MINISTRY OF
TECHNOLOGY AND INDUSTRY

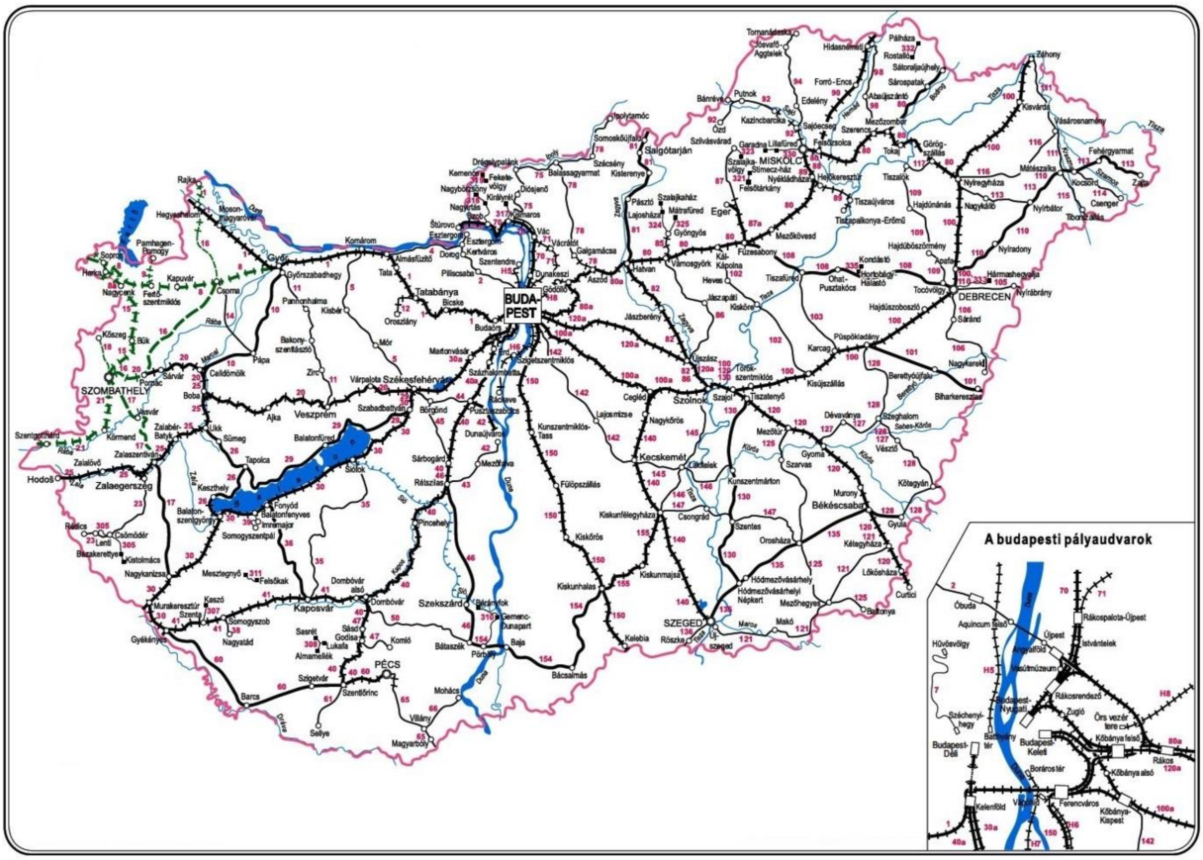
ANNUAL REPORT 2021

Transportation Safety Bureau

Hungary

TABLE OF CONTENTS

RAILWAY NETWORK IN HUNGARY



Basic data of the infrastructure: 8350 km rail network

National lines:	7685 km IM: MÁV (94%), GySEV (6%) Trans-European network: 2830 km (37%)
Regional lines:	320 km (100% narrow gauge)
Suburban lines:	136 km
Local tramway network:	209 km in Budapest, Debrecen, Miskolc, Szeged

Level crossings:	6041 (48% active, 52% passive)

SUMMARY

Hungary fully implemented all essential requirements concerning accident investigation of the Railway Safety Directive 2004/49/EC and 2016/798/EC in its national law.

Transportation Safety Bureau was established on 1st January 2006 as the legal successor of Civil Aviation Safety Bureau (founded in 2002). TSB operates in a multimodal form. Its main duty is the independent safety investigation of aviation, railway and marine accidents and incidents. Within the organisational framework of TSB, the Railway Department began to operate on 1st March 2006.

Pursuant to Government Decree 230/2016. (VII. 29.) on the assignment of a Transportation Safety Body and the termination of Transportation Safety Bureau with legal succession, the independent organisational status (as a central authority) of Transportation Safety Bureau was terminated with an effect of 1 September 2016, and TSB was integrated in Ministry of National Development (what is the predecessor of Ministry for Innovation and Technology) as a division. As part of this integration, the functions supporting the operation of the organisation (finance, communication, law, IT, HR) were wound up, and their responsibilities were transferred to the Ministry and other entities and units of public administration. As a result of such reorganisation, the Railway Department of TSB, which used to work with a clear professional profile dedicated to railway, became Railway and Duty Service Unit. The year 2017 was the first full year of our operation in the new form of organisation.

In 2021, there were no organizational changes at TSB, within the Ministry of Innovation and Technology, TSB operated under the supervision of the Secretary of State responsible for transport politics.

In 2021, there was no occurrence (serious accident) on the railways which the Railway Department of TSB was, pursuant to the regulations, obliged to investigate.

TSB decided at its own discretion to conduct independent safety investigation into 29 occurrences.

During year 2021, TSB published 27 final reports closing 29 investigations, including 11 safety recommendations. 9 of these recommendations have been accepted, 1 was rejected, and 1 was left without response. 1 of the accepted recommendations has been implemented; implementation of 8 more recommendations is in progress.

At its own discretion, TSB included in the scope of the safety investigation some occurrences of signals passed at danger (SPADs), taking into consideration hazards and high frequency of these cases with an otherwise fortunate outcome. Based on previous positive experiences, TSB monitored with particular consideration the occurrences related to level crossings (LC accidents) and to persons injured by railway vehicles, initiating safety investigations in cases that appeared to be instructive. In 2021, we laid great emphasis on revealing the root causes of the occurrences, especially in the aspects of human and organisational factors for example fatigue, safety critical communication etc.

In 2021, we also set out the lessons learnt in the area of safety culture if we found it necessary and possible.

Abbreviations	
IC	Investigating Committee
LC	Level crossing
MÁV Co.	Hungarian State Railways Plc.
NIB	National Investigation Body
NSA	National Safety Authority (the National Safety Authority of Hungary)
RSD	Railway Safety Directive (Directive (EU) 2016/798)
TSB	Transportation Safety Bureau

1. INTRODUCTION

The Transportation Safety Bureau of Hungary (TSB) as a multimodal organisation for the investigation of accidents was established on 1st January 2006.

The Annual Report 2021 of TSB - in accordance with Article 24 (3) of the Railway Safety Directive 2016/798/EC - gives an account on the following:

- the implementation of 2004/49/EC and 2016/798/EC Railway Safety Directive into the Hungarian law,
- the relations of TSB with other concerned organisations,
- the philosophy and process of the independent safety investigation at TSB,
- the overview of the past 12 months from transport safety point of view,
- the experiences of the independent safety investigations carried out by TSB,
- the safety recommendations issued by TSB and the provisions made in relation to the recommendations, and
- the participation of TSB in the work of the European Railway Agency.

Legal basis - The implementation of the Safety Directive in the Hungarian law

Hungary implemented all essential requirements concerning accident investigation of Railway Safety Directive 2004/49/EC and later 2016/798/EC in Act CLXXXIV of 2005 on the safety investigation of aviation, rail and marine accidents and incidents. Based on the Directive, Transportation Safety Bureau was established on 1st January 2006 and – as a multimodal organisation - is responsible for the independent safety investigation of aviation, railway and marine accidents and incidents.

The detailed regulations of the safety investigation are included in the decrees of Act CLXXXIV of 2005 which were separately issued for the three modes of transport by the Minister of transport. The decree on the regulation of the safety investigation of serious railway accidents, railway accidents and incidents (7/2006 GKM) was issued on 27th February 2006.

Powers of TSB have been extended: previously, the scope of TSB activity had not included investigations of accidents and incidents occurred on local railways. Serious accidents are not frequent on these railways (underground railway, cogwheel railway, tram – Budapest, Miskolc, Debrecen, Szeged), nevertheless, related hazards are high, considering the high number of passengers transported daily. Extension of the investigation scope by including these railway systems was justified by this hazard, completion of the safety investigations additionally generated being possible by an allocation of minor extra resources.

Act CLXXXIV of 2005 on the safety investigation of aviation, rail and marine accidents and incidents was also amended parallel to this, the amendment concerning TSB activity by introducing the institution of accident investigation of the operator in the railway sector as well. Positive experiences of the accident investigation system of the operator, well established in the aviation sector, can be effectively applied to enhance safety in the railway sector also. Therefore, according to the new regulation for occurrences not included in the serious accidents category required to be investigated by the National Investigation Body (NIB), in case NIB takes decision on not conducting a safety investigation of the occurrence, the safety unit of the railway undertaking will be requested to conduct the investigation of the operator and inform NIB on the results in a report.

This regulation does not aim the duplication the safety system, it does not concern investigations required by the safety management system (SMS). Its objective is to ensure that reports, being issued anyway by the accident services of railway undertakings, would be forwarded to NIB, furthermore, authorizes NIB to request additions, when necessary, to these reports – by this, the regulation helps NIB in collecting data on safety issues. Involving organisations already actors of the SMS in the activity of NIB does not require extra resources (HR, etc.) on either side, nevertheless, it broadens significantly the information base of NIB activity and, by this, the enhancement possibilities of railway safety.

These rules were implemented into the decree on the regulation of the safety investigation of serious railway accidents, railway accidents and incidents (7/2006 GKM) issued on 27th February 2006, the new number of this decree: 24/2012 NFM issued on 8th May 2012.

Within the organisational framework of TSB, the Railway Department began to operate on 1st March 2006 pursuant to the regulations.

The national Act guarantees the complete independence of TSB from all other actors of the concerned transport sector. The Act defines the objective of the independent safety investigation as follows:

'The objective of the independent safety investigation is to reveal the causes and circumstances of serious railway accidents, accidents and incidents and to initiate the necessary technical measures and make recommendations in order to prevent similar cases in the future.' It also states that 'it is not the purpose of the investigation carried out by TSB to apportion blame or legal liability'.

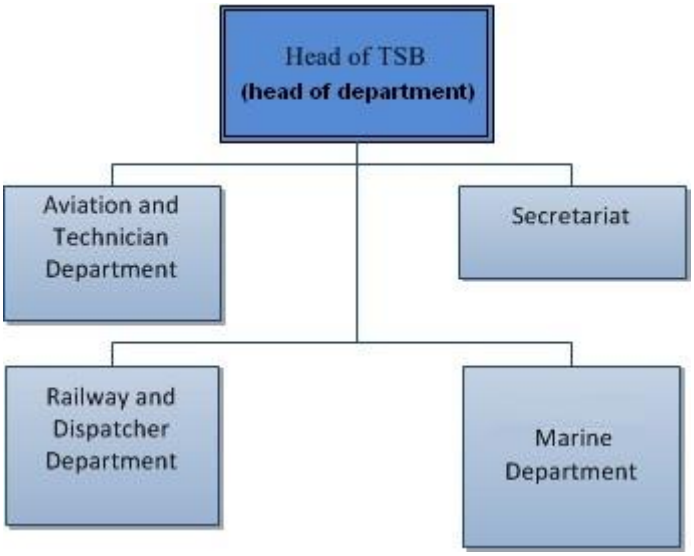
The Act contains the rights and responsibilities of the investigators defined in the Safety Directive.

