APP	Go ahead
	LJU APP	Servus! Just advice the OE-DYM that the RVR at touch down is 650m and ja and the rest is 500 and 50 and fog and visibility 400
	GRZ APP	OK I will tell him, bye bye
18:25:03	LJU APP	Ja, ciao

Time (UTC)	Aircraft/ATC	Communication on frequency 135,275 MHz
18:26:04	OE-DYM	Ljubljana good day OEDYM
	ATC	OEDYM Ljubljana radar good evening identified cleared to DOL
	OE-DYM	Cleared DOL OYM, request the weather situation for landing in Ljubljana OYM
	ATC	There is Low visibility procedures in operation, visibility is 400, RVR *(RWY)*30 700, midpoint 550 at on the end 600, wind is calm and fog, vertical visibility 100
	OE-DYM	Do you think weather will be improving for landing or it will stay or even become worse OYM
	ATC	It looks like becoming worst it's nothing better because the visibility is lower than before
	OE-DYM	So it is not good idea to continue to Ljubljana OYM?
	ATC	Just say again it is not good idea to go to Ljubljana or…?
	OE-DYM	Yes if the weather does not improve, eee 550 is the very low visibility OYM
	ATC	The fog it's all day in Ljubljana it's, now it is worse than before, so expect nothing better
	OE-DYM	Ja OK, so I will check it again latter and will see what we do OYM thank you
	ATC	Ja no problem
	XXXXXX	Ljubljana good evening XXXXXX FL 380 to TIBRO
	ATC	XXXXXX Ljubljana radar good evening identified
	XXXXXX	Ljubljana good evening XXXXXX FL 390
	ATC	XXXXXX Ljubljana radar good evening identified cleared to ETIDA
	XXXXXX	cleared to ETIDA thank you XXXXXX
18:31:14	ATC	XXXXXX contact Zagreb Radar 132.340
	XXXXXX	32340 XXXXXX Tchüss
	ATC	Tchüss
18:32:17	XXXXXX	Good evening XXXXXX FL 340
	ATC	XXXXXX Ljubljana radar good evening identified, cleared direct to ERKIR maintain level 340
18:35:400	XXXXXX	Ljubljana good evening XXXXXX maintaining FL400 inbound ERKIR
	ATC	Other communication AIC137
	ATC	XXXXXX
	ATC	XXXXXX (other communication)
18:38:20	ATC	OYM for information RVR touch down 800, midpoint 550 on the end 650, VV 150
	OE-DYM	OYM, checked thank you

	ATC	XXXXXX to KFT
	ATC	XXXXXX to ZAG freq
18:39:31	ATC	OYM descent to 7000 feet QNH 1033
	OE-DYM	Descent to 7000 feet repeat the QNH OYM
	ATC	1033
	OEDYM	1033 OYM
	ATC	XXXXXX to BAXON (other communication)
18:40:13	ATC	OYM expect vectors for ILS30
	OE-DYM	Expecting vectors for 30 OYM
18:41:48	ATC	XXXXXX to SOLGU (other communication)
	ATC	OYM descend to 5000 feet
	OE-DYM	Clear 5000 feet OYM
	ATC	XXXXXX to PODET (other communication)
18:43:37	ATC	OYM descent to 4000 feet
	OE-DYM	Descent to 4000 feet OYM
	ATC	OYM distance from touch down 20 nautical miles
	OE-DYM	Repeat OYM
	ATC	disregard
	ATC	XXXXXX to ERKIR (other communication)
18:44:37	ATC	OYM turn right heading 270 cleared for approach report established ILS 30
	OE-DYM	270 and cleared for the ILS approach 30 OYM
	ATC	XXXXXX (other communication)
	ATC	XXXXXX (other communication)
	ATC	XXXXXX (other communication)
18:46:35	XXXXXX	Ljubljana dober večer XXXXXX climbing FL120 passing 3100 on GIMIX departure
	ATC	XXXXXX Ljubljana radar dober večer identified follow departure clearance
	XXXXXX	departure clearance XXXXXX
18:46:56	ATC	XXXXXX contact Wien radar 133,6
	XXXXXX	133,6 XXXXXX good night
	ATC	Good night
18:48:14	ATC	OYM confirm established
18:48:23	ATC	OEDYM confirm established

18:48:29	OE-DYM	I have problem OYM
18:48:33	ATC	Confirm are you established ILS30
18:48:36	OE-DYM	ILS Established OYM
18:48:38	ATC	Contact Ljubljana Tower 118,0
18:48:45	OE-DYM	I have a problem OYM
18:48:49	ATC	Confirm you have a problem
18:48:51	OE-DYM	Yes Sir OYM
18:48:54	XXXXXX	Ljubljana radar XXXXXX heavy good evening level 400
18:48:59	ATC	OYM what kind of problem you have
18:48:06	ATC	XXXXXX identified cleared to ERKIR 400
18:48:11	XXXXXX	Continue ERKIR 400 XXXXXX
18:49:18	OE-DYM	OYM I'm climbing
18:49:23	ATC	OYM climb to 5000 QNH 1033
18:49:28	OEDYM	Climb 5000 OYM
18:49:30	ATC	XXXXXX cleared direct to ERKIR climb to FL 240
18:49:33	XXXXXX	Direct ERKIR climb 240
18:49:41	ATC	OYM report intentions
18:50:00	ATC	OYM continue left heading 130
18:50:45	ATC	XXXXXX contact Padova radar 127,380
18:50:49	XXXXXX	27380 bye bye XXXXXX
18:50:56	ATC	XXXXXX contact Padova 132340
	XXXXXX	132340 ciao
18:51:06	ATC	XXXXXX contact Wien radar 129125
	XXXXXX	129,125 XXXXXX bye
18:51:13	ATC	Bye
18:51:24	ATC	OYM Ljubljana calling do you read
18:51:39	ATC	OEDYM Ljubljana calling do you read
18:51:47	XXXXXX	XXXXXX FL380 inbound GIMIX
	ATC	XXXXXX Cleared to ERKIR maintain FL380
	XXXXXX	XXXXXX direct to ERKIR
18:52:02	ATC	XXXXXX contact Wien radar 133,6
	XXXXXX	336 XXXXXX
18:52:09	ATC	XXXXXX contact Wien radar 133,6
	XXXXXX	133,6 XXXXXX adijo
18:52:16	ATC	Adijo
18:52:19	XXXXXX	Ljubljana radar XXXXXX maintain FL370 on course MAGAM
	ATC	XXXXXX Ljubljana radar good evening identified continue present heading maintain FL370
	XXXXXX	Maintain FL370 maintain heading and for information we are experiencing sometimes light chops at FL370 any reported turbulence

LAST PILOT RESPONSE

		in front of us
18:52:41	ATC	Negative not yet do you request a level change
	XXXXXX	No not now thank you very much
18:52:47	ATC	No problem
	New controller	NEW CONTROLLER ON DUTY
18:53:50	ATC	XXXXXX Contact Zagreb 135,8 bye bye
18:53:54	XXXXXX	XXXXXX 135,8 good bye
18:54:00	ATC	OEDYM do you read
18:54:16	ATC	OEDYM Ljubljana do you read

1.8 Crash site information

Air traffic control triggered the search and rescue immediately after the event. The Safety Investigation Agency was notified of the accident minutes after the aircraft search activity was initiated. In the late evening, the wreckage of the aircraft was found in the sloping forest terrain about 4,3 nautical miles from the runway 30 threshold of LJLJ. The Police, accompanied with members of the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief, located the accident site and adequately protected the accident area until the arrival of the investigator-in-charge. Human remains of the pilot were transferred to the Institute of Forensic Medicine in Ljubljana. A dead dog was also found at the crash site. The dog was onboard of the airplane at the time of the accident.

