



MINISTRY OF TRANSPORTS AND INFRASTRUCTURE
ROMANIAN RAILWAY AUTHORITY - AFER

ROMANIAN RAILWAY INVESTIGATING BODY



INVESTIGATING REPORT

on the railway accident
occurred on the 20th of May 2011 in the railway station CFR Gheorghieni on the range of activity of
CFR Brasov Regional Branch



*Final report
The 8th of June 2011*

NOTICE

With reference to the railway accident occurred on the **20th of May 2011**, at **1:30 p.m.**, on the range of activity of **CFR Brasov Regional Branch**, the running section Brasov - Deda (simple line electrified), **in the railway station CFR Gheorghieni**, at the passing over the switch no. 6, on the area of the cross core **consisting of the derailment by the first axle of the first bogie in the running direction of the locomotive EA 179 towing the freight train no. 50562-1**, belonging to the freight railway undertaking SC UNIFERTRANS SA Bucharest, Romanian Railway Investigating Body carried out an investigation, according to the provisions of the Government Decision no. 117/2010. Through the investigation, the information on the respective accident was gathered and analyzed, the conditions were established and the causes determined.

Romanian Railway Investigating Body investigation did not aim to establish the guilty or the responsibility in this situation.

Bucharest, the 8th of June 2011

Approved by
Dragoş FLOROIU
Director

*I agree the compliance with the
legal provisions on the
investigation performance and
drawing up of this Investigation
Report, that I submit for approval*

Chief Investigator
Nicu PĂLĂNGEANU

This approval is part of the Report for the investigation of the accident occurred on the 20th of May 2011, at 1:30 p.m., on the range of activity of CFR Brasov Regional Branch, the running section Brasov-Deda (simple line electrified), in the railway station CFR Gheorghieni, on the switch no. 6, consisting of the derailment by the first axle of the locomotive EA 47-6-0179-7 towing the freight train no. 50562-1.

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I. PREAMBLE

I.1. Introduction

With reference to the railway accident occurred on the **20th of May 2011**, at **1:30 p.m.**, on the range of activity of **CFR Brasov Regional Branch**, the running section Brasov - Deda (simple line electrified), **in the railway station CFR Gheorghieni**, at the passing over the switch no. 6, on the area of the cross core **consisting of the derailment by the first axle of the first bogie in the running direction of the locomotive EA 179 towing the freight train no. 50562-1**, belonging to the freight railway undertaking SC UNIFERTRANS SA Bucharest, Romanian Railway Investigating Body carried out an investigation, according to the provisions of the Government Decision no. 117/2010, in order to prevent accidents with similar causes by establishing the conditions and determining the causes.

Romanian Railway Investigating Body investigation did not aim to establish the guilty or the responsibility in this situation, its objective being to improve railway safety and to prevent railway incidents or accidents.

I.2. Investigation process

According to the provisions of the art. 48, paragraph 1 of the Regulations for the investigation of the accidents and incidents, for the development and improvement of Romanian railway and subway safety, approved by Government Decision no. 117/2010, on the 20th of May 2011 Romanian Railway Investigating Body decided to start an investigation regarding the accident occurred on the range of activity of **CFR Brasov Regional Branch**, the running section Brasov-Deda (simple line electrified), **in the railway station CFR Gheorghieni**, at the passing over the switch no. 6, on the area of the cross core **consisting of the derailment by the first axle of the first bogie in the running direction of the locomotive EA 179 towing the freight train no. 50562-1**, belonging to the freight railway undertaking SC UNIFERTRANS SA Bucharest.

