Transporta nelaimes gadījumu un incidentu izmeklēšanas birojs

Transport Accident and Incident Investigation Bureau of the Republic of Latvia

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FINAL REPORT No. 4-02/2-17(3-2018)

AVIATION ACCIDENT WITH HELICOPTER R44, REGISTRATION NO. YL-HBH, ON OCTOBER 8, 2017, IN PRIEKULE MUNICIPALITY, GRAMZDA RURAL TERRITORY, IN LOCALITY OF GRAMZDA PIT

Transport accident and incident investigation bureau (hereinafter – Investigation bureau) is functionally independent from all aviation institutions of Republic of Latvia, which are responsible for airworthiness, certification, flight operation, maintenance, licensing, air traffic control or aerodrome operation.

The task of Investigation bureau is to investigate civil aviation accidents, serious incidents and if necessary for the improvement of flight safety, also incidents. The sole objective of the investigation in accordance with Annex 13 of the Chicago convention on International Civil aviation and Regulation (EU) No.996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation is to improve the flight safety and to prevent the civil aviation accident and incident occurrence in the future, as well as to elaborate safety recommendations if necessary.

The investigation of Transport accident and incident bureau is not connected with apportioning blame or liability.

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AVIATION ACCIDENT WITH HELICOPTER R44,

REGISTRATION NO. YL-HBH,

ON OCTOBER 8, 2017, AT PRIEKULE MUNICIPALITY, GRAMZDA RURAL TERRITORY, IN LOCALITY OF GRAMZDA PIT

CONTENT

Abbreviations

ATIS	- Automatic terminal information service
CAA	- Civil aviation agency
LGS	- State Joint Stock company “Latvijas gaisa satiksme” (Latvian Air traffic)
GPS	- Global positioning system
ACFT	- Aircraft
VFR	- Visual flight rules
UTC	- Coordinated Universal Time

TAIIB - Transport accident and incident investigation bureau
JAA - Join Aviation Authorities
JAR - Join Aviation Rules
AGL - Above ground level
FCL - Flight crew licensing
Kts - knot (nautical mile per hour)

GENERAL INFORMATION ON AVIATION ACCIDENT

All information in the Final report is indicated according to local time (UTC + 3).

On October 8, 2017, at 13:14 in Priekule municipality, Gramzda rural territory, during the rally competition ”Rally Liepāja” occurred the civil aviation accident with helicopter R44, registration No YL-HBH. Flight was performed by private pilot. Shortly after take-off the helicopter, collided with the electric power line, became uncontrolled and hit the ground, as a result the helicopter sustained substantial damage. One person was killed and three were injured in accident. Two from injured persons have sustained miscellaneous injuries.

Picture 1. Helicopter R44 at the accident site (frontal look)

INVESTIGATION

Notification about aviation accident with helicopter R44, which occurred on October 8, 2017, round 13:14 in Priekule municipality, investigators of Transport accident and incident investigation bureau (TAIIB) received at 13:30 by mobile phone from person on duty of State Fire and Rescue service.

After arriving at the aviation accident site, investigators of TAIIB examined the accident site and the wreckage of the helicopter, involved in the aviation accident, and carried out all

necessary procedures, in order to collect and protect the evidence and to fix records of witnesses. Police provided guarding of the accident site.

At the accident site investigators of TAIIB carried out:

- Inspection and photography of the accident site;
- Clarification of accident circumstances;
- Interviewing of witnesses.

After the above mentioned procedures were conducted the wreckage of helicopter was collected and transported from the accident site to the TAIIB hangar for storage and further investigation. (Pic. 2). Aircraft's technical documentation and flight documentation and GPS device were seized.

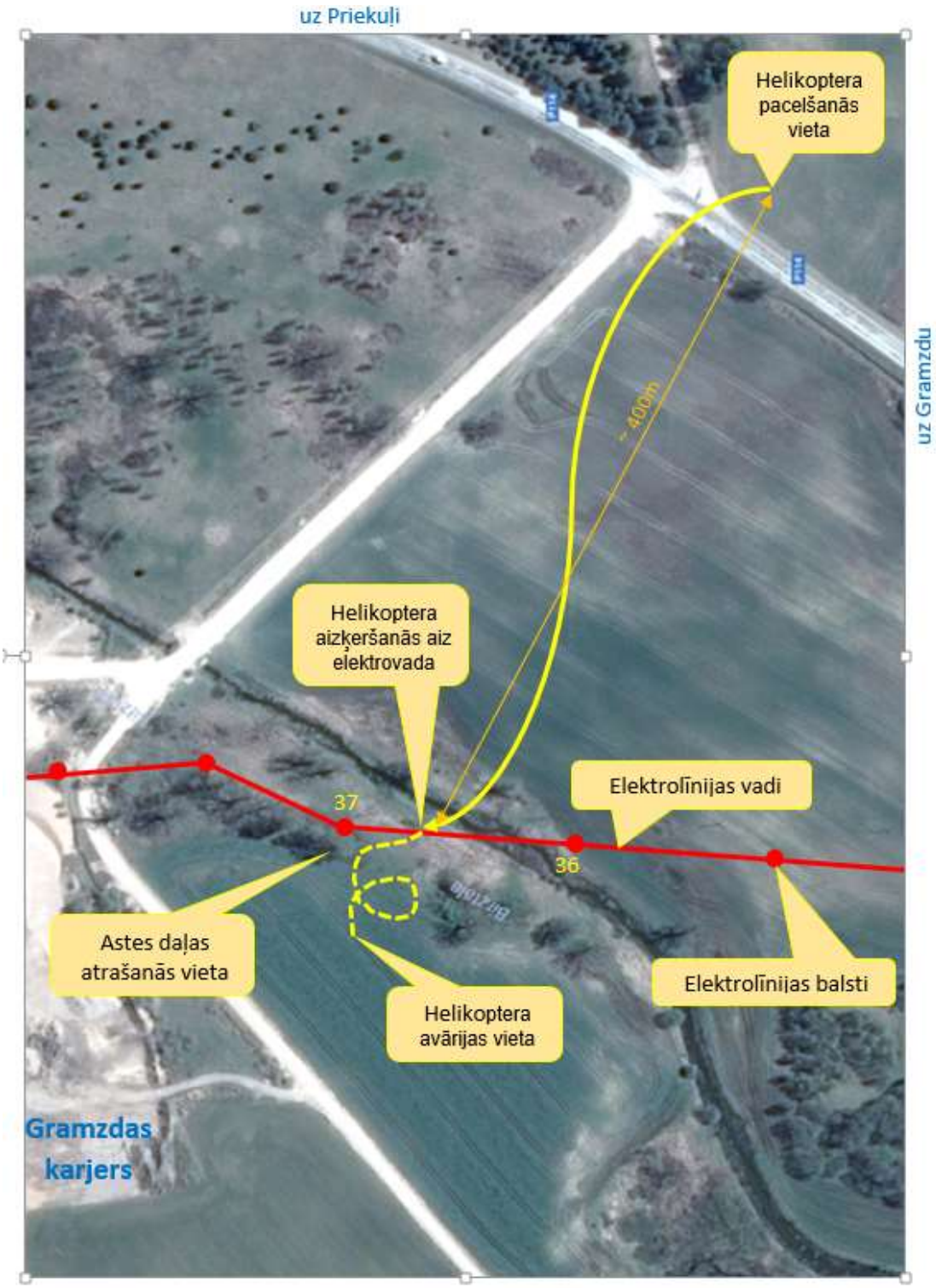
Picture 2. Process of loading of helicopter wreckage

1. FACTUAL INFORMATION

1.1. History of flight

1.1.1. Information about the flight

On October 8, 2017, at 13:14 in Priekule municipality, Gramzda rural territory, during the rally competition "Rally Liepāja" approximately 400m from take-off place helicopter R44 with the tail rotor touched the upper wire of electric powerline between the poles No. 36 and No. 37, as a result helicopter crashed (Pic.3).