Image 5: The crash site captured from a helicopter. Red line marks the trajectory of impact.

The investigation process, in cooperation with Police representatives, began the next day. The site of the accident was documented from the air by a Police helicopter. During the investigation, logistic assistance in clearing the parts of the wreckage from the tree canopies and in the wider forest area was provided by firefighters and Mountain Rescue Association members.

1.9 Medical and pathological information

Based on the report provided by Institute of Forensic Medicine and the review of the pilot's documentation, there were no disease factors or health restrictions that could have affected the accident. The pilot was in good health. Toxicological tests were negative.

1.10 Fire information

There was no fire at the site.

1.11 Information on chances of survival

There was no chance of survival in this event.

1.12 Information on operator / aircraft owner

The operator and owner of the aircraft was the pilot involved in the accident. The aircraft documentation indicated that the airplane was airworthy and maintained by a competent and approved maintenance organization. The airplane was used for private purposes. The owner, as could be seen from the documentation of the aircraft, flew in most cases accompanied by another pilot (he operated the aircraft in the role of pilot in command in the presence of a more experienced pilot). More detailed information is provided in chapter 1.4 of this report.

2. Analyses

2.1 General

Based on the data obtained from the radar recordings, which recorded instrument arrival and approach and the analysis of voice communication recordings provided by the Slovenia Control, a flight path analysis was made by individual points in the final approach (ILS approach). An instrument landing system signal was confirmed operational at all times for both, the localizer and the glide slope.

After the inspection of the wreckage of the fuselage, engine and propeller, no evidence of malfunction or mechanical defects was found, that would indicate that the engine, propeller, airplane controls and instruments could contribute to the accident. The analysis also utilized data provided by the representative of the Austrian Aviation Investigation Authority - BMVIT, acting as an accredited representative.

2.2 Flight analyses

The analysis of the trajectory of the airplane's movement and the communication between the ATC, which was obtained from the Slovenia Control showed that the flight was conducted in accordance with the regulations and procedures for instrument approach to LJLJ. The communication between the pilot and the controller was carried out according to the established procedures, until the moment when the pilot informed the controller that he had a problem which he did not clarify. The message from the pilot "I have a problem OYM" was spoken in a rather calm, monotonous voice that did not differ significantly from his communication

previously exchanged with the controller. There was no expression of emotion, surprise or distress in pilot’s voice.

Based on the information obtained and analyzed by the commission, it was difficult to determine the exact cause of the problem reported by the pilot. Given the complexity of the problem, the following potential factors that would have an impact are worth mentioning:

- The meteorological conditions were extremely challenging for performing an instrument approach in a single pilot aircraft.

- According to the testimonials of pilots who were sometimes present on board of the accident aircraft in the past, the illumination of the instrument panel, or more precisely the attitude indicator, was defective or was nonexistent.

- An unsecured dog was present in the cabin at the time of the accident.

- A longer interruption in exercising flight qualifications, such as flight in instrument meteorological conditions, increased the possibility of loss of orientation and increased the risk of illusions.

Following the pilot's decision to initiate a missed approach, problems started that could be influenced by all of the above stated factors. A possibility of illusion and thus the loss of spatial orientation in transition from descent to climb, combined with a turn remains predominant.

2.3 Analyses of aircraft mass

The airplane did not exceed the permitted mass limits at any stage of the flight (as indicated in in chapter 1.5.3 of this report - Mass and balance). The CG was within limits.

2.4 Flight data analyses

In analyzing the flight data, the Commission used the data recorded by the Slovenia Control radar system. The information in the form of the ATC report on the OE-DYM ILS approach is attached to this report. The text is a summary of the radar image analysis combined with voice communications transcript and weather data at the time of the accident.

On 3 December 2015 at 18:50:10 local time, ATC lost radar contact with aircraft OE-DYM attempting to land at Ljubljana Airport. The last contact was recorded 926 meters south of the L/OM marker (outer marker in the precision instrument approach) near Mengeš. The aircraft was at that time located at an altitude of 1800 feet AMSL. The coordinates in the WGS-84 format of the last radar contact were: N 46° 09' 55.1984", E 014° 33' 12.8686".

At the time of the accident, Slovenian ATC used 6 radars (three of which are located in Slovenia and three abroad). For the analysis, a picture of a radar stationed at the Ljubljana airport and a radar in the vicinity of Ljubljana was used. These two systems were closest to the aircraft at the time of the accident and therefore their resolution provides the best indication of flight parameters.

At 17:43:27 local time, 20.4 km north of the SNU VOR (the navigation aid located south of the Vienna airport), the Slovenia control radar system first detected the OE-DYM aircraft as it was

climbing through an altitude of 3,600 feet. The aircraft entered the Slovenian airspace at 18:28:55 local at FL 100. The aircraft was directed by the controller towards the DOL VOR and after vectoring (one vector a heading of 270° was issued and instrument approach cleared) to close on instrument landing system localizer. Aircraft was established on the localizer at 18:45:53.

At a distance of 23.34 km from touchdown, the aircraft was positioned in the direction of the landing runway. Initially, the airplane was about 1° to the left of the intended course. Just before BASTA (Final approach point), the aircraft was still 0.3° to the left of the localizer and slightly above the glidepath (standard 3° approach plane). After passing the BASTA point, the aircraft again turned left, for a maximum deviation of 1°. When the plane had a deviation of 1°, it was located 1.48 km from BASTA. The aircraft then turned right and at a distance of 3.33 km from BASTA, flew over the localizer. At this point the plane was below the glideslope. After crossing the localizer, the aircraft began to climb, then descend and climb again.
5.92 km from BASTA point towards the airport (10.56 km before the intended touchdown) the aircraft reached a maximum deviation to the right, again about 1°. After the maximum deviation in direction to the right, the aircraft began to turn left towards the localizer. The localizer was overflown 9.07 km before the intended touchdown, when left turn continued at an increased angular velocity. According to radar data, the manoeuvre ended with a steep spiral about 8.33 km before intended touchdown (or 926 meters southwest of the outer marker).

The last radar contact was made at 18:50:10 when the aircraft was at an altitude of 1760 feet or about 480 feet above ground.

Ground speed varied between 98 knots and 157 knots in the last part of the recording, depending on whether the aircraft was in climb or descent. The rate of climb and descent varied between 4000 feet per minute in climb and 9000 feet per minute in steep descent.

The difference between the position of the last radar contact and the GPS position of the first contact of the aircraft with tree canopies was 40 meters. The point of collision with the ground was 260 meters north of the last position recorded by radar.

The pilot in radio communication with the ATC stated that he was having a problem. The nature of problem could not be determined from the flight parameters recorded by the radar system.

Based on the direction data, it can be concluded that the pilot maintained sufficient lateral accuracy through the majority of the flight to the outer marker, which probably took most of his attention. He did not pay enough attention on maintaining adequate vertical speed to ensure controlled descent along the planned 3° glide path.

The Commission concludes that the problem reported by the pilot may be of a navigational nature, namely:

a) The glideslope indicator on the ILS instrument in the aircraft did not work properly.

b) Pilot had problems with understanding the autopilot operation (improper vertical speed adjustment when starting ILS).

c) The pilot could have set a LBL VOR frequency instead of the ILS frequency. LBL VOR serves as the navigation aid for published non-precision approach and does not include an indication of the glide path.

In the event of partial failure of the autopilot, a bank of about 45˚ and a loss of altitude of 150 feet can occur during climb, horizontal flight and descent within 3 seconds. Which is hard to confirm or dismiss from a radar recording (information obtained from autopilot system operational instructions).

The problem with the instruments however, is possible due to the inadequate illumination of the artificial horizon, which is evident from the photos of the cabin of the aircraft during the flights before the accident. **The commission did not find any official records of the failed illumination of the attitude indicator in the aircraft technical logs**. The attitude indicator itself and some aircraft documentation were also destroyed in the crash.
.