According to the national regulations:

- All aviation, railway and marine occurrences shall be reported to TSB.
- The members of the Investigating Committee of TSB are authorized to be present at the site of any occurrence and to conduct the safety investigation parallel with the police investigation (if there is one).
- Based on the results of the investigation, TSB is entitled to issue safety recommendations and recommend immediate preventive actions before the completion of the investigation, if necessary. The implementation of safety recommendations is not obligatory, however, the addresses must report to TSB once a year whether they have accepted or rejected them. (The addresses must forthwith respond to the recommended immediate preventive actions.)
- The anonymity of the relevant parties is guaranteed. TSB shall make public the final reports on the results of the investigation. However, the final report shall not contain data based on which the relevant parties can be identified. The final report shall not be used in criminal procedures.

1.1 Organisation of TSB Hungary

The organisation and relations of the multi-modal NIB is shown in organogram.

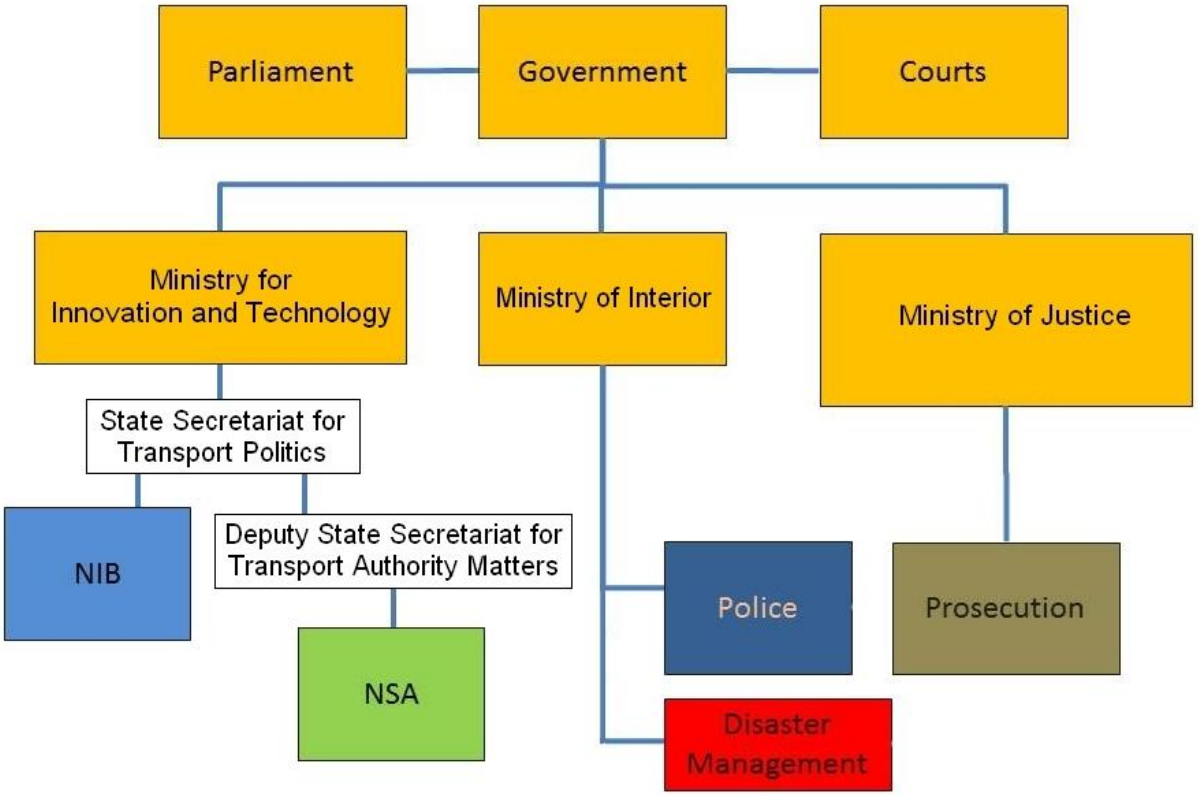


The organisation of the TSB

- TSB regards prevention as the main objective of its activity. TSB endeavours to share the findings, the results and the experiences of the safety investigations with a wide circle of organisations in the profession as well as with the civil sector.
- TSB was established on 1st January 2006. The Aviation Department and the 24/7 Duty Services operated from the beginning of 2006 and the other departments and units grew gradually during the year. The Railway and the Marine Department began to work officially on 1st March 2006.
- As the TSB is integrated in Ministry for Innovation and Technology as a division the Head of the TSB is a Head of Department in the structure of the Ministry.
- The Railway Department consists of 7 investigators 6 dispatchers and the Head of Railway and Dispatcher Department.

1.2 Organisational flow of TSB Hungary

The following chart shows the system of relations of the NIB:



System of relations

- Within Ministry for Innovation and Technology, NSA is ranked Deputy State Secretariat, and TSB (the NIB) is a Division. Accordingly, NSA is positioned at another level, the addressee of the safety recommendations is different within the same entity, and supervision is common at the ministerial level.
- The Ministry for Innovation and Technology is the national regulator.
- Based on the outcome of the investigations, TSB may issue safety recommendations to the National Safety Authority (NSA). The implementation of safety recommendations is not mandatory; the addressees however are obliged to compile an annual report on their response (acceptation, implementation, or refusal).
- TSB is part of the Ministry for Innovation and Technology. The Head of TSB works under direct supervision of the State Secretary. According to the national law, the Minister shall not instruct TSB in matters concerning the independent investigations, but, according to the organizational rules, the Minister has the power to do so.
- TSB reports to the government annually on the activities of TSB, the lessons learned from the independent investigations, the processes and trends concerning transportation safety.
- The general rules regarding the operation of the railways are currently defined by the state-owned MÁV Co., the largest infrastructure manager in Hungary. The National Safety Authority only assents to the amendments to the rules.

- TSB is authorized to get access to all data relevant to the occurrence in question (including data stored on data recorders).
- The Investigating Committee of TSB may conduct its on-site investigation simultaneously with the police investigation.
- TSB and the police may help each other's work with exchange of factual data and results of expert analyses. The IC may withhold information obtained in the course of the investigation from other authorities in occurrences when the owner of the information would have had the right to do so.
- TSB, the police and the disaster management mutually inform each other about the received occurrence reports.

2. INVESTIGATION PROCESS

2.1 Independent basis of the investigation

Pursuant to national law, TSB is independent of all persons and organisations whose interests are contrary to the duties of the investigating organisation, in particular:

- authorities granting permission to put vehicles into service,
- authorities granting permission and controlling the operation and the maintenance of the vehicles,
- authorities issuing driving licences,
- the organisation operating the transport infrastructure,
- transport companies,
- railway undertakings
- the organisation determining railway tariffs,
- the organisation distributing routes,
- the safety authority and
- all regulators in the field of railways.

Under the national law, the civil servants of TSB shall not be the owners, senior officials or employees of the above mentioned organisations.

The Director-General and the Investigating Committee of TSB shall not be instructed in their scope of duties concerning the safety investigation.

Functional independence of TSB remained intact during its operation within the Ministry.

2.2 Accident investigation philosophy of TSB Hungary

Under the Hungarian regulations, TSB shall investigate serious railway accidents.

The definition of 'serious accident' under the national regulations - in accordance with the Railway Safety Directive 2016/798/EC – is as follows:

'*Any train collision or derailment of trains, resulting in the death of at least one person or serious injuries to five or more persons or extensive damage to rolling stock, the infrastructure or the environment of at least HUF 500 million and any other similar accident with an obvious impact on railway safety regulation or the management of safety*'.

Apart from serious accidents, the national regulations permit TSB to investigate other occurrences – at its own discretion – that may have an impact on the safety of rail transport as well as on the regulations and management of railway safety.

TSB availed itself of the opportunity provided by the regulations to decide which occurrences – apart from serious accidents – are to be investigated. TSB based its decisions regarding which occurrences require investigation on the following fundamental principles:

- **occurrences resulting in serious injuries to persons, extensive material damage and/or hindering railway transport significantly,**
- **the latent danger of the occurrence can be considered significant – irrespective of its actual consequences,**
- **accidents or incidents recurring at the same site or in the same manner**

should be investigated.

When deciding which occurrences to investigate - besides the ones with serious consequences - it helps a great deal that the Railway Department regularly requests information from railway undertakings and relevant authorities on occurrences which are not investigated in details. The collection and evaluation of these data provides the possibility to be able to discover recurrence and certain tendencies in the accidents. These observations can create basis for further investigations.

In order to increase efficiency in decision making, it is necessary to gain as much information as possible. The institution of accident investigation of the operator has been introduced in the railway sector as well. Positive experiences of the accident investigation system of the operator, well established in the aviation sector, can be effectively applied to enhance safety in the railway sector also. Therefore, according to the new regulation for occurrences not included in the serious accidents category required to be investigated by NIB, in case NIB takes decision on not conducting a safety investigation of the occurrence, the safety unit of the railway undertaking will be requested to conduct the investigation of the operator and inform NIB on the results in a report.

2.3 The investigation process of TSB

The Duty Services of TSB (dispatchers) receive the notifications of the occurrences 24 hours a day.

The members of the Investigating Committee (IC) are appointed by the Head of TSB or by his deputy on duty. The IC consists at least two accident investigators. In case of more serious or complicated occurrences, one of the heads of department on duty TSB may be present on the site.

If an occurrence is not obliged to be investigated under the law, the head of the concerned department advises the Head of TSB to decide whether or not to conduct an investigation.

The Investigating Committee carries out the site survey (parallel with other authorities) and decides on the direction of the investigation, the required technical and technological examinations as well as selecting the organisations and/or experts to be initiated in the investigation if necessary.

Other processes are the same as those specified in the ERA guide relating to technical investigations: collecting of data, investigative interviews, analysis etc.

The draft reports on the occurrences are discussed by a board made up of the heads of departments of TSB.

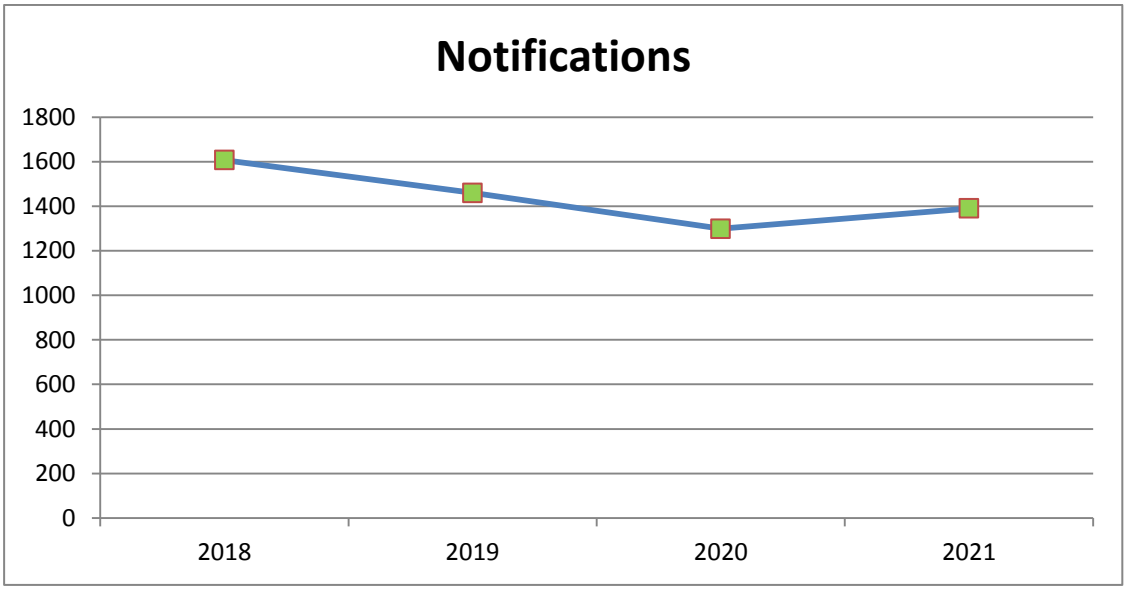
The relevant parties of the investigation may make reflections on the draft report within 60 days from the date of receipt which is to be evaluated when compiling the final report. After this 60-day-period, TSB convenes a meeting for a final discussion with the participation of the representatives of the persons and organisations concerned. The purpose of the final discussions is that all concerned parties can hear the comments sent in reflection to the draft report as well as the viewpoint of TSB regarding

the comments before the completion and publication of the final report. According to Hungarian law, the investigators may decide whether or not to include the parties' comments in the final report, the comments of an NIB of a Member State have to be included. Subsequently, the final report is made public.

