



**LIETUVOS RESPUBLIKOS SUSISIEKIMO MINISTERIJOS
ORLAIVIŲ AVARIJŲ BEI INCIDENTŲ TYRIMŲ VADOVAS**
**MINISTRY OF TRANSPORT AND COMMUNICATIONS OF THE REPUBLIC OF LITHUANIA
CHIEF INVESTIGATOR OF AIRCRAFT ACCIDENT AND INCIDENT**

REPORT

No B02-08

**ACCIDENT TO THE SU-29, EC-HPX AIRCRAFT
AT ROJŪNAI AERODROME ON 18 JUNE 2008**

In accordance with Annex 13 of the Convention on International Civil Aviation, with Directive 94/56/EC and with Law on Aviation of 17 October 2000 the sole objective of this investigation is the prevention of future accidents and it is not intended to apportion blame or liability. The use of this report for any other purpose could lead to erroneous interpretations.

FINAL REPORT

| | |
|--|-----------------------------------|
| Operator: | Sky Service Aviation, S.L. |
| Manufacturer: | Sukhoi OKB |
| Aircraft type: | SU-29 |
| National and registration mark: | EC-HPX |
| Place of the accident: | Rojūnai Aerodrome |
| Date: | 18 June 2008 |

SYNOPSIS

Following the flight from Poznan (Poland), a group of 4 aerobatic aircrafts, after making a circle over the Rojūnai aerodrome (Lithuania), landed at that aerodrome. The first three SU-26 type aircraft successfully landed after the first attempt on Runway 90°. The fourth SU-29, with one pilot and one passenger on board, flying at a high vertical, low horizontal speed and high angle-of-attack made two approaches to Runway 90° (RWY 09). Approaching the runway with course considerably less than a runway heading, the plane twice made a go-around. During the third attempt the aircraft performed the base turn at a low speed and close to the runway. Turning final and descending with a high angle-of-attack, the aircraft hit flatly the surface of the ground and caught fire. Impact happened 170 m away from the threshold of the runway and 52 m to the right from its centerline. During the accident, the passenger was fatally injured, the pilot suffered spinal injuries. The aircraft burned down.

1. FACTUAL INFORMATION

1.1. History of the Flight

18 June 2008 a group of four aerobatic aircrafts performed a flight from Lyon (France) Bron Aerodrome to Rojūnai Aerodrome in Panevėžys region (Lithuania). The group continued the transit flight that commenced the day before along the route Casarubios-Sabadell-Lyon-Walburg-Poznan-Rojūnai. The group consisted of three single-seat SU-26 type aircraft (registration numbers: EC-HPD, EC-HYU, EC-JRQ) and one double-seat SU-29 type aircraft (Reg. No. EC-HPX) which had one pilot and one passenger on board. The group departed from Lyon around 7.00 hrs (hereinafter UTC time shall be indicated). On the way the group landed at Walburg (Germany) and Poznan

(Poland) aerodromes and after the 7.5-hour flight at around 19.00 hrs it approached the Rojūnai aerodrome. Upon the approach, the group made a right-hand circle over the aerodrome, spreading out for individual landing on Runway 90°. The first landed SU-26 EC-HPD. After landing the aircraft turned to the right and stopped outside the runway facing it near the end. The second landed EC-HYU. After landing it stopped near the first aircraft. When landed, the third aircraft SU-26 EC-JRQ stopped in the same place as well. The last to land was SU-29. According to witnesses, the pilots who had just landed, during the approach EC-HPX reduced the flight circle by performing the base turn early. During the base and final turns the aircraft was descending at a high vertical speed with a high angle-of-attack. The final turn was completed at a low height, the aircraft aborted landing and initiated a go-around. When airborne, it turned right and performed a steep second turn. The third turn, according to a witness, was performed again at a similar location near the threshold of the runway and at a low speed. During the final turn, at about 25m height and 100 m distance from the threshold of the runway, SU-29 aborted landing for the second time and performed a go-around. At that time its course was 30-40 degrees less than the landing heading. While climbing, the aircraft turned right, flew straight ahead then turned left and commenced the base turn at a close proximity to the runway. The base and the final turns were being performed in a similar manner as in the first two approaches: with a high angle-of-attack and low reserve in horizontal speed. The witness stated that the aircraft was rapidly descending during the last turn, a louder sound of engine was heard, the aircraft nose slightly lowered and then the aircraft disappeared from view due to the obstacles of the terrain. Then the witnesses heard the explosion and a fire broke out. People who were at the aerodrome at the time tried to fight the fire with fire-extinguishers and to pull out the passenger who was not moving, however, they failed to rescue him as the fire grew stronger very rapidly. The passenger was killed. The pilot, although seriously injured, managed to get out of the aircraft by himself. The fire truck that arrived later neutralized the fire when the aircraft was almost completely burnt. The aircraft crashed on the right-hand side of RWY 09 170 m away from the threshold and 52 m away from its centerline. Approximate time of the accident – 19.05 hours.

