MINISTRY OF
CONSTRUCTION AND TRANSPORT
TRANSPORTATION SAFETY BUREAU

FINAL REPORT (EXTRACTION)

2023-1152-5
(HU-10475)

Railway accident / Collision
Sáp, 15th November 2023

Translation

This document is the translation of Points 1, 5 and 6 of Hungarian version of the Final Report. Although efforts have been made to translate the mentioned parts of the Final Report as accurately as possible, discrepancies may occur. In this case, the Hungarian Final Report is the authentic, official version.

Basic principles of the safety investigation

The purpose of the safety investigation fulfilled by Transportation Safety Bureau (TSB) as National Investigation Body of Hungary is to reveal the causes and circumstances of serious railway accidents, railway accidents and railway incidents and propose recommendations in order to prevent similar incidents. The safety investigation is not intended to examine and determine fault, blame or liability in any form.

The findings of the safety investigation are based on an assessment of the evidence available and obtained by TSB in the course of the investigation, taking into account the principles of a fair and impartial procedure. In the Final Report, the persons involved in the occurrence shall be referred to by the positions and duties they had at the time of the occurrence.

The Final Report shall not have binding force and no appeal proceedings may be initiated against it.

This safety investigation has been carried out by TSB pursuant to relevant provisions of

- Act CLXXXIV of 2005 on the safety investigation of aviation, railway and marine accidents and incidents;
- Commission Implementing Regulation (EU) 2020/572 of 24 April 2020 on the reporting structure to be followed for railway accident and incident investigation reports;
- in the absence of other related regulation of the Act CLXXXIV of 2005, the TSB conducts the investigation in accordance with Act CL of 2016 on General Public Administration Procedures.

Act CLXXXIV of 2005 is to serve compliance with Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety.

The competence of the TSB 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.

The safety investigation is independent of other investigations, administrative infringement or criminal proceedings, as well as proceedings initiated by employers in connection with the accident or incident.

Copyright Notice

1. SUMMARY

On 15 November 2023, at 4:20 am, freight train No. 47487-2 passed the entry signal at danger without permission at Sáp station and entered track II at a speed of approximately 60 km/h, where it collided with the locomotive of passenger train no. 6419 staying there. Both locomotives were severely damaged, as were two wagons of the passenger train and one wagon of the freight train. The driver of the passenger train was seriously injured and four other people suffered minor injuries.

Based on the investigation:

- Due to fatigue, the driver of the freight train did not notice the station entry signal and the emergency situation. The driver did not manage his fatigue properly, but he had not been trained in this regard.
- The railway line underwent extensive reconstruction prior to the accident, during which new safety equipment was installed two months before the accident, but the track-side elements of the train control system were not installed, so the train control equipment on the freight train was unable to stop the train. The reconstruction was based on an economic decision, and no risk analysis was carried out with regard to train control.
- The combination of the traffic technology (selection of the receiving track) and the specific characteristics of the safety equipment (slipping route) prevented the incident from being averted by simultaneous active intervention by the controller after the emergency situation had arisen.

As regards fatigue, the TSB draws attention to a previously issued safety recommendation (BA2022-1268-5-01).

An official measure has been taken by the supervisory authority regarding the risk analysis related to train control, therefore it is not necessary to issue a safety recommendation.

5. CONCLUSIONS

5.1 Summary

5.1.1 Direct causes

Acts, mistakes, events or conditions or a combination thereof the elimination or avoiding of which could probably have prevented the accident or incident:

a) the driver of the freight train passed the entry signal at danger at Sáp station, without permission, and continued without slowing down until the collision;
b) on the section before the station, the driver was not alert enough to drive, and his responses to fatigue were counterproductive;
c) there was no train control equipment installed on the railway line involved.

