KÖZLEKEDÉSBIZTONSÁGI SZERVEZET

TRANSPORTATION SAFETY BUREAU

FINAL REPORT

2010-069-5
Railway accident

Budapest- Nyugati station
9 February 2010

Train no. 2759

The sole objective of the technical 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 is not the purpose of this activity to apportion blame or liability.

This present investigation was carried out on the basis of

- Act CLXXXIV of 2005 on the technical investigation of aviation, railway and marine accidents and incidents (hereinafter referred to as Kbvt.),
- MET Decree 7/2006. (II. 27.) on the regulations of the technical investigation of serious railway accidents, railway accidents and incidents.
- In absence of other related regulation of the Kbvt., the Transportation Safety Bureau of Hungary carried out the investigation in accordance with Act CXL of 2004 on the general rules of administrative authority procedure and service,
- The Kbvt. and the MET Decree 7/2006. (II. 27.) jointly serve the compliance with the following EU acts:
  Directive 2004/49/EC of the European Parliament and of the Council of 29 April 2004 on safety on the Community's railways and amending Council Directive 95/18/EC on the licensing of railway undertakings and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification (Railway Safety Directive)

The competence of the Transportation Safety Bureau of Hungary is based on Government Decree 278/2006 (XII. 23.).

Under the aforementioned regulations

- The Transportation Safety Bureau of Hungary shall investigate serious railway accidents.
- The Transportation Safety Bureau of Hungary may investigate railway accidents and incidents which - in its judgement - would have resulted in serious accidents in other circumstances.
- The technical investigation is independent of any administrative, infringement or criminal procedures.

This present final report shall not be binding, nor shall an appeal be lodged against it.

Incompatibility did not stand against the members of the IC.

Persons participating in the technical investigation did not act as experts in other procedures concerning the same case and shall not do so in the future.

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

This present final report

was based on the draft report prepared by the IC and accepted by the Director-General of TSB. The draft report was sent to the relevant parties - defined by law - for reflections. At the same time, the relevant parties and organisations were also informed and invited to the closing discussion of the draft report.

The following organisations were represented at the closing discussion which was held on 19 October 2010:

- National Transport Authority
- MÁV Zrt.
- MÁV-TRAKCIÓ Zrt.

ABBREVIATIONS

BIG	Safety Directorate of Máv Zrt.
CSM	Engine driver on duty on his own in the driver's cab ("**CS**ak **M**ozdonyvezető" = "Engine driver only")
MET	Ministry of Economy and Transport
(GKM)	(Gazdasági és Közlekedési Minisztérium)
TSB	Transportation Safety Bureau
Kbvt.	Act CLXXXIV of 2005 on the technical investigation of aviation, railway and marine accidents and incidents
MÁV Zrt.	Hungarian State Railways Plc. (Magyar Államvasutak Zártkörűen Működő Részvénytársaság)
IC	Investigating Committee
VBO	The competent Regional Railway Safety Department of MÁV Zrt. Safety Directorate

SUMMARY

Type of occurrence	**railway accident**
Character	**derailment**
Time of occurrence	**08:27 on 9 February 2010**
Location of occurrence	**Budapest-Nyugati station**
Type of railway system	**national**
Type of movement	**passenger train**
Fatalities/injuries	**-**
Extent of damage	**the rail track and two carriages sustained minor damage**
Registration number of the involved train(s)	**2759**
Infrastructure manager	**MÁV Zrt.**
Operator	**MÁV-Start Zrt.**
State of Registry	**Republic of Hungary**

