MINISTRY FOR
INNOVATION AND TECHNOLOGY
TRANSPORTATION SAFETY BUREAU

FINAL REPORT

2016-340-4

Serious incident

Latvia

Riga Airport (EVRA)

15 August 2016

Airbus A320

HA-LPN

General information

This investigation is being carried out by Transportation Safety Bureau on the basis of

- Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and repealing Directive 94/56/EC,
- Act XCVII of 1995 on aviation,
- Annex 13 identified in the Appendix of Act XLVI. of 2007 on the declaration of the annexes to the Convention on International Civil Aviation signed in Chicago on 7th December 1944,
- Act CLXXXIV of 2005 on the safety investigation of aviation, railway and marine accidents and incidents (hereinafter referred to as Kbvt.),
- NFM Regulation 70/2015 (XII.1) on safety investigation of aviation accidents and incidents, as well as on detailed investigation for operators,
- In the absence of other relevant regulation in the Kbvt., in accordance with Act CL of 2016 on General Public Administration Procedures.

The competence of the Transportation Safety Bureau of Hungary is based on Government Regulation № 230/2016. (VII.29.) on the assignment of a transportation safety body and on the dissolution of Transportation Safety Bureau with legal succession.

Pursuant to the aforesaid laws,

- Transportation Safety Bureau Hungary shall investigate aviation accidents and serious incidents.
- Transportation Safety Bureau Hungary may investigate aviation and incidents which – in its judgement – could have led to more accidents with more serious consequences in other circumstances.
- Transportation Safety Bureau Hungary is independent of any person or entity which may have interests conflicting with the tasks of the investigating body.
- In addition to the aforementioned laws, the ICAO Doc 9756 and the ICAO DOC 6920 Manual of Aircraft Accident Investigation are also applicable.
- This Report shall not be binding, nor shall an appeal be lodged against it.
- The original of this report was written in the Hungarian language.

Incompatibility did not stand against the members of the IC. The persons participating in the safety investigation did not act as experts in other procedures concerning the same case and shall not do so in the future.

The IC shall retain the data having come to their knowledge in the course of the safety investigation. Furthermore, the IC shall not be obliged to make the data – regarding which the owner of the data could have refused its disclosure pursuant to the relevant act – available for other authorities.

This Final Report

was based on the draft report prepared by the IC and sent to all affected parties for comments.

Copyright Notice

Translation

This document is the translation of the Hungarian version of the Final Report. Although efforts have been made to translate it as accurately as possible, discrepancies may occur. In this case, the Hungarian is the authentic, official version.

Table of Contents

Definitions and Abbreviations

A320	*Airbus A320/A321 typerating*
ATPL	*Airline Transport Pilot Licence*
CPL	*Commercial Pilot Licence*
EASA	*European Union Aviation Safety Agency*
Flight plan	*Specified information provided to air traffic service units, relative to an intended flight or portion of flight of an aircraft;*
FTL	*Flight and Duty Time Limitation*
IC	*Investigating Committee*
ICAO	*International Civil Aviation Organization*
IR	*Instrument Rating*
Kbvt.	*Act CLXXXIV of 2005 on the safety investigation of aviation, railway and marine accidents and incidents (hereinafter referred to as Kbvt.)*
MIT	*Ministry for Innovation and Technology*
MND	*Ministry for National Development*
NTA AA	*National Transport Authority Aviation Authority (till 31 12 2016) (Hungary)*
ORO	*Organisation Requirements for Air Operations*
PAN PAN	*a radiotelephony urgency signal consisting of the spoken words PAN, PAN*
TSB	*Transportation Safety Bureau (Hungary)*
UTC	*Coordinated Universal Time*

Introduction

Occurrence category		Serious incident
Aircraft	Manufacturer	Airbus Industrie
	Type	Airbus A320
	Registration number	HA-LPN
	Operator	Wizz Air Hungary Kft., till 31 March 2019 Wizz Air Hungary Zrt., as from 31 March 2019
Occurrence	Date and time	15 August 2016, 21:10 UTC
	Location	Riga Airport (EVRA), Latvia (Figure 1)
Number of people fatally / seriously injured in the occurrence:		0 / 0
Extent of damage to the aircraft involved in the occurrence:		Undamaged

Any clock-time indicated in this report is given in UTC.