1.2. Injuries to Persons

| Injuries | Crew | Passengers | Others |
|------------|------|------------|----------------|
| Fatal | 0 | 1 | 0 |
| Serious | 1 | 0 | 0 |
| Minor/None | 0/0 | 0/0 | Not applicable |

1.3. Damage To Aircraft

The aircraft was destroyed during the impact with the ground and a fire that followed the impact (See Pictures 3 and 4).

1.4. Other Damage

No damage was done by the third parties.

1.5. Personnel Information

The pilot of the SU-29 – citizen of Spain, aged 48 years. Properly licensed. Hold valid Commercial Pilot's and Private Pilot's licences. Qualification: single-engine piston (land) aircrafts (SE). Valid Second Class Medical Certificate No.0048543. Hold Private Helicopter Pilot's and Glider's licences as well.

Flying experience:

Experience since 1993.

Experience on SE-type aircraft, total 397.54 hours, 363.49 hours of which as commander.

Experience on SU-29 type aircraft, total 202.34 hours, 202.34 of which as commander.

Experience during last 30 days, total 17.21 hours, 17.21 hours of which on SU-29 type.

Experience during last 7 days, total 14.22 hours, 14.22 hours of which on SU-29 type.

Experience on helicopters, total 54.45 hours, gliders – 208.53 hours, ultralight aircraft – 23.25 hours.

Experience on all types, total 684.57 hours, 588.59 hours of which as commander.

1.6. Aircraft Information

The aircraft SU-29 is an aerobatic aircraft designed for performance of aerobatic flights while flying in a usual manner and inversely. Manufactured in 1995 by OKB Sukhoi, Russian Federation. Serial No. 80-05. National and registration mark EC-HPX. Certificate of Registration No.5030. Valid Permit to Fly issued by the General Directorate of Civil Aviation of the Kingdom of Spain. Total flight time/landings since the beginning of operation: 621.52 flight hours and 1769 landings. The last major inspection – maintenance after 100 flight hours was performed 6 May 2008.

1.7. Meteorological Information

The video recording shows that factual weather conditions at the time of SU-29 approaches for landing were good: no clouds above the aerodrome area, visibility approximately 8-10 km. Aerodrome windsock installed at the right safety strip near the beginning of RWY 09, indicated a light stable 3-5 m/s southerly wind. The accident occurred just after the sunset, at dusk (Picture 1).



Picture 1. Meteorological conditions at the aerodrome during the SU-29 landing

1.8. Communications

A radio communication at Rojūnai Aerodrome is optional. The callsign of the Aerodrome flight information service is “ROJŪNAI INFO”, frequency 122.500 MHz. According to a witness, during the approach for landing of the SU-29, there was an intensive radio traffic between the EC-HPX pilot and group leader EC-HPD commander.

1.9. Aerodrome Information

Rojūnai Aerodrome (Picture 2) is 16 km from the Panevėžys city centre. Coordinates: 55°36.65'N, 024°13.25'E. The aerodrome is the property of a private person. Aerodrome elevation 54 m. Runway directions: MK 090° x 270°, dimensions: 800 x 60 m. RWY surface – grass. The group of aircrafts were to land on runway 90°, the wind was light, southerly crosswind.

1.10. Flight Recorders

The aircraft SU-29 was not equipped with an emergency Flight Data Recorder or a Cockpit Voice Recorder, nor are such obligatory on this type of aircraft.

1.11. Wreckage and Impact Information

The aircraft flatly impacted the ground near the aerodrome on the right-hand side of RWY 09. According to a witness, nose of the aircraft was raised during the impact. The aircraft slid the grass for 28 metres and came to a stand at the distance of 170 m from RWY 09 and 52 m to the right of its centerline facing south (Picture 3). The fire that commenced during the first impact rapidly flared up and destroyed the aircraft completely (Pictures 3 and 4).

1.12. Medical and Pathological Information

During the accident the pilot of SU-29 suffered a spinal injury. The passenger was fatally injured during the fire.

1.13. Fire

The aircraft caught fire due to the impact with the ground. The main flashpoints were petrol tanks of the aircraft: wing tanks in the left and in the right wings and the main tank located between the engine and front cockpit. The most damaged parts during the fire were the cabin, fuselage, stabilizer, fin and wing parts near fuselage (Pictures 3 and 4). The fire was extinguished by four manually operated fire-extinguishers and the fire truck that arrived to the site of the accident after 20 minutes.