When the pilot noticed that the altitude deviation was too large, he wanted to lower the altitude to reach the glide path, as shown in the timeline on the altitude diagram at 18:48:29. There is no information on the exact vertical speeds at that point. There are quite a few changes in speed and altitude. As the pilot descended, speed increased from 100 knots at the highest altitude to just over 140 knots at the lowest altitude. Then the pilot noticed that he is unlikely to reach the outer marker stabilized, and in communication with the controller, decided to climb to 5000 feet. This climbing turn first takes place at a fairly constant speed of between 90 and 100 knots. The aircraft first quickly gains nearly 500 feet, then reaches a maximum altitude of about 3800 feet at a speed of around 100 knots. At this point (at 18:50:00), the aircraft enters a steep spiral, which may be the result of a short dynamic stall during a turn. The radar data shows that the

aircraft reached high vertical speeds and made a sharp turn. During this manoeuvre, the speed has grown exponentially to around 160 knots.

The engine power that was set at the point when pilot decided to initiate the climb, is unknown to the commission, as is the bank angle of the turn performed. The fact is that a manoeuvre without adequate speed with increased bank and load (pulling the elevator control) can lead to a dynamic stall and thus an increased vertical speed in a very short time - turning stall.

A violent deflection of elevator and aileron control may also be associated with somatogravic illusions in conditions of reduced visibility (multiple layers of clouds present at the time of the event, flight was executed during the night) and additional fatigue after demanding flight, in terms of preparing to continue flight towards demanding approach at the destination airport and the selection of appropriate alternates.

The pilot did not request priority nor used distress phraseology, even during the loss of control of the aircraft. The configuration of the aircraft due to damage upon impact is not known to the Commission except that the landing gear was extended and locked in the down position. It can also be assumed (due to speed ranges) that the flaps were retracted and the stall speed was 60 knots in straight and level flight.

Possible scenario:

Upon establishing on the ILS, the pilot probably selected the appropriate frequency and set the appropriate OBS setting on the cockpit instrument (as a direction reference only). Based on the data available, the airplane had the prescribed altitude and direction, or it was within the parameters for safe completion of the approach. The speed was 140 knots, which required an approximate vertical speed of 700 feet per minute upon reaching the 3° descent slope at Final

approach point BASTA. Glideslope is usually intercepted from below, but in this case the airplane intercepted the glideslope slightly from above. The pilot tried to correct this deviation, but in doing so he increased the speed, which further destabilized the flight path and also changed the required vertical speed parameters to reach the glide path. After two descend attempts, the pilot decided to discontinue the approach, but without a clear objective (in this case immediate stabilization of the airplane by maintaining wings level and gaining sufficient speed for coordinated transition to climb to a safe altitude, followed by the standard missed approach procedure or radar vectoring from the ATC (when the airplane is at the approved radar vectoring altitude).

The airplane was supposed to make a climb to 5000 feet AMSL and after controller intervention a turn to a heading of 130˚. The pilot never confirmed the given heading to the controller (the planned change of direction was about 170° in relation to communication with the controller. Reception and understanding of ATC instruction by the pilot cannot be confirmed in communication transcripts, but can be seen from airplane manoeuvring.

If the airplane would make a 360° coordinated turn at a speed of 100 knots, using a 70° bank, the radius of turn would be slightly less then 100 meters. The aircraft would achieve a load of 2.9 G, bringing pilots who are not accustomed to such loads, to a surprise. A 360° turn would take 12 seconds. The stall speed increases to 103 knots and could be achieved with great certainty at 18:49:55. For a moment, a stall warning would sound, which ceases when the elevator control is pushed (released forward).

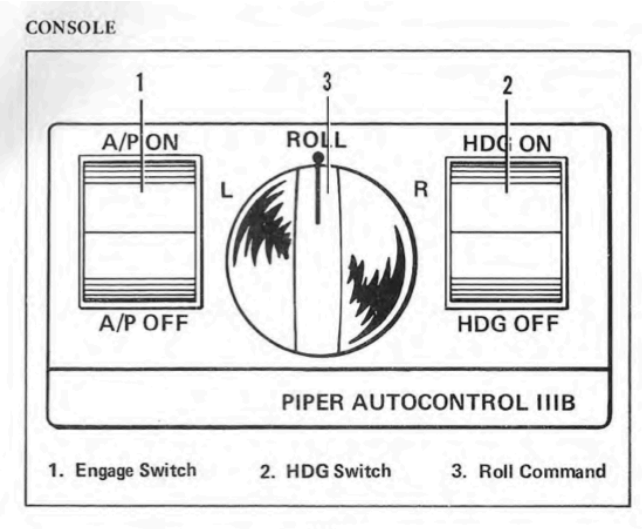
The Commission estimates that under heavy load factor, with no external visual reference (to the horizon), inadequate illumination of instruments accompanied with poor preparation or non-continuous maintenance of aviation experience in instrument meteorological conditions, safe escape from such a manoeuvre at such low height above ground is almost impossible.

Commission conducted the analyses of aircraft equipment and possible use of autopilot during the ILS approach. According to available information on pilot experience in IFR and IMC, Commission has an opinion that pilot did not have enough experience in utilization of autopilot and also doubts in pilot's suitable knowledge about autopilot and electric trimer operation.

Airplane was equipped with 2D autopilot Piper Autocontrol IIIB, which is certified for IFR operating in HDG mode. Operating instructions are contained in AFM Supplement. The following text is a summary of the Operating instructions.

Basic modes of the autopilot directional control are ROLL and HDG. ROLL switch controls the execution of left or right turn by turning switch no. 3 (Image 6), when the autopilot is ON (A/P ON) – switch 1 (Image 6). The ROLL switch returns to neutral position when released. HDG mode enables flight in 5 sub-modes. Sub-modes also utilize selected radio navigation receiver being NAV1 or NAV2 and OBS selection of selected navigational receiver.

If we assume that pilot used an autopilot on transition to ILS approach, we are then concentrating only on HDG and LOC NORM sub-modes. When the autopilot is on and is operating in basic HDG mode (switch 1 A/P ON, switch 2 HDG ON, Image 7 – position 1), direction is controlled by means of HDG bug on the HSI.



Umage 6 Autoppilot control switches

When the aircraft is on final vector to intercept the ILS, OBS is set to localizer course, heading bug is turned towards ILS course, then we switch sub-mode from position 1 to position 4 - LOC

NORM (Image 7) and autopilot intercepts and maintains the localizer (including correction for wind effect).

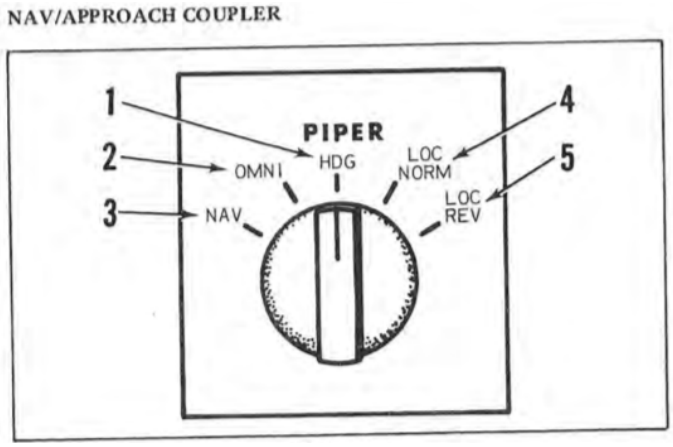


Image 7 Selctor of autopilot sub-modes

Following text describes how the interception of the ILS approach is conducted including procedures during ATC vectoring:

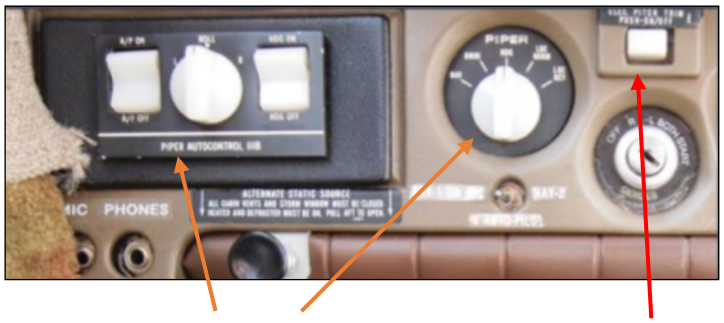


Image 8 – Position of autopilot control switches and main Electric pitch trim switch

ILS APPROACH (Radar Surveillance Directed)

It must be realized by the operator that the Instrument Landing and Approach System (ILS) is four times as narrow and four times as sensitive as the VOR system of navigation. Therefore, to use the coupler on a localizer, the speed of the aircraft must be held to approach speeds in order for the coupler to perform as required. The coupler will not make up for lack of knowledge and understanding of the ILS system on the part of the operator. However, the coupler will function with a high degree of safety if standard ILS procedures are followed. It must also be understood that while the OBS is not used on ILS approaches (because of the radio transmission principles involved) the Course Selector must be set to the inbound heading of the Localizer to prevent the aircraft from orbiting. The Piper coupler will not orbit when used correctly, as most other systems will.

1. When receiving Airport Surveillance Radar (ASR) vectors to a localizer, the pilot will be given headings to steer by the radar controller. When contacting the controller, make sure he is aware of the intercept angle limitations by stating "THIS WILL BE AN AUTOMATIC APPROACH". This will alert the radar operator that the intercept angle must not be 90 degrees or some large angle, thereby adversely effecting the performance of the coupler. At this point the pilot will have the coupler in the HDG Mode and will use the Course Selector to dial the headings given by the radar controller.

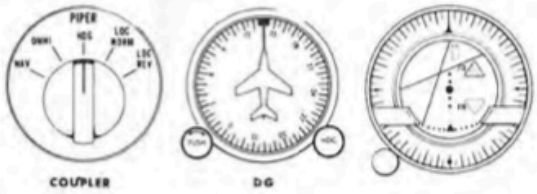
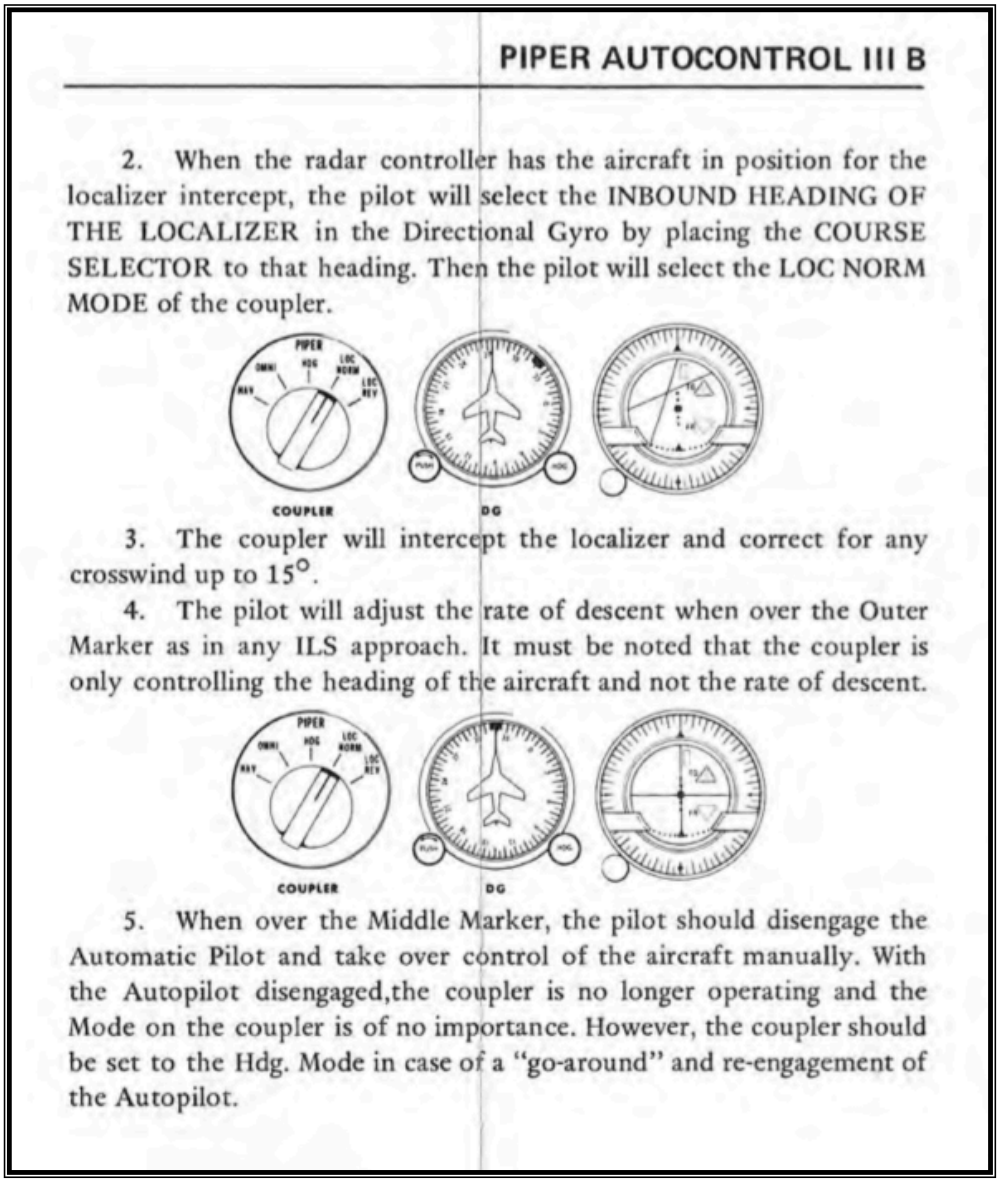


Image 9 – Instructions for the use of an autopilot Piper Autocontrol IIIB (ILS approach)

4. The pilot will adjust the rate of descent when over the Outer Marker as in any ILS approach. It must be noted that the coupler is only controlling the heading of the aircraft and not the rate of descent.

It must be stressed, that interconnection with navigation reciever will only provide autopilot lateral control, but not the vertical control.

As the aircraft was destabilized in vertical plane it is possible, that the pilot missed the right moment to start a descend and follow the glideslope. As a resault he needed to increase agressively the vertical rate to become established on the glideslope. The vertical speed increased as did the airspeed.



PIPER AUTOCONTROL III B

2. When the radar controller has the aircraft in position for the localizer intercept, the pilot will select the INBOUND HEADING OF THE LOCALIZER in the Directional Gyro by placing the COURSE SELECTOR to that heading. Then the pilot will select the LOC NORM MODE of the coupler.

3. The coupler will intercept the localizer and correct for any crosswind up to 15°.

4. The pilot will adjust the rate of descent when over the Outer Marker as in any ILS approach. It must be noted that the coupler is only controlling the heading of the aircraft and not the rate of descent.

5. When over the Middle Marker, the pilot should disengage the Automatic Pilot and take over control of the aircraft manually. With the Autopilot disengaged,the coupler is no longer operating and the Mode on the coupler is of no importance. However, the coupler should be set to the Hdg. Mode in case of a "go-around" and re-engagement of the Autopilot.