Taking into account that what occurred is defined as accident, according to the art. 3 point 1 of the Law 55/2006 on railway safety and that this accident is relevant for the railway system, under the article 19 paragraph (2) of the Law no. 55/2006 on railway safety, corroborated with the art. 49, paragraph 2, letter a) of the, the OIFR director decided to start an investigation. So, through the decision no. 58 from the 23rd of May 2011, of the OIFR director, the investigation commission was appointed consisting of:

- | | | |
|------------------|--|---------------------|
| ▪ STOIAN Eduard | - Head of Service of the Structural Subsystems Failures Investigation and Interoperability Constituents – OIFR | - main investigator |
| ▪ PAUL Sever | - Investigator II – OIFR | - member |
| ▪ MORUȘCA Mihai | - Territorial State Inspector-ISF Brasov | - member |
| ▪ BOACĂ Gheorghe | - Head of Division L-CF Brasov Regional Branch | - member |
| ▪ DRĂGHICI Marin | - Head of Division - SC UNIFERTRANS SA Bucharest | - member |

A. BRIEF PRESENTATION OF THE ACCIDENT

A.1. Brief presentation

On the **20th of May 2011**, at **1:30 p.m.**, on the range of activity of **CFR Brasov Regional Branch**, the running section **Brasov - Deda** (simple line electrified), **in the railway station CFR Gheorghieni**, at the passing over the switch no. 6, occurred the **derailment by the first axle of the first bogie in the running direction of the locomotive EA 179 towing the freight train no. 50562-1**, belonging to the freight railway undertaking **SC UNIFERTRANS SA Bucharest**.

The freight train no. 50562-1 belonging to the freight railway undertaking **S.C. UNIFERTRANS SA Bucharest**, was running on the section **Barbosi-Valea lui Mihai** and had in composition the towing locomotive **EA 179** to which were linked a number of 33 wagons **Fas empty** and the pushing locomotive **EA 843**.

Both locomotives were served by staff belonging to the freight railway undertaking **SC UNIFERTRANS SA Bucharest**.

There were no deaths or injuries in this accident.

A.2. Direct cause, contributing factors, underlying causes and root causes

A.2.1. The direct cause of the occurrence of this accident was the side threshold created at the insulating joint (of polarity) near the expansion joint between the rail end on the right of the transition panel 49/60 and the rail end on the direct from the heel of the crossing core of the switch no. 6, which allowed the escalation of the rolling surface of the graft rail of the core by the wheel bandage rim on the right of the first axle of the first bogie of the locomotive, the rolling of the bandage rim of this wheel on the rail head to the top of the crossing core, followed by the fall of the wheel on the right of the side rail.

Contributing factors at the forming of the side threshold were:

- the mechanic wear of the top side of the sleeper next to the joint of the insulating joint and of the next sleeper on the transition coupon 60/49 from the switch no. 10;
- the untightened coach screws at the metallic plate on the right of the sleeper placed before the polarity joint;
- the horizontal screws from the polarity joint, which had the ends buried in the straps body on the right of the joint;
- The degradation of the technical condition of the lignopholium straps from the insulating joint on the right of the crossing core heel of the switch no. 6.

A.2.2. Underlying causes

None.

A.2.3. Root cause

None.

A.3. Severity level

According to the provisions of the art. 3, letter l of the Law no. 55/2006 on railway safety, the event through its consequences is categorized as railway accident.

According to the provisions of the art. 7, paragraph (1), letter b of the Regulations for the investigation of the accidents and incidents, for the development and improvement of Romanian railway and subway safety, approved by Government Decision no. 117/2010, the event is categorized as accident.

A.4. Safety recommendations

None.

This Investigating Report will be sent to Romanian Railway Safety Authority, to the manager of the public railway infrastructure CNCF “CFR” SA, to the freight railway undertaking SC UNIFERTRANS SA Bucharest.

B. INVESTIGATING REPORT

B.1. Description of the accident

On the 19th of May 2011 the freight train no. 50562-1, belonging to the railway undertaking SC UNIFERTRANS SA Bucharest, was sent from the railway station CFR Barbosi, at 7:35 p.m., having as destination the railway station CFR Valea lui Mihai.

