

MINISTRY FOR INNOVATION AND TECHNOLOGY

TRANSPORTATION SAFETY BUREAU

FINAL REPORT (EXTRACTION)



2020-0301-5 (HU-6269)

Railway incident / Signal passed at danger Isaszeg, 21 March 2020

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.

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1 SUMMARY

An instructor and a trainee locomotive driver were in service, within the framework of locomotive driver training, on the freight train № 55907 running from Miskolc-Gömöri station to Ferencváros station, and the controls of the locomotive were actually handled by the trainee. The train was planned to be waiting on Track III at Isaszeg station due to the traffic situation, but, at 00:10 o'clock on 21 March 2020, it passed the K3 exit signal at danger and stopped 200 metres after the signal.

The IC attributes the direct causes of the occurrence to human factors on the part of the locomotive crew. According to investigation findings, neither locomotive driver noticed the Danger aspect of the entry signal (which acted as distant signal for the exit signal), and they noticed the Danger aspect of the exit signal too late.

- The instructor's attention was distracted by something that would not have been a problem in the case of adequate line knowledge; however, due to some modification of the line, his line knowledge was of administrative nature only, but it was inadequate from technical aspect or in terms of safety. According to the IC's findings, it is not possible to assure in each case that locomotive drivers have line knowledge in the technical sense. However, regulation is based on the assumption that adequate line knowledge is available in each case therefore the risk of similar incidents is not managed.
- The instructor did not supervise the trainee's activity properly and he did not intervene in the trainee's driving in due time.
- The trainee based his driving style on the signals received from the train control system. However, the station concerned had such a short section with continuous signalling (similarly to another station involved in a similar incident earlier) which was neither able to furnish the locomotive driver with information in a timely manner, nor to enforce deceleration of the train before the signal at least.

The IC found the following indirect (organisational, regulatory) causes relating to the occurrence:

- Shortcomings of the practicability of line knowledge;
- Weaknesses in the training of the instructors involved in the practical areas of the railway jobs; and
- Insufficient continuous signalling installations.

TSB issues a safety recommendation:

- For amendment of the regulations relating to line knowledge, for the compensation and management of the risks of the lack of driving trains without technically reliable line knowledge, which is unavoidable in certain cases;
- For the introduction and widespread of up-to-date methods of acquiring line knowledge;
- For proper management of the risks related to too short sections of continuous signalling installations.

5. CONCLUSIONS

1.1 Summary

1.1.1 Causal factors

Any action, omission, event or condition, or a combination thereof that if corrected, eliminated, or avoided would have prevented the occurrence, in all likelihood:

- a) Neither the trainee nor the instructor noticed the aspect of the entry signal, and they noticed the exit signal aspect too late;
- b) In addition, the trainee based his driving style on the signals received from the train control system therefore he started to apply the brake too late, while the instructor had not identified such driving style and had not made the trainee give up that habit, and it became hazardous, because
- c) The information provided by the too short continuous signalling installation at the station was not suitable for supporting the stopping of a train in front of the signal.

1.1.2 Contributing factors

Any action, omission, event or condition that affects an occurrence by increasing its likelihood, accelerating the effect in time or increasing the severity of the consequences, but the elimination of which would not have prevented the occurrence:

a) The instructor's line knowledge was of administrative nature only, but it was inadequate from the technical aspect.

1.1.3 Systemic factors

Any causal or contributing factor of an organisational, managerial, societal or regulatory nature that is likely to affect similar and related occurrences in the future, including, in particular the regulatory framework conditions, the design and application of the safety management system, skills of the staff, procedures and maintenance:

- a) The rule relating to the installation of continuous signalling does not assure that continuous signalling be suitable for supporting vehicle driving or at least for preventing locomotive drivers' mistakes;
- b) Neither regulations nor the railway undertakings' practice takes into account those practically unavoidable situations where the locomotive driver has no technically reliable knowledge of the line, and the training system does not resolve that problem by using the available up-to-date training methods, or at least by requiring other risk mitigation measures;
- c) The training and examination of instructors of practical training in the railway qualifications predominantly focuses on the knowledge of rules and regulations and not so much on the issues and capability of supervision and transferring knowledge.

1.2 Actions taken or planned

The railway undertaking puts a presentation on SPAD events (first presented at TSB's Workshops of 2020) on the program of its training sessions.

The infrastructure manager gave no account of any action taken.

In their comments to the Draft Report, KTI Vasúti Képzési Módszertani Központ (Railway Training Methodology Center, KTI) gave the following information:

"In order to enforce the points of view included in the Draft Report, Railway Training Methodology Center, KTI has prepared simulation software for locomotive drivers who intend to carry out trainee drivers' practical training: it helps prepare them, in a way not used before, for their instruction activity to be performed as part of the practical driving training. Railway Training Methodology Center, KTI has ready simulation software and training session plan for this kind of really essential training of instructors involved in practical training."

In addition, a proposal to amend the training regulation has also been completed; it obligates railway infrastructure managers to serve more current and accurate data relating to railway newly constructed or reconstructed tracks, on the basis of which the railway undertakings can prepare their locomotive drivers for the changes.

