NATIONAL BUREAU OF AIR ACCIDENTS INVESTIGATION OF UKRAINE

(NBAAI)

PRELIMINARY REPORT

of Investigation into Serious Incident, Which Took Place With CESSNA C510, Reg. YR-CMO, Aircraft on March 03, 2021, During Operating Flight en Route Kyiv (Zhulyany) – Odesa.

OPERATOR:	**CONARG MOTION S.R.L.**
TYPE AIRCRAFT:	**CESSNA C510**
NATIONALITY AND REGISTRATION	
REGISTRATION:	**YR-CMO**
MANUFACTURER:	**TEXTRON AVIATION (USA)**
SERIAL NUMBER:	**510-0433**
PRODUCTION DATE OF AIRCRAFT:	**NOVEMBER 20, 2013**
COUNTRY OF OCCURRENCE:	**UKRAINE**

Introduction

In accordance with the third part of Article 119 of the Air Code of Ukraine, based on the results of the investigation, the NBAAI does not apportion blame or liability of legal entities and individuals. The sole purpose of this investigation is to prevent future accidents and incidents.

The present report and materials of the technical investigation cannot be used by administrative, official, public prosecutors, judicial authorities, insurers for establishment of fault or responsibility (according to requirements of part 5 of Art. 119 of the Air Code of Ukraine.)

1.1. Circumstances of the serious incident

On 03/03/2021, Cessna C510, Reg. YR-CMO, the operator of the aircraft was CONARG MOTION S.R.L. (Romania), performed the flight YR-CMO en route UKKK-UKOO. The flight was performed at night, in visual meteorological conditions. At 18:02:58 (hereinafter UTC time) the crew requested permission from the taxi controller to start taxiing. The taxiing of the aircraft from the L-8 stand to the start point of the TW-2 was performed along the apron following the follow-me vehicle. Then the crew taxied along the TW-2. After the crew reported on the approach to the holding area near the RW-26, the aircraft was switched to the frequency of the airport traffic control tower. Ahead of the Cessna C510 YR-CMO aircraft, the An-74 aircraft of the Aviation of the National Guard of Ukraine was taxiing for take-off.

At l8:08:21, the crew of Cessna C510 got in touch with the airport traffic control tower and reported that they had reached the holding position near the RW26 on the TW-2. Thereafter, the controller issued a clearance to the crew to occupy RW26 and an instruction to await further commands. According to the video recording from a video surveillance camera located opposite the junction of TW-2 with RWY26, at 18:10, Cessna C510 aircraft crossed RWY26, passed over side light No. 45 and stopped along the side (left) lights of RWY26 (see the sketch-map for the movement of Cessna C510 aircraft).

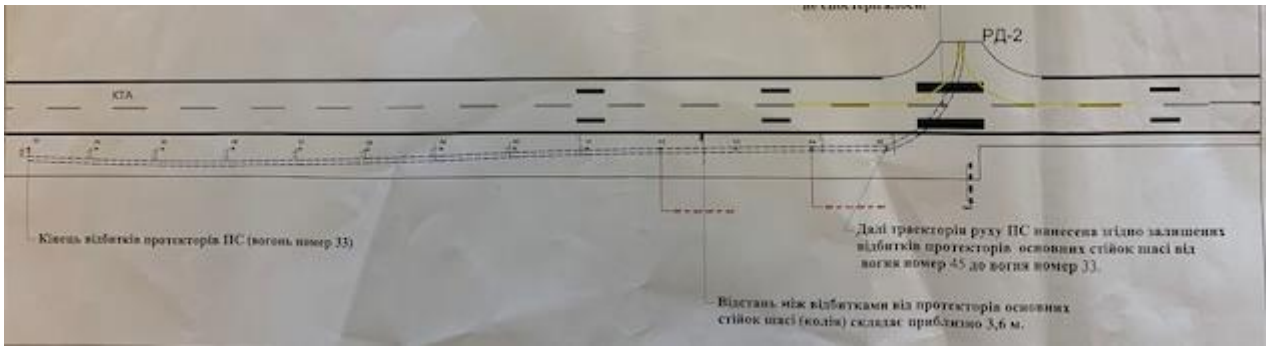

Fig. 1. The sketch-map of a serious incident with the Cessna C510 YR-CMO aircraft

At 18:12:15, the controller of the airport traffic control tower gave permission to the crew of the Cessna C510 aircraft to take off. According to the traces of the landing gear of the aircraft, which remained along the take-off line, the aircraft passed through the side lights № 44, 43 and 42, then moved to the left of the line of lights and took off at a heading of 259º. As a result of the collision and incursion, lights No. 44 and No. 42 were destroyed. The aircraft was not damaged.

