PRELIMINARY REPORT

SERIOUS INCIDENT 2022/2076

State Commission on Aircraft Accidents Investigation (PKBWL)

UL. CHAŁUBIŃSKIEGO 4/6, 00-928 WARSZAWA | DUTY PHONE (+48) 500 233 233

PRELIMINARY REPORT

SERIOUS INCIDENT

OCCURRENCE NO – 2022/2076

AIRCRAFT – Aeroplane, Tecnam P2008-JC, SP-SCS

DATE AND PLACE OF OCCURRENCE– 6 May 2022, Chojna, Poland (52°38’08.10”N 017°27’23,66”E)

The Report is a document presenting the position of the State Commission on Aircraft Accidents Investigation concerning circumstances of the air occurrence, its causes and safety recommendations. The Report was drawn up on the basis of information available on the date of its completion.

The investigation may be reopened if new information becomes available or new investigation techniques are applied, which may affect the wording related to the causes, circumstances and safety recommendations contained in the Report.

Investigation into air the occurrence was carried out in accordance with the applicable international, European Union and domestic legal provisions for prevention purposes only. The investigation was carried out without application of the legal evidential procedure, applicable for proceedings of other authorities required to take action in connection with an air occurrence.

The Commission does not apportion blame or liability.

In accordance with Article 5 paragraph 6 of the Regulation (EU) No 996/2010 of the European Parliament and of the Council on the investigation and prevention of accidents and incidents in civil aviation […] and Article 134 of the Act – Aviation Law, the wording used in this Report may not be considered as an indication of the guilty or responsible for the occurrence. For the above reasons, any use of this Report for any purpose other than air accidents and incidents prevention can lead to wrong conclusions and interpretations.

This Report was drawn up in the Polish language. Other language versions may be drawn up for information purposes only.

WARSAW 2022

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Abbreviations

AGL	Above ground level
ANSW	Agenzia Nazionale per la Sicurezza del Volo (Italy)
CPL(A)	Commercial Pilot Licence (Aeroplanes)
FI	Flight Instructor
ft	Feet
IR	Instrument Rating
IPC	Illustrated Parts Catalog
kt	Knot
MEP (L)	Multi Engine Piston (Land)
PPL (L)	Private Pilot Licence (aeroplanes)
P/N	Part Number
RWY	Runway
SEP(L)	Single Engine Piston (Land)
UTC	Coordinated Universal Time
TSN	Time Since New
TSO	Time Since Overhaul

General Information

Occurrence reference number:	**2022/2076**			
Type of occurrence:	SERIOUS INCIDENT			
Date of occurrence:	6 May 2022			
Place of occurrence:	Chojna (52°38’08.10”N 017°27’23,66”E)			
Type and model of aircraft:	Airoplane, Tecnam P2008-JC			
Aicraft registration marks:	SP-SCS			
Aircraft user/operator:	Sky City			
Aircraft commander:	CPL(A)			
Number of victims/injuries:	Fatal	Serious	Minor	None
	-	–	–	2
Domestic and international authorities informed about the occurrence:	Polish Civil Aviation Authority, ICAO, EASA, ANSV			
Investigator-in-Charge:	Roman Kamiński			
Investigating Authority:	State Commission on Aircraft Accidents Investigation (PKBWL)			
Accredited Representatives and their advisers:	ACCREP from ANSV Technical adviser from Tecnam			
Document containing results:	Preliminary Report			
Safety recommendations:	YES			
Addressees of the recommendations:	CA. TECNAM S.R.L.			

1. FACTUAL INFORMATION

1.1. History of the flight

On 6 May 2022 at 13:09 hrs UTC, during an aerodrome traffic circuit training flight (7th circle near the Chojna aerodrome), the crew of the Tecnam P2008-JC aircraft at an altitude of about 1000 ft AGL noticed increased resistance in the elevator control system. To displace the elevator, the pilot had to use more force than in normal conditions.

The instructor immediately took over the controls and made the decision to land on the aerodrome. The pilot started descending at low speed in order to reduce the force acting on the elevator. On the RWY 27 final approach, about 10 seconds prior to touchdown, the instructor noticed even greater resistance of the control system, indicating that it was blocked. The pilot was forced to land with application of the trim. The landing was successful.

During the inspection of the plane after the flight, it was revealed that the left bolt of the stabilator hinge was broken and the right bolt was damaged (Fig. 1).

Fig. 1. Broken (1) and damaged (2) bolt of the stabilator hinge [source: PKBWL]

1.2 Injuries to persons

Injuries	Crew	Passengers	Others	Total
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	2	-	-	2

1.3. Damage to aircraft

Two bolts of the stabilator hinge were damaged.