Image 10 – Instructions for use of autopilot Piper Autocontrol IIIB (ILS approach – Part two)

This brings up the question whether the electric pitch trim was also engaged (which is not part of the autopilot). Electric pitch trim is controlled by the means of a two-position switch on the yoke, main electric pitch trim which is located on the instrument panel under the yoke, near autopilot control switches and an Electric pitch trim circuit breaker. Operation of Electric pitch trim is described in the AFM Supplement.

Main Electric pitch trim switch is utilized by pressing the switch to turn the system ON (switch goes in) or push again to turn the system OFF (switch is in extended position – sign OFF visible from the top and the switch appears longer). The switch is hard to see from pilot position, as it is located under the yoke.

It is unknown to the Commission, how much training did the pilot receive on usage of autopilot and Electric pitch trim. The Commission the focused on the operation of Electric pitch trim and the influence it could have on the accident. Possible issues that could arise during the use of the Electric pitch trim are:

- Trim runaway,
- Delayed operation of the yoke Electric pitch trim switch,
- Physical failure of the trim system (blockage),
- Failure or partial failure of Electric pitch trim clutch,
- Pilot error – manual Electric pitch trim override (pilot not knowing it was on),
- Automatic disconnection of Electric pitch trim due to build in excessive control force protection at speeds above 140 kts IAS.

During the time that pilot transmitted a problem the aircraft did not drastically destabilize, so the trim runaway to full deflection is out ruled, but there is still a possibility of partial system failure or reduced function ability.

Pilot continued the ILS, because he thought that the airplane is controllable enough to continue the approach. If the Electric pitch trim was ON, manual pitch control was harder (sense of blocked flight controls), as it is meant that the aircraft is controlled by switch on the yoke, but not yoke itself.
When the deviation from the glideslope was too high by the Outer Marker ILS, the pilot decided that he is not stabilized and made a right decision to follow missed approach procedure. He did not declare a Missed approach, but instead he informed the ATC that he is climbing. If the autopilot and Electric pitch trim were still ON, the pilot had to overpower both systems.

Three possible scenarios exist:

1. Aircraft not properly configured (power, gear) for missed approach would contribute to stall – pilot overpowers Electric pitch trim and excessive nose down attitude is established;
2. Aircraft stalls at the highest point, pilot then regains control and commences a turn. Forces on yoke at first accommodated a normal turn, but by increasing the bank angle during the descend they led to spiral dive. The Electric pitch trim at first did not work as

the speed was over 140 kts, so when it reengaged the aircraft was not properly trimmed for manoeuvre.

In first part of missed approach (declared as climb) the aircraft did climb, but with three level-offs (vertical speed reductions), until the moment when vertical speed drastically increased into descend. Logical explanation for such aircraft flight path is flight near stall speed followed by full stall as the angle of attack and pitch are increased. Such flight path could also represent overpowering of electric trimmer.

Stall can sometimes also be a result of aggressive increase of pitch while still in landing configuration (gear down and flaps position is unknown).
The pilot afterwards shortly stabilized the aircraft while entering a turn (given by ATC but not confirmed by the pilot). After completing around 180˚ of turn aircraft continues with the left turn (towards runway) and starts descending again with a very high vertical speed. Turn ends with a steep spiral dive and impact with sloped terrain in the vicinity of the Outer Marker.

During the investigation it was not possible to obtain any readouts from the instruments. In case that the autopilot and Electric pitch trim were ON, there is a possibility that both systems in some extent controlled the flight path or had a negative influence on pilot's efforts to manually satbilize the aircraft. Proper operation of aircraft systems and readyness to imediattely react in case of doubtfull operation or system failure are of most importance for safe flight execution.

CONCLUSIONS

3.1 Findings

- The pilot had a valid license and ratings to fly in visual and instrument conditions on aircraft type involved;

- The pilot had a valid Medical Certificate Class 2. Medical Certificate Class 1, however expired on 8 November 2015;

- The investigation concluded that the accident was not affected by the pilot's medical condition. The results of toxicology tests were negative;

- In the investigation of the wreckage of the aircraft, no evidence was obtained to indicate that the operation of the engine, propeller and flight control system contributed to the accident;

- The investigation did not identify any deviations or errors in indication of instruments indicating flight parameters and engine performance;

- Meteorological conditions at the time of the accident were within limits of an ILS CAT I approach operations but near the RVR limit for landing in so low visibility conditions;

- During the flight to the destination airport, the pilot obtained weather information in communication with the controller and was aware of the complexity of the weather situation at the airport;

- Insufficient pilot experience in instrument flight in IMC conditions has contributed to the accident;

- An improperly illuminated instrument panel, especially attitude indicator illumination affected the control of the position of the aircraft in the approach path and thus contributed to the accident;

- The long interruption in exercising qualifications for instrument flight and flight on aircraft type has contributed to the accident;

- In the final phase of the ILS approach, the pilot decided for a missed approach procedure, but combination of turn and climb was followed by illusion which induced a pilot error that resulted in a spiral dive.

3.2 Concerns about possibilities of risk

On the basis of the analysis of the event, the Commission estimates that in case of single pilot instrument flights after a long interruption in flying, and especially for private flights, the presence of an additional pilot (safety pilot) would be appropriate in very demanding meteorological conditions with RVR near to minimum.

3.3 Cause of accident

Direct cause:

- Collision of the aircraft with terrain as a result of the loss of spatial orientation when discontinuing the ILS approach and performing the missed approach manoeuvre.

Indirect causes:

- Pilot's longer interruption in flying in instrument meteorological conditions and according instrument flight rules.

- Demanding IMC weather conditions for IFR flying.

- Insufficient illumination for reading of information on the instrument panel in the cabin.

- The presence of an unsecured dog in the cabin of the aircraft.

4. SAFETY RECOMMENDATIONS

Note: In accordance with the provisions of Article 17.3 of Regulation (EC) No. 1049/2001 and No. 996/2010 of 20 October 2010 on the investigation and prevention of civil aviation accidents and incidents, the safety recommendation does not in any case apportion blame or liability in an accident, serious incident or incident. Recipients of safety recommendations shall report to the authority responsible for the safety investigations that they have received recommendations and will implement them, as provided for in Article 18 of the above Regulation.

Pilot, did not declare an emergency or urgency in terms of the need of assistance from the ATC or to illuminate the problem reported. The crash analysis revealed that the pilot stated in the instrument approach that he had a problem, which meant that he was in some sort of a distress. The understanding and guidance given by the controller in such a situation would be primarily directed towards the objective of providing assistance. Given the circumstances of the event, being demanding IMC conditions, the pilot would be expected to declare an emergency in a timely manner in order to benefit from the immediate assistance of the controller. This would enable the controller to identify pilot issues and be prepared to respond in a timely manner and offer an appropriate level of assistance to the pilot in distress.

Therefore, Safety Investigation Agency recommends:

[Recommendation No. SI-SR004-2020]

Slovenia Control, Ltd should present this case, to the reasonable extent, in the process of initial and refresher training of air traffic controllers. This should include the presentation of the most important facts regarding the findings of this investigation and the utilization of the knowledge acquired in the future.