All the three major departments of TSB have a separate 'Investigators' Manual' which lays down the methodological and technical requirements based on which the investigations shall be conducted by the investigators of TSB, taking the special characteristics of the given mode of transport into account.

3. OVERVIEW OF THE YEAR 2021

3.1 Notifications

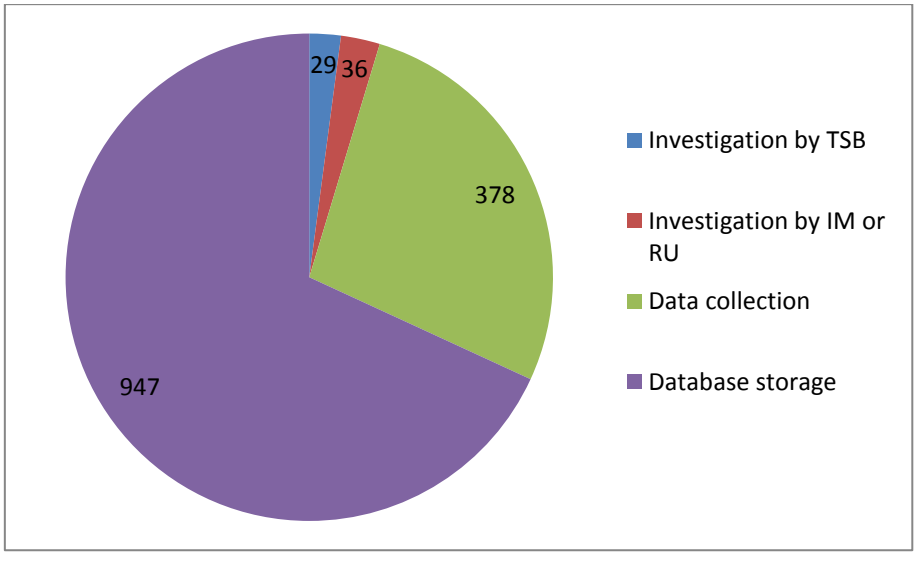


Numbers of notifications

Our dispatcher service received 1390 notifications in total in 2021, which is 7% increase compared to the previous year. No major conclusions can be drawn from the magnitude of the ascent, but rather from the stochastic nature of accidents and unexpected rail events.

Breakdown to track networks also reflects a slight increase in the total number of notifications. The most significant increase in the number of notifications can be observed in the instance of tram networks (571 to 612) and the public railway network (629 to 672). The increase can be explained by the end of the pandemic closures, that made possible again for people to commute and travel around the country.

3.2 Investigations



Activities following notifications in 2021

In 2021, we decided to perform an immediate *on site survey* (based on data in the notifications) on 61 occasions; such surveys were usually performed by a team of two members. 49 of the 61 site surveys affected locations in the national railway network, which shows that the consequences of the accidents and incidents in such networks are more serious, and that the investigation into such accidents/incidents is more likely to require detailed data collection at the scene.

Detailed data collection was performed on 378 occasions in total. A purpose of detailed data collection was to find out whether the occurrence may offer such lessons to learn which justify the performing of a full investigation by us. In these cases, we asked the railway companies for information and data, and decided on the investigation on the basis of such inputs. Another form of detailed data collection is when we ask the competent authorities for information relating to whether a case where a person by a vehicle was a suicide or an accident caused by rolling stock in motion. This is needed because, pursuant to the relevant EU regulation, classification must be made on the basis of a decision of the authorities.

In 2021, we commenced a *full safety investigation* in 29 cases. With regard to the nature of the given occurrence, an investigating committee of 2 to 5 members is appointed to perform the investigation. When staffing an investigating committee, we ensure that investigators with relevant professional knowledge and experience be available in each committee for a successful investigation. Such areas of expertise are, for instance: traffic control, mechanics, infrastructure or human and organisational factors. The investigating committee is chaired by a member appointed by the Head of TSB, and such chair is responsible for successful and timely completion of the investigation. Compared to the changing headcount, it can be seen that an investigator had to chair 5 to 6 investigating committees on average in 2021. This number significantly exceeds the quantity of 2 investigations/year specified by the European Union Agency for Railways in its activity assessment report on the operation of Railway Department TSB in 2012.

In 2021, TSB requested operators to investigate 36 occurrences. In the railway sector, since 2012 – similarly to aviation – TSB has the opportunity to request information from operators on the causes of railway occurrences which need no investigation by TSB but may offer a lesson to learn in connection with general safety on rail transport. Today, the conditions of investigation by the operator are given: in order to meet the personal requirement of the performing of investigation by operators, accident investigation training sessions are running since 2013. Over 200 people involved in the investigation of occurrences completed the courses.

An advantage of this practice is that we gain more detailed information from the reports made of the investigations performed by the operators, and we are also informed on the preventive safety recommendations of the railway companies.

3.3 Safety Investigations started by TSB in 2021

Attachment-A

Safety investigations started by TSB in the area of railway transport in 2020

Date	Description of occurence	Classification
17.01.	At Murakeresztúr station, the locomotive of freight train no. 45998 carrying containers entered the I. track of the station while the wagons of the train continued on the II. track. The two wagons behind the locomotive derailed with 4-4 axles and the container on the first wagon fell off. No injuries occured.	Railway accident
25.01.	At Kerta junction, the freight train no. 42002 collided with a sleeper–screw driver. No injuries occured, because the track workers could manage to leave the structure gauge of the track in the last moment before the collision.	Railway accident
01.02.	The front carriage of InterCity train no. 934 derailed with one bogey and the train broke up while it was leaving Tatabánya station. A passenger of the train suffered minor injuries.	Railway accident
14.02.	Train of locomotives no. 14523 passed entry signal at danger „D" of Pécel station without permission and stopped at the station's end point switch area. No injuries occured.	Railway incident
10.03.	Freight train train no. 44290-1 passed the entry signal „N" of Rákos station at danger without permission. No injuries occured.	Railway incident
25.03.	Service train no. 20627 derailed on point no. 2/a while entering Budapest-Nyugati station. No injuries occured.	Railway accident
05.04.	Stopping train no. 8905 entering Nagykanizsa station accidentally arrived on the occupied track no. II. instead of track no. I. which was locked for this train. The train stopped in a distance of about 50 meters from the InterCity train no. 855, which was waiting for departure. No injuries occured.	Railway incident
07.04.	Stopping train no. 2376 stopped at Rákosrendező station due to a technical malfunction. After turning away the malfunction, the train departed without	Railway incident

	permission. It trailed a point and harmed the locked route of stopping train no. 2386. Train no. 2386 stopped immediately. No injuries occured.	
10.04.	Stopping train no. 4951 entering Bicske station near subsidiary signal, arrived to track no. IV., which was occupied by stopping train no. 4948. The distance between the two trains was 200 meters. No injuries occured.	Railway incident
20.04.	Stopping train 6254, which was running in the up direction collided with a tractor in level crossing no. AS2527 between Hajdúhadház and Újfehértó stations. After the crash the tractor drifted on the down direction-track where stopping train no. 6203 crashed into it. The locomotive and three carriages of train no. 6203 derailed, one derailed carriage turned on it's side. The locomotive drifted away from the tracks about 20 meters. The driver of the tractor died on the scene, the driver and four passengers of train no. 6203 suffered minor injuries. The level crossing worked well by the time of occurence.	Railway accident
17.05.	Stopping train no. 3135 departed from Gödöllő station without permission, passed the exit signal at danger and trailed point no. 22. No injuries occured.	Railway incident
31.05.	Stopping train no. 5228 collided with a truck at level crossing no. SR2 at Sátoraljaújhely station. The level crossing was protected with light signals, that worked well by the time of the accident. After the collision the driving trailer of the train derailed. The driver of the truck and the train driver both suffered serious injuries.	Railway accident
09.06.	Stopping train no. 6105 entering Püspökladány failed to stop at the designated place near the platform and passed „K4" exit signal at danger. No injuries occured.	Railway incident
15.06.	Stopping train no. 4018 departed after a scheduled stop from Sárosd station and passed the „V2" exit signal at danger without permission. The train stopped in a distance of 228 meters from train of locomotives no. 28279, which was waiting near the entry signal. No injuries occured.	Railway incident
16.06.	After a scheduled stop at Mosonmagyaróvár station, stopping train no. 9412 passed the exit signal „V3" at danger without permission and stopped at the switch	Railway incident

	area. Stopping train no. 9467 approaching the station from the opposite direction on the wrong track stopped at the station's entry signal which was at danger with normal brake application. No injuries occured.	
18.06.	Stopping train no. 39847 collided with a sleeper-screw driver between Mosonszolnok and Jánossomorja stations. No injuries occured, because the track workers could manage to escape from the structure gauge in the last moment before the crash.	Railway accident
25.06.	The locomotive of stopping train no. 39523 derailed with it's front bogey's two axles between Zirc and Eplény stations. No injuries occured.	Railway accident
11.07.	Freight train no. 66822 entered to Ferencváros station on track no. IV., which was occupied by stopping train no. 3545. The freight train trailed a point and harmed the locked route of the passenger train before it was ordered to stop at the switch area. No injuries occured.	Railway incident
13.07.	The 16th wagon of freight train no. 45296 derailed and turned on it's side on point no. 23 at Rákospalota-Újpest station, while the train was leaving the station.	Railway accident
28.07.	The 4th carriage of service train no. 23613 derailed with one axle while the train was leaving Nagykáta station. No injuries occured.	Railway accident
09.08.	The relief locomotive no. CT02 crashed into passenger train no. 1082 standing on the open line between Kerepes and Mogyoród stations on suburban train line H8 of Budapest. No injuries occured.	Railway accident
20.08.	Stopping train no. 36613 collided with a car at level crossing no. AS46 between Tócóvölgy and Hajdúböszörmény stations. The 2 persons travelling in the car suffered fatal injuries and died on the scene. The level crossing was protected with light signals and barriers that worked well by the time of the accident.	Railway accident
25.08.	Freight train no. 44284 passed the exit signal „V2" of Győr station at danger without permission and trailed point no. 5. The freight train also entered the locked route of stopping train no. 9444 which was also exiting the station. The driver of the stopping train recognised the danger and stopped his train by emergency braking. No injuries occured.	Railway incident