Location of the occurrence

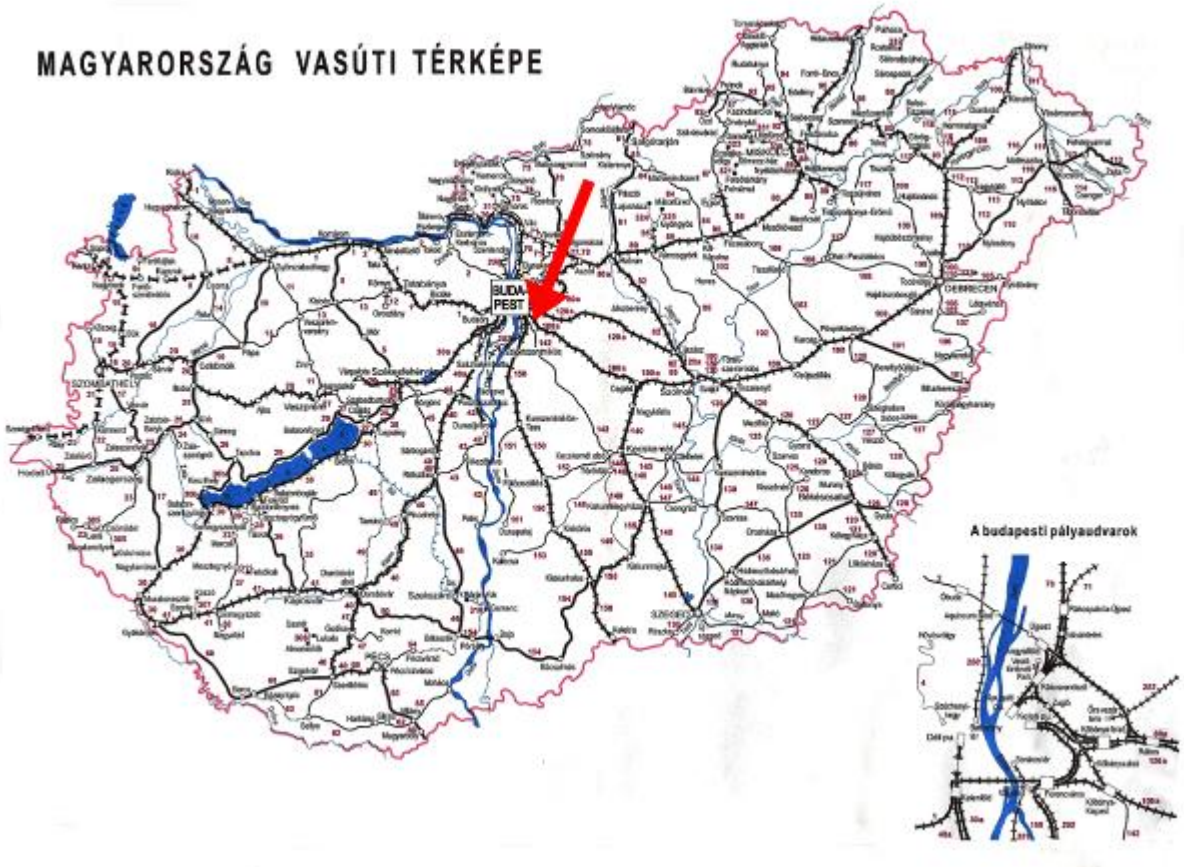


Figure 1: The location of the accident on the railway map of Hungary

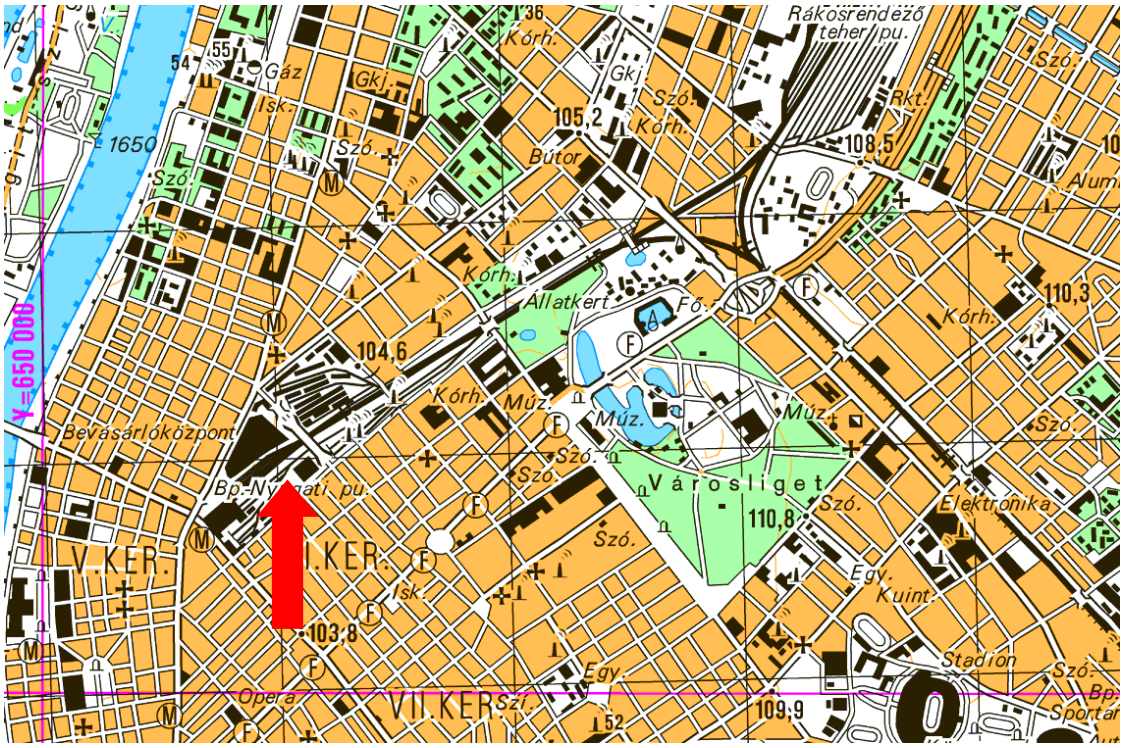


Figure 2: the location of the accident on a more detailed map

Reports and notifications

The head of traffic operations control of MÁV Zrt. reported the occurrence to the TSB duty services at 08:44 hrs on 9 February 2010. The on duty personnel of TSB reported the occurrence to the TSB's head of department on duty.

Investigating Committee

The Director-General of TSB appointed the following Investigating Committee (hereinafter referred to as IC) to investigate the railway accident on 9 February 2010:

Investigator-in-charge	Gábor Chikán	accident investigator
Members of the IC	János Rózsa	accident investigator
	Zoltán Nyári	accident investigator
	Szilárd Sárközi	meteorologist

Overview of the investigation

The IC conducted a site survey on 9 February 2010.

- examined the rail track before its repair,
- requested and received the necessary documents,
- evaluated the strip chart recorder,
- reviewed the organisation of railway operation.

Overview of the occurrence

On 9 February 2010 at 08:27 hrs, 2010, one carriage (the penultimate) of train no. 2759 derailed with four axles between points no. 13 and 19 when approaching track XIV of Budapest-Nyugati station.

The IC conducted a site survey after the occurrence.

The IC established that the track gauge where the train derailed was faulty. The direct causes of the derailment were as follows:

- the track was overused and had been worn away; the gauge was significantly broader than prescribed
- the previously installed gauge stabilizer was broken.

The required resources to maintain the rail track were not provided by the infrastructure manager and this led to the occurrence of the accident. Furthermore, not only the resources are scarce but due to the inadequate organisation of work the usage of the resources is less efficient. Nonetheless, the railway undertaking has an operation licence (whose granting is subject to the above preconditions i.e. sufficient resources, their efficient allocation and good organisation of work).

Therefore the IC issues a safety recommendation in order to improve supervision in the procedure of granting operation licences.

1 FACTUAL INFORMATION

1.1 Course of events

On 9 February at 08:27 hrs, the fifth carriage of passenger train no. 2759 - on the Szolnok-Cegléd-Budapest route derailed with four axles between points no. 13 and 19 when approaching track XIV of Budapest-Nyugati station. As a consequence of the occurrence, the train pulled apart and the coupling of the fourth carriage broke off. The derailed carriage damaged the rail track on an approximately 15-metre-length and stopped half metre from the points operation building (see Figure 3). The blades of points no. 19 (double slip) sustained minor damage.

Figure 3: the derailed carriage beside the wall of the points operation building

1.2 Injuries to persons

No one was injured.

1.3 Damage to railway vehicles

The fourth and fifth carriage of the train sustained minor damage. The coupling broke off from the fourth carriage and minor surface friction was visible on the fifth carriage.

1.4 Damage to infrastructure

The rail track sustained damage on a short section (sleepers and switches).