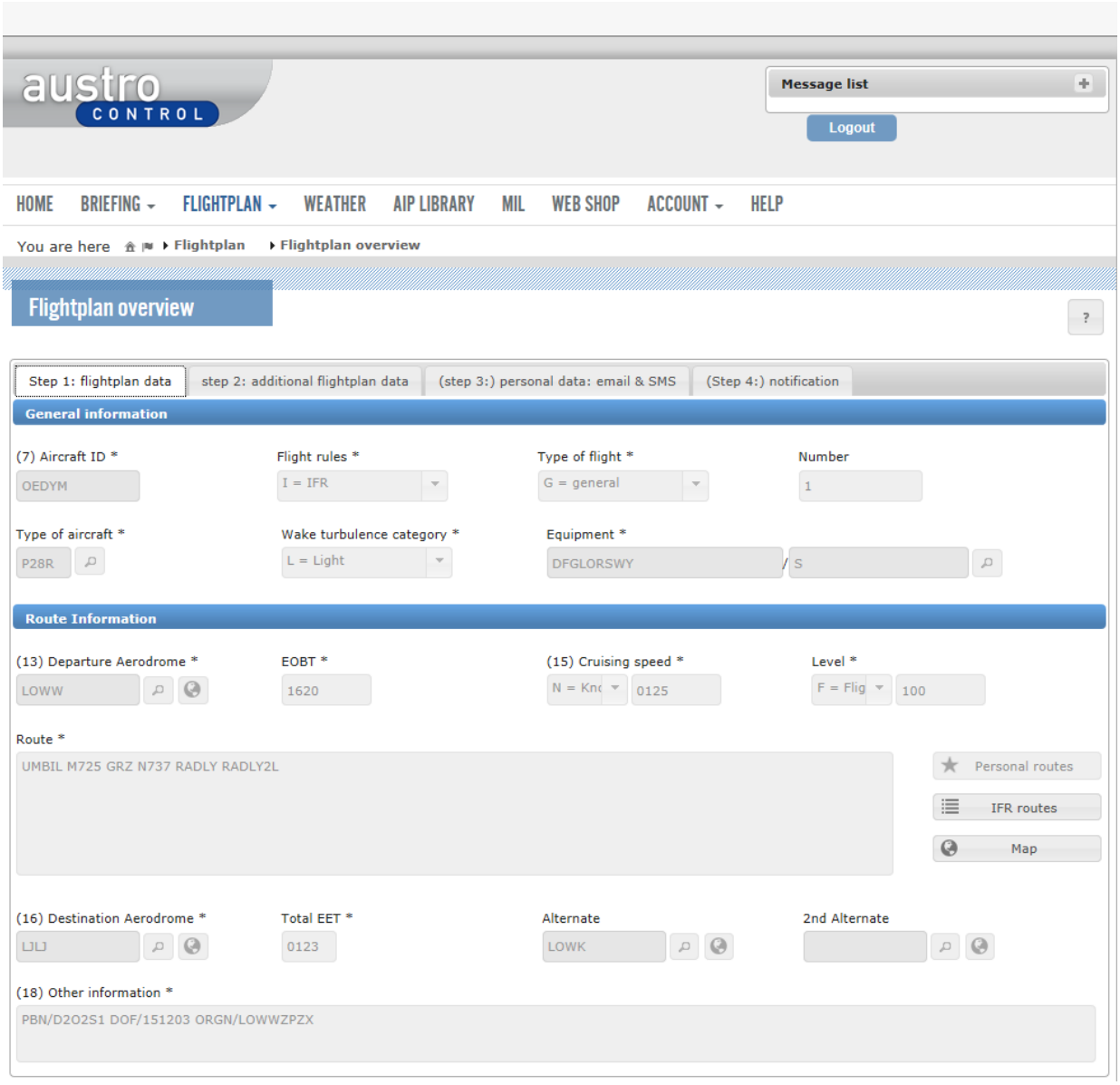
[Recommendation No. SI-SR005-2020]

Aviation Safety Promotion - CAA Slovenia, CAA Austria

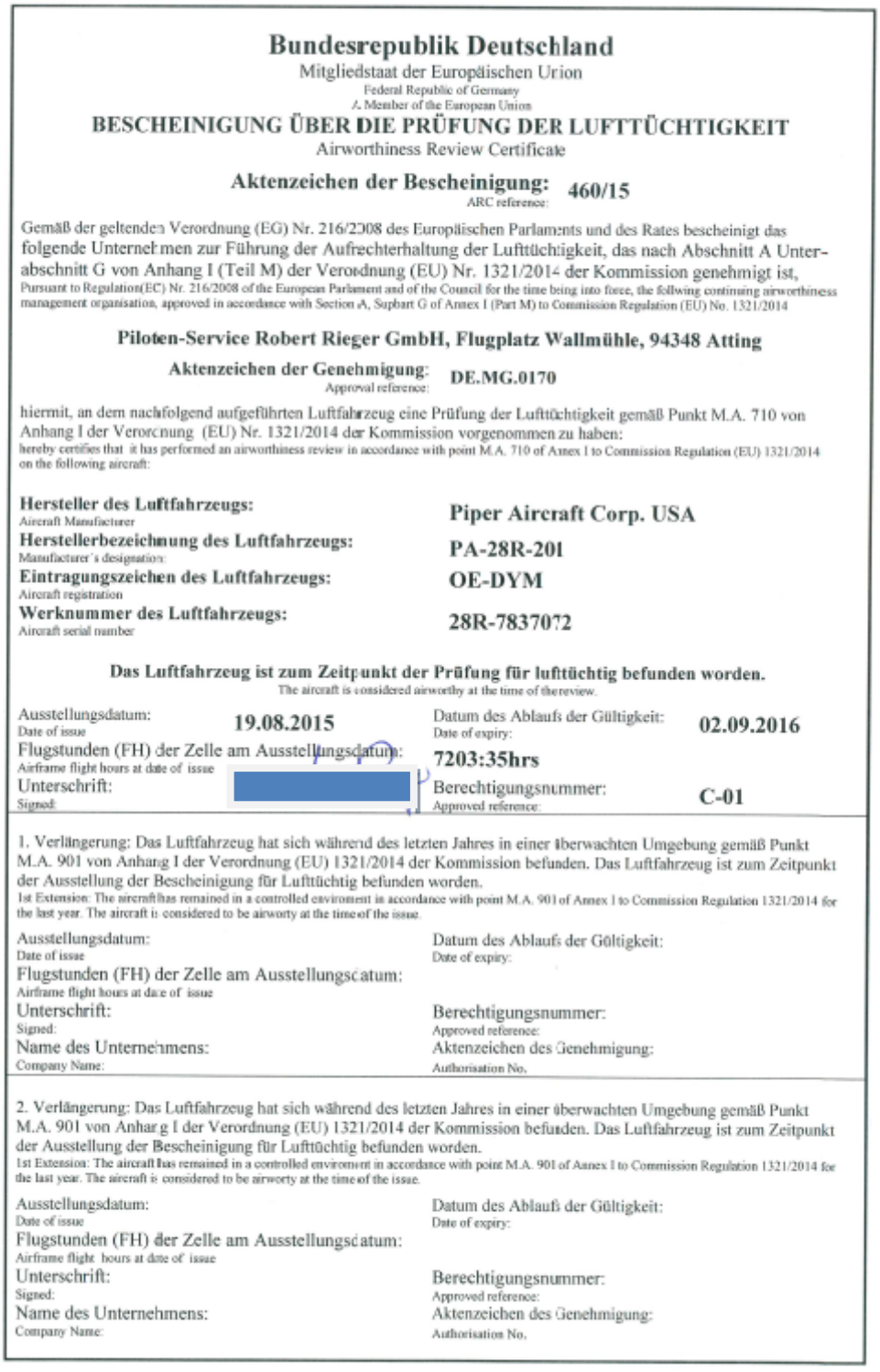
CAA should include this accident case in the aviation safety promotion program to raise awareness and encourage pilots to properly perform flight planning for IFR flights in demanding IMC conditions and encourage pilots to promptly and correctly declare an emergency in communication with the air traffic controllers.