11.09.	The stopping train no. 5228 passed exit signal „V2” of Bodrogkeresztúr station at danger without permission. The train trailed point no. 5 which was set for stopping train no. 5221, running in the opposit direction. The driver of train no. 5221 was notified about the occurence so the two trains stopped in a distance of about 2 kilometers from each other. No injuries occured.	Railway incident
10.10.	Stopping train no. 7726 forwarded a cold locomotive, which was attached behind the pulling locomotive. As the train entered Szeged-Rókus station, the cold locomotive derailed with 4 axles and the first carriage derailed with 2 axles on the closure panel of point no. 10., due to a rail breakage. No injuries occured.	Railway accident
15.10.	Three empty cars of freight train no. 56554-1 derailed on point no. 505., while the train was entering Miskolc-Rendező station. No injuries occured.	Railway accident
21.10.	Freigh train no. 48402 passed the exit signal „V4” of track no. IV. at danger at Császárszállás station, and trailed point no. 7. No injuries occured.	Railway incident
06.11.	Stopping train no. 9600-1 crashed with a car at level crossing no. AS460, between Pápa and Mezőlak stations. The level crossing was flashing with a white light at the time of the accident. No injuries occured.	Railway accident
07.12.	Freight train no. 45999 passed signal „K” at danger with permission at Szolnok-Rendező station, passed point no. B4 towards a trap siding and crashed into the buffer with earth stabilization. No injuries occured.	Railway accident

4. INVESTIGATIONS COMPLETED IN 2021 WITH THE ISSUED RECOMMENDATIONS

In 2021, 27 final reports were compiled and published on the website of TSB, closing 29 investigations**.**

The final reports issued in 2021 analysed occurrences of the following types:

- Derailment 9 occurrences
- Accident at LC 2 occurrences
- SPAD 11 occurrences
- Collision to obstruct 3 occurrences
- Fire in rolling stocks 1 occurrence
- Other 3 occurrences

Investigations completed in 2021 by the amount of damages:

In 2021, the damages related to an occurrence exceeded EUR 150,000 in 4 case, but there were no cases that exceeded EUR 2 Million.

Number of investigations lasting longer than one year over 2019-2021

Year	at the end of 2019	at the end of 2020	at the end of 2021
Amount	4 (2)[1]	1 (0)	1 (0)

Numbers in brackets show the amount of reports sent to relevant parties for reflections until the end of the year.

[1] Both investigation were paused because of the expert reports

INVESTIGATIONS CLOSED IN 2021

SUMMARY OF OCCURRENCE № HU-6164

Grade:	*Railway accident*
Date and time:	*10 September 2019*
Location:	*Budapest-Nyugati (station)*
Occurrence type:	*Train derailment*
Movement type:	*Passenger train*
Description:	*The second bogie of the first wagon of the arriving train no. 22629 derailed on the switch no. 19/a at Budapest-Nyugati station.*
Consequences:	*0 fatality / 0 serious injury* *Total damage < EUR 150,000*
Parties:	*MÁV Zrt. (IM)* *MÁV-START Zrt. (RU)*
Direct cause(s):	• *one of the tongue rails of the switch fractured under the incoming train, causing the derailment of second bogie of the first wagon*
Contributory factor(s):	• *due to poor prop up of the track, the rail was exposed to loads that led to fatigue fractures in the long term*
Underlying cause(s):	• *the railway track in the area of Budapest Nyugati station is in a significantly degraded condition, the track maintenance system is not able to reduce the degradation process*
Recommendation(s):	*none*

SUMMARY OF OCCURRENCE № HU-6162

Grade:	*Railway accident*
Date and time:	*15 January 2020*
Location:	*Mende (station)*
Occurrence type:	*Fire in rolling stock*
Movement type:	*Regional passenger train*
Description:	*A bearing of a wagon of passenger train no. 3330 caught fire, then the train was stopped at Mende station and the fire was extinguished with a fire-extinguisher.*
Consequences:	*0 fatality / 0 serious injury* *Total damage HUF 522,011 (< EUR 150,000)*
Parties:	*MÁV Zrt. (IM)* *MÁV-START Zrt. (RU)*
Direct cause(s):	• *the bearing was stucked, probably due to mechanical damage from fatigue fracture; the rolling elements and the inner ring have stopped rotating, the withdrawal sleeve rotated on the shaft journal and on the inner ring of the bearing* • *due to high friction, the heat generated ignition of the lubricant (grease)*
Contributory factor(s):	• *the bearing had already reached the end of its fatigue lifetime, but this was not detectable due to the nature of the maintenance system* • *there is a manufacturer's recommendation for the lifetime of the bearing, but the maintenance system does not adapted it to the operating conditions and does not specify an expected lifetime period, so there is not a known maintenance requirement to replace the bearing before the end of its life*
Underlying cause(s):	• *none*
Recommendation(s):	***Transportation Safety Bureau recommends to MÁV-START Zrt. to consider introducing a procedure in its passenger car maintenance system that takes into account the manufacturer's recommendations on bearing lifetime and requires bearings to be replaced before the end of their expected lifetimes.***

SUMMARY OF OCCURRENCE № HU-6188

Grade:	*Railway incident*
Date and time:	*28 January 2020*
Location:	*Jánosháza elágazás (junction)*
Occurrence type:	*Signal passed at danger*
Movement type:	*Long distance passenger train*
Description:	*The passenger train no. IC952 passed the signal of Jánosháza-elágazás at danger. The train was stopped by the engineer 149 metres behind the signal.*
Consequences:	*0 fatality / 0 serious injury* *No damage (EUR 0)*
Parties:	*MÁV Zrt. (IM)* *MÁV-START Zrt. (RU)*

Direct cause(s):

- *the driver did not check the aspect of the warning signal and did not expect a "Danger" aspect on the "YV" signal and therefore did not apply the brakes in time*

Contributory factor(s):

- *the driver's attention was distracted from checking the pre-indication signal by making the necessary switches to cross the phase boundary located in front of the signal*
- *the line-side of this section of the railway is not equipped for continuous train control system operation*

Underlying cause(s):

- *during the training of locomotive drivers, it is possible that they acquire certificate of knowledge of a line section without having actually travelled on certain parts of it*
- *within the infrastructure managing entity, the incident was not initially handled in accordance with its real safety risk and the relevant legislation and instructions, and therefore its immediate reporting to the TSB was delayed and the scene of the accident was disrupted without authorisation*

Recommendation(s): *none*

SUMMARY OF OCCURRENCE № HU-6229

Grade:	*Railway accident/incident*
Date and time:	*3 February 2020*
Location:	*Pusztaszabolcs (station)*
Occurrence type:	*Trains collision*
Movement type:	*Shunting operation*
Description:	*A shunting train crossed the route of an overpassing freight train no. 82901 and collided with it side to side at Pusztaszabolcs station.*
Consequences:	*0 fatality / 0 serious injury* *Total damage HUF 10,984,875 (< EUR 150,000)*
Parties:	*MÁV Zrt. (IM)* *Kárpát Vasút Kft. (RU)* *Rail Cargo Hungaria Zrt. (RU)*

Direct cause(s):

- *the safety installation did not detect the occupation of the № 14 switch, so the route of the passing freight train could be locked and "green" light could appear on the signal*
- *the traffic controller gave authorisation to start the shunting movement without having information about the actual position of the train, without having competence over the tracks where the train was located (in the construction site) and without the presence of a forman shunter at the shounting site*
- *the train making the shunting movement stopped on the № 14 in a position of violating the structure gauge (clearance) of the route of the ongoing freight train*
- *the transition points between the station area in use and the construction area and the way of managing the movements crossing them were not clearly defined*

Contributory factor(s):

- *limited information was available to the traffic controller on the processes in progress at the construction site*
- *shunting movement was performed without a forman shunter being present in the construction area*

Underlying cause(s):

- *no implementing instructions had been drawn up on the traffic management procedures applicable at the time of the reconstruction works*
- *the staff were only allowed to work under instructions which did not indicate a person authorising the shunting operations in the work area*

Recommendation(s): *none*

SUMMARY OF OCCURRENCE № HU-6181

Grade:	*Railway accident*
Date and time:	*4 February 2020*
Location:	*Rákosrendező (station)*
Occurrence type:	*Train derailment*
Movement type:	*Commuter train*
Description:	*The passenger train no. 2067 derailed on the switch no. 11 at Rákosrendező station.*
Consequences:	*0 fatality / 0 serious injury* *Total damage HUF 37,430,000 (< EUR 150,000)*
Parties:	*MÁV Zrt. (IM)* *MÁV-START Zrt. (RU)*
Direct cause(s):	• *during the train's approach, the switch tongue in the diverging direction fractured, causing the derailment of the leading bogie of the train*
Contributory factor(s):	• *none*
Underlying cause(s):	• *the cycle time for ultrasound rail testing (which can detect hairline cracks in the web and the foot of the rail) is much longer than the time needed by the processes leading to similar fractures (from the formation of detectable hairline cracks to the final fracture), therefore fractures cannot always be prevented*
Recommendation(s):	*none*

SUMMARY OF OCCURRENCE № HU-6202

Grade:	*Railway incident*
Date and time:	*21 February 2020*
Location:	*Lőkösháza (station)*
Occurrence type:	*Signal passed at danger*
Movement type:	*Locomotive running solo*
Description:	*The train no. 27355 passed the signal of Lőkösháza station at danger. Eventually the train was stopped by the engine driver before leaving the station. The passenger train what was coming from the opposite direction (no. 7504), stopped before reaching the entry signal of the station.*
Consequences:	*0 fatality / 0 serious injury* *No damage (EUR 0)*
Parties:	*MÁV Zrt. (IM)* *CER Hungary Zrt. (RU)* *MÁV-START Zrt. (RU)*
Direct cause(s):	• *the driver remembered incorrectly the aspect of the entrance signal which also gave pre-indication for the exit signal* • *the locomotive driver was late in checking the aspect of the "K2" exit signal* • *the driver's work was interrupted by a telephone conversation with the dispatcher of the railway company and then by the receive of the journey documents*
Contributory factor(s):	• *the driver was also distracted by the fact that, after a phone call with the dispatcher, he was already planning the rest of the work to be done at Szolnok station when he got back on the locomotive and departed* • *the locomotie driver's concentration may have been reduced by the fact that he has had to leave home quite early, about four hours before the start of the service*
Underlying cause(s):	• *none*
Recommendation(s):	*none*

SUMMARY OF OCCURRENCE № HU-10053

Grade:	*Railway incident*
Date and time:	*15 March 2020*
Location:	*Vác (station)*
Occurrence type:	*Signal passed at danger*
Movement type:	*Regional passenger train*
Description:	*For the passenger train no. 32228 the route was set incorrectly by the signaller from track no. 4b instead from track no. 3b at Vác station. The train left the station this way: passed a signal at danger and opened up a switch.*
Consequences:	*0 fatality / 0 serious injury* *No damage (EUR 0)*
Parties:	*MÁV Zrt. (IM)* *MÁV-START Zrt. (RU)*

Direct cause(s):

- *the traffic controller in the computer did not lock the proper track route for the train that was actually departing, and then gave instructions to his co-worker to authorise the train driver verbally, without ensuring that the track route had actually been formed, because he was not staying at his place of work*
- *the external traffic controller, on the basis of receiving an incorrect verbal instruction, authorised the locomotive driver without checking the aspect of the exit signal*
- *under the influence of the authorisation and the signal from the exit signal of the adjacent track allowing the train to proceed, the driver started his train without checking the signal concerning his train, and did not check the signal either while moving towards it*

Contributory factor(s):