5.1.2 Indirect causes

Acts, mistakes, events or conditions which influenced the occurrence by increasing its probability, accelerating the effects or the severity of the consequences, but the elimination of which would not have prevented the occurrence:

d) the locomotive driver of the freight train had undertaken a lot of shifts, although the number was still within the legal limit;
e) the locomotive driver of the passenger train did not recognize the emergency situation or did not act appropriately;
f) the choice of receiving tracks prevented the accident from being avoided;
g) the logic of the safety equipment installed on the slipping route prevents such incidents from being avoided;
h) the weather conditions in the hours preceding the incident and the night-time hour increased the risk of fatigue.

5.1.3 Systemic factors

Causal or contributing factors of organisational, management, social or regulatory nature which are likely to have an effect on similar or related occurrences, particularly including regulatory framework conditions, the design and use of the safety management systems, the skills of the personnel, the procedures and maintenance:

a) the training system is instruction-based and does not include knowledge on fatigue recognition and management;
b) risk assessments are based solely on the operator’s perspective and do not examine the risks inherent in the design of the equipment and its integration into the national regulatory system; this was only done after the investment decisions had been made.

5.2 Actions taken

The railway infrastructure manager had not taken any measures to prevent similar incidents by the time the draft final report was issued.

The railway undertaking reported the following measures:

- Before and after the incident, great emphasis was/is being placed on the working time schedule of locomotive drivers, with fixed time slots, rest periods longer than the legal minimum and reduced overtime.

- The rules for allowing locomotive drivers to work for more than one railway company have been tightened.

5.3 Additional notes

The IC did not identify any factors that are unrelated to the occurrence but increase risk.

5.4 Proven procedures, good practices

The IC identified no factor that helped to reduce the consequences of the occurrence and avoid a more serious outcome.

5.5 Lessons learnt

Although the incident can be directly attributed to the fatigue of a locomotive driver and his resulting incapacity to act, the surrounding system contributed to his fatigue and the serious consequences that ensued:

- there are tools available at company level to prevent and manage fatigue; furthermore, the recognition and management of fatigue can be learned, but this is lacking in the Hungarian railway system;
- the infrastructure can be supplemented with safety equipment even if this is not required by the law; furthermore, the capabilities of the safety equipment actually installed, traffic control technology and the choice of train reception tracks can also influence the consequences of errors.

6. SAFETY RECOMMENDATION

The TSB has previously issued a safety recommendation related to fatigue, the importance of which is also highlighted by the IC in the final report.

Risk analyses and assessments support the proper installation of safety equipment and related decision-making. At the time of the investigation, the Railway Authority Department of the ÉKM issued instructions to MÁV Zrt. in this regard; therefore, no safety recommendation is necessary on this matter.

6.1 Earlier safety recommendation

The probability of such cases can be reduced if train drivers are trained to recognize and manage fatigue (and if employers also support train drivers in managing fatigue). In this regard, the TSB previously issued a safety recommendation for the improvement of the training system in connection with a SPAD at Beled station, registered under number 2022-1268-5, the relevance of which it hereby draws attention to:

During its investigation, the TSB's investigating committee found that the immediate cause of the incident was the locomotive driver's fatigue, which he did not notice or recognize, but which was increasing. In view of the fact that the unrecognized and inadequately managed fatigue of the crew was a contributing factor in several events that occurred before and after the investigation of this event, the TSB issues the following safety recommendation:

Number: **BA2022-1268-5-01**
Addressed to: **Ministry of Construction and Transport, Railway Authority Department**
Responsible for introduction: **Magyar Közlekedéstudományi és Logisztikai Intézet (Hungarian Institute for Transportation Sciences and Logistics), Vasúti Képzési és Módszertani Központ (Railway Training and Methodology Centre)**

The TSB recommends the development of educational materials that provide information on the prevention, development, recognition and management of fatigue for those working in safety-critical jobs, and that this be made a mandatory part of basic and periodic training for personnel.

If the recommendation is accepted and implemented, the risk of accidents caused by staff fatigue can be reduced.