1.5 Other damage

The occurrence caused traffic jams/obstructions. Tracks no. XII and XIV were closed off for 15 hours and 5 minutes. 65 trains were delayed by altogether 961 minutes as a consequence of the accident.

The environment was not harmed.

1.6 Personnel information

Engine-driver:

Age	**40 years**
Gender	**male**
Qualification(s)	**engine-driver**
Medical certificate valid	**group II, May 2012**
On duty since (on the day of the occurrence)	**06:20 hrs, 09. 02. 2010**

1.7 Train information

Registration number	2759
Route	Szolnok-Budapest
Train type	regional passenger train
Type of traction	CSM
Registration number of locomotive	V43 1291
Owner of locomotive	MÁV-Trakció Zrt.
Registration number of carriages	50 55 20-05 726-4 50 55 20-05 634-0 50 55 20-05 839-5 50 55 20-05 677-9 50 55 20-05 599-5 (derailed) 50 55 80-05 439-1
Length of train	159 m
Tonnage	328 t
Prescribed braked weight percentage	103 %
Actual braked weight percentage	109 %

1.7.1 Marks on the wheels

Scrapes were visible on the derailed wheel of the derailed carriage. Similar marks were also found:

- on one of the wheels of the locomotive (see Figure 4), one of the wheels of the first carriage and that of the control car;
- on the locomotive and one carriage of train no. IC 709 running on the same track previously (two trains before the derailed train).

Another train ran on this track section prior to the derailment, which the IC was unable to examine.

Figure 4: marks (scrapes) on the wheel of the locomotive

1.8 Description of the rail track and the signal box

The accident occurred at Budapest-Nyugati railway station, between points (double slips) no. 13 and 19. Tracks X – XVII (arrivals) and the points in their area lie on 48 kg/m wooden sleepers with geo reinforcing in ballast chips. The rail track in this area is overused and is worn away. The speed limit on the tracks and at the points is 20 km/h.

The signal box here is equipped with light signals and mechanical wiring. The signal box had no effect on the accident.

1.8.1 Previous track inspections

The following were found during the previous track inspections:

- No fault requiring repair was found based on the graph (November 2009) of testing train no. EM 120.
- No fault requiring repair was found during the manual examination of the curve between points no. 13 and 19 in 2009.
- No fault requiring repair was found during the manual track gauge examination and inspection of super-elevation between points no.13 and 19 in August 2009.
- Sleeper replacement and gauge rectification was recorded on the worksheet dated April 2008.

1.8.2 Inspection after the accident

The first derailment mark was found on the left rail (from the running direction of the train) between the 2nd and 3rd sleeper (see table 1.8.3 at the area of sleeper 24.)

Figure 5: first derailment mark on the rail

The second derailment mark was found on the right rail, under the rear bogie of the control car, in the area of sleeper 31 (see Figure 6)

Figure 6: second derailment mark on the rail

Marks of ploughing and corrosion were visible on the right rail where the wheel flange touches the rail-head in the area of sleepers 14-21 (see Figure 7).

Figure 7: marks of ploughing and corrosion

A gauge stabilizer had been installed in the track. The installation of the stabilizer (date) was not documented; according to the personnel, it was done in the autumn of 2009. The stabilizer was broken at the time of the accident, however, the breakage was not a result of the accident.

According to the track maintenance personnel, there are approximately 50 gauge stabilizers installed in the area of the station.

1.8.3 Track inspection after the accident

After the accident, the IC - together with the track maintenance personnel - examined the track at the area of the derailment when there was no load on it (see Appendix 3 for the details).

1.9 Station information

Budapest-Nyugati is a very busy railway station with both suburban (Vác, Vácrátót, Esztergom, Monor-Szolnok) and long-distance trains (Debrecen-Záhony, and Szeged) arriving at and departing from it.

Usually trains to and from Monor-Szolnok and Szeged use the tracks involved in the accident.

1.10 Data recorders of railway vehicles

The strip chart recorder of the locomotive is shown in Figure 8 below.

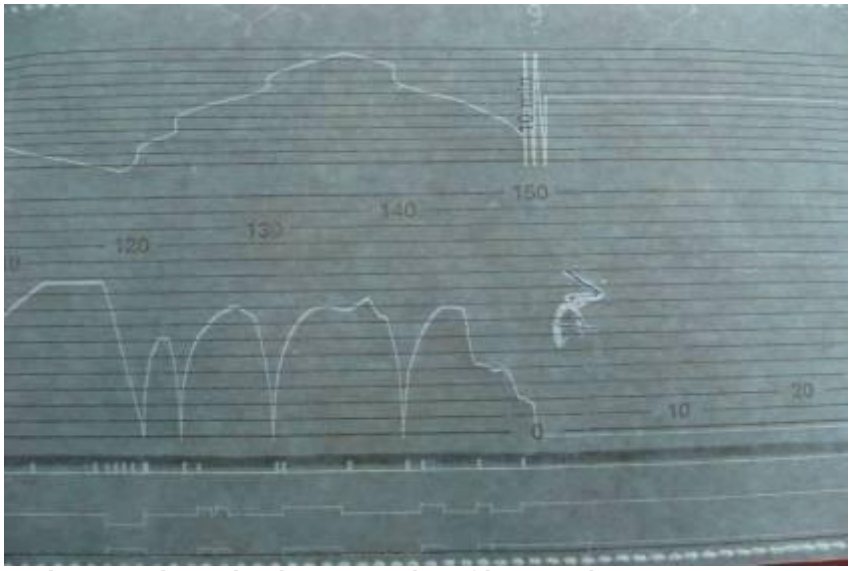


Figure 8: the strip chart recorder of locomotive mo. V43 2291

The locomotive was equipped with Teloc RT12 type data recorder whose measuring limit was 150 km/h, and so was the measuring limit of the strip chart recorder inside it.

1.11 Communications

The communications equipment had no effect on the accident, therefore their analysis was not required.

1.12 Meteorological information

It had been snowing for weeks prior to the accident, continuously since 18 January. On the day of the accident, the station was covered with snow. The last snowing before the accident was on 31 January bringing approximately 20 cm snow which did not melt until the day of the occurrence.

The weather was calm and overcast with temperature of -6 ºC. The visibility was normal.

1.13 Survival aspects

N.a.