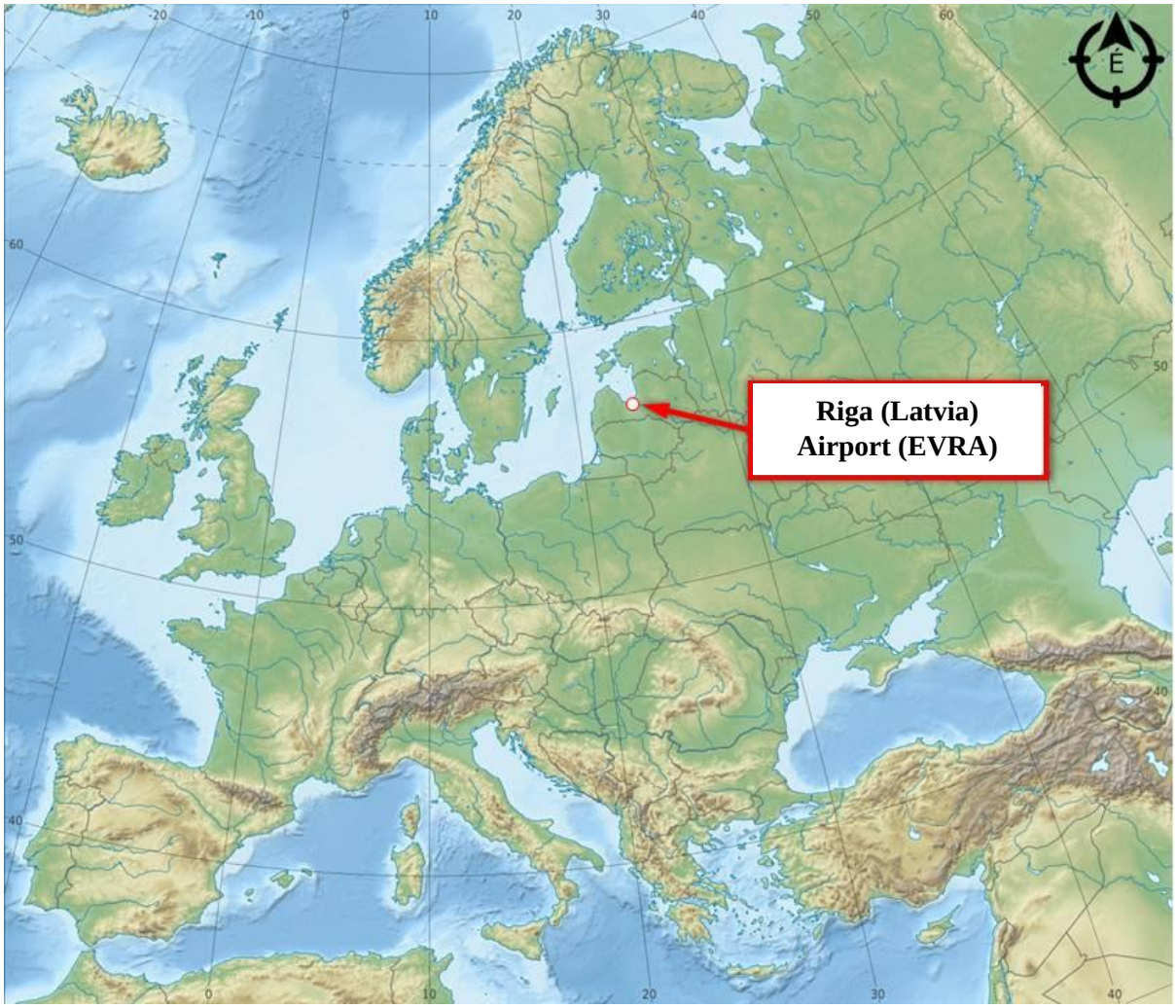

Figure 1: Location of the occurrence in Europe (Internet)

Reports and notifications

The occurrence was reported to the duty service of TSB by the flight safety staff of the operator on 16 August 2016, at 23:14.