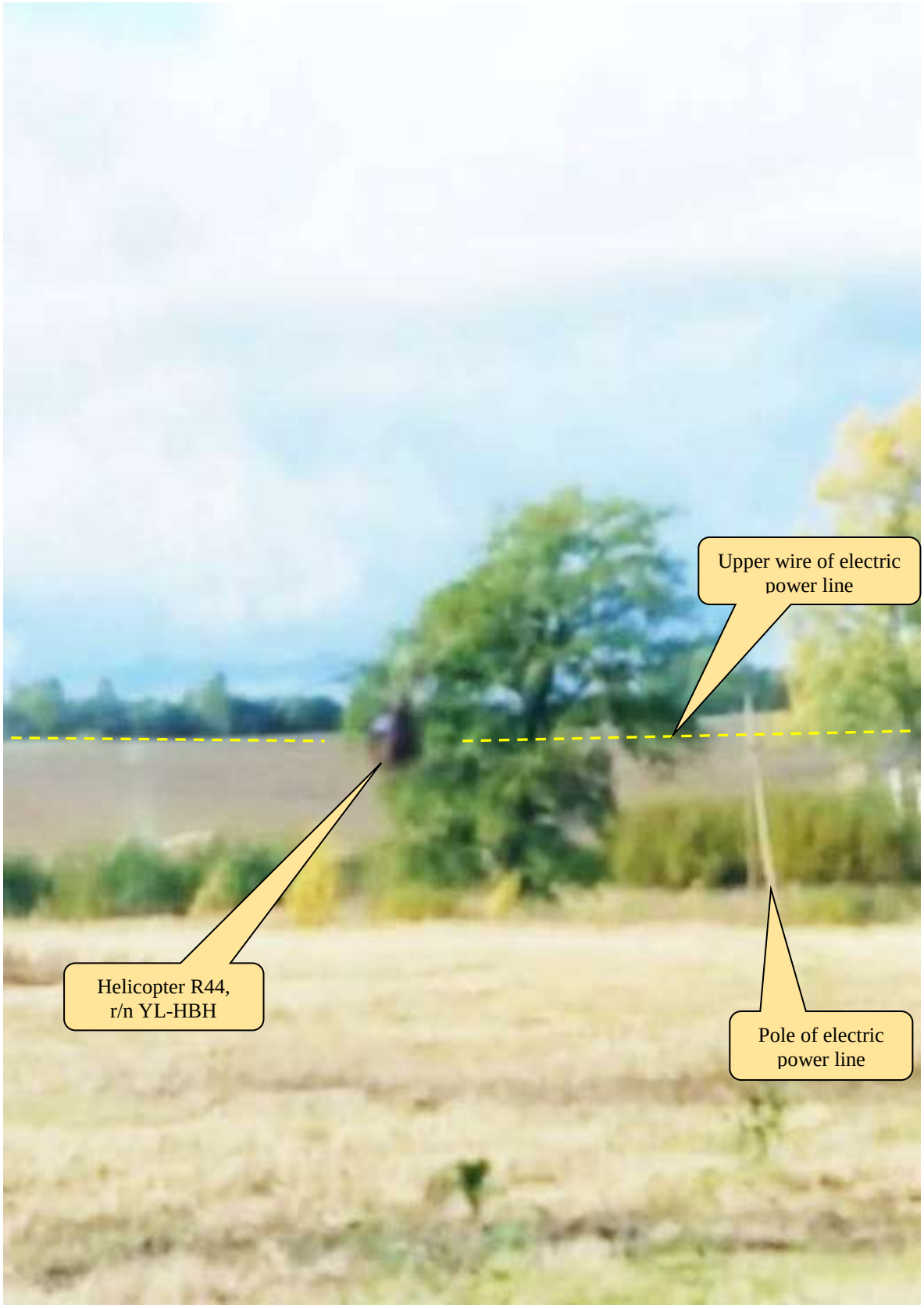
Pic. 3 Flight scheme

1.1.2. Reconstruction of flight

Aviation accident site was very close to the "Rally Liepaja" competition place, therefore there were many witnesses of the aviation accident. Thanks to the pictures and footage taken by the witnesses, investigators had an opportunity to clarify the flight history of helicopter and to clarify the last flight circumstances of helicopter R44.

According to the pictures in the possession of investigators the flight chronology was restored:

- Approaching of helicopter to the electric power line, flight under the wires of electric power line (Pic. 4);



Picture 4.

- Fast climbing of helicopter, in order to avoid colliding the electric power line (Pic. 5);

Picture 5.

- Uncontrolled flight of helicopter with rotation in horizontal plane (Pic. 6);

Picture 6.

- Falling of the helicopter with high vertical speed (Pic. 7).

Picture 7.

From the statements of witnesses, photo and video recordings follows, that on October 8, 2017, in Priekule municipality, Gramzda rural territory, during the rally competition ”Liepaja” pilot with three passengers in helicopter took off from the field close to the rally control post. After take-

off helicopter carried out horizontal flight around at altitude of 7-8m to the direction of Gramzda pit (Pic. 8).

Picture 8. The altitude of helicopter flight

After aircraft had flown around 300-350m in flight direction, noticing the wires of electric power line, pilot tried sharply to increase the flight angle, but helicopter with tail boom and tail rotor touched the upper wire of electric power line, which was at height of 9.20m. Helicopter by inertia reached the altitude approximately to 50m, tail part together with rotor were separated off from the fuselage of helicopter. Helicopter became uncontrollable, started to rotate around vertical axis until it collided with the ground surface approximately 60m away from electric power line.

1.2. Injuries to persons

No.	Injuries	Crew	Passengers	Total	Other persons
1.	Fatal injuries	no	1	1	no
2.	Serious injuries	1	2	3	no
3.	Insignificant injuries	no	no	no	no

1.3. Damage to aircraft

After collision with the ground at the aviation accident site, helicopter R44 stopped without skidding marks on the left side.

Pic. 9. Helicopter at accident site

Helicopter R44 was seriously damaged in aviation accident, its repair and further operation is not possible.