1.14 Tests and research

The derailed carriage was inspected on 10 February 2010 in the Wagon-repair Depot of Bp. Nyugati station. (for the inspection and measurements worksheet, see Appendix 1 - *in Hungarian only*).

1.15 Organisational and management information

The infrastructure manager at the station is MÁV Zrt which is in possession of an operation licence (dated 29 December 2008, licence number: HU OP 2008 0001).

1.15.1 Work within the organisation

The track inspectorate division not only supervises Budapest-Nyugati railway station but several other stations as well. In this area, there are approximately 500 points. This division employs 24 manual workers.

Their task is to check/examine the tracks, lubricate the points regularly and repair faults. Surveyors also check the condition of the rail tracks once a week. There are two surveyors working at Budapest-Nyugati station who take part in other tasks in the field of track maintenance as well, and in the wintertime a major part of their work time is taken up by cleaning the points.

Materials to be built in are not provided to the track inspectorate division; there is only disassembled, used material available (which is in relatively good condition), approximately 50 used sleepers for this track section in 2010.

1.15.2 Work performed by contractors

The planned maintenance works are performed by contractors (not the employees of Máv Zrt). The selection of the contractor is done centrally and the given department is obliged to 'use' the selected contractor to do the required work.

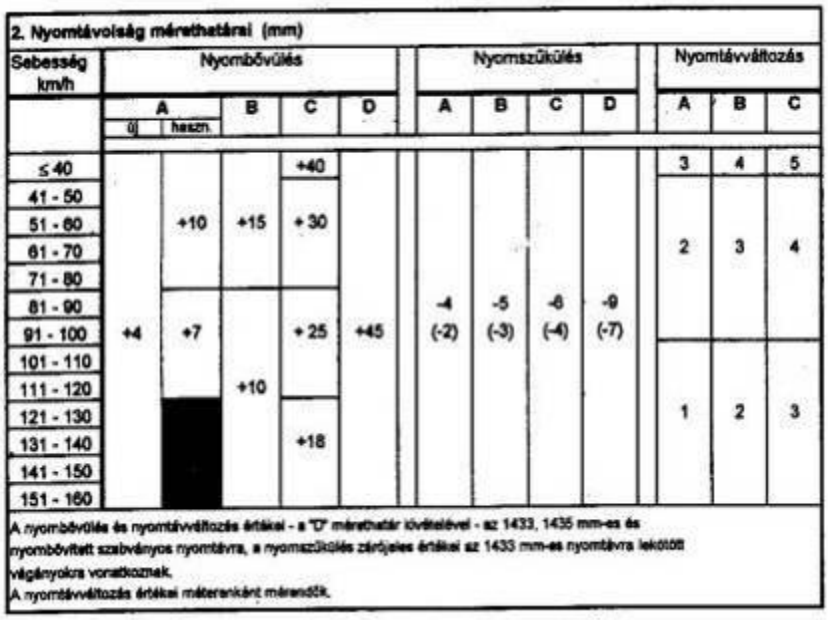
The track inspectorate division annually compiles a plan on the required works and materials to be built in, specifying the quantity of the materials needed. The Board of Director-Generals decides on the plan. Based on their decision, much less material is provided than it was requested in the plan. According to the data given to the IC, in 2010, only a fraction of the requested materials (altogether 66 points-sleepers and 4700 further sleepers) are provided for Budapest-Nyugati and Rákosrendező stations (200 sleepers were replaced in 2009).

The track inspectorate division assigns the tasks to be done by the contractor within these limits, however, it is not entitled to define the time frame, order and technology used for the work, therefore it may happen that the sleepers are replaced before the track correction (levelling). The track inspectorate division has to tolerate the limits of the capacity and work organisation of the contractors.

1.16 Rules and regulations

1.16.1 Track gauge

Section 51 of Regulations D. 54 includes the rules on the size limits to be considered when building and maintaining tracks. This is a 'speed-dependant', three-category, geometric size-limit system (see Figure 9). When exceeding the size limit defined in category "D", rail transport safety cannot be ensured, therefore the track shall be closed down until it is repaired.



2. Nyomtávolság mérethatárai (mm)

Sebesség km/h	Nyombővülés					Nyomszűkülés				Nyomtávváltozás		
	A		B	C	D	A	B	C	D	A	B	C
	új	használt										
≤ 40	+4	+10	+15	+40	+45	-4 (-2)	-5 (-3)	-6 (-4)	-9 (-7)	3	4	5
41 - 50				+ 30								
51 - 60										2	3	4
61 - 70												
71 - 80												
81 - 90		+7	+10	+ 25								
91 - 100												
101 - 110												
111 - 120										1	2	3
121 - 130				+18								
131 - 140												
141 - 150												
151 - 160												

A nyombővülés és nyomtávváltozás értékei - a "D" mérethatár kivételével - az 1433, 1435 mm-es és nyombővített szabványos nyomtávra, a nyomszűkülés zárójeles értékei az 1433 mm-es nyomtávra lekötött vágányokra vonatkoznak.
A nyomtávváltozás értékei méterenként mérendők.

Figure 9: Geometric size limit system

1.16.2 Track inspection

At the periodical track inspections, the arch after the points shall also be measured and the measurements/data shall be recorded in an inspection book. This book has a section for this in case of ordinary points but there is no separate section for double slips.

The arch in this present case is between two double slips. The measurements were done by the track maintenance staff. They said that they had measured the tracks and recorded the data separately; however, they were unable to present it to the IC.

1.16.3 Operation licence

Pursuant to Decree 45/2006. (VII. 11.) GKM on the operation licence of railway undertakings, one of the prerequisites of granting (and receiving) a licence is that the undertaking shall have enough financial and other resources to maintain the tracks and perform regular safety inspections on the tracks and their fittings.

1.17 Additional information

The IC does not wish to add further information.

1.18 Previous occurrences of a similar character

The TSB has investigated other accidents which could be attributed to the worn away condition of the rail track. These are as follows:

- 7 January 2008, a passenger train derailed at Tarcal station (file no. 2008-008-5);
- 7 February 2008, a freight train carrying dangerous goods derailed at Budafok–Háros station (file no. 2008-052-5);
- 9 September 2008, a freight train derailed at Székesfehérvár station (file no. 2008-408-5);
- 3 February 2009, a freight train derailed at Rajka station (file no. 2009-052-5).