The duty service of TSB notified:

- National Transport Authority Aviation Authority on 17 August 2016, at 02:13.
- The European Union Aviation Safety Agency (EASA) on 18 August 2016, at 12:35.
- International Civil Aviation Organization (ICAO) on 18 August 2016, at 12:48.

Investigating Committee

The Head of TSB assigned the following investigating committee (hereinafter referred to as the "IC") for the investigation of the case:

Investigator-in-charge	**Gábor Erdősi**	Investigator
Member	**József Mezei**	Investigator

Overview of the investigation process

The operator informed the IC that the Latvian accident investigation body did not intend to launch a technical investigation into the occurrence. In the course of the investigation, the IC:

- obtained weather, NOTAM and other information related to the flight concerned;
- obtained the reports produced by the persons and entities concerned in the occurrence;
- obtained and studied the transcripts of crew interviews;
- obtained the operator's operation manual;
- consulted experts dealing with the risks related to the fatigue of the operator's flight crews;
- obtained the documentation prepared by the operator's system in relation to the occurrence;
- analysed available data and information, and drafted an investigation report of the occurrence.

Short summary of the occurrence

During the flight from Barcelona to Riga, the Captain of the flight began to show the symptoms of severe physical and mental exhaustion. With time, such symptoms became so severe that the Captain handed over his task to his co-pilot until landing. His seat was occupied by an other co-pilot of the airline, who was staying on the plane as a passenger. The Captain watched the events from the observer's seat.

In the opinion of the Investigating Committee of the Transportation Safety Bureau (hereinafter: the "IC"), the incident was caused by unusually demanding stresses on the Captain during the preceding period and the fact that his state had not been assessed properly neither by himself nor by his environment. The IC did not find any circumstances justifying the issue of a safety recommendation.

1. Factual information

1.1. History of the flight

On the day of the occurrence, the crew were doing a Riga-Barcelona-Riga flight of the airline Wizz Air. During the pre-flight preparation, the crew discussed the Captain's state of health, but he said he felt fully fit to perform his duties. The implementation of the flight was somewhat more complicated than usual for the crew, especially for the Captain, mainly due to the special features of the timetable and the unfavourable weather conditions in Riga. The take-off in Riga was delayed first by the late availability of the aircraft for the flight, and then by the change of the runway in use due to wind direction. The delay of the departure was a more important issue than usual because the expected time of their return was too close to the time of the closing of Riga Airport for the night at 22:00. The situation was exacerbated by the fact that the forecasts had also indicated unfavourable, stormy weather for the period of their arrival. (That did not happen at last, but the crew could not know it at the time of departure.)

Finally, they took off with a delay of an hour, at 13:57. The flight and landing in Barcelona were uneventful. The period of their staying on the ground in Barcelona again placed considerable stress on the Captain. The return flight, which would have been urgent due to the closure of the Riga Airport, was delayed by several technical difficulties, such as clarification of differences of views with the ground handling personnel and the expiry of the flight plan earlier submitted to the air traffic management. The ATC clearance was finally received at 18:05. During the taxi towards the runway, the Captain's health problems became visible to others as well. He replied to the co-pilot's question that he felt tense but fit to fly.

The take-off in Barcelona took place at 18:25. The flight was uneventful until the aircraft entered to the Italian airspace, but the Captain's health problems worsened, which, as he said, manifested in a tense mood, intense heartbeat, and mood swings. The symptoms worsened in the Italian airspace where the Captain began to complain of sickness and panic attacks already. However, the idea of the emergency landing in Milan was discarded, but the Captain assigned all flight-related tasks to the co-pilot.

Despite a thirty-minute rest, the Captain's symptoms got even worse, so a co-pilot of the airline, who was on board as a passenger, was invited into the cockpit, in accordance with the procedure of the airline, to assist work from the observer's seat. As the situation still did not improve, the Captain decided to swap seats with the invited Co-pilot after starting the descent before landing. The flight was completed in this layout. Prior to the approach, the air traffic controller was notified about the situation in a PAN PAN message via the radio. The landing took place without further mentionable events on Runway 18 at Riga Airport at 21:40. A mobile health service unit examined the captain, but found no reason for transporting him to the hospital or performing immediate medical care.