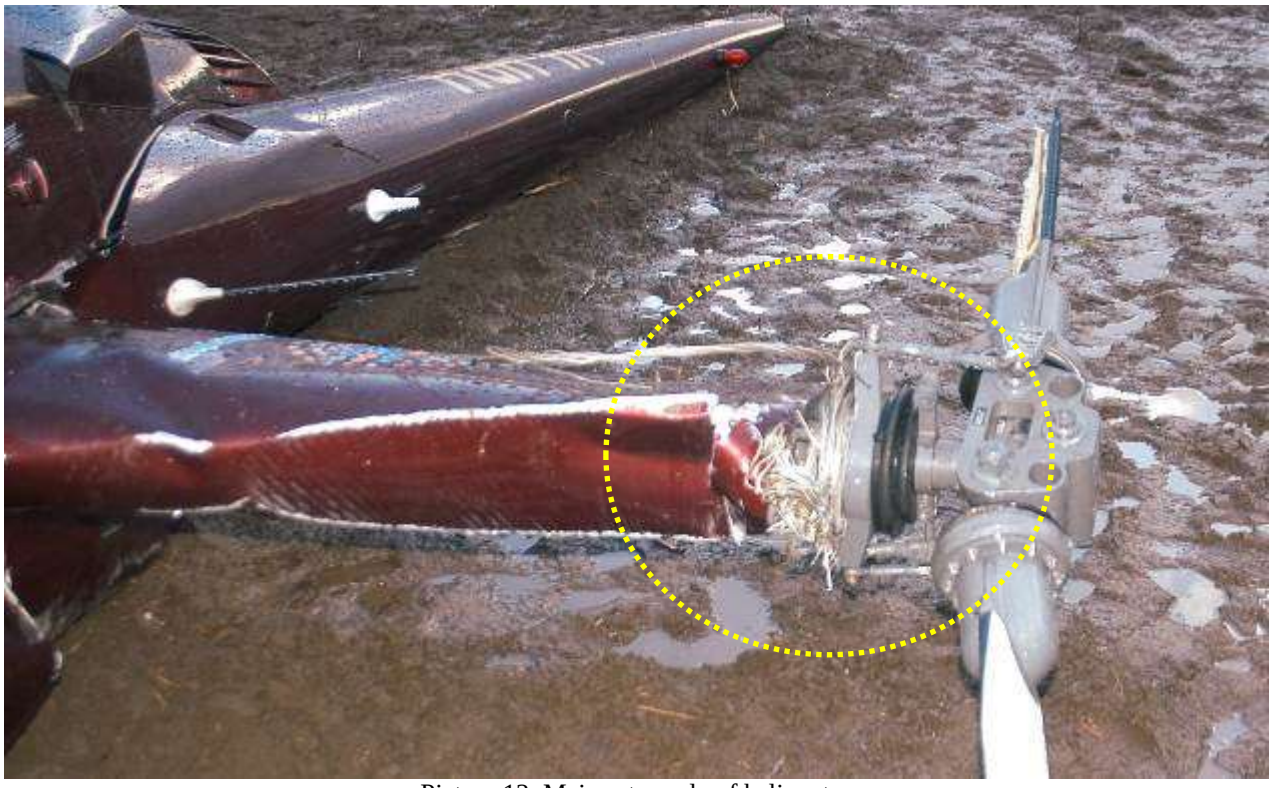
The following damages of helicopter were detected at the accident site:

- Separated tail part of fuselage with stabilizers, tail rotor with blade parts were found approximately 50m from helicopter accident site (Pic. 10, 11);

Picture 10. Tail part of helicopter (stabilizer)

Picture 11. Tail boom of helicopter

- Main rotor axle of helicopter twisted with wires of electric power line (Pic.12);


Picture 12. Main rotor axle of helicopter

- Skin with deformation and cracks of upper part of helicopter fuselage (Pic. 13);

Picture 13. View on helicopter from above

- Broken landing gear skids of helicopter (Pic. 14);

Picture14. View on helicopter from below

- Blade damages of main rotor complied to the helicopter collision with the ground with running engine. (Pic.15)

Picture 15. Condition of main rotor after collision with the ground

- Helicopter control elements - flight direction, altitude and bank angle control cables, and lever and brackets bindings were without apparent defects or damage, which not indicate to technical faults, and which could affected the helicopter control during the flight.

1.4. Other damage

Helicopter R44 during the flight collided the upper wire of 20kW electric powerline, as a result of it the broken wire, falling to the other two wires, caused the three-phase short circuit; relay automatics worked and started protection from maximum current due to short circuit.

Picture 16a. Electric power line


Picture 16b. Fragment of wire of electric power line

1.5. Personnel information

Aircraft pilot: - citizen of Republic of Latvia, age 53;

Qualification of pilot: - Aircrafts class "A" private pilot licence No.LVA.FCL.000586P, issued in Civil Aviation agency of Latvia on November 9, 2015;

	-	Aircrafts class “H” private pilot licence No.LVA.FCL.000586P, issued in Civil Aviation agency of Latvia on April 1, 2015;
Last examination of helicopters pilot qualification:	-	For helicopter R44, on September 4, 2017, in Civil Aviation agency of Latvia;
Medical certificate:	-	2nd class Health certificate No LVA/MED-2-A-0089, issued in Civil Aviation agency of Latvia, valid until January 23, 2018;
Total flight hours of pilot:	-	at the January 29, 2017, in the pilot flight book is recorded 1725 flight hours;
Total pilot’s flight hours with R44:	-	at the January 29, 2017, in the pilot flight book is recorded 1288 flight hours;
Flight hours on previous day before accident:	-	NIL;
Rest time before the flight:	-	NIL.

1.6. Aircraft information

Crashed helicopter is four-seated light helicopter «Robinson R44», manufactured in 2006 in USA and registered in Latvia on February 7, 2014, national registration YL-HBH.

Picture 17. Helicopter R44, r/n YL-HBH

1.6.1. Fuselage of aircraft

Manufacturer:	- Robinson Helicopter Company, USA;
Aircraft model:	- R44 I;
Serial number:	- 1616;
Manufactured:	- In 2006;
Registration number:	- YL-HBH;
Registration certificate:	- HBH20140207REG, issued on February 7, 2014;
Airworthiness certificate:	- ARCYLHBH-03, issued by "Baltijas Helikopters" Ltd., valid until November 24, 2017;
Total flight hours:	- 1402.9 hours;
Flight hours since last technical maintenance:	- approximately 38.8 hours;
Registered owner:	- "Baltijas Helikopters" Ltd.

1.6.2. Engine

Manufacturer of engine:	- Lycoming Engines INC., USA;
Model of engine (pistons):	- Lycoming O-540-F1B5;
Engine serial number:	- L-26563-40A;
Total flying hours of engine:	- 1402.9 hours;

1.6.5. Weight of aircraft

Empty weight of helicopter:	- 658 kg;
Take-off weight of helicopter:	- approximately 950-1000 kg;
Maximum take-off weight of helicopter:	- 1134 kg.

Last periodic 100 hours maintenance on August 22, 2017, in accordance with technical maintenance program requirements of aircraft manufacturer.

1.7. Meteorological information

Information on meteorological conditions in Gramzda pit area, in Gramzda rural territory, Priekule municipality on October 8, 2017, in time period from 12:00-14:00 from operative data of weather observation station Liepaja (address of station: Liepaja Observation station, Grinvaldi, Nicas rural territory, Nicas municipality, LV-3473) and Rucava (address of station: Zvirbuli, Rucava rural territory, Rucava municipality, LV-3477).

Information on actual weather conditions at airport "Liepaja" (address: Lidostas street 8, Cimdenieki, Grobina municipality, LV-3430) on October 8, 2017, in time period from 11:50-14:20 in METAR code, zonal forecast for territory in GAMET and forecast in SWL map for the abovementioned time period.