- *after a change of direction, continuous train controlling does not work on the train until the new track route setting is made, so the more frequently given vigilance alert does not help the driver detect the situation, nor does the emergency brake apply when passing a signal at danger*
- *because of the spatial position of the signals, their apparent order due to the curve in the track causes problems when checking them*
- *the movement inspector on the platform was accustomed to the fact that in daylight the signals were not clearly visible, so he did not even attempt to check them by stepping back from the train in the dark, nor did he ask about the aspect of the exit signal by radio*

Underlying cause(s):

- *none*

Recommendation(s): *none*

SUMMARY OF OCCURRENCE № HU-6269

Grade:	*Railway incident*
Date and time:	*21 March 2020*
Location:	*Isaszeg (station)*
Occurrence type:	*Signal passed at danger*
Movement type:	*Freight train*
Description:	*The freight train no. 55907 passed the signal of Isaszeg station at danger. The train was stopped by the train control system.*
Consequences:	*0 fatality / 0 serious injury* *No damage (EUR 0)*
Parties:	*MÁV Zrt. (IM)* *MMV Zrt. (RU)*

Direct cause(s):

- *neither the trainee driver nor the instructor checked the aspect of the home signal, and they cheked the aspect of the exit signal too late*
- *in addition, the trainee driver based his driving style on the signals coming from the train control system and therefore he started braking too late, while the instructor had not recognised this driving style and did not wean the trainee off it – this became dangerous because the information provided by the train control system was insufficient to support a stopping before the signal, because of the short signal evaluation distance given at the station*

Contributory factor(s):

- *the instructor had only administrative but not real knowledge of the line*

Underlying cause(s):

- *the rule relating to the layout of continuous signalling of the train control system does not ensure that signalling is capable of supporting driving or even just preventing driver errors*
- *the regulation and the practice of railway undertakings do not take account of the inevitable situation where drivers do not have professional knowledge on the route, and the training system does not solve this problem by using the training methods already available or, in their absence, by requiring other risk mitigation measures*
- *the training and examination of practical railway instructors is based to a large extent on knowledge of rules and regulations, not on the issue and capability of knowledge transfer and the supervision of that*

Recommendation(s):

Transportation Safety Bureau recommends the Railway Aurthority Division, Ministry of Technology and Industry (as National Safety Authority) to consider requiring the development of procedures in the safety management systems of railway companies to identify and manage driving situations where drivers do not have up-to-date route knowledge (e.g. lines under reconstruction, infrequently travelled lines), and analyse the risks and apply risk mitigation procedures as a result.

The TSB recommends the Railway Training and Methodology Centre, Institute for Transport Sciences to consider investigating the applicability of simulators and virtual reality in order to ensure drivers' route knowledge, and based on the results of the investigation, take measures – by drafting proposals for amending legislation if necessary – to establish and introduce simulator training in the Hungarian railway industry.

Transportation Safety Bureau recommends the Railway Aurthority Division, Ministry of Technology and Industry (as National Safety Authority) to consider examining the maximum length of the track to which signalling of the used train control system is suitable to support safe driving and accordingly, requiring the application of the rules for no signals on tracks that are too short for continuous signalling.

SUMMARY OF OCCURRENCE № HU-10007

Grade:	*Railway accident*
Date and time:	*22 March 2020*
Location:	*Püspökladány (station)*
Occurrence type:	*Train derailment*
Movement type:	*Freight train*
Description:	*The freight train no. 47481-2 derailed at Püspökladány station.*
Consequences:	*0 fatality / 0 serious injury* *Total damage HUF 91,000,000 HUF (EUR 150,000 – 2,000,000)*
Parties:	*MÁV Zrt. (IM)* *Rail Cargo Hungaria Zrt. (RU)*

Direct cause(s):

- *a rail of the track fractured under the load of the locomotive, after wear-and-tear may have caused cracks on the surface when contacting the wheel flange*
- *the driver exceeded the speed limit in the situation by 75%*

Contributory factor(s):

- *none*

Underlying cause(s):

- *the set of points involved in this case (type: 'Group B') is not subject to the eddy current inspection procedure that would be appropriate to detect the rail defect that caused the present accident*

Recommendation(s):

Transportation Safety Bureau recommends the Railway Aurthority Division, Ministry of Technology and Industry (as National Safety Authority) carrying out a risk analysis as part of the operation of the safety management system to assess whether surface crack detection should be extended to lower class sidings or to a defined group of sidings based on operational conditions (e.g. frequency of use, load, time spent since installation, etc.) and that the track inspection system should be amended accordingly as necessary.

SUMMARY OF OCCURRENCE № HU-6238

Grade:	*Railway incident*
Date and time:	*7 April 2020*
Location:	*Nyírbátor (station)*
Occurrence type:	*Signal passed at danger*
Movement type:	*Freight train*
Description:	*The freight train no. 68001 passed the signal of Nyírbátor station at danger. Eventually the train was stopped by the engine driver before leaving the station. The passenger train what was coming from the opposite direction (no. 6316), stopped before reaching the entry signal of the station.*
Consequences:	*0 fatality / 0 serious injury* *No damage (EUR 0)*
Parties:	*MÁV Zrt. (IM)* *Rail Cargo Hungaria Zrt. (RU)*
Direct cause(s):	• *the locomotive driver did not stop his train at the shunting limit signal at the station, contrary to the train's timetable*
Contributory factor(s):	• *the exit signal "K3" involved in the route had not been repaired in six months following a previous accidental damage and was not standing in place at the time of the incident* • *the man-portable 'Stop' sign previously placed in place of the "K3" sign was removed within a short time* • *the permanently changed traffic conditions at the station have not been modified in the Station Instructions, nor in the Route Book*
Underlying cause(s):	• *the replacement of the signal was not seen as a safety issue but as a financial one* • *the station staff and area managers, who were uncertain about the applicable procedures, received only informal guidance on the interpretation of the applicable rules from the management*
Recommendation(s):	*none*

SUMMARY OF OCCURRENCE № HU-6259

Grade:	*Tramway accident*
Date and time:	*27 April 2020*
Location:	*Budapest, Lehel tér (station)*
Occurrence type:	*Train derailment*
Movement type:	*Tramway*
Description:	*The tram no. 14 derailed on the switch of the terminus Budapest, Lehel tér.*
Consequences:	*0 fatality / 0 serious injury* *Total damage HUF 149,400 (< EUR 150,000)*
Parties:	*BKV Zrt. (IM)* *BKV Zrt. (RU)*

Direct cause(s):

- *the control panel operator initiated a shift on the signalling equipment while a vehicle was on the set of points*
- *due to the design of the vehicle detection system at the terminal, there is no direct, continuous occupancy detection of the different track sections and the remote controlled set of points, therefore the signalling equipment at the terminal did not detect the track section – containing the set of points – as an occupied section after the restart of the signal box and allowed the switches to be operated*
- *the driver did not contact the control panel operator to agree on the procedure to be followed, despite the fact that according to the rules and instructions in force, he could only have set the switch and entered the terminal station with the permission of the control panel operator via a communication device*

Contributory factor(s):

- *the control panel operator accepted the fact that, in the absence of internet connection, he could not ascertain the next tram service to the terminal and did not inform the driver of the tram approaching the terminal of his intention to switch the signal equipment off and on and of the procedure should be followed*

Underlying cause(s):

- *several human factors identified during the investigation indicate the presence of a low level of safety culture, which implies a higher safety risk in adverse operational and traffic conditions*

Recommendation(s): *none*

SUMMARY OF OCCURRENCE № HU-6261

Grade:	*Railway incident*
Date and time:	*29 April 2020*
Location:	*Budapest-Déli (station)*
Occurrence type:	*Signal passed at danger*
Movement type:	*Locomotive running solo*
Description:	*The train no. 20348-1 passed the signal at danger at Budapest-Déli station and opened up a switch. Eventually the train was stopped by the engineer.*
Consequences:	*0 fatality / 0 serious injury* *No damage (EUR 0)*
Parties:	*MÁV Zrt. (IM)* *MÁV-START Zrt. (RU)*
Direct cause(s):	• *the locomotive driver did not stop at the shunting limit signal at the end of the 'T4' track* • *the yard foreman did not meet the train in front of the signal box 'B' and did not give the train the 'Slow down!' and 'Stop!' handsignals as it is required by the Station Instructions*
Contributory factor(s):	• *the driver did not have a professional, substantive route knowledge relating to the station's storage sidings and tracks* • *the driver was busy with a protracted operational telephone call*
Underlying cause(s):	• *the volume of work load concerning for staff working as yard foremen at the station may mean that they are not always able to carry out their duties fully* • *having a legally valid route knowledge licence for locomotive drivers does not guarantee that their real knowledge is in fact adequate and up-to-date, and the associated risk is not managed by the safety management system*
Recommendation(s):	*none*

SUMMARY OF OCCURRENCE № HU-6271

Grade:	*Railway incident*
Date and time:	*27 May 2020*
Location:	*Kaba (station)*
Occurrence type:	*Signal passed at danger*
Movement type:	*Locomotive running solo*
Description:	*The train no. 14566 (work train) passed the signal of Kaba station at danger and moved on towards the oncoming freight train no. 48911. Eventually the two trains stopped 200 metres away from each other.*
Consequences:	*0 fatality / 0 serious injury* *No damage (EUR 0)*
Parties:	*MÁV Zrt. (IM)* *MÁV FKG Kft. (RU)* *Rail Cargo Hungaria Zrt. (RU)*

Direct cause(s):

- *both the driver (who is presumed to have fallen asleep) and the second attendant failed to detect the 'Danger' aspect of the second entry signal 'C' and neither of them stopped the vehicle before the signal*

Contributory factor(s):

- *the driver and the second employee on watch had spent a large part of their time on night duty, which led to long-term fatigue*
- *the vehicle with registration number 99 55 9481 123-5 was not fitted with vigilance equipment that would have stopped the train if the driver had failed to react*

Underlying cause(s):

- *the employees' need for resting periods was not taken into account in the scheduling of their working hours*

Recommendation(s): *none*

SUMMARY OF OCCURRENCE № HU-6275

Grade:	*Railway accident*
Date and time:	*2 June 2020*
Location:	*Hatvan (station)*
Occurrence type:	*Train derailment*
Movement type:	*Freight train*
Description:	*The freight train no. 45290-1 derailed on the switch no. 33 at Hatvan station.*
Consequences:	*0 fatality / 0 serious injury* *Total damage HUF 6,600,000 (< EUR 150,000)*
Parties:	*MÁV Zrt. (IM)* *CER Hungary Zrt. (RU)*

Direct cause(s):

- *there was a rapid loss of gauge in the curve of № 33 set of points, which was not detected by the track supervision system and therefore was not corrected*
- *at the front of the train, a light wagon was inserted as a guard wagon, which was more sensitive for the trajectory error*
- *the causes implied by the technical condition of the derailed wagon could not be investigated, but could not be excluded either*

Contributory factor(s):

- *the fault of a rapid loss of gauge in the curve of the set of points cannot be detected by following the track inspection rules*
- *the amendment to the rules on guard vehicles, scheduled for April 2020, has been postponed until August 2020 due to external circumstances*

Underlying cause(s):

- *the infrastructure manager does not fulfill the safety management task to take immediate corrective action to prevent the recurrence of accidents involving known safety risks*

Recommendation(s):

The TSB recommends the Railway Aurthority Division, Ministry of Technology and Industry (as National Safety Authority) considering to review the safety management system and operation of MÁV Zrt. to ensure that it adequately provides for immediate corrective action to be taken in response to identified risks and that the company operates its safety management system accordingly.