The train was composed of the towing locomotive EA 179, after which were 33 wagons Fas empty and the locomotive EA 843 running as towed vehicle according to the traffic order no. 00085835 delivered by the railway station Siculeni. The train belonged to the freight railway undertaking SC UNIFERTRANS SA Bucharest, was driven and served by staff belonging to the same railway undertaking.



● - place of the accident

The running of the train from formation to the moment of the accident occurrence was without technical or railway safety problems, on the range of CFR Brașov Regional Branch this having stops and stationing until the time of the accident occurrence in the railway stations CFR Livezi Ciuc, Siculeni and Voslabeni.

To perform the sending from the deviated line 5 on the current line to the railway station CFR Toplita the switches in the sending path were handled in the installation CED as follows:

-

Passing over the switch no. 6 attached to the heel, at the insulating joint composed of lignopholium straps from the right side in the running direction of the train, under the action of the horizontal force induced by the bandage rim of the wheel on the right of the axle no. 1 of the first bogie of the locomotive, occurred the displacement in horizontal plane of the two rail ends, followed by the local deformation of the lignopholium straps and the forming of a side threshold.

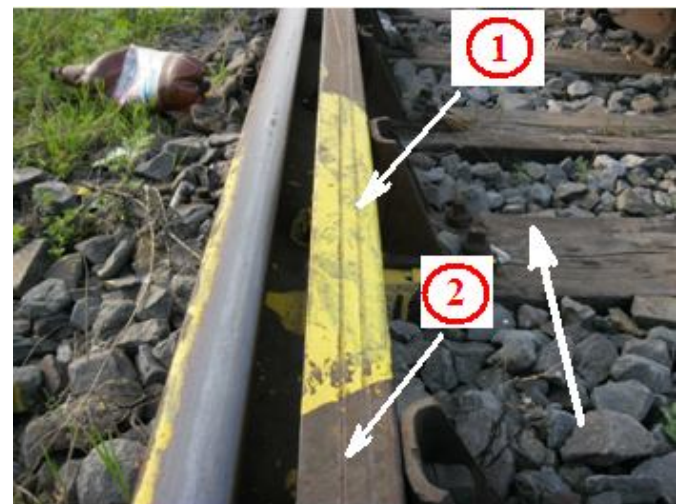
When the wheel on the right of the first axle of the first bogie of the locomotive hit and escalated the end of the graft rail of the crossing core of the switch no. 6 from the direct, the bandage rim of the wheel on the left of the same axle hit the end from the transition coupon of the checkrail near the core from the direct, escalated the checkrail and rolled on its top side to the area of the first 3 supports of the checkrail from the top joint of the core.



After passing by the top of the crossing core and the fall of the wheel on the right of the first axle on the right of the side rail, the bandage rim of the wheel on the left of the same axle rolled on the top side of the 3 supports from the top joint of the crossing core, then it fell on the right of the rail from which was fixed the checkrail.

The wheels of the axle no. 2 of the first bogie of the locomotive rolled normally to the stop of the train.

The axle no. 3 of the first bogie of the locomotive rolled with the bandage rim of the wheel on the left on the top side of the checkrail near the core from the direct, to the middle of this checkrail, then it went towards the rail on which was fixed this checkrail, rolling normally on it. As long as the bandage rim of the wheel on the left of the 3rd axle of the first bogie of the locomotive rolled on the top side of the checkrail near the core from the direct, the wheel on the right of the same axle was suspended. After getting back on the rail of the wheel on the left, the wheels of the 3rd axle rolled normally to the stop of the train.



- 1 – sign left by the bandage rim of the wheel on the left of the first axle of the first bogie
- 2 - sign left by the bandage rim of the wheel on the left of the 3rd axle of the first bogie

The locomotive ran in this way with the wheels bandages of the first axle rolling on the end of the vertical screws rods, to near the beams between the needles and counter-needles, where after the shocks occurred as consequence of their hit, the wheel on the left get back on the right counter-needle and the wheel on the right get back on the right needle (this was the position of the switch in the ordered path). Near the needles top the wheel on the right derailed on the right of the curved counter-needle and the wheel on the left of the same axle felt between the wires of the path.