1.2. Injuries to persons

Injuries	Crew		Passengers	Other
	Pilot	Flight Attendant		
Fatal	0	0	0	0
Serious	0	0	0	0
Minor	0	0	0	
None	2	4	182	

1.3. Damage to aircraft

There was no material damage to the aircraft involved in the incident.

1.4. Other damage

The IC had got no information on other damage by the completion of the investigation.

1.5. Crew data

1.5.1. Pilot Flying (Captain)

Age, nationality, gender		35 years old, Belgian, male
Licence data	Type	ATPL
	Ratings	A320, IR
Flight hours	In the previous 24 hours	7 hours and 50 minutes
	In the previous 7 days	30 hours and 09 minutes
	In the previous 90 days	219 hours and 45 minutes
	Total:	8 060 hours

The Captain of the flight had joined the airline as a captain. A specialist examination performed abroad after the event found fatigue due to long-lasting stress (according to information available to the IC). The Captain reported that several stressful events in the previous period had contributed to his physical and mental exhaustion (multiple changes of base airport, an adverse change in his private life, several bird strike incidents in the previous months, and a flight with malfunctioned weather radar in stormy weather a few weeks before).

It was also the source of an emotionally charged conflict in the previous month when he had to land at an alternate airport with his passengers because their flight had missed the closing time of Riga Airport. His condition was aggravated by the events of the day of the occurrence, in particular the risk of late arrival at Riga airport, which had previously been a very unpleasant experience, and on that date Vilnius Airport (their usual alternate airport) was closed, so they would have had to take a longer detour to Helsinki.

After the event, the Captain was not scheduled for a long time, and finally he left the airline.

1.5.2. Pilot Monitoring (Co-pilot) data

Age, nationality, gender		33 years old, French, male
Licence data	Type	CPL
	Ratings	A320, IR
Flight hours	In the previous 24 hours	7 hours and 50 minutes
	In the previous 7 days	22 hours and 15 minutes
	In the previous 90 days	174 hours and 14 minutes
	Total:	3 486 hours
	Total on the type concerned:	1 486 hours
Types flown:		Airbus A320

The co-pilot assigned to the flight had received training for the Airbus A320 type at Wizz Air.

1.6. Aircraft data

The Airbus A320 is a metal structured, narrow-body, twin jet engine transport aircraft. It may carry 150 to 186 passengers depending on the seat arrangement. Its wingspan is 38.8 m, and its maximum take-off mass is 78 t (limited to 71.5 t in the case of the aircraft concerned). Its a multi crew aircraft, the flight procedures are designed for two pilots, but the layout of the controls allow one pilot operation if necessary. The aircraft had a valid airworthiness certificate at the time of the incident. The parameters of the aircraft did not affect the occurrence and therefore not be discussed in detail.

1.7. Meteorological data

The landing in Riga took place after sunset, in full darkness. During this period, a southern wind of 15 km/h was blowing and the visibility was more than 10 kms, there were cumulonimbus clouds among the clouds in the sky, but not in the vicinity of the airport.

1.8. Navigation equipment

The equipment specified in the type-certificate was installed on the aircraft and no comments were made by or reported to the IC relating to the operation thereof.

No comments on the operation of the ground-based equipment were made by or reported to the IC. The navigation equipment had no impact on the course of the events, so they are not be discussed in detail.

1.9. Communications

The equipment specified in the type-certificate was installed on the aircraft and no comments were made by or reported to the IC relating to the operation thereof.

No comments on the operation of ground-based equipment were made by or reported to the IC, it was suitable for the task.

Prior to the approach to Riga, the crew informed the air traffic controller about the Captain's health problem in a PAN PAN message.

The communication equipment had no impact on the course of the events, so they are not be discussed in detail.