1. ANALYSIS

2.1 The motion of the train

The IC evaluated the strip chart recorder of the locomotive (see Figure 8) and established that train no. 2759 did not exceed the 20 km/h speed limit.

The typical marks on the wheels of the derailed carriage (see 1.7.1 and Figure 4) indicate that the wheel running on the inner side of the arch first fell in between the rails, and while in motion, the outer surface of the wheel grated against the rail. From this position (towards the end of the gauge widening) the wheel running on the outer rail jumped over the rail and left the track.

In this situation it is possible that the wheel may get back onto the rail.

The IC found marks of this on several wheels of the train as well as on the wheels of one carriage of another train (IC 709) and its locomotive running on the same track section earlier that day. Thus the rail track had already been in a critical condition under more than one train.

2.2 The condition of the rail track

2.2.1 Gauge widening

Based on the measurements on the gauge and super-elevation (see 1.8.3) and according to Regulation D. 54 (see 1. 16) it can be established that the gauge on the 3rd and 4th sleepers before the derailment mark exceeded the critical size to such an extent that was unsafe to run on the track. (The inadequate sizes can be found in the table in Appendix 3 - from sleeper 21 to 25). The excess gauge width (45 mm or more) was only found in the area of the derailment marks.

The dangerous gauge widening, however, can not only be the reason but may well be the consequence of the derailment.

2.2.1.1 Documentation

Although while measuring the points, the connecting arches shall also be measured, there is no separate section for double slips in the track inspection documentation book (see 1.16.2). As a consequence, some data may be lost and the measuring may only be done if the workers are conscientious enough.

2.2.2 The application of gauge stabilizers

In this present occurrence

The gauge stabilizer found at the site of the derailment is a temporary solution which ‘substitutes’ the replacement of the sleepers (which can stay in their place for a longer time), however, their repair or replacement should be done within the earliest possible time.

The IC did not receive information either on why exactly the stabilizer had been installed or on previous measurements, data etc. According to the interviews, no data had been found during the earlier track inspections which would indicate that there is a need for repair (**Hiba! A hivatkozási forrás nem található.**).

Nevertheless, the fact that the gauge stabilizer was installed justifies that the sleepers had already been in a very bad condition in the autumn of 2009, thus the gauge had been faulty. It is probable that the more positive measurements of late

2009 were as a result of stabilizers installed previously, which substituted the aged sleepers and thus solved the problems temporarily (1.8.1).

However, as the stabilizers were cracked and were also in a bad condition, it indicates that they had not been checked regularly.

Inspection

The surveyor normally checks the gauge stabilizers but this time he was unable to do so due to the weather conditions. The station had been covered with snow for 20 days (to examine them, the snow should have been shovelled from the track where stabilizers are installed - altogether approximately 50 at the station). Furthermore, surveyors usually have less time in the winter as they also clean the points - which are not heated - in order to maintain safe traffic.

Possibility of repairing faults

The gauge stabilizers are only temporary solutions; the track faults should be corrected/repaired urgently. The track inspectorate division, however, has no capacity and new material for this. With the scarce human resources, faults can only be repaired within a longer time frame using materials from other sites (where sleepers and other fittings have been dismantled but are still in a relatively good condition). Thus the given track section will wear away sooner than when new materials are used.

The track inspectorate division cannot count on contractors in this respect as they are doing the pre-planned track maintenance work (see 1.15.2), - not when the track inspectorate division requests it but when they have capacity for it.

The direct consequence of this work organisation is that the temporary gauge stabilizers remain in the track for a longer time.

Documentation

The rail track maintenance field considers the installation of stabilizers a temporary solution, therefore there is no system for their registration and documentation. In practice, however, the stabilizers stay in their places for a longer time (they may become a permanent solution) due to the lack of resources, and the absence of documentation may create dangers.

In the view of the IC, rethinking and creating a system for the inspection and documentation of the gauge stabilizers can only be efficient if it is not done instead of the repair (and does not take resources from it) but the stabilizers remain only a temporary solution. Besides, faults should actually be repaired urgently.

2.3 Resources for track maintenance

According to the data given to the IC by specialists, the material provided for Budapest-Nyugati and Rákosrendező stations (in the area of the track inspectorate division) is enough for the maintenance of 20-25 mainline points. This is just a fraction of the amount which would be needed. No new material is provided for repairing faults at all, and the human resources are also insufficient.

The above indicates that the infrastructure manager is unable to perform its tasks (related to track inspection and maintenance) efficiently due to lack of resources.

The speed limits do not solve the problem, just postpone the time when the track has to be closed off because of its bad condition (moreover, at that time, the tracks would have to be fully repaired/rebuilt to be used safely.

On the contrary, the infrastructure manager is in possession of an operation licence by which the body granting the licence certifies that the infrastructure manager is able to perform the above task efficiently.

This contradiction may come about when:

- the operation licence is granted on the basis of untrue data,
- the granting procedure is inadequate to evaluate the data efficiently, or
- the infrastructure manager is unable to use its competencies effectively due to some organisational problems.

2.4 Contractors

Adapting itself to the current market economy practice, the infrastructure manager hires contractors to perform maintenance work - usually the pre-planned work - among other tasks.

Both the characteristics of the work and the market economy principles require that by selecting the most suitable contractor (undertaking) the tasks would be done within an optimal time frame and with the best quality. However, this is not ensured (see 1.15.2).

- The required work is done depending on the capacity and time of the contractor and not when the track inspectorate division assigns it (when it would be needed). Thus the track inspectorate division has to tolerate the limits of the capacity and work organisation of the contractor, creating safety risk with this.
- For the same reasons, the order of performing various technological tasks does not meet the professional expectations, therefore the work done is not of the required quality.

2.5 Inspection of railway vehicles

Based on the ‘Vehicle inspection and measurements worksheet’ (see Appendix 1), the technical condition of the derailed carriage had no effect on the occurrence of the accident.

The fact that marks had been found on other previous trains and carriages also indicates the above (see **Hiba! A hivatkozási forrás nem található.**).

3 CONCLUSIONS

3.1 Factual statements directly connected to the occurrence of the accident

Excess gauge width was found at the location of the derailment, at which it is unsafe to maintain railway traffic. The previously installed gauge stabilizer was broken, which also contributed to the gauge widening.