The locomotive continued to run with the first axle derailed for a total distance of 43.39 m, then it stopped at 1.80 m before the heel joint of the core of the switch no. 2 as a result of the braking actions took by the locomotive driver.

B.2. Circumstances of the accident

B.2.1. Involved parties

The running section where the railway accident took place is managed by CNCF “CFR” SA and maintained by its employees.

The railway infrastructure and superstructure are managed by CNCF “CFR” S.A. and maintained by the employees of the Lines District 9 Gheorghieni in the Section L6 Gheorghieni, CFR Brasov Regional Branch.

Installations signaling, centralization and blocking (SCB) from the railway station CFR Gheorghieni are managed by CNCF “CFR” SA and maintained by the employees of the Section CT 4 Tg. Mures, CFR Brasov Regional Branch.

The installation of railway communications from the railway station CFR Gheorghieni is managed by CNCF “CFR” S.A. and maintained by the employees of SC TELECOMUNICATII CFR S.A.

The locomotive involved in the derailment and the installation of railway communications on the locomotive are the property of the railway undertaking SC UNIFERTRANS SA Bucharest and maintained by its employees.

B.2.2. Forming and equipments of the train

The freight train no. 50562-1 belonging to the freight railway undertaking SC UNIFERTRANS SA Bucharest was composed of 33 wagons Fas empty, having 132 axles, 831 gross tones, of which automatically braked according to the service book 416 tones, real automatically braked 922 tones, hand braked according to the service book 91 tones and real hand braked 181 tones and had a length of 572 meters.

The automatic brake of the train was active, the safety and vigilance equipments (DSV), the equipment for the point control of the speed and hitchhiking (INDUSI) in the equipment of the locomotive were active and instructionally working, the lever from the enclosure of the installation INDUSI which was on the position “M”, corresponding to the freight trains.

B.2.3. Railway equipments

Description of the railway path

The derailment occurred in the area of the switches in the Y end of the railway station CFR Gheorghieni which is located in alignment and slope of 0.2‰ (gradient in the running direction of the train).

The escalation of the crossing core of the switch no. 6 by the wheel on the right of the first axle of the locomotive (in the running direction of the train) occurred at the joint on the right from the core heel on the direct of this switch.



photo no. 1 – joint on the right of the running direction where occurred the escalation



photo no. 2 – forming of the side threshold at the passing of the rolling stock

Description of the railway superstructure

In the area of the accident occurrence the railway superstructure is composed of rail type 60, wooden sleepers, indirect clamping type K, path with joints.

The switch no. 6 on which occurred the escalation of the graft rail of the crossing core on the right from the direct of the switch no. 6 by the wheel on the right of the first axle of the locomotive, has the following features: type 60, radius $R=300$ m, tangent $tg=1:9$, right deviation (left in the running direction of the train because the switch was attacked from the heel), flexible needles, wooden sleepers, indirect clamping type K.

The line section between the switch no. 10 and the switch no. 6 is composed of a panel having transition panels 49/60, fixed on normal wooden sleepers, indirect clamping type K and the line section between the switch no. 6 and the switch no. 2 is composed of a panel of rails type 60, fixed on normal wooden sleepers, indirect clamping type K.

The polarity joints (insulating) from the core heel of the switch no. 6 are composed of lignopholium straps type 60.

B.2.4. Means of communication

The communication between the locomotive driver and the movement inspectors and between the locomotive driver and the party of the train was provided through the radio-telephone installations.

