Final Report

By the Civil Aviation Safety Investigation and Analysis Center

Investigation Board CIAS

Concerning the serious incident involving the AN2 aircraft

Registration YR-PMY

On 10 June 2013, 11:30 LT

Albești Paleologu Locality, Prahova County

No. A14- 03
Data: 17.03.2014
AKNOWLEDGEMENT

This REPORT presents data, analysis, conclusions and recommendations concerning the civil aviation safety, issued by the Civil Aviation Safety Investigation Commission appointed by the General Director of the Civil Aviation Safety Investigation and Analysis Center.

The flight safety investigation was conducted in accordance with the provisions of the Government Ordinance No. 51/1999 concerning the technical investigation of civil aviation accidents and incidents, approved with amendments and additions by Law No. 794/2001, of the REGULATION (EU) No. 996/2010 of the European Parliament and of the Council from 20 October 2010 on the investigation and prevention of accidents and incidents occurred in civil aviation and repealing of Directive 94/56/EC and the provisions of Annex 13 to the Convention on International Civil Aviation signed at Chicago on December 7, 1944.

The sole objective of civil aviation safety investigation is preventing the occurrence of accidents and incidents, by effective determination of causes and circumstances that led to this occurrence and establishing the necessary recommendations for civil aviation safety and it HAS NOT THE PURPOSE of finding guilty, individual or collective responsibilities.

As a consequence, the use of this REPORT for other purposes than preventing the occurrence of accidents and incidents might generate misinterpretations.
CONTENT

1. PRELIMINARY INFORMATION ................................................................. 5
   1.1. History of the incident ................................................................. 5
   1.2. Victims ...................................................................................... 5
   1.3. Damage to the aircraft ........................................................... 6
   1.4. Other damage ......................................................................... 6
   1.5. Crew information ................................................................. 6
   1.6. Aircraft information ........................................................... 6
   1.7. Meteorological situation ..................................................... 7
   1.8. Aerodrome data ................................................................. 7
   1.9. Flight recorders ................................................................. 7
   1.10. Wrack and impact information ........................................ 7
   1.11. Medical and pathological information ................................ 9
   1.12. Fire ....................................................................................... 9
   1.13. Surviving information ..................................................... 9
   1.14. Tests and research ............................................................. 9

2. ANALYSIS ......................................................................................... 10

3. CONCLUSIONS .................................................................................. 10
   3.1. Findings .................................................................................... 10
   3.2. Causes of the occurrence .................................................... 11

4. RECOMMENDATIONS ..................................................................... 11
SYNOPSYS

CLASSIFICATION: Serious Incident
Operator: AGROAVIA COMPANY
Aircraft: An-2
Registration: YR-PMY
Date and time: 10.06.2013 / 11.30 LT
Location: Albești Paleologu (PH)

On 10.06.2013 the aircraft type An-2, registered YR-PMY, belonging to SC Agroavia Company SRL, was performing an avio-chemical mission from the working field close to Albești Paleologu Locality, Prahova County.

After detaching from the ground, the aircraft has been clogged, it hit with the right wheel of the main landing gear a slight bump of ground, which led to the damage of the pyramidal assembly of the landing gear.

The incident took place at 11.30LT. The pilot and the flight engineer, on board of the aircraft, did not suffer injuries or bodily damage.

The most probable cause for the occurrence of this serious incident is an error in the flight technique, through the inadequate managing of the aircraft take-off in concrete load and temperature conditions from the moment of the incident occurrence.

The incident has been notified in writing to CIAS, being registered with the number 7250 /12.06.2013.

The flight safety investigation was conducted in accordance with the provisions of the Government Ordinance No. 51/1999 concerning the technical investigation of civil aviation accidents and incidents, approved with amendments and additions by Law No. 794/2001, of the REGULATION (EU) No. 996/2010 of the European Parliament and of the Council from 20 October 2010 on the investigation and prevention of accidents and incidents occurred in civil aviation and repealing of Directive 94/56/EC and the provisions of Annex 13 to the Convention on International Civil Aviation signed at Chicago on December 7, 1944.
1. PRELIMINARY INFORMATION

1.1. History of the incident

On 10.06.2013 the aircraft type An-2, registered YR-PMY, belonging to SC Agroavia Company SRL, was performing an avio-chemical mission from the working field close to Albești Paleologu Locality, Prahova County.

The aircraft, supplied with 400 litres of petrol, 65 litres of oil and almost 1000 litres of substance, took-off around 8.30 LT. It performed an avio-chemical flight after which it landed on another working field, from the same area, to be closer to the next plot that was to be treated.