According to the IC's position, the planned amendment of the regulation may improve the contents of training, but will not eliminate the unavoidable risk that, during their initial solo journeys, the locomotive driver's knowledge of the modified line will be limited compared to the line knowledge training runs carried out on lines not involved in the reconstruction works. Similar cases may be managed by the railway undertaking's safety management system, to which the Safety Recommendation № BA2020-0301-5-01 applies.

1.3 Other factors

Other factors which cannot be linked to the case but increase risk:

- a) The on-board data recorder of the locomotive was out of service, which the railway undertaking had not detected in due course;
- b) The train exceeded the speed limit to various extents.

1.4 Proven procedures, good practices

The IC identified no factors which would have mitigated the consequences of the occurrence or would have helped avoiding more a serious outcome.

1.5 Lessons learnt

The key to avoiding similar occurrences is attention paid by the crew. However, attention may be adversely influenced by the lack of proper line knowledge, as well as the fact that the system is not aware of it and fails to apply risk mitigating measures which help safe work in the case that driving work must be done in such circumstances.

In addition, too much confidence was placed in the signals coming from the train control system, which became a hazard in the situation concerned, due to shortage of the track section where continuous signalling was installed. The crew was not aware of that as a possible risk, although it exists at several points of the railway infrastructure. It must be emphasised during the training of the personnel that they should keep that in mind.

2 SAFETY RECOMMENDATIONS

Safety recommendations, together with the findings and conclusions in the final investigation report, represent important information for the further improvement of railway safety. Accordingly,

- The authorities responsible for safety shall take action as necessary to ensure that safety recommendations are duly taken into consideration and applied where appropriate;
- The organisations responsible for introducing such safety recommendations shall start, with no delay, the risk assessment and risk safetv management activities related to the contents of such recommendation within the procedural framework of their safetv management system.

Within 90 days of the issue of the safety recommendation, they shall report back to the IC on the actions taken or planned or on their non-acceptance (with justification) of such safety recommendation.

2.1 BA2020-0301-5-01

The regulations in effect, as well as current practice, relies on the assumption that always there is at least one person on the locomotive who has up-to-date knowledge of the line, bit that cannot always be provided by the available training capabilities. But the procedures applied lack the rules for the managing of the risks of journeys without proper line knowledge therefore TSB issues the following safety recommendation:

Number: BA2020-0301-5-01

Addressee: Railway Authority Division, Ministry for Innovation and Technology

Responsible for introduction: Railway undertakings

TSB recommends that the railway undertakings should be obligated to include such procedures in their safety management systems which reveal and manage those situations of vehicle driving where locomotive drivers do not have current line knowledge (e.g. due to line reconstruction or rarely visited line) and assess the risks of such situations and apply risk mitigation procedures as necessary.

The recommendation addresses improvement of railway undertakings safety culture for the sake of development of more risk-conscious behaviours on the part of such companies and that their safety management systems include measures to compensate for the risks originating in the absence of proper line knowledge.

2.2 BA2020-0301-5-02

The IC found during the investigation that the locomotive drivers' line knowledge training includes no modern methods that would help them acquire current, technically valid line knowledge even in the case of reconstructed or newly constructed line sections where no preliminary visit is provided.

Number: **BA2020-0301-5-02**

Addressee: KTI Institute for Transport Sciences non-profit Ltd. Railway Training Methodology Center

Responsible for introduction: **KTI Institute for Transport Sciences non-profit Ltd. Railway Training Methodology Center**

> TSB recommends KTI Railway Training Methodology Center to consider reviewing the applicability of simulators and virtual reality in the line knowledge training of locomotive drivers and, on the basis of the results, taking action to design and introduce a scheme of simulator training in the Hungarian railway industry, including the formulation of legislative proposals as necessary.

By acceptance and expected implementation of the safety recommendation, it will be possible, among others, to provide deeper line knowledge for locomotive drivers in a safer environment, thus the number of emergency situations caused by inadequate line knowledge may be reduced.

2.3 BA2020-0301-5-03

The rules relating to the train control system used in a significant part of the Hungarian railway infrastructure require the installation of the associated infrastructure (continuous signalling system) on such short sections which render the system unsuitable for supporting the driving of vehicles and timely intervention in the case of a driver error.

Number: **BA2020-0301-5-03**

Addressee: Railway Authority Division, Ministry for Innovation and Technology

Responsible for introduction: **MÁV Zrt.**

Transportation Safety Bureau recommends Railway Authority Division, ITM to consider reviewing the sufficient length of the section of installation of continuous signalling for supporting safe vehicle driving, and requiring that the rules relating to track sections without continuous signalling be applied to track sections with too short continuous signalling installation accordingly.

By acceptance and expected implementation of the safety recommendation, the train crews' unjustified trusting in continuous signalling could be avoided in places where such signalling does not sufficiently support the safety functions of driving due to shortages of the installation. On such railway tracks the rules adjusted to the risks of absent or limited continuous signalling can provide the movement of rolling stock with acceptable level of safety.