1.4. Crew data

Flight instructor: Male, aged 22, holder of the CPL(A) issued on 8 January 2021, with ratings:

- SEP(L) (valid until 31 December 2022);
- MEP(L) (valid until 31 March 2023);
- IR (valid until 31 October 2022);
- FI (valid until 30 September 2024).

Flight time: 487:50 FH
Tecnam P2008-JC flight time: 27:23 FH

Student-pilot, during training for PPL(A).
Flight time: 23:54 FH

1.5. Aircraft information

Tecnam P2008-JC is a single-engine, two-seat, high-wing, metal-laminate construction aircraft, intended for basic training. The fuselage and the vertical stabilizer are made of carbon fiber. Wings and a stabilator are made of metal. The single-slot type flaps are electrically driven. The stabilator is equipped with an electric trimmer. Fixed landing gear with a nose wheel.
Fuel tanks with a total capacity of 110 litres are located in the wings.

Airframe:

Year of manufacture	Manufacturer	Serial Number	Registration marks	Register number	Register date
2014	Tecnam	1038	SP-SCS	5390	14.12.2020

Certificate of Airworthiness valid until: 18 April 2023

TSN: 3386 FH

Flights since new:	11484
TSO:	48,5 FH
Remaining overhaul life:	6,5 h
Date of the last periodic works - 100 H:	25 March 2022
after TSN e:	3337 FH
carried out by:	Zonda sp. z o.o.

Engine

Year of manufacture	Manufacturer	Serial number
2018	**Rotax 912 S2-01**	**9564675**

Date of installation on airframe:	2018
Maximum take-off power:	100 HP
TSN:	1386 h
Remaining overhaul life:	613 h
Date of the last periodic works - 100 H	25.03.2022
after TSN:	1338 h
carried out by:	Zonda sp. z o.o.

Propeller: 2-blade, wooden, fixed pitch

Year of manufacture	Manufacturer	Serial number
2021	**Hoffman HO17G HM-A174**	**81476**

Date of installation on airframe:	2021
TSN:	275 h
Date of the last periodic works - 100 H	25.03.2022
after TSN:	226 h
carried out by:	Zonda sp. z o.o.

Fuel quantity prior to the flight:

fuel: PB95, 70 l;

Mass data:

- empty aircraft : 421,5 kg
- fuel: 50,4 kg
- oil: 4,0 kg
- crew: 165,0 kg
- luggage: 3,0 kg

Total mass:

- permissible: 650 kg
- actual: 643,9 kg

1.6. Meteorological information

METARs from the nearest aerodromes:

METAR 061200Z EPSC 31013KT 280V340 CAVOK 17/05 Q1024

METAR 061200Z EPZG 34003KT 220V030 CAVOK 19/05 Q1024

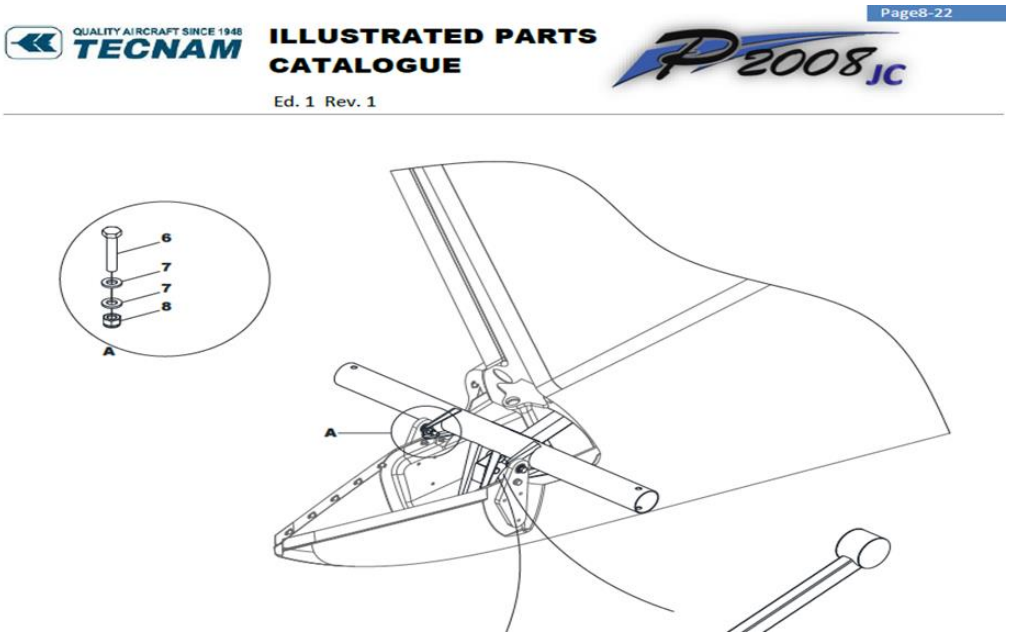
Based on the preliminary analysis, weather conditions had no impact on the course of the occurrence.