Liepāja

Stunda	Stundas minimālā gaisa temperatūra, °C	Stundas vidējā gaisa temperatūra, °C	Stundas maksimālā gaisa temperatūra, °C	Stundas vidējais vēja ātrums, m/s	Stundas vidējais vēja virziens, rumbs	Stundas maksimālās vēja brāzmas, m/s	Stundas vidējais gaisa mitrums, %	Stundas nokrišņu daudzums, mm
12.00-13.00	+10,0	+10,3	+10,8	6,2	DR	11,5	75	nokrišņu nebija
13.00-14.00	+9,7	+10,1	+10,6	5,9	R	11,0	78	nokrišņu nebija

Rucava

Stunda	Stundas minimālā gaisa temperatūra, °C	Stundas vidējā gaisa temperatūra, °C	Stundas maksimālā gaisa temperatūra, °C	Stundas vidējais vēja ātrums, m/s	Stundas vidējais vēja virziens, rumbs	Stundas maksimālās vēja brāzmas, m/s	Stundas vidējais gaisa mitrums, %	Stundas nokrišņu daudzums, mm
12.00-13.00	+9,5	+9,9	+10,2	5,2	R	9,3	73	nokrišņu nebija
13.00-14.00	+9,1	+10,0	+10,9	5,5	R	11,6	77	0,2

Liepāja

Novērojumu termiņš	Zemo mākoņu daudzums, balles	Kopējais mākoņu daudzums, balles	Mākoņu augstums, m	Meteoroloģiskā redzamība, km
12.00	6	8	500	10
15.00	4	7	600	10

Informējam Jūs, ka laika periodā no 2017. gada 8. oktobra plkst. 13.35 līdz plkst. 13.45 novērojumu stacijā *Liepāja* **tika novērots gāzienlietus**.

Faktiskie laika apstākļi lidlaukā "Liepāja" METAR koda veidā 2017.gada 8. oktobrī laika posmā no plkst. 11:50-14:20 (08:50-11:20 UTC)

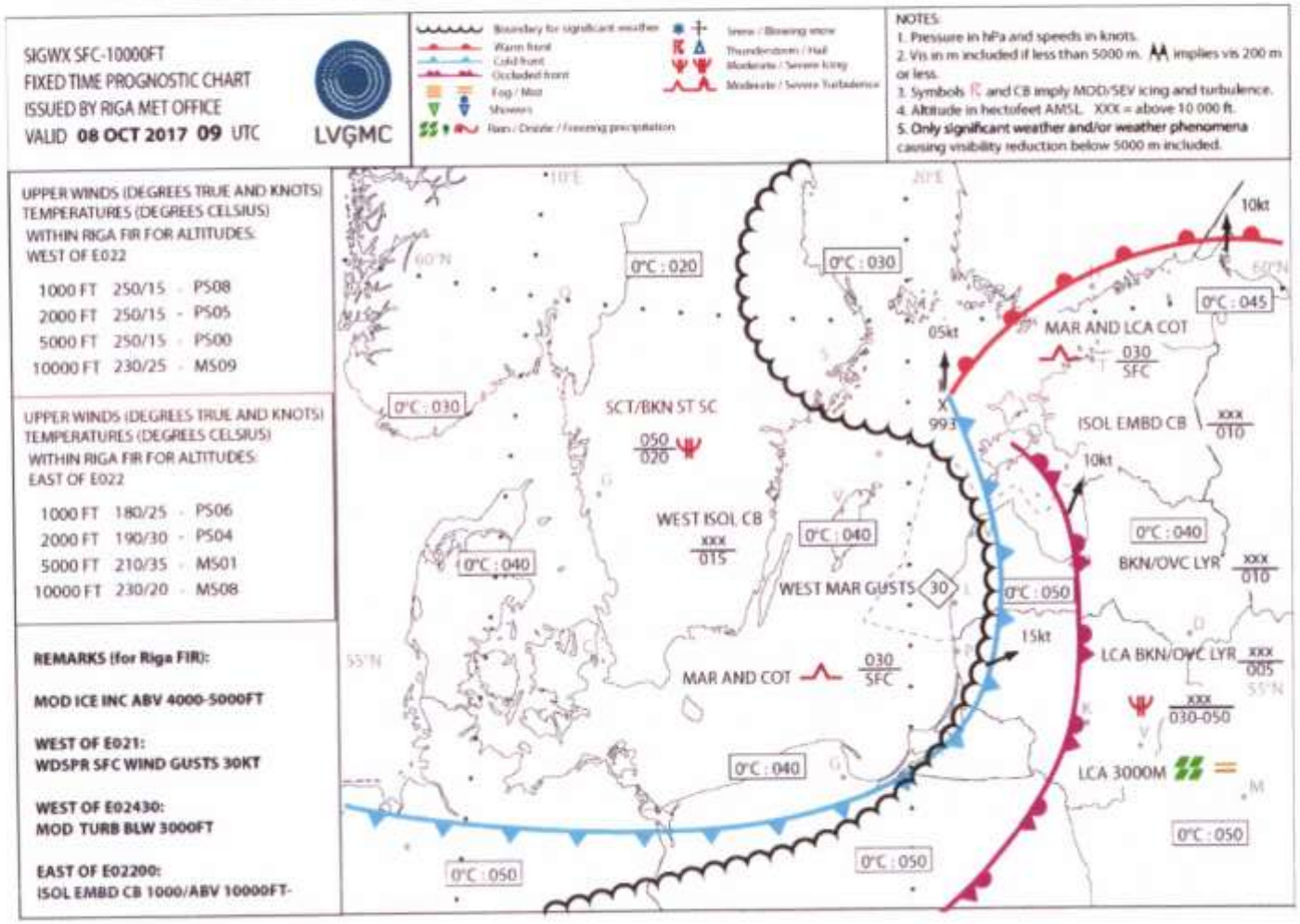
METAR EVLA 080850Z AUTO 25013KT 9999 SCT025/// BKN038/// BKN050/// 12/08 Q0996=
METAR EVLA 080920Z AUTO 25015KT 9999 BKN023/// BKN040/// 11/07 Q0996=
METAR EVLA 080950Z AUTO 25016KT 9999 BKN024/// BKN033/// BKN038/// 10/07 Q0997=
METAR EVLA 081020Z AUTO 25015KT 9999 FEW020/// BKN023/// OVC046/// 11/07 Q0997=
METAR EVLA 081050Z AUTO 25014KT 9999 FEW019/// BKN025/// BKN037/// 10/07 Q0997=
METAR EVLA 081120Z AUTO 26008KT 230V300 9999 FEW020/// BKN023/// BKN028/// 10/07 Q0998=

VALSTS SIA
"LATVIJAS VIDES, ĢEOLOĢIJAS UN METEOROLOĢIJAS CENTRS"
Maskavas iela 165, Rīga, LV-1019
T.: +371 67032600
F.: +371 67145154
E.: lvgmc@lvgmc.lv
Reģ. Nr. 50103237791
Banka: Nordea Bank AB Latvijas filiāle
Kods: NDEALV2X
Konts: LV48 NDEA 0000082360836