B.2.5. Triggering the railway emergency plan

Immediately after the occurrence of the railway accident, triggering the intervention plan to remove damages and restore trains traffic was performed in accordance with the provisions of the Regulations for the investigation of the accidents and incidents, for the development and improvement of Romanian railway and subway safety, approved by Government Decision no. 117/2010, so there came representatives of the manager of the public railway infrastructure (CNCI "CFR" SA - CFR Brasov Regional Branch), of the freight railway undertaking SC UNIFERTRANS SA Bucharest, of Romanian Railway Authority - AFER and of the Operative Department of Railway Transports Police.

B.3. Consequences of the accident

B.3.1. Deaths and injuries

None.

B.3.2. Material damages

The amount of the material damages in accordance with the estimates prepared by the owner of the rolling stock and by the manager of the public railway infrastructure is the following:

• at the locomotive EA 179	
according to the estimate no. 457/606/2011 prepared by	
SNTFC "CFR Calatori SA-CF Brasov Depot	6 042.98
lei	
• at the lines	none
• at the installations	none
Total amount of the damages	6 042.98 lei

B.3.3. Consequences of the accident in railway traffic

The railway traffic was affected as follows:

- from 1:30 p.m. to 7:22 p.m. the railway traffic was closed between the railway stations Gheorghieni-Toplita;
- **train delays:** - 4 passenger trains with a total of 509 minutes;
- **canceled trains:** - 4 passenger trains.

B.4. External circumstances

On the 20th of May 2011, between 1:00 p.m. - 2:00 p.m. the visibility was good and the air temperature was of about 20° C.

The visibility of the light signals was in accordance with the specific regulations in force.

B.5. Investigation course

B.5.1. Summary of the involved staff statements

The locomotive driver who drove the locomotive EA 47-6-0179-7, which towed the freight train no. 50562-1 stated as follows:

- he took over the locomotive EA 47-6-0179-7 at 1:30 p.m. in the railway station Gheorghieni to tow the train 50562-1 on the section Gheorghieni-Dej Triaj;
- after the train left from the railway station with the output signal with permissive indication and running of about 100 m he stopped the train by a quick braking, feeling strong vibrations under the locomotive;
- after stopping the train he went down from the locomotive and checked its condition, finding at the locomotive he was driving that the axle no. 1 was derailed by both wheels, near the rail head;

The driver assistant who served the locomotive EA 47-6-0179-7, which towed the freight train no. 50562-1 stated as follows:

- after taking over the locomotive, he left from the railway station Gheorghieni from the line 5 with the output signal with permissive light;
- passing over the switches at the exit of the railway station he felt strong vibrations under the locomotive ;
- the locomotive driver took actions of stopping the train;
- after stopping the train and going down from the locomotive, he found that the axle no. 1 of the locomotive in the running direction was derailed by both wheels near the rail head.

The movement inspector on duty in the railway station Gheorghieni on the 20th of May 2011, stated as follows:

- he received the train 50562-1 in the railway station Gheorghieni at the line 5 to be performed the exchange of staff “T”;
- after the staff exchange he sent the train with the signal X5 with the indication “green-yellow”;
- at the moment of the train scrolling he noticed that after running of a distance of about 10 wagons, the train stops;
- he went in the movement office where the locomotive driver announced him through the RTF that he had stopped the train because the first axle from the locomotive in the train head had derailed;
- on the lumino-scheme he found that all the indications were appropriate, without problems.

The head of the railway station Gheorghieni, stated as follows:

- he took part at the performance of the last inspection in the commission MLCT in the railway station Gheorghieni on the 12th of May 2011;
- at this inspection were not found irregularities at the isolated joint from the heel of the switch no. 6;

The team leader L in the District D9 Gheorghieni stated as follows:

- he performed the last fortnightly inspection in the railway station Gheorghieni on the 15th of April 2011;
- at this inspection there were not found irregularities at the isolated joint from the heel of the switch no. 6, there were no broken or leaped coach screws;

The head of the district L in the District D9 Gheorghieni stated as follows:

- he performed the last inspection in the commission MLCT in the railway station Gheorghieni on the 12th of May 2011;
- he inspected visually the isolated joint from the heel of the switch no. 6 and there were not found irregularities, the horizontal bolts were tightened and the gauge was in the instructional parameters.
- at the isolated joint from the heel of the switch no. 6 visually he did not find cracks at the straps, neither side threshold. The coach screws were weakened but were not broken. The sleepers with defects were not replaced because they were allowing traffic with reduced speed;
- he considers that the straps deformation occurred under the locomotive.