After refuelling with almost 1000 litres of substance, the aircraft is started at 11.25 LT, it is performed a rolling, and in the second phase of the take-off after detaching from the ground the aircraft clogs, hits with the right wheel of the main landing gear a slight bump of ground and after that it catches height. At the referral made by the flight engineer concerning the landing gear leg damage, the captain decided to throw the chemical substance and to land on the main working field where it had parking,anchoring and aircraft guard conditions.

From the pilot’s declaration, it results that the landing was made with flaps 30° at a small speed.

The aircraft touched down on the left wheel, position which was maintained till a speed of almost 40 Km/h, when also the right wheel touched down which led to the aircraft pivoting to the right and its stop.

Aircraft localization: 44° 56’9.80” N
26° 16’0.01” E
Quota: 107 m

1.2. Victims

N/A.
1.3. Damage to the aircraft

After the touchdown the main right landing gear was damaged.

Fig. no.2

1.4. Other damage

No damages were produced by third parties.

1.5. Crew information

<table>
<thead>
<tr>
<th>Pilot (captain)</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>License</td>
<td>CPL, issued by AACR valid until 22.07.2015</td>
</tr>
<tr>
<td>Medical certificate</td>
<td>Issued by AACR, valid until 24.03.2014</td>
</tr>
<tr>
<td>Flight experience</td>
<td>4120 FH</td>
</tr>
<tr>
<td>Work time</td>
<td>N/A</td>
</tr>
<tr>
<td>Rest time</td>
<td>The determination of the rest time was not possible</td>
</tr>
</tbody>
</table>

1.6. Aircraft information

The aircraft was built in the year 1985 and it belongs to the category of historical aircrafts.

The aircraft is authorized for:
- operations for the benefit of agriculture and forestry;
- parachutists and materials launch;
- surveillance operations;
- search and rescue operations.

General data:

<table>
<thead>
<tr>
<th>Aircraft type and manufacturer</th>
<th>WSK Mielec Poland, AN-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series number and manufacture year</td>
<td>S/N 1G21310</td>
</tr>
<tr>
<td>Registration state and brand</td>
<td>YR-PMY</td>
</tr>
<tr>
<td>Owner</td>
<td>SC Micavia Company SRL</td>
</tr>
<tr>
<td>Holder (Operator)</td>
<td>SC Agroavia Company SRL</td>
</tr>
<tr>
<td>Navigability certificate</td>
<td>PZN 059-2010-16</td>
</tr>
<tr>
<td>Total number of hours:</td>
<td></td>
</tr>
<tr>
<td>- from release to service</td>
<td>DPS 3129</td>
</tr>
<tr>
<td>- since the last capital repair</td>
<td>DURG 1129</td>
</tr>
</tbody>
</table>
Engine

<table>
<thead>
<tr>
<th>Engine series</th>
<th>Series K-1623121</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of hours</td>
<td>DPS 4171</td>
</tr>
<tr>
<td>Number of hours since the last verification</td>
<td>DURG 443</td>
</tr>
</tbody>
</table>

Propeller

<table>
<thead>
<tr>
<th>Propeller type</th>
<th>AV-2 Series 02 Nr W321149, Pale: 17961, 18025, 18089, 17831</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producer</td>
<td>Nikolaev-Aero</td>
</tr>
<tr>
<td>Manufacture year</td>
<td>1982</td>
</tr>
<tr>
<td>Number of hours since the last capital repair</td>
<td>3541h la 27.05.2008</td>
</tr>
<tr>
<td>The resource received after the capital repair</td>
<td>1500h, out of which there were used 483h</td>
</tr>
</tbody>
</table>

1.7. Meteorological situation

Wind of 1-2 m/s direction 08, temperature of 28°C, visibility over 10 Km.

1.8. Aerodrome data

The field on which the flight activity was performed falls, according to the provisions of the Romanian Government Decision No. 912 from 25.08.2010, under other fields but the authorized aerodromes on/from which there can be performed take-off and landing of civil aircrafts.

1.9. Flight recorders

This aircraft type is not previewed with flight recorders on board.

1.10. Wrack and impact information

When the investigation commission arrived at the incident site, it found out that the aircraft of the type An-2, was anchored and secured with a crank for its maintenance in normal position but as well for the avoidance of some subsequent possible damage of the aircraft structure. At the same time the assembly of the right landing gear was damaged.
The plane AN-2 has a non-retractable landing gear with the particularity of a pyramidal structure that allows the taking-over of shocks on the sustaining points and on the damped landing gear legs. This particularity consists of the fact that once with the damper compression the mobile elements of the landing gear rotate their position in space as follows: the struts rotate around their own axis, the dampers cylinders rotate on the piston stems and the wheels change their inclination both towards the vertical axis but also towards the longitudinal axis of the plane.