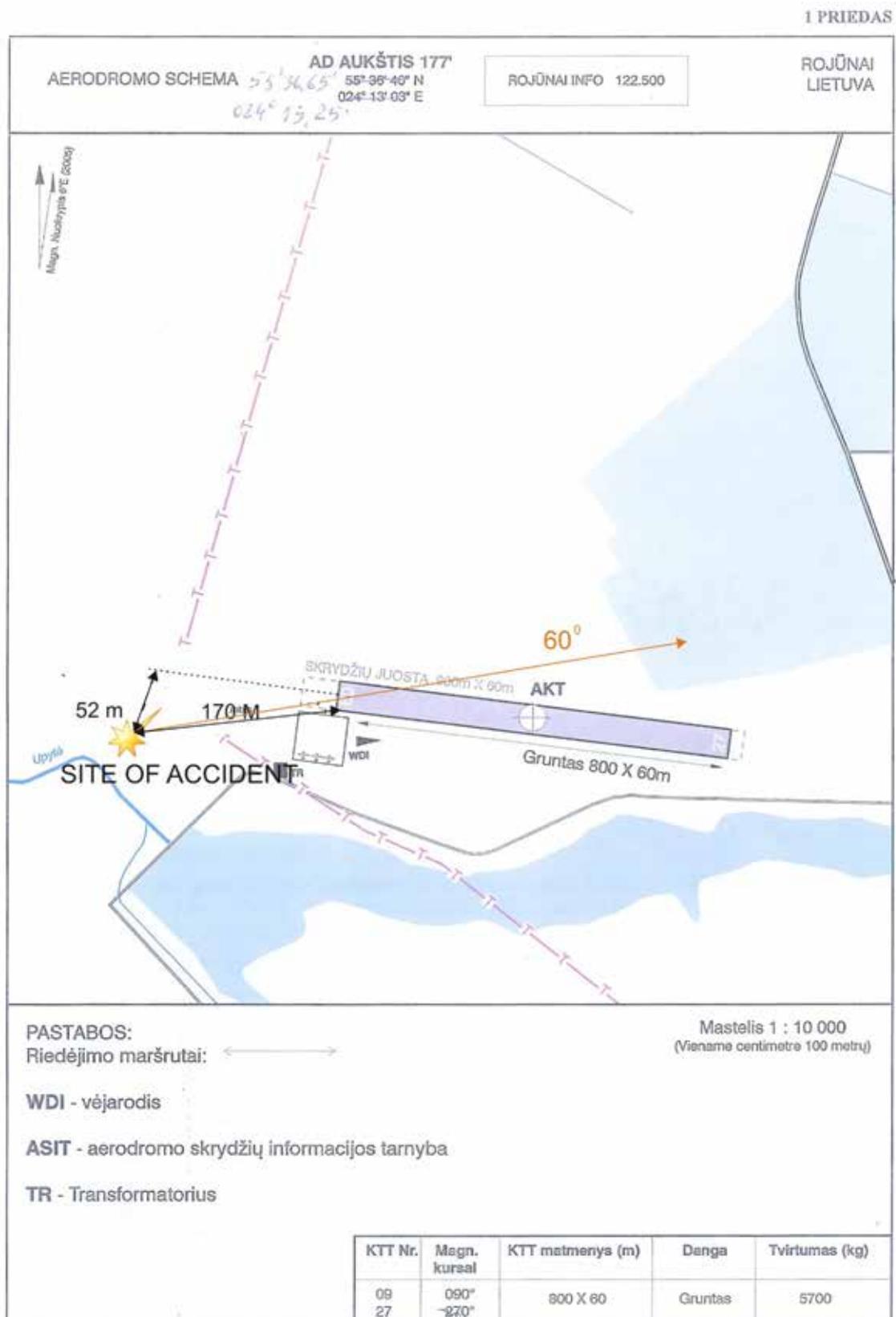
1.14. Survival Aspects

According to witnesses, fire spread out very rapidly. Due to a strong flame it was impossible to pull out the immobile passenger from the back seat as four manually operated fire-extinguishers were able to subdue the fire only for a brief moment. There were no alternative more effective fire fighting facilities at the aerodrome. The pilot managed to evacuate from the burning aircraft himself. He was transported to the Panevėžys hospital.

1.15. Additional Information

The Investigation Commission received video records that recorded landings of the three aircraft SU-26 and two landing attempts of the aircraft SU-29 at the Rojūnai Aerodrome (Pictures 5-10). All this time the operator filmed the events from the same location near RWY 09, therefore, the records provide a possibility of comparing flight paths during the approach of the aircrafts SU-26 and SU-29 and their attitudes. The records show that SU-29 failed to align with the runway twice. Upon the approach to the centerline of RWY 09 the course of SU-29 was significantly less than the heading of the runway. Both times during the descent in the area of the final turn, the aircraft flew at the

minimal speed and high angle-of-attack. The descent of the aircraft at times seemed like a fall stopped by increasing the engine power.