The path inspector in the District D9 Gheorghieni stated as follows:

- he performed the last inspection two days before the occurrence of the accident;
- at this inspection he did not visually notice irregularities, he did not notice inappropriate sleepers or broken or inclined coach screws, the lignopholium straps were not cracked or broken and the horizontal bolts were tightened.

The head of the district SCB in the District SCB Toplita stated as follows:

- he performed the last inspection in the commission MLCT on the 26th of January 2011, occasion on which he did not find anything special because of the large snow layer;
- the inspection on the 12th of May 2011 was performed by one of the substitutes as an electromechanical specialist;
- from the minute prepared on the 12th of May 2011 does not result that would have been found problems at the isolated joint from the heel of the switch no. 6.

B.5.2. Safety management system

At the moment of the railway accident occurrence, CNCF “CFR” SA as manager of the railway infrastructure had implemented its own railway safety management system, according to the provisions of the Directive 2004/49/CE on community railway safety, of the Law no. 55/2006 on railway safety and of the Order of the Minister of Transport no. 101/2008 on granting the security authorization to the administrator / management of railway infrastructure in Romania.

At the moment of the railway accident occurrence, S.C. UNIFERTRANS SA Bucharest as railway undertaking had implemented its own safety management system, according to the provisions of the Directive 2004/49/CE on community railway safety, of the Law no. 55/2006 on railway safety and of the Order of the Transport Minister no. 535/2007 on granting the safety certificate to perform railway transport services on Romanian railways.

B.5.3. Norms and regulations. Sources and references for the investigation

In the investigation of the railway accident one took into account:

norms and regulations

- Regulation for railway technical operation No. 002, approved by the Order of the Minister of Transports, Constructions and Tourism no. 1186 from the 29th of August 2001;
- The Order of the Traction General Direction no. 310/4/a/2800/col. 1993 – Technical operation conditions for the axles of the electric locomotives – CFR.
- Instruction for setting terms and order for the rail inspections no. 305 approved by OMT no. 71 on the 17th of February 1997;
- Instruction for the lineman head of district for the rail maintenance no. 323/1965;
- Instruction for the activity of the foreman for the maintenance of the line no. 322/1972;
- Instruction for the flagmen and rail or dangerous points inspectors no. 321/1972;

- Instruction of standards and tolerances for the construction and maintenance of the rail - standard gauge lines no. 314/1989;

sources and references

- copies of the documents required by the members of the investigation commission submitted as annexes to the investigation file;
- photos taken immediately after the railway accident by the members of the investigation commission;
- photos taken at the involved locomotive EA 179, taken at the place of the accident and at SC Locomotives Repairs Brasov SA-Repairs Section Brasov;
- documents on the lines maintenance provided by the responsible with their maintenance;
- results of the measurements performed immediately after the occurrence of the railway accident at the railway superstructure;
- inspection and interpretation of the technical condition of the elements involved in the accident: infrastructure, railway installations and train;
- questioning of the staff involved in the occurrence of the railway accident;

B.5.4. Work of the technical installations, of the infrastructure and of the rolling stock

B.5.4.1. Data found on the line

Technical condition of the line and of the path devices

The last maintenance work performed on the switch no. 6 from the railway station CFR Gheorghieni was performed on the 28th of September 2010 and consisted of checking the hidden sides.