On 4 March 2021, at 06:40 AM, the shift foreman of the aerodrome service (AS) of the UKKK aerodrome drove to the runway in the staff car for the routine inspection of the runway. During the inspection, damaged runway side lights No. 42 and 44 were found. The shift foreman of the AS informed the shift engineer of the flight electrical and lighting service about damage of side lights. In order to eliminate damage to the lights of the lighting system, specialists from the flight electrical and lighting service arrived at the site. Damage of two lights were found on the runway, in particular: light No. 44 was completely destroyed, debris were scattered on the area between lights No. 44 and No. 43. Light No. 42 had damage to the outer and inner scattering caps and their attachments. At the site of the incident, the AS specialists, flight electrical and lighting service and the airport inspection engineer photographed the damage and made a sketch-map. On the bases of lights No. 44 and 42 attachments and along the line of the left side lights of RWY-26, faintly visible traces from the wheels of the main landing gear of the aircraft were found. The track width of the visible traces was 360 cm. After reviewing the recording of information from a video surveillance camera located opposite the junction of TW-2 and runway, it was found that the takeoff over the runway lights could have been carried out by the Cessna C510 YR-CMO aircraft, which took off at 18:13 en route UKKK-UKOO.

In order to confirm the assumption of the type of the aircraft that left wheel traces during take-off from the RWY26 side safety strip, information was requested from the NTSB on the Cessna C510 aircraft dimensions. According to the information provided by the aircraft manufacturer, the track width of the Cessna C510 aircraft is 11.79 feet (3 m 59 cm), which corresponds to the track width that remained on the left side safety strip of the RWY26.

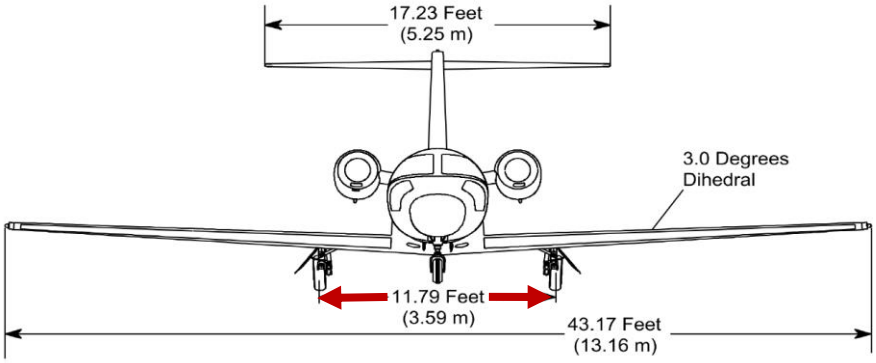

Fig. 2. Dimensions of Cessna C510 type aircraft

According to daily flight plans for the corresponding period on March 3 and 4, except for the Cessna C510 YR-CMO aircraft, other aircraft with a similar track gauge did not take off.

According to crew reports, the crew did not hear or feel anything unusual during takeoff. There were no changes in the parameters of the aircraft systems. During the post-flight inspection, the PIC did not find anything unusual in the technical condition of the aircraft.

The NBAAI received a report about the incident from Kyiv International Airport (Zhulyany) on March 04, 2021 at 11:29 in the format of a mandatory notification of the occurrence. The notification reported on the detected destroyed side lights No 42 and No 44 during a routine inspection of the runway by the aerodrome service. Due to the lack of information about the presence of a high level of safety risk, the NBAAI did not take a decision to investigate the incident. On March 16, 2021 at 13:17 local time, NBAAI received from Kyiv International Airport (Zhulyany) the additional notification of the occurrence that was classified by the provider as a serious incident (takeoff of the flight YRCMO to the south of the RWY26 side lights, during which two runway side lights were damaged). On March 06, 2021 NBAAI received a report on the results of the internal investigation of the incident from Kyiv International Airport (Zhulyany), assessed the safety risk as acceptable and decided to conduct an independent investigation. On April 13, 2021 at 09:12, the NBAAI informed the Romanian Safety Investigation and Analysis Authority (SIAA) of the initiation of an investigation and requested the appointment of an accredited representative. On April 14, 2021 NBAAI sent a Notification on serious incident to ICAO and NTSB as the State of Design and Manufacturer of the aircraft. To assist in the investigation of a serious incident, the SIAA has appointed an accredited representative.

1.2. Injuries

As a result of the incident, no one was injured.