The rail track is in very bad condition at this part of the station, therefore a 20 km/h speed limit had been introduced

3.2 Factual statements indirectly connected to the occurrence of the accident

The resources (human and material) at the disposal of the infrastructure manager are insufficient to maintain the rail tracks as prescribed.

The work organisation (of contractors) does not ensure that the tasks are performed professionally and at the right time.

3.3 Other risk factors

N.a.

4 SAFETY RECOMMENDATIONS

BA-2010-069-5-01

The experiences of the investigation indicate that the available resources are insufficient to maintain the rail tracks and their fittings at the required quality. Furthermore, the current way of work organisation does not ensure the adequate, fast and professional usage of the resources available while the operation licence of the infrastructure manager states the opposite.

Therefore the IC recommends the National Transport Authority to review whether or not the required resources are provided for the infrastructure manager - in harmony with the operation licence - and whether the way they use the resources fulfils the safety requirements at the location of the accident (financial and professional suitability).

This way - with the adequate work organisation and usage of the resources - safe railway traffic would be ensured at this part of the railway network as prescribed in the operation licence.

4.1 Observations and opinions

The NTA did not send a written response to the safety recommendation issued in the Draft Report. It did, however, express its opinion at the closing discussion, according to which the IC slightly altered the safety recommendation.

MÁV Zrt. responded to the Draft Report (see Appendix 4 - *in Hungarian only*). The IC believes that the opinion of MÁV Zrt also reinforces that the condition of the station requires serious repair whose obstacle is the lack of resources.

The above opinion, however, contradicts the data made available for the IC in the course of the investigation, according to which the infrastructure manager is unable to replace sleepers by its own means (see 1.15.1). The fact that a lot of gauge stabilizers remain in the tracks (even though they should only be used temporarily) also reinforces the above statement (see the last paragraph of 1.8.2).

The IC disagrees that it was not possible to notice the deficiencies leading to the accident - due to the snow blanket - and to prevent it. If the installation and locations of the gauge stabilizers are well-known and documented, the snow can be cleaned off of them when inspecting the tracks. However, if there are too many stabilizers in the track, in practice it may be difficult to do so. (This also reinforces the statement of this report, namely that under the current conditions, the temporary solutions cannot be replaced by permanent solutions (final repair).

The suggestion of MÁV Zrt with regard to the sections of the inspection book could be feasible and is a possible solution for the documentation problem described in **Hiba! A hivatkozási forrás nem található.** and 2.2.1.1.

5 APPENDICES *(in Hungarian only)*

Appendix 0. Appendix 1:

Appendix 0. Appendix 2: Graph done by the test train

Appendix 0. Appendix 3:

Appendix 0. Appendix 4: Response of MÁV Zrt. to the Draft Report

Budapest, ….. November 2010

Gábor Chikán Investigator-in-charge	Zoltán Nyári Member of IC
János Rózsa Member of IC	Szilárd Sárközi Member of IC

NOTE:

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

Appendix 1: Vehicle inspection and measurements worksheet

Ért. 107/2010 VFO/158/5 (2010)

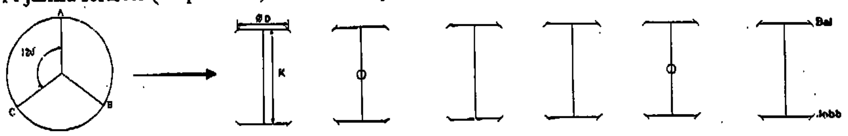
FOGADOTT 2010-02-24 09:13 KINEK 0615112105 KITOL KBSZ OLDAL 002

Biztonsági Igazgatóság
Területi VBO: Budapest
Iktató szám: ....

6.sz. melléklet

Járművizsgálati és mérési adatlap

1. A baleset időpontja: 2010. 02. 09. 8.27 Helye: Bp. Nyugati
   Vonatszám: 2759 Vonattömeg: .... Vonathossz: ....
   Siklás, ütközés sebessége: .... A vonatban hányadik kocsi: 5
   A vizsgálat helye, időpontja: Bp. Nyugati Kocsijavító telephely 2010.02.10.
   A vizsgálatot végezte: [redacted]
2. Tengelyszám: 4 Tengelytáv: 2,5 Teljes hossz: 23,74
   Hordmű típusa: C90-es forgóváz
   Forgócsaptáv: 16,5 Fv-n belüli tengelytáv: 2,5 m Forgóváz típus: C90-es
   Tulajdonos vasút: MÁV START Gyártás helye, időpontja: 1964 – Fjav 2000
   Utolsó jav.(ok) helye, időpontja: Sz. 2007.05.30.
   Üres tömeg: .... Rakomány megnev.: .... Rakomány tömege: ....
   Rakodási szabálytalanság: igen nem
   A jármű felülete (csapszámot, haladási irányt értelemszerűen bejegyzése):



		I	II	III	IV	V	VI
Kerékátmérők ØD [mm]	jobb	900	900	900	900		
	bal	900	900	900	900		
		1-8	2-7	6-3	4-5		
Kerékhátlaptávok K [mm]	A	1360	1361	1361	1361		
	B	1360,5	1360,5	1361	1361		
	C	1360	1360	1361	1360,5		

Kerékprofil méretek:

	1. tengely		2. tengely		3. tengely		4. tengely		5. tengely	6. tengely
	1. ts.	2. ts.	3. cs.	4. cs.	5. cs.	6. cs.	7. cs.	8. cs.		
V_j	60	60	60	60	60	60	60	60		
m_j n_j q_{rj}	32; 32; 12	31,5; 31,5; 12	32; 31,5; 12	32; 32; 12	32; 32; 12	31,5; 31,5; 10,5	32; 31,5; 12,5	32; 32; 12		
m_b n_b q_{rb}										
V_b										

m: nyomkarima vastagság V: abroncsvastagság
n: nyomkarima magasság k: kerékhátlap távolság

Egyéb méretek:

	csapágytok felütési hézaga [mm]						ágyvezeték hézagok [mm] (elöl – hátul)												ütköző középpont magasság [mm]		f.váz-szekrény közötti elm.hat elem hézagérték [mm]	
							1		2		3		4		5		6		elöl	hátul	elöl	hátul
	1	2	3	4	5	6	A	B	A	B	A	B	A	B	A	B	A	B				
jobb	57	49	58	55	–	–													1050	1050	77	76
bal	55	53	57	55	–	.													1050	1050	72	74