SUMMARY OF OCCURRENCE № HU-10158

Grade:	*Railway incident*
Date and time:	*14 June 2020*
Location:	*Püspökladány (station)*
Occurrence type:	*Signal passed at danger*
Movement type:	*Regional passenger train*
Description:	*The passenger train no. 6417 could not stop thus passed the signal of Püspökladány station at danger. Eventually the train could stop 2,6 kilometres away from the station.*
Consequences:	*0 fatality / 0 serious injury* *No damage (EUR 0)*
Parties:	*MÁV Zrt. (IM)* *MÁV-START Zrt. (RU)*

Direct cause(s):

- *a glide on an electrical cable has slipped off the electro-pneumatic brake valve connector on side A, causing the brake valve to fail*
- *the driver did not recognise the brake valve failure during troubleshooting and therefore did not apply the relevant rules*
- *the locomotive driver started the train after manual release of the brakes, despite the main pipeline pressure was 0 bar*
- *the locomotive driver had severe deficiencies in his knowledge of the type of locomotive and was therefore unable to activate the independent braking devices*

Contributory factor(s):

- *the glides of the electrical wires connected to the brake valve were not the fixing lock type and were able to slip off the connector and cause the electro-pneumatic brake valve to fail*
- *the DMU train set does not have a main line pressure switch to prevent traction when the main brake line is empty*
- *the driver did not use the direct engine brake, even in an emergency, because he thought that it could lead to a technical failure*

Underlying cause(s):

- *locomotive drivers' current knowledge of the type and decades of driving experience do not necessarily reflect their confidence in handling vehicles, and their knowledge is not always at a skill level*
- *the DMU train set was not overhauled within the required time*

Recommendation(s): *none*

SUMMARY OF OCCURRENCE № HU-6288

Grade:	*Railway incident*
Date and time:	*27 June 2020*
Location:	*Uzsa (station)*
Occurrence type:	*Signal passed at danger*
Movement type:	*Regional passenger train*
Description:	*The train no. 9694 passed the signal of Uzsa station at danger. Eventually the train was stopped by the engine driver.*
Consequences:	*0 fatality / 0 serious injury* *No damage (EUR 0)*
Parties:	*MÁV Zrt. (IM)* *MÁV-START Zrt. (RU)*
Direct cause(s):	• *instead of passing through, as it was in the timetable of the train, the signaller wanted the train to stop at the station, but the locomotive driver did not intend to stop at the station and therefore did not apply the brakes in time* • *the locomotive driver did not check the aspect of the level crossing protecting signal at the other end of the station and did not miss the authority (hand signal) to pass the station from the signaller* • *the signaller did not meet the train at the trackside and did not give the "Slow down" hand signal because he was on the phone with the line traffic controller*
Contributory factor(s):	• *the chief ticket inspector was staying in the driver's cabin* • *the pintsman did not stop the train at the entry signal* • *the signaller prioritised his tasks incorrectly* • *the line traffic cotroller changed the trains' meeting point several times and issued his last order too late*
Underlying cause(s):	• *the audit by the station master did not take action to address the poor practices identified after a previous similar incident at the station what are also relevant to this incident*
Recommendation(s):	*none*

SUMMARY OF OCCURRENCES № HU-6302

Grade: *Heritage railway accidents*

Date and time: *24 June 2020 / 10 July 2020 / 14 July 2020*

Location: *Papírgyár - Puskaporos, km 4,3 (line) / Lillafüred - Fazolakohó, km 7,7 (line) / Papírgyár - Puskaporos, km 4,3 (line)*

Occurrence type: *Train derailment*

Movement type: *Heritage passenger trains*

Description: *Three passenger trains derailed on the network of LÁEV narrow-gauge railway.*

Consequences: *0 fatality / 0 serious injury*
Total damage < EUR 150,000

Parties: *Északerdő Zrt. (IM)*
Északerdő Zrt. (RU)

Direct cause(s):

- *direct technical causes:*
  - *low wheel flange angles of derailed vehicles, which is a normal consequence of the overhaul*
  - *high friction between the wheel and the rail, which can be traced back to*
    - *the high proportion of vehicles that are refurbished, and*
    - *the lack of rail lubrication;*
  - *high guiding force on the derailed wheels, which is due to*
    - *in track section 43, the modified coupling of the wagon turned the bogie out*
    - *in track section 77, the car could not follow the change of the track curve due to the sliding plate being jammed and there was too little superelevation of the outer rail of the track*
  - *wagon 012 had a low wheel load because the wagon did not tolerate the track distortion*
- *additional causes:*
  - *high percentage of refurbished vehicles on the line*
  - *the incorrectly modified coupling design*
  - *the overall quality of the refurbishment of the wagon № 012 was poor, the refurbisher did not have sufficient railway experience and was not officially licensed*
  - *application of standards and regulations that are not appropriate to the railway system*
    - *in the absence standards for own and forest railways*
    - *over-reliance on similar specifications from other railway companies*

Contributory factor(s):

- *track supervision is carried out by a railway manager who is also burdened with managerial duties, due to the absence of a company or staff member available for this purpose, since no measures have been taken to involve the necessary company or to increase the staff headcount*
- *on the refurbisher side, the controllability of quality assurance processes is weak, with shortcomings of documentation of work processes and vehicle characteristics*
- *there is no professional staff or company available for vehicle supervision or maintenance*

Underlying cause(s):

- *in project management:*
  - *in the case of public procurement, the tasks concerning different types of vehicles were not split into separate tenders*
  - *the project was not managed professionally, including the absence of a designated engineer organization, and the role of the engineers was not clearly defined among the actors*
- *in vehicle maintenance:*

- *the maintenance system is not based on continuous renovation*
- *the maintenance and technical supervision of rolling stock on the railway is unresolved*
- *lack of vehicle maintenance infrastructure due to corporate decisions*
- *the drawings of the refurbished bogie are not detailed enough to allow an outside firm to successfully refurbish it*

- *in the field of regulaiton:*
  - *the applicable track supervision rules are outdated*
  - *there are no specific own technical specifications adapted to the railway operation and railway system*
  - *authorisation procedures are typically administrative, with overly rigid requirements preventing operators from meeting expectations at any level*
- *the company's management did not respond to the risks (already identified) inherent in the workload of the railway operations managers, which was exacerbated by the fact that they did not involve a specialist in the management of the renovation project, which added extra tasks.*

Recommendation(s):

The TSB recommends to Északerdő Zrt. to develop standards for coupling devices for all (applicable) types used, ensuring safe coupling and/or imposing application restrictions, with the involvement of similar railway companies.

The TSB recommends to Északerdő Zrt. to clearly identify the person responsible for making technical decisions in the ongoing vehicle renewal (and the planned track renewal) project.

The TSB recommends the Rail Technical Committee to develop technical rules for narrow gauge railways with the meaningful involvement of the narrow gauge rail industry, with regulatory requirements proportionate to the risks and opportunities of these railways.

SUMMARY OF OCCURRENCE № HU-6309

Grade:	*Railway incident*
Date and time:	*23 July 2020*
Location:	*Budapest-Nyugati (station)*
Occurrence type:	*Signal passed at danger*
Movement type:	*Locomotive running solo*
Description:	*The train no. 22425 passed the signal „G" of Budapest-Nyugati station at danger and moved on towards the oncoming passenger train no. 2346. Eventually the two trains stopped 288 metres away from each other.*
Consequences:	*0 fatality / 0 serious injury* *No damage (EUR 0)*
Parties:	*MÁV Zrt. (IM)* *MÁV-START Zrt. (RU)*
Direct cause(s):	• *after the train № 2036 (moving in the opposite direction) had passed, the locomotive driver of train № 22425 departed without authorisation and without observing (or after not observing it carefully enough) the aspect of signal "G" which was in 'Danger'*
Contributory factor(s):	• *the 75 Hz continuous signal transmission for train control systems is not installed at the location of the occurrence, so active train control is not available there* • *the personnel of the traffic-regulating signal box № 2 did not notice that train № 22425, which had been waiting in their area, started to move without authorisation, passed the area of the train-regulating signal box № 2 and then entered the track which lead towards signal box № 1, and so did not take any action to stop the dangerous movement(s)*
Underlying cause(s):	• *the train protection system based on 75 Hz track-circuit signals is not suitable to prevent head-on traffic when it is only partially installed*
Recommendation(s):	*none*

SUMMARY OF OCCURRENCE № HU-6321

Grade:	*Railway accident*
Date and time:	*14 August 2020*
Location:	*Biatorbágy (station)*
Occurrence type:	*Fire in rolling stock*
Movement type:	*Freight train*
Description:	*There was an explosion inside the electric-engine of the freight train no. 92905 and the roof of the engine fell down onto the second track, where the oncoming passenger train no. IC910 collided with the pieces of it.*
Consequences:	*0 fatality / 0 serious injury* *Total damage EUR 150,000 – 2,000,000*
Parties:	*MÁV Zrt. (IM)* *Rail Cargo Hungaria Zrt. (RU)* *MÁV-START Zrt. (RU)*
Direct cause(s):	• *one capacitor of the locomotive was overheated, and produced a combustible gas which inflamed, because* – *the materials of the capacitor decompose as a result of heat and* – *the detection and venting of such gases is not ensured* • *the failure can be traced back to the capacitor's manufacturing de-fect, or possible overvoltage*
Contributory factor(s):	• *the locomotive driver did not respond adequately to the fire alarm that had appeared, because sometimes false fire alarms do occur*
Underlying cause(s):	• *the failure of the capacitors had been a known phenomenon, but its safety risks were underestimated*
Recommendation(s):	*none*

SUMMARY OF OCCURRENCE № HU-6352

Grade:	*Railway accident*
Date and time:	*7 October 2020*
Location:	*Ferencváros - Kelenföld, km 8,2 (line)*
Occurrence type:	*Trains collision*
Movement type:	*Freight train*
Description:	*The freight train no. 42000-1 passed the section signal '83a' at danger and collidied with the end of the freight train no. 47141 which was standing 21 metres behind the signal. The last 2 twin-wagons of the train no. 47141 derailed, the engine of the train no. 42000-1 was damaged.*
Consequences:	*0 fatality / 0 serious injury* *Total damage HUF 15,000,000 (< EUR 150,000)*
Parties:	*MÁV Zrt. (IM)* *METRANS Danubia Kft. (RU)* *LTE Hungária Kft. (RU)*

Direct cause(s):

- *the locomotive driver did not apply the brake in time because he did not scan the 'Danger' signal he was approaching*
- *the locomotive driver was occupied by handling an error message which had appeared on the display when he ought to have been prepared for stopping the train*
- *the train control system in use at the time of the occurrence is not suitable for avoiding similar cases*

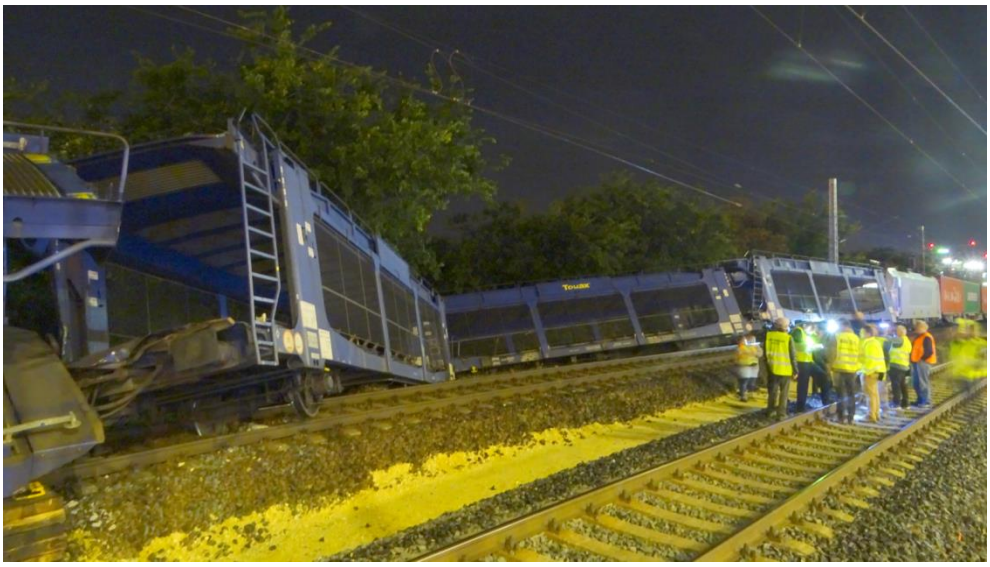
Contributory factor(s):