The last inspection of the switch no. 6 when were performed checks of the gauge and of the cross level with the rail measuring pattern were performed on the 12th of May 2011. The measured values at that moment were not exceeding the tolerances admitted by the Instruction of standards and tolerances for the construction and maintenance of the rail - standard gauge lines no. 314/1989.

a) the diagonal between the switch no. 6 and the switch no. 2

The line section between the switch no. 6 and the switch no. 2 is composed of a panel with the length of 11.96 m composed of rails type 49, wooden sleepers, indirect clamping type K.

On this line section on the top ends of the vertical screws rods on the right of the left rail and of the right of the right rail were found signs of rolling of the bandages rims.

Also were found slight signs of polishing of the top edge of the metallic straps and of their horizontal screws ends.

b) measurements performed at the line

There were performed checks in static condition with the rail measuring pattern of the gauge and of the cross level at equidistance of 2.5 m, starting from the polarity joint in the opposite of the running direction of the train. The measured values were within the tolerances admitted by the provisions of the Instruction of standards and tolerances for the construction and maintenance of the rail - standard gauge lines no. 314/1989.

After the checks performed in static condition with the rail measuring pattern of the gauge and of the cross level on the two rails ends composing the heel joint of the crossing core of the switch no. 6 (the lignopholium joint), was found that between the gauge values was a difference of 8 mm, as consequence of the side threshold created.

This side threshold determined the escalation by the bandage rim of the wheel on the right of the first axle of the first bogie of the locomotive, of the rolling surface of the graft rail of the crossing core of the switch no. 6.

B.5.4.2. Data found on the work of the rolling stock and of its technical installations

Findings performed in the railway station CFR Gheorghieni at the locomotive EA 40-6-0179-7

- the locomotive EA 179 was stopped on the diagonal 2-6 with the first axle of the first bogie derailed at about 1.8 m before the heel joint of the core of the switch no. 2, the other axles of the first bogie not being derailed.
- the sides of the wheels on the left of the axles no. 1 and no. 3 of the first bogie had friction signs.



- the axles of the 2nd bogie of the locomotive were not derailed and were placed in the area of the switch no. 6 needles



photo no. 4

Findings performed at the locomotive EA 40-6-0179-7 at SC Locomotives Repairs Brasov SA-Repairs Section Brasov

- the locomotive wheelbase is of 10300 mm;
- the distance between the end axle and the intermediate axle of the bogie is of 2250 mm;
- the distance between the intermediate axle and the inner axle of the bogie is of 2100 mm;
- there were performed measurements of the bandages rates of the locomotive wheels, inclusively the rate “D”, the measured values being within the provided instructional values;
- after the measurement of the load on the axle and of the mechanic strokes were not found exceeding of the provided values;
- there were not found construction or functional defects of the cross coupling, the length of the couple being of 1009 mm (without being found the label with the value marked on the coupling);
- at the visual check of the axles were found hits on the bandage rim at the axle 1 wheel on the left and frictions on the outer sides of the bandages at the axles 1 and 3 wheels on the left;

After the reading and checking of the speedometer band of the locomotive EA 40-6-0179-7 performed in the Depot Brasov, according to the minute no. 453B/1137/2011, resulted that from the departure of the train to be sent from the deviated line no. 5 from the railway station CFR

Gheorghieni and to the stop after the derailment it ran 116 m. The maximum running speed was of 13 km/h.

