MINISTRY OF
TECHNOLOGY AND INDUSTRY

TRANSPORTATION SAFETY BUREAU

FINAL REPORT (EXTRACTION)

2021-0797-5
(HU-10224)

Railway accident / Collision
Kerepes - Mogyoród, 9th August 2021

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, 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 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

On the night of 9 August 2021, a squall line passed over the Gödöllő hills, causing a power failure at the railway section H8 of MÁV-HÉV Zrt. (railway line № 253) at the converter station in Mogyoród. Due to the loss of traction power, the passenger train № 1082 stopped on the open line between Kerepes and Mogyoród stations, near the Kerepes station home signal “C”.

The Unit Dispatcher managing the traffic on the line decided to dispatch a banking locomotive, but due to the increasing number of power supply faults, the planned use of the banking locomotive continued to change even after its dispatch. A written order was delivered to the banking locomotive crew by the traffic manager of Kerepes station, on the basis of which the relief was to be implemented. After the banking locomotive left for the Kerepes - Mogyoród interstation track to pick up train № 1082, it collided with the railcar № 920 of the passenger train waiting for relief, causing considerable damage. Although there were passengers on board at the time of the collision, no injuries occured.

The investigation revealed that the unpredictable, increasingly numerous power supply failures on the Kerepes - Gödöllő section of the line, coupled with the need to maintain traffic continuity, caused a level of stress among the line crew that was already negatively affecting their situational awareness, resulting in inconsistent communication between them. Low levels of safety-critical communication resulted in either a lack of substantive information being passed on or certain communications remaining unacknowledged.

The traffic controller at Kerepes station had a false mental image of the disorder, and thus of the location of train 1082, which persisted even after the accident. The mental image did not change before the accident, despite the fact that a lot of information had been given which could have led the traffic manager to recognise, directly or indirectly, that his own perception was wrong. The traffic controller also presented the wrongly identified situation to the staff of the banking locomotive when he delivered the written instructions and authorised the locomotive driver to start the locomotive, who thus approached the real situation of train № 1082 in the knowledge that the train was much further away, which made it impossible to prepare for a timely stop.

The investigation also revealed deficiency in the regulatory environment, which, despite the network conditions of MÁV-HÉV Zrt. (topography and curvature), does not oblige the trains crews stopped on the open line due to an extraordinary cause to protect the trains, nor does it prescribe the exact method of determining the stopping point on the open line.

In view of the above, TSB issues a safety recommendation on the provision of notices and instructions requiring location and on the development of the conscious practice of safety-critical communication for workers in jobs related to railway safety.

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 braking distance was not sufficient despite rapid braking by the driver of the banking locomotive when the stationary passenger train was detected;
b) the driver of the banking locomotive had incorrect knowledge of the position of the passenger train and therefore approached the location of the incident at a speed higher than was safe in the actual situation,
c) The traffic manager at Kerepes station inaccurately determined the position of the train waiting for emergency assistance for the banking train's crew (4.3.2.3, 4.3.2.5).
d) the driver of the train № 1082 did not specify the exact location where his train had become unfit for service (4.3.2.4).

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:

No such factor was identified by the IC during the investigation.

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 regulatory environment in force at the time of the accident did not impose any obligation to protect the train for the crew of trains stopping on the open line due to an extraordinary cause;

b) the regulations also do not impose specific content requirements on the determining of the position of trains stopped on an open line due to an extraordinary cause (4.4).

5.2 Actions taken

Based on the information provided by MÁV-HÉV Zrt. to the IC, the lessons learned from the case were passed on to all the company's staff who are obliged to undergo periodic training during the periodic training sessions. It has also been ordered for all the railway company's junction stations that, in the event of a permanent loss of traction voltage, diesel powered traction vehicles may not be used to assist motor trains stopped on the sections affected by the loss of traction voltage.

Individual exit signals were installed at Kerepes station in November 2021.

5.3 Additional notes

The IC has no more comments to share on the case.

5.4 Proven procedures, good practices

The IC identified no such item relating to the occurrence.

5.5 Lessons learnt

The case offers a lesson about the possibility that, if the criteria for safety-critical communication are not properly applied by any of the parties involved in the traffic flow, the boundaries between the roles can become blurred and, as a consequence, essential information can be lost in the communication process.

The investigation also found deficiencies in the regulatory environment, but the accident could have been prevented by proper situational awareness on the part of the traffic managing and the train crews and by the conscious application of safety-critical communication skills.

6. SAFETY RECOMMENDATION

During the investigation, the IC found that the system of instructions of MÁV-HÉV Zrt. did not specify in a precise manner the reference system to be used for the positioning of trains, therefore TSB issues the following safety recommendation:

number: **BA2021-0797-5-01**

addressee: **MÁV-HÉV Zrt.**

responsible for introduction: **MÁV-HÉV Zrt.**

TSB recommends MÁV-HÉV Zrt. to develop a uniform standard for employees working in jobs related to railway safety in order to ensure that the designation of individual points on the network is always carried out in a uniform, clear reference system.

If the safety recommendation is adopted and implemented, once the notices and provisions defining the location have been issued, it will be possible to avoid that the recipients of the notices and provisions inaccurately identify the designated location. In this way, occurrences similar to the accident that is the subject of this report can be avoided.

During the investigation, the IC found that the inaccurate positioning of a train stopped on an open line due to an extraordinary cause by its crew and inconsistent communication by the traffic crew posed a significant risk of an accident. In view of this, TSB issues the following safety recommendation:

number: **BA2021-0797-5-02**

addressee: **MÁV-HÉV Zrt.**

responsible for introduction: **MÁV-HÉV Zrt.**

TSB recommends MÁV-HÉV Zrt. to review its basic and periodic training topics for employees employed or intended to be employed in jobs related to railway safety in order to ensure that safety-critical communication is also consciously practised during training.

If the safety recommendation is adopted and implemented, the risk of loss of essential information needed to make the right decisions in traffic situations requiring operational decisions can be reduced.