1.10. Aerodrome data

The aircraft took off from Josep Tarradellas Barcelona - El Prat Airport (BCN / LEBL) on 15 August 2016 at 18:25. The destination aerodrome was Riga International Airport (RIX/EVRA), where the landing was performed at 21:40 on 15 August 2016. At the time of the occurrence, Riga Airport was closed for aircrafts arriving after 22 o'clock. The usual alternate aerodrome would have been Vilnius International Airport (VNO / EYVI), but on the day of the occurrence Vilnius airport was closed, so the crew would have used Helsinki-Vantaa International Airport (HEL / EFHK) as an alternate aerodrome.

The parameters of the airports did not affect the occurrence of the case and therefore need not be discussed in detail.

1.11. Flight data recorders

The aircraft had the flight data recorders specified in its type-certificate. As the IC became aware of the incident one day after the event, it was not possible to obtain and evaluate the recording of the voice recorder.

1.12. Wreckage and impact data

There was no wreckage in the occurrence.

1.13. Information on medical examination

The health service unit that went to the aircraft in Riga examined the Captain, but did not justify hospitalization or immediate medical care. After the occurrence, an expert examination carried out abroad revealed exhaustion due to persistent stress (according to information available to the IC). The Captain reported that several stressful events in the previous period had contributed to his physical and mental exhaustion: multiple changes in base airports, a negative change in his personal life, more bird strike events in the previous months, and a flight with malfunctioned weather radar in stormy weather a few weeks before. There was also a source of a serious human conflict in the previous month when he had to land at an alternate destination aerodrome with his passengers due to missing the closing of Riga Airport.

No forensic examination was performed.

1.14. Fire

The occurrence involved no fire.

1.15. Chances of survival

There was no injury to people.

1.16. Tests and research

No tests or examinations were performed or ordered by the IC.

1.17. Organisational and management information

1.17.1. Rules

The requirements relating to flight and duty time limits and rest periods for the air crew concerned are set out in Annex III ORO1.FTL[2] to Commission Regulation (EU) No 965/2012 (as modified several times). The air operations manual of the airline concerned sets out these rules in Chapter 7 of Volume A, typically in agreement with the EU Regulation, or even more strictly in certain places. In the course of the investigation, there was no indication that the above rules would have been infringed in relation to the pilot concerned. With effect from 18 February 2016, the Commission Regulation (EU) No 83/2014 provides for the establishment of a subsystem managing the risk of fatigue of crew members as an integral part of the system of management of operators.

[1] Organisation Requirements for Air Operations
[2] Flight and Duty Time Limitations

1.17.2. Organisation

The airline concerned started the establishment of a compliant internal division to manage the risk arising from fatigue of flight crews ten months before the occurrence. The main areas of operation of such division are:

- raise awareness of the subject through training and regular information for flight crews, their managers, and the personnel who manages aircrew roster;
- gather information on exhaustion or imminent danger of exhaustion among flight crews;
- assess and evaluate the extent and evolution of the risk arising from exhaustion;
- develop proposals to reduce these risks;
- follow up and monitor the implementation and impact of the proposals adopted.

During the period in which the event occurred, the establishing of the division was still underway, its operation was about to start, with the impact of its activity becoming perceptible gradually. As a result of a slightly delayed decision-making process, the computerised flight crew roster program was completed with an illustrative (visual) crewmember fatigue module at the time of the closing of this investigation.

1.17.3. Organisational culture

In the air transport industry, the fatigue-related organisational culture of flight crews is contradictory and difficult to quantify. Although it is well known that the fatigue of the flight crew poses a threat to aviation safety, the assessment of the risk it entails for the crew member and its meaning is not a simple task. On the one hand, it may conflict with the image perceived by the person of his/her own physical condition and endurance, and on the other hand, the anxiety about the real or perceived danger of reprisal from the airline may act against open admission of fatigue. Ensuring the highest possible anonymity of reports and credible communication of thereof can help to overcome those difficulties. In the case of the airline concerned, an increase in the number of reports from year to year (Diagram 1) may indicate the gradual acceptance of the system, which is an important pre-requisite for effective recognition and management of fatigue and fatigue-related problems.