1.3. Aircraft damage

As a result of the incident, the aircraft was not damaged. After the aircraft returned from UKOO to UKKK and the aircraft was parked at L-17, the airport inspector, together with a representative of the handling company, took pictures of the right main landing gear of the Cessna C510 YR-CMO aircraft. On the right landing gear, red paint was clearly visible from the spring-loaded runway side light markers (see Figure 3).

Fig. 3. Photo of the right landing gear with a red mark from the spring-loaded runway side light markers

1.4. Other damage

As a result of the incident, the side lights of runways No 42 and 44 were damaged. Runway side light No. 42:

the upper part of the light was damaged, including the outer and inner scattering hoods and their attachments. At the base of the light attachment, a trace from the wheel of the landing gear of the aircraft is visible.

Fig. 4. Destroyed runway light No. 42.

Runway side light No. 44:

the light is completely destroyed, fragments of light are scattered in the area between the lights No. 44 and 43. On the base of the light attachment, the aircraft wheel trace is clearly visible, which passes through the center of the base of the attachment.

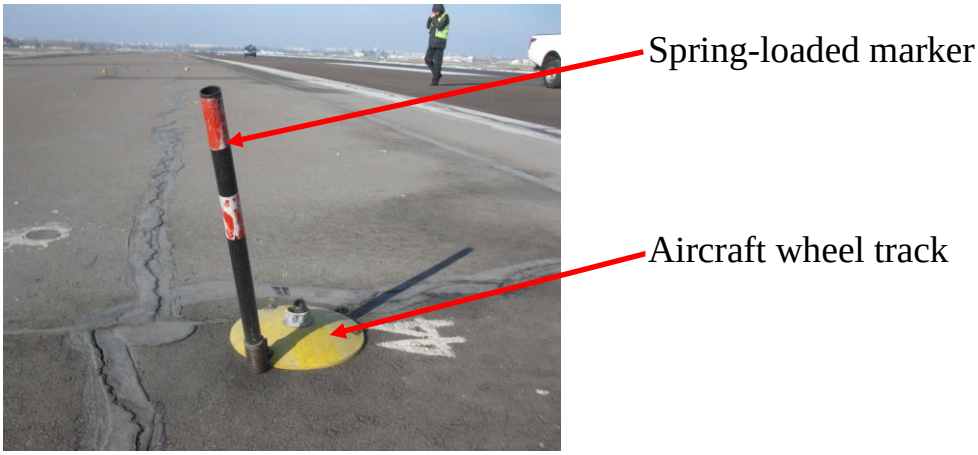

Fig. 3. Destroyed runway light No 44.

1.5. Personnel information

Position	PIC
Age	55 years
Position	Co-pilot
Age	59 years

1.6. Aircraft information

Aircraft	Cessna C510
Manufacturer serial number	510-0433
Nationality and registration mark	YR-CMO
Operator	Conarg Motion
Manufacturer	Textron Aviation
Date of manufacture of the aircraft	20.11.2013
Flight hours since the beginning of operation / last repair	1860 h/38 h
Engine No. 1:	
Engine type	PW615F-A
Manufacturer number	LB0887
Operating time since the beginning of operation	1860 h.
Engine No. 2:	
Engine type	PW615F-A
Manufacturer number	LB0886
Operating time since the beginning of operation	1860 h.

1.7. Meteorological information

According to the information on the actual weather (MET REPORT) provided by the AMSC "Kyiv", at "Kyiv" airfield (Zhulyany) at the time of the occurrence, the weather was as follows:

for 18:00: wind in the landing zone of RWY26 250º 4 m/s, at the end of RWY 250º 4 m/s, good weather conditions, air temperature + 02ºC, dew point temperature -02ºC, atmospheric pressure reduced to mean sea level according to

standard atmosphere 1023 GPa, atmospheric pressure at the runway threshold level 1002 GPa, landing forecast without significant changes;

for 18:30: wind in the landing zone of RWY26 230º 3 m/s, at the end of the runway 230º 2 m/s, good weather conditions, air temperature + 02ºC, dew point temperature -02ºC, atmospheric pressure reduced to mean sea level according to standard atmosphere 1023 GPa, atmospheric pressure at the runway threshold level of 1002 GPa, landing forecast without significant changes.

1.8. Navigational aids

Information about the lighting system installed at the aerodrome

At the Kyiv (Zhulyany) aerodrome, a high-intensity lighting system has been installed and is being operated to ensure accurate approach, landing, taxiing and take-off of aircraft of the 1st ICAO category in accordance with magnetic bearing to landing 259º / 079º. The length of approach lights from magnetic bearing to landing 259º is 300 m. The system has been in operation since 2011. Manufacturer - IDMAN (Finland). Certificate of suitability of equipment for operation № АО 09-02-192 was issued by the State Aviation Administration and is valid until 01.09.2023.