A: keresztirányban B: hosszirányban

14/02 2010 09:20 0615112105 MAV|BIZT.IG.TER.VBO.BUDAPEST #4891 P.002/004

Rugózás típusa, állapota: Spirálrugó, rendben

Lengéscsillapítók típusa, fenntart. állapota: DK 140-50-50 A ; Rendben

Oldaltámok rendszere, fenntart. állapota: csúszóoldaltámaszos ; Rendben

Forgóvázkeret állapota: rendben

Vonókészülék típusa, fenntart. állapota: átmenő ; Rendben

A fékberendezés típusa: KE - P Száma: 030 85

Ki-be váltó állása: bekapcsolva Kézifék: Rendben

Raksúlyváltó állása: — Fékberendezés működőképessége: Rendben

3. A siklott kocsit ütköző középmagassága: Rendben

	Elöl	Hátul
jobb	1050	1050
bal	1050	1050

4. Megelőző kocsi psz.: 50 55 20-05 647

Ütköző középpont magasság:

Megelőző kocsi

	Elöl	Hátul
jobb		
bal		

5. Rongálás, sérülés leírása: kézifékes végen az alváz diagonáltartója sérült. Homlokfal lemez /kézifékes vég/ sérült.

6. Kerékterhelés mérés eredménye: —

7. Terelőerő mérés eredménye: —

8. Egyéb megállapítások: A csapágytokokon sérülés, zsírfolyás és egyéb sérülés nem tapasztalható. A csapágytokok helyzete üzemszerű állapotban van. A kézifékes végen lévő vonórudazat sérült (görbült) a siklásból adódóan. A forgóváz környezetében lévő alvázra szerelt csőkötések sérültek. A kocsi a siklásból származó sérülései miatt kp. esztergára utalva.

Budapest 2010 év 02. hó 10. nap

[redacted]

~~Személyszállítási Üzletág~~
MÁV-START Zrt.

[redacted]

~~Gépészeti Üzletág~~
MÁV-GÉPÉSZET Zrt.

Árufuvarozási Üzletág

[redacted]

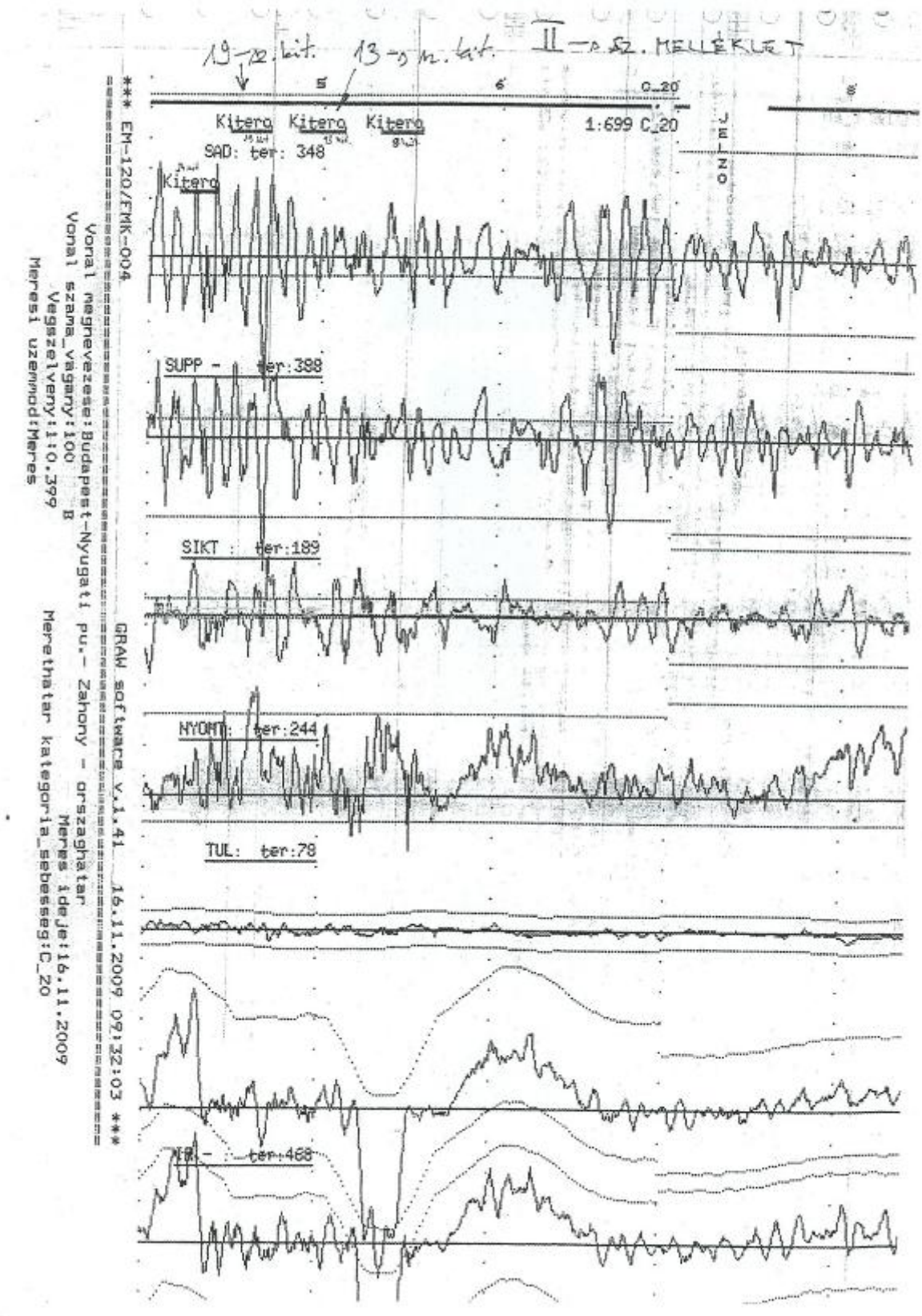
Vasútbiztonsági Osztály
balesetvizsgálója

