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Swiss Transportation Safety Investigation Board STSB

2nd status report by the Swiss Transportation Safety Investigation Board STSB

concerning the status of the investigation into the accident involving the Junkers Ju 52/3m g4e transport aeroplane, HB-HOT,

operated by Ju-Air

on 4 August 2018

1.2 km south-west of Piz Segnas, municipality of Flims (canton of Grisons)

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Purpose of this status report

In accordance with Article 16, Section 7 of (EU) Regulation No. 996/2010 of the European Parliament and of the Council of 20 October 2010, which is directly applicable in Switzerland, concerning the investigation and prevention of accidents and incidents in civil aviation and repealing Directive 94/56/EC (996/2010/EU), the Swiss Transportation Safety Investigation Board (STSB) is publishing a report describing the progress of the investigation on the anniversary of the accident.

Since the Swiss Transportation Safety Investigation Board will shortly publish the final report, it does not present any partial results in the framework of this status report. The STSB can answer questions about the results of the investigation only when the final report is published.

Synopsis

Summary

Owner	Swiss Air Force, Postfach 1072, 8600 Dübendorf, Switzerland
Operator	Ju-Air as part of Verein der Freunde der Schweizerischen Luftwaffe (Association of the Friends of the Swiss Air Force [VFL]), Überlandstrasse 271, 8600 Dübendorf, Switzerland
Manufacturer	Junkers Flugzeug- und Motorenwerke AG, Germany
Aircraft type	Ju 52/3m g4e
Country of registration	Switzerland
Registration	HB-HOT
Location	1.2 km south-west of Piz Segnas, at 2475 m AMSL[1]
Date and time	4 August 2018, 16:57
Type of operation	Commercial
Flight rules	Visual Flight Rules (VFR)
Starting point	Locarno (LSZL)
Destination	Dübendorf (LSMD)
Flight phase	Cruise

Overview

On 4 August 2018 at 16:14, the historic Junkers Ju 52/3m g4e transport aeroplane registered as HB-HOT and operated by Ju-Air, took off from Locarno aerodrome for a flight to Dübendorf military aerodrome. Approximately 40 minutes later the aircraft flew on a north-north-easterly track into the valley south-west of Piz Segnas. Towards the northern end of the valley basin the aeroplane began a left turn, which developed into a downward spiral-shaped trajectory. Seconds later the aeroplane collided almost vertically with the terrain. All 20 persons on board suffered fatal injuries. The aircraft was destroyed.

History of the investigation

Since in the case of this accident the reconstruction of the actual flight involved in the accident was complex, the Swiss Transportation Safety Investigation Board's investigation team initially concentrated primarily on a detailed analysis of the wreckage. These clarifications provided information on technical factors involved in the accident and on systemic risks related to flight operations and maintenance. They also revealed certain systemic safety deficits. Therefore, on 20 November 2018, the STSB published an interim report with a safety recommendation and a safety notice so that flight safety could be improved even as the investigation was progressing.

With the same intention, in September 2019 the Swiss Transportation Safety Investigation Board comprehensively informed the management of the operator, the maintenance companies and the Federal Office of Civil Aviation (FOCA) of the investigation results available up to

[1] AMSL: above mean sea level

that point and the identified safety deficits. By so doing, the STSB wished to give these organisations an opportunity to take timely measures to improve safety before conclusion of the investigation.

Reconstruction of the accident

Since the aircraft involved in the accident, a historic Junkers Ju 52/3m g4e transport aeroplane, had no kind of recording equipment installed on board, the investigation team had to resort to other data sources for the reconstruction of the accident flight:

The STSB reconstructed large parts of the flight paths of HB-HOT using radar data. Furthermore, it evaluated extensive image and video material as well as statements from numerous witnesses who had observed HB-HOT from the ground. In addition, 44 data media from mobile telephones and video cameras of passengers and crewmembers were able to be recovered. Some of these recording devices had been badly damaged in the accident. It was finally possible to read eight of these data media.

The STSB used photogrammetric methods to determine the positions in space of the aircraft involved in the accident, its orientation angles in three axes and its speed relative to the ground, especially for the crucial flight phase before the accident.

An analysis of the audio tracks from the available video recordings made it possible to determine the rotational speed of the engines and to assess their operation during the accident.

In addition to a detailed analysis of the weather conditions, the STSB arranged for the wind flow around the Segnes Pass to be simulated using a fine-mesh model, by means of which the actual wind and temperature data were used as boundary values. Moreover, for several weeks last summer, the STSB took measurements in the area of the accident. In addition to a classic weather station, which measured the wind, air pressure, temperature and humidity on the ridge of the Segnes Pass, a solar-powered wind measuring system (Lidar[2]) recorded the three-dimensional flow conditions in the area of the flight path shortly before the onset of the spiral-shaped flight path. This measurement enabled the STSB to reconstruct the wind conditions on the day of the accident in the valley basin southwest of Piz Segnas to such a degree that it could assess their likely effect on the aeroplane involved in the accident.

Systemic aspects

To assess previous Ju-Air flights with reference to flying tactics in the mountains and general flight operations, the STSB's flight data laboratory analysed radar data from flights between 6 April 2018 and 4 August 2018. This was necessary because the air operator used its aeroplanes without continuous flight data monitoring up to the time of accident. The STSB supplemented this analysis of radar data with photographs and video recordings, other flight path recordings and verbal descriptions of flights, which had been made available to it by the public. The Swiss Transportation Safety Board thanks all those who supported the investigation with their great willingness to help.

The STSB also examined the operating principles, crew training and the management instruments of the air operator in relation to their impact on the events leading to the accident. The investigation team also documented and assessed the effectiveness of the air operator's quality and safety management and the supervision of the company by national authorities.

These results ultimately serve to reliably explain the sequence of events of the accident and also to show the systemic background which allowed the accident to develop.

[2] Lidar: Laser detection and ranging – a measuring system that emits laser pulses and evaluates the backscattered light from the atmosphere, in this case with regard to the Doppler effect. In this investigation, it was used for three-dimensional measurements of wind above the site.

Conclusion of the investigation

At the beginning of June 2020, the STSB was able to send the draft of the final report to the persons involved in and participating in the investigation for their comments. After this phase of 60 days, the STSB will evaluate the feedback and make any additions or justified corrections to the draft. The Board will then finally review and approve the final report so that it can be published before the end of this year.

Bern, 3 August 2020 Swiss Transportation Safety Investigation Board