Picture 2. Site of the accident as shown in the chart of the Rojūnai Aerodrome



Picture 3. Aircraft SU-29 after the accident



Picture 4. Aircraft SU-29 after the accident



Picture 5. SU-26 EC HPD landing



Picture 6. SU-26 EC HYU landing



Picture 7. SU-26 EC JRQ landing



Picture 8. SU-29 EC 1st approach for landing



Picture 9. SU-29 EC 2nd approach for landing



Picture 10. SU-29 EC 2nd missed approach

2. ANALYSIS

The video records show that the aircraft SU-29 twice approached the runway with a course that was less than the runway heading. According to witnesses, the difference between the heading of runway 09 and the aircraft flight course was approximately 30-40 degrees. During the second approach on final the aircraft, flying right of the track, descended too early. The video records also show that the aircraft was closing the runway at a high angle-of-attack that was comparable with the angle during missed approach. All interviewed witnesses confirmed that the aircraft descended to the runway with a high angle-of-attack at a low speed. One of the witnesses claimed to have been worried by the dangerous manoeuvring of SU-29, thus, he drove to the pilots of the aircraft that had landed previously to have them communicate with SU-29 pilot via radio. Since, according to the witness, the aircrafts made a survey circle prior to landing, it seems that the SU-29 failed to make correct calculations with regard to the approach for landing twice, i.e. the second and base turns that lead to insufficient lateral and longitudinal distances from the runway. Attempting to approach the runway at a shortest distance, the pilot flew at the lowest possible speed with no speed reserve and the descent of the aircraft seemed like a fall being stopped by increasing the engine power. During the third approach, according to the witness, the pilot performed the second turn even earlier. In order to make correction before the base turn, the pilot turned left and then immediately started turning right. Both the location of the third turn and the flight manner, according to the witness, were similar to the ones performed during the first two approaches. The aircraft was very close to the runway. After the base turn the aircraft started an abrupt descent with a high angle-of-attack. During the descent it increased the engine power, slightly lowered the front part of the aircraft and impacted the ground. The evidence suggests that during the third approach the pilot made the same mistakes as in previous: the base turn was performed too close to the threshold of the runway and its centreline, at a low horizontal speed and high angle-of-attack. Prolonged descent downwind at a high vertical speed after the base turn could have been another mistake. It seems, engine power was increased too late. When the pilot saw that the speed is not increasing promptly and tried to lower the angle of attack by lowering the forward part of the aircraft, the height was already insufficient.

The piloting errors may have been caused by stress and fatigue resulting from the long flight. On the day of the accident the pilot flew for 7.5 hours, landed at two transit foreign aerodromes and the total amount of workload was about 13 hours.

3. CONCLUSIONS

3.1. Findings

3.1.1. The aircraft had a valid Permit to Fly. The maintenance records indicated that required maintenance tasks of the aircraft were performed.

3.1.2. There was no evidence of engine or other aircraft equipment failure that could have contributed to the emergency situation during the flight.

- 3.1.3. The aircraft was completely destroyed due to the impact with the ground followed by the fire.
- 3.1.4. The pilot was properly licensed.
- 3.1.5. The accident approach was the third consecutive attempt to land at the aerodrome.
- 3.1.6. During all three attempts to land the aircraft flew very narrow aerodrome circuit performing the base turn very close to the runway.
- 3.1.7. During the first two attempts to land the aircraft approached the runway failing to finish the final turn, i.e. with a course less than the landing direction.
- 3.1.8. During the accident approach the flight route of the aircraft at the last stage was similar to the previous one.
- 3.1.9. All attempts to land were performed at a low speed and high angle-of-attack with no speed reserve.
- 3.1.10. The aircraft hit a ground flatly with running engine.
- 3.1.11. All attempts to land were performed after sunset.
- 3.1.12. The pilot tried to perform landing after a long two-day international flight with four transit landings. On the day of the accident the pilot flew for 7.5 hours, landed at two transit foreign aerodromes and the total amount of workload was about 13 hours.

3.2. Cause

The Commission believes that the accident of the aircraft was caused by the following circumstances:

- 1) the pilot's decision to follow a narrow aerodrome circuit and the early base turn;
- 2) descent downwind at a high vertical speed and high angle-of-attack after the base turn;
- 3) possibly belated decision to abort the descent by increasing the engine power.

The piloting errors may have been caused by stress and fatigue resulting from the long flight.

4. SAFETY RECOMMENDATIONS

- 4.1. The owners of the Rojūnai aerodrome should provide more effective fire fighting facilities at the aerodrome while preparing for competitions and during the competitions.