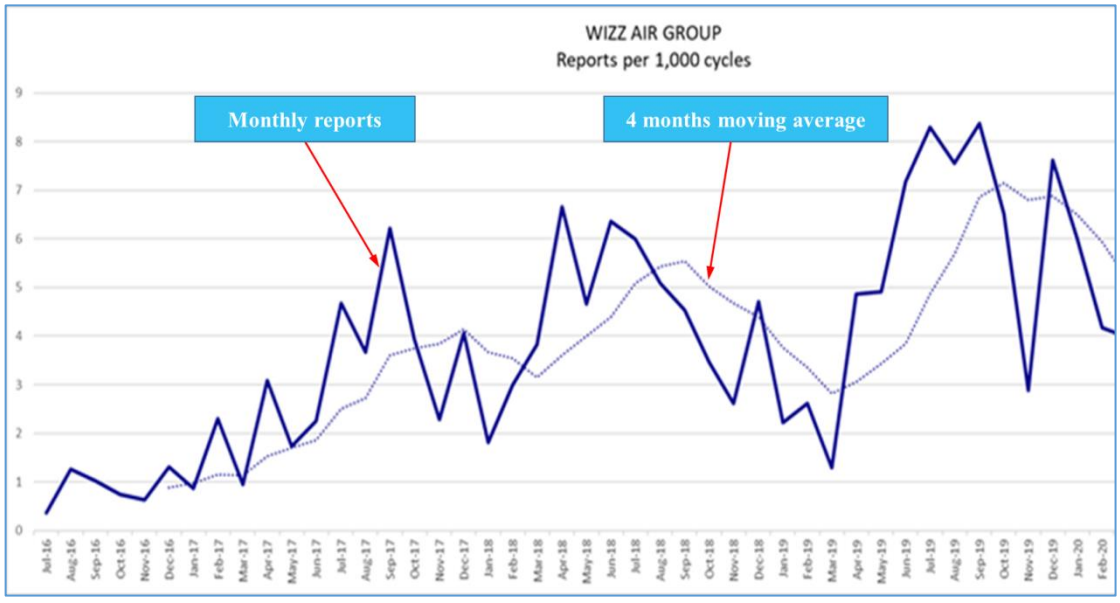

Diagram 1: Monthly number of reports (per 1 000 flights) of fatigue submitted by crewmembers of the airline concerned, (source: Airline)

1.17.4. Specific measures at the airline concerned, following the incident:

- The captain concerned was not allowed to fly until his aeromedical/psychological fitness was established.
- The occurrence was communicated to the staff concerned in the regular quarterly safety publication.
- The topic of the recognition and treatment of fatigue was given an emphasis in the syllabus of the training during the period following the occurrence.

1.18. Additional information

The IC has received no meaningful additional information and does not consider it necessary to disclose any information other than the above facts.

1.19. Useful or effective investigation methods

The investigation did not require the use of nonconventional methods.

2. Analysis

During the weeks and months preceding the event, the life of the Captain concerned contained a number of events which increased his fatigue to a level exceeding the usual, and was also fairly demanding for him mentally. In addition, the efficient use of rest periods for him was not only hampered by irregular working hours typical of a pilot's lifestyle, but a strong stress originating in his private life also largely prevented him from resting. Although the Captain noticed the worsening symptoms of his fatigue and stress, he considered that they had not yet reached the level that would hinder the performance of his work as a pilot-in-command. As a result, he did not consider it necessary to inform his colleagues nor the airline on his condition.

At the time of their meeting before the departure from Riga, the crew had a conversation about the Captain's condition, but the Captain said he felt fully fit to perform his duties. The situation of the subordinated crew members is not easy in such a situation. The system of flight procedures is based on the captain's clear leading position, to which the incapacitation of the captain is the only exception. In this case, the Captain was far from incapacitated at the time of the departure, so the rest of the crew would not have been able to question the Captain's decision even if they had foreseen the events. There was a similar situation before the departure from Barcelona where the Co-pilot mentioned the captain's condition to him, but the Captain deflected the issue.