- *while the vehicle was in motion, the locomotive driver opened a description of tasks to do at standstill, related to the error message*
- *the description was unprofessional*
- *this error message occurs frequently, and if it is handled inappropriately, it may be necessary to restart the locomotive, which is a time-consuming process; the locomotive driver was aware of it, which resulted in him a stressful situation*
- *the use of short blocks increases the risk of collision in cases of signal overrun*

Underlying cause(s):

- *none*

Recommendation(s): *none*



SUMMARY OF OCCURRENCE № HU-6360

Grade:	*Railway incident*
Date and time:	*23 October 2020*
Location:	*Budapest-Keleti (station)*
Occurrence type:	*Wrong-side signalling failure*
Movement type:	*Long distance passenger train*
Description:	*The passenger train no. IC545 arrived onto an occupied track, with a green light on the entry signal due to signalling failure at Budapest Keleti station.*
Consequences:	*0 fatality / 0 serious injury* *No damage (EUR 0)*
Parties:	*MÁV Zrt. (IM)* *MÁV-START Zrt. (RU)*
Direct cause(s):	• *the safety installation gave a false clear signal for Track IV because the detector rack-circuit of the track had been bypassed* • *the traffic managers were not aware of the given impairment of safety service in the safety installation, because* • *the modification performed had not been reported through the specified communication channels and had not been entered in the appropriate logbooks either*
Contributory factor(s):	• *the headcount of the personnel responsible for safety installation maintenance is insufficient* • *replenishment of supplies for safety installation maintenance does not run smooth* • *it is an existing practice that defects and temporary solutions are not indicated through the specified channels* • *transmission of information (including the rules of handing off the duties or the logbooks) applied relating to temporary solutions for the safety installation is not reliable* • *the safety installation maintenance unit faces high expectations from the traffic division, which can occasionally be fulfilled only at the cost of safety*
Underlying cause(s):	• *the operation of the safety installation maintenance unit is not compliant with the approved organisational structure* • *the necessary quantity of spare parts is not specified, although it is a legal requirement as well*
Recommendation(s):	***Transport Safety Bureau of Hungary recommends to Railway Authority Division, Ministry for Innovation and Technology (as National Safety Authority) considering a review of the safety installation maintenance organisation of MÁV Zrt. to see whether it works in compliance with its approved organisational structure, and to modify their organisational structure as necessary or restore operation in compliance with it.***

SUMMARY OF OCCURRENCE № HU-6373

Grade:	*Railway accident*
Date and time:	*14 November 2020*
Location:	*Budakalász (station)*
Occurrence type:	*Train derailment*
Movement type:	*Commuter train*
Description:	*The suburban train no. 4015 derailed at Budakalász station.*
Consequences:	*0 fatality / 0 serious injury* *Total damage HUF 1,400,000 HUF (< EUR 150,000)*
Parties:	*MÁV-HÉV Zrt. (IM)* *MÁV-HÉV Zrt. (RU)*

Direct cause(s):

- *there was a plane distortion of the track exceeding the dimension limit „D" at the location of the derailment, but the track was not excluded from traffic and speed limit was not introduced either*
- *sleepers were replaced and adjusted in the turnouts linked to the track, which increased the plane distortion of the linked track section as a side effect, but it was not detected because the linked track was not measured and adjusted after the sleeper replacement*
- *the right-hand side track is sagged in the switching zone and, accordingly, the short crossover between the two tracks is a sensitive part of the line*

Contributory factor(s):

- *the track maintenance organisation has no objective measured data of the crossover*
- *the vehicle's wheel load difference exceeded the limit*
- *the vehicle had novel wheel flanges*

Underlying cause(s):

- *the track maintenance rules do not require inspection of the track geometry in cases where the track itself was not disassembled but its geometry changed*

Recommendation(s):

Transport Safety Bureau of Hungary recommends MÁV-HÉV Zrt. to consider reviewing the requirements for the frequency of track measurements in the track supervision rules applicable to the MÁV-HÉV railway infrastructure, in order to provide sufficient frequency of the assessment of tracks used by trains, with attention to the definitions of the terms used relating to the tracks.

Transport Safety Bureau of Hungary recommends adjustment of the track supervision rules and practice on the MÁV-HÉV railway infrastructure in such manner that the follow-up measurements carried out on completion of track repairs should also cover an appropriate length of such adjacent track sections which were not worked on but may have related geometric changes due to such works.

SUMMARY OF OCCURRENCE № HU-10010

Grade:	*Tramway accident*
Date and time:	*28 December 2020*
Location:	*Budapest, Közvágóhíd (station)*
Occurrence type:	*Trains collision*
Movement type:	*Tramway*
Description:	*Two trams were leaving the terminus of Budapest, Közvágóhíd (one from the track no. 1 and one from the track no. 2) towards the same direction at the same time and they collided side to side at the switch.*
Consequences:	*0 fatality / 0 serious injury* *Total damage HUF 431,216 (< EUR 150,000)*
Parties:	*BKV Zrt. (IM)* *BKV Zrt. (RU)*
Direct cause(s):	• *the driver of the № 24 tram departed despite the "Danger" aspect of signal "C"* • *while departing (with 'Proceed' signal), the driver of the № 2 tram did not realise that the № 24 tram had also started its journey and got in the way*
Contributory factor(s):	• *the time pressures inherent in tramway operations (which are most pronounced on return departures at terminals) can, in unfavourable circumstances, facilitate distraction of drivers' attention from rail safety issues*
Underlying cause(s):	• *psychological testing is not a compulsory part of the periodic medical evaluation of drivers, therefore any changes in the employees' circumstances that may preclude or limit their fitness and competence can remain hidden*
Recommendation(s):	*none*

SUMMARY OF OCCURRENCE № HU-10042

Grade:	*Railway incident*
Date and time:	*10 March 2020*
Location:	*Rákos (station)*
Occurrence type:	*Signal passed at danger*
Movement type:	*Freight train*
Description:	*The train no. 44290-1 passed the entry signal of Rákos station at danger.*
Consequences:	*0 fatality / 0 serious injury* *No damage (EUR 0)*
Parties:	*MÁV Zrt. (IM)* *Train Hungary Kft. (RU)*

Direct cause(s):

- *the locomotive driver did not prepare for stopping in front of the home signal of the station at danger*
- *the vigilance warning and train control device did not brake the train after the locomotive driver failed to respond to the vigilance alert*
- *despite being aware of the defect, the railway undertaking failed to arrange for identification and elimination of the error in the locomotive*

Contributory factor(s):

- *the vigilance warning and train control device of the locomotive had a malfunction which made its operation unreliable and had the potential to distract the locomotive driver's attention*

Underlying cause(s):

- *the railway undertaking has not met the requirement relating to the inspection of recordings from on-board data recorders as included in its safety management system*
- *the safety management system does not specify a register which would serve traceability of malfunctions of locomotives, and the railway undertaking keeps no such records*

Recommendation(s):

Transport Safety Bureau of Hungary recommends to Railway Authority Division, Ministry for Innovation and Technology (as National Safety Authority) considering a review of the safety management system as well as completion of the processes in it, and taking action as necessary, with a focus on

- ***the accuracy of the rules of monitoring the technical defects of vehicles and compliance with such rules in practice, and***
- ***compliance with the rules relating to the inspection of recordings from the on-board data recorders.***

SUMMARY OF OCCURRENCE № HU-10046

Grade:	*Railway accident*
Date and time:	*20 April 2020*
Location:	*Hajdúhadház - Újfehértó, km 252,7 (line)*
Occurrence type:	*Level crossing accident*
Movement type:	*Regional passenger train*
Description:	*Between Hajdúhadház and Újfehértó stations at a level crossing (equipped with active level crossing protection) the train no. 6254 collided with a tractor what was thrown onto the second track where the oncoming train no. 6203 collided with the wreck. The train no. 6203 derailed – in the derailment one wagon was overturned.*
Consequences:	*1 fatality / 0 serious injury* *Total damage HUF 272,000,000 (EUR 150,000 – 2,000,000)*
Parties:	*MÁV Zrt. (IM)* *MÁV-START Zrt. (RU)*
Direct cause(s):	• *the road vehicle (agricultural tractor) failed to stop at the "Beginning of railway crossing" sign and entered the level crossing despite the red light signal of the active level crossing protection system*
Contributory factor(s):	• *the severity of the consequences was considerably increased by the fact that the wheel of the tractor, which had come off the tractor, was thrown onto the left-hand track, where it was hit by the train coming from the opposite direction, and caused it to derail*
Underlying cause(s):	• *none*
Recommendation(s):	*none*

SUMMARY OF OCCURRENCE № HU-10056

Grade:	*Railway accident*
Date and time:	*31 May 2020*
Location:	*Sátoraljaújhely (station)*
Occurrence type:	*Level crossing accident*
Movement type:	*Regional passenger train*
Description:	*At the level crossing of Sátoraljaújhely station (equipped with active level crossing protection) the train no. 5228 collided with a truck what caused the derailment of the train.*
Consequences:	*0 fatality / 2 serious injury* *Total damage HUF 71,100,000 (EUR 150,000 – 2,000,000)*
Parties:	*MÁV Zrt. (IM)* *MÁV-START Zrt. (RU)*
Direct cause(s):	• *the truck driver entered the level crossing despite the blinking red warning lights of the active level crossing protection system*
Contributory factor(s):	• *none*
Underlying cause(s):	• *none*
Recommendation(s):	*none*

SUMMARY OF OCCURRENCE № HU-10065

Grade:	*Railway incident*
Date and time:	*16 June 2020*
Location:	*Mosonmagyaróvár (station)*
Occurrence type:	*Signal passed at danger*
Movement type:	*Regional passenger train*
Description:	*At Mosonmagyaróvár station after passengers got off/on, the train no. 9412 departed to continue its journey, upon the signal "Ready to start" given by the chief ticket inspector, passing the exit signal at danger, finally stopped in the switching zone upon (too late) brake use by the locomotive driver. As a result, the entry signal ahead of the train no. 9467 arriving from the opposite direction dropped back to 'Danger!' aspect automatically and the locomotive driver stopped the train (using the brake) before the signal.*
Consequences:	*0 fatality / 0 serious injury* *No damage (EUR 0)*
Parties:	*MÁV Zrt. (IM)* *MÁV-START Zrt. (RU)*
Direct cause(s):	• *neither the locomotive driver nor the chief ticket inspector checked the 'Danger' aspect of the exit signal before the departure* • *although the moderner train control system, which could have prevented the occurrence was available and in service, but following a decision of the railway undertaking, it was not used, but they used the older system which cannot prevent similar occurrences*
Contributory factor(s):	• *the train control system in use does not meet the safety requirements set for it as regards speed limits of up to 160 km/h*
Underlying cause(s):	• *the railway undertaking let their train go with the train control system that provided the lower level of the two available safety levels and assigned a locomotive driver for that configuration*
Recommendation(s):	*none*

5. SAFETY RECOMMENDATIONS

SUMMARY OF RECOMMENDATIONS

In 2021, the addressee of the safety recommendations was primarily the National Transportation Authority, as National Safety Authority (NSA). TSB deviates from this practice only when it issues safety recommendations to organisations which are not under the scope of authority of the NSA (e.g. rescue services), or the supervision rights are at a regional authority (e.g. supervision of level crossings). This way it could be achieved that when the addressee of the recommendation is a railway undertaking, the response would not come from the addressee itself for which the implementation would involve considerable work and/or financial sources but an outside, impartial professional organisation would respond to the recommendation. The other advantage is that when the recommendation suggests eliminating conditions/factors that are unlawful or pose risks to transport safety, the NSA has the possibility to oblige the relevant parties with deadlines to take action, which would increase efficiency in the implementation of recommendations. Disadvantage of this process – laid down in the RSD – is that it brings delay in the implementation process, and there are some cases, when the NSA has no legal right to take action in topics, which could be solved easily by the IM or RU. In 2020, in some cases we have already addressed the recommendation to the railway company as the body responsible for application, and at the same time sent it to the NSA as the supervisor body to control the application.