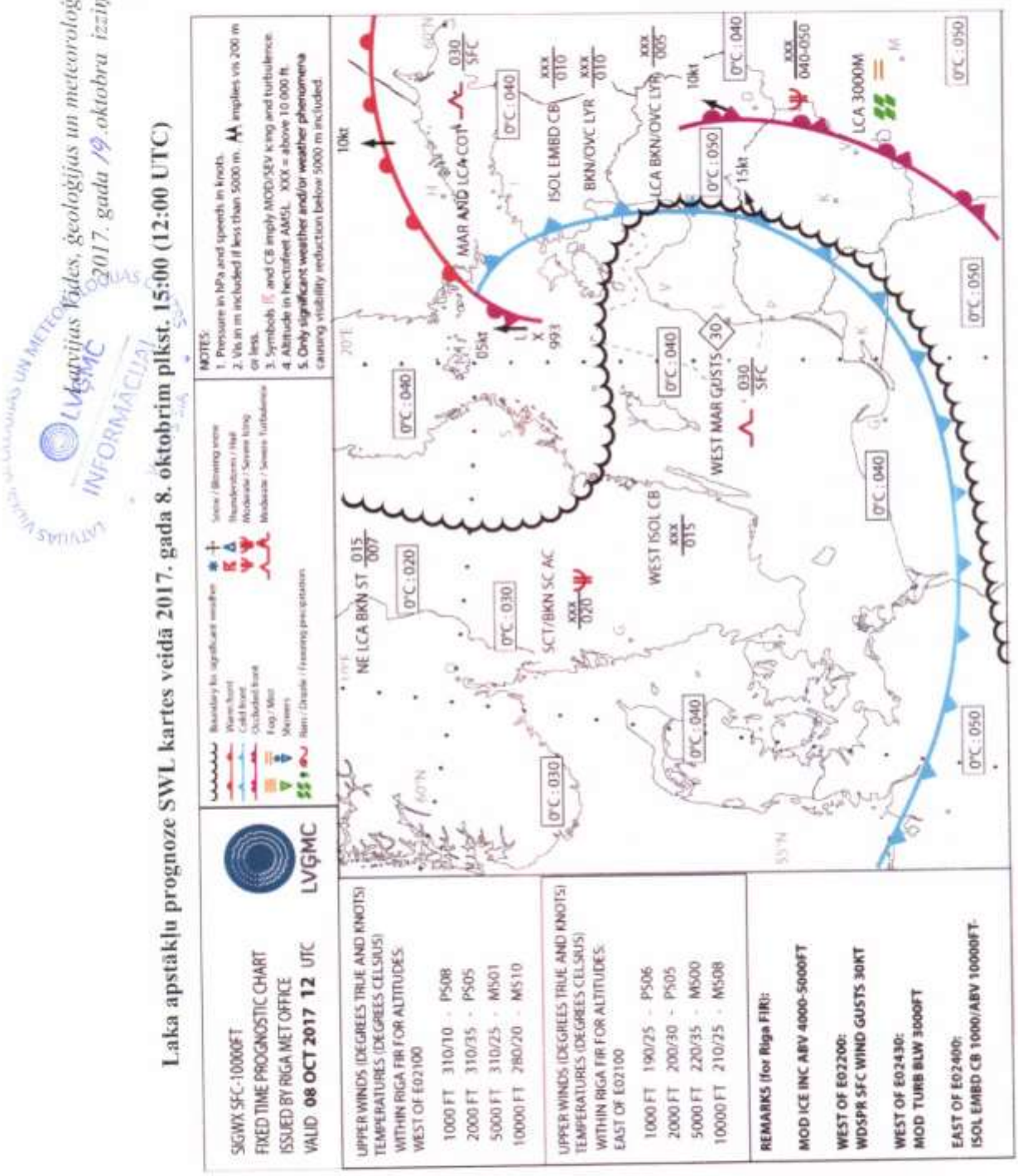
GAMET zonālā prognoze ar darbības periodu plkst. 12:00-18:00 (09:00-15:00 UTC) 2017.gada 8.oktobrī (izsūtīta plkst. 11:10 (08:10 UTC))

EVRR GAMET VALID 080900/081500
EVRR RIGA FIR BLW FL100
SECN I
SIG SFC WIND:FOR AREAS S AND LCA 1 GUSTS 270/30KT
SIG SFC VIS:FOR AREAS 3 AND 09/12 FOR 1 2 LCA 3000M RA BR
SIG CLD:FOR AREAS 3 AND 09/12 FOR 1 2 LCA BKN 500/ABV 10000FT AGL
ICE:MOD INC ABV 4000-5000FT AMSL
TURB:FOR AREAS S, W OF 1, N OF 2 MOD BLW 3000FT AMSL
SIGMET APPLICABLE:NIL
SECN II
PSYS:09 OCCLUSION FRONT FM N TO SW OVER THE CENTRAL PART OF LATVIA
MOV NE 10KT NC
SFC WIND:FOR AREAS S 1 280/12-17KT GUSTS TO 27KT
FOR AREAS 2 3 180/07-12KT FOR AREA NORTH OF 2 GUSTS TO 25KT
WIND/T: FOR AREAS S W OF 1 FOR AREAS 2 3 AND E OF 1
1000FT 250/15KT PS08 1000FT 180/25KT PS06
2000FT 250/15KT PS05 2000FT 190/30KT PS04
5000FT 250/15KT PS00 5000FT 210/35KT MS01
10000FT 230/25KT MS09 10000FT 230/20KT MS08
SFC VIS:10KM
CLD:FOR AREAS 3 09/12 FOR 2 W OF 1 BKN/OVC LYR 1000/ABV 10000FT AGL
FOR S AND 12/15 1 2 SCT/BKN 2000/5000FT AGL
FZLVL:4000-5000FT AMSL
MNM QNH:
09/12 993HPA FOR S 1, 994HPA FOR 2
997HPA FOR 3
12/15 993HPA FOR S 1, 995HPA FOR 2
997HPA FOR 3
SEA:T12 HGT 1.5M
OTLK:081500/081800 SAME HAZARDOUS WX=

Laika apstākļu prognoze SWL kartes veidā 2017. gada 8. oktobrim uz plkst. 12:00 (09:00 UTC)



Pielikums
Latvijas Vides, ģeoloģijas un meteoroloģijas centra
2017. gada 19. oktobra iziņai Nr. 4-6/
Lapa 4 (4)



According to information from meteorological stations during the aviation accident strong wind gusts and precipitations were not noticed. Weather conditions were according to the requirements of regulations for visual flights.

1.8. Aids to navigation

"Garmin" GPSmap 695.

1.9. Communication

NIL.

1.10. Aerodrome information

Not necessary.

1.11. Flight recorders

NIL.

1.12. Wreckage and impact information

Accident site is locally situated. No skidding signs were detected at accident site. Wires parts of electric power line were found on main rotor of helicopter and also at accident site.

1.13. Medical and psychological aspects

In accordance with the examination for alcohol content in blood, carried out by "Regional hospital of Liepaja" Ltd., alcohol and ethanol presence in pilot blood were not detected.

1.14. Fire

Not caused.

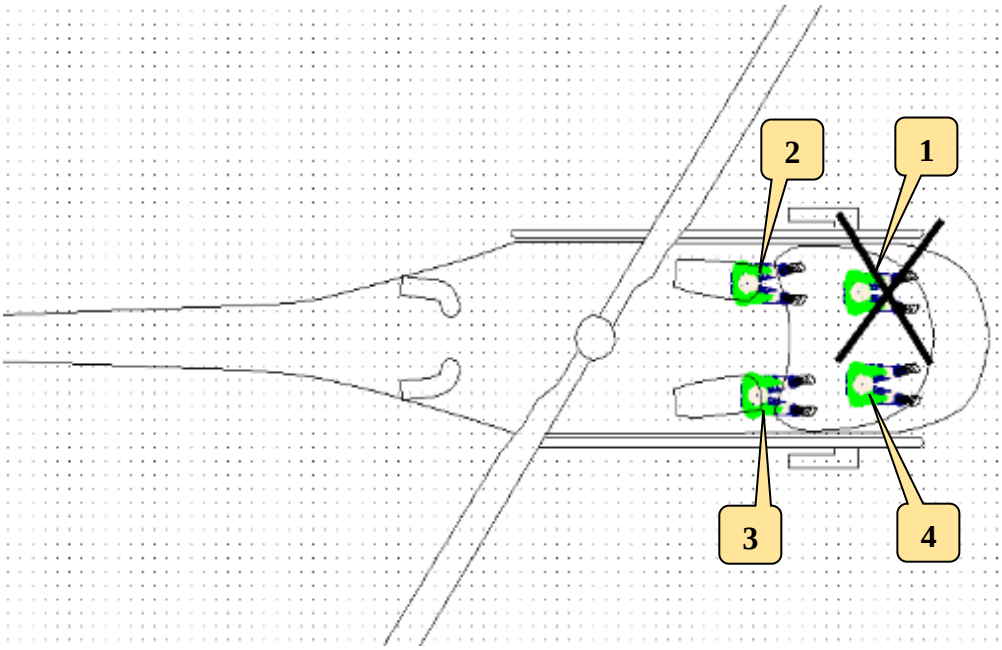
1.15. Survival aspects

According to helicopter damages, deformation of fuselage, skids and helicopter cockpit damages, as well as to witnesses evidences, injuries of pilot and passengers and they placing at accident site, point to that, helicopter, after separated tail rotor, rotated around the vertical axis in clockwise direction. (Pic. 18).