1.7. Place of occurrence information

Area of Chojna aerodrome (N52°56'21.9" E14°25'51.3").
Concrete RWY 1000 x 40 m, direction 09/27.
Elevation – 161 ft

1.8. Tests and research

During visual inspection the left bolt of the stabilator hinge (PN UNI 5736-6-35) was found broken (Fig. 2, item 6).



QUALITY AIRCRAFT SINCE 1948 TECNAM **ILLUSTRATED PARTS CATALOGUE** P2008 JC

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FIG.ITEM	P/N	DESCRIPTION	S/N	Qty LH RH
1	28-7-2000-000	MASS BALANCING ASSY		1
2	20-7-100-000	TORQUE TUBE ASSY		1
3	UNI5737-6-45	BOLT		2
4	UNI6592-6	WASHER		4
5	UNI7473-6	STOP NUT		2
6	UNI5737-6-35	BOLT		2
	AN4-11A	BOLT (MOD2008/106)	FROM 1086	2
7	UNI6592-6	WASHER		4
	AN960-416L	WASHER (MOD2008/106)	FROM 1086	4
8	UNI7473-6	STOP NUT		2
	MS21044-N4	STOP NUT (MOD2008/106)	FROM 1086	2

Fig.2. Broken bolt P/N UNI5737-6-35 (item.6) [source: IPC]

After dismantling the right bolt, damage in the form of dents and material losses was detected on its threaded part (Fig. 3).

Fig.3. The right bolt with damaged thread [source: PKBWL]

The thread was also damaged on the broken bolt. In addition, both bolts were bent.

According to the information obtained, from some users in recent years, due to the occurrence of excessive play at the stabilator, the bolts were replaced on eight aircraft and all of them were detected during inspections or maintenance. The incident that occurred on May 6, 2022 occurred inflight and posed a serious hazard to flight safety due to blockade of the stabilator.

In order to determine the factors causing damage to the thread, measurements of bolts and connected elements (hinges, washers, adjustment washers) were taken. It was found that PN UNI 5737-6-35 bolts with a diameter of 6 mm and a length of 35 mm have a non-threaded portion of 12 mm. The joined elements, after tightening the nut with a torque of 10 Nm, should be on the unthreaded part. The measurements showed that the thickness of the joined elements exceeded 12 mm.

The thickness of the joined elements increased with the increase of the thickness of the installed adjustment washers decreasing the play of the stabilator control system.

Moving the connected elements towards the threaded part of a bolt caused its damage visible on both bolts.

On 10 April 2018 the manufacturer issued Service Bulletin No. SB 298 - CS recommending the replacement of PN UNI 5737-6-35 bolts with a diameter of 6 mm and a length of 35 mm to PN AN4 - 11A with a diameter of 6,35 mm and a length of 30 mm and on 18 June 2021 issued Job Card No. 1466 describing the procedure for their replacement. The PN AN4 - 11A bolt with a diameter of 6,35 mm has the unthreaded part longer of about 8 mm, which eliminates the main factor causing damage to the bolts.

The Bulletin No. SB 298 - CS is not mandatory and its implementation is to be decided only by aircraft users, which may significantly extend the period of its implementation or, in extreme cases, may lead to its omission.

2. SAFETY RECOMMENDATIONS

Recommendation No. 1/2022/2076 for CA.TECNAM S.R.L - Tecnam P2008 – JC manufacturer

The occurrence on the Tecnam P2008 - JC aircraft on 6 May 2022 is of significant importance for safety.

The main factor determining the high probability of the recurrence of an incident similar to the investigated incident is damage to the thread of the bolts resulting from interaction with mating elements (hinges and washers) during normal operation, and this probability increases with increasing time of operation.

The current scope of service does not provide for the disassembly of the bolts and thus makes it impossible to check their mechanical condition on an ongoing basis.

The Bulletin No SB 298-CS recommending bolts replacement eliminates the cause of malfunctions, but it is not mandatory and therefore it has not been implemented on all concerned airplanes.

Consequently, SCAAI recommends that the aircraft manufacturer, changes the status of the Bulletin No SB 298 - CS to mandatory.

THE END

Investigator-in-Charge

Signature on original

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