In 2020 the Railway Department of TSB published 11 safety recommendations. 9 of these recommendations has been implemented.

Issuance of safety recommendation is usually preceded by consultation with the railway companies involved and National Transport Authority. As a result of such consultations, it is often unnecessary to issue a safety recommendation formally, because the railway companies recognize the anomalies and take action voluntarily to eliminate such anomalies. Therefore no immediate preventive recommendation was issued in 2021.

Response	2019	2020	2021
Accepted and implemented	**5**	**1**	**1**
Accepted and partially implemented	-	-	-
Accepted, implementation in progress	**3**	**6**	**8**
Accepted, no information on implementation	-	-	-
Rejected	-	**2**	**1**
No answer	**1**	**5**	**1**
Total	**9**	**14**	**11**

SAFETY RECOMMENDATIONS ISSUED IN 2021

BA2020-0050-5-01

The „3L" wheel bearing of passenger carriage series 20-05 had a hot box and it's lubricant caught fire. According to the finding of the safety investigation the event was caused by the overoperation of the wheel bearing, as the bearing reached the fatigue threshold and got stuck, due to a mechanical damage caused by fatigue. The withdrawal sleeve started to turn around the axle journal and the inner ring of the bearing, and the heat created by the friction set the lubricant to fire.

Transportation Safety Bureau recommends MÁV-START Zrt. to introduce in the maintenance system of passenger carriages such procedures that take into account the factory recommendations referring to the lifetime of bearings and prescribes the replacement of bearings before the end of their expected lifetime.

In the opinion of the IC, in case of the acceptance and execution of the safety recommendation the occurrence of hot boxes caused by the fatigue of wheel bearings and the number of accidents triggered by hot boxes can be reduced.

REJECTED

BA2020-0301-5-01

The operative regulations and the everyday practice builds on the fact, that the crew working on a locomotive always has an up-to-date route knowledge, but in reality with the training tools available in some cases it can't be provided. The applied procedures are missing the rules that handle the risks of driving without formal route knowledge. Therefore TSB issues the following safety recommendation.

TSB recommends Railway Authority Division, Ministry for Technology and Industry to require the establishment of such procedures in RU's safety management systems, which are suitable for revealing and handling driving situations, when train drivers have no up-to-date route knowledge (e.g. driving on lines under reconstruction), analyzing it's risk and applies risk-mitigating procedures as a result.

The recommendation aims to raise the safety culture of railway companies in order to develop a more risk-aware behavior and to compensate the risks of the lack of up-to-date route knowledge with other measures in their safety management system.

ACCEPTED, EXECUTION IN PROGRESS (ITM)

BA2020-0301-5-02

During the investigation process the IC found out, that the route knowledge training of train drivers does not contain such methods that can help drivers to gain an up-to-date, professional knowledge of reconstructed or new line sections in case preliminary travel on these lines is not possible.

TSB recommends that KTI VKMK inspect the possibility of application of simulators and VR technology in route knowledge training of train drivers and, according to the results of inspection, take measures – even recommendations for legislative changes – to form the order of simulator trainings in the Hungarian railway industry.

In case of acceptance of the recommendation, among others, it will be possible to shape up deeper route knowledge of train drivers in a safe environment, so the number of dangerous situations caused by insufficient route knowledge can be mitigated.

ACCEPTED, EXECUTED

BA2020-0301-5-03

Regulations relating to the train control system used on the majority of the Hungarian railway network prescribe the establishment of the necessary trackside infrastructure (continuous signaling) on such short line sections that it makes the train control system unsuitable to support the work of drivers and to intervene on time, if it is necessary.

TSB recommends Railway Authority Division, Ministry for Technology and Industry to determine the minimal length of establishment of continuous signaling necessary to support safe driving, and to prescribe the usage of rules relevant for tracks without continuous signaling on line sections where the minimal establishment length of continuous signaling does not meet the new criteria.

With the acceptance and execution of the recommendation it can be avoided that the crew trust gratuitously in continuous signaling on lines where due to the establishment it cannot support the safety functions of driving properly. On these lines, rules made for handle the risks of running on lines where the establishment of continuous signaling is improper or not exist make it possible to drive with an acceptable level of safety.

ACCEPTED, EXECUTION IN PROGRESS (ITM)

BA2020-0304-5-01

The IC found during the investigation that surface cracks occurred on the rail, which – presumably – led to the crack that caused the accident. There is an existing procedure to reveal surface cracks, but in that case it was not applied on the point involved in the accident. TSB issued the following safety recommendation.

TSB recommends Railway Authority Division, Ministry for Technology and Industry and MÁV Zrt. to perform risk analysis in the safety management system to inspect if it worth to extend surface crack checks to points with lower classification or at least to a group of them (determined by e.g. time since built in, load or the rate of usage). In that case, the track supervisory system is also needs to be modified.

In case of acceptance and execution of the recommendation – if the inspections are truly suitable to reveal the failures and their execution is proportional to the safety advantages – surface cracks that can lead to further rail cracks can be identified in time.

ACCEPTED, EXECUTION IN PROGRESS (ITM)

BA2020-0515-5-01

The IC found during the investigation that the railway infrastructure manager had not made the necessary steps to manage the risks revealed in a previous safety investigation and also admitted by infrastructure manager itself. The IM made risk management dependent from outer compulsion (the order of Railway Authority). This fact harmed the principle of the safety management system that says one task of the IM is to take immediate corrective measures in order to prevent the repetition of accidents.

TSB recommends Railway Authority Division, Ministry for Technology and Industry to supervise the operation and the safety management system of MÁV Zrt. to check whether it ensures the taking of immediate corrective measures to the upcoming risks, and to decide is the company working it properly or not.

In case of acceptance and execution of the recommendation it can be achieved that the recognized risks are managed properly by the IM.

ACCEPTED, EXECUTION IN PROGRESS (ITM)

BA2020-0685-5-03

During the investigation, the IC found that the regulations relating to the operation of narrow gauge railways are outdated, deficient and in several cases the regulations relating to the national railway network are used, which can lead to dangerous situations.

TSD recommends Railway Technical Committee to estabilish the technical standards of narrow gauge railways in close cooperation with those working with narrow gauge railways. During the process regulations should be established in proportion to risks and possibilities given on narrow gauge railways.

In case of acceptance and execution of the recommendation, technical standards can be created that fit to that railway system and can be applicable. Authorities could require conformity to the regulations in such way that it doesn't make the operation impossible for the actors in that industry. This can lead to a truly safe operation.

NO RESPONSE

BA2020-1058-5-01

During the investigation the IC found that the safety installation maintenance branch of the railway infrastructure manager does not operate according to its planned organizational structure, co-workers of that branch do tasks that doesn't suite to their scope of practice and they violate the decision routes.

TSB recommends Railway Authority Division, Ministry for Technology and Industry to supervise the operation of the safety installation maintenance branch of MÁV Zrt., compare the operational conformity to the planned organizational structure and to modify the organizational structure if necessary, or to restore the operations according to the planned structure.

By accepting and executing the recommendation the tasks and scopes will be unambiguous, which is the basic requirement of the Safety Management System.

ACCEPTED, EXECUTION IN PROGRESS (ITM) /REJECTED (MÁV)

BA2020-1144-5-01

During the investigation, the IC found that according to the improper wording of ordinance no. P.2., it requires very rare track measurements on open line tracks and on cross-overs used by trains (the everyday practice does not follow the ordinance in case of open line tracks, measurements are done more often that they are prescribed).

TSB recommends MÁV-HÉV the supervision of regulations relating to the frequency of track measurements needed to be carried out on its track network to provide an adequate measuring frequency.

By accepting and executing the recommendation the company's track maintenance branch can get an adequate view of the actual track conditions.

ACCEPTED, EXECUTION IN PROGRESS

BA2020-1144-5-02

During the investigation the IC found that during track maintenance works parameters of tracks connected to the ones under maintenance can change too (e.g. track distortion), but control measures are done only on tracks that were effectively taken under maintenance. With this method, some failures that were arisen during track maintenance, remain hidden. Therefore TSB issues the following recommendation.

TSB recommends MÁV-HÉV to change its track supervisory regulations and practices in order to extend post-maintenance controlling measures in an adequate length to the tracks connecting to the ones that were under maintenance.

The acceptance and execution of that recommendation can help avoiding accidents caused by the unintentional creation of failures on tracks connected to the ones under maintenance.

ACCEPTED, EXECUTION IN PROGRESS

BA2021-0235-5-01

During the investigation the IC found that the railway company's Safety Management System – and its practices – cannot ensure the following of vehicle failures and their repair, nor are the regular checks of the recordings of on-train data monitoring systems guaranteed.

TSB recommends Railway Authority Division, Ministry for Technology and Industry the supervision of the company's Safety Management System and the procedures involved in it, the taking of necessary measures, with particular regard to

- **the accuracy and practical application of the rules for monitoring vehicle failures**
- **the monitoring of recordings from the on-train data monitoring systems.**

By accepting and executing the recommendation the failures endangering safety will be revealed with a bigger chance, which gives an opportunity to take corrective measures.

ACCEPTED, EXECUTION IN PROGRESS (ITM)

6. OTHER ACTIVITIES

International Cooperation

The 2020-2021 pandemic situations made it difficult to participate in the work of international organizations. Nevertheless, KBSZ representatives took part in the meetings held in the virtual space. The European Union Railway Agency (ERA) brings together the national accident investigation organizations in a working group. The chief investigator participated on the online plenary meeting of the working group 3 times.

The European Parliament and the Council (EU) 2016/798. no., Article 22 (7) of its directive on railway safety requires the operation of the joint expert evaluation program for the accident investigation organizations of the member states. In 2021, the chief investigator personally participated in the evaluation of the Swedish accident investigation organization in Stockholm.

In previous years, members of the Regional Conference of Central European Accident Investigation Organizations met regularly, but these meetings were unfortunately cancelled in 2020 and 2021 due to the pandemic.

During the reporting period, the KBSZ did not participate in the investigation of a railway incident that took place abroad but had Hungarian involvement.

An event that took place in Hungary but had a significant foreign impact, where active cooperation with a foreign partner organization would have been necessary, was the signal passed at danger at Pécel station on February 14, 2021. In this case where the possibility of a technical fault of the locomotive arose. However, due to the long-term travel restrictions in force at the time, the IC was unable to participate in the workshop inspection of the locomotive at its Slovakian operator, which later made it difficult to accurately reveal the technical factors contributing to the incident.