APPENDICES

APPENDIX 1 ATC Flight plan



APPENDIX 2 AIRCRAFT DOCUMENTS



Bundesrepublik Deutschland

Mitgliedstaat der Europäischen Union

Federal Republic of Germany
A Member of the European Union

BESCHEINIGUNG ÜBER DIE PRÜFUNG DER LUFTTÜCHTIGKEIT

Airworthiness Review Certificate

Aktenzeichen der Bescheinigung: **460/15**
ARC reference:

Gemäß der geltenden Verordnung (EG) Nr. 216/2008 des Europäischen Parlaments und des Rates bescheinigt das folgende Unternehmen zur Führung der Aufrechterhaltung der Lufttüchtigkeit, das nach Abschnitt A Unterabschnitt G von Anhang I (Teil M) der Verordnung (EU) Nr. 1321/2014 der Kommission genehmigt ist,
Pursuant to Regulation(EC) Nr. 216/2008 of the European Parliament and of the Council for the time being into force, the follwing continuing airworthiness management organisation, approved in accordance with Section A, Supbart G of Annex I (Part M) to Commission Regulation (EU) No. 1321/2014

Piloten-Service Robert Rieger GmbH, Flugplatz Wallmühle, 94348 Atting

Aktenzeichen der Genehmigung: **DE.MG.0170**
Approval reference:

hiermit, an dem nachfolgend aufgeführten Luftfahrzeug eine Prüfung der Lufttüchtigkeit gemäß Punkt M.A. 710 von Anhang I der Verordnung (EU) Nr. 1321/2014 der Kommission vorgenommen zu haben:
hereby certifies that it has performed an airworthiness review in accordance with point M.A. 710 of Annex I to Commission Regulation (EU) 1321/2014 on the following aircraft:

Hersteller des Luftfahrzeugs: Aircraft Manufacturer	**Piper Aircraft Corp. USA**
Herstellerbezeichnung des Luftfahrzeugs: Manufacturer's designation:	**PA-28R-201**
Eintragungszeichen des Luftfahrzeugs: Aircraft registration	**OE-DYM**
Werknummer des Luftfahrzeugs: Aircraft serial number	**28R-7837072**

Das Luftfahrzeug ist zum Zeitpunkt der Prüfung für luftüchtig befunden worden.
The aircraft is considered airworthy at the time of the review.

Ausstellungsdatum: Date of issue	**19.08.2015**	Datum des Ablaufs der Gültigkeit: Date of expiry:	**02.09.2016**
Flugstunden (FH) der Zelle am Ausstellungsdatum: Airframe flight hours at date of issue		**7203:35hrs**	
Unterschrift: Signed:	[redacted]	Berechtigungsnummer: Approved reference:	**C-01**

1. Verlängerung: Das Luftfahrzeug hat sich während des letzten Jahres in einer überwachten Umgebung gemäß Punkt M.A. 901 von Anhang I der Verordnung (EU) 1321/2014 der Kommission befunden. Das Luftfahrzeug ist zum Zeitpunkt der Ausstellung der Bescheinigung für Lufttüchtig befunden worden.
1st Extension: The aircraft has remained in a controlled environment in accordance with point M.A. 901 of Annex I to Commission Regulation 1321/2014 for the last year. The aircraft is considered to be airworty at the time of the issue.

Ausstellungsdatum: Date of issue	Datum des Ablaufs der Gültigkeit: Date of expiry:
Flugstunden (FH) der Zelle am Ausstellungsdatum: Airframe flight hours at date of issue	
Unterschrift: Signed:	Berechtigungsnummer: Approved reference:
Name des Unternehmens: Company Name:	Aktenzeichen des Genehmigung: Authorisation No.

2. Verlängerung: Das Luftfahrzeug hat sich während des letzten Jahres in einer überwachten Umgebung gemäß Punkt M.A. 901 von Anhang I der Verordnung (EU) 1321/2014 der Kommission befunden. Das Luftfahrzeug ist zum Zeitpunkt der Ausstellung der Bescheinigung für Lufttüchtig befunden worden.
1st Extension: The aircraft has remained in a controlled environment in accordance with point M.A. 901 of Annex I to Commission Regulation 1321/2014 for the last year. The aircraft is considered to be airworty at the time of the issue.

Ausstellungsdatum: Date of issue	Datum des Ablaufs der Gültigkeit: Date of expiry:
Flugstunden (FH) der Zelle am Ausstellungsdatum: Airframe flight hours at date of issue	
Unterschrift: Signed:	Berechtigungsnummer: Approved reference:
Name des Unternehmens: Company Name:	Aktenzeichen des Genehmigung: Authorisation No.

EASA-Formblatt 15b Ausgabe 4

Pilotten - SERVICE
ROBERT RIEGER GMBH
DE.145.0170-DE.MG.0170-LBA II-A170

AIRCRAFT CERTIFICATE OF RELEASE TO SERVICE

AIRCRAFT TYPE: Piper PA-28R-201 ORDER NO: 1192/15

SERIAL NO: 28R-7837072 REGISTRATION: OE-DYM

AIRCRAFT TOTAL HOURS/CYCLES CHECK COMPLETED: 7203:35 / 7801

MAINTENANCE ACTION COMPLETED: MAINTENANCE MANUAL REV. USED: 761-639 Rev. 13

100h Inspection i.a.w. Piper SM performed for more details see Work Report

MAINTENANCE RECORDS:

LOCATION WHERE CHECK WAS COMPLETED: Straubing / EDMS

Certifies that the work specified, except as otherwise specified, was carried out in accordance with Part-145 and in respect to that work the aircraft is considered ready for release to service.

CERTIFYINGSTAFF AIRFRAME AND POWERPLANT

SIGNATURE [redacted] PRINTED NAME

CERTIFYINGSTAFF AVIONIC

SIGNATURE PRINTED NAME

Straubing / EDMS, den 21.08.2015
place date of issue

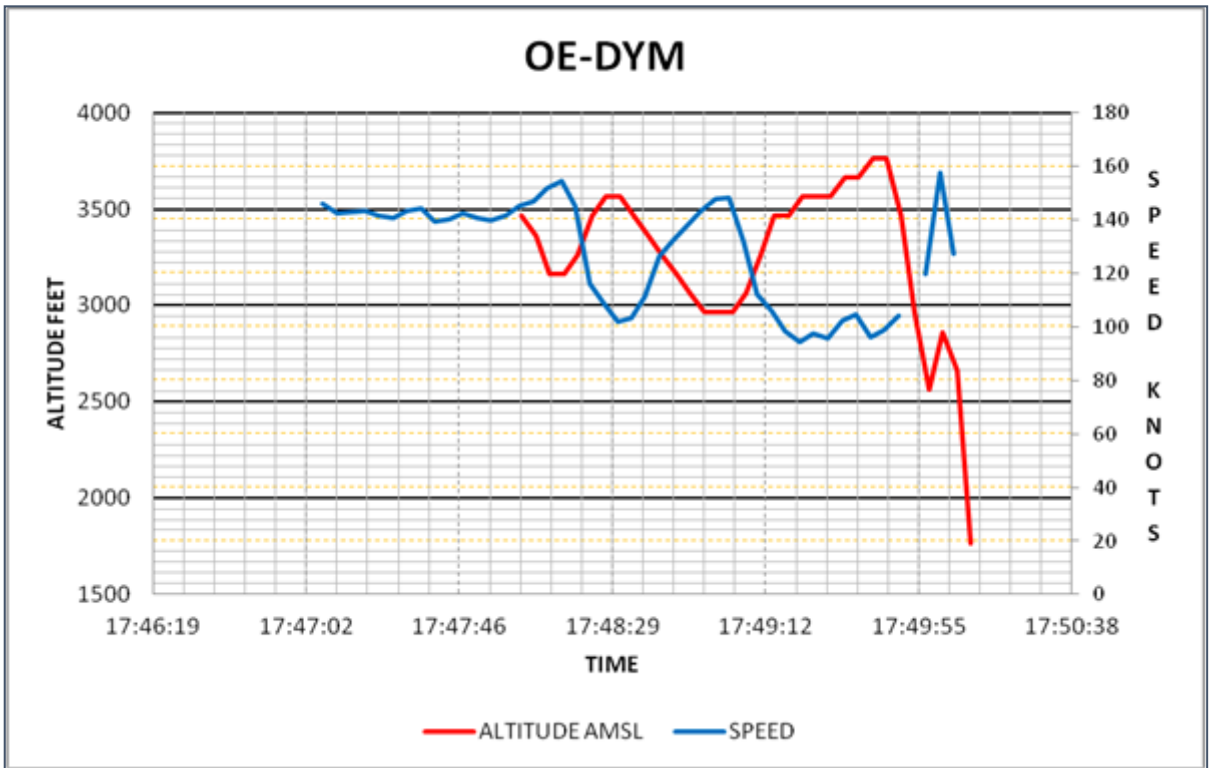
ASA-AMOffice Form No.: EN88 Rev. 0

APPENDIX 3 IMAGE OF INSTRUMENT PANEL (OE-DYM)