B.6. Analysis and conclusions

B.6.1. Conclusions on the technical condition of the railway superstructure and geometry

In the area of the heel joint of the core on the direct, on the right in the running direction of the locomotive the inappropriate technical condition of the sleepers and of the assembly “joint” was inappropriate, which favored the forming of a side threshold, escalation of the rolling surface of the core graft rail by the bandage rim of the wheel on the right of the first axle of the first bogie, its rolling to the top of the core, followed by its fall on the right of the side rail.



photo no. 5 - technical condition of the joint which favored the escalation of the rail by the bandage rim of the wheel on the right in the running direction of the locomotive

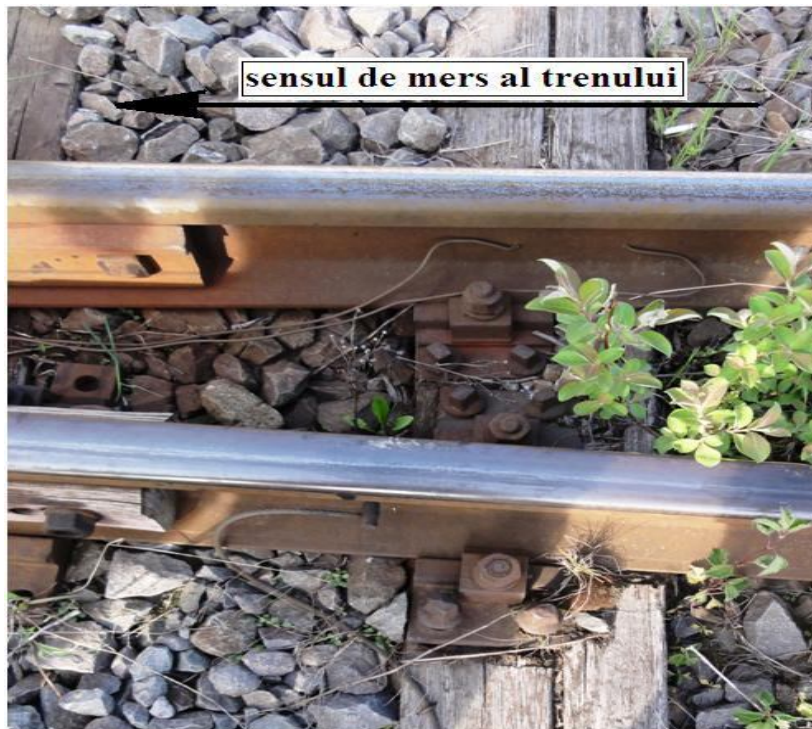


photo no. 6 - technical condition of the sleeper before the joint where the escalation occurred

B.7. Causes of the accident

B.7.1. The direct cause of the occurrence of this accident was the side threshold created at the insulating joint (of polarity) near the expansion joint between the rail end on the right of the transition panel 49/60 and the rail end on the direct from the heel of the crossing core of the switch no. 6, which allowed the escalation of the rolling surface of the graft rail of the core by the wheel bandage rim on the right of the first axle of the first bogie of the locomotive, the rolling of the bandage rim of this wheel on the rail head to the top of the crossing core, followed by the fall of the wheel on the right of the side rail.

Contributing factors at the forming of the side threshold were:

- the mechanic wear of the top side of the sleeper next to the joint of the insulating joint and of the next sleeper on the transition coupon 60/49 from the switch no. 10;
- the untighten coach screws at the metallic plate on the right of the sleeper placed before the polarity joint;
- the horizontal screws from the polarity joint, which had the ends buried in the straps body on the right of the joint;

The degradation of the technical condition of the lignopholium straps from the insulating joint on the right of the crossing core heel of the switch no. 6.

B.7.2. Underlying causes

None.

B.7.3. Root cause

None.

C. SAFETY RECOMMENDATIONS

None.

This Investigating Report will be sent to Romanian Railway Safety Authority, to the manager of the public railway infrastructure CNCF “CFR” SA, to the freight railway undertaking SC UNIFERTRANS SA Bucharest.

Members of the investigation commission:

- | | |
|------------------|---------------------|
| ▪ STOIAN Eduard | - main investigator |
| ▪ PAUL Sever | - investigator |
| ▪ MORUȘCA Mihai | - investigator |
| ▪ BOACĂ Gheorghe | - investigator |
| ▪ DRĂGHICI Marin | - investigator |