The lighting facilities include the following subsystems of lights:

- with magnetic heading 259º: side row lights, runway end lights, approach threshold lights, visual glide-path indication lights of type PAPI, simple touchdown zone lights, lead-in lights and crossbar lights 300 m long;
- with magnetic heading 079º: side row lights, runway end lights, approach threshold lights, visual glide-path indication lights of type PAPI, simple touchdown zone lights, lead-in lights and crossbar lights 900 m long, approach flashing lights;
- edge lights on taxiway-1,2,4, centerline lights on taxiway-4, clearance bar on taxiway-4, runway protection lights on taxiway-1 and taxiway-2, aerodrome signs, side row lights of expansion RWY.

Side row lights

Side row lights, which include damaged lights No. 42 and No. 44 - elevated-type lights, panoramic lights, lens lights type IDM 5848/150W.

Note: *elevated-type lights are frangible and located low enough above the ground to provide clearance to propellers and aircraft engine nacelles.*

In the places of the runway expansion and the taxiway junction, the deepened bi-directional lights of the IDM 4062/2x105W type are installed. Side row lights are continuous white lights, at the last 600 m of the artificial runway they are yellow in the direction of aircraft landing. The average luminous intensity for the runway lights is more than 10 efficiency. In the section, starting from the start of the runway to the shifted threshold with magnetic bearing to landing 79º, the lights emit a red color in the direction of aircraft landing. The side row lights are equipped with spring-loaded “markers”.

Note: *the side row lights are additionally equipped with spring-loaded "markers" in order to prevent their damage during snow-clearing operations in the*

autumn-winter period (the corresponding recommendation is contained in paragraph 5.2.15 of the Manual on Aerodrome Service in Civil Aviation, according to which, when performing snow cleaning or snow compaction work, on the runway and other elements of the airfield, it is necessary to ensure that the landing lights and other lighting equipment are not damaged, for this lights and equipment should be marked with landmarks, red flags or branches. Over the past few years, "markers" have been used not only in winter, but remain for the whole year.

1.9. Communication

The radio exchange of the crew with the air traffic controllers was carried out at the operating frequencies of the Tower of the Kyiv (Zhulyany) aerodrome.

1.10. Aerodrome information

Aerodrome "Kyiv" (Zhulyany) is a certified civil aviation aerodrome, entered at the state register of civil aerodromes in Ukraine. Aerodrome certificate No. АП 09-02, valid at the moment of the occurrence, was valid until March 16, 2021.

On March 17, 2021, the State Aviation Administration issued a new aerodrome certificate UA - 004 in accordance with the provisions of the Aviation Regulations of Ukraine "Technical requirements and administrative procedures for certification of aerodromes." The owner of the aerodrome is the Kyiv City State Administration, the operator is the Communal Enterprise “International Airport “Kyiv” (Zhulyany).

The runway has dimensions of 2310x45m (with two take-off and landing courses - magnetic heading 79º / magnetic heading 259º), type of pavement - mixed, PCN 46/R/C/X/T, equipped for a precision approach according to Category I. With magnetic heading 259°, the runway threshold is shifted by 48m, with magnetic heading 79° - by 150m.

Aerodrome class – B (4C).

The Aerodrome is suitable for operation day and night, all year round.

Aerodrome elevation – 179 m.

Magnetic inclination – 7ºE.

Runway status information

Date	**Runway survey time (UTC)**	**Airfield Status Log Entries**
03.03.2021	15:40	Runway magnetic heading 259: wet. Friction coefficient = 0.58/0.58/0.58, treated with a liquid anti-icing agent, the estimated braking action is "good", R26/190058. No foreign objects were found.
	17:01	
	19:14	
	20:58	

	23:03	
04.03.2021	02:20	Runway magnetic heading 259: wet. Friction coefficient = 0.58/0.58/0.58, treated with a liquid anti-icing agent, the estimated braking action is "good", R26/190058. No foreign objects were found.
	04:42	
	06:15	
	06:52	

1.11. Flight recorders

During the investigation of a serious incident, information from the flight recorders is not used. Due to the fact that the investigation was launched a month after the occurrence of the event, information about the flight on 03.03.2021 was not saved at the flight recorders.

Investigator-in-Charge **Igor MISHARIN**

21.05.2021