The landing gear leg sustaining pyramid with damper is placed on the bottom of the leading edge and it is fixed in 3 points at the resistance structure of the fuselage by two upper fers fixed on frame number 5 of the fuselage and on the spar of the central plan.

After the impact the following damage was found:

a) breakage of the sustaining strut ear of the landing gear in vertical plan from the aircraft console;
b) the fastening screws of the strut didn’t present any damage and the strut deformation was made effortlessly.

c) the console in the aircraft structure on which the strut was fixed didn’t present any damage and the holes made in this for fastening the strut with screws didn’t present any roundness;

d) The fastening screw didn’t present any deformation or damage of the iron.

e) the leading edge (landing gear leg protection) was damaged;

f) the loading valve of the landing gear leg was broken;

g) the sustaining arm of the pyramid in horizontal plan was bent.

At the visual inspection of the aircraft, the members of the investigation commission didn’t identify other structural elements of it (fuselage, plans, etc.) which might have suffered deformations, breakage, damage or traces of contact with rough surfaces as a consequence of the occurred incident or that there might have existed previously to the incident occurrence and which might have influenced directly or indirectly its occurrence.

1.11. Medical and pathological information

Both the pilot and the flight engineer didn’t suffer bodily injury requiring medical care.

1.12. Fire

There was neither fuel leakage nor fire.

1.13. Surviving information

The intervention of specialized medical staff was not needed.

1.14. Tests and research

In order to determine if the resistance structure of the aircraft was affected in the fastening points of the pyramid components belonging to the right landing gear leg it was made a NDT test with EDDY CURRENT. According to the issued report, it was found out that it didn’t suffer any damage after the incident.
In order to remedy the faults there were taken actions according to the provisions from the maintenance and repairs manual of the plane, namely the replacement of the affected pieces according to the working procedures.

The following pieces were replaced:
- strut of pyramid vertical plan;
- strut of pyramid horizontal plan;
- fastening fer of front strut;
- valve (servicing) of right landing gear leg.

2. ANALYSIS

The clogging of the aircraft in take-off phase, after detaching from ground, may be due at least the following causes to:

a) Decrease of engine power

Taking into account that:
- after the bounce, the aircraft pilot did not seek to make an emergency landing but he decided to continue the performance of the avio-chemical mission by repeated passing over the working plot;
- both the pilot and the flight engineer declared that, during take-off, the aircraft engine functioned in normal take-off parameters;
- There were not reported by eyewitnesses abnormal noises to suggest incorrect functioning of the engine (misfires, detonation, flames in the exhaust manifold, etc.),

the commission considers that the engine parameters, during take-off, were within normal limits of operation and the aircraft clogging was not due to some malfunction in its functioning.

b) Aircraft detaching in speed limit

The detaching in speed limit may lead to an accentuated clogging of the aircraft, depending on the specific load conditions of the aircraft and of the atmospheric conditions. If the aircraft was detached from the ground in speed limit and it was attempted its maintenance at a relatively small height (performance of a small height flight) together with the existence of an obstacle, then hitting the aircraft is possible in take-off.

3. CONCLUSIONS

3.1. Findings

The investigation commission of the serious incident occurred on 10.06.2013 in which it was involved the aircraft of the type An-2, registered YR-PMY, operated by Agroavia Company, found out the following:
a) the aircraft was certified, equipped and had valid approval for national flight;
b) the recordings on maintenance, show that the aircraft was maintained in conformity with the regulations and procedures applicable for this type of aircraft;
c) the aircraft pilot had a valid pilot license;
d) the landing field was chosen in conformity with the provisions of the Romanian Government Decision No. 912 from 25.08.2010;
e) the main right landing gear was damaged;
f) the meteorological conditions were optimal for carrying out the flight activity;
g) landing was controlled, with front wind, with the attempt of making as less as possible damage to the aircraft at touchdown of the wheel tire of the main right landing gear.

3.2. Causes of the occurrence

The probable cause for the occurrence of this serious incident is an error in the flight technique through inadequate managing of the aircraft take-off in concrete load and temperature conditions from the moment of the incident occurrence.

4. RECOMMENDATIONS

For this serious incident, the investigation commission does not issue any safety recommendations.

Note: The documents and the analysis objects used for the elaboration of the Investigation Report on flight safety are confidential and they are stored at the Civil Aviation Safety Investigation and Analysis Center, according to the legal provisions.