When the Captain's condition actually turned critical on the way back to Riga, the crew, including the Captain, acted really in a constructive and responsible manner. The finding and activation of the co-pilot who was staying on board as a passenger in accordance with the company's required procedure proved to be especially useful. In fact, this arrangement did not only provide a fully capacitated person to manage the controls, but a third pair of eyes became also available to detect possible anomalies, which is particularly important in such an unexpected and unsettling situation.

The periods of work and rest for flight crews were uniformly regulated by the European Commission in a relevant Regulation, with the result of ensuring a unified guarantee of aviation safety, and the additional result of preventing the migration of airlines to other Member States with less strict national regulations. These mandatory requirements for work and rest periods significantly reduce the risks arising from the fatigue of members of flight crews, but, for reasons of size and manageability, cannot cover all possible situations. In order to further mitigate risks, operators should be able to collect information on the subject using an appropriate organisation and procedures, and to take measures tailored to local specificities. As flight crews perform their work and make their decisions in a fairly autonomous manner, workplace culture is also an important element of safety, in addition to proper regulation. One of the indicators in this culture is the number and content of voluntary reports on fatigue. In the case of the airline concerned, an increasing trend in the number of reports per year suggests the development of this culture.

3. Conclusions

3.1. Findings

3.1.1. Aircraft

The aircraft was airworthy.

The aircraft had a valid airworthiness certificate.

The aircraft concerned was not damaged in the occurrence.

According to its documents, the aircraft was equipped and maintained in compliance with effective requirements and the adopted procedures.

No information emerged during the investigation on malfunction of the structure or any system of the aircraft prior to the occurrence, thus contributing to the occurrence or influencing the course of events.

The navigation and communication equipment specified in the type certificate was installed in the aircraft, and the IC had made no notice and received no notice relating to its operation.

3.1.2. Crew / Pilot

At the time of the occurrence, the flight crew had the appropriate licences and ratings as well as adequate experience for the given flight task.

3.1.3. Air operations

The search for and activation of the airline co-pilot staying on-board the aircraft was carried out in compliance with the procedures of the airline.

The crew performed the flight in accordance with the requirements in force.

The aircraft was refilled with suitable quantity of fuel for the flight.

The landing took place in satisfactory night-time visibility conditions. (1.7)

3.1.4. Operating entity

In the period preceding the event, an internal division had already been established and began to work in order to identify and manage aircrew fatigue.

3.1.5. Flight data recorders

The equipment of air traffic management as well as the flight data recording systems required for the aircraft were at work. The voice records were not available for use already.

3.1.6. Medical and pathological information

During the flight, the Captain of the flight showed more and more serious symptoms of physical and mental exhaustion. With time, such symptoms became so severe that the Captain handed over his tasks, including the landing, to his Co-pilot and to the other pilot who had been staying on board as a passenger.

According to information available to the IC, a specialist evaluation performed abroad revealed fatigue due to chronic stress of the Captain.

3.1.7. Survival aspects

There was no personal injury.

3.2. Causes

During the investigation, the IC came to the conclusion that the occurrence was caused by the Captain's serious physical and mental exhaustion which had been the result of the combined effect of chronic fatigue and stress.

The IC identified the following contributing factors:

- The captain had not properly assessed his physical and mental condition.
- The crew members have no means to override the captain's decision on his own physical and/or mental condition until he/she gets incapacitated.

4. Safety recommendations

4.1. Measures taken by the operator during the technical investigation

Ten months before the occurrence, the airline concerned started to establish an internal division to assess the risk of fatigue of aircrews in accordance with Regulation (EU) No 83/2014. At the time of the occurrence, the establishing of the division was still in progress, with its operation only being started up. Completion of the computerised flight crew roster program with an illustrative (visual) crewmember tiredness module was started before the closing of this investigation.

4.2. Safety recommendation made in the course of the investigation

TSB issued no safety recommendation during the investigation.

4.3. Safety recommendation issued on completion of the investigation

The Investigating Committee of TSB identified no circumstance which would warrant the issuance of a safety recommendation.

Budapest, "24" March 2021

Gábor Erdősi
Investigator-in-charge

József Mezei
IC Member