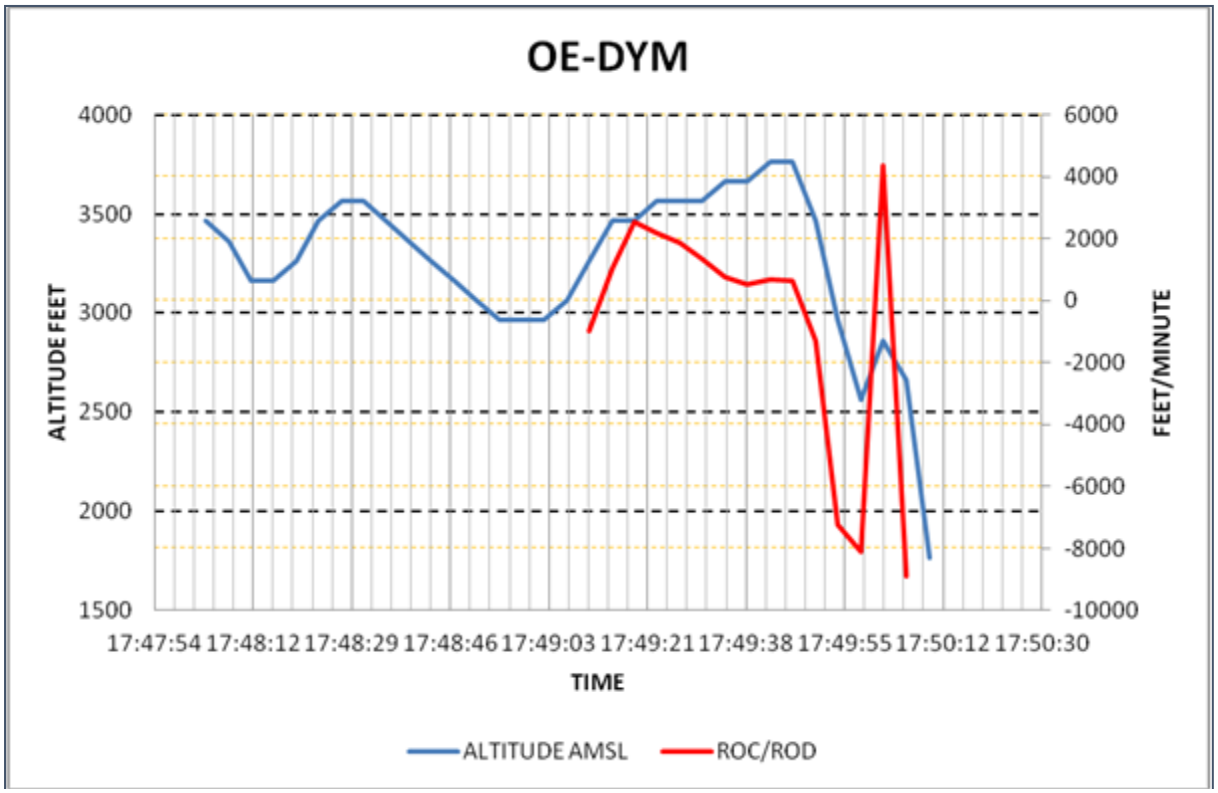
(taken on flights before the accident)

APPENDIX 4 FLIGHT DATA OBTAINED FROM RADAR RECORDINGS

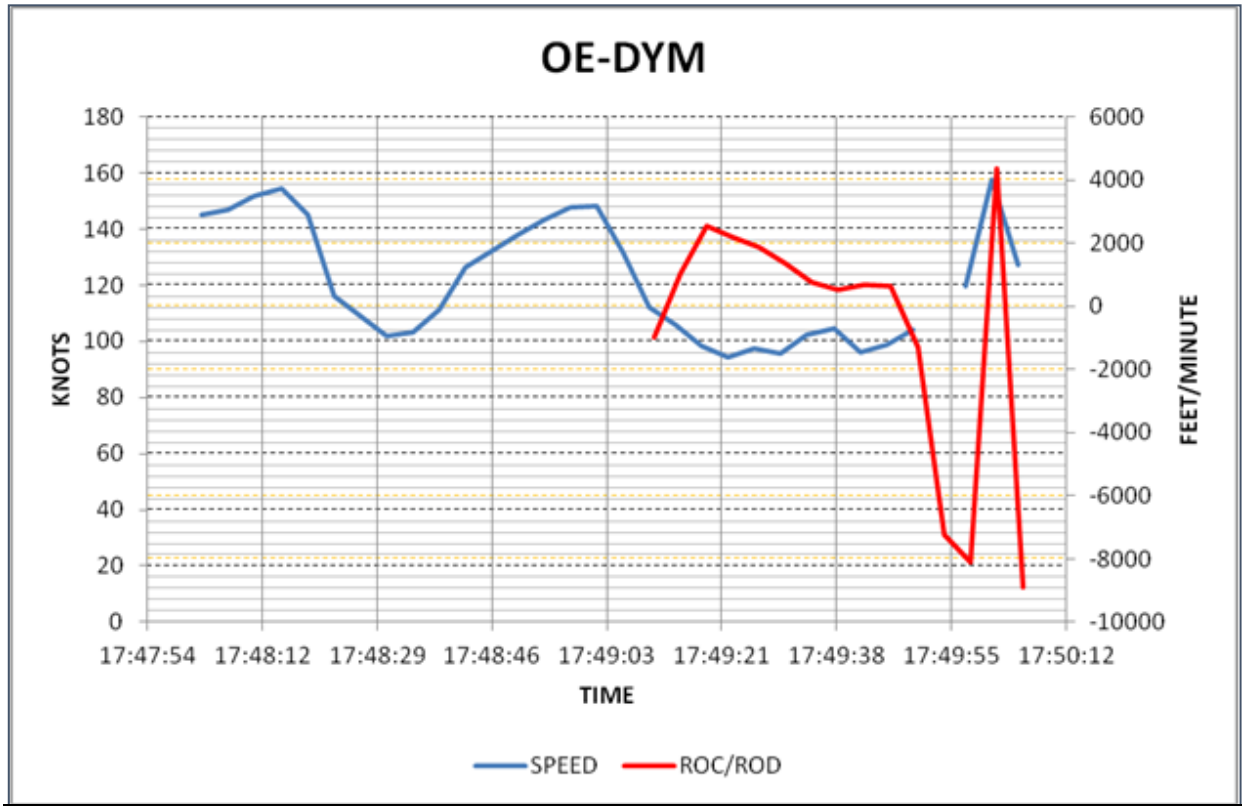
(Time in UTC – local time is UTC + 1 hour)



Altitude and groundspeed



Altitude and vertical speed (climb/descend)



Groundspeed and vertical speed