Keréktávolság	1363	1357
Nyomszélesség	1426	1416
Abroncsvastagság	-	35
Nyomkarima magasság	36	28
Nyomkarima vastagság	33	27
Nyomkarima meredekség	-	6,5

k		$V_{jobb\ oldal}$
$m_{jobb\ oldal}$	$n_{jobb\ oldal}$	$q_{rjobb\ oldal}$
$m_{bal\ oldal}$	$n_{bal\ oldal}$	$q_{rbal\ oldal}$
t		$V_{bal\ oldal}$

	Dátum Aláírás	1.tengely			2.tengely			3.tengely			4.tengely			5.tengely	6.tengely
	2010.02.10.	1360		60	1360,5		60	1361		60	1361		60		
		32	32	12	31,5	31,5	12	32	31,5	12	32	32	12		
	[redacted]	32	32	12	32	31,5	12,5	31,5	31,5	12,5	32	32	12		
		90-126		60	90-126		60	90-125		60	90-125		60		
	Dátum Aláírás	1.tengely			2.tengely			3.tengely			4.tengely			5.tengely	6.tengely
	Dátum Aláírás	1.tengely			2.tengely			3.tengely			4.tengely			5.tengely	6.tengely
	Dátum Aláírás	1.tengely			2.tengely			3.tengely			4.tengely			5.tengely	6.tengely
	Dátum Aláírás	1.tengely			2.tengely			3.tengely			4.tengely			5.tengely	6.tengely
	Dátum Aláírás	1.tengely			2.tengely			3.tengely			4.tengely			5.tengely	6.tengely
	Dátum Aláírás	1.tengely			2.tengely			3.tengely			4.tengely			5.tengely	6.tengely
	Dátum Aláírás	1.tengely			2.tengely			3.tengely			4.tengely			5.tengely	6.tengely
	Dátum Aláírás	1.tengely			2.tengely			3.tengely			4.tengely			5.tengely	6.tengely
	Dátum Aláírás	1.tengely			2.tengely			3.tengely			4.tengely			5.tengely	6.tengely

Appendix 2: Graph done by the test train



Appendix 3: Track inspection after the accident

mérési pont (aljanként)	nyomtávolság (mm)	eltérés a névleges nyomtávtól (mm)	túlemelés (mm)	megjegyzés
0	1470	35	3	A 16a kitérő csúcssínjeinek elejével egy magasságban
1	73	38	4	
2	70	35	3	
3	68	33	4	
4	64	29	6	
5	60	25	7	
6	56	21	7	
7	55	20	5	
8	50	15	5	
9	49	14	5	
10	49	14	5	
11	52	17	6	
12	54	19	6	
13	54	19	6	
14	55	20	4	a jobb sínszál futófelületén kb. 8 alj hosszon gyalulási, marási nyom látható a
15	55	20	4	
16	57	22	7	
17	57	22	8	
18	58	23	8	
19	57	22	8	(Illesztés a 19. aljnál, a haladás szerinti jobb sínszálon)
20	71	36	8	
21	80	45	8	
22	80	45	8	
23	88	53	6	
24	92	57	3	a bal sínszálon siklási nyom
25	96	61	0	
26	a vonat (vezérlőkocsi) vége			
27				
28				
29				
30				
31				a jobb sínszálon siklási nyom

Appendix 4: Response of MÁV Zrt. to the Draft Report

A 2010.02.09-én Bp. Nyugati pályaudvaron történt kocsi-kisiklásról készített Zárójelentés-tervezet Biztonsági ajánlásában foglaltakkal nem értünk egyet!
Az egy kocsi kisiklásából és az 1.18. pontban felsorolt korábbi négy hasonló eseményből azt a következtetést levonni, hogy

> *„a vasúti gyakorlatban üzemszerűvé vált, hogy a rendelkezésre álló erőforrások nem elegendőek a vasúti pályák és tartozékaik elvárt fenntartására, továbbá a munkaszervezés nem biztosítja a rendelkezésre álló erőforrások gyors és szakszerű felhasználását sem, miközben a társaságok működési engedélye ennek ellenkezőjét igazolja."*

túlzónak és elhamarkodottnak tartjuk.
A MÁV Zrt. felügyeleti rendszere és erőforrásai illetve a munkaszervezete a vasúti pálya jelenlegi állapotának, működtetésének megfelelő. A jelenlegi létszám és szervezet a pályafelügyelet ellátására, az üzemzavarok megszüntetésére és a baleset-megelőzésére elegendő.
A pályafenntartási szakaszmérnökségek mindig rendelkeznek akkora élő erővel, felszereltséggel és szakanyaggal, hogy a hibás helyek kiszűrhetők legyenek.

A vizsgálati anyag is tartalmazza, hogy a baleset bekövetkezésekor téli időjárási körülmények voltak, a siklás helyét kb. 20 cm-es hó takarta. Az alatta elhelyezkedő húzató már korábban elszakadt, „mely szakadás az eseménynek nem következménye" (1.8.2.). A hiányosság észlelésére, a balest megelőzésére lehetőség sem volt.
Bp. Nyugati-pu. régi vágányhálózatának állapota miatt a VII-XVII. vágányokon (a 0-7 szelvények között) 20 km/ó sebességkorlátozás van bevezetve 2008 óta. A pályaudvar átépítése, vágányainak korszerűsítése évek óta szükséges lenne, amely feladat a fejpályaudvarok korszerűsítési koncepciójának része. Azonban ennek megvalósítására forráshiány miatt eddig nem került sor.
A vágányok forgalom-biztos állapotban tartása a feladatunk, amelyhez ideiglenes, átmeneti megoldás a húzatók beépítése. Ezeknek aljcserével történő kiváltása saját erővel is elvégezhető feladat.

A zárójelentés-tervezet 1.16.2 Vágányok mérése című fejezetben leírtakkal kapcsolatban az alábbi az észrevételünk:
A kitérővizsgálati könyvben az egyszerű kitérőnél 19 helyen kell mérést végezni, míg az átszelési kitérőnél 58 mérési hely van. Ugyanakkor külön rovat áll rendelkezésre a kitérő „A" és „B" végén rögzített adatoknál a „Vizsgálat során tapasztalt hiányosságok" bejegyzésére. A csatlakozó pálya, kitérők közötti vágányrészek méréseit itt lehet rögzíteni.