After collision with upper wire of electric power line injured persons did not sustain electric injuries, because helicopter touched and broke the upper wire, and after occurrence did not get into direct contact with ground or other conductor.

Picture 18. Accident site before rescue works

Despite the crashworthiness of helicopter fuselage and of construction strengths elements, as well as safety belts construction (pilot and passengers of helicopter used the safety belt system), as a result of severe impact into the ground with the left side of helicopters fuselage passenger (1), who was sitting in front of helicopter cabin on the left side, sustained fatal injuries, pilot (4) and other passengers (2) (3) sustained serious injuries (Pic.19).



Picture19. Placing scheme of pilot and passengers

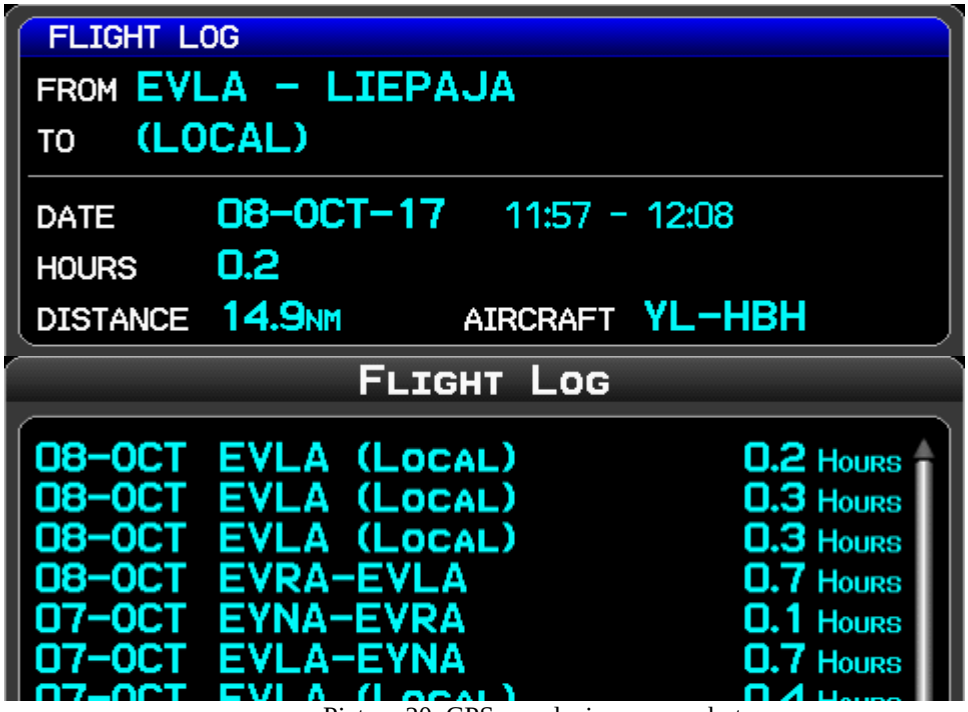
1.17. Organizational and management information

On August 30, 2017, "Baltijas Helikopters" Ltd. submitted to State agency "Civil Aviation agency" (CAA) a request No. 4BH-01-17 with requirement to implement short term changes in the structure of airspace, in order to ensure the filming and also safety of European rally championships "Liepaja", by conducting flight with helicopters. After receipt of request and assessment of it CAA made changes to the structure of airspace with decision No. 01-8/1383 and created restricted flight zone (R) "EUROPEAN RALLY CHAMPIONSHIP 2017" (hereinafter – zone) in the following coordinates: 562200N 0212600E – 562100N 0213600E – 562500N 0215700E – 565400N 0220000E – 564300N 0211700E – 563755N 0212406E – 563016N 0212850E – 562200N 0212600E, in the altitude from surface of the Earth (either land or water) GND) till 1000 feet (FT) Above Mean Sea Leve (AMSL), within the time period from October 7, 2017, 08:30UTC until October 8, 2017, 17:00UTC. For aircrafts not involved in operation in that zone restriction was imposed to fly in airspace of that zone.

- In accordance with the information received from the organiser of rally "RA EVENTS" Ltd., contract with "Baltijas helikopters" Ltd. to provide safety services using helicopter during the competition "Rally Liepaja" in October of 2017 was not concluded and "Baltijas Helikopters" Ltd. such services did not provide, but performed pleasure flights with passengers on board during the rally competition.

1.18. Additional information

According to information, preserved by navigation device "Garmin" GPSmap 695 of helicopter R44, registration No YL-HBH, after arriving to Priekule municipality, Gramzda rural territory, Gramzda pit, helicopter on October 8, 2017, performed three flights. (Pic.20).



Picture 20. GPSmap device screen shot

Other information about the flight were not found in GPS device, because taking into account the data saved in the device can be concluded, that GPS was not turned on, thereby helicopter flight track was not recorded.

1.19. New investigation technique

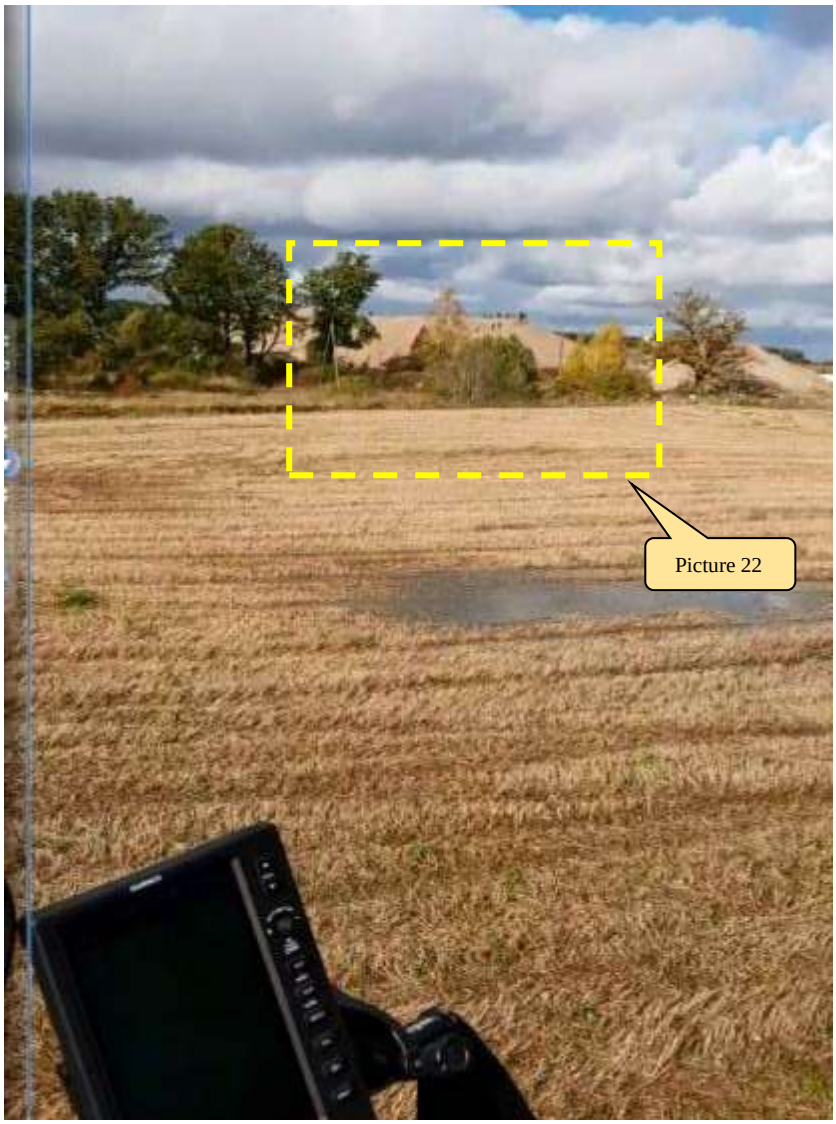
Aviation accident investigation was conducted in accordance with Annex 13 of Chicago convention on international civil aviation and European Parliament and Council Regulation (EU) No.996/2010 of October 20, 2010.

2. ANALYSES

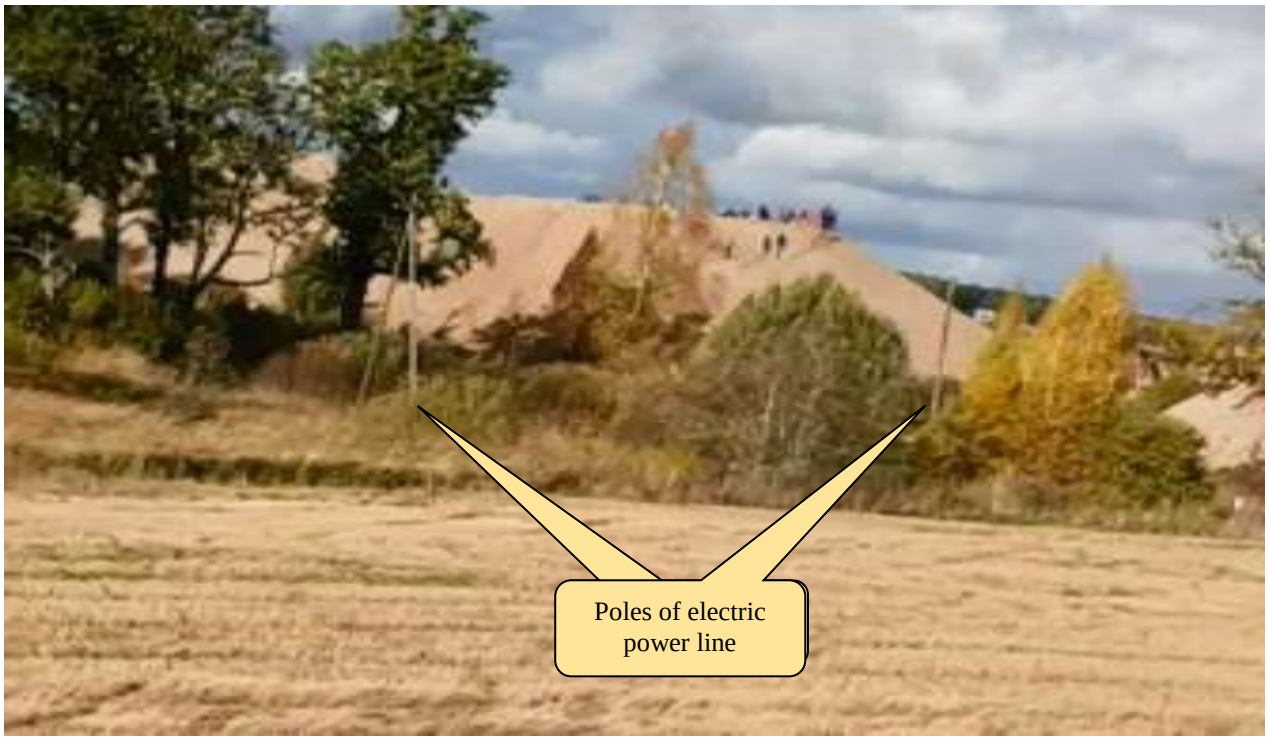
2.1. Analysis of flight

2.1. Impact of weather conditions and visibility to the helicopter flight

Weather conditions on October 8, 2017, in Priekule municipality, Gramzda rural territory, Gramzda pit area at 13:11 during the flight of helicopter R44, registration No YL-HBH, were corresponding to requirements for performing visual flights. During the take-off sun was behind the pilot's back, maximum wind gusts did not exceed 11 m/s. On video, taken from the cabin of helicopter few seconds before the aviation accident, it is possible to see, that dangerous obstacles to the flight safety (electric power line, poles of electric power line, top of trees etc.), were clearly visible (Pictures 21 and 22).



Picture 21. Snapshot during the flight from cabin of helicopter R44, r/n YL-HBH



Picture 22. Zoomed in picture 21 from the cabin of helicopter R44, r/n YL-HBH

2.2. Analysis of possible technical causes of aviation accident

Witness interviews and examination of engine and control elements didn't indicate any technical faults during the flight, thereby in case of malfunction in operation of helicopter engine or interruption of it during the flight, pilot would have possibility to balance helicopter and in the autorotation regime perform safe landing, because field conformation in the area of aviation accident site was flat enough for landing.

Rapid reach of altitude 50m by helicopter after colliding the electric power line indicates, that engine of helicopter operated without interruption. Also by video recording of flight it is possible to deduce of normal operation of helicopter and the pilot, which do not indicate to existing technical problems from take-off until accident occurred. Thereby the investigation consider, that technical reasons could not be a cause of helicopter accident.

2.3. Pilot action, conducting the flight

In accordance with paragraph 2.5. "Duties of pilot-in-command" of part III "International operations – helicopters" of Annex 6 of International Civil aviation convention:

- *The pilot-in-command shall be responsible for the operation and safety of the helicopter and for the safety of all crew members, passengers and cargo on board, from the moment the engine(s) are started until the helicopter finally comes to rest at the end of the flight, with the engine(s) shut down and the rotor blades stopped.*

In accordance with paragraph 3.3. "Obstacle data" of part III "International operations – helicopters" of Annex 6 of International Civil aviation convention:

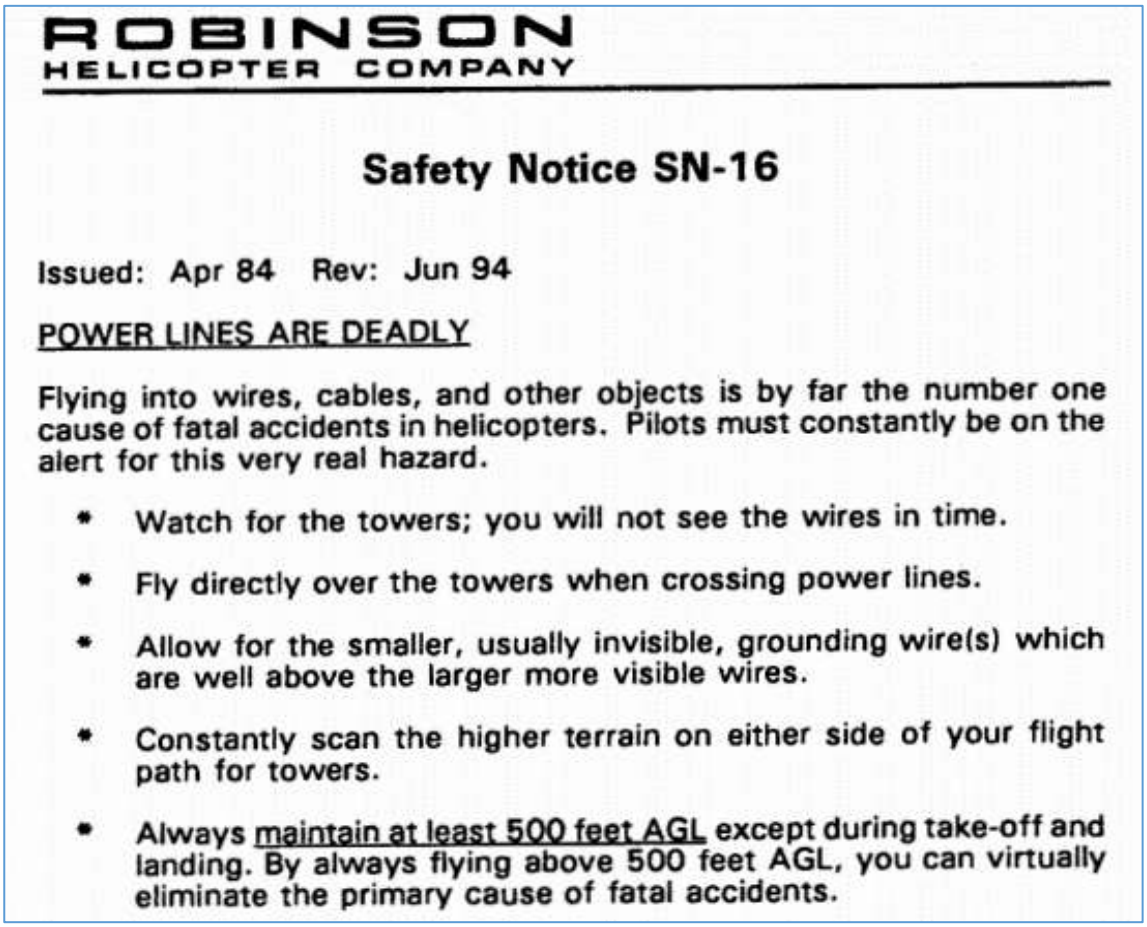
The operator shall use available obstacle data to develop procedures to comply with the take-off, initial climb, approach and landing phases detailed in the code of performance established by the State of the Operator.

After analysis of the helicopter flight, investigators concluded, that the pilot hadn't to examine the placement of obstacles and their parameters within the area of intended flights. It should be taken into account, that it was not the first flight at that day, because during the previous two flights pilot had a possibility to view vicinity of Gramzda pit and the ground terrain, in order to notice placement of potentially dangerous objects to flight and their height.

Also the manufacturer of helicopter R44 "Robinson Helicopter Company", after conducting analysis of some aviation accidents and incidents, has developed for pilot's safety notices in the R44 Pilot's Operating Handbook, what is available at www.robinsonheli.com.

In the safety notice SN-16 (Pic. 22) it is described flight regulations for helicopter's pilot in the area of electric power lines, which provides to cross electric power lines above towers of those electric lines and to fly in safe height above 500ft (approximately 150m) and so on.

Pilot actions indicate, that pilot had not taken into account the regulations of Safety notices, before performing flight with helicopter.



ROBINSON
HELICOPTER COMPANY

Safety Notice SN-16

Issued: Apr 84 Rev: Jun 94

POWER LINES ARE DEADLY

Flying into wires, cables, and other objects is by far the number one cause of fatal accidents in helicopters. Pilots must constantly be on the alert for this very real hazard.

* Watch for the towers; you will not see the wires in time.
* Fly directly over the towers when crossing power lines.
* Allow for the smaller, usually invisible, grounding wire(s) which are well above the larger more visible wires.
* Constantly scan the higher terrain on either side of your flight path for towers.
* Always maintain at least 500 feet AGL except during take-off and landing. By always flying above 500 feet AGL, you can virtually eliminate the primary cause of fatal accidents.

Pictures 23. R44 Pilot's Operating Handbook (220 page)

Taking into account the pilot operation of helicopter, investigators consider, that pilot had not followed the requirements of normative documents (requirements of Part III of Annex 6 of International convention on civil aviation and Safety notice SN-16 of R44 Pilot's Operating Handbook, did not assess the placement of real dangerous obstacles at the flight area, as a result of it collision with wires of electric power lines occurred.

Operation of helicopter in public event area and aviation accident that occurred created dangerous situation to the safety of rally viewers and participants, because the take-off and approaching place for helicopter was not marked with warning signs and restricted.

3. CONCLUSIONS

3.1. Findings

- The pilot of helicopter had a valid "H" class private pilot licence and valid Medical certificate;
- The pilot of helicopter had sufficient experience for flights with helicopter R44;
- On the aviation accident day the pilot of helicopter performed flights as private person;
- Flights of helicopter within the "Rally Liepaja" flight area were coordinated with State aviation safety authority (Civil Aviation Agency);
- After the examination of the pilot of helicopter and medical conclusion, presence of alcohol and ethanol in the pilot's blood were not detected;
- After examination of Technical maintenance documentation of aircraft has been established, that the helicopter was equipped and maintained in accordance with the regulations of manufacturer and approved procedures;
- The actual take-off mass of helicopter did not exceed the maximum permissible take-off mass provided in the manufacturers technical documentation;
- Collision of helicopter with the wire of electric power line occurred due to failure to examine the placement of obstacles within the flight performing area in accordance with the requirements of international standards and Safety notice in the Pilot's Operating Handbook;
- Pilot was not acquainted with the requirements of international standards and requirements of Safety notice in the Pilot's Operating Handbook in relation with action, when electric power lines are located within the flight area;
- Actual weather during the accident could not be a cause for aviation accident and affect the maneuvering of helicopter;
- During the investigation no evidence was detected what could indicate about the technical malfunction of helicopter, what could adversely affect the flight safety.

3.2. Aviation accident causes

3.2.1. Direct cause of aviation accident

Collision of helicopter with the electric power line.

3.2.2. Aviation accident root cause

Disregarding of international standards and safety notice in the Pilot's operation handbook.

3.2.3. Aviation accident contributing cause

Probably, passengers on board distracted the pilots attention, as a result of it the pilot did not noticed in due time the electric power line in good visibility conditions.

3.2.4. Main cause of aviation accident

Underestimation of obstacle placement within the flight area.

4. FLIGHT SAFETY RECOMMENDATIONS

The following flight safety recommendation has been addressed to the State agency „Civil aviation agency":

Recommendation LV2018-003

Elaborate proposals for amendments in Laws and regulations on the operation of general aircrafts of civil aviation and surveillance of its operation in the public events, in order to prevent dangerous situations to the participants of public events in relation to the operation of aircraft.

